Digitron

Digital instruments for measurement

Humidity	Air Velocity
Dewpoint	Flow
Moisture in oil	Temperature
CO_2	

Strumentazione elettronica di misura

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OVERVIEW

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Building Automation / HVAC

Apart from pleasant temperature adapted air, humidity and low CO2-content are decisive for a comfortable room climate with optimized energy costs. Climatic measurement and regulation are not only crucial for the well-feeling factor but also play an important role for the conservation of exhibits

Meteorology

Humidity and temperature play an important role in meteorology. Exact measurement of these climatic values is the basis for appropriate forecasts and significant recordings. For demanding applications - like the requirement to recognize the danger of icing up - special solutions like heated humidity sensors have to be used

Automotive Industry

For more than 20 years customers have been placing their trust in humidity sensors. In the automotive industry capacitive humidity sensors are used in their millions in modern control circuits, disigned for the purpose of adapting fuel mixtures, controlling air conditioning systems or detecting fogged up windscreens

Pharma & Food Industry

Controlled production processes are essential for the production of high-quality and healthy food or in the pharmaceutical industry. The quality parameter humidity is indispensable in various kinds of food, pharmaceutical and cosmetic products.

Industrial Measurement

It could be argued that humidity plays a part in every industrial production process. The very fact that our own atmosphere contains water vapour bears witness to this fact even if it is only that the end product is likely to be stored and eventually used in our environment. The extent to which humidity plays a part in any given production process may vary but in many cases it is essential that, at the very least, it is monitored and, in most cases, controlled

Energy and Environmental Technology

Alternative energy sources are renewable and have lower carbon emissions, compared to conventional energy sources. These include energy generated out of biomass, wind, solar, geothermal or hydroelectric. Combined with the use of recycling, the use of clean alternative energies will help ensure man's survival into the 21st century and beyond. All renewable energy sources are given by nature and therefore vary in their behavior which has to be measured and monitored to be used effectively

Cleanroom Technology

A cleanroom is an environment, typically used in manufacturing or scientific research, that has a low level of environmental pollutants such as dust, airborne microbes, aerosol particles and chemical vapors. More accurately, a cleanroom has a controlled level of contamination that is specified by the number of particles per cubic meter at a specified particle size. in order to constantly monitor and control the climate, highly sophisticated measurment devices have to be installed

Agriculture

Lowering of energy costs, acceleration of growth and extension of the possible storekeeping duration can be optimized by the precise measurement of humidity, CO2-content and temperature. Optimum basic conditions for animals and plants ensure best agricultural products. As different applications demand various adopted solutions for optimization of agricultural processes, provides a broad portfolio of agricultural monitoring products

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HLX06 Series
HLX061 Series

Small Size Humidity / Temperature Transmitter for OEM Applications

The analogue humidity output provides according to model type, a current signal with 4-20mA or a voltage signal with 0-1V. A passive temperature output signal is available for both versions.
The voltage version can be ordered also with an active output.

Wide temperature and supply voltage ranges, excellent long term stability and the optional sensor coating allow the use in many applications.

Typical Applications

stables
green houses
humidifiers and dehumidifiers
monitoring of storage rooms

Features

very small dimensions
excellent price/performance ratio
very good long term stability
easy installation
optional sensor coating

Technical Data

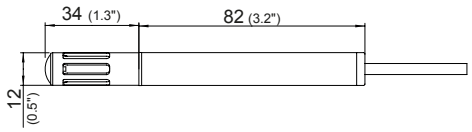
Measuring values	HLX06-x1 (voltage output)	HLX061-x6 (current output)
Relative humidity		
Sensor	HC101	HC105
Working range[1)]	0...100% RH	0...100% RH
Analogue output 0...100% RH	0-1 V -0.2 mA < I_L < 0.2 mA	4...20mA (two wire) R_L<500Ohm
Accuracy at 20°C (68°F), 12V DC	±3% RH (10...90% RH)	±3% RH (10...90% RH)
	±5% RH (<10% RH and >90% RH)	±5% RH (<10% RH and >90% RH)
Temperature dependence [% RH/°C]	model F/FT: -0.00035 x RH x (T-20°C)	model F/FP: typ. ±0.03
	model FP: typ. (-0.003 x RH + 0.01) x (T-20°C)	
Temperature active		
Sensor	Pt1000 (class A, DIN EN 60751)	
Analogue output -40...60°C (-40...140°F)	0-1 V -0.2 mA < I_L < 0.2 mA	
Accuracy at 12V DC, 20°C (68°F)	±0.3°C (±0.5°F)	
Temperature passive		
Output	resistive, 2 wire	resistive, 4 wire
Type of T-Sensor	refer to ordering guide	refer to ordering guide
General		
Supply voltage	4.5V DC - 30V DC	9V DC - 28V DC
Current consumption	typ. 1.5 mA	
Electrical connection	cable with 0.5m (1.6ft) or 3m (9.8ft)	cable with 0.5m (1.6ft) or 3m (9.8ft)
Housing	polycarbonate / IP65 in vertical mounting (filter cap upside)	polycarbonate IP65
Sensor protection	membrane filter, metal grid filter	membrane filter, metal grid filter
Electromagnetic compatibility	EN61326-1	EN61326-1 CE
	EN61326-2-3	EN61326-2-3
Temperature ranges	working temperature: -40...60°C (-40...140°F)	working temperature: -40...60°C (-40...140°F)
	storage temperature: -40...65°C (-40...149°F)	storage temperature: -40...70°C (-40...158°F)

1) Refer to the working range of the humidity sensor

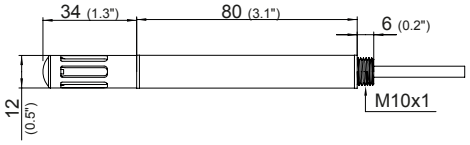
Dimensions (mm)

HLX06-x1 (voltage output)

Type A:

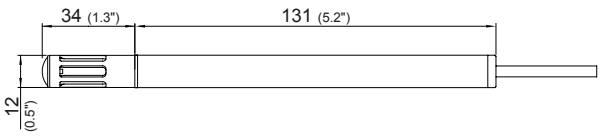


Type C:



HLX061-x6 (current output)

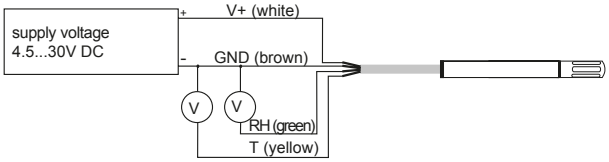
Type A:



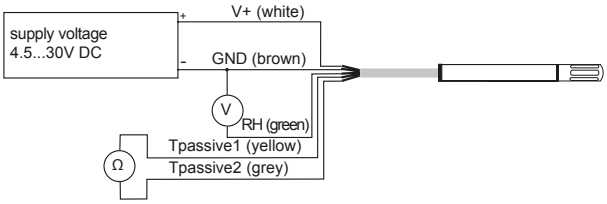
Connection Diagram

HLX06-x1 (voltage output):

with active T-output:

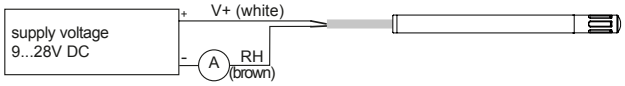


with passive T-sensor:

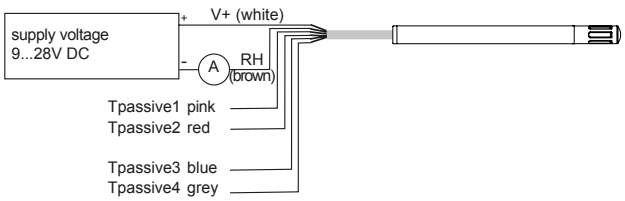


HLX061-x6 (current output):

with active humidity output:



with active humidity output and passive T-sensor:



Ordering Guide

HLX06 (Voltage Output):

MODEL	OUTPUT	T-SENSOR (passive only)	TYPE	FILTER	COATING	CABLE LENGTH
humidity + temperature (FT)	0 - 1V (1)	Pt 100 DIN A (A)	with housing (A)	membrane filter (1)	without coating (no code)	0.5m (1.6ft) (co code)
humidity (F)		Pt 1000 DIN A (C)	with thread (C)	metal grid filter (6)	with coating (HC01)	3m (9.8ft) (K300)
humidity+temperature passive (FP)		NTC 10K at 25°C (E)				10m (K1000)
HLX06-						

HLX061 (Current Output):

MODEL	OUTPUT	T-SENSOR (passive only)	FILTER	COATING	CABLE LENGTH
humidity (F)	4 - 20mA (6)	Pt 100 DIN A (A)	membrane filter (1)	without coating (no code)	0.5m (1.6ft) (co code)
humidity+temperature passive (FP)		Pt 1000 DIN A (C)	metal grid filter (6)	with coating (HC01)	3m (9.8ft) (K300)
		NTC 10K at 25°C (E)			10m (K1000)
HLX061-					

Order Example

HLX061-FP6A6HC01K300

model: humidity+temperature passive
output: 4 - 20mA
T-sensor: Pt 100 DIN A
filter: metal grid filter
coating: with coating
cable length: 3m

Accessories

For more information please refer to data sheet "Accessories"

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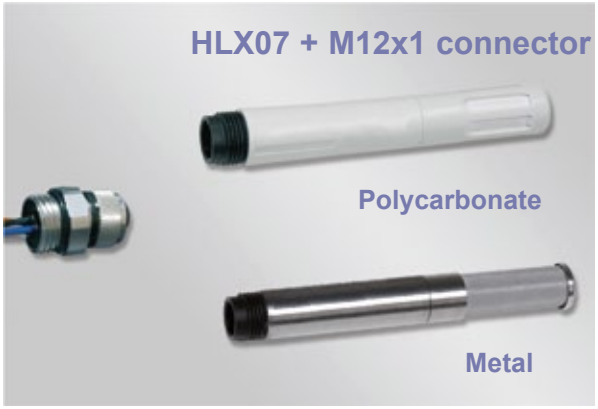
HLX07 Series

Interchangeable Humidity / Temperature Transmitter for OEM Applications

alterations according to customer specifications possible

The compact HLX07 humidity and temperature probe is based on a new electronic concept in combination with the miniaturized SMD humidity sensor element HC105 series.
A wide humidity and temperature working range, small dimensions of the polycarbonate or metal housing and appropriate filters allow for the use in a large variety of applications.

Calibration data and other measurement relevant functions (e.g. linearization or temperature compensation) are stored in the electronics, integrated in the probe. In combination with the M12 connector, replacement in seconds without readjustment of the evaluation electronics is guaranteed.
The digital output signal allows for easy processing of the measurement results and cost efficient interfacing to customers electronics.



Typical Applications

humidifiers and dehumidifiers
meteorological applications
climate and ventilation control
snowguns
OEM applications

Features

digital output
fast interchangeable
very small dimensions
highest accuracy
traceable calibration
easy interfacing to microcontroller

Technical Data

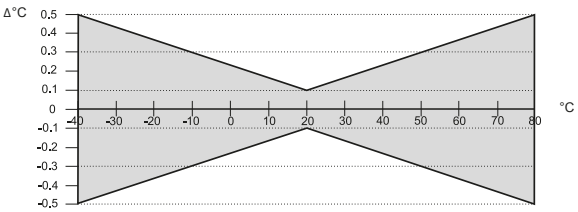
Measuring values

Relative Humidity

Sensor element	HC105
Digital output (2 wire)[1]	output value: 0.00...100.00% RH
Working range[2]	0...100% RH
Accuracy incl. hysteresis and nonlinearity	±2% RH (0...90% RH) ±3% RH (90...100% RH)
	Traceable to intern. standards, administrated by NIST, PTB, BEV...
Temperature dependence	< (0.025 + 0.0003 x RH) [$\frac{\%\,RH}{°C}$]

Temperature

Sensor element	Pt1000 (tolerance class A, DIN EN 60751)
Digital output (2 wire)[1]	output value: -40.00...+80.00°C (-40...176°F)
Accuracy (at 20°C: ±0,1°C)	



General

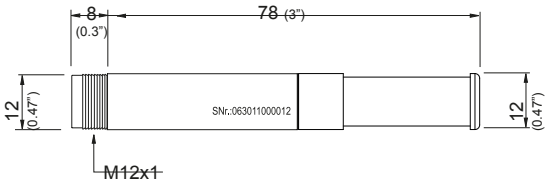
Supply voltage	3.8V DC - 5.5V DC
Current consumption	< 1.5mA
Housing	polycarbonate or stainless steel / IP65
Sensor protection	membrane filter, PTFE filter, metal grid filter (polycarbonate), metal grid filter (stainless steel)
Electromagnetic compatibility[3]	EN 61326-1 EN 61326-2-3
Temperature range	working temperature: -40...80°C (-40...176°F) storage temperature: -40...60°C (-40...140°F)
max. cable length[4]	30m (98.4ft)

CE

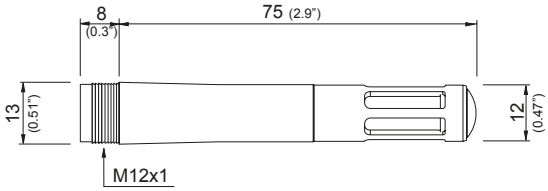
1) serial protocol
2) refer to the working range of the humidtiy sensor HC105
3) HLX07 is not protected against surge
4) dependent on selected Bus frequency

Housing Dimensions (mm)

Metal housing
HLX07-MFTx

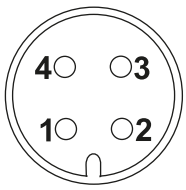


Polycarbonate housing
HLX07-PFTx



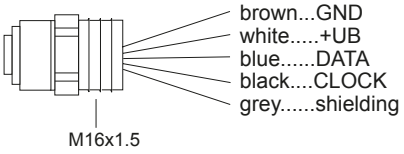
Connection Diagram

HLX07:



1...GND
2...+UB
3...DATA
4...CLOCK

M12x1 flange coupling with 50mm (2") litz wire (HA010705):



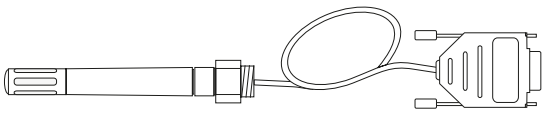
Ordering Guide

HOUSING		MODEL		FILTER		COATING	
metal	(M)	humidity and temperature	(FT)	membrane filter	(1)	without	(no code)
polycarbonate	(P)			PTFE filter	(5)	with	(HC01)
				metal grid filter (polycarbonate)	(6)		
				metal grid filter (stainless steel)	(9)		

HLX07-

Accessories

- E2 interface - RS232 converter: (HA011001)
  For first testing measurements by a PC is a RS232 converter available
- M12x1 flange coupling with 50mm (2") litz wire (HA010705)
- filter caps (HA0101xx)
- radiation shield (HA010502)



E2 interface - RS232 converter

Order Example

HLX07-PFT6

Housing:	polycarbonate
Model:	humidity and temperature
Filter:	metal grid filter (polycarbonate)

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HLX071

Low Power OEM Humidity / Temperature Transmitter with modbus interface

The digital humidity / temperature transmitter HLX071 is optimized for the flexible use in bus applications. The standard modbus RTU protocol is implemented on the RS485 interface. The modbus transmitter HLX071 is extremely energy efficient and also ideal for use in battery-powered devices.

Calibration data and all other measurement features like linearization and temperature compensation are stored in the electronic inside the probe.

By this HLX071 is interchangeable and the plug connection allows replacement within seconds. The humidity and temperature measured values as well as the calculated variables dew point and mixing ratio is available on the bus interface.

Typical Applications

battery powered equipment
data loggers
handheld meters

Features

highest accuracy
extreme low power consumption
calculated dew point and mixing ratio
replaced within seconds
digital output

Technical Data

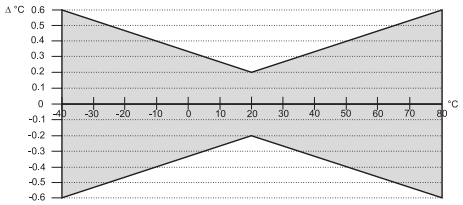
Measuring values

Relative Humidity

Sensor element	HCT01-00D
Digital output (2 wire)[1)]	output value: 0.00...100.00% RH
Working range	0...100% RH
Accuracy incl. hysteresis and nonlinearity	±2% RH (0...90% RH) ±3% RH (90...100% RH)
Temperature dependence	< (0.025 + 0.0003 x RH) [% rH/°C]

Temperature

Sensor element	Pt1000 (tolerance class B, DIN EN 60751)
Digital output (2 wire)[1)]	output value: -40.00...+80.00°C (-40...176°F)
Accuracy:	
±0.2°C at 20°C	
±0.6°C at the end of scale	



General

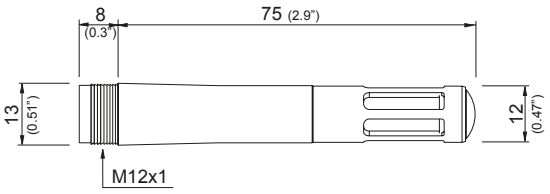
Supply voltage	4 - 18V DC
Current consumption	typ. 0.2mA (at a measuring rate of 1 sec. and without communication)
Max. current pulse during power-up)	at UB 7V: I_{max} 60mA <10mA after 350µs
(with serial resistance 100 Ohm)	at UB 12V: I_{max} 110mA <10mA after 400µs
Response Time	< 300ms
Output load	no bus termination no pullup or pulldown resistor } within probe
Interface / Bus	RS485 / Modbus in slavemode
Interface setting	9600 baud, 8 data bits, 1 stop bit, even parity
Housing	polycarbonat / IP65
Sensor protection	membrane filter, PTFE filter, metal grid filter (polycarbonate)
Electromagnetic compatibility [2)]	EN61326-1 EN61326-2-3
Temperature range	working temperature: -40...80°C (-40...176°F) storage temperature: -40...80°C (-40...140°F)
Max. cable length	100m (328,1ft)

CE

1) Modbus protocol

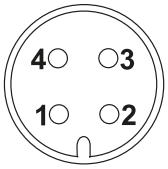
2) Module is not protected against surge

Housing Dimensions (mm)



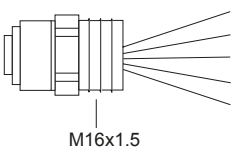
Connection Diagram

HLX071:



1...+UB
2...B-RS485
3...A-RS485
4...GND

M12x1 flange coupling with 50mm (2") litz wire (HA010705):



brown...+UB
white.....B-RS485
blue.....A-RS485
black....GND
grey.....shielding

Modbus Map

The measured values are saved as a 32Bit *float* value from 0x19 to 0x25 and as 16Bit *signed integer* between 0x27 and 0x2D. The factory setting for the Slave-ID is 247 as an *integer* 16Bit value.
This ID can be customised in the register 0x00 (value margin 1 - 247 permitted).

FLOAT:

Register addresse	*Protocol addresse*	*Parameter name*	
30026	19	Temperature	[°C]
30028	1B	Temperature	[°F]
30030	1D	Rel Humidity	[%]
30032	1F	Abs Humidity	[g/m³]
30034	21	Dew Point	[°C]
30036	23	Dew Point	[°F]
30038	25	Mixing ratio	[g/kg]

*INTEGER:**

Register addresse	*Protocol addresse*	*Parameter name*	
30040	27	Temperature	[°C]
30041	28	Temperature	[°F]
30042	29	Rel Humidity	[%]
30043	2A	Abs Humidity	[g/m³]
30044	2B	Dew Point	[°C]
30045	2C	Dew Point	[°F]
30046	2D	Mixing ratio	[g/kg]

* Values are stored with a scaling of 1:100
(e.g.: 2550 is equivalent to 25.5°C)

INTEGER:

Register addresse	*Protocol addresse*	*Parameter name*
40001	00	Slave-ID

The serial number is located as a128Bit value from 0x1D.

Ordering Guide

MODEL	HOUSING	FILTER	BAUD RATE	PARITY	STOPBITS
Humidity and Temperature (HT)	polycarbonat (P)	membrane filter (B)	9600 (A)	odd (O)	1 stopbit (1)
		metal grid filter (polycarbonat) (C)	19200 (B)	even (E)	2 stopbits (2)
		PTFE - filter (E)	38400 (C)	no parity (N)	
HLX071-					

Accessories

- M12x1 flange coupling with 50mm (2") litz wire (HA010705)
- filter caps (HA0101xx)

Order Example

HLX071- HTPBAO1

Model:	humidity & temperature
Housing:	polycarbonat
Filter:	membrane filter
Configuration:	baud rate 9600, even paity, 1 stopbit

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HLX08 Series

High-Precision Miniature Humidity / Temperature Transmitter

Accurate humidity / temperature measurement over a wide working range, fitted in a small-sized housing and high flexibility have been the main goals for the development of the HLX08 series.
Low power consumption and short start-up time support efficient energy management for battery operated systems.
For this application an additional version (V10) with supply voltage 4.5-15V DC has been developed.
Calibration data and other relevant functions like linearization or temperature compensation are stored in the probe. This feature, together with the optional connector, allows for easy replacement of the probe without a need for re-adjustment of the reading device (interchangeability).

The humidity and temperature measurement are available as analogue outputs (0-1/2.5/5V) and as a digital interface (E2-interface). Easy implementation and data processing is warranted.
Humidity and temperature reading can be re-adjusted using the calibration software; available as an accessory.

Typical Applications

meteorology / weather stations
humidity / temperature data logging
incubators
fermentation chambers
green houses
snow machines
dry storage facilities

Features

small dimensions
wide working range, high accuracy
traceable calibration
customer adjustment possible
interchangeable in seconds
low power consumption / short start-up time
analogue outputs / digital interface

Technical Data

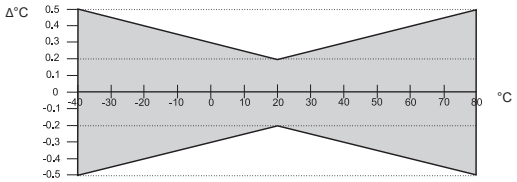
Measuring values

Relative Humidity

Sensor	HC101	
Working range[1)]	0...100% RH	
Digital output (2 wire)[2)]	output value: 0.00...100.00% RH	
Analogue output 0...100% RH	0-1/2.5/5/10V	-0.2mA < I_L < 0.2mA
Accuracy at 20°C (68°F) and 12V DC	±2% RH (0...90% RH)	±3% RH (90...100% RH)
	Traceable to intern. standards, administrated by NIST, PTB, BEV...	
	(typ. 0.02% RH/°F)	

Temperature

Sensor	Pt 1000 (DIN A)	
Digital output (2 wire)[2)]	output value: -40.00...+80.00°C (-40...176°F)	
Analogue output	0-1/2.5/5/10V	-0.2mA < I_L < 0.2mA
Accuracy at 12/24V DC		



General

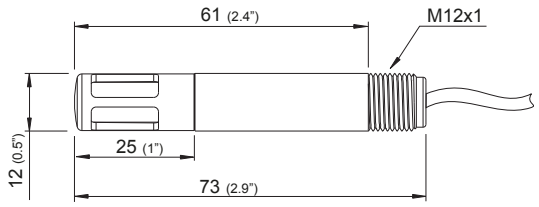
Supply voltage	output 0-1V / 0-2.5V	4.5-15V DC or 7-30V DC
	output 0-5V	7-30V DC
	output 0-10V	12-30V DC
Current consumption	typ. < 1.3mA	
Digital interface	E2-interface	level = 3.3V / ±0.1V
Housing	polycarbonate / IP65	
Sensor protection	metal grid filter	
Electromagnetic compatibility	EN61326-1	EN61326-2-3
	Industrial Environment	
Temperature ranges	working temperature: -40...80°C (-40...176°F)	
	storage temperature: -40...80°C (-40...176°F)	

CE

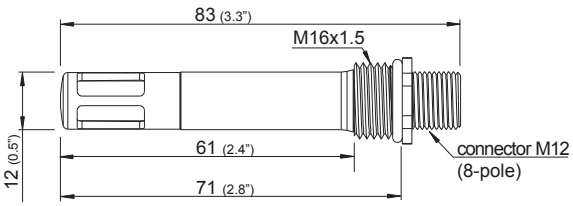
1) refer to the working range of the humidtiy sensor HC101
2) serial protocol

Dimensions (mm)

HLX08 with cable (Type E)



HLX08 with connector (Type D)



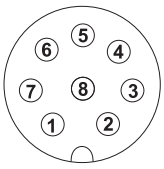
Connection Diagram

Type E:

	Temp. active	Temp. passive, 4-wire
T-passive	white (not connected)	white, black
T-passive	blue (not connected)	blue, violet
GND	pink	pink
T-out	grey	grey (not connected)
RH-out	yellow	yellow
SCL } E2-interface	green	green
SDA } E2-interface	brown	brown
+UB	red	red

Type D:

1	T-passive	
2	SDA }	E2-interface
3	SCL }	E2-interface
4	RH-out	
5	T-out	
6	GND	
7	T-passive	
8	+UB	



Ordering Guide

HOUSING	MODEL	OUTPUT	SUPPLY	T-SENSOR (passive, 4-wire)	TYPE
polycarbonate (P)	humidity active / temperature active (FT)	0 - 1V [1] (1)	4.5 - 15V DC (V10)	Pt 100 DIN A (A)	with connector (D)
	humidity active / temperature passive (FP)	0 - 2.5V [1] (7)	7 - 30V DC (V11)	Pt 1000 DIN A (C)	with cable (E)
		0 - 5V [2] (2)			
		0 - 10V [2] (3)			

HLX08-

1) possible with supply 4.5 - 15V DC (V10) or 7 - 30V DC (V11)
2) possible with supply 7 - 30V DC (V11) only

FILTER	COATING	CABLE LENGTH (Type E only)	T-SCALING
metal grid filter (6)	without coating (no code)	1m (3.3ft) (01)	-40...80 (T22)
	with coating (HC01)	2m (6.6ft) (02)	-40...60 (T02)
		5m (16.4ft) (05)	-30...70 (T08)
			-20...80 (T24)
			-20...50 (T48)
			other (Txx)

Order Example

HLX08-PFT2V11E602T22

housing:	polycarbonate	filter:	metal grid filter
model:	humidity active / temp. active	coating:	without
output:	0 - 5V	cable length:	2m (6.6ft)
supply:	7 - 30V DC	T-scaling:	-40...80°C (-40...176°F)
type:	with cable		

Accessories / Replacement Parts

- M12 connection cable for type D, length 1,5m (5ft) (HA010322)
- M12 connection cable for type D, length 3m (10ft) (HA010323)
- M12 connection cable for type D, length 5m (16.4ft) (HA010324)
- M12 connection cable for type D, length 10m (32.8ft) (HA010325)
- E2-interface - RS232 converter (incl. calibration software) for testing purposes and customer adjustment (HA011005)
- radiation shield (HA010506)
- M12 female socket with wires (HA010703)
- M12 female cable connector assembly possible (HA010704)
- metal grid filter (HA010113)

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Digitron

HLX10

HVAC Humidity / Temperature Transmitter for Indoor Applications

HLX10 room transmitters are the ideal solution for indoor applications such as HVAC in residential and official buildings. The very stylish, functional housing makes easy installation and fast exchange of the sensing unit for service purposes possible. The high quality humidity sensor and state-of-the-art microprocessor controlled electronics are the guarantee for best accuracy and a wide range of options.
The standard humidity output of HLX10 transmitters is 4 - 20 mA or 0 - 10 V. The temperature output signal can be active or passive.
All HLX10 versions can be equipped with a good legible LC display. For HLX10-FT versions the displayed values for humidity and temperature will alternate.
Two different housing designs ensure professional appearance according to regional standards.

Typical Applications

building management for residential and office areas
air conditioning in switching cabinets
climate control in hotels and museums

Features

excellent price / performance ratio
easiest installation
modern design
long term stable
optional display

Technical Data

Measuring Quantities

Relative Humidity

Humidity sensor	HC103	
Analogue output 0...100% RH	0-10 V	-1 mA < I_L < 1mA
	4-20 mA (two wires)	$R_L < (U_v-10)/0.02 < 500$ Ohm
Working range[1]	0...95 % RH	
Accuracy at 20°C (68°F) and U_v=24VDC	±2% RH (40...60% RH)	±3% RH (10...90% RH)
	Traceable to intern. standards, administrated by NIST, PTB, BEV...	
Temperature dependence at 60% RH	typical 0.06% RH /°C (0.03% RH / °F)	

Temperature (active output)

Analogue output 0...50°C (32...122°F)[2]	0-10 V	-1 mA < I_L < 1mA
	4-20 mA (two wires)	$R_L < (U_v-10)/0.02 < 500$ Ohm
Accuracy at 20°C (68°F) and U_v=24VDC	FT3: ±0.25°C (±0.45°F)	FT6: ±0.4°C (±0.72°F)

Temperature (passive output)

Type of T-Sensor	please see ordering guide

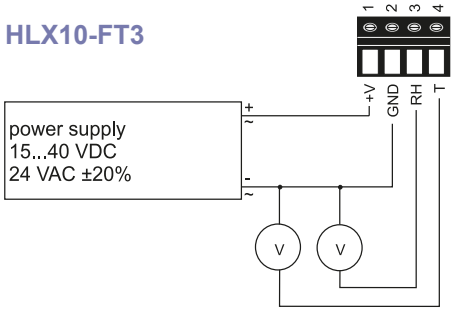
General Data

Voltage supply (U_v)		
for 0 - 10 V	15 - 40 VDC or 24 VAC ±20%	
for 4 - 20 mA	28V DC > U_v > 10 + 0.02 x R_L (R_L < 500 Ohm)	
Current consumption	for DC supply: typical 4 mA	
	for AC supply: typical 15 mA_{eff}	
Electrical connection	screw terminals max. 1.5 mm^2 (AWG 16)	
Housing	PC / IP30	
Display	for HLX10-FTx version	Humidity / Temperature alternating
	for HLX10-Fx and HLX10-FPx version	Humidity
CE compatibility according	EN61326-1	CE
	EN61326-2-3	
Temperature ranges	working temperature range:	-5...55°C (23...131°F)
	working temperature with display:	-5...55°C (23...131°F)
	storage temperature range:	-25...60°C (-13...140°F)

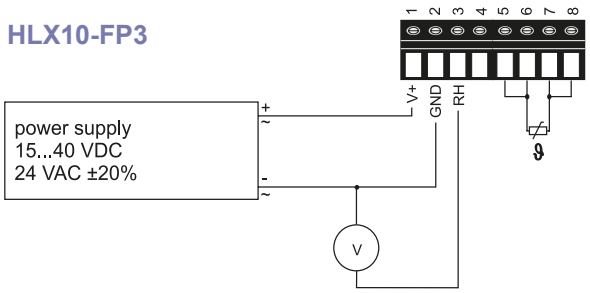
1) Please refer to the working range of the HC103
2) Other T-scaling refer to data sheet "T-Scalings"

Connection Diagram

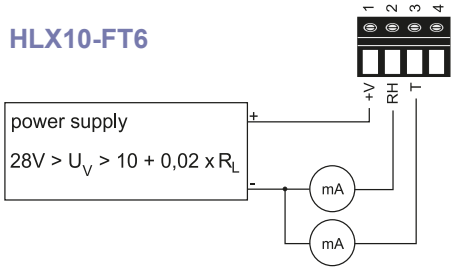
HLX10-FT3



HLX10-FP3

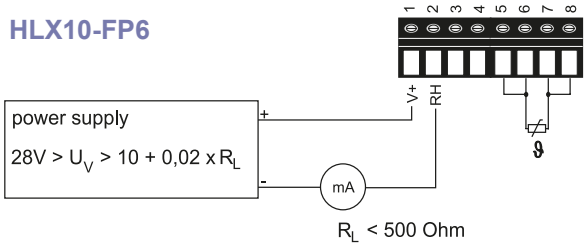


HLX10-FT6



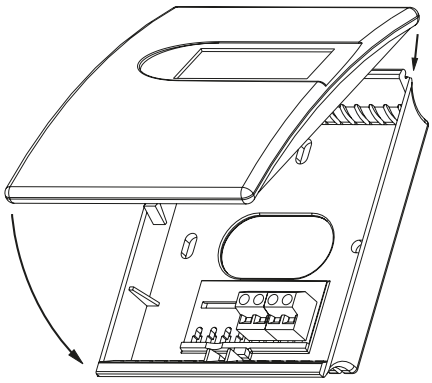
R_L < 500 Ohm

HLX10-FP6



R_L < 500 Ohm

Dimensions (mm)



Housing colour: Cover: RAL 9003 (signal white)
Back: RAL 7035 (light grey)

Europe: W x H x D = 85 x 100 x 26mm (3.3 x 3.9 x 1")
USA: W x H x D = 85 x 136 x 26mm (3.3 x 5.4 x 1")

Order Example

HLX10-FT3-D04-T04

Model:	humidity + temperature
Output humidity:	0-10V
Output temperature:	0-10V
Display:	with display
T-Unit:	°C
T-Scale:	0...50°C

Ordering Guide

MODEL	OUTPUT	T-SENSOR (only passive)	DISPLAY	HOUSING	T-UNIT	T-SCALE (only for FT)
humidity + temperature (FT)	0 - 10 V (3)	Pt 100 DIN A (A)	without display (--)	Europa (--)	°C (--)	0...50 (T04)
humidity+temp. passive (FP)	4 - 20 mA (6)	Pt 1000 DIN A (C)	with display (D04)	USA (US)	°F (E01)	-5...55 (T31)
						0...40 (T55)
						other (Txx)
HLX10-						

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HLX10-T Series

HVAC Temperature Transmitter for Indoor Applications

HLX10 room transmitters are the ideal solution for indoor applications such as HVAC in residential and official buildings.
The very stylish, functional housing makes possible easy installation and fast exchange of the sensing unit for service purposes.

The temperature output signal can be active or passive.

For on site display of the measured values the HLX10 with active temperature output can be equipped with an easily readable display.

Typical Applications

building management for residential and office areas
switching cabinets
climate control in hotels and museums

Features

excellent price / performance ratio
easiest installation
modern design
optional display

Technical Data

Measuring Quantities

Temperature (active output)

Analogue output 0...50°C (32...122°F)[1]	0-10 V	-1 mA < I_L < 1mA
	4-20 mA (two wires)	R_L < (U_v-10)/0.02 < 500 Ohm
Accuracy at 20°C (68°F)	±0.3°C (±0.54°F)	

Temperature (passive output)

Type of T-Sensor	please see ordering guide

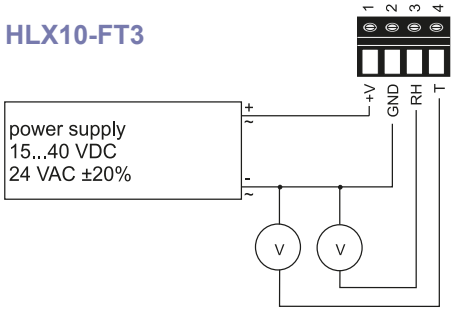
General Data

Voltage supply (U_v)		
for 0 - 10 V	15 - 40 VDC or	24 VAC ±20%
for 4 - 20 mA	28V DC > U_v > 10 + 0.02 x R_L	(R_L < 500 Ohm)
Current consumption		
for DC supply:	typical 4 mA	
for AC supply:	typical 15 mA_{eff}	
Electrical connection	Screw terminals max. 1.5 mm^2 (AWG 16)	
Housing / Protection class	PC / IP30	
Display	only for HLX10-Tx version: temperature	
CE compatibility according	EN61326-1	FCC Part15 ClassB
	EN61326-2-3	ICES-003 ClassB
Temperature ranges	Working temperature range:	-5...55°C (23...131°F)
	Working temperature with display:	-5...55°C (23...121°F)
	Storage temperature range:	-25...60°C (-13...140°F)

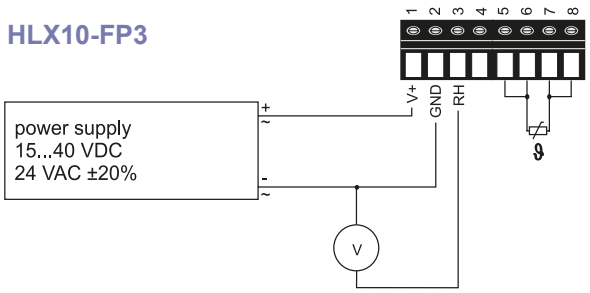
1) Other T-scalins refer to data sheet "T-Scalings"

Connection Diagram

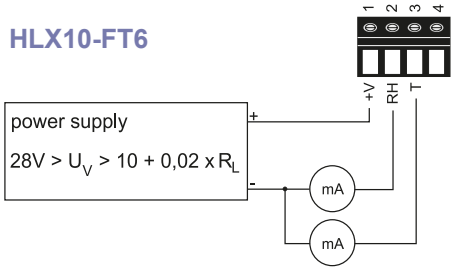
HLX10-FT3



HLX10-FP3

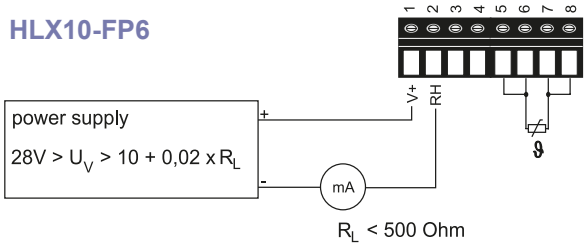


HLX10-FT6



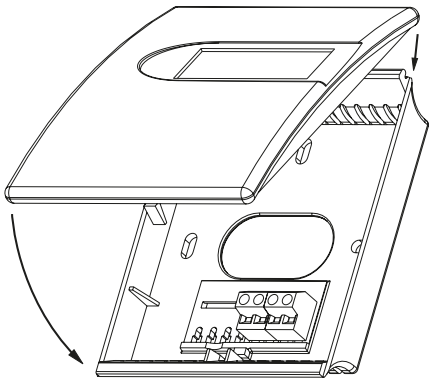
R_L < 500 Ohm

HLX10-FP6



R_L < 500 Ohm

Dimensions (mm)



Housing colour: Cover: RAL 9003 (signal white)
Back: RAL 7035 (light grey)

Europe: W x H x D = 85 x 100 x 26mm (3.3 x 3.9 x 1")
USA: W x H x D = 85 x 136 x 26mm (3.3 x 5.4 x 1")

Order Example

HLX10-FT3-D04-T04

Model:	humidity + temperature
Output humidity:	0-10V
Output temperature:	0-10V
Display:	with display
T-Unit:	°C
T-Scale:	0...50°C

Ordering Guide

MODEL	OUTPUT	T-SENSOR (only passive)	DISPLAY	HOUSING	T-UNIT	T-SCALE (only for FT)
humidity + temperature (FT)	0 - 10 V (3)	Pt 100 DIN A (A)	without display (--)	Europa (--)	°C (--)	0...50 (T04)
humidity+temp. passive (FP)	4 - 20 mA (6)	Pt 1000 DIN A (C)	with display (D04)	USA (US)	°F (E01)	-5...55 (T31)
						0...40 (T55)
						other (Txx)
HLX10-						

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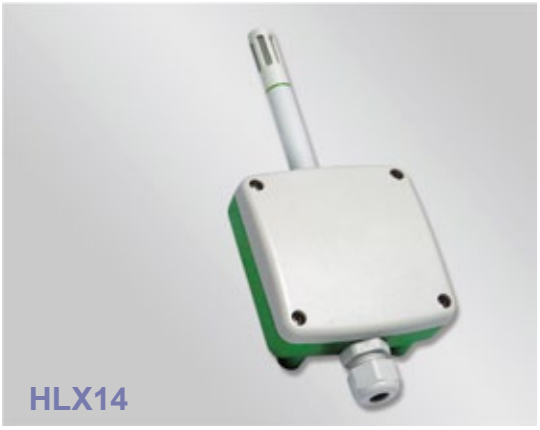
HLX14 Series

Hygrostats for Wall and Duct Mounting Applications

The HLX14 hygrostat is based on the well proved humidity sensors of the HC series, which guarantee excellent long term stability, low hysteresis and high resistance to pollutants. The switching threshold is freely adjustable in the range of 10...95% RH with a hysteresis which can be set independently between 3% and 15% RH.

HLX14 hygrostat is available for wall or duct mounting, the right choice of protection filter cap enables maintenance free function in heavily polluted environment.



Typical Applications

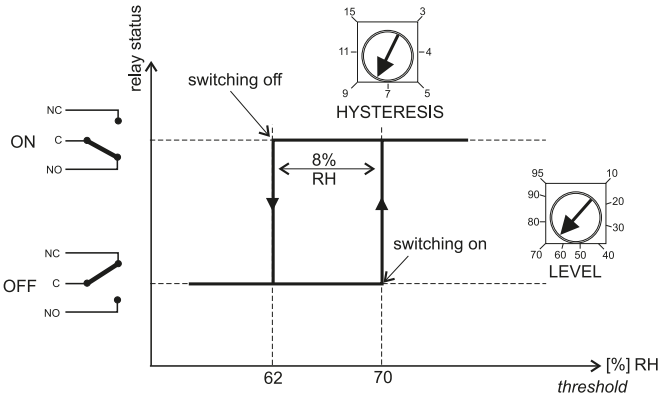
refrigeration
swimming halls
climate- and ventilation controls

Features

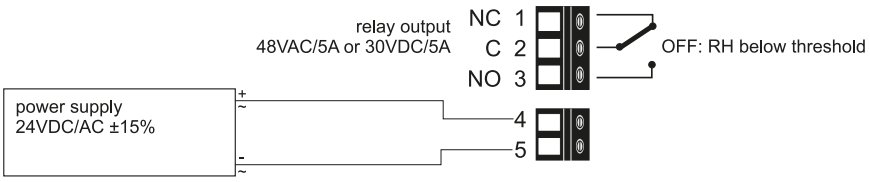
maintenance free operation
easy adjustment via poti
working range 10...95% RH
wettable

Working Principle

With a potentiometer it is possible to adjust the threshold between 10 and 95% RH. A second potentiometer is setting the switching-hysteresis between 3 and 15% RH.



Connection Diagram



Technical Data

Measuring value

Humidity sensor	HC101	
Output	centre-zero relay up to 30V DC / 5A or 48V AC / 5A	
	threshold	hysteresis
Setting range	10...95% RH	3...15% RH
Setting accuracy	± 3% RH	

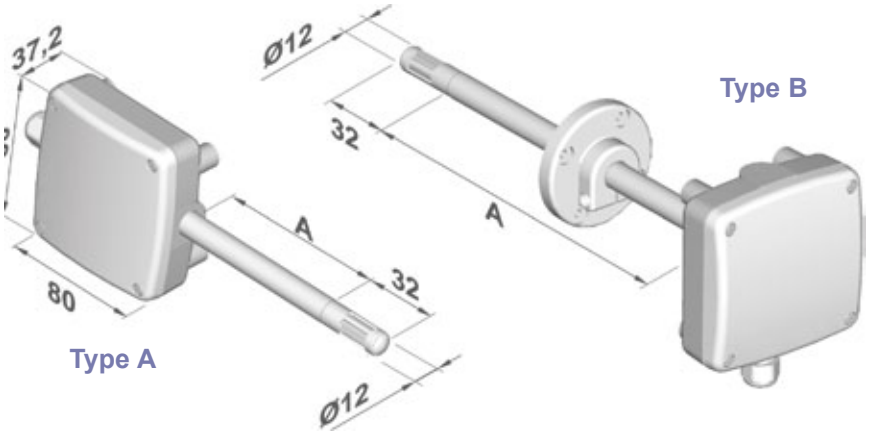
General

Supply voltage	24V DC / V AC ± 15 %	
Current consumption for DC supply	typ. 12 mA	
Electrical connection	screw terminals max. 1.5 mm^2 (AWG 16)	
Housing/ protection class	Polycarbonat / IP65, Nema 4	
Cable gland	M16x1.5; cable Ø 4.5 - 10 mm (0.18 - 0.39")	
Sensor protection	membrane filter, metal grid filter	
Electromagnetic compatibility	EN 50081-2	EN 50081-1
	EN 50082-2	
Temperature range	working temperature:	-5...50°C (23...122°F)
	storage temperature:	-30...60°C (-22...140°F)

CE

Housing Dimensions (mm)

1 mm = 0.03937"/ 1" = 25.4 mm



Ordering Guide

HOUSING		PROBE LENGTH (according to "A")		FILTER	
wall mounting	(A)	20 mm (0.7")	(1)	membrane filter	(1)
duct mounting	(B)	200 mm (7.9")	(5)	metal grid filter	(6)

HLX14-

Order Example

HLX14-A1

housing:	wall mounting
probe length:	20 mm (0.7")
filter:	membrane filter

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HLX16 Series

Humidity / Temperature Transmitter for HVAC Applications

HLX16 transmitters are the ideal solution for accurate measurement of relative humidity and temperature at a reasonable price in HVAC applications. The appropriate filter cap enables employment in heavily polluted environment.

The new developed humidity sensors HC101 guarantee excellent long term stability and resistance against chemical pollutants. Their excellent reproducibility allows a simple low-cost-one-point calibration for very good accuracy over the entire working range.

HLX16 transmitters are available as wall or duct mounted, with current or voltage output signals.

Typical Applications

building-automation
storage rooms
climate and ventilation control

Features

excellent price/performance ratio
wettable
long term stable
traceable calibration

Technical Data

Measuring values

Relative Humidity

Sensor	HC101	
Output appropriate 0...100% RH	0-10 V	-1 mA < I_L < 1 mA
	4-20 mA (two wire)	R_L < 500 Ohm
Working range[1)]	10...95% RH	
Accuracy at 20°C (68°F)	±3% RH	
	Traceable to intern. standards, administrated by NIST, PTB, BEV...	
Temperature dependence at 45% RH	typ. -0.05% RH /°C (-0.03% RH / °F)	

Temperature

Sensor	Pt1000 (class A, DIN EN 60751)	
Output appropriate 0...50°C (32...122°F)	0-10 V	-1 mA < I_L < 1 mA
	4-20 mA (two wire)	R_L < 500 Ohm
Accuracy at 20°C (68°F)[2)]	±0.3°C (±0.5°F)	

General

Supply voltage		
for 0 - 10 V	15 - 35V DC or 24V AC ±20%	
for 4 - 20 mA	10V + R_L x 20 mA < Uv < 35V DC	
Current consumption	for DC supply	typ. 8 mA
	for AC supply	typ. 20 mA_{eff}
Electrical connection	screw terminals max. 1.5 mm^2 (AWG 16)	
Housing / protection class	Polycarbonat / IP65; Nema 4	
Cable gland	M16 x 1.5	cable Ø 4.5 - 10 mm (0.18 - 0.39")
Sensor protection	membrane filter, metal grid filter, stainless steel sintered filter	
Electromagnetic compatibility	EN61326-1	
	EN61326-2-3	
Temperature range	working temperature:	-5...50°C (23...122°F)
	storage temperature:	-25...60°C (-13...140°F)

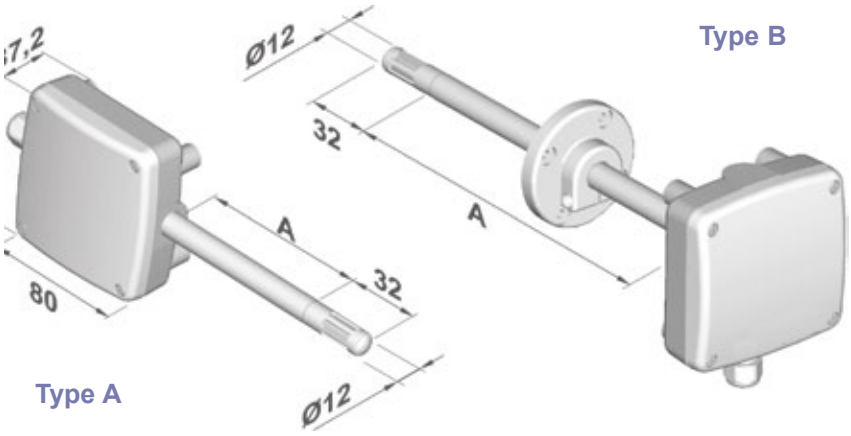
CE

1) Please refer to working range of HC101

2) Please note: temperature accuracy HLX16-x6xx2x: ±0.5°C (±0.9°F)

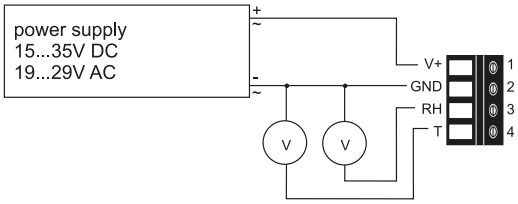
Housing Dimensions (mm)

1 mm = 0.03937" / 1" = 25.4 mm

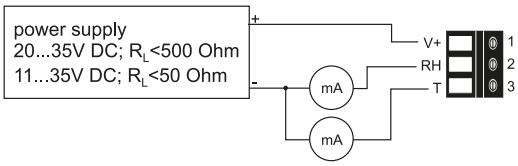


Connection Diagram

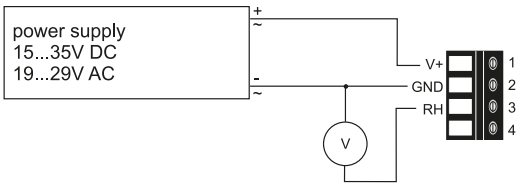
HLX16-FT3xxx



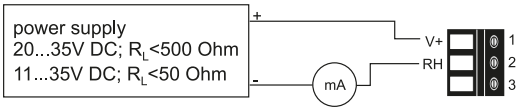
HLX16-FT6xxx



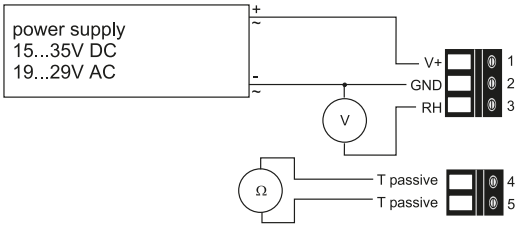
HLX16-F3xxx



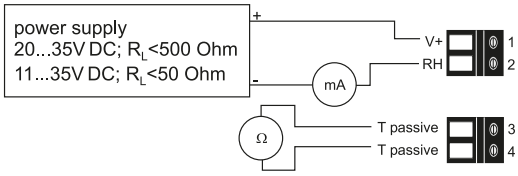
HLX16-F6xxx



HLX16-FP3xxx



HLX16-FP6xxx



Ordering Guide

MODEL	OUTPUT	T-Sensor (only model FP)	HOUSING	PROBE LENGTH (according to "A")	FILTER
humidity + temperature (FT)	0-10V (3)	Pt 100 DIN A (A)	wall mounting (A)	50 mm (1.9") (2)	membrane filter (1)
humidity (F)	4-20 mA (6)	Pt 1000 DIN A (C)	duct mounting (B)	200 mm (7.9") (5)	sintered stainless steel filter (3)
humidity + temperature passive (FP)		NTC 10k (E)			metal grid (6)
		others on request			
HLX16-					

Order Example

HLX16-F3A21

model:	humidity transmitter
output:	0-10V
housing:	wall mounting
probe length:	50 mm (1.9")
filter:	membrane filter

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HLX160

HVAC Humidity and Temperature Transmitter

Specially designed for HVAC, the HLX160 sensor is a coste effective highly accurate and reliable solution for measuring relative air humidity and temperature.
The enclosure minimizes installation costs and provides outstanding protection against contamination and condensation, thus ensuring flawless operation.

The HLX160 employs the new humidity/temperature sensor element HCT01 with excellent long term stability and resistance against pollutants. In combination with a long calibration experience, the HLX160 provides a measurement accuracy of ±2.5%RH and is available for wall or duct-mounted with current, voltage or Modbus RTU output.

A configurator makes it possible to freely select the scaling of the temperature output and configure the Modbus parameters. The configurator software, which is free of charge, allows additionally for an on-site adjustment of the humidity and temperature.

Easily Adapted for the US Market

» Knockout for ½" conduit fitting

External mounting holes

» Mounting with closed cover

» Electronics protected against construction site pollution

» Easy and fast mounting

Electronics on the Underside of the PCB

» Optimum protection against mechanical damage during installation

Bayonet Screws

» Open/closed with a ¼ rotation

Cast Electronics

» Mechanical protection

» Condensation-resistant

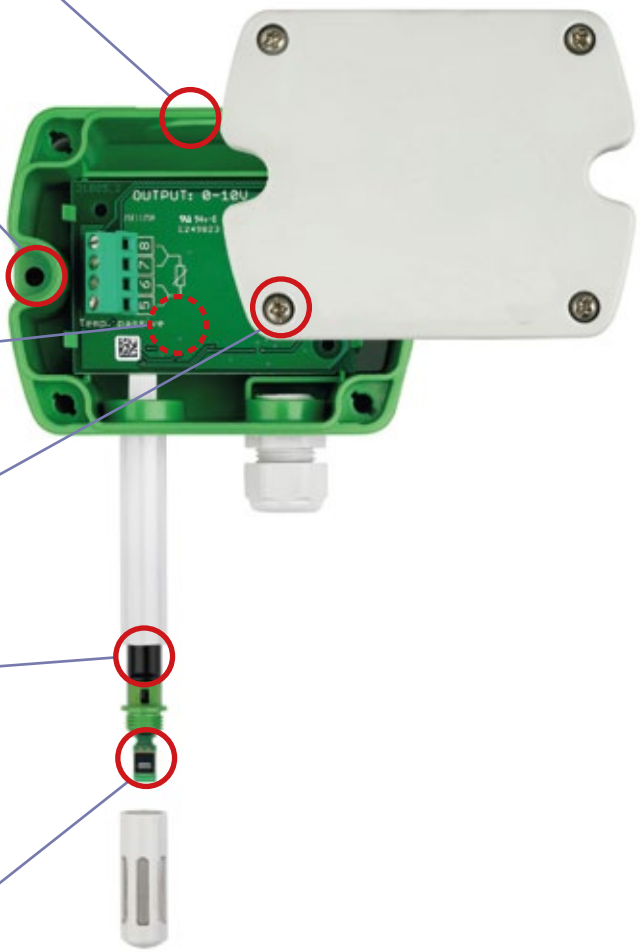
Humidity sensor HCT01

» Long-term stability

» Protected RH sensor surface

» Protected solder pads

» Tested according to automotive standard AEC-Q200



Technical data

Measured values

Relative Humidity

Sensor	Sensor HCT01-00D	
Analog output 0...100% RH	0-10 V	-1 mA < I_L < 1 mA oder
	4-20 mA (two-wire)	R_L < 500 Ohm
Digital output*	RS485	
Working range	10...95% RH	
Accuracy at 20°C	±2.5% RH	
Temperature dependency	typ. ±0.03% RH/°C	

Temperature

Sensor	Pt1000 (tolerance class B, DIN EN 60751)
Analog output[1)]	0-10 V
	4-20 mA
Digital output*	Modbus RTU
T-Accuracy at 20°C	±0.3°C
passive T-output	see ordering code

General

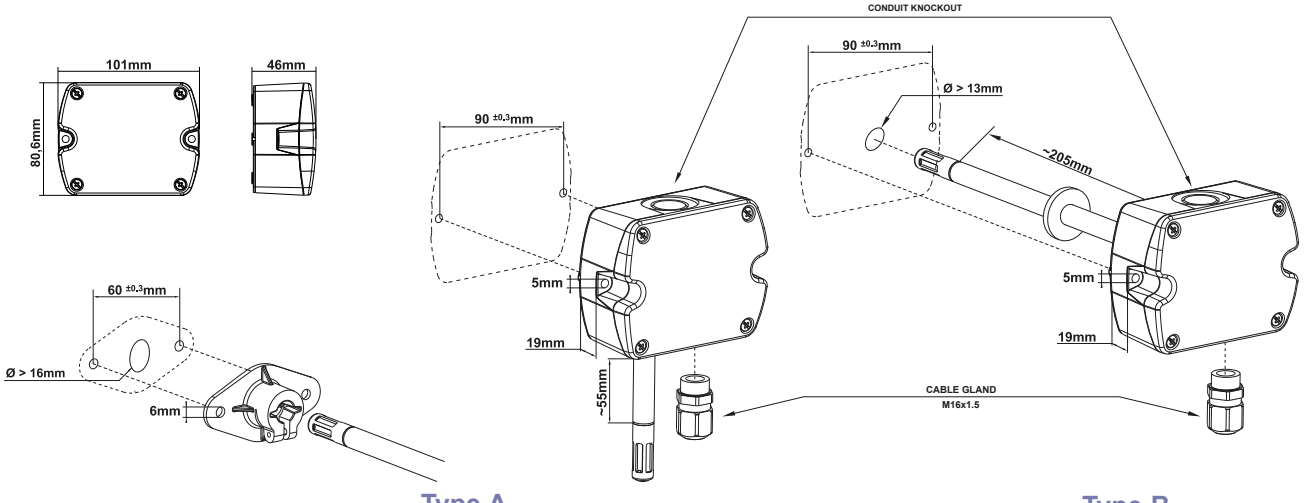
Power supply		
for 0 - 10 V / RS485	15 - 35V DC or 24V AC ±20%	
for 4 - 20 mA	10V + R_L x 20 mA < U_V < 35V DC	
Current consumption		
Analog	with DC power supply	typ. 5mA
	with AC power supply	typ. 13mA$_{eff}$
Digital*	with AC power supply	typ. 2mA
Connection	Screw terminals, max. 1.5 mm²	
Housing / protection class	Polycarbonate (UL listed) / IP65	
Cable gland	M16 x 1.5	
Sensor protection	membrane filter	
Electromagnetic compatibility	EN61326-1	
	EN61326-2-3	
Temperature ranges	Operating temperature:	-15...60°C (5...140°F)
	Storage temperature:	-25...60°C (-13...140°F)

CE

* Available from Q4/2012

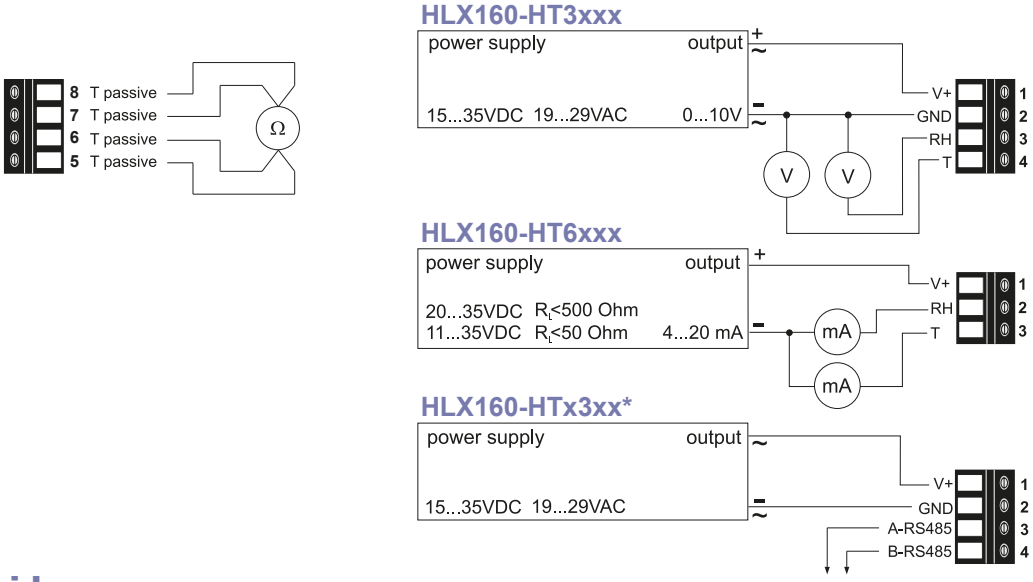
[1)] Output scaling see Ordering Guide

Dimensions (mm)



Type A Type B

Connection diagram



Ordering Guide

Configuration

MODEL		ANALOG[1]		DIGITAL[1]*		PASSIVE T-SENSOR[2]		HOUSING		TYPE		FILTER	
humidity + temperature	(HT)	0-10V	(3)	RS485	(3)	Pt 100 DIN A	(A)	polycarbonate	(P)	wall mount	(A)	membrane filter	(B)
		4-20mA	(6)	none	(x)	Pt 1000 DIN A	(C)			duct mount	(B)		
		none	(x)			NTC 10k	(E)						
						none	(x)						
EE160-													

Interface parameter - analog output

OUTPUT SCALING		SCALING		UNIT	
temperature	(Tx)	-30...40°	(001)	metric	(M)
		-40...60°	(002)	non-metric	(N)
		-10...50°	(003)		
		0...50°	(004)		
		other	(xxx)		

Interface parameter - digital output*

PROTOCOL		BAUDRATE		PARITY		STOPBITS		UNIT	
modbus	(1)	9600	(A)	odd	(O)	1 stopbit	(1)	metric	(M)
		19200	(B)	even	(E)	2 stopbit	(2)	non-metric	(N)
		38400	(C)	no parity	(N)				

[1] a combination of analog and digital version is not possible [2] analogue version only
* Available from Q4/2012

Accessories

- HLX160 Cable for configuration adapter (HA011059)*
- Configuration adapter (HA011050)

* only for HLX160 analog version

Order example

Analog output

HLX160-HT6xAPAB/Tx001M

Model:	humidity + temperature transmitter
Analog output:	4-20mA
Passive T-Sensor:	Pt 100 DIN A
Housing:	polycarbonate
Type:	wall mounting
Filter:	membrane filter
Output scaling:	temperature
Scaling:	-30...40°
Unit:	metric

Digital output

HLX160-HTx3xPBB/1AE1N

Model:	humidity + temperature transmitter
Digital output:	RS485
Housing:	polycarbonat
Type:	duct mounting
Filter:	membrane filter
Protocol:	Modbus
Baudrate:	9600
Parity:	even
Stopbits:	1
Unit:	non-metric

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HLX16-T Series

Temperature Transmitters for HVAC Applications

HLX16 temperature transmitters are the ideal solution for accurate measurement of temperature in the range 0...50°C (32...122°F) in HVAC applications.

HLX16 temperature transmitters are available as wall or duct mounted with current or voltage output signals.

Typical Applications

building-automation
storage rooms
climate and ventilation control

Features

excellent price/performance ratio

Technical Data

Measuring values

Temperature (active output)

Sensor	Pt1000 (class A, DIN EN 60751)	
Output appropriate 0...50°C (32...122°F)	0-10 V	-1 mA < I_L < 1 mA
	4-20 mA (two wire)	R_L < 500 Ohm
Accuracy at 20°C (68°F)[1)]	±0.3°C (±0.5°F)	

Temperature (passive output)

Type of T-Sensor	please see ordering guide

General

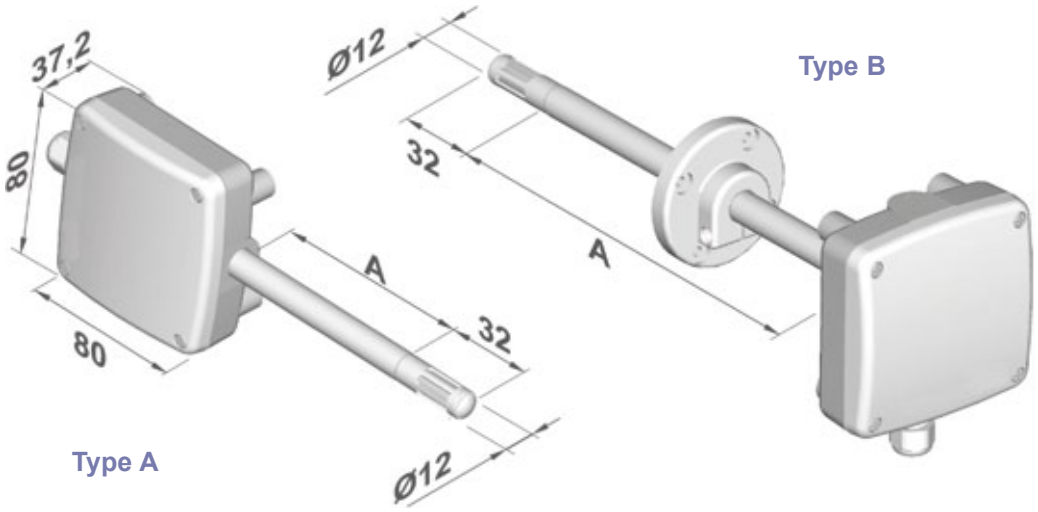
Supply voltage		
for 0 - 10 V	15 - 35V DC or	24V AC ±20%
for 4 - 20 mA	10V + R_L x 20 mA < U_v < 35V DC	
Current consumption	for DC supply	typ. 8 mA
	for AC supply	typ. 20 mA_{eff}
Electrical connection	screw terminals max. 1.5 mm^2 (AWG 16)	
Housing / protection class	Polycarbonate / IP65, Nema 4	
Cable gland	M16x1.5	cable Ø 4.5 - 10 mm (0.18 - 0.39")
Sensor protection	membrane filter or plastic grid	
Electromagnetic compatibility	EN61326-1	
	EN61326-2-3	
Temperature range	working temperature:	-5...50°C (23...122°F)
	storage temperature:	-25...60°C (-13...140°F)

CE

1) Please note: temperature accuracy HLX16-T6x2x: ±0.5°C (±0.9°F)

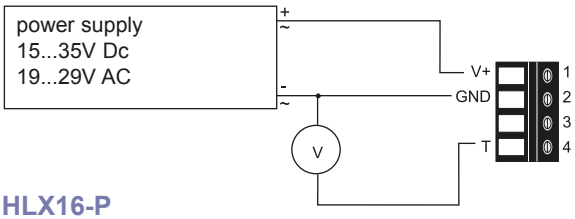
Dimensions (mm)

1 mm = 0.03937" / 1" = 25.4 mm

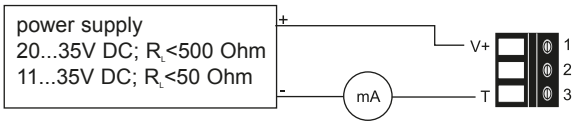


Connection Diagram

HLX16-T3xxx



HLX16-T6xxx



HLX16-P

Ordering Guide

MODEL	OUTPUT	HOUSING	PROBE LENGTH (according to "A")	FILTER
temperature active (T)	0-10 V (3) 4-20 mA (6)	wall mounting (A) duct mounting (B)	50mm (1.9") (2) 200mm (7.9") (5)	membrane filter (1) plastic grid (4)
HLX16-				

MODEL	T-SENSOR	HOUSING	PROBE LENGTH (according to "A")	FILTER
temperature passive (P)	Pt 100 DIN A (A) Pt 100 DIN B (B) Pt 1000 DIN A (C) Pt 1000 DIN B (D) others on request	wall mounting (A) duct mounting (B)	50mm (1.9") (2) 200mm (7.9") (5)	membrane filter (1) plastic grid (4)
HLX16-				

Ordering Example

HLX16-T3A21

model:	temperature transmitter
output:	0-10 V
housing:	wall mounting
probe length:	50mm (1.9")
filter:	membrane filter

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HLX21 Series

High-Precision Humidity / Temperature Transmitter for HVAC Applications

Transmitters of the HLX21 series have been developed for high-precision measurement of relative humidity and temperature.
HLX21 transmitters are available for wall and duct mounting with or without the very useful snap in-mounting kit, which allows a quick and easy exchange of the transmitter. Outputs can be selected between voltage and current.
An optional radiation shield providing a forced ventilation is recommended for use in outdoor applications.
Special protection coating for the sensing element (code - HC) permits the permanent use in very polluted environments.

Humidity Two-point Adjustment

With an easy routine via the push-buttons “UP” and “DOWN” on the circuit board the user can perform a fast and accurate two-point adjustment of relative humidity.

Typical Applications

green houses
storage rooms
swimming halls
meteorology

Features

measuring range 0...100% RH
accuracy ±2% RH
traceable calibration
working range -40...60°C (-40...140°F)
wettable
excellent long term stability

Technical Data

Measuring values

Relative Humidity

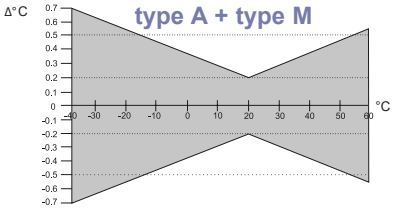
Sensor	HC1000 or HC1000C (with coating)	
Analogue output appropriate 0...100% RH	0-1V	-0.5mA < I_L < 0.5mA
	0-5V / 0-10V	-1mA < I_L < 1mA
	4-20mA (two wires)	R_L < 500 Ohm
Working range[1)]	0...100% RH	
Accuracy at 20°C (68°F)	± 2% RH (0...90%)	± 3% RH (90...100%)
	Traceable to international standards, administrated by NIST, PTB, BEV...	
Hysteresis 10% - 80% - 10%	< 2% RH	
Temperature dependence of electronics	typ. 0.03% RH/°C	(0.02% RH/°F)
Temperature dependence of probe	typ. 0.03% RH/°C	(0.02% RH/°F)

Temperature

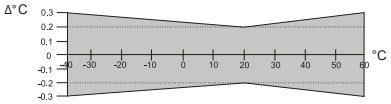
Sensor	Pt1000 (tolerance class A, DIN EN 60751)	
Analogue output -40...60°C (-40...140°F)	0-1V	-0.5mA < I_L < 0.5mA
	0-5V / 0-10V	-1mA < I_L < 1mA
	4-20mA (two wires)	R_L < 500 Ohm

Accuracy

type A + type M



type B + type N



Temperature dependence of electronics	typ. 0.01°C /°C

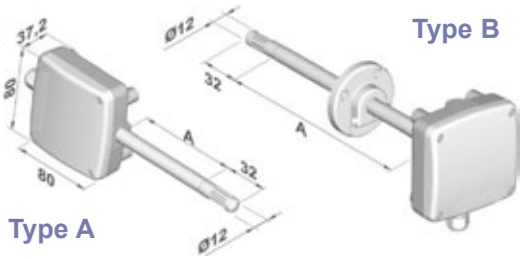
General

Supply			
for 0 - 1V	10 - 35V DC	or	9 - 29V AC
for 0 - 5V	12 - 35V DC	or	15 - 29V AC
for 0 - 10V	15 - 35V DC	or	15 - 29V AC
for 4 - 20mA	10V +R_L x 0,02 < U_V < 35V DC; R_L < 500 Ohm		
Current consumption	for DC supply: typ. 5mA		for AC supply: typ. 15mA_{eff}
Electrical connection	screw terminals max. 1.5 mm^2 (AWG 16)		
Cable gland	M16x1.5 or connection plug (only snap-in models N + M) cable Ø 4.5 - 10 mm (0.18 - 0.39")		
Sensor protection	membrane filter, sintered stainless steel filter, metal grid filter, PTFE filter		
Electromagnetic compatibility	EN61326-1 Industrial Environment	EN61326-2-3	ICES-003 ClassB FCC Part15 ClassB
Temperature ranges	working temperature probe:		-40...60°C (-40...140°F)
	working temperature electronics:		-40...60°C (-40...140°F)
	storage temperature:		-25...60°C (-13...140°F)

1) Please refer to working range of HC1000!

Dimensions (mm)

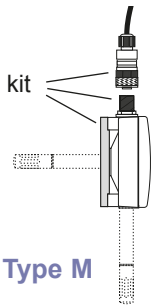
1 mm = 0.03937" / 1"= 25.4 mm



Type A

Type B

housing: PC
protection class: IP65, Nema 4



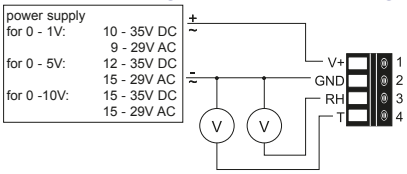
snap in - mounting kit

Type N

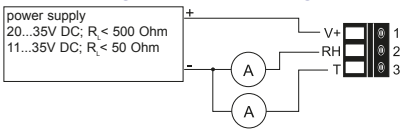
Type M

Connection Diagram

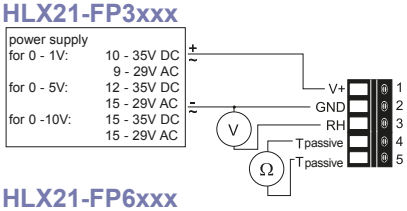
HLX21-FT1/2/3xxx /HLX21-F1/2/3xxx



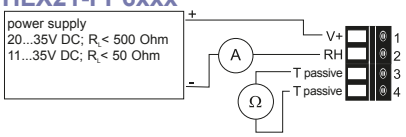
HLX21-FT6xxx / HLX21-F6xxx



HLX21-FP3xxx



HLX21-FP6xxx



Ordering Guide

MODEL	OUTPUT	T-SENSOR (only passive)	HOUSING TYPE	PROBE LENGTH (see dimensions "A")	FILTER
humidity + temperature (FT)	0 - 1 V (1)	Pt 100 DIN A (A)	wall mounting (A)	50 mm (1.9") (2)	membrane filter (1)
humidity (F)	0 - 5 V (2)	Pt 1000 DIN A (C)	duct mounting (B)	200 mm (7.9") (5)	sintered stainless steel filter (3)
humidity+temp. passive (FP)	0 - 10 V (3)		snap in - wall mounting[1] (M)		metal grid filter (6)
	4 - 20 mA (6)		snap in - duct mounting[1] (N)		

HLX21-

COATING		T-UNIT		SCALING OF T-OUTPUT	
no	(no code)	°C	(no code)	-40...60	(T02)
yes	(HC01)	°F	(E01)	-20...80	(T24)
				-30...70	(T08)
				other	(Txx)

1) Combination snap - in mounting and model FP is not possible

Order Example

HLX21-FT3A26/T24

model:	RH/T transmitter
output:	0 - 10V
housing type:	wall mounting
probe length:	50 mm (7.9")
filter:	metal grid filter
sensor coating:	no
calibration:	standard
T-unit:	°C
Scaling of T-output:	-20...80°C

Accessories

- radiation shield (HA010501)
- filter caps (HA0101xx)

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HLX22-T Series

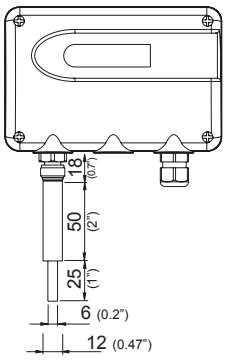
Temperature Transmitter with interchangeable probes

Unique for the HLX22-T series are the interchangeable sensing probes with connector.
The calibration data is stored in the probes, which are therefore interchangeable and probe replacement does not affect the performance of HLX22-T.
The outstanding accuracy over the entire temperature range is based on very precise calibration methods and on the latest microprocessor technology. Well-proven humidity sensor elements ensure excellent long-term stability.
For high temperature applications (up to +80°C / +176°F) or in case of limited space availability, the sensing probes can be connected to HLX22-T housing with cables (2m, 5m or 10m / 6.6ft, 16.4ft or 32.8ft) without any repercussions for the overall accuracy of the instrument.
Voltage 0 - 1 / 10V or current 4 - 20mA (2 wire) outputs are available, of which the temperature output can be scaled according to the application (see ordering guide).

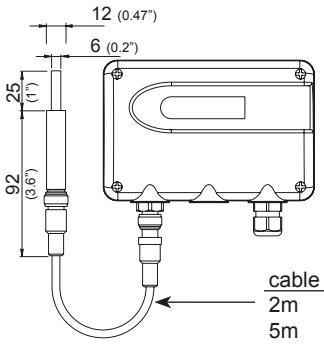
HLX22-T is suitable for direct wall mounting and for installation on rails according to DIN EN 50022.
For easy duct mounting a duct mounting kit is available as an option.
An optional display indicates the actual T values.

Probe Dimensions (mm)

with plugable T probe
HLX22-xTx1x

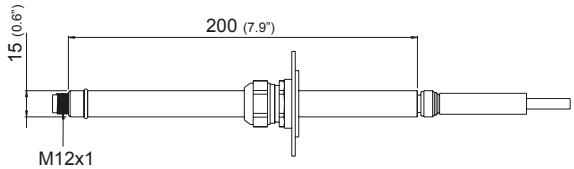


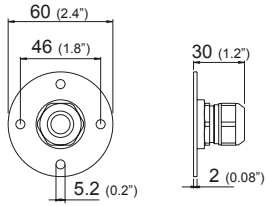
with remote T probe
HLX22-xTx1x
+HAxxxx



cable length	ordering code
2m	HA010801
5m	HA010802
10m	HA010803

duct mounting kit:





Typical Applications

pharmaceutical industry
clean rooms
storage rooms
green houses
cooling chambers

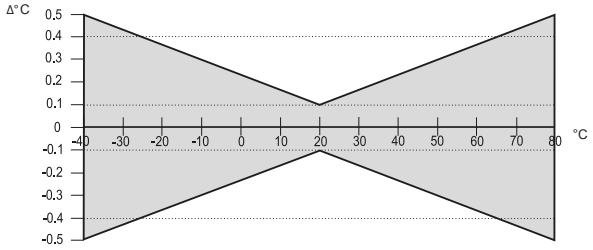
Features

accuracy ±0,1°C at 20°C
interchangeable probes
remote sensing probe up to 10m (32.8ft)
measuring range -40...80°C (-40...176°F)
optional display
traceable calibration
cost saving, easy loop-calibration of T probes

Technical Data

Measuring values of sensing probe

Temperature

Sensor element	Pt1000 (tolerance class A, DIN EN 60751)
Working range sensing probe	fixed sensing probe: -40...60°C (-40...140°F) remote sensing probe: -40...80°C (-40...176°F)
Accuracy (±0.1°C at 20°C)	
Temperature dependence of electronics	typ. ± 0.007°C/°C
Response time	t_{63}: typ. < 6min

Outputs

xx...yy°C[1)] (temperature output scale according to Txx ordering code)	0 - 1V	-0.5mA < I_L < 0.5mA
	0 - 10V	-1mA < I_L < 1mA
	4 - 20mA (two wire)	R_L < 500 Ohm
Temperature dependence of analogue outputs	max. 0.2 $\frac{mV}{°C}$ resp. 1 $\frac{\mu A}{°C}$	
Resolution voltage output	0.6mV	
current output	4.3µA	

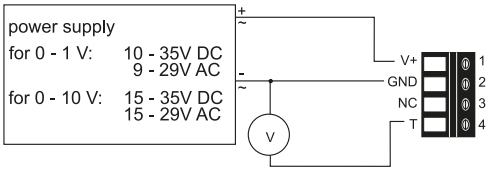
General

Supply voltage			
for 0 - 1V output	10 - 35V DC	or	9 - 29V AC
for 0 - 10V output	15 - 35V DC	or	15 - 29V AC
for 4 - 20mA output	10 - 35V DC		
Load resistor for 4 - 20mA output	$R_L < \frac{U_v - 10V}{0.02\ A}$ [Ω]		
Current consumption	typ. 10mA for DC supply		typ. $20mA_{eff}$ for AC supply
Electrical connection	screw terminals max. 2.5mm²		
Cable gland	M16x1.5 or connector (type: Lumberg, RSF 50/11)		
Material	housing: PC or Al Si 9 Cu 3		probe: stainless steel 1.4571 (316Ti)
Protection class of housing	IP65; Nema 4		
Electromagnetic compatibility	EN61326-1	EN61326-2-3	ICES-003 ClassB FCC Part15 ClassB
	Industrial Environment		
Working temperature range of probe	-40...60°C (-40...140°F) / 80°C (176°F) for remote sensing probe		
Working temperature range of electronics	-40...60°C (-40...140°F)		
Storage temperature range	-40...60°C (-40...140°F)		

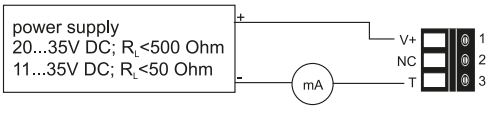
1) Refer to ordering guide

Connection Diagram

HLX22-T1,3xx

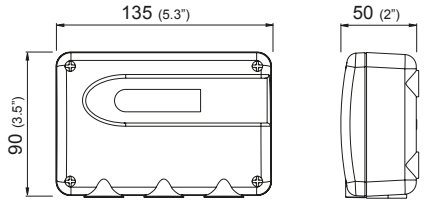


HLX22-T6xx

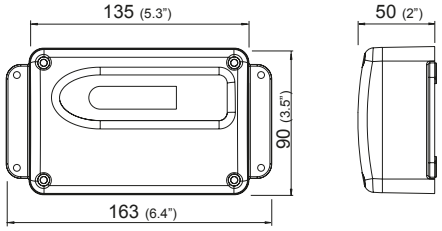


Housing Dimensions (mm)

polycarbonate housing



metal housing



For use in harsh industrial environments all models of HLX22-T series are available in a robust metal housing.
The smooth surface and the rounded outlines allow for the use in clean room applications.

Ordering Guide

Position 1 - Transmitter **HLX22-**

Hardware Configuration				
Housing	metal housing			M
	polycarbonate housing			P
Type	temperature			T
Output	0-1V			1
	0-10V			3
	4-20mA			6
Model	wall mounting - cable gland M16x1.5	cable Ø 4.5 - 10 mm (0.18 - 0.39")		A
	wall mounting - rear cable outlet			F
Probe	1 probe T			1
Display	without display			
	with display			D07
Plug	without plug			
	1 plug for power supply and outputs			C03
Software Configuration				
T-Unit	°C			
	°F			E01
Scaling of T-output in°C or °F	-40...60 (T02)	0...120 (T16)	-20...50 (T48)	Select according to Ordering Guide (Txx)
	-10...50 (T03)	-30...60 (T20)	-40...176 (T80)	
	0...50 (T04)	0...80 (T21)	0...140 (T85)	
	0...60 (T07)	-40...80 (T22)	0...176 (T86)	
	-30...70 (T08)	-20...80 (T24)	32...120 (T90)	
	-10...70 (T11)	-20...60 (T25)	32...140 (T91)	
	-40...120 (T12)	-30...50 (T45)	32...132 (T96)	Other T-Scaling refer to data sheet "T-Scalings"
Position 2 - Probe cable				
Cable length	2m (6.6ft)			HA010801
	5m (16.4ft)			HA010802
	10m (32.8ft)			HA010803

Accessories / Replacement Parts

(For further information see data sheet "Accessories")

- probe cable 2m (6.6ft) / 5m (16.4ft) / 10m (32.8ft) (HA0108xx)
- bracket for rail installation (HA010203)
- external supply unit (V02)
- Replacement probe T in metal (HLX07-MT)
- Display + housing cover in polycarbonate (D07P)
- Display + housing cover in metal (D07M)
- Reference probes (HA010403)
- Duct mounting kit (HA010209)

Order Example

Position 1 - Transmitter:

HLX22-MT3A1C03/T07

housing:	metal housing
type:	temperature
output:	0-10V
model:	wall mounting - cable gland M16x1.5
probe:	1probe T
display:	without display
plug:	1 plug for power supply and outputs
T-Unit:	°C
scaling of T-output:	0...60°C

Position 2 - Probe cable:

HA010802

cable length: 5m (16.4ft)

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HLX220 Series

Humidity / Temperature Transmitter with interchangeable probes

Unique for the HLX220 series are the interchangeable sensing probes.
The calibration data is stored in the probes, therefore a probe replacement does not affect the accuracy of HLX220.
The outstanding accuracy over the entire temperature range is based on very precise calibration methods and on the latest microprocessor technology. Well-proven humidity sensor elements ensure excellent long-term stability.
For high temperature applications (up to +80°C / +176°F) or in case of limited space availability, the sensing probes can be connected to HLX220 housing with cables (2m, 5m or 10m / 6.6ft, 16.4ft or 32.8ft) without any repercussions for the overall accuracy of the instrument.
Voltage 0 - 1 / 10V or current 4 - 20mA (2 wire) HLX220-outputs are available, of which the temperature output can be scaled according to the application (see ordering guide).

HLX220 is suitable for direct wall mounting and for installation on rails according to DIN EN 50022.
The optional display indicates the actual RH- and T-values.
Duct mounting can be done easily with the optional duct mounting kit.

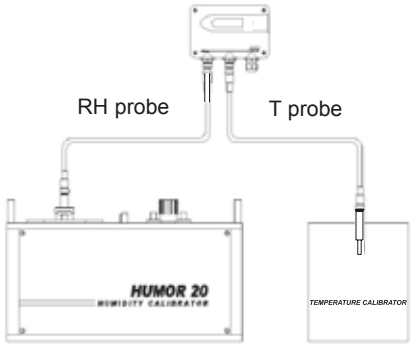

HLX220 + HLX07 in polycarbonate housing


HLX220 + HLX07 in metal housing

Field calibration of humidity and temperature

In the pharmaceutical and biotechnology industry a Loop-Calibration of the RH- and T-outputs, recommended by the FDA (Food and Drug Administration), can easily be performed utilizing separate RH- and T-probes (Type: HLX220-xxx2x).

The RH- and T-outputs can be adjusted with push buttons on the printed circuit board.



Reference probes

As useful accessories reference probes (incl. test report) representing fixed humidity and temperature values are available.

They shall be installed instead of the measuring probes to check function and accuracy of the evaluation unit.

One probe simulates high humidity and low temperature, the other low humidity and high temperature, to check the upper and lower end of both analogue outputs.

Typical Applications

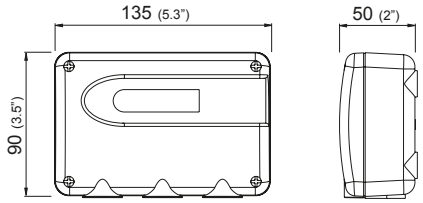
pharmaceutical industry
clean rooms
storage rooms
green houses
cooling chambers

Features

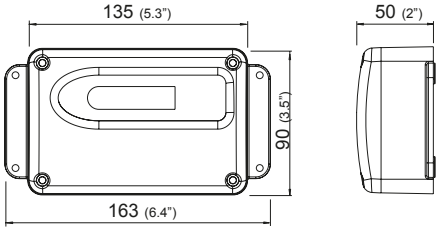
interchangeable probes
remote sensing probe up to 10m (32.8ft)
measuring range 0...100% RH / -40...80°C (-40...176°F)
optional display
easy field loop-calibration

Housing dimensions (mm)

polycarbonate housing



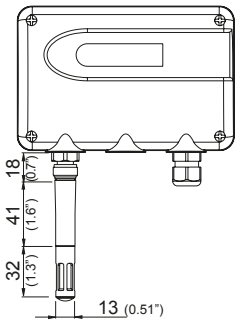
metal housing

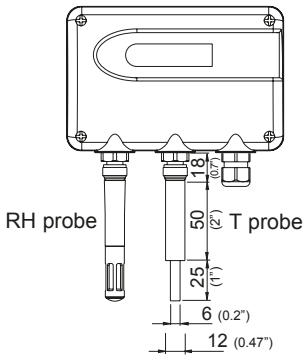


For use in harsh industrial environments all models of HLX220 series are available in a robust metal housing. (Interchangeable probes are also available in metal version.)
The smooth surface and the rounded outlines allow the use in clean room applications.

Probe dimensions (mm)

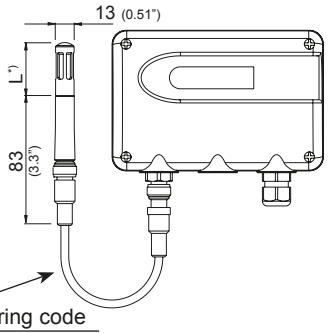
with one RH&T probe
HLX220-xxx1x



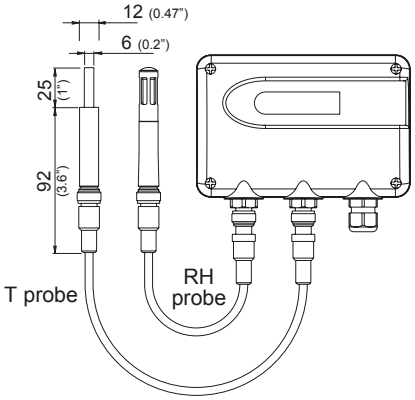


with two separate probes for RH and T
HLX220-xxx2x

with one remote RH&T probe
HLX220-xxx1x
+HAxxxx



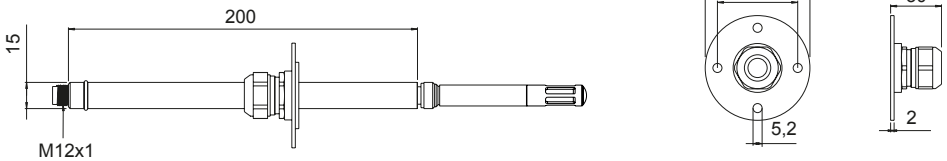
cable length	ordering code
2m (6.6ft)	HA010801
5m (16.4ft)	HA010802
10m (32.8ft)	HA010803



with two remote separate probes for RH and T
HLX220-xxx2x
+2x HAxxxx

*) L = Filter lenght see Datasheet „Accessories“

duct mounting kit
HA010209



Technical Data

Sensing probe

refer to data sheet of respective sensing probe

Outputs

0...100% RH/ xx...yy°C[2] (temperature output scale according to Txx ordering code)	0 - 1V 0 - 10V 4 - 20mA (two wire)	-0.5mA < I_L < 0.5mA -1mA < I_L < 1mA R_L < 500 Ohm
Temperature dependence of analogue outputs	max. 0.2 $\frac{mV}{°C}$ resp. 1 $\frac{\mu A}{°C}$	

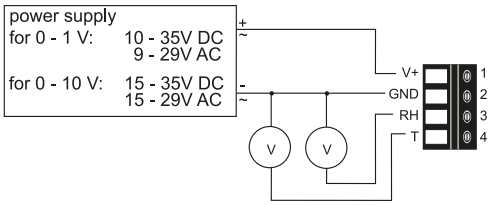
General

Supply voltage			
for 0 - 1V output	10 - 35V DC	or	9 - 29V AC
for 0 - 10V output	15 - 35V DC	or	15 - 29V AC
for 4 - 20mA output	10 - 35V DC		
Load resistor for 4 - 20mA output	$R_L < \frac{U_v - 10V}{0.02\ A}$ [Ω]		
Current consumption	typ. 10mA for DC supply		typ. 20mA_{eff} for AC supply
Electrical connection	screw terminals max. 2.5mm^2		
Cable gland	M16x1.5	cable Ø 4.5 - 10 mm (0.18 - 0.39")	
	(optional connector; type: Lumberg, RSF 50/11)		
Material	PC or Al Si 9 Cu 3		
Protection class of housing	IP65; Nema 4		
Electromagnetic compatibility	EN61326-1 Industrial Environment	EN61326-2-3	ICES-003 ClassB FCC Part15 ClassB
Working temperature range of electronics	-40...60°C (-40...140°F)		
Storage temperature range	-40...60°C (-40...140°F)		

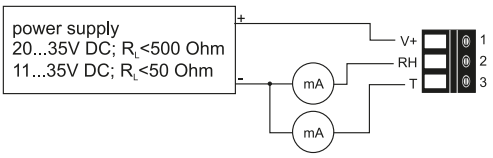
1) Refer to ordering guide

Connection Diagram

HLX220-x1x - x3x



HLX220-x6x



Overview of Sensing Probes

Application	Picture	Measuring Range	Accuracy	Order Code
Humidity/Temperature Probes				
RH/T probe for standard applications		0...100% RH -40...80°C (-40...176°F)	±2% RH (0...90% RH) ±3% RH (90...100% RH) ±0.1°C (±0.18°F) at 20°C (68°F)	HLX07-PFT1
RH/T probe for clean room applications, food and pharmaceutical industry		0...100% RH -40...80°C (-40...176°F)	±2% RH (0...90% RH) ±3% RH (90...100% RH) ±0.1°C (±0.18°F) at 20°C (68°F)	HLX07-MFT9
RH/T module for installation in small spaces or unobtrusive mounting		0...95% RH -40...85°C (-40...185°F)	±3% RH (10...100% RH) at 21°C (69.8°F) ±0.3°C (±0.54°F) at 20°C (68°F)	HLX03-FT9
Temperature Probes				
T probe for standard applications		-40...80°C (-40...176°F)	±0.1°C (±0.18°F) at 20°C (68°F)	HLX07-PT1
T probe for clean room applications, food and pharmaceutical industry		-40...80°C (-40...176°F)	±0.1°C (±0.18°F) at 20°C (68°F)	HLX07-MT

Ordering Guide

Position 1 - Convertor		HLX220-
Hardware Configuration		
Housing	metal housing	M
	polycarbonate housing	P
Output	0-1V	1
	0-10V	3
	4-20mA	6
Model	wall mounting - cable gland M16x1.5	A
	wall mounting - rear cable outlet	F
Number of probes	1 (for probe RH/T)	1
	2 (for probe RH+T)	2
Display	without Display	
	with Display	D07
Plug (only for type A)	without plug	
	1 plug for power supply and outputs	C03
Software Configuration		
T-Unit	°C	
	°F	E01
T-Scaling	-40...60 (T02), 0...120 (T16), -20...50 (T48)	Select according to Ordering Guide (Txx)
	-10...50 (T03), -30...60 (T20), -40...176 (T80)	
	0...50 (T04), 0...80 (T21), 0...140 (T85)	
	0...60 (T07), -40...80 (T22), 0...176 (T86)	Other T-scaling refer to data sheet „T-Scalings“
	-30...70 (T08), -20...80 (T24), 32...120 (T90)	
	-10...70 (T11), -20...60 (T25), 32...140 (T91)	
	-40...120 (T12), -30...50 (T45), 32...132 (T96)	
Position 2 - Probe		
Humidity / Temperature	probe RH/T (polycarbonat)	HLX07-PFTx
	probe RH/T (metal)	HLX07-MFTx
	module RH/T	HLX03-FT9
Temperature	probe T (polycarbonat)	HLX07-PTx
	probe T (metal)	HLX07-MT
Position 3 - Probe cable		
Cable for HLX07	2m (6.6ft)	HA010801
	5m (16.4ft)	HA010802
	10m (32.8ft)	HA010803
Cable for HLX03	2m (6.6ft)	HA010328
	5m (16.4ft)	HA010329

Accessories / Replacement Parts

(For further information see data sheet „Accessories“)

- Display + housing cover in metal (D07M)
- Display + housing cover in polycarbonate (D07P)
- Duct mounting kit (HA010209)
- Probe cable 2m (6.6ft) / 5m (16.4ft) / 10m (32.8ft) (HA0108xx)
- Bracket for rail installation* (HA010203)
- External supply unit (V02)
- Reference probes (HA010403)

*Note: Only for plastic housing, not for metal housing

Order Example

Position 1 - Convertor:

HLX220-M3A1C03/T07

housing:	metal housing
output:	0-10V
model:	wall mounting - cable gland M16x1.5
number of sensor slots:	1
display:	without display
plug:	1 plug for power supply and outputs
T-Unit:	°C
scaling of T-output:	0...60°C

Position 2 - Probe:

HLX07-MFT9

probe:	probe RH/T (metal)
filter:	metal grid filter (stainless steel)

Position 3 - Probe cable:

1x HA010802
5m (16.4ft) cable for HLX07

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HLX23 Series

Humidity / Temperature Transmitter for Industrial Applications

Calculation of Dew Point and Frost Point Temperature

The HLX23 series stands for multifunctionality, highest accuracy, easy mounting and service.
The new IP65 water proof housing concept is based on three modules:
- back module with connectors
- middle module which accommodates the electronics
- cover module with optional display

It offers easy installation and the possibility for fast exchange of the sensor unit for service purposes.

For use in harsh industrial environments all models of the HLX23 are available in a robust metal housing.

The HLX23 can be employed in all common applications by choosing the appropriate housing combination.

- **Model A / B:** wall / duct mounting
- **Model C:** remote sensing probe has a working temperature range –40...120°C (-40...248°F)
- **Model H**: with remote miniature probe for concealed mounting (e.g. in museums) or in tight spaces.

The high quality HC series humidity sensor elements and newest microprocessor technology are the guarantee for:
- best accuracy over the whole working range
- display and output of relative humidity, temperature, dew point and frost point temperature
- small hysteresis
- excellent long term stability
- highest resistance to pollutants.

Easy configuration of the humidity and temperature outputs is made possible by the innovative design of the HLX23 electronics. One can select between various current or voltage output signals.

One can very easily perform a two point humidity and temperature adjustment on site by using two push buttons on the PCB.
The three modules concept makes it also possible to perform a loop calibration according to FDA (Food and Drug Administration) recommendations.

Further options are the integrated display, cable outlets via connectors, sensor coating and an hygrostate output for control and alarm purposes.


Model A


Model B


Model C


Model H

Typical Applications

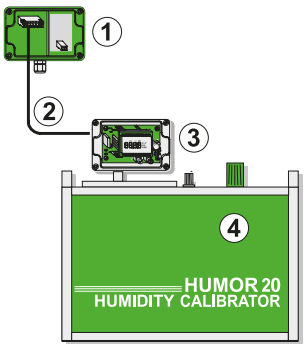
high end HVAC
climate chambers
process technology
dryers
clean rooms
green houses
stocks
meteorology

Features

temperature range -40...120°C (-40...248°F)
traceable calibration
calculation of dew point / frost point temperature
two point humidity and temperature calbration
very easy mounting and maintenance
on site calibration
best accuracy over whole temperature range
remote sensing probe up to 20m (65.6ft)
alarm output

Field Calibration

The three modules housing design allows a fast and easy dismounting of the HLX23 for humidity field calibration. No interruption of the measure ment is necessary for loop calibration which is essential for the calibration procedure recommended by FDA (Food and Drug Administration).



① HLX23 back module mounted on the wall
② HLX23 extension cable (can be ordered separately)
③ HLX23 middle module mounted in the calibrator
④ Humidity reference system (e.g. HUMOR 20)

Utilization of the extention cable enables the user to perform full loop calibration as recommended by FDA.

Two Point Adjustment

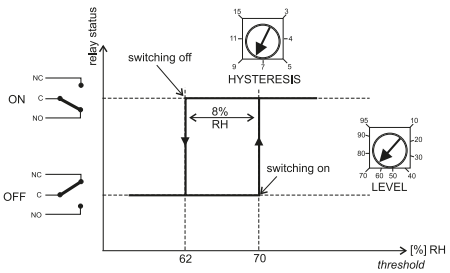
With an easy routine the user can perform a fast and accurate two point adjustment of relative humidity and temperature.

Display

The actual measured data can be indicated on the optional integrated display. It is possible to choose between relative humidity (RH), temperature (T), dew point (Td), frost point (Tf) or an alternating display of two values.

Alarm Output

Simple control applications can be solved by the optional alarm output of the HLX23. The user can set threshold and hysteresis by potentiometers.



Integrated power supply

A power supply, integrated in the back module of the housing, can be ordered optionally (100...240V AC, 50/60Hz; ordering code V01). The power supply V01 is available for both polycarbonate and metal housing and comes standard with two plugs for supply and outputs to allow an easy connection.

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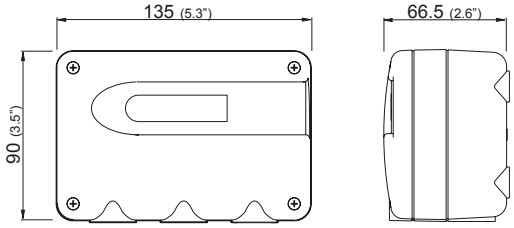
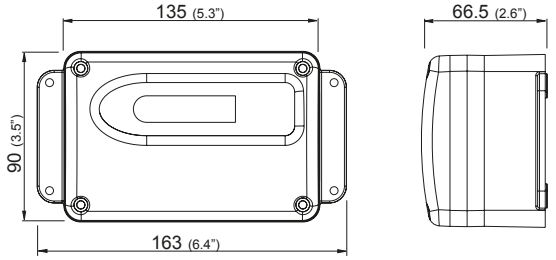
Dimensions in mm

Housing:

polycarbonate housing

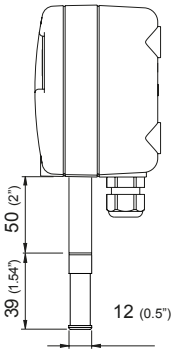


metal housing

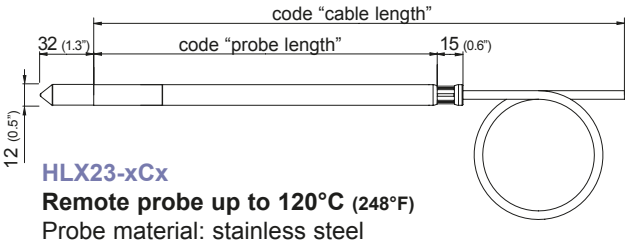


For use in harsh industrial environments all models of the HLX23 are available in a robust metal housing.
The very smooth surface and the rounded outlines allow for the use in clean rooms as well.

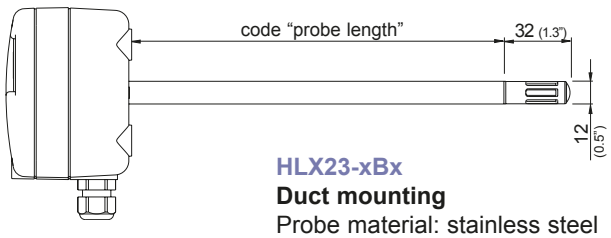
Models:



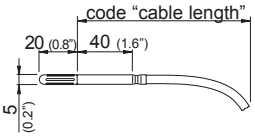
HLX23-xAx
Wall mounting
Probe material: PC



HLX23-xCx
Remote probe up to 120°C (248°F)
Probe material: stainless steel



HLX23-xBx
Duct mounting
Probe material: stainless steel



HLX23-xHx
Remote miniature probe
Probe material: stainless steel

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Technical Data

Measured quantities

Relative humidity

Humidity sensor[1]	HLX23-xA/B/Cx	HC1000-200	
	HLX23-xHx	HC105	
Working range[1]		0...100% RH	

Accuracy[2] (including hysteresis, non-linearity and repeatability, traceable to intern. standards, administrated by NIST, PTB, BEV...)

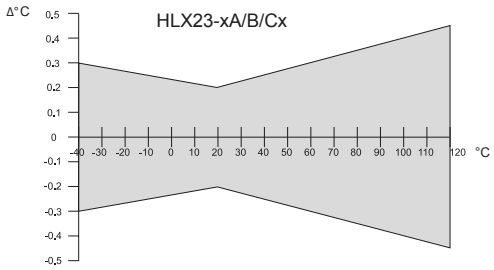
		HLX23-xA/B/Cx	HLX23-xHx
-15...40°C (5...104°F)	≤90% RH	± (1.3 + 0.3%*mv) % RH	± (1.8 + 0,3%*mv) % RH
-15...40°C (5...104°F)	>90% RH	± 2.3% RH	± 2.8% RH
-25...70°C (-13...158°F)		± (1.4 + 1%*mv) % RH	± (1.9 + 1%*mv) % RH
-40...120°C (-40...248°F)		± (1.5 + 1.5%*mv) % RH	-

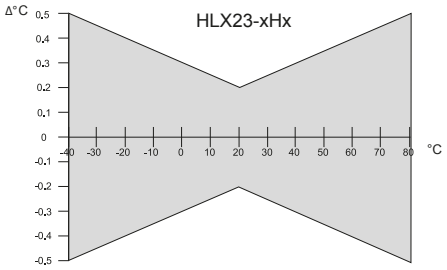
Temperature dependence electronics	typ. ± 0.015% RH/°C
Response time with metal grid filter at 20°C / t_{90}	< 15 sec.

Temperature

Temperature sensor element	HLX23-xA/B/Cx	Pt1000 (class A, DIN EN 60751)			
	HLX23-xHx	Pt1000 (class B, DIN EN 60751)			
Working range sensing head	HLX23-xAx	-40...60°C	(-40...140°F)	HLX23-xBx -40...80°C	(-40...176°F)
	HLX23-xCx	-40...120°C	(-40...248°F)	HLX23-xHx -40...80°C	(-40...176°F)

Accuracy





Temperature dependence of electronics	typ. 0.002°C/°C	
0...100% RH / xx...yy°C[3]	0 - 1 V	-0.5 mA < I_L < 0.5 mA
(temperature output scale adjustable or	0 - 5 V	-1 mA < I_L < 1 mA
with configuration kit)	0 - 10 V	-1 mA < I_L < 1 mA
	0 - 20mA	R_L < 470 Ohm
	4 - 20 mA	R_L < 470 Ohm

Outputs

Max. adjustable output scaling[4]

		from	up to *HLX23-A*	*HLX23-B, H*	*HLX23-C*	units
Humidity	RH	0	100	100	100	% RH
Temperature	T	-40 (-40)	60 (140)	80 (176)	120 (248)	°C (°F)
Dew-point temperature	Td	-40 (-40)	60 (140)	80 (176)	100 (212)	°C (°F)
Frost-point temperature	Tf	-40 (-40)	0 (32)	0 (32)	0 (32)	°C (°F)

General

Supply voltage		
for 0 -1 V, 0 - 5 V outputs	10.5 - 35V DC or 12 - 28V AC	
for 0 - 10 V, 0 - 20 mA and 4-20 mA outputs	15.0 - 35V DC or 15 - 28V AC	(optional 100...240V AC, 50/60Hz)
Current consumption for voltage output		
for DC supply ≤ 25 mA	with alarm module: for DC supply	≤ 35 mA
for AC supply ≤ 35 mA_{eff}	for AC supply	≤ 60 mA_{eff}
Current consumption for current output		
for DC supply ≤ 50 mA	with alarm module: for DC supply	≤ 60 mA
for AC supply ≤ 90 mA_{eff}	for AC supply	≤ 110 mA_{eff}
Housing / protection class	PC or Al Si 9 Cu 3 / IP65; Nema 4	
Cable gland[5]	M16x1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")	
Electrical connection[5]	screw terminals max. 1.5 mm² (AWG 16)	
Working temperature range of electronics	-40...60°C (-40...140°F)	
Working temperature range with display	-30...60°C (-22...140°F)	
Storage temperature range	-40...60°C (-40...140°F)	

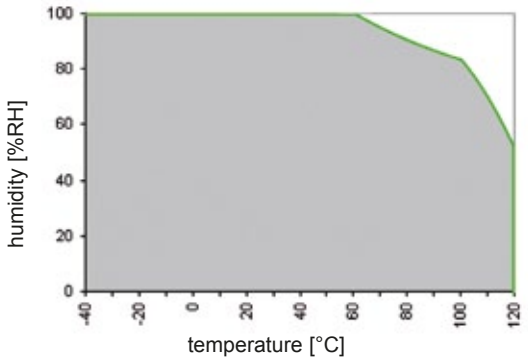
1) Refer to the working range of the humidity sensor 3) Refer to ordering guide 4) Refer to accuracies of calculated values (page 152) 5) Connection plugs refer to ordering guide
2) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

CE compatibility according	EN61326-1 EN61326-2-3 Industrial Environment	ICES-003 ClassB FCC Part15 ClassB

Alarm Module - optional

Output	SPDT-Switch up to 250V AC/8A or 28V DC/8A	
	threshold	hysteresis
Setting range	10...95% RH	3...15% RH
Setting accuracy	± 3% RH	

Humidity Sensor - Working Range



The working range of the humidity sensor element is shown in terms of humidity / temperature limits.

Although the sensors would not deteriorate beyond the limits, their performance can only be specified within the limits of the working range.

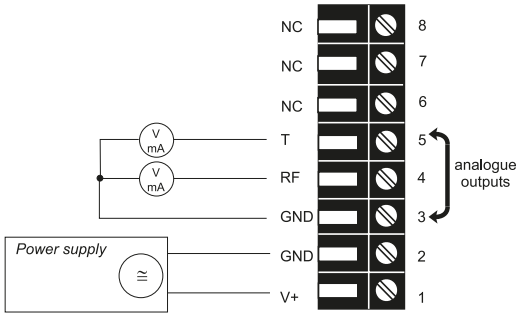
Sensor Coating

Operation in heavily polluted and/or corrosive environments is typical for many industrial processes and can lead to drift or damage of the humidity sensor and thus to false measured values. The unique protective coating developed for the sensing probe (ordering code: HC01) brings a significant improvement on the long-term stability of the transmitter in very dirty and aggressive environments.

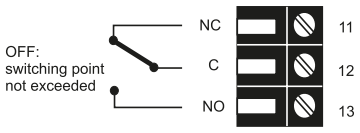
Connecting Diagram

output and supply

with active temperature output



alarm output



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Ordering Guide

		HLX23-	HLX23-
Hardware Configuration			
Housing	metal housing	M	M
	polycarbonate housing	P	P
Type	humidity + temperature	FT	FT
Model	wall mounting	A	
	duct mounting	B	
	remote probe up to 120°C (248°F)	C	
	remote miniature probe		H
Filter	membrane filter 5mm		1
	stainless steel sintered filter	3	
	PTFE filter	5	
	metal grid filter	6	
Cable length (incl. probe length; models C and H only)	2m (6.6ft)	02	02
	5m (16.4ft)	05	05
	10m (32.8ft)	10	10
	20m (65.6ft)	20	20
Probe length (models B and C only)	65mm (2.6")	2	
	200mm (7.9")	5	
	400mm (15.8")	6	
Display (refer to software-code)	no display		
	with display	D03	D03
Alarm output[1]	no alarm output		
	with alarm output	SW	SW
Plug	standard cable 1 gland M16x1.5; cable Ø 4.5 - 10 mm (0.18 - 0.39")		
	1 plug for supply + outputs	C03	C03
Coating Sensor	no		
	yes	HC01	
Supply voltage	15...35V DC / 15...28V AC		
	integrated power supply 100...240V AC, 50/60Hz[2]	V01	V01

Software Configuration						
Physical parameters of outputs	relative humidity	RH	[%]	(A)	Output 1	Select according to Ordering Guide (A - D)
	temperature	T	[°C or °F]	(B)		
	dew-point temperature	Td	[°C or °F]	(C)	Output 2	Select according to Ordering Guide (A - D)
	frost-point temperature	Tf	[°C or °F]	(D)		
Type of output signals	0 - 1V			(1)		Select according to Ordering Guide (1 - 6)
	0 - 5V			(2)		
	0 - 10V			(3)		
	0 - 20mA			(5)		
	4 - 20mA			(6)		
Temperarture unit	°C					E01 / E01
	°F					
Scaling of T-output	-40...60 (T02)	-40...120 (T12)	-40...248 (T78)		Output T	Select according to Ordering Guide (Txx)
Scaling of Td-output	-10...50 (T03)	20...120 (T15)	0...140 (T85)			
Scaling of Tf-output	0...50 (T04)	-30...60 (T20)	0...248 (T87)		Output Td	Select according to Ordering Guide (Tdxx)
in°C or °F	0...100 (T05)	0...80 (T21)	32...120 (T90)			
	0...60 (T07)	-40...80 (T22)	32...140 (T91)		Output Tf	Select according to Ordering Guide (Tfxx)
	-30...70 (T08)	-20...80 (T24)	32...248 (T93)			
	-30...120 (T09)	-20...60 (T25)	32...132 (T96)			
	-20...120 (T10)	-30...50 (T45)				Other T/Td/Tf-scaling refer to data sheet "T-Scalings"
	-10...70 (T11)	-20...50 (T48)				
Display mode	measurand output 1+2 alternating					M12 / M12
	measurand output 1					M01 / M01
	measurand output 2					M02 / M02

1) Combination alarm output and plugs is not possible (with cable glands only) / combination alarm output and integrated power supply is not possible / alarm output for RH only
2) Integrated power supply includes 2 plugs for power supply and outputs / further plug options are not possible

Accessories (additional information see data sheet "Accessories")

- filter caps (HA0101xx)
- external power supply unit (V02)
- display + housing cover in metal (D03M)
- display + housing cover in polycarbonate (D03P)
- mounting flange (HA010201)
- mounting flange 5mm (for model H only) (HA010208)
- bracket for installation onto mounting rails* (HA010203)
- spare part sensor (FE09 or FE09-HC01)
- drip water protection (HA010503)
- calibration set (HA0104xx)
- extension cable for field calibration (HA010302)
- radiation shield (HA010502)

*Note: Only for plastichousing, not for metalhousing

Order Example

HLX23-MFTC6025D03/AC2-Td04-M01

housing:	metal housing
type:	humidity + temperature
model:	remote sensor probe
filter:	metal grid
cable length:	2 m (6.6ft)
probe length:	200 mm (7.9")
display:	with display
output 1:	rF
output 2:	Td
output signal:	0-5V
scaling of T-output:	0...50°C
display mode:	measurand output 1

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HLX240 Series

Wireless Sensor for Humidity / Temperature / CO_2

State of the art sensor technology, highest reliability of data transmission and the ease of system installation are the outstanding features of the wireless sensor series HLX240. Indifferent whether a point-to-point connection or a complex network is required, the series HLX240 offers the ideal solution.


HLX245 Transmitter

Wireless Transmitter HLX245
The elegant housing combines the measurement of temperature, humidity and CO_2. An optional display is available to provide local indication. As a standard, batteries provide for the power supply. For more power demanding applications the device can be powered through an external adapter.


HLX244 Transmitter

Wireless Transmitter HLX244
The industrial housing can be equipped with up to three sensing probes to contact the interchangeable probes. An optional display is available to provide local indication. As a standard, batteries provide for the power supply. For more power demanding applications the device can be powered through an external adapter.

Interchangeable Sensing probes
A modular structure and easy extendable assortment of sensing probes allow the usage in many applications. For many years, the proven sensor technology for the measurement values of humidity, tem - perature, and CO_2 guarantee precise measurements and the highest longtime stability.
The standard interface and the stored calibration data of the sensing probe allow for any choice or combination of the available sensing probes offered. An adaptation or expansion of the number of sensing probes afterwards or an exchange for service purposes can be achieved in seconds – a must-have for uninterrupted data acquisition. For high temperature applications or installations in small spaces, the sensing probe can be connected with a sensor cable of up to 10 m (33 ft) in length.


Sensing Probes for HLX244

Base Station HLX241 and HLX242
Do you have to traverse a street? The inexpensive point-to-point connection can be accomplished very easily with the **HLX241**.
The configuration at the factory of the up to four transmitted measurement values is done in accordance with your specifications, meaning that the values are available as analogue outputs (0 – 5 / 10 V or 4 - 20 mA) immediately after installation.
For more complex networks (up to 500 transmitters or up to 2000 measurement values) is the user-configurable **HLX242** available.
Independent of the topology of the network the integrated Webserver and the Ethernet interface warrants highest flexibility in the configuration of the network with a computer. A simple integration of the measurement system in the customer's network and the easy remote access and diagnostic of the measurement data are additional helpful features. The output values can be transferred as an analogue signal, as well as in digital form (via Ethernet). For a bus integration, Modbus will be supported. The actual measurement values and some operational information can be indicated on an optional display.


HLX241 Base Station HLX242


Router HLX244-R

Router Series HLX244-R
The radio range is greatly depending on local circumstances. With the router series HLX244-R obstacles can be bypassed or the transmission distance expanded.

Typical Applications

Pharmaceutical Industry
Warehouses
Control Rooms
Cooling Chambers
Museums
HVAC Systems
Food Industry

Features

Interchangeable Sensing Probes
Remote Probes up to 10 m (33 ft)
Battery Operating Life up to 1 Years
Webserver
Ethernet
Long Rangeability

Highest Transmission Reliability

The data transmission is based on the IEEE 802.15.4 protocol with a transmission frequency of 2.4 GHz, which can be used all over the world without any additional cost. A special identification address, checksums, handshakes, and bidirectional communication provide the highest transmission reliability. Typical radio ranges are 100 m (330 ft) for indoor applications and 1000 m (3300 ft) in the open field. Greater radio ranges are easy obtainable with routers. The self-configuring, scalable, and self-healing mesh network, even when a connection fails, is another component contributing to the improvement of the transmission reliability and security. The highest possible data security level is accomplished with a preset encryption key according to AES-128.

Digital bus connection

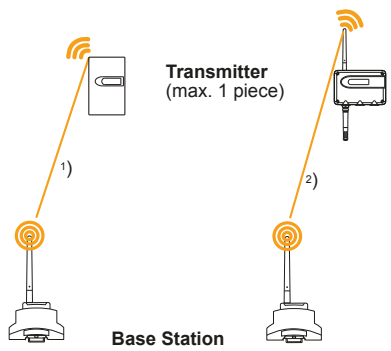
For bus integration, Modbus is supported. Communication is implemented via Ethernet or RS485 interface. Bus connection is only supported by the base station HLX242.

Installation / Remote Access / Maintenance via Webserver

The integrated Webserver allows platform-independent installation, remote access and easy maintenance with any commercially available browser (Internet Explorer, Firefox, OPERA...) on a computer without additional software.

Wireless Networks

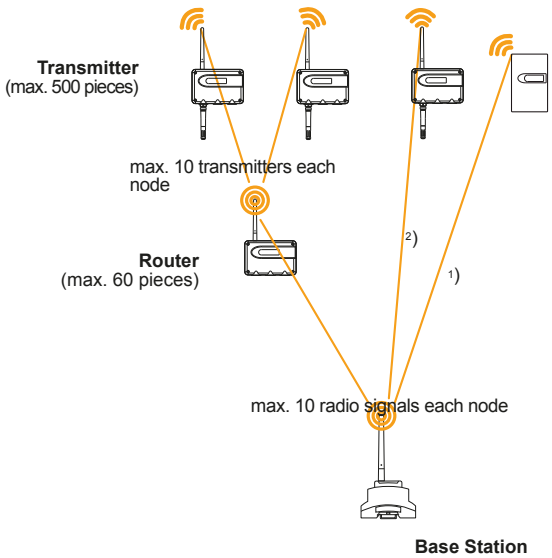
HLX241 (point-to-point connection)



1) Radio ranges:
- up to 60m (197 ft) indoors

2) Radio ranges:
- up to 100m (330 ft) indoors
- up to 1000m (3300 ft) in open field

HLX242 (wireless network)



Comparison	HLX241	HLX242
Transmitter:		
max. number of transmitters HLX244 / HLX245	1	500
Router:		
maximum number of routers HLX244-R	60	60
Base Station:		
configuration of analogue outputs	acc. to order code	✓ via Webserver
user-configurable after delivery	--	✓ via Webserver
digital interface	--	✓ Ethernet, Modbus

Technical data Transmitter HLX244 & HLX245

General

Transmission frequency	2.4 GHz	
Transmission system	IEEE 802.15.4	
Transmission power	10mW	
Radio range	up to 100m (330 ft) indoors, up to 1000m (3300 ft) in open field	
Approval	ETSI / FCC Part 15.247 / IC	
Electromagnetic compatibility	EN61326-1 Industry	FCC Part 15 Class B
	EN61326-2-3 Industry	ICES-003 Class B

CE

HLX244 (Transmitter, Router)

Supply transmitter (HLX244-A)	battery 4x1.5V AA	
Battery lifetime	> 1 year with a measuring data transmission every 5 min. (for T / %RH)	
External supply transmitter (HLX244-B)	8...28V DC SELV, typ. I_L = 20mA at 24V; max. I_L = 35mA at 24V DC	
External supply router (HLX244-R)	8...28V DC SELV, typ. I_L = 20mA at 24V; max. I_L = 35mA at 24V DC	
Housing material	polycarbonate (PC)	
Protection class housing	IP65	
Temperature ranges	working temperature range of probe:	refer to respective data sheet of sensing probe
	working temperature range:	-40...+50°C (-40...122°F)
		(with display: -20...+50°C / -4...122°F)
	storage temperature range:	-40...+50°C (-40...122°F)
		(with display: -20...+50°C / -4...122°F)
Max. number of sensing probes	3 (2*)	
Max. number of measuring signals	6 (4*) (T / RH / CO_2**)	

HLX245 (Transmitter)

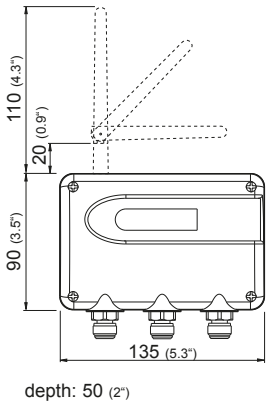
Power Supply	battery 4x1.5V AA	
Battery lifetime	> 1 year with a measuring data transmission every 5 min. (for T / %RH)	
Radio Range	up to 60m (197 ft) indoors	
Antenna	internal	
External supply transmitter (HLX245)	DC 8-28V SELV / AC 12V (±20%)	
Housing material	polycarbonate (PC)	
Protection class housing	IP30	
Temperature ranges	working temperature range: 0...90%RH (non-condensing) / -5...+55°C (23...131°F)	
	storage temperature range: 0...90%RH (non-condensing) / -5...+55°C (23...131°F)	
Max. numbers of measuring values	3 (T / RH / CO_2**)	
Accuracy	T: ± 0,3 °C (at 20 °C) / ± 0,4 °C (20...55 °C)	
	Rh: ± 3 % (30...70 %) / ± 5 % (70...90 %)	
	CO_2: 2000ppm (± 50ppm +2 % of m.v.)	
	5000ppm (± 50ppm +3 % of m.v.)	
Connection	screw terminal 1,5mm²	

*) with external power supply

**) For CO_2 an external power supply is recommended.

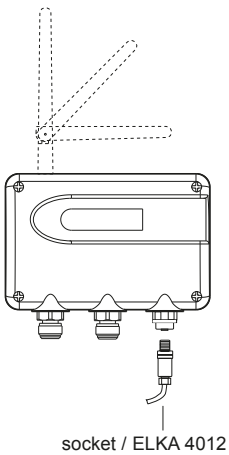
Dimensions in mm

HLX244-Ax3:



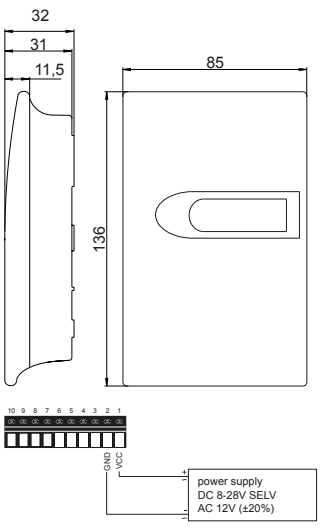
depth: 50 (2")

HLX244-Bx2:



socket / ELKA 4012 PG7

HLX245

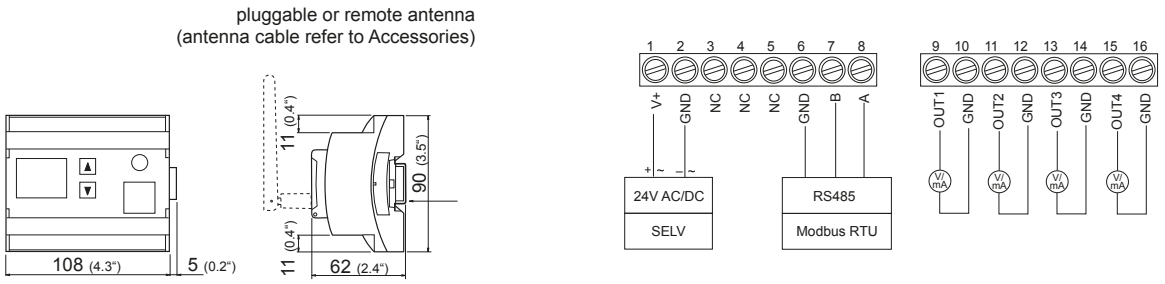


Technical data Base Station HLX241 & HLX242

HLX241/HLX242 (Base Station)

Supply voltage SELV		24V AC/DC ±20%
digital interface		• Ethernet • Modbus (RTU / ASCII 7TCP)
Current consumption	HLX241	typ. I_L = 70mA at 24V DC; max. I_L = 100mA at 24V DC
	HLX242	typ. I_L = 150mA at 24V DC; max. I_L = 180mA at 24V DC
Analogue outputs		0-5V -0.5mA < I_L < 0.5mA 0-10V -1mA < I_L < 1mA 0-20mA / 4-20mA R_L < 500 Ohm
Number of analogue outputs		4
Accuracy of analogue outputs		±5mV resp. ±10µA
Temperature dependence of analogue outputs		max. 0.1 $\frac{mV}{°C}$ resp. 1 $\frac{\mu A}{°C}$
Resolution of analogue outputs		0.7mV resp. 1.50µA
Electrical connection		screw terminals max. 2.5mm²
Housing material		polycarbonate (PC)
Protection class housing		IP20
Temperature ranges		working temperature range: -30...+50°C (-22...122°F) (with display: -20...+50°C / -4...122°F) storage temperature range: -30...+50°C (-22...122°F) (with display: -20...+50°C / -4...122°F)

Dimensions in mm - connection Diagram HLX241 / HLX242



Overview of HLX244 Sensing Probes

Application	Picture	Measuring Range	Accuracy	Order Code
Humidity/Temperature Probes				
RH/T probe for standard applications		0...100% RH -40...80°C (-40...176°F)	±2% RH (0...90% RH) ±3% RH (90...100% RH) ±0.1°C (±0.18°F) at 20°C (68°F)	HLX07-PFT1
RH/T probe for clean room applications, food and pharmaceutical industry		0...100% RH -40...80°C (-40...176°F)	±2% RH (0...90% RH) ±3% RH (90...100% RH) ±0.1°C (±0.18°F) at 20°C (68°F)	HLX07-MFT9
RH/T module for installation in small spaces or unobtrusive mounting		0...95% RH -40...85°C (-40...185°F)	±3% RH (10...100% RH) at 21°C (69.8°F) ±0.3°C (±0.54°F) at 20°C (68°F)	HLX03-FT9
Temperature Probes				
T probe for standard applications		-40...80°C (-40...176°F)	±0.1°C (±0.18°F) at 20°C (68°F)	HLX07-PT1
T probe for clean room applications, food and pharmaceutical industry		-40...80°C (-40...176°F)	±0.1°C (±0.18°F) at 20°C (68°F)	HLX07-MT
CO_2 Probes				
CO_2 probe for standard applications		0…2000ppm 0…5000ppm 0…10000ppm	±(50ppm+2% of m.v.) ±(50ppm+3% of m.v.) ±(100ppm+5% of m.v.)	HLX871

Ordering Guide

BASE STATION - „point-to-point connection“ (HLX241) and „wireless network“ (HLX242)

						HLX241-	HLX242-
Hardware Configuration							
Frequency	2,4GHz (10mW)					A	A
Output signal	0-5V					2	2
	0-10V					3	3
	0-20mA					5	5
	4-20mA					6	6
Display	with					D	D
	without					-	-
Software Configuration							
Physical parameters of outputs	relative humidity		RH	[%]	(A)	output 1	A	A / B / C / R
	temperature		T	[°C]	(B)	output 2	B	A / B / C / R
	dew point temperature		Td	[°C]	(C)	output 3	C	A / B / C / R
	CO_2		CO_2	[ppm]	(R)	output 4	R	A / B / C / R
Unit	metric / SI						-	-
	non metric / US						E01	E01
T-Scaling (in °C or °F)	-40...60	(T02)	0...50		(T04)	output T	Select Txx code	Select Txx code
Td-Scaling (in °C or °F)	-20...50	(T48)	furhter scalings on request			output Td	Select Tdxx code	Select Tdxx code
CO_2-Scaling (in ppm)	0...2.000	(C20)	0...10.000		(C22)		Select Cxx code	Select Cxx code
	0...5.000	(C21)						

TRANSMITTER HLX245

		HLX245-
Type	RH + T + CO_2	FTC
	RH + T	FTx
	CO_2 +T	xTC
	T	xTx
CO_2 (only for TC and FTC)	0...2000ppm	2
	0...5000ppm	5
	without CO_2 measurement	x
Frequency	2,4GHz (10mW)	A
Display	with	D
	without	x
Software Configuration		
Unit	°C	-
	°F	E01

TRANSMITTER / ROUTER HLX244

		HLX244-	HLX244-
Type	transmitter	A	
	transmitter with external supply	B	
	router		R
Frequency	2,4GHz (10mW)	A	A
Number of sensing probes	1	1	
	2	2	
	3 (not possible with type B - transmitter with external supply)	3	
Display	with	D	
	without	-	

SENSING PROBES FOR HLX244

Humidity / Temperature	probe RH/T (polycarbonat)	HLX07-PFT1
	probe RH/T (metal)	HLX07-MFT9
	module RH/T	HLX03-FT9
Temperature	probe T (polycarbonat)	HLX07-PT1
	probe T (metal)	HLX07-MT
CO_2	probe CO_2	HLX871

Accessories / Replacement Parts

Base Station:

- Antenna cable 2m (7ft)	(HA010330)
- Crossover cable (PC to base station)	(HA010333)
- External power supply unit	(V02)

Transmitter:		HLX244	HLX245
- Probe cable for HLX07 - 2m (7ft) / 5m (16ft) / 10m (33ft)	(HA0108xx)	(✓)	
- Connection cable for HLX03, 2m (7ft)	(HA010328)	(✓)	
- Connection cable for HLX03, 5m (16ft)	(HA010329)	(✓)	
- Antenna cable 2m (7ft)	(HA010330)	(✓)	
- Bracket for rail installation	(HA010203)	(✓)	
- Reference probes	(HA010403)	(✓)	
- Duct mounting kit for HLX07	(HA010209)	(✓)	
- External power supply unit	(V02)	(✓)	(✓)

Oder Example

1)

Position 1 - Base Station:
HLX242-A3D/ABCR-T04-Td48-C20

Frequency:	2,4GHz
Output signal:	0-10V
Display:	yes
Outputs:	RH, T, Td, CO_2
Unit:	SI
Scaling:	T: 0...50; Td: -20...50

Position 2 - Transmitter / Router:
HLX244-BA1D

Type:	Industral transmitter with external supply
Frequency:	2,4GHz
Probe:	1
Display:	yes

Position 3 - Sensing Probes:
HLX07-PFT1, HLX07-MT

2)

Position 1 - Base Station:
HLX242-A3D/ABCR-T04-Td48-C20

Frequency:	2,4GHz
Output signal:	0-10V
Display:	yes
Outputs:	RH, T, Td, CO_2
Unit:	SI
Scaling:	T: 0...50; Td: -20...50

Position 2 - Transmitter:
HLX245-FTC5Ax

Type:	Room transmitter for relative Humidity, Temperature and CO_2
CO_2:	0...5000ppm
Frequency:	2,4GHz
Display:	without

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HLX30EX

Humidity/Temperature Transmitter for Intrinsically Safe Applications

HLX30EX are designed for the accurate measurement of humdity and temperature in the range between 0...100% RH and -40...180°C (-40...356°F). Models for pressure tight installations from 0.01...15 bar (0.15...218psi) complete the range of products.


Model A

HLX30EX meets the **ATEX requirements** and **IECEx standards** of intrinsically safe machinery:

Applied standards for ATEX:	Applied standards for IECEx:
EN60079-0:2009	**IEC 60079-0:2011**
EN60079-11:2007	**IEC 60079-11:2011**
EN60079-26:2007	**IEC 60079-26:2006**


Model D

The EC type examination was carried out by Physikalisch-Technische Bundesanstalt (PTB), the German national institute for science and technology.

The transmitters of HLX30EX series consist of:

- HLX30EX supply and evaluation unit, classified according to **II (1) G [Ex ia Ga] IIC** subject to EC-type examination certificate **PTB 99 ATEX 2042** and **[Ex ia Ga IIC** according to **IECEx PTB 05.0031-2**.
- sensor driver unit and sensor probe, classified according **II 1/2 G Ex ia IIC T6 Ga/Gb** subject to EC-type examination certificate **PTB 99 ATEX 2043 X** and **Ex ia IIC T6 Ga/Gb** according to **IECEx PTB 05.0032X-2**.


Model E

The sensor probe can be employed in zone 0 and in temperature class T6 (apparatus group II, category 1). For HLX30EX versions D and E the cable length between sensing probe and sensor driver unit can be up to 10m (32.8ft). The maximum length of the cable between the supply and evaluation unit and the sensor driver unit is 100m (328ft).

The analogue output signals for humidity and temperature are available as current or as voltage. State-of-the-art microprocessor technology makes both analogue outputs free selectable and scaleable via RS232 serial interface.

Besides measurement of humidity and temperature HLX30EX series calculate the values of the following physical quantities:

- dew point temperature	Td
- frost point temperature	Tf
- wet bulb temperature	Tw
- water vapour pressure	e
- mixing ratio	r
- absolute humidity	dv
- specific enthalpy	h

These are available on the RS232 serial interface, on the analogue outputs and on the integrated LC display. The communication with a PC is assisted by an user friendly software, running under MS Windows™ which enables the user to change original factory settings easily.

Configuration Software

The Configuration Software is used for:

- flexible, easy, and fast setup of the analogue outputs resp. of the RS232 serial interface.
- adjustment of the humidity and temperature outputs.
- exchange of the sensor.

Typical Applications

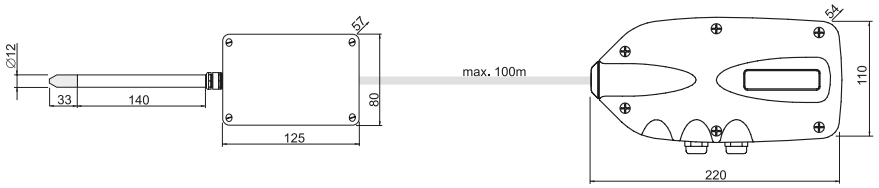
chemical processes
pharmaceutical applications
explosive endangered storage rooms

Features

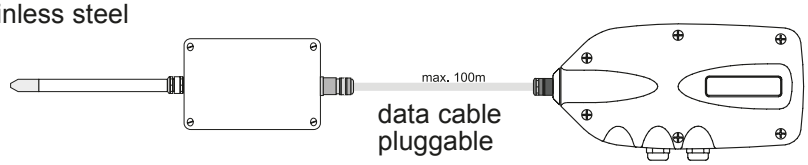
EC-Type examination according to ATEX
approved to IECEx
approved for zone 0
highest accuracy up to 180°C (356°F)
traceable calibration
dew point, absolute humidity,... measurement
incl. MS Windows™ Software

Housing Dimensions (mm)

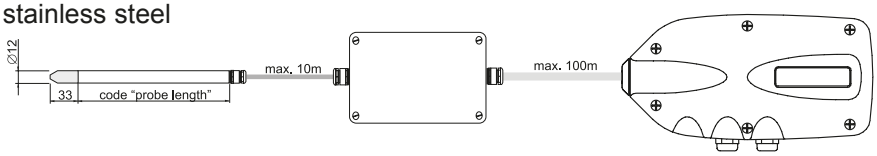
1m = 3.28ft / 1ft = 0.30m
1 mm = 0.03937" / 1" = 25.4 mm

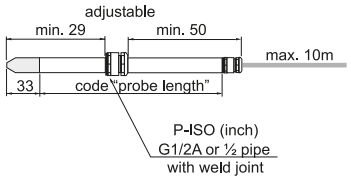


wall mounting
HLX30EX-A
probe material: stainless steel



remote probe up to 180°C (356°F)
HLX30EX-D
probe material: stainless steel





pressure tight probe up to 15 bar (218psi)
HLX30EX-E
probe material: stainless steel

Classifications

Europe:

EU (94/9/EG, ATEX 100a)

- supply and evaluation unit:
  Ex II (1) G [Ex ia Ga] IIC
  PTB 99 ATEX 2042
- sensor unit:
  Ex II 1/2 G Ex ia IIC T6 Ga/Gb
  PTB 99 ATEX 2043 X
- environmental specifications:
  $T_{amb:}$ -20...+60°C (-4...140°F)
  $P_{amb:}$ 0.8...1.1bar (11.6...16psi)

International:

- supply and evaluation unit:
  Ex [Ex ia Ga] IIC
  IECEx PTB 05.0031-2
- sensor unit:
  Ex Ex ia IIC T6 Ga/Gb
  IECEx PTB 05.0032X-2
- environmental specifications:
  $T_{amb:}$ -20...+60°C (-4...140°F)
  $P_{amb:}$ 0.8...1.1bar (11.6...16psi)

Technical Data HLX30EX

Measuring values

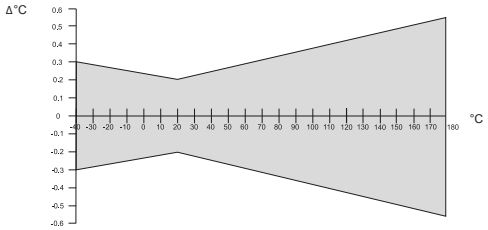
Relative humidity

Humidity sensor[1]		HC1000-400
Measuring range[1]		0...100% RH
Accuracy[2] (including hysteresis, non-linearity and repeatability, traceable to international standards, administrated by NIST, PTB, BEV...)		
-15...40°C (5...104°F)	≤90% RH	± (1.3 + 0.3%*mv) % RH
-15...40°C (5...104°F)	>90% RH	± 2.3% RH
-25...70°C (-13...158°F)		± (1.4 + 1%*mv) % RH
-40...180°C (-40...356°F)		± (1.5 + 1.5%*mv) % RH
Temperature dependence electronics		typ. 0.08% RH/°C
Response time with filter at 20°C / t_{90}		< 30 sec.

Temperature

Temperature sensor		Pt1000 (DIN EN 60751, class A)	
Measuring range sensor head	HLX30EX-A	-20...60°C	(-4...140°F)
	HLX30EX-D	-40...180°C	(-40...356°F)
	HLX30EX-E	-40...180°C	(-40...356°F)

Accuracy



Temperature dependence: typical 0.005°C/°C

Max. adjustable Measurement Range[3]

		from		to		to		unit	
				HLX30EX-A		*HLX30EX-D/E*			
Humidity	RH	0		100		100		%RH	
Temperature	T	-40	(-40)	60	(140)	180	(356)	°C	(°F)
Dew point temperature	Td	-40	(-40)	60	(140)	100	(212)	°C	(°F)
Frost point temperature	Tf	-40	(-40)	0	(32)	0	(32)	°C	(°F)
Wet bulb temperature	Tw	0	(32)	60	(140)	100	(212)	°C	(°F)
Water vapour pressure	e	0	(0)	200	(3)	1100	(15)	mbar	(psi)
Mixing ratio	r	0	(0)	425	(2900)	999	(9999)	g/kg	(gr/lb)
Absolute humidity	dv	0	(0)	150	(60)	700	(300)	g/m³	(gr/ft³)
Specific enthalpy	H	-50	(-15000)	400	(150000)	2800	(999999)	kJ/kg	(lbf/lb)

Outputs

Two freely selectable and scalable outputs	0 - 5 V	-1 mA < I_L < 1 mA
	0 - 10 V	-1 mA < I_L < 1 mA
	4 - 20 mA	R_L < 360 Ohm
Serial interface	RS232C	

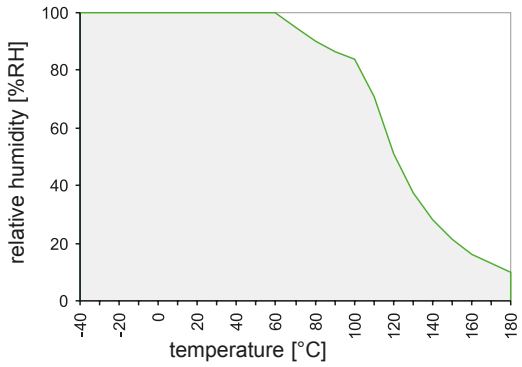
General

Supply voltage	SELV 24V DC/V AC ± 15%		
Current consumption	≤ 150mA (24V DC); ≤ 280mA (24V AC)		
Pressure range with pressure tight sensor probe	0.01...15 bar (0.15...218psi)		
System requirements for software	WINDOWS 2000 or later; serial interface		
Housings	supply- and evaluation unit	ABS-plastic / IP65	
	sensor driver unit	AlSi12 / IP65	
Cable gland	PG 7 and PG 9; for cable diameter 5 - 9 mm (0.2 - 0.35")		
Electrical connection	screw terminals max. 1.5 mm² (AWG 16)		
Sensor protection	sintered stainless steel filter, PTFE-filter or metal grid filter		
Temperature range	sensor probe:	according measuring range	
	electronic sensor driver device:	-20...60°C	(-4...140°F)
	electronic supply- and evaluation device:	-40...60°C	(-40...140°F)
	electronic with display:	0...40°C	(32...104°F)
Storage temperature range	electronics and sensor head	-30...60°C	(22...140°F)
Electromagnetic compatibility according	EN61326-1	EN61326-2-3	ICES-003 ClassB
	Industrial Environment		FCC Part15 ClassB

CE

1) Refer to the working range of the humidity sensor.
2) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).
3) Refer to accuracies of calculated values.

Working Range Humidity Sensor



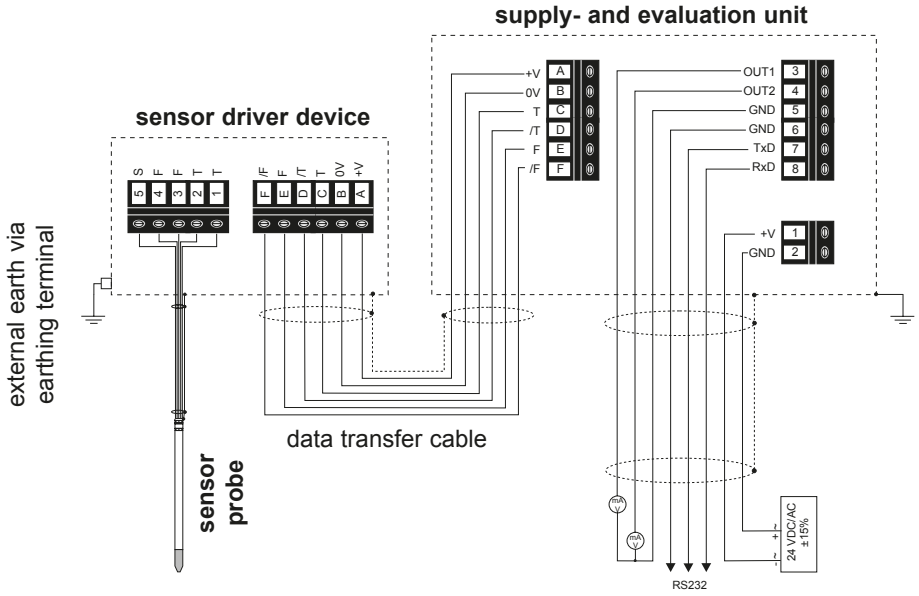
The specified working range for the humidity sensor element is shown in terms of humidity/temperature limits.

Although the sensors would not deteriorate beyond the limits, their performance can only be specified within the limits for the working range.

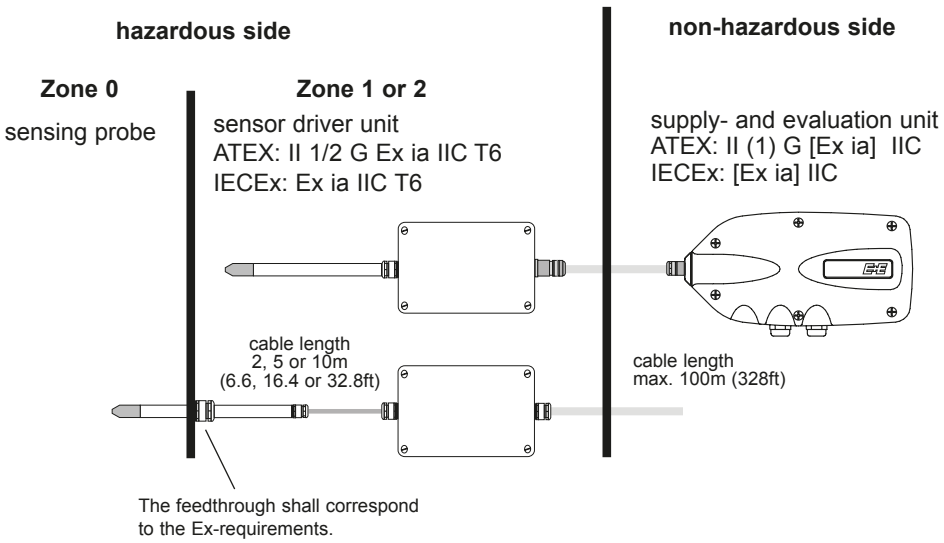
Sensing head with protective coating

For use in heavy polluted or aggressive environment has developed a special protective coating process (order code: HC01). Both humidity and temperature sensor elements are covered with a polymer film. Extensive tests have proved an amazing improvement of the resistance to chemical pollutants which leads to a much better long term stability of the transmitter.

Connection Diagram



Installation



Series HLX30EX-A

Series HLX30EX-D
Series HLX30EX-E

Ordering Guide HLX30EX

Position 1 - Transmitter

		HLX30EX-A	HLX30EX-D	HLX30EX-E
Hardware Configuration				
Filter	stainless steel sintered filter	3	3	3
	PTFE filter*)	5	5	5
	metal grid filter (up to 120°C/248 °F)*	6	6	6
	stainless steel gird filter (up to 180°C/ 356 °F)	9	9	9
Cable length	2m (6.6ft)		02	02
	5m (16.4ft)		05	05
	10m (32.8ft)		10	10
Probe length	200mm (7.9")		5	5
	400mm (15.8")		6	6
Pressure tight Feedthrough	1/2" male thread		HA03	HA03
	1/2" pipe weld joint		HA05	HA05
	1/2" NPT thread		HA07	HA07
Data cable	not pluggable			
	pluggable	P02	P02	P02
Display	without display			
	with display	D01	D01	D01
Coating sensor	no			
	yes	HC01	HC01	HC01
Software Configuration				
Physical parameters of outputs	Relative humidity RH [%] (A) Output 1	Select according to Ordering Guide(A-H,J)		
	Temperature T [°C] (B)			
	Dew point temperature Td [°C] (C)			
	Frost point temperature Tf [°C] (D) Output 2	Select according to Ordering Guide (A-H, J)		
	Wet bulb temperature Tw [°C] (E)			
	Water vapour partial pres. e [mbar] (F)			
	Mixture ratio r [g/kg] (G)			
	Absolute humidity dv [g/m³] (H)			
	Specific enthalphy h [kJ/kg] (J)			
Type of output signals	0-5V (2)	Select according to Ordering Guide(2,3,6)		
	0-10V (3)			
	4-20mA (6)			
Measure value units	metric / SI	E01	E01	E01
	non metric / US			
Scaling of T-output Scaling of Td-output in°C or °F	-40...60 (T02), -40...120 (T12), -40...160 (T33) Output T	Select according to Ordering Guide (Txx)		
	-10...50 (T03), -20...100 (T14), -40...180 (T52)			
	0...50 (T04), +20...120 (T15), -40...140 (T83)			
	0...100 (T05), 0...120 (T16), 32...120 (T90) Output Td	Select according to Ordering Guide (Tdxx)		
	0...60 (T07), 0...80 (T21), 32...140 (T91)			
	-30...70 (T08), -40...80 (T22), 32...180 (T92)			
	-30...120 (T09), -20...80 (T24), 32...132 (T96)			
	-20...120 (T10), -20...60 (T25)	Other T or Td-scaling refer to data sheet „„T-Scalings““		
Position 2 - Data cable				
Data cable	maximal 100m (328ft) / transmitter	xxxm	xxxm	xxxm

*) to be used for the apparatus group II B only

Order Example

Position 1 - Transmitter: **HLX30EX-E3056HA03P02/BC3-T05-Td14**
Humidity/Temperature Transmitter Series HLX30EX

Model:	For pressure tight installations
Filter:	stainless steel sintered filter
Cable length:	5m (16.4ft)
Probe length:	400mm (15.8")
Feedthrough:	1/2" male thread
Data cable:	pluggable
Output 1:	T
Output 2:	Td
Output signal:	0-10V
Scaling of T-output:	0...100°C
Scaling of Td-output:	-20...100°C

Position 2 - Data cable: **Data cable 60m (196.8ft)**

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HLX31 Series

Multifunctional Industrial Transmitter for Humidity / Temperature / Dew Point / Absolute Humidity...

The precise and reliable measurement of humidity in industrial processes is gaining more and more importance. The multifunctional transmitters series HLX31 offer the ideal solution.

The result of many years of experience in humidity measurement technology for industrial applications, the HLX31 series builds on the high-quality HC series capacitive humidity sensor elements.

The optimal hardware structure for varying applications is achieved by combining various standard mechanical and electronic modules. User friendly MS Windows software tools simplify the configuration of the transmitter, the data recording, visualization and processing.

The measured values are available on two freely configurable and scaleable analogue outputs and on the serial RS232 interface. With an optional RS485 module or Ethernet module up to 32 transmitters can be connected to a network and one single PC interface allowing easy remote monitoring.

Two freely configurable optional alarm outputs can be set by software. The measured data and the corresponding MIN/MAX values can be viewed on the optional LC display.

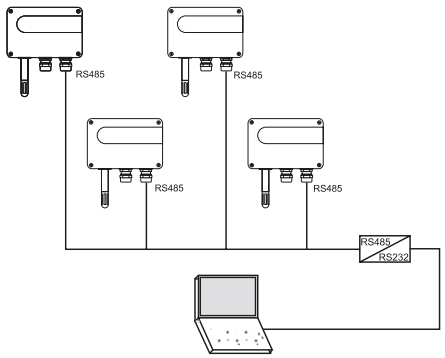
Other features especially tailored for harsh industrial applications are the new housing concept consisting of three modules, the easy on-site adjustment and calibration, and the pluggable sensor option.
These features allow for very fast and easy servicing of the transmitter.

By selecting a suitable housing version the HLX31 series can be used for the entire range of humidity measurement applications:

- Model A for wall mounting
- Model B for duct mounting
- Model D with remote sensing probe for measurements in the extended temperature range -40...180°C (-40...356°F).
- Model E with remote sensing probe for pressure tight applications between 0.01...20 bar (0.15...300psi).

Network with up to 32 transmitters

Up to 32 transmitters can be connected in a RS-485 bus system to a single PC interface.
The measured and calculated data is stored in a PC database which is available for further processing by using the data - logging and analysis software.
The data base can also be stored in ASCII format or in a database with ODBC interface.



Ethernet interface

HLX31 transmitters can be connected through a standard Ethernet-port for easy remote monitoring (ordering code E). The software-tools are in the standard scope of supply.

Software Tools

Configuration Software (included in the scope of supply):

The Configuration Software is used for:

- flexible, easy and fast setup of the analogue and alarm outputs.
- adjustment of the humidity and temperature outputs.
- exchange of the sensing probe or of the sensors.

Datalogging and Analysis Software (optional):

This user friendly software tool is a great help for easy data analysis in graphical or spreadsheet format on a PC as well as for data and alarms management by e-mail or SMS.

Easy calibration and adjustment of the transmitter

The modular housing of the HLX31 enables a fast and easy on-site adjustment and calibration. Using the optional extension cable one can adjust or calibrate the entire measurement loop without interrupting the measurement. No need for time-consuming dismounting and wiring of the instrument.
This feature makes the HLX31 series suitable for use in regulatory environments (e.g. FDA, GAMP).
The adjustment of humidity and temperature (2 points or 1 point) is performed either with a simple routine using two push buttons on the printed circuit board or with the configuration software.

2 Status LEDs

Two status LEDs on the printed circuit board indicate the transmitter status and eventual errors, especially useful during installation or service operations.

Sensor Coating

Operation in heavily polluted and/or corrosive environments is typical for many industrial processes and can lead to drift or damage of the humidity sensor and thus to false measured values. The unique protective coating developed for the sensing probe brings a significant improvement on the long-term stability of the transmitter in very dirty and aggressive environments. (ordering code: HC01)

Integrated Display

The actual measured and calculated values as well as the corresponding Min/Max values can be indicated on an optional display. The physical quantity to be displayed is choosen with the push buttons on the housing. (ordering code: D05)

Pluggable sensing probe

The pluggable sensing probe with plug connection can be easily exchanged in the versions D and E. The installation of the probe cable (up to 20m / 65ft) is significantly simplified and can be installed prior to fitting the transmitter. (ordering code: P01)

Alarm outputs

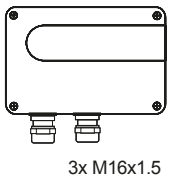
An optional alarm module with 2 relay outputs is available for control and alarm purposes. The selection of the physical quantity for the relay ouputs and the setting of threshold and hysteresis can be easily made with the configuration software included in the standard scope of supply.

Integrated power supply

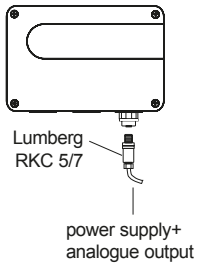
A power supply, integrated in the back module of the housing, can be ordered optionally (100...240V AC, 50/60Hz; ordering code V01). The power supply V01 is available for both polycarbonate and metal housing and comes standard with two plugs for supply and outputs to allow an easy connection.

Connection versions

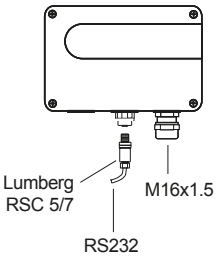
standard



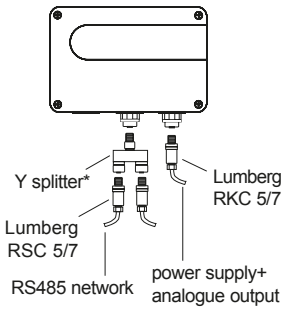
plug option C03



plug option C06



plug option C08

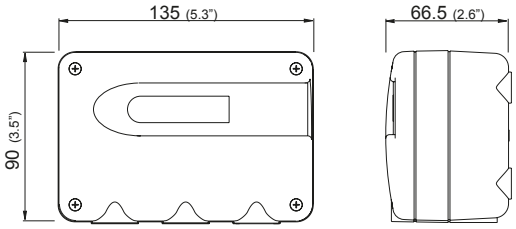


* Siemens 6ES7 194-1KA01-0XA0

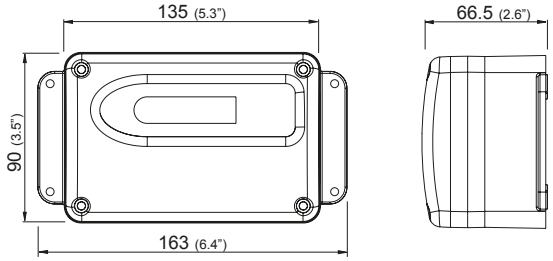
Dimensions in mm

Housing:

polycarbonate housing

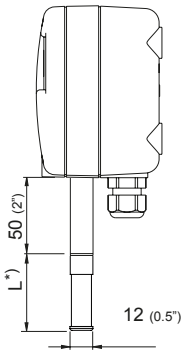


metal housing

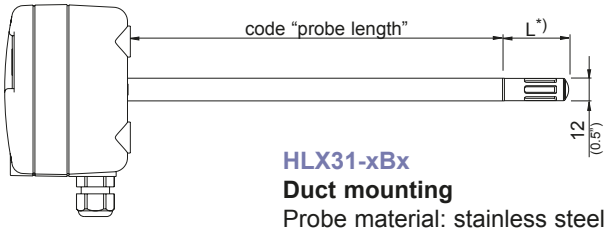


For use in harsh industrial environments all models of the HLX31 are available in a robust metal housing.
The very smooth surface and the rounded outlines allow for the use in clean rooms as well.

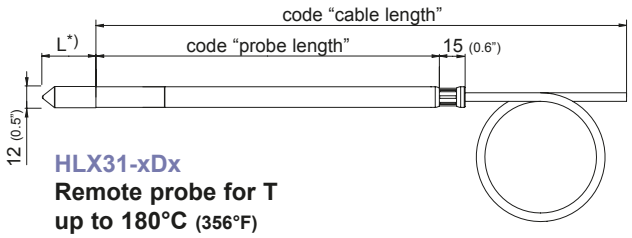
Models:



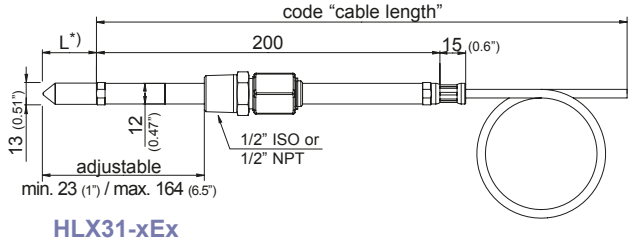
HLX31-xAx
Wall mounting
Probe material: PC



HLX31-xBx
Duct mounting
Probe material: stainless steel



HLX31-xDx
Remote probe for T up to 180°C (356°F)
Probe material: stainless steel



HLX31-xEx
Pressure tight probe up to 20bar (300psi)
Probe material: stainless steel

*) L = Filter length: refer to data sheet "Accessories"

Digitron

Technical Data

Measurement values

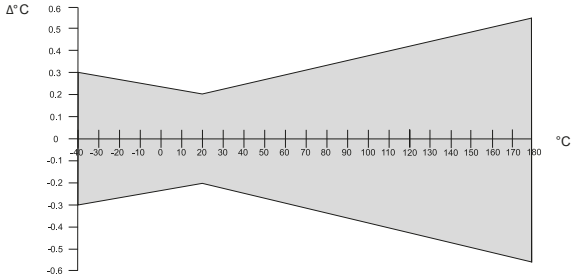
Relative humidity

Humidity sensor[1]		HC1000-400
Working range[1]		0...100% RH
Accuracy[*] (including hysteresis, non-linearity and repeatability, traceable to intern. standards, administrated by NIST, PTB, BEV...)		
-15...40°C (5...104°F)	≤90% RH	± (1.3 + 0.3%*mv) % RH
-15...40°C (5...104°F)	>90% RH	± 2.3% RH
-25...70°C (-13...158°F)		± (1.4 + 1%*mv) % RH
-40...180°C (-40...356°F)		± (1.5 + 1.5%*mv) % RH
Temperature dependence of electronics		typ. ± 0.01% RH/°C (0.0055% RH/°F)
Response time with metal grid filter at 20°C / t_{90}		< 15s

Temperature

Temperature sensor element		Pt1000 (Tolerance class A, DIN EN 60751)
Working range sensing head	HLX31-xAx: -40...60°C (-40...140°F)	HLX31-xDx:-40...180°C (-40...356°F)
	HLX31-xBx: -40...80°C (-40...176°F)	HLX31-xEx:-40...180°C (-40...356°F)

Accuracy



Temperature dependence of electronics	typ. ± 0.005°C/°C

Outputs[2]

Two freely selectable and scaleable analogue outputs 0...100% RH / xx...yy°C respectively	0 - 5V	-1mA < I_L < 1mA
	0 - 10V	-1mA < I_L < 1mA
	4 - 20mA	R_L < 500 Ohm
	0 - 20mA	R_L < 500 Ohm
Serial interface	RS232C	
	RS485 optional	

Max. adjustable measurement range[2)3)]

		from	up to *HLX31-A*	*HLX31-B*	*HLX31-D,E*	units
Humidity	RH	0	100	100	100	% RH
Temperature	T	-40 (-40)	60 (140)	80 (176)	180 (356)	°C (°F)
Dew-point temperature	Td	-40 (-40)	60 (140)	80 (176)	100 (212)	°C (°F)
Frost-point temperature	Tf	-40 (-40)	0 (32)	0 (32)	0 (32)	°C (°F)
Wet-bulb temperature	Tw	0 (32)	60 (140)	80 (176)	100 (212)	°C (°F)
Water vapour partial pressure	e	0 (0)	200 (3)	500 (7.5)	1100 (15)	mbar (psi)
Mixture ratio	r	0 (0)	425 (2900)	999 (9999)	999 (9999)	g/kg (gr/lb)
Absolute humidity	dv	0 (0)	150 (60)	300 (120)	700 (300)	g/m³ (gr/ft³)
Specific enthalpy	h	0 (0)	400 (50000)	1000 (375000)	2800 (999999)	kJ/kg (lbf/lb)

General

Supply voltage	8...35V DC	
	12...30V AC	(optional 100...240V AC, 50/60Hz)
Current consumption - 2x voltage output	for 24V DC/AC: typ. 40mA	
- 2x current output	typ. 80mA	
Pressure range for pressure tight probe	0.01...20bar (0.15...300psi)	
System requirements for software	WINDOWS 2000 or later; serial interface	
Housing / protection class	PC or Al Si 9 Cu 3 / IP65; Nema 4	
Cable gland	M16 x 1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")	
Electrical connection	screw terminals up to max. 1.5mm² (AWG 16)	
Working and storage temperature range of electronics	-40...60°C (-40...140°F)	
	-20...50°C (-4...122°F) - housing with display	
Electromagnetic compatibility according to	EN61326-1 Industrial Environment	EN61326-2-3 ICES-003 ClassB FCC Part15 ClassB

CE

1) Refer to the working range of the humidity sensor. 2) Can be easily changed by software. 3) Refer to accuracies of calculated values (page 152)

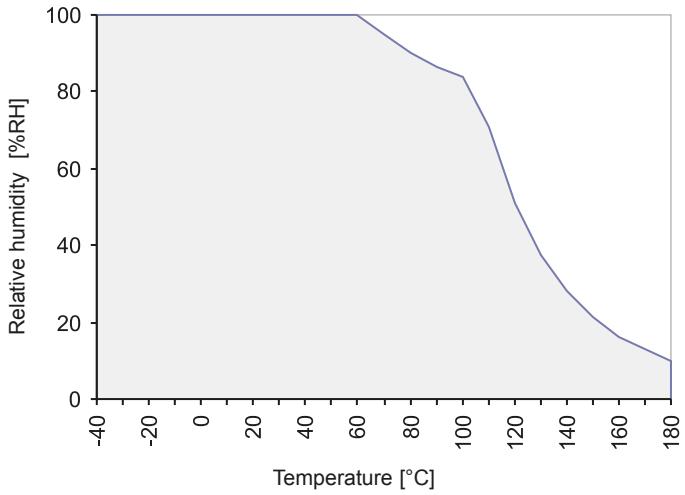
*) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

Technical Data for Options

Display	graphical LC display (128x32 pixels), with integrated push-buttons for selecting parameters and MIN/MAX function
Alarm outputs	2 x 1 switch contact 250V AC / 6A 28V DC / 6A
Threshold + hysteresis	can be adjusted with configuration software
Switching parameters	freely selectable between:

RH	Relative humidity
T	Temperature
Td	Dew-point temperature
Tf	Frost-point temperature
Tw	Wet-bulb temperature
e	Water vapour partial pressure
r	Mixture ratio
dv	Absolute humidity
h	Specific enthalpy

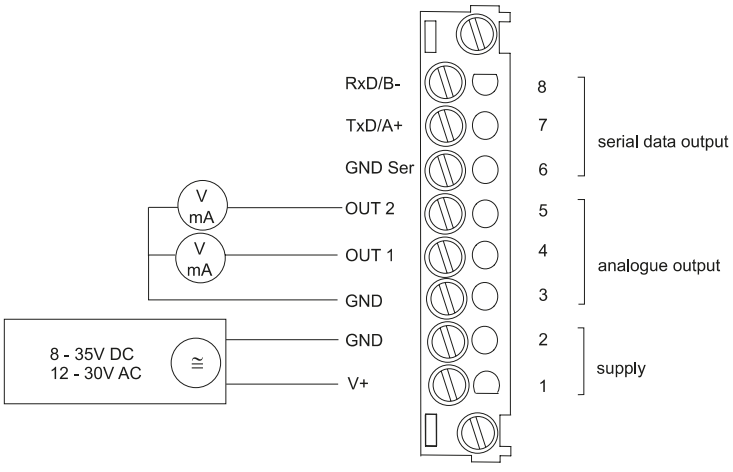
Working range humidity sensor



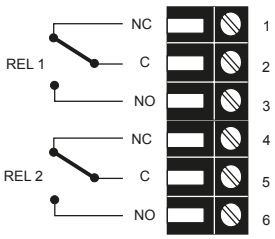
The gray area shows the allowed measurement range for the humidity sensor.

Operating points outside of this range do not lead to destruction of the element, but the specified measurement accuracy cannot be guaranteed.

Connection diagram



Terminal configuration - Alarm output



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Ordering Guide

		HLX31-	HLX31-	HLX31-	HLX31-
Hardware Configuration					
Housing	metal housing	M	M	M	M
	polycarbonate housing	P	P	P	P
Type	humidity + temperature	FT	FT	FT	FT
Model		A	B	D	E
Filter	stainless steel sintered filter	3	3	3	3
	PTFE filter	5	5	5	5
	stainless steel grid filter (up to 180°C / 356°F)	9	9	9	9
Cable length	2m (6.6ft)			02	02
(incl. probe length)	5m (16.4ft)			05	05
	10m (32.8ft)			10	10
	20m (65.6ft)			20	20
Probe length	65mm (2.6")			2	
	200mm (7.9")		5	5	5
	400mm (15.8")		6	6	
Pressure tight Feedthrough	1/2" male thread				HA03
	1/2" NPT thread				HA07
Interface	RS232				
	RS485	N	N	N	N
	ethernet interface[1)]	E	E	E	E
Display	without display				
	with display	D05	D05	D05	D05
Alarm output [2)]	without relay				
	with relay	SW	SW	SW	SW
Plug	cable glands				
	1 plug for power supply and outputs	C03	C03	C03	C03
	1 cable gland / 1 plug for RS232	C06	C06	C06	C06
	2 plugs for power supply/outputs and RS485 Network	C08	C08	C08	C08
Sensing probe	fixed				
	pluggable			P01	P01
Coating sensor	no				
	yes	HC01	HC01	HC01	HC01
Supply voltage	8...35V DC / 12...30V AC				
	integrated power supply 100...240V AC, 50/60Hz[1)3)]	V01	V01	V01	V01

Software Configuration							
Physical parameters of outputs	relative humidity	RH	[%]	(A)		Output 1	Select according to Ordering Guide (A - H,J)
	temperature	T	[°C or °F]	(B)			
	dew point temperature	Td	[°C or °F]	(C)		Output 2	Select according to Ordering Guide (A - H,J)
	rost point temperature	Tf	[°C or °F]	(D)			
	wet bulb temperature	Tw	[°C or °F]	(E)			
	water vapour partial pressure	e	[mbar]	(F)			
	mixture ratio	r	[g/kg]	(G)			
	absolute humidity	dv	[g/m³]	(H)			
	specific enthalpy	h	[kJ/kg]	(J)			
Type of output signals	0-5V			(2)			Select according to Ordering Guide (2,3,5,6)
	0-10V			(3)			
	0-20mA			(5)			
	4-20mA			(6)			
Measured value units	metric / SI						
	non metric / US						E01 E01 E01 E01
Scaling of T-output	-40...60 (T02)	-20...80 (T24)	0...350 (T89)			Output T	Select according to Ordering Guide (Txx)
Scaling of Td-output	0...50 (T04)	0...180 (T26)	32...120 (T90)				
in°C or °F	0...100 (T05)	-40...180 (T52)	32...140 (T91)			Output Td	Select according to Ordering Guide (Tdxx)
	0...60 (T07)	-40...100 (T79)	32...180 (T92)				
	-40...120 (T12)	-40...350 (T82)	32...250 (T94)				Other T and Td-scaling refer to data sheet
	0...120 (T16)	-40...140 (T83)	32...300 (T95)				"T-Scalings"
	0...80 (T21)	-40...300 (T84)	32...132 (T96)				
	-40...80 (T22)	0...250 (T88)	32...350 (T101)				

1) Combination ethernet and alarm output is not possible / combination ethernet and integrated power supply is not possible
2) Combination alarm output and plugs is not possible (with cable glands only) / combination alarm output and integrated power supply is not possible
3) Integrated power supply includes 2 plugs for power supply and outputs / further plug options are not possible

Order Example

HLX31-PFTB55SW/BC2-T07-Td03

Housing:	polycarbonate housing		
Type:	humidity + temperature	Output 1:	T
Model:	duct mounting	Output 2:	Td
Filter:	PTFE Filter	Output signal:	0-5V
Probe length:	200mm (7.9")	Scaling of T-output:	0...60°C
Alarm output:	yes	Scaling of Td-output:	-10...50°C

Accessories / Replacement Parts

(For further information, see data sheet "Accessories")

- Filter caps (HA0101xx)
- Display + housing cover in metal (D05M)
- Display + housing cover in polycarbonate (D05P)
- Sensing probe (Pxx)
- Humidity sensor (FE09 or FE09-HC01)
- Interface cable for PCB (HA010304)
- Interface cable for plugs C06 (HA010311)
- Bracket for installation onto mounting rails* (HA010203)
- Drip water protection (HA010503)
- Calibration set (HA0104xx)
- Datalogging and analysis software (HA010602)
- RS485 Kit (HW + SW) for networking (HA010601)
- Mounting flange stainless steel (HA010201)

*Note: Only for plastichousing, not for metalhousing

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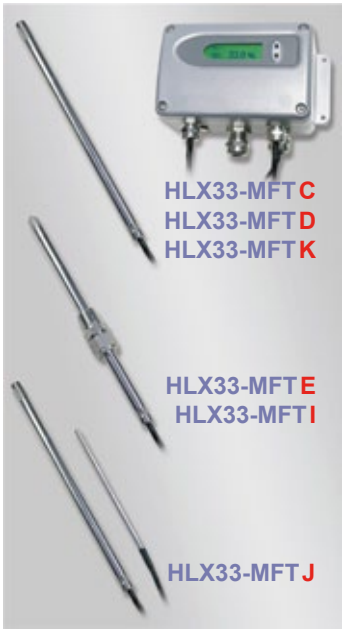
HLX33

Humidity / Temperature Transmitter for High Humidity and Chemical Applications

The highly accurate HLX33 series are designed for fast and reliable measurement of relative humidity / dew point temperature / absolute humidity / ...under the most demanding conditions.
Neither condensation nor heavy chemical pollutions will affect prompt and reliable measurements. Process pressures as high as 100 bar (1450 psi) and continuous high humidity are also no problem for the HLX33 series.
The core of the HLX33 series is the new monolithic measurement cell type HMC1, manufactured in thin-film technology
Chemical contamination and also condensation will actually evaporate due to the innovative design of the HMC1 measurement cell. The monolithic construction of the sensor allows a fast return to normal conditions and a continuation of the measurement.
Additionally, with the inimitable sensor coating the HMC1 measurement cell is even better protected against corrosive and short-circuit-causing conductive soils.
Distinctive models and mounting versions allow the HLX33 series to be utilized in numerous applications:

heated, monolithic measurement cell



- **Measurement of relative humidity during temporary condensation:** the measurement cell is briefly heated, but very intense
- **Measurement of dew point temperature at continuous high humidity:** the measurement cell is controlled and heated continuously
- **Measurement of relative humidity at continuous high humidity:** the measurement cell is controlled and heated continuously; an additional temperature sensor is added
- **Measurement of relative humidity at high chemical exposure and average humidity:** the measurement cell is briefly heated, but very intense
- **Measurement of relative humidity at process pressure up to 100bar (1450psi) and average humidity:** the measurement cell is installed in a special high pressure probe

The configuration software included in the scope of supply allows user friendly setup of the operation / sensor heating mode as well as selection and adjustment of the electrical outputs.

Model	Environmental Conditions
C - remote sensing probe up to 120°C (248°F)	chemical pollution, temporary condensation
D - remote sensing probe up to 180°C (356°F)	chemical pollution, temporary condensation
E - remote sensing probe, pressure tight up to 20bar (300psi)	chemical pollution, temporary condensation
I - remote sensing probe, pressure tight up to 100bar (1450psi)	chemical pollution, temporary condensation
J - 2 remote sensing probes (RH-measurement), pressure tight up to 20bar (300psi)	continuous high humidity and condensation
K - remote sensing probe (Td-measurement) pressure tight up to 20bar (300psi)	continuous high humidity and condensation

Typical Applications

pharmaceutical and food industry
dryers for ceramics, wood, concrete, polyester, etc
mushroom farms
high-humidity storage rooms
climate, test and curing chambers
meteorology

Features

heated, monolithic measurement cell
working range 0...100% RH / -40...+180°C (-40...356°F)
measurement near condensation
fast recovery after condensation
chemical purge after chemical exposure
pressure tight up to 100bar (1450psi)
calculation of additional physical quantities
optional sensor coating

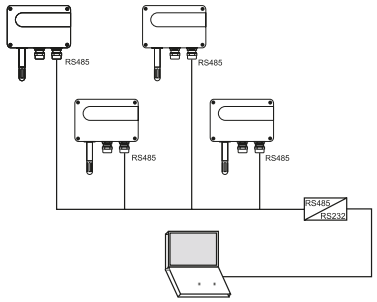
Functions

	Comment
Measurement of humidity and temperature	✓
Calculation h, r, dv, Tw, Td, Tf, e	✓
2 freely scaleable and configurable analogue outputs	✓
Remote sensing probe up to 20m (65.6ft)	✓
On-site adjustment for relative humidity and temperature	✓
LED indication of transmitter status / error diagnosis of probes	✓
RS232 for transmitter configuration via PC	✓
Configuration software	✓
Alternating display with MIN/MAX indication	optional
2 freely configurable alarm outputs	optional
Removeable sensing probe	optional
Sensor protection with coating	optional
Pluggable electrical connections	optional
Data output via RS232 interface	✓
Data output via RS485 interface	optional
Networking for up to 32 transmitters via RS485 bus	optional
Ethernet interface for networking and remote monitoring	optional
Data logging and analysis PC software	optional
ARC-Module for external triggering of sensor-heating	optional

Networkability / Ethernet Interface

The optional RS485 interface (order code N) allows for building a network of up to 32 transmitters.
The measurement data can be collected in a shared database and made available for all kinds of further processing.

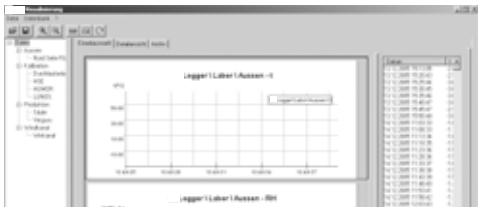
Additionally, the transmitters can be networked with an Ethernet module (order code E) for remote monitoring.



Software

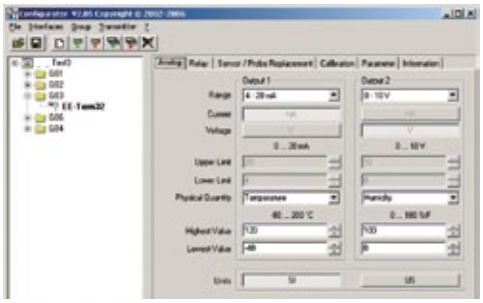
Configuration Software (included in the scope of supply):

The configuration software allows flexible and simple adjustment of the analogue and alarm outputs in accordance with the requirements. The adjustment / calibration of the humidity and temperature outputs is possible as well. Furthermore the settings of the start and duration of the heating of the measurement cell can be defined.



Data Logging / Analysis Software (optional):

An additional software package enables data recording and management, including alerts by e-mail or text message when set points are triggered.
It is also possible to present the collected measurement data on a PC in graphs or tables. If the option N (RS485) or E (Ethernet) is selected in the ordering code, the data logging and analysis software will be included in the scope of supply.



Integrated Display

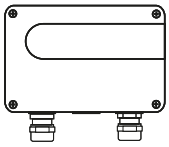
The actual measurement data and the corresponding Min/Max values can be indicated in an optional display (order code D05). The physical quantity to be displayed is selected by the push buttons next to the display.

Alarm Outputs

An optional alarm module with 2 relay outputs is available for control and alarm purposes (order code SW). The selection of the physical quantity and the setting of threshold and hysteresis can be made with the configuration software included in the scope of supply.

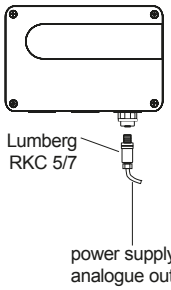
Connection Versions

standard

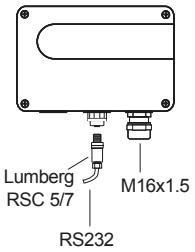


3x M16 x 1.5

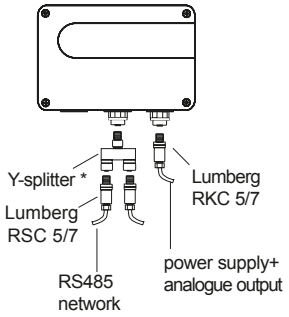
plug option C03



plug option C06



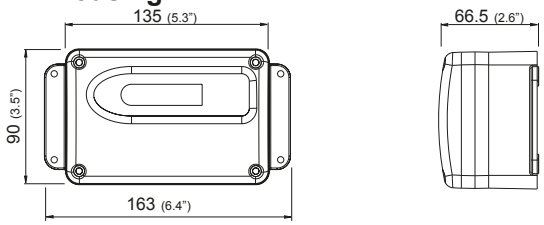
plug option C08



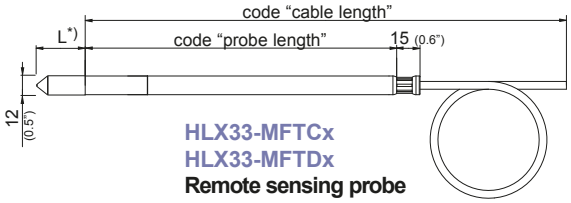
* Siemens 6ES7 194-1KA01-0XA0

Dimensions (mm)

Housing:

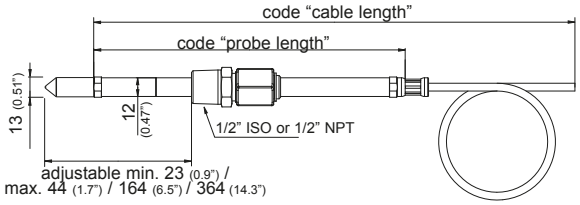


Remote Probe:

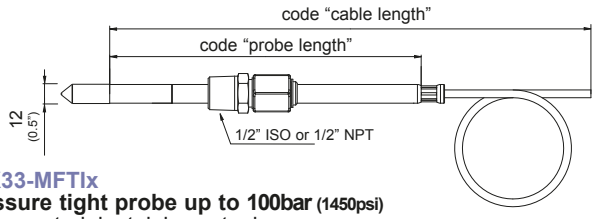


HLX33-MFTCx
HLX33-MFTDx
Remote sensing probe
Probe material: stainless steel

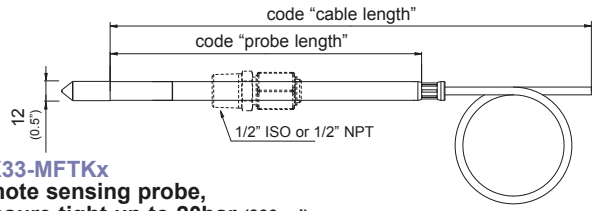
Sensing probes:



HLX33-MFTEx
Pressure tight probe up to 20bar (300psi)
Probe material: stainless steel

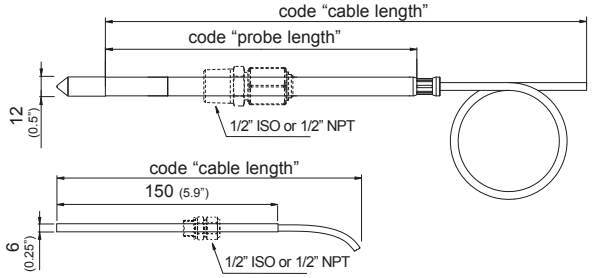


HLX33-MFTIx
Pressure tight probe up to 100bar (1450psi)
Probe material: stainless steel



HLX33-MFTKx
Remote sensing probe,
pressure tight up to 20bar (300psi)
(screw connection is not included in the scope of supply)
Probe material: stainless steel

screw connection:		order code:
1/2" ISO	12mm	HA011102
1/2" NPT	12mm	HA011103



HLX33-MFTJx
Two remote sensing probes,
pressure tight up to 20bar (300psi)
(screw connections are not included in the scope of supply)
Probe material: stainless steel

screw connection:		order code:
1/2" ISO	12mm	HA011102
1/2" NPT	12mm	HA011103
1/2" ISO	6mm	HA011104
1/2" NPT	6mm	HA011105

*) L = Filter length: refer to data sheet "Accessories"

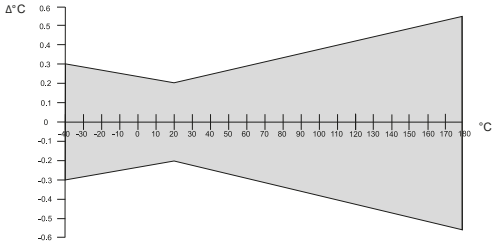
Technical Data

Measurement values

Relative humidity

Humidity sensor[1]		heated, monolithic measurement cell HMC1
Working range[1]		0...100% RH
Accuracy*) (including hysteresis, non-linearity and repeatability, traceable to intern. standards, administrated by NIST, PTB, BEV...)		
-15...40°C (5...104°F)	≤90% RH	± (1.3 + 0.3%*mv) % RH
-15...40°C (5...104°F)	90% RH	± 2.3% RH
-25...70°C (-13...158°F)		± (1.4 + 1%*mv) % RH
-40...180°C (-40...356°F)		± (1.5 + 1.5%*mv) % RH
Temperature dependence of electronics		typ. ± 0.01% RH/°C (0.0055% RH/°F)
Response time with metal grid filter at 20°C (68°F) / t_{90}		< 15s

Temperature

Temperature sensor element	monolithic measurement cell HMC1
Working range sensing head	HLX33-MFTC: -40...120°C (-40...248°F) HLX33-MFTD/E/I/J/K: -40...180°C (-40...356°F)
Accuracy	
Temperature dependence of electronics	typ. ± 0.005°C/°C
External temperature probe	Pt1000 (DIN A)

Outputs[2]

Two freely selectable and scaleable analogue outputs	0 - 1V	-1mA < I_L < 1mA
	0 - 5V	-1mA < I_L < 1mA
	0 - 10V	-1mA < I_L < 1mA
	4 - 20mA	R_L < 500 Ohm
	0 - 20mA	R_L < 500 Ohm
Digital interface	RS232	optional: RS485 or ethernet

Max. adjustable measurement range[2)3)]

		from	to			Unit
			HLX33-C	HLX33-D/E/I/J	HLX33-K	
Humidity	RH	0	100	100	/	% RH
Temperature	T	-40 (-40)	120 (248)	180 (356)	/	°C (°F)
Dew point temperature	Td	-40 (-40)	100 (212)	100 (212)	100	°C (°F)
Frost point temperature	Tf	-40 (-40)	0 (32)	0 (32)	0	°C (°F)
Wet bulb temperature	Tw	0 (32)	100 (212)	100 (212)	/	°C (°F)
Water vapour partial pressure	e	0 (0)	1100 (15)	1100 (15)	/	mbar (psi)
Mixture ratio	r	0 (0)	999 (9999)	999 (9999)	/	g/kg (gr/lb)
Absolute humidity	dv	0 (0)	700 (300)	700 (300)	/	g/m3 (gr/ft³)
Specific enthalpy	h	0 (0)	2800 (99999)	2800 (99999)	/	kJ/kg (lbf/lb))

General

Supply voltage		8...35V DC 12...30V AC (optional 100...240V AC, 50/60Hz)
Current consumption	- 2x voltage output	for 24V DC/AC: typ. 40mA / 80mA
	- 2x current output	typ. 80mA / 160mA
Pressure range for pressure tight probe		HLX33-MFTEx/Jx/Kx: 0.01...20bar (0.15...300psi) HLX33-MFTIx: 0...100bar (0...1450psi)
System requirements for software		WINDOWS 2000 or later; serial interface
Housing / protection class		Al Si 9 Cu 3 / IP65; (Nema 4)
Cable gland		M16 x 1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")
Electrical connection		screw terminals up to max. 1.5mm² (AWG 16)
Working and storage temperature range of electronics		-40...60°C (-40...140°F) -20...50°C (-4...122°F) - housing with display
Electromagnetic compatibility according to		EN61326-1 EN61326-2-3 ICES-003 ClassB Industrial Environment FCC Part15 ClassB

1) Refer to the working range of the humidity sensor. 2) Can be easily changed by software. 3) Refer to accuracies of calculated values (page 152)

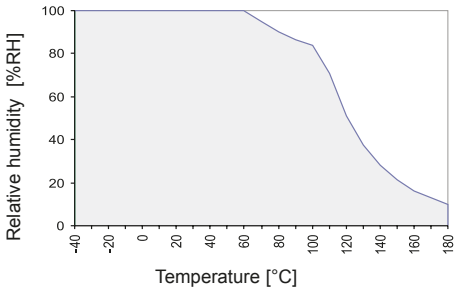
*) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

Technical Data for Options

Display	graphical LC display (128x32 pixels), with integrated push-buttons for selecting parameters and MIN/MAX function
Alarm outputs	2 x 1 switch contact 250V AC / 6A 28V DC / 6A threshold + hysteresis: can be adjusted with configuration software switching parameters:

freely selectable between		HLX33-MFTA/C/D/E/I/J	HLX33-MFTK
RH	Relative humidity	✓	
T	Temperature	✓	
Td	Dew point temperature	✓	✓
Tf	Frost point temperature	✓	✓
Tw	Wet bulb temperature	✓	
e	Water vapour partial pressure	✓	
r	Mixture ratio	✓	
dv	Absolute humidity	✓	
h	Specific enthalpy	✓	

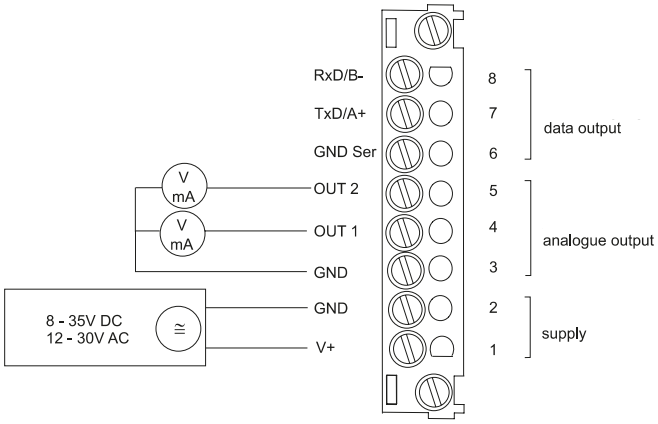
Working Range Humidity Sensor



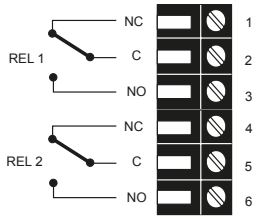
The grey area shows the allowed measurement range for the humidity sensor.

Operating points outside of this range do not lead to destruction of the sensor, but the specified measurement accuracy cannot be guaranteed.

Connection Diagram



Terminal configuration - Alarm output
(order code SW)



Accessories / Replacement Parts
(For further information, see data sheet "Accessories")

- Filter caps	(HA0101xx)	- Drip water protection	(HA010503)
- Display + housing cover	(D05M)		
- Interface cable for PCB	(HA010304)	- Calibration set	(HA0104xx)
- Interface cable for plug C06	(HA010311)	- Pressure tight screw connections	
- ½“ NPT-adapter for configuration	(HA011101)	1/2” ISO 12mm	(HA011102)
- Mounting flange 12mm (RH probe)	(HA010201)	1/2” NPT 12mm	(HA011103)
- Mounting flange 6mm (T probe)	(HA010207)	1/2” ISO 6mm	(HA011104)
- Adapter M16x1.5 to NPT ½"	(HA011101)	1/2” NPT 6mm	(HA011105)
- RS485 Kit (HW + SW) for networking	(HA010601)	- Radiation shield for RH-probe	(HA010502)
- Data logging / analysis software	(HA010602)	- Radiation shield for T-probe	(HA010506)

Ordering Guide

		HLX33	HLX33	HLX33	HLX33	HLX33	HLX33
Hardware Configuration							
Housing	metal housing	M	M	M	M	M	M
Type	humidity	FT	FT	FT	FT	FT	FT
Model		C	D	E	I	J	K
Filter	PTFE stainless steel filter					2	
	stainless steel sintered filter	3	3	3	3		
	PTFE filter	5	5	5	5		
	stainless steel grid filter(up to 180°C/ 356°F)	9	9	9	9	9	9
Cable length	2m (6.6ft)	02	02	02	02	02	02
(incl. probe length)	5m (16.4ft)	05	05	05	05	05	05
	10m (32.8ft)	10	10	10	10	10	10
	20m (65.6ft)	20	20	20	20	20	20
Probe length	65mm (2.6") (for model E: 80mm (3.1"))	2	2	2		2	2
	200mm (7.9")	5	5	5	5	5	5
	400mm (15.8")	6	6	6		6	6
Pressure tight	1/2" male thread			HA03	HA03		
feedthrough	1/2" NPT thread			HA07	HA07		
Interface[1) 5)]	RS232						
	RS485	N	N	N	N	N	N
	ethernet interface[5)]	E	E	E	E	E	E
Display	without display						
	with display	D05	D05	D05	D05	D05	D05
Alarm output[1)]	without relay						
	with relay	SW	SW	SW	SW	SW	SW
ARC-Module[1) 2) 4)]	without external triggering of sensor-heating						
	with external triggering of sensor-heating[4)]	ARC	ARC	ARC	ARC	ARC	ARC
Plug[1)]	cable glands						
	1 plug for power supply and outputs	C03	C03	C03	C03	C03	C03
	1 cable gland / plug for RS232	C06	C06	C06	C06	C06	C06
	2 plugs for power supply / outputs and RS485 network	C08	C08	C08	C08	C08	C08
Sensing probe	fixed						
	connectable in the housing	P03	P03	P03	P03	P03	P03
Coating sensor	no						
	yes	HC01	HC01	HC01	HC01	HC01	HC01
Supply voltage	8...35V DC / 12...30V AC						
	integrated power supply 100 ...240V AC, 50/60Hz[1) 3)]	V01	V01	V01	V01	V01	V01

Software Configuration					Select according to Ordering Guide (A - J)	C
Physical parameters of outputs	Relative humidity	RH	[%]	(A)	Output 1	
	Temperature	T	[°C]	(B)		
	Dew point temperature	Td	[°C]	(C)	Output 2	Select according to Orderin Guide (A-J) D
	Frost point temperature	Tf	[°C]	(D)		
	Wet bulb temperature	Tw	[°C]	(E)		
	Water vapour partial pres.	e	[mbar]	(F)		
	Mixture ratio	r	[g/kg]	(G)		
	Absolute humdity	dv	[g/m³]	(H)		
	Specific enthalphy	h	[kJ/kg]	(J)		

Type of output signal	0-1V	1	1	1	1	1	1
	0-5V	2	2	2	2	2	2
	0-10V	3	3	3	3	3	3
	0-20mA	5	5	5	5	5	5
	4-20mA	6	6	6	6	6	6
Measured value units	metric / SI						
	non metric / US	E01	E01	E01	E01	E01	E01

T-Scaling	-40...60 (T02)	-20...100 (T14)	Output T	Select according to Ordering Guide (Txx)	
Td-Scaling	-10...50 (T03)	+20...120 (T15)			
Tf-Scaling	0...50 (T04)	0...120 (T16)	Output Td	Select according to Ordering Guide (Tdxx)	
Tw-Scaling	0...100 (T05)	0...80 (T21)			
(in °C or °F)	0...60 (T07)	-40...80 (T22)	Output Tf	Select according to Ordering Guide (Tfxx)	
	-30...70 (T08)	-20...80 (T24)			
	-30...120 (T09)	-40...160 (T33)	Output Tw	Select according to Ordering Guide(Twxx)	
	-20...120 (T10)	+20...180 (T40)		Other T/Td/Tf/Tw-scaling refer to data sheet „T-Scalings“	
	-40...120 (T12)	-40...180 (T52)			

1) Following combinations are not possible: RS485 / Ethernet / alarm output / ARC-Module / integrated power supply
2) If using an ARC-Module the transmitter has to be supplied with 24V AC/DC +/- 20%
3) Integrated power supply includes 2 plugs for power supply and outputs / further plug options are not possible
4) RS232 interface occupied
5) only C03 plug possible

Order Example

HLX33-MFTD5025ND05SW/BC3-T02-Td07

Hardware Configuration:

Housing:	metal	Display:	with display
Type:	humidity + temperature	Alarm output:	with relay
Model:	remote sensing probe	ARC-Module:	without
Filter:	PTFE filter	Plug:	cable glands
Cable length:	2m (6.6ft)	Sensing probe:	fixed
Probe length:	200mm (7.9")	Coating sensor:	no
Interface:	RS485	Supply voltage:	8...35V DC / 12...30V AC

Software Configuration:

Output 1:	T
Output 2:	Td
Output signal:	0-10V
Measurand value unit:	metric / SI
T-Scaling:	-40...60°C
Td-Scaling:	0...60°C

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HLX35 Series

Industrial Transmitter for Dew Point Measurement

Exact dew point monitoring is increasingly playing a more important role in many industrial applications, such as drying processes, air pressure pipelines, etc. For these purposes the multifunctional HLX35 Series offers the ideal features.

The HLX35 Series is based on a functional, user-friendly housing concept and on the proven polymer humidity sensors of the HC Series.
A specially developed autocalibration process enables measurements in a measurement range of -60...60°C Td (-76...140°F Td), with a Td measurement accuracy of ±2°C (±3.6°F).
Two freely configurable and scaleable analogue outputs are available for the two measurement values (Td, T).
An optional hygrostat output, which can be set by means of a potentiometer, provides an alarm signal in a simple way when a threshold of the permitted dew point is exceeded.
An optional display for the measurement values and the associated MIN/MAX values allows a quick overview of the current situation.

Autocalibration

Dew points in the range of -60...-20°C (-76...-4°F) at room temperatures correspond to relative humidity values of 0.08...5.37% RH. The measurement of such low humidity values is not possible with conventional capacitive measurement methods. For the HLX35 Series, a special autocalibration process is used to compensate for the usual drift effects and thus to achieve high accuracy measurements also at -60°C Td (-76°F Td).

Installation

In addition to the direct mounting of the dew point probe, a ball valve installation enables the mounting and removal of the probe without having to interrupt the running process.

Alarm Output

An optional alarm module with one relay output is available for control and alarm purposes. The setting of the Td threshold can be easily done with the potentiometer on the printed circuit board.

Integrated power supply

A power supply, integrated in the back module of the housing, can be ordered optionally (100...240V AC, 50/60Hz; ordering code V01). The power supply V01 is available for both polycarbonate and metal housing and comes standard with two plugs for supply and outputs to allow an easy connection.

Typical Applications

industrial processes
monitoring of air pressure pipelines
warehouses
drying processes
paper industries
chemical industries

Features

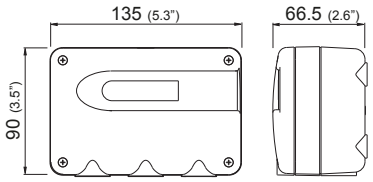
measuring range -60...60°C Td (-76...140°F Td)
accuracy of measurement ±2°C Td (±3.6°F Td)
traceable calibration
alarm output for dew point
autocalibration

Housing Dimensions (mm)

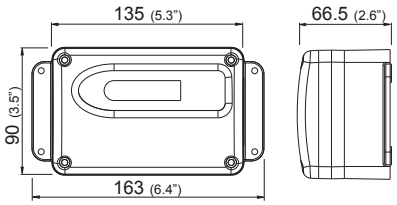
Installation Example

Housing:

polycarbonate housing

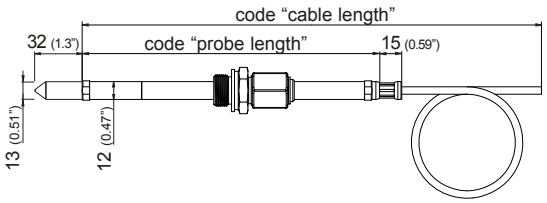


metal housing

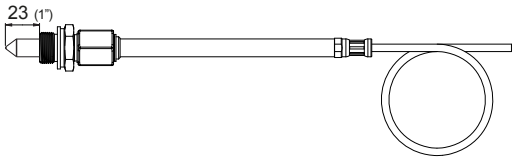


For use in harsh industrial environments the HLX35 series is available in a robust metal housing.

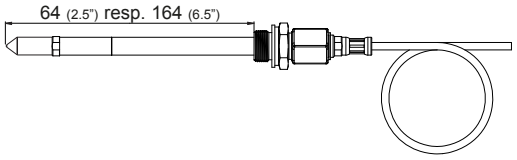
Model:



HLX35-xEx
Remote probe for T up to 60°C (140°F) and pressure-tight up to 20bar (300psi)
Probe material: stainless steel

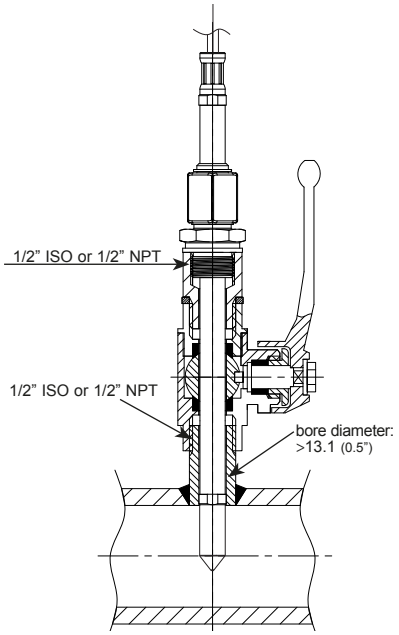


minimum installation depth

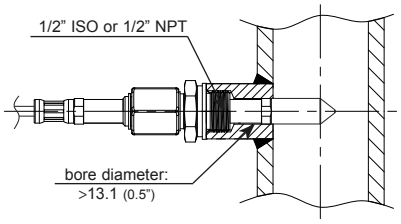


maximum installation depth

ball valve installation
(pressure-tight up to 10bar/145psi)

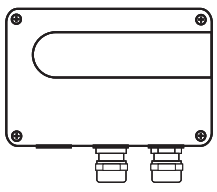


fixed installation
(pressure-tight up to 20bar/300psi)



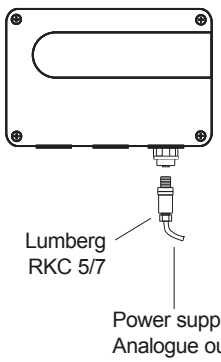
Connection Versions

Standard

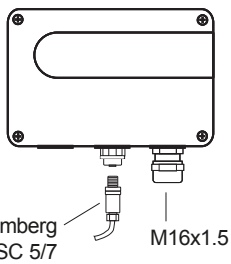


2x M16x1.5

Plug Option C03



Plug Option C06

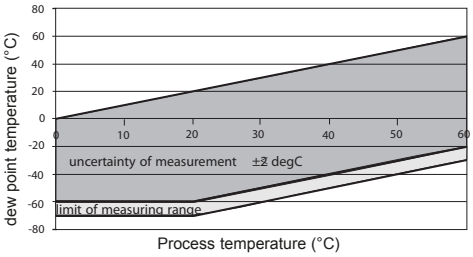


Technical Data

Measuring Quantities

Dew point

Humidity sensor	HC1000-400
Measuring range	standard calibration: -40...60°C (-40...140°F)
(below 0°C / 32°F the transmitter outputs frostpoint)	special calibration: -60...60°C (-76...140°F)
Accuracy	≤ ±2°C (≤ ± 3.6°F)
Traceable to intern. standards, administrated by NIST, PTB, BEV...	



Response time t_{90}	80 sec.	-20°C	-40°C	(-4°F	-40°F)
	10 sec.	-40°C	-20°C	(-40°F	-4°F)

Temperature

Sensor	Pt1000 DIN A
Measuring range	0...60°C (32...140°F)
Accuracy of temperature measurement at 20°C (68°F)	±0.2°C (±0.36°F)
Sensitivity error at full scale	±0.1°C (±0.18°F)
	0.005°C/°C

Outputs

Two freely selectable and scaleable analogue outputs xx...yy°C T, Td/Tf / xx...yy°C respectively

0 - 5V	-1mA < I_L < 1mA
0 - 10V	-1mA < I_L < 1mA
4 - 20mA	R_L < 500 Ohm
0 - 20mA	R_L < 500 Ohm

General

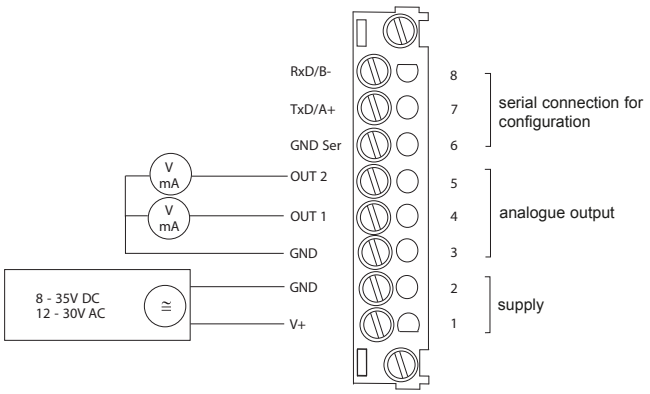
Supply voltage	8...35V DC 12...30V AC (optional 100...240V AC, 50/60Hz)
Current consumption - voltage output	typ. 40mA, with autocalibration: 100mA
- current output	typ. 80mA, with autocalibration: 140mA
Pressure range	0...20bar (0...300psi)
Housing / protection class	PC or Al Si 9 Cu 3 / IP65; Nema 4
Cable gland	M16 x 1.5 (option: plug) cable Ø 4.5 - 10 mm (0.18 - 0.39")
Electrical connection	screw terminals up to max. 1.5mm² (AWG 16)
Sensor protection	stainless steel sintered filter
Working temperature range	probe: -40...60°C (-40...140°F) electronic: -40...60°C (-40...140°F) with LC display: -20...50°C (-4...122°F) with alarm module: -40...60°C (-40...140°F)
Storage temperature range	-40...60°C (-40...140°F)
Electromagnetic compatibility according to	EN 61326-1 EN61326-2-3 ICES-003 ClassB Industrial Environment FCC Part15 ClassB

CE

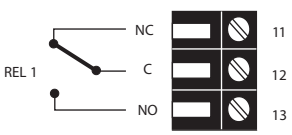
Technical Data for Options

Display	graphical LC display (128x32 pixels), with integrated push-buttons for selecting parameters Td or T and MIN/MAX functions
Alarm output for Td/Tf	- range: -60...40°C Td (-60...40°F Td) adjustable with the potentiometer on the printed circuit board - 1 switch contact - 250V AC/6A or 28V DC/6A

Connection Diagram



Terminal configuration - Alarm output



Ordering Guide HLX35

		HLX35-
Hardware Configuration		
Housing	metal housing	M
	polycarbonate housing	P
Type	pressure tight	E
Cable length	1m (3.3ft)	01
(incl. probe length)	2m (6.6ft)	02
	5m (16.4ft)	05
Probe length	100mm (3.9")	3
	200mm (7.9")	5
Pressure tight	1/2" male thread	HA03
feedthrough	1/2" NPT thread	HA07
Display	without display	
	with display	D05
Alarm output[1]	without relay	
	with relay	SW
Plug	cable glands	
	1 plug for power supply and outputs	C03
	1 cable thread / 1 plug for RS232	C06
Probe	fixed	
	pluggable	P01
Td Calibration	standard -40...60°C (-40...140°F)	
	special calibration -60...60°C (-76...140°F)	CA02
Supply voltage	8...35V DC / 12...30V AC	
	integrated power supply 100...240V AC, 50/60Hz[2]	V01

Software Configuration						
Physical parameters	temperature	T	[°C/°F]		output 1	B
of the outputs	dew point temperature	Td	[°C/°F]		output 2	C
	frost point temperature	Tf	[°C/°F]			D
Type of ouput signals	0-5V					2
	0-10V					3
	0-20mA					5
	4-20mA					6
T / Td / Tf Unit	°C					
	°F					E01
Scaling of T-output	-40...60 (T02)	-60...20 (T65)	-40...100 (T79)		output T	Select accorcding to ordering guide (Txx)
	-50...50 (T27)	-50...100 (T66)	-40...140 (T83)			
	-80...20 (T63)	-20...70 (T73)	-60...120 (T97)			Other T-scaling refer to page 165
	-60...60 (T64)	20...140 (T77)				
Scaling of Td/Tf-output	-40...60 (T02)	0...60 (T07)	-60...60 (T64)		output Td resp.Tf	Select accorcding to ordering guide (Tdxx resp. Tfxx)
	-10...50 (T03)	0...80 (T21)	32...120 (T90)			
	0...50 (T04)	-40...80 (T22)	32...140 (T91)			
	0...100 (T05)	-20...80 (T24)	32...132 (T96)			Other Td/Tf-scaling refer to page 165

1) Combination alarm output and plugs is not possible (with cable glands only) / combination alarm output and integrated power supply is not possible
2) Integrated power supply includes 2 plugs for power supply and outputs / further plug options are not possible

Accessories

- Ball valve set 1/2" ISO (HA050101)
- Ball valve set 1/2" NPT (HA050104)
- Display + housing cover in metal (D05M)
- Display + housing cover in polycarbonate (D05P)
- Stainless steel sintered filter (HA010103)
- Interface cable for PCB (HA010304)
- Interface cable for plug C06 (HA010311)
- Bracket for installation onto mounting rails* (HA010203)
- Sealing element (HA050308)

*Note: Only for plastichousing, not for metalhousing

Order Example

HLX35-ME025HA03D05P01/BC5-T02-Td02

Housing:	metal housing
Type:	pressure tight
Cable length:	2m (6.6ft)
Probe length:	200mm (7.9")
Pressure tight feedthrough:	1/2" male thread
Display:	with display
Alarm output:	without relay
Plug:	cable glands
Sensing probe:	pluggable
Td Calibration:	standard
Supply voltage:	8...35V DC / 12...30V AC

Output 1:	T
Output 2:	Td
Output signal:	0-20mA
Measured value unit:	metric
Scaling of T-output:	-40...60°C
Scaling of Td-output:	-40...60°C

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HLX36 Series

Transmitters for Moisture Content in Oil

Transmitter Series HLX36 are specially designed for the measurement of water content in oil. They are certified in accordance with the regulations of the "Germanischen Lloyd (GL)" and therefore can be utilized in the maritime field as well. The Series HLX36 is ideal for online monitoring of mois ture in lubrication or insulation oil, which is very important for the long-term performance and adaptive maintenance of plant and machinery. For instance, moisture affects dramatically the insulation characteristics of electrical transformer oil and therefore continuous monitoring is extremely important.

HLX36 +
Ball valve set

Humidity measurement in oil
Similar to the humidity in the air, the water content in an oil can be described by the absolute value in ppm or by the relative value a_w:
- ppm (mass of water / mass of oil)
- a_w (actual water content as fraction of the water content in the saturated oil)

a_w = 0 corresponds to water-free oil, while a_w = 1 describes fully saturated oil. a_w measurement with HLX36 transmitter series is based on the outstanding long term stability and resistance to pollution of the capacitive sensor elements series HC.

Product Versions
The physical quantities measured are water activity a_w and temperature T. With these quantities HLX36 calculates the water content (ppm) in mineral transformer oils. Calculation of water content in non-mineral transformer oils and lubrication oils can be accomplished by downloading specific parameters of the oil.
The measured and the calculated values are available on two free scaleable and configurable analogue outputs. In addition, an optional relay output can be used for alarms and process control.

Installation
The sensing probe is designed for inline monitoring and can be placed directly in the oil, at pressures up to 20bar (300psi). In addition to direct mounting of the sensing probe, a ball valve installation provides mounting and removal of the probe without interrupting the process.

Easy Calibration and Adjustment of HLX36
The user can easily readjust or calibrate the transmitter by using either a simple procedure with two push buttons on the printed circuit board or the configuration software.

Software Tools

The configuration software is included in the scope of supply and allows an easy and fast configuration of the analogue outputs and of the alarm and control thresholds. Further features of the configuration software are adjustment and calibration of the outputs and service operations such as replacement of the sensing elements or of the entire sensing probe.

Features of HLX36

Measurement of a_w and T at pressure up to 20bar (300psi)	✓
Calculation of water content in ppm for mineral transformer oil	✓
Two free scaleable and configurable analogue outputs	✓
Probe cable length up to 20m (66ft)	✓
Easy on site adjustment and calibration of a_w and T outputs	✓
LED indication for operation and sensing probe status	✓
User configuration of the instrument with PC via RS232 interface	✓
Configuration software	✓
Display of a_w, T and water content with MIN/MAX function	optional
Two free configurable relays outputs	optional
Pluggable sensing probe	optional
Connector for power supply and outputs	optional

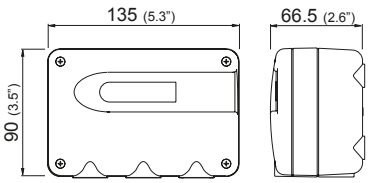
Integrated power supply

A power supply, integrated in the back module of the housing, can be ordered optionally (100...240V AC, 50/60Hz; ordering code V01). The power supply V01 is available for both polycarbonate and metal housing and comes standard with two plugs for supply and outputs to allow an easy connection.

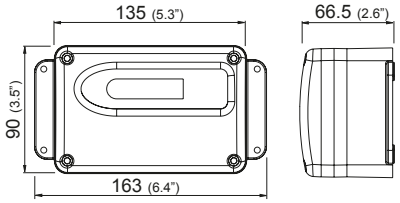
Housing Dimensions (mm)

Housing:

polycarbonate housing

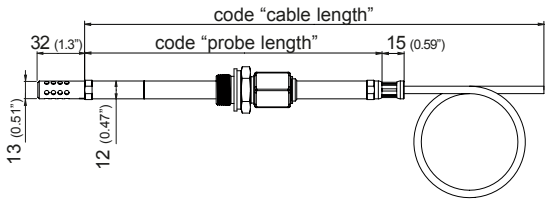


metal housing

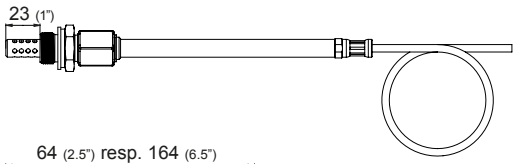


For use in harsh industrial environments the HLX36 series is available in a robust metal housing.

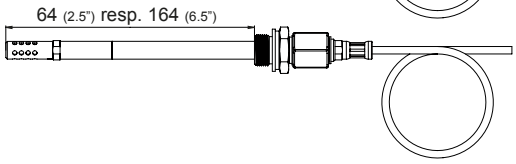
Model:



HLX36-xEx
Remote probe for T -40...180°C (-40...356°F) and pressure-tight up to 20bar (300psi)
probe material: stainless steel



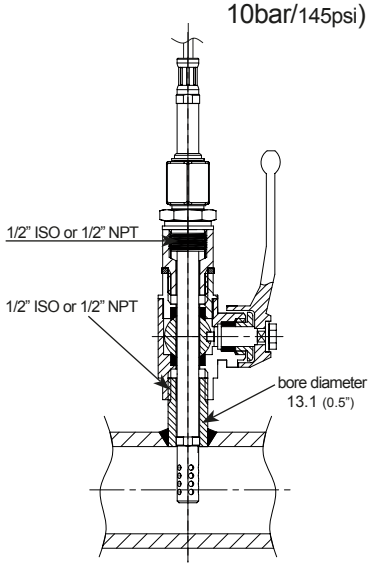
minimum installation depth



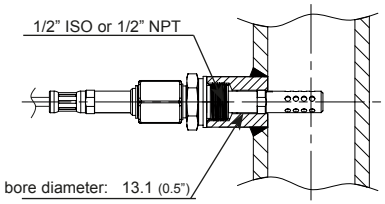
maximum installation depth

Installation Example

ball valve installation
(pressure-tight up to 10bar/145psi)

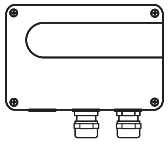


fixed installation
(pressure-tight up to 20bar/300psi)



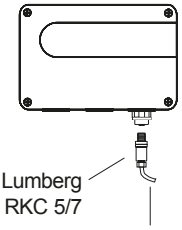
Connection Versions

Standard

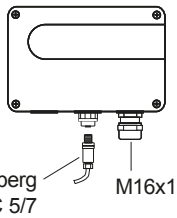


2x M16x1.5

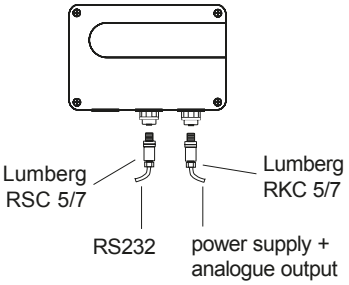
Plug Option C03



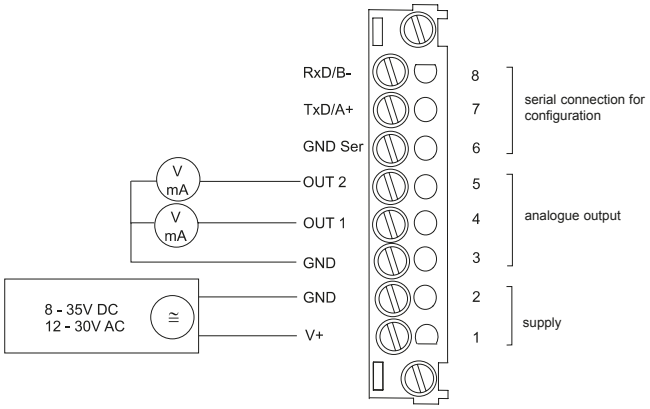
Plug Option C06



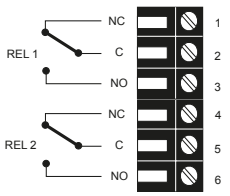
Plug Option C07



Connection Diagram



Terminal configuration - Alarm output



Technical Data

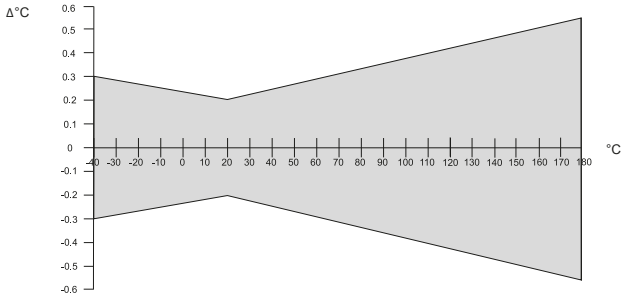
Measuring values

Water activity

Water activity sensor[1]		HC1000-400
Measuring range[1]		0...1 a_w
Accuracy[*] (including hysteresis, non-linearity and repeatability, traceable to intern. standards, administrated by NIST, PTB, BEV...)		
-15...40°C (5...104°F)	≤0.9 a_w	± (0.013 + 0.3%*mv) a_w
-15...40°C (5...104°F)	>0.9 a_w	± 0.023 a_w
-25...70°C (-13...158°F)		± (0.014 + 1%*mv) a_w
-40...180°C (-40...356°F)		± (0.015 + 1.5%*mv) a_w
Temperature dependence of electronics		typ. ± 0.0001 [1/°C] (typ. ± 5.6 * 10^{-5} [1/°F])
Temperature dependence of sensing probe		typ. ± (0.00002 + 0.0002 x a_w) x ΔT [°C] ΔT = T - 20°C
Response time with stainless steel filter at 20°C / t_{90}		typ. 10min in still oil

Temperature

Temperatur sensor element	Pt1000 (tolerance class A, DIN EN 60751)
Working range sensing probe	-40...180°C (-40...356°F)
Accuracy	



Temperature dependence of electronics	typ. ± 0.005°C/°C

Outputs[2]

Two freely selectable and scaleable analogue outputs	0 - 5V	-1mA < I_L < 1mA
	0 - 10V	-1mA < I_L < 1mA
	4 - 20mA	R_L < 500 Ohm
	0 - 20mA	R_L < 500 Ohm

Adjustable measurement range[2]

		from	up to	units
Water activity	a_w	0	1	
Temperature	T	-40 (-40)	180 (356)	°C (°F)
Water content[3]	x	0	100 000	ppm

General

Supply voltage		8...35V DC 12...30V AC (optional 100...240V AC, 50/60Hz)
Current consumption	- 2x voltage output	for 24V DC/AC: typ. 40mA
	- 2x current output	typ. 80mA
Pressure range sensing pobe		0.01...20bar (0.15...300psi)
System requirements for software		WINDOWS 2000 or later; serial interface
Serial interface for configuration[4]		RS232C
Housing / Protection class		PC or Al Si 9 Cu 3 / IP65; Nema 4
Cable gland		M16 x 1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")
Electrical connection		screw terminals up to max. 1.5mm² (AWG 16)
Sensor protection		stainless steel filter
Operating temperature range of electronics		-40...60°C (-40...140°F)
Working and storage temperature range		
Housing with display		-20...50°C (-4...122°F)
Storage temperature		-40...60°C (-40...140°F)
Electromagnetic compatibility according to		EN61326-1 EN61326-2-3 ICES-003 ClassB Industrial Environment FCC Part15 ClassB
GL-Certification[5]		Environmental Category D

Options

Display	graphical LCD (128x32 pixels), with integrated push-buttons for selecting parameters and MIN/MAX function
Alarm outputs	2 x 1 switch contact: 250V AC / 6A and 28V DC / 6A threshold + hysteresis can be adjusted with configuration software
Switching parameters (freely selectable)	a_w Water activity T Temperature x Water content

1) refer to the working range of the humidity sensor.
2) can be easily changed by software
3) ppm output is valid in the range 0...100°C (32...212°F)
4) no data output
5) not for polycarbonate housing or integrated power supply (V01)

*) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

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Ordering Guide

HLX36-

Hardware Configuration		
Housing	metal housing	**M**
	polycarbonate housing[1]	**P**
Type	pressure tight	**E**
Cable length (incl. probe length)	1m (3.3ft)	**01**
	2m (6.6ft)	**02**
	5m (16.4ft)	**05**
	10m (32.8ft)	**10**
	20m (65.6ft)	**20**
Probe length	100mm (3.9")	**3**
	200mm (7.9")	**5**
Pressure-tight feedthrough	1/2" male thread	**HA03**
	1/2" NPT thread	**HA07**
Display	without display	
	with display	**D05**
Alarm output[2]	without relay	
	with relay	**SW**
Plug	cable thread	
	1 plug for power supply and output	**C03**
	1 cable thread / 1 plug for RS232	**C06**
	2 plugs for power supply/outputs and RS232	**C07**
Sensing probe	fixed	
	pluggable	**P01**
Supply voltage	8...35V DC / 12...30V AC	
	integrated power supply 100...240V AC, 50/60Hz [1,3]	**V01**

Software Configuration						
Physical parameters of outputs	Temperature	T	[°C / °F]	**(B)**	Output 1	**select according to Ordering Guide (B,K,L,M)**
	Water activity	aw	[ ]	**(K)**		
	Water content in mineral transformer oil	x	[ppm]	**(L)**	Output 2	**select according to Ordering Guide (B,K,L,M)**
	Water content in lubrication or non-mineral transformer oil[4]	x	[ppm]	**(M)**		
Type of output signals	0-5V			**(2)**		**select according to Ordering Guide (2,3,5,6)**
	0-10V			**(3)**		
	0-20mA			**(5)**		
	4-20mA			**(6)**		
Temperature unit	°C					
	°F					**E01**
Scaling of T-output in°C or °F	-40...60 **(T02)**	-20...100 **(T14)**	-40...140 **(T83)**		Output T	**select according to Ordering Guide (Txx)**
	0...50 **(T04)**	0...120 **(T16)**	0...250 **(T88)**			**other T-scaling refer to data sheet "T-Scalings"**
	0...100 **(T05)**	0...80 **(T21)**	32...120 **(T90)**			
	-30...70 **(T08)**	-20...80 **(T24)**	32...140 **(T91)**			
	-20...120 **(T10)**	-40...160 **(T33)**	32...250 **(T94)**			
	-40...120 **(T12)**	-40...250 **(T81)**	32...132 **(T96)**			
ppm Range x	0...100ppm **(X01)**	0...1000ppm **(X03)**				
	0...500ppm **(X02)**	0...10000ppm **(X04)**			Output x	**select according to Ordering Guide (X01 - X04)**

1) No GL-Certification
2) Combination alarm output and plugs is not possible (with cable glands only) / combination alarm output and integrated power supply is not possible
3) Integrated power supply includes 2 plugs for power supply and outputs / further plug options are not possible
4) Input of oil specific parameters necessary

Accessories / Replacement Parts
(For further information see data sheet "Accessories")

- Stainless steel filter for HLX36 (HA010110)
- Display + housing cover in metal (D05M)
- Display + housing cover in polycarbonate (D05P)
- Replacement probe (PExxxx)**
- Humidity sensor (FE09)
- Bracket for installation onto mounting rails* (HA010203)
- Sealing element (HA050308)
- Calibration set (HA0104xx)
- Interface cable for PCB (HA010304)
- Interface cable for plug C06, C07 (HA010311)
- Ball valve set 1/2" ISO (HA050101)
- Ball valve set 1/2" NPT (HA050104)
- Double nibble G1/2" to G3/4" (HA011107)
- Enlargement G1/2" to G3/4" (HA011106)

*Note: Only for plastichousing, not for metalhousing
**Only for Version P01 available

Order Example

HLX36-PE055HA03D05P01/BL3-T08-X01

Housing:	polycarbonate housing
Type:	pressure tight
Cable length:	5m (16.4ft)
Probe length:	200mm (7.9")
Pressure-tight feedthrough:	1/2" male thread
Display:	with display
Alarm output:	without relay
Plug:	1 plug for power supply and output
Sensing probe:	pluggable
Suppy voltage:	8...35V DC / 12...30V AC
Output 1:	T
Output 2:	x (mineral transformer oil)
Output Signal:	0-10V
Temperature unit:	°C
Scaling of T-output:	-30...70°C
Water content x:	0...100ppm

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HLX371

Compact Dew Point Temperature Transmitter / Switch

The exact monitoring of dew point temperature in compressed air systems, dryers for plastic and other industrial processes is becoming increasingly more important.
HLX371 series with a measuring range -60...60°C Td (-112...140°F Td) is the ideal solution for such applications.
The core of the transmitter is the monolithic measurement cell type HMC01, developed in thin-film technology.

An autocalibration procedure which is integrated in the device and years of experience in low humidity adjustment make an accuracy of <2°C Td (±3.6°F Td) possible.
The compact construction in a robust aluminium housing and the numerous options allow easy mounting and many application possibilities.

Autocalibration

Dew point temperatures in the range of -60...-20°C (-76...-4°F) at room temperature correspond to relative humidity values of 0.08...5.37% RH. The measurement of these low humidity values is not possible with conventional capacitive measurement methods. For the HLX371 series a special autocalibration procedure is utilized to achieve high accuracy measurements at lowest dew points too.

Outputs

Model T: The transmitter has two freely selectable and scaleable outputs for dew point, frost point or ppm volume concentration.

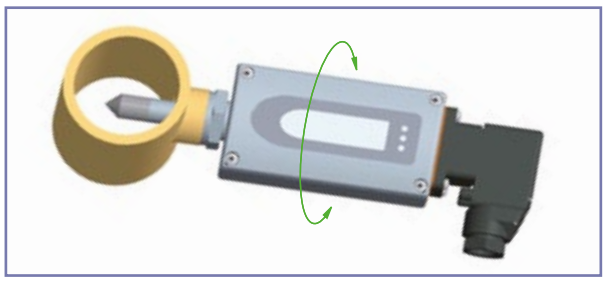
Model S: The switch with two relay outputs is designed for control and alarm purposes. The status for early warning and main alarm is indicated by LED's. Adjustment of the Td/Tf set point and hysteresis can be achieved with the optional configuration software.

Configuration Software

The optional configuration software allows flexible and easy adjustment of the analogue resp. relay outputs to the respective requirements.
The adjustment / calibration of the transmitters can easily be performed.

Screw Connection for Mounting - 360° positionable

The construction of this screw connection enables any position / rotation of the mounted transmitter.
So an optimal position of the display resp. the cable outlet is guaranteed.



Typical Applications

monitoring of compressed air systems
refrigerant type dryer
absorption dryer
plastics dryer

Features

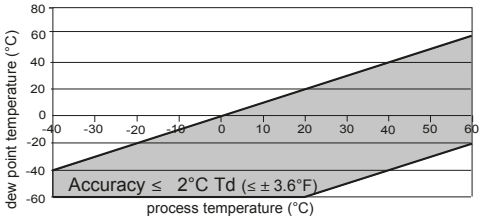
measuring range -60...60°C Td (-76...140°F Td)
accuracy of measurement ±2°C Td (±3.6°F Td)
two Td/Tf alarm outputs
autocalibration
pressure tight up to 100 bar (1450psi)

Technical Data

Measuring Quantities

Dew point (Td)

Dew point sensor	HMC01
Measuring range	-60...60°C Td (-76...140°F Td)
Accuracy	Traceable to intern. standards, administrated by NIST, PTB, BEV...



Response time t_{90}	80 sec.	-20°C Td	-40°C Td	(-4°F Td -40°F Td)
	10 sec.	-40°C Td	-20°C Td	(-40°F Td -4°F Td)

Volume concentration

Measuring range	20...200,000ppm
Accuracy at 20°C (68°F) and 1013mbar	5ppm + 9% of reading

Outputs

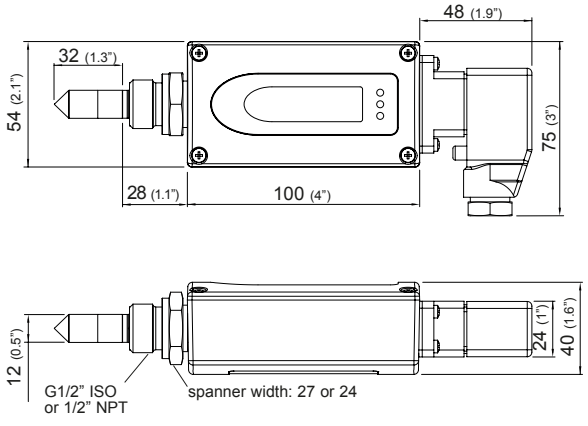
HLX371-Tx two freely selectable and scaleable analogue outputs for Td, Tf, Wv	0 - 1V / 0 - 5V / 0 - 10V[1)] -1mA < I_L < 1mA 4 - 20mA / 0 - 20mA R_L < 500 Ohm[1)]
HLX371-Sx Alarm output	2 potential-free relays (NC) 30V DC 0.6A / 35V AC 0.3A (resistive)

General

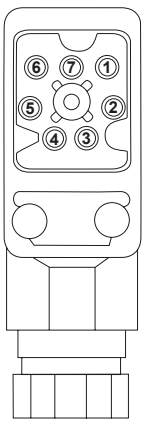
Supply voltage	10...30V DC
Current consumption at 24V DC	voltage output: typ. 40mA / during autocalibration: 100mA current output: typ. 80mA / during autocalibration: 140mA
Pressure range	0...20bar (0...290psi) / 0...100bar (0...1450psi)
System requirements for software	WINDOWS 2000 or later; serial interface
Serial interface for configuration	RS232C
Housing / protection class	Al Si 9 Cu 3 / IP65
Electrical connection	7-pole industrial plug: DIN VDE 0627 / IEC 61984 cable cross-section: 0.25 - 1 mm² cable connection: PG 11
Sensor protection	stainless steel sintered filter
Working temperature range	probe: -40...70°C (-40...158°F) electronic: -40...60°C (-40...140°F) with LC display: -20...50°C (-4...122°F)
Storage temperature range	-40...60°C (-40...140°F)
Electromagnetic compatibility according to	EN 61326-1 EN61326-2-3 ICES-003 ClassB Industrial Environment FCC Part15 ClassB

1) minimum supply voltage 15V DC

Dimensions (mm)



Connection Diagram



analogue output

1	V+
2	GND
3	GND
4	OUT1
5	OUT2
6	NC
7	NC

10...30V DC

relay output

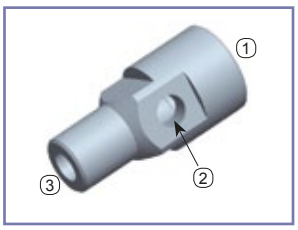
1	V+
2	GND
3	NC11
4	NC12
5	NC21
6	NC22
7	not connected

10...30V DC

Basic Sampling Cell

The basic sampling cell offers the possibility to integrate the HLX371 into an existing or self-constructed sampling system.

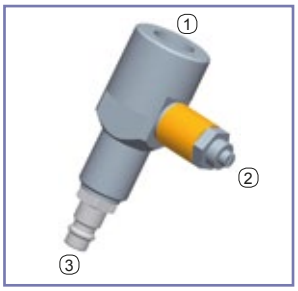
1 = G 1/2“ ISO
2 = G 1/4“
3 = G 1/4“



Sampling Cell with Quick Connector up to 10 bar (145psi)

The sampling cell is specially developed for use in compressed air lines and has a quick-connector suitable for standard compressed air connections.
It allows for the cell to be fitted and removed without interrupting the process.
The flow of gas can be adjusted using a bleed screw.

1 = G 1/2“ ISO
2 = Bleed screw
3 = Quick connector



Ordering Guide

						HLX371-	HLX371-
Hardware Configuration							
Model	transmitter switch					T	 S
Pressure range	up to 20bar up to 100bar (1450psi)					E I	E I
Pressure tight feedthrough	G1/2" male thread 1/2" NPT thread					HA03 HA07	HA03 HA07
Display	without display with display					 D08	 D08
Software Configuration							
Physical parameters of the outputs/relays	dew point temperature frost point temperature volume concentration	Td Tf Wv	[°C/°F] [°C/°F] [ppm]	(C) (D) (P)	output/relay 1 output/relay 2	select accoriding to Ordering Guide(C,D,P) select according to Ordering Guide(C,D,P)	
Type of output signals	0-1V 0-5V 0-10V 0-20mA 4-20mA					1 2 3 5 6	
Measured value units for T / Td / Tf	metric/SI non metric /US					 E01	 E01
Scaling of Td/Tf-ouput (in °C or °F)	-40...60 (Td/Tf02) -10...50 (Td/Tf03)	-60...20 (Td/Tf65)			Other Td/Tf-scaling refer to data sheet „T-Scalings“	select according to Ordering Guide (Tdxx / Tfxx)	
ppm range Wv	0...100ppm (X01) 0...500ppm (X02) 0...1000ppm (X03)	other measurment range: _____				select according to Ordering Guide	
Setting of alarm output	standard for configuration CC other set points	R1: -40 °C (-40°F) H1: 2 °C (35.6°F) relay 1: _____ hysteresis 1: ____		R2: -35°C (-31°F) H2: 2°C (35.6°F) relay 2: _____ hysteresis 2: _____			SP

Accessories

- sampling cell with quick connector (HA050102)
- basic sampling cell (HA050103)
- configuration software + interface cable (HA010604)
- stainless steel sintered filter (HA010103)
- display (D08)

Order Example

HLX371-TEHA07D08/CD2-Td/Tf03

Model:	transmitter	Output 1:	Td
Pressure range:	up to 20bar (290psi)	Output 2:	Tf
Pressure tight feedthrough:	1/2” NPT thread	Output signal:	0-5V
Display:	with display	Measured value unit:	metric
		Scaling of output:	-10...50°C

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HLX375 Series

Compact Dew Point Temperature Transmitter for OEM Applications

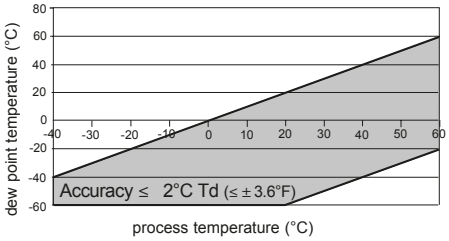
The exact monitoring of dew point temperature in compressed air systems, dryers for plastic and other industrial processes is becoming increasingly more important.
The HLX375 is designed for measurement of low dew points in OEM applications down to -60°C.
The core of the transmitter is the monolithic measurement cell type HMC01 developed by in thin-film technology.
An autocalibration procedure which is integrated in the device and years of experience in low humidity adjustment make an accuracy of <2°C Td (±3.6°F Td) possible.
The transmitter has one analogue output for dew point, frost point or ppm volume concentration.

Technical Data

Measuring Quantities

Dew point (Td)

Dew point sensor	HMC01
Measuring range	-60...60°C Td (-76...140°F Td)
Accuracy	
Traceable to intern. standards, administrated by NIST, PTB, BEV...	



Response time t_{90}	80 sec.	-20°C Td	-40°C Td	(-4°F Td	-40°F Td)
	10 sec.	-40°C Td	-20°C Td	(-40°F Td	-4°F Td)

Volume concentration

Measuring range	20...200 000ppm
Accuracy at 20°C (68°F) and 1013mbar	5ppm + 20% of reading

Outputs

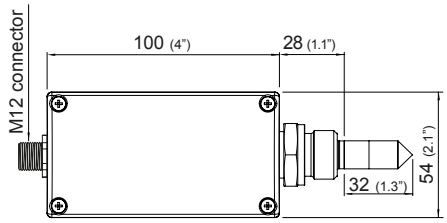
Selectable and scaleable	0 - 10V	-1mA < I_L < 1mA
analogue output for Td, Tf, Wv	4 - 20mA	R_L < 500 Ohm

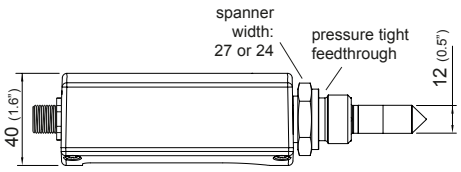
General

Supply voltage	21...28V DC
Current consumption at 24V DC	voltage output: typ. 40mA / during autocalibration: 100mA current output: typ. 80mA / during autocalibration: 140mA
Pressure range	0...20bar (0...290psi)
System requirements for software	WINDOWS 2000 or later; serial interface
Serial interface for configuration	RS232C
Housing / protection class	Al Si 9 Cu 3 / IP65
Electrical connection	M12 connector
Sensor protection	stainless steel sintered filter
Working temperature range	probe: -40...70°C (-40...158°F) electronic: -40...60°C (-40...140°F)
Storage temperature range	-40...60°C (-40...140°F)
Electromagnetic compatibility according to	EN 61326-1 EN61326-2-3 ICES-003 ClassB Industrial Environment FCC Part15 ClassB

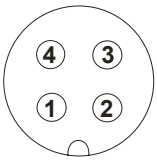
CE

Dimensions in mm





Connection Diagram



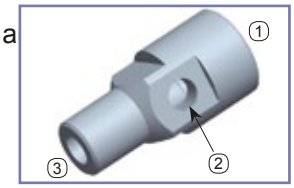
Male connector

1...V+
2...output 1
3...GND

Basic Sampling Cell

The basic sampling cell offers the possibility to integrate the HLX375 into a existing or self-constructed sampling system.

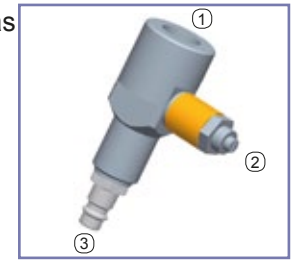
1 = G 1/2“ ISO / 2 = G 1/4“ / 3 = G 1/4“



Sampling Cell with Quick Connector up to 10 bar (145psi)

The sampling cell is specially developed for use in compressed air lines and has a quick-connector suitable for standard compressed air connections.
It allows for the cell to be fitted and removed without interrupting the process.
The flow of gas can be adjusted using a bleed screw.

1 = G 1/2“ ISO / 2 = Bleed screw / 3 = Quick connector



Ordering Guide

					HLX375-
Hardware Configuration					
Model	transmitter				T
Pressure range	up to 20bar (290psi)				E
Pressure tight feedthrough	G1/2" male thread				HA03
	1/2” NPT thread				HA07
	5/8”-18 UNF				HA08
Software Configuration					
Physical parameters of the output	dew point temperature	Td	[°C/°F]	output	C
	frost point temperature	Tf	[°C/°F]		D
	volume concentration	Wv	[ppm]		P
Type of output signal	0-10V				3
	4-20mA				6
Measured value units	metric / SI				
	non metric / US				E01
Scaling of Td/Tf-output (in °C or °F)	-40...60 (Td/Tf02)	-60...20 (Td/Tf65)		Other Td/Tf-scaling refer to data sheet "T-Scalings"	Select accorcding to order guide (Tdxx or Tfxx)
	-10...50 (Td/Tf03)				
ppm range Wv	0...100ppm (X01)				select according to Ordering Guide
	0...500ppm (X02)				
	0...1000ppm (X03)	other measuring range: _____			

Accessories

- sampling cell with quick connector (HA050102)
- basic sampling cell (HA050103)
- configuration software + interface cable (HA010604)
- stainless steel sintered filter (HA010103)
- display (D08)

Order Example

HLX375-TEHA07/C3-Td03

Model:	transmitter	Output signal:	0-10V
Pressure range:	up to 20bar (290psi)	Measured value unit:	metric
Pressure tight feedthrough:	1/2” NPT thread	Scaling of output:	-10...50°C
Output:	Td		

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HLX381 Series

Compact Transmitter / Switch for Moisture Content in Oil

Transmitter Series HLX381 are specially designed for the measurement of water content in oil.HLX381 is ideal for online monitoring of moisture in lubrication or insulation oil, which is very important for the long-term performance and preventive maintenance of plant and machinery.
For instance, moisture affects dramatically the insulation characteristics of electrical transformer oil and therefore continuous monitoring is extremely important.

Humidity measurement in oil
Similar to the humidity in the air, the water content in oil can be indicated by the absolute value in ppm or by the relative value a_w:
- ppm (mass of water / mass of oil)
- a_w (actual water content as fraction of the water content in saturated oil)

a_w = 0 corresponds to water-free oil, while a_w = 1 indicates saturated oil. a_w measurement with the HLX381 transmitter is based on the outstanding long term stability and resistance to pollution of the capacitive sensor elements series HC.

The measured physical quantities are water activity a_w and temperature T.With these quantities HLX381 calculates the water content x (ppm) in mineral transformer oils. Calculation of water content (ppm) in non-mineral oils and lubrication oils can be achieved by programming the specific parameters of the oil into the HLX381.

Outputs

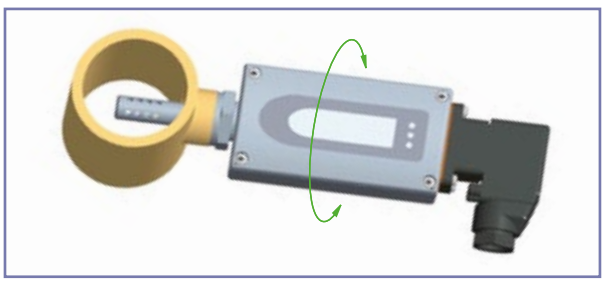
The HLX381 transmitter has two freely selectable and scaleable outputs forwater activity, water content or temperature.
The HLX381 switch with two relay outputs is designed for control and alarm purposes. The status for early warning and main alarm is indicated by LED's.
Adjustment of the a_w/T/ppm set point and hysteresis can be achieved with the optional configuration software.

Configuration Software

The optional configuration software allows flexible and easy adjustment of the analogue resp. relay outputs to the respective requirements.
The adjustment / calibration of the transmitters can easily be performed.

Screw Connection for Mounting - 360° positionable

The construction of this screw connection enables any position / rotation of the mounted transmitter.
So an optimal position of the display resp. the cable outlet is guaranteed.



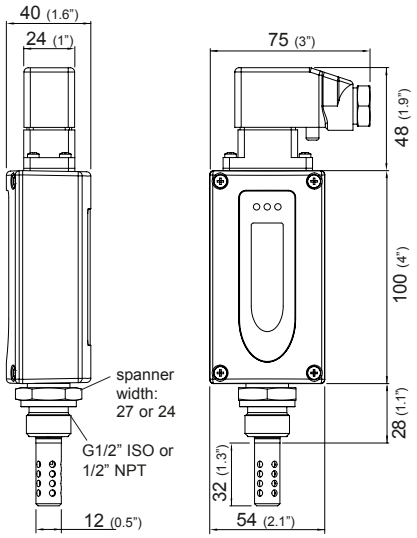
Typical Applications

monitoring of
- transformer oil
- hydraulic oil
- ship engines

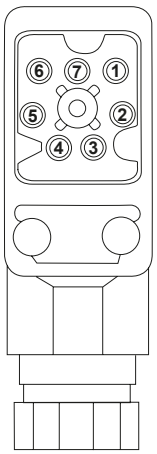
Features

measuring range 0...1 a_w
measurement of water content in ppm
medium temperature -40...80°C (-40...176°F)
two relay outputs for a_w/ppm/T

Dimensions in mm



Connection Diagram



analogue output

1	V+
2	GND
3	GND
4	OUT1
5	OUT2
6	NC
7	NC

10...30V DC

V mA

V mA

relay output

1	V+
2	GND
3	NC11
4	NC12
5	NC21
6	NC22
7	not connected

10...30V DC

Technical Data

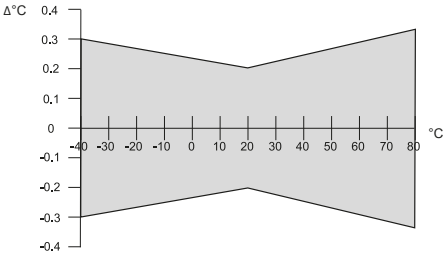
Measuring values

Water activity

Humidity sensor	HMC01
Measuring range	0...1a_w
Accuracy incl. hysteresis and nonlinearity in air	±0.02a_w (0...0.9a_w) ±0.03a_w (0.9...1a_w)
	Traceable to intern. standards, administrated by NIST, PTB, BEV...
Temperature dependence	a_w: ±(0.00022 + 0.0002 x a_w) x ΔT [°C] ΔT = T - 20°C
	T: ±(0.0003°C/°C)
Response time with stainless steel filter at 20°C / t_{90}	typ. 10min in still oil

Temperature

Temperatur sensor element	HMC01
Working range sensing probe	-40...120°C (-40...248°F)
Accuracy	



Outputs

HLX381-Tx two freely selectable and scaleable analogue outputs for a_w, T, ppm	0 - 1V / 0 - 5V / 0 - 10V[1] -1mA < I_L < 1mA
	4 - 20mA / 0 - 20mA R_L < 500 Ohm[1]
HLX381-Sx alarm output	2 potential-free relays (NC)
	30V DC 0.6A / 35V AC 0.3A (resistive)

General

Supply voltage	10...30V DC
Current consumption at 24V DC	voltage output: typ. 40mA / during autocalibration: 100mA
	current output: typ. 80mA / during autocalibration: 140mA
Pressure range	0...20bar (0...290psi) / 0...100bar (0...1450psi)
System requirements for software	WINDOWS 2000 or later; serial interface
Serial interface for configuration	RS232C
Housing / Protection class	Al Si 9 Cu 3 / IP65
Electrical connection	7-pole industrial plug: DIN VDE 0627 / IEC 61984
	cable cross-section: 0.25 - 1 mm² / cable connection: PG 11
Sensor protection	stainless steel filter (punched)
Working temperature range	probe: -40...120°C (-40...248°F)
	electronic: -40...80°C (-40...176°F)
	with LC display: -20...50°C (-4...122°F)
Storage temperature range	-40...60°C (-40...140°F)
Electromagnetic compatibility according to	EN 61326-1 EN61326-2-3 ICES-003 ClassB
	Industrial Environment FCC Part15 ClassB

CE

1) minimum supply voltage 15V DC

Digitron

Ordering Guide

		HLX381	HLX381
Hardware Configuration			
Model	transmitter	T	
	switch		S
Pressure range	up to 20bar (290psi)	E	E
	up to 100bar (1450psi)	I	I
Pressure tight feedthrough	G1/2" male thread	HA03	HA03
	1/2" NPT thread	HA07	HA07
Display	without display		
	with display	D08	D08

Software Configuration							
Physical parameters of outputs	Temperature	T	[°C / °F]	(B)	output/relay 1	select according to Ordering Guide (B,K,L,M)	
	Water activity	a_w	[ ]	(K)			
	Water content in mineral transformer oil	x	[ppm]	(L)	output/relay 2	select according to Ordering Guide (B,K,L,M)	
	Water content in lubrication or non-mineral transformer oil 1)	x	[ppm]	(M)			

Type of output signals (only for model T)	0-1V					1	
	0-5V					2	
	0-10V					3	
	0-20mA					5	
	4-20mA					6	
Temperature unit	°C						
	°F					E01	E01
Scaling of T-output (in °C or °F)	-40...60 (T02)	-20...100 (T14)	-40...140 (T83)			select according to Ordering Guide (Txx) other T-Scaling refer data sheet "T-Scalings"	
	0...50 (T04)	0...120 (T16)	0...250 (T88)		output/relay T		
	0...100 (T05)	0...80 (T21)	32...120 (T90)				
	-30...70 (T08)	-20...80 (T24)	32...140 (T91)				
	-20...120 (T10)	-40...160 (T33)	32...250 (T94)				
	-40...120 (T12)	-40...250 (T81)	32...132 (T96)				
ppm Range x	0...100ppm (X01)					select according to Ordering Guide	
	0...500ppm (X02)	other measuring range: _____			output/relay x		
	0...1000ppm (X03)						
Setting of alarm output	standard for conficuration KK:	R1: 0.8 [ ]	R2: 0.9 [ ]				
		H1: 0.05 [ ]	H2: 0.05 [ ]				
	other set points:	relay 1: _____	relay 2: _____				SP
		hysteresis 1: _____	hysteresis 2: _____				

1) Input of oil specific parameters necessary

Accessories

- Stainless steel grid (HA010110)
- Display (D08)
- Configuration software + interface cable (HA010604)

Order Example

HLX381-TEHA03D08/BL2-T05-X01

Model:	transmitter	Output 1:	T
Pressure range:	up to 20bar (290psi)	Output 2:	x
Pressure tight feedthrough:	G1/2" male thread	Output signal:	0-5V
Display:	with display	Temperature unit:	°C
		Scaling of T-output:	0...100°C
		ppm Range:	0...100ppm

HLX381-SEHA03/KK

Model:	switch	Relay 1:	a_w
Pressure range:	up to 20bar (290psi)	Relay 2:	a_w
Pressure tight feedthrough:	G1/2" male thread	Temperature unit:	°C
Display:	without display	Setting of alarm output:	standard

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HLX385

Compact Moisture Content in Oil Transmitter for OEM Applications

Transmitter Series HLX385 are specially designed for the measurement of moisture content in oil and temperature. HLX385 is ideal for online monitoring of moisture in lubrication, hydraulic or insulation oil, which is very important for the long-term performance and preventive maintenance of plant and machinery.

Humidity measurement in oil
Similar to the humidity in the air, the water content in oil can be indicated by the relative value a_w:
- a_w (actual water content as fraction of the water content in saturated oil)

a_w = 0 corresponds to water-free oil, while a_w = 1 indicates saturated oil.
a_w measurement with the HLX385 transmitter is based on the outstanding long term stability and resistance to pollution of the capacitive sensor elements series HC.

Technical Data

Measuring values

Water activity

Measuring range	0...1a_w
Accuracy incl. hysteresis and nonlinearity	±0.02a_w (0...0.9a_w) ±0.03a_w (0.9...1a_w)
0...60°C (32...140°F)	Traceable to intern. standards, administrated by NIST, PTB, BEV...
Response time with stainless steel filter at 20°C / t_{90}	typ. 10min in still oil

Temperature

Measuring range	-40...120°C (-40...248°F)
Accuracy at 20°C (68°F)	±0.2°C (±0.36°F)

Outputs

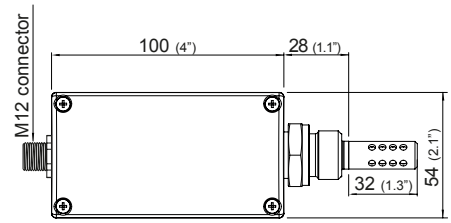
Analogue outputs for a_w and T	2 x 4 - 20mA R_L < 500 Ohm

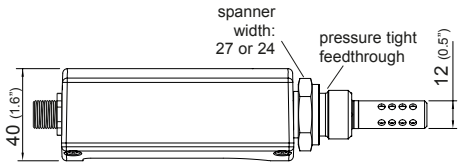
General

Supply voltage	21...28V DC
Current consumption at 24V DC	typ. 80mA
Pressure range	0...20bar (0...290psi) / 0...100bar (0...1450psi)
Housing / Protection class	Al Si 9 Cu 3 / IP65
Electrical connection	M12 plug connector
Working temperature range	probe: -40...120°C (-40...248°F) electronic: -40...80°C (-40...176°F)
Storage temperature range	-40...80°C (-40...176°F)
Electromagnetic compatibility according to	EN 61326-1 EN61326-2-3 ICES-003 ClassB Industrial Environment FCC Part15 ClassB

CE

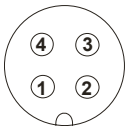
Dimensions in mm





Connection Diagram

Male connector



1...V+
2...Temperature output
3...GND
4...Water activity output

Ordering Guide

HLX385-

Hardware Configuration				
Model	transmitter			T
Pressure range	up to 20bar (290psi)			E
	up to 100bar (1450psi)			I
Pressure tight feedthrough	G1/2" male thread			HA03
	1/2" NPT thread			HA07
	3/8" BSPP			HA09
Software Configuration				
Physical parameters of outputs	Temperature	T [°C / °F]	(B)	B
	Water activity	aw [ ]	(K)	K
Type of output signals	4-20mA			6
Temperature unit	°C			
	°F			E01
Scaling of T-output (in°C or °F)	-40...60 (T02)	-20...100 (T14)	-40...140 (T83)	select according to Ordering Guide (Txx)
	0...50 (T04)	0...120 (T16)	0...250 (T88)	
	0...100 (T05)	0...80 (T21)	32...120 (T90)	
	-30...70 (T08)	-20...80 (T24)	32...140 (T91)	
	-20...120 (T10)	-40...160 (T33)	32...250 (T94)	
	-40...120 (T12)	-40...250 (T81)	32...132 (T96)	other T-scaling on request

Accessories

- Stainless steel filter (HA010110)

Order Example

HLX385-TEHA03/BK6T02

Model:	transmitter
Pressure range:	up to 20bar (290psi)
Pressure tight feedthrough:	G1/2" male thread
Output:	temperature, water activity
Output signal:	4-20mA
Temperature unit:	°C
Scaling of T-output:	-40...60°C

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HLX575 Series

HVAC Miniature Air Velocity Transmitter

The HLX575 is a compact air velocity transmitter designed for high volume applications. Due to the small design, the module can be fitted to nearly every application.
The use of a high-quality thin film sensor element based on the hot film anemometer principle ensures optimal precision and maximum sensitivity.
The innovative design makes velocity sensor elements less sensitive to dust and other pollution than conventional hot wire anemometers. This is reflected in the excellent reproducibility and proven long-term stability of the measuring results.
The HLX575 can be mounted fast and easily.
The alignment strip along the probe's tube and the matching mounting flange determine the orientation of the sensor probe. The mounting flange allows for an infinitely variation of the depth of the sensor probe.
The electronics integrated in the probe tube provide a linear analogue signal of 0-5V or 0-10V for the velocity range 0...5m/s (0...1000ft/min) / 0...10m/s (0...2000ft/min) or 0...20m/s (0...4000ft/min).

Typical Applications

heating and ventilation systems
fan control
intake air measurement in furnaces

Features

excellent price/performance ratio
compact housing
easy and fast mounting
customization possible

Technical Data

Measuring values

Working range[1]	0... 5m/s (0...1000ft/min)
	0...10m/s (0...2000ft/min)
	0...20m/s (0...4000ft/min)
Output signal[1]	0-5V (max. 1mA)
0...5m/s / 0...10m/s / 0...20m/s	0-10V (max. 1mA)
Accuracy[2]	0.5... 5m/s (100...1000ft/min): ±(0.2m/s / 40ft/min +3% of measuring value)
at 20°C / 68°F / 45%RH and 1013hPa	1... 10m/s (200...2000ft/min): ±(0.3m/s / 60ft/min +4% of measuring value)
	1... 20m/s (200...4000ft/min): ±(0.4m/s / 80ft/min +6% of measuring value)
Response time at 10m/s (2000ft/min) t_{90}	typ. 4 sec.

General

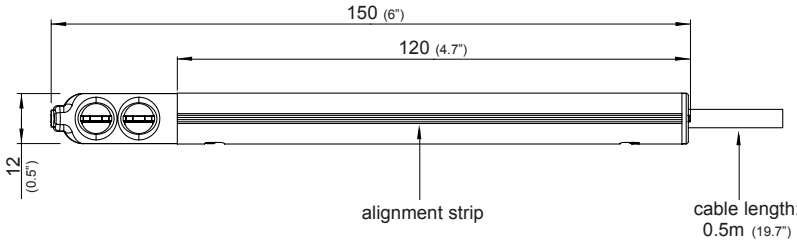
Supply voltage[1]	10 - 19V DC or 19 - 29V DC
Current consumption	max. 70mA at 20m/s (4000ft/min)
Working range	humidity: 10...95% RH (non-condensing)
	working temperature: 0…60°C (-4...140°F)
	storage temperature: -30…60°C (-22...140°F)
Connection	0.5m cable, PVC 3x0.25mm² with cable end sleeves
Electromagnetic compatibility	EN61326-1
	EN61326-2-3
Housing / Protection class	polycarbonate / IP20 (sensor); IP40 (housing)

CE

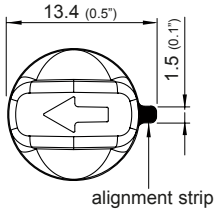
1) refer to ordering guide
2) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation).
The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

Dimensions (mm)

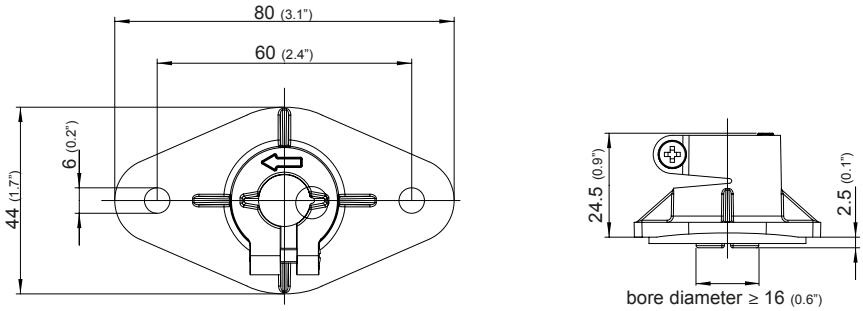
Probe:



Front view sensor head:



Flange (included in the scope of supply):



Cable Assignment

white	V+
brown	GND
green	output signal

Ordering Guide

MODEL		OUTPUT		WORKING RANGE		SUPPLY		CABLE LENGTH	
air velocity	(V)	0 - 5V	(2)	0...5m/s (0...1000ft/min)	(A)	10 - 19V DC	(1)	0.5m (1.6")	(no code)
		0 - 10V[1)]	(3)	0...10m/s (0...2000ft/min)	(B)	19 - 29V DC	(2)	2m (6.5")	(K200)
				0...20m/s (0...4000ft/min)	(C)				
HLX575-									

1) with supply 19-29V DC only

Order Example

HLX575-V2B1

Model:	air velocity
Output:	0 - 5V
Working range:	0...10m/s
Supply:	10 - 19V DC
Cable length:	0.5m

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HLX576 Series

Miniature Air Velocity Transmitter for Measurement of Lowest Velocity

The HLX576 is a compact air velocity transmitter designed for measurement of lowest velocity. Equipped with a newly developed sensor head and utilizing the proven hot-film element, already tested a million times in the automotive industry, these transmitters are less sensitive to dust and dirt than conventional hot-wire elements. This is reflected in the excellent reproducibility and proven long-term stability of the measuring results.
The factory calibration with a special wind tunnel for lowest velocity ensures optimal precision and maximum sensitivity.
The HLX576 can be mounted fast and easily.


HLX576

The alignment strip along the probe's tube and the matching mounting flange determine the orientation of the sensor probe. The mounting flange allows for an infinitely variation of the depth of the sensor probe.
The electronics integrated in the probe tube provide a linear analogue signal of 0-5V or 0-10V for the velocity range 0...1m/s (0...200ft/min) or 0...2m/s (0...400ft/min).

Typical Applications

laminar flow control
filter monitoring
exhaust systems
glove boxes

Features

excellent price/performance ratio
compact housing
easy and fast mounting

Technical Data

Measuring values

Working range[1]	0...1m/s (0...200ft/min)	
	0...2m/s(0...400ft/min)	
Output signal[1]	0-5V (max. 1mA)	
0...1m/s / 0...2m/s	0-10V (max. 1mA)	
Accuracy[2] at 20°C / 68°F / 45%RH and 1013hPa	0.2...1m/s (40...200ft/min): ±(0.05m/s +2% of m.v.)	0.2...2m/s (40...400ft/min): ±(0.08m/s +4% of m.v.)
Response time at 1m/s (200ft/min) t_{90}	typ. 4 sec.	

General

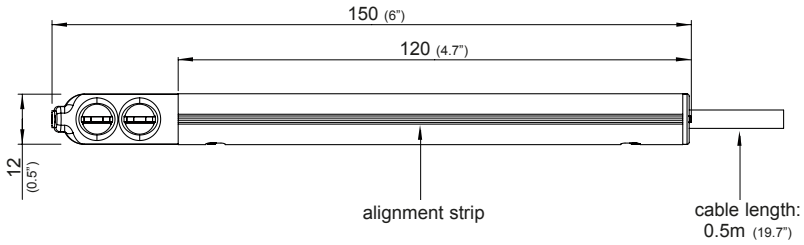
Supply voltage[1]	10 - 19V DC or 19 - 29V DC	
Current consumption	max. 70mA at 2m/s (400ft/min)	
Working range	humidity:	10...95% RH (non-condensing)
	working temperature:	0…60°C (-4...140°F)
	storage temperature:	-30…60°C (-22...140°F)
Connection	0.5m cable, PVC 3x0.25mm² with cable end sleeves	
Electromagnetic compatibility	EN61326-1	
	EN61326-2-3	
Housing / Protection class	polycarbonate / IP20 (sensor); IP40 (housing)	

CE

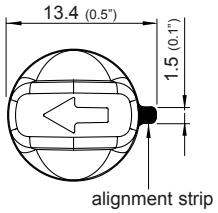
1) refer to ordering guide
2) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation).
The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

Dimensions (mm)

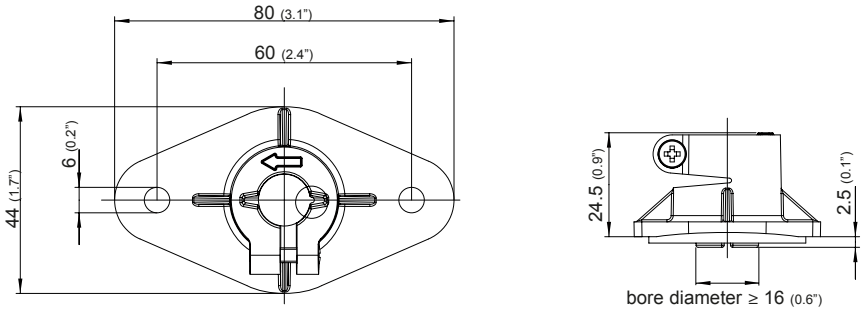
Probe:



Front view sensor head:



Flange (included in the scope of supply):



Cable Assignment

white	V+
brown	GND
green	output signal

Ordering Guide

MODEL		OUTPUT		WORKING RANGE		SUPPLY		CABLE LENGTH	
air velocity	(V)	0 - 5V	(2)	0...1m/s (0...200ft/min)	(A)	10 - 19V DC	(1)	0.5m (1.6")	(no code)
		0 - 10V[1)]	(3)	0...2m/s (0...400ft/min)	(B)	19 - 29V DC	(2)	2m (6.5")	(K200)
HLX576-									

1) with supply 19-29V DC only

Order Example

HLX576-V2B1K200

Model:	air velocity
Output:	0 - 5V
Working range:	0...2m/s
Supply:	10 - 19V DC
Cable length:	2m

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HLX65 Series

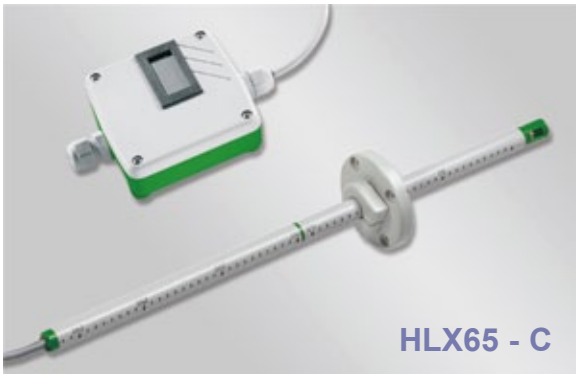
Air Velocity Transmitter for HVAC Applications

HLX65 air velocity transmitters are ideal for accurate ventilation control applications. They are operating on an innovative hot film anemometer principle.
The thin film sensor guarantees very good accuracy at low air velocity, which is not possible for conventional anemometers with commercial temperature sensors or NTC bead thermistors.
Moreover, the sensor is much more insensitive to dust and dirt than all other anemometer principles. This means high reliability and low maintenance costs.

HLX65 series are available with current or voltage output, the measuring range and the response time can be selected with jumpers by the user.

Low angular dependence enables easy, cost-effective installation.
An integrated LC display and a version with remote sensing probe are available.


HLX65 - B


HLX65 - C

Typical Applications

HVAC
process and environmental control

Features

low angular dependence
easy installation
adjustable to application requirements

Technical Data

Measuring values

Working range[1]	0...10m/s (0...2000ft/min)	
	0...15m/s (0...3000ft/min)	
	0...20m/s (0...4000ft/min)	
Output[1]	0 - 10 V	-1 mA < I_L < 1 mA
0...10m/s / 0...15m/s / 0...20m/s	4 - 20 mA	R_L < 450 Ω
Accuracy at 20°C (68°F), 45 % RH	0.2...10m/s (40...2000ft/min)	± (0.2m/s / 40ft/min + 3 % of m. v.)
and 1013hPa	0.2...15m/s (40...3000ft/min)	± (0.2m/s / 40ft/min + 3 % of m. v.)
	0.2...20m/s (40...4000ft/min)	± (0.2m/s / 40ft/min+ 3 % of m. v.)
Response time τ_{90} [1) 2)]	typ. 4 sec. or typ. 0.7 sec.	(at constant temperature)

General

Power supply	24V AC/DC ± 20 %
Current consumption for AC supply	max. 150 mA
for DC supply	max. 90 mA
Angular dependence	< 3 % of measurement at | Δα | < 10°
Cable gland	M16x1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")
Electrical connection	screw terminals max. 1.5 mm² (AWG 16)
Electromagnetic compatibility	EN61326-1
	EN61326-2-3
Housing/protecting class	Polycarbonate / IP65, Nema 4; with LC display: IP40; remot sensor probe: IP20

CE

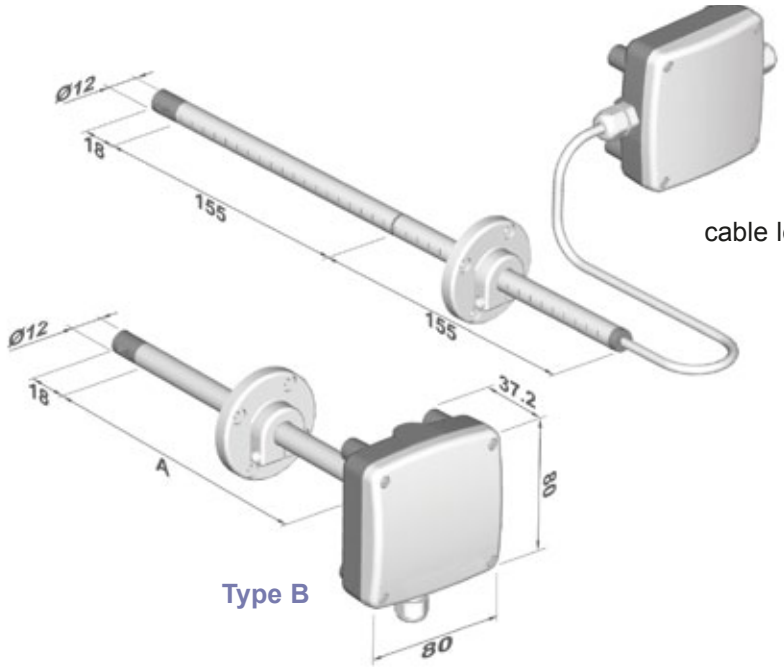
1) Selectable by jumper

2) Response time τ_{90} is measured from the beginning of a step change of air velocity to the moment of reaching 90% of the step.

Temperature range	working temperature probe	-25...50°C (-13...122°F)
	working temperature electronic	-10...50°C (14...122°F)
	storage temperature	-30...60°C (-22...140°F)

Dimensions (mm)

1 mm = 0.03937" / 1" = 25.4 mm

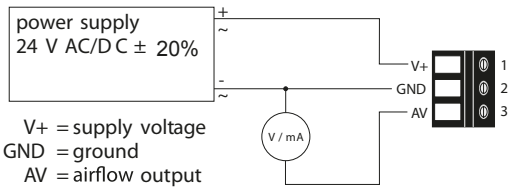


Type C

cable length: standard 1m (3.3ft)

Type B

Connection Diagram



Ordering Guide

MODEL	HOUSING	PROBE LENGTH (according to "A") (Type B only)	CABLE LENGTH (Type C only)	DISPLAY
velocity (V)	duct mounting (B)	100mm (3.9") (3)	1m (3.3ft) (no code)	without display (no code)
	remote sensor probe (C)	200mm (7.9") (5)	2m (6.6ft) (K200)	with display (D02)
		others (x)	5m (16.4ft) (K500)	
			10m (32.8ft) (K1000)	
HLX65-				

Order Example

HLX65-VB5-D02

model:	velocity
housing:	duct mounting
probe length:	200mm (7.9")
display:	with LC display

Accessories

- Snap in - mounting flange for duct mounting (HA010205)

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HLX66 Series

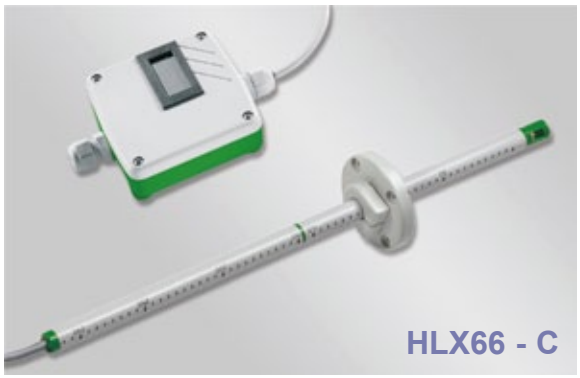
Air Velocity Transmitter for Measurement of Lowest Velocity

HLX66 air velocity transmitter series are designed for high accuracy measurement of lowest air velocities. It is the ideal solution for laminar flow control and special ventilation applications. The thin film sensor is operating on an innovative hot film anemometer principle. This guarantees excellent accuracy for air velocity down to almost 0.15m/s, which is not possible for conventional anemometers with commercial temperature sensors or NTC bead thermistors.
The sensor is much more insensitive to pollution than all other anemometer principles. This increases reliability and reduces maintenance costs.

HLX66 series are available with current or voltage output, the measuring range and the response time can be selected with jumpers by the user.

Low angular dependence enables easy, cost-effective installation.
An integrated LC display and a version with remote sensing probe are also available.


HLX66 - A / B


HLX66 - C

Typical Applications

clean room control
laminar flow control

Features

measurement down to 0m/s
low angular dependence
easy installation

Technical Data

Measuring values

Working range[1]	0...1m/s (0...200ft/min)	
	0...1.5m/s (0...300ft/min)	
	0...2m/s (0...400ft/min)	
Output[1]	0 - 10 V	-1mA < I_L < 1 mA
0...1m/s / 0...1.5m/s / 0...2m/s	4 - 20 mA	R_L < 450 Ω (linear, 3 wires)
Accuracy at 20°C (68°F), 45% RH	0.15...1m/s (30...200ft/min)	± (0.04m/s / 7.9ft/min + 2 % of m. v.)
and 1013 hPa	0.15...1.5m/s (30...300ft/min)	± (0.05m/s / 9.8ft/min + 2 % of m. v.)
	0.15...2m/s (30...400ft/min)	± (0.06m/s / 11.8ft/min + 2 % of m. v.)
Response time τ_{90} [1) 2)]	typ. 4 sec. or typ. 0.7 sec.	(at constant temperature)

General

Power supply	24V AC/DC ± 20 %
Current consumption for AC supply	max. 150 mA
for DC supply	max. 90 mA
Angular dependence	< 3 % of measurement at | Δα | < 10°
Cable gland	M16x1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")
Electrical connection	screw terminals max. 1.5 mm² (AWG 16)
Electromagnetic compatibility	EN61326-1 EN61326-2-3
Housing / protecting class	Polycarbonate / IP65, Nema 4; with LC display: IP40; remot sensor probe: IP20

CE

1) Selectable by jumper

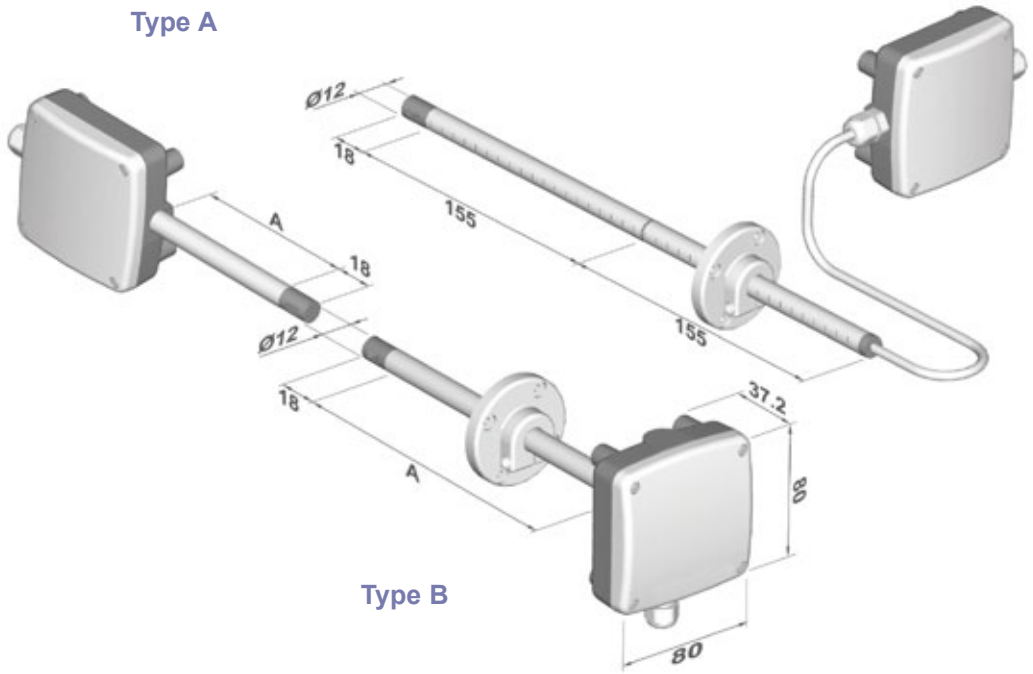
2) Response time τ_{90} is measured from the beginning of a step change of air velocity to the moment of reaching 90% of the step.

Temperature range	working temperature probe	-25...50°C (-13...122°F)
	working temperature electronic	-10...50°C (14...122°F)
	storage temperature	-30...60°C (-22...140°F)

Dimensions (mm)

1 mm = 0.03937" / 1" = 25.4 mm

Type A

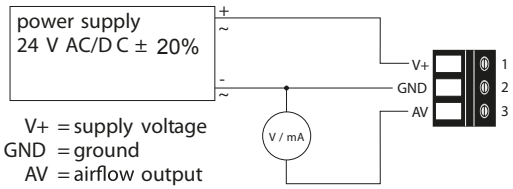


Type B

Type C

length: standard 1m (3.3ft)

Connection Diagram



V+ = supply voltage
GND = ground
AV = airflow output

Ordering Guide

MODEL	HOUSING	PROBE LENGTH (according to "A") (Type B only)	CABLE LENGTH (Type C only)	DISPLAY
velocity (V)	wall mounting (A)	100mm (3.9") (3)	1m (3.3ft) (no code)	without display (no code)
	duct mounting (B)	200mm (7.9") (5)	2m (6.6ft) (K200)	with display (D02)
	remote sensor probe (C)	others (x)	5m (16.4ft) (K500)	
			10m (32.8ft) (K1000)	
HLX66-				

Order Example

HLX66-VB5-D02

model:	velocity
housing:	duct mounting
probe length:	200mm (7.9")
display:	with LC display

Accessories

- Snap in - mounting flange for wall mounting (HA010204)
- Snap in - mounting flange for duct mounting (HA010205)

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HLX75 Series

High-Precision Air / Gas Velocity Transmitter for Industrial Applications

The HLX75 series air velocity transmitters were developed to obtain accurate measuring results over a wide range of velocities and temperatures.
A high-quality hot film sensor element based on cutting-edge thin film technology ensures maximum sensitivity, even at lowest mass flows. At the same time, the innovative probe design produces reliable measuring results at high flow velocities of up to 40m/s (8000ft/min).

The integrated temperature compensation minimises the temperature cross-sensitivity of the HLX75 series which, combined with the robust mechanical design, allows it to be used at process temperatures between -40 to +120°C (-40 to 248°F).

In addition to air velocity and temperature values, the transmitter calculates the volumetric flow rate in m³/min or ft³/min. The cross section of the duct needs to be determined for this purpose and the volumetric flow rate can be displayed and directed to one of the analogue outputs.

The configuration software included in the scope of supply allows to choose the appropriate output parameter and freely scale the display range and signal level of the two analogue outputs. In addition user-friendly calibration of the air velocity and temperature and the adjustment of key parameters (e.g. response time of the velocity measurement, low flow cut-off points, etc.) are supported as well.

An optional illuminated display with two control buttons integrated in the cover is available. In addition, this enables changes of the configuration to be made directly on the unit.

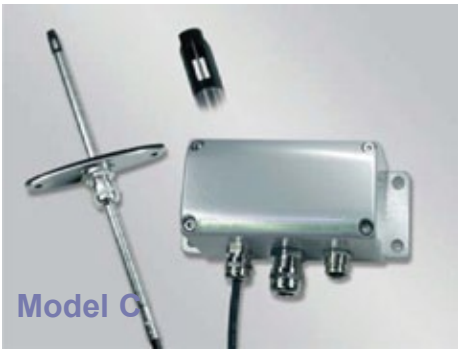
The HLX75 series has a robust metal housing to protect against possible damage in rough industrial environments. There are five different models, providing a comprehensive range of mounting options:

- **Model A** for wall mounting
- **Model B** for duct mounting
- **Model C** with remote probe
- **Model E** with remote probe, pressure-tight up to 10bar (145psi)

The HLX75 series can be used to measure the velocity of other gasses as well, although a correction has to be applied to the unit at the factory.


Model A


Model B


Model C

Typical Applications

- **monitoring incoming and outgoing air (energy management) in HVAC applications**
- **filter monitoring and laminar flow control in cleanrooms**
- **exhaust systems, exhaust hoods and glove boxes in the pharmaceutical, bio and semiconductor industries**
- **mass flow measurement during incineration processes**
- **monitoring and measurement of compressed air systems**
- **air conveying systems**
- **wind tunnels and climate simulators**

Features

high accuracy

working range 0...40 m/s (0...8000ft/min) and -40...120°C (-40...248°F)

measurement of air velocity and temperature

calculation of volumetric flow rate

low dependence on angle of inflow

probe diameter 8mm (0.3")

remote probe up to 10m (32.8ft)

easy mounting and maintenance

correction for pressure, humidity and media

low flow cut-off

pressure tight up to 10bar (145psi)

SI and US units selectable

Technical Data

Measuring value

Air velocity

Working range	0... 2m/s (0...400ft/min)	
	0... 10m/s (0...2000ft/min)	
	0... 40m/s (0...8000ft/min)	
Accuracy[1] in air at 25°C (77°F)[2]	0.06... 2m/s (12...400ft/min)	± 0.03m/s / 6ft/min
at 45% RH and 1013hPa	0.15...10m/s (30...2000ft/min)	± (0.10m/s / 20ft/min + 1 % of measuring value)
	0.2... 40m/s (40...8000ft/min)	± (0.20m/s / 40ft/min + 1 % of measuring value)
Uncertainty of factory calibration[1]	± (1% of measuring value, min. 0.015m/s (3ft/min))	
Temperature dependence electronics	typ. -0.005 % of measuring value / °C	
Temperature dependence probe	± (0.1% of measuring value/°C)	
Dependence	of angle of inflow:	< 3% for α < 20°
	of direction of inflow:	< 3%
Response time τ_{90}[3]	< 1.5...40s (configurable)	

Temperature

Working range	probe:	-40...120°C (-40...248°F)
	probe cable:	-40...105°C (-40...221°F)
	electronic:	-40...60°C (-40...140°F)
	electronic with display:	-30...60°C (-22...140°F)
Accuracy at 20°C (68°F)	±0.5°C (±0.9°F)	
Temperature dependence electronics	typ. -0.01°C / °C	
Response time τ_{90}[3]	10s	

Outputs

output signals and display ranges are freely scaleable (see ranges below)

voltage	0-10V (e.g: 0-5V, 1-5V etc.)	-1mA < I_L < 1mA
current (3-wire)	0-20mA (e.g: 4-20mA etc.)	R_L < 350 Ohm
v-scaling	0...2 / 10 / 40m/s (0...400 / 2000 / 8000ft/min)	
T-scaling	-40...120°C (-40...248°F)	
Vol-scaling	0...10000m³/min (0...353147ft³/min)	

General

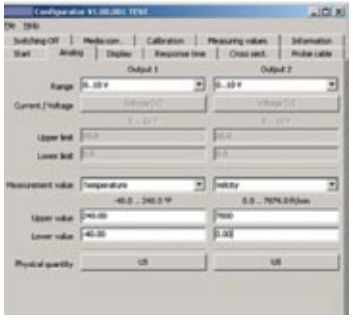
Supply voltage	24V DC/AC ± 20%		
Current consumption	max. 100mA; max. 160mA (with display)		
Connection	screw terminals max. 1.5mm² (AWG 16)		
Electromagnetic compatibility	EN61326-1	EN61326-2-3	ICES-003 ClassB
	Industrial Environment		FCC Part15 ClassB
Pressure range	Model E and P pressure tight up to 10bar (145psi)		
Material	housing / protection class:	metal (AlSi3Cu) / IP65; Nema 4	
	measuring probe:	stainless steel	
	measuring head:	PBT (polybuthylenterephthalat)	
System requirements			
for configuration software	Windows 2000 or Windows XP		
Interface	USB 1.1		

CE

1) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).
2) Accuracy refers to measurement in air
3) Response time τ_{90} is measured from the beginning of a step change to the moment of reaching 90% of the step.

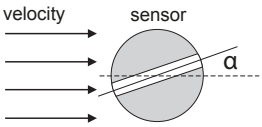
Configuration Software

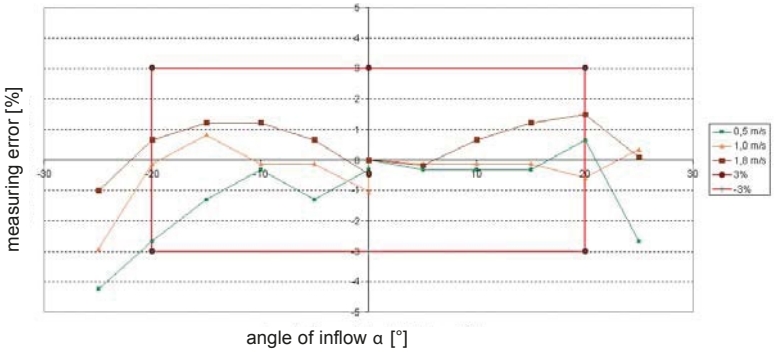
An easy setup of the HLX75 can be made via standard USB interface and the software included in the scope of supply.
The user can easily set the response time, correct for the gas (air) pressure, perform an one or two point adjustment and define the duct cross section for the volumetric flow rate.



Angular Dependence

The innovative design of the probe head minimises the effect of the angle of inflow on the measuring result. The deviation of the measuring value remains < 3% up to an angle of inflow (α) of ± 20° between the direction of inflow and the sensor element's longitudinal axis.





Low flow cut-off

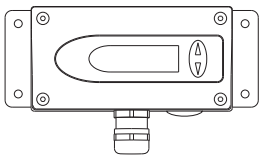
Small temperature differences in shut-off pipes and ducts can cause minimal flows. Even these would be detected and measured by the HLX75. The resulting fluctuations in the output signal can be suppressed by the low flow cut-off. Cut-off point and switching hysteresis can be specified using the configuration software.

Calculation of volumetric flow

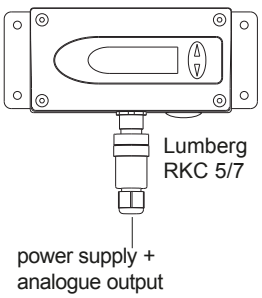
The HLX75 measures air velocity in m/s or ft/min. The configuration software can be used to enter the cross-section. This enables the transmitter to calculate the volumetric flow rate in m³/min or ft³/min. The data can be displayed and directed to one of the analogue outputs.

Connection versions

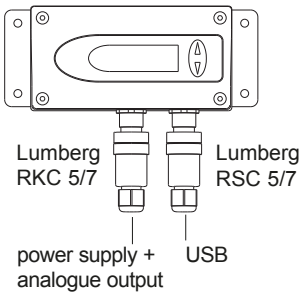
standard



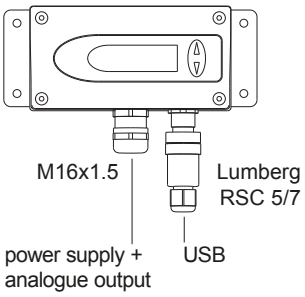
plug option C12



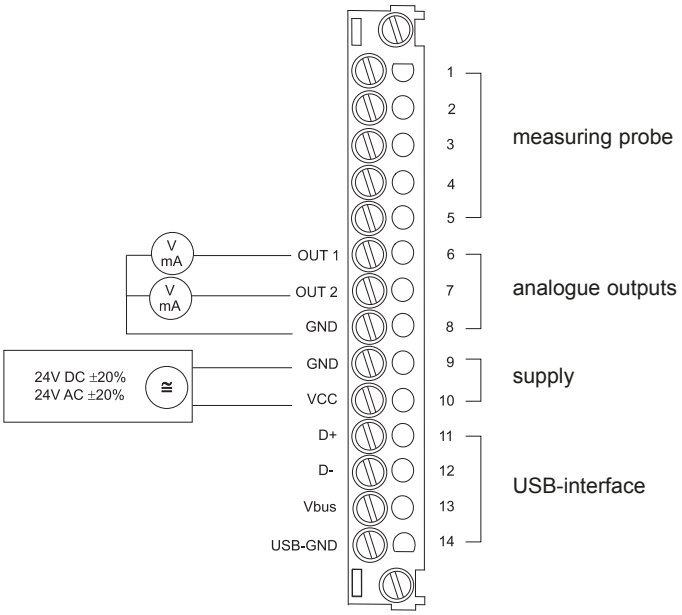
plug option C13



plug option C14



Connection Diagram



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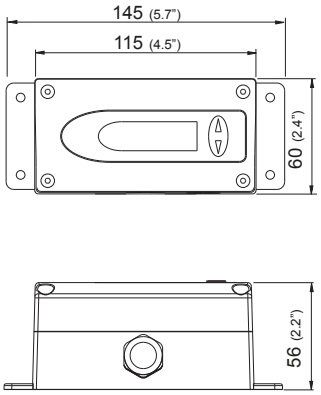
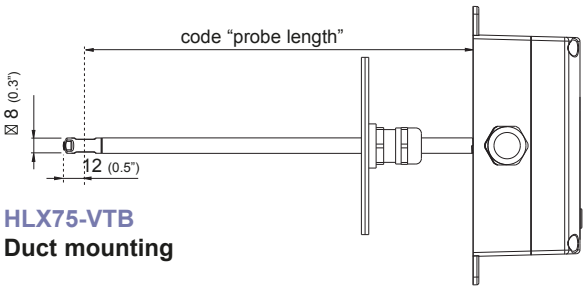
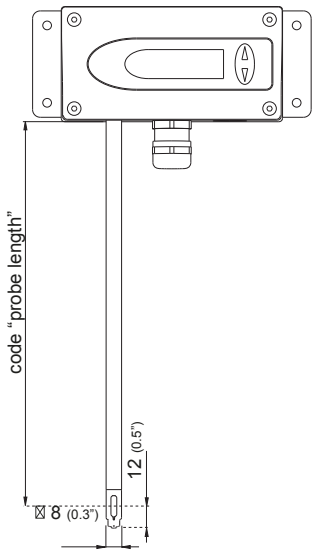
Dimensions in mm

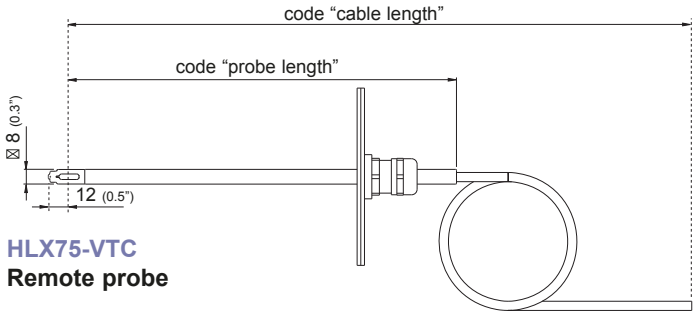




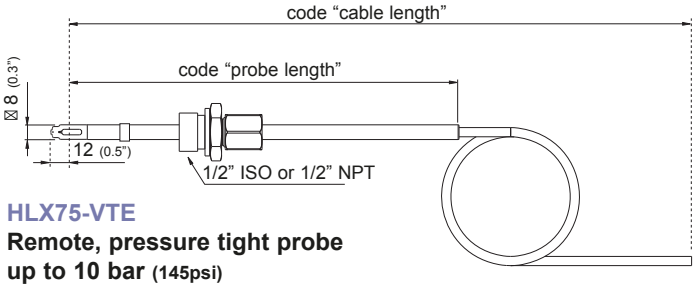
HLX75-VTB
Duct mounting



HLX75-VTA
Wall mounting

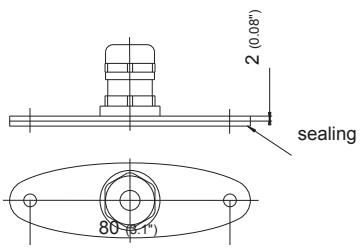


HLX75-VTC
Remote probe



HLX75-VTE
Remote, pressure tight probe up to 10 bar (145psi)

Mounting flange (included in the scope of supply)



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Ordering Guide

		HLX75-VT A	HLX75-VT B	HLX75-VT C	HLX75-VT E
Hardware Configuration					
Output	0...10V	3	3	3	3
	4...20mA	6	6	6	6
Working range	0...2m/s (0...400ft/min)	1	1	1	1
	0...10m/s (0...2000ft/min)	2	2	2	2
	0...40m/s (0...8000ft/min)	3	3	3	3
Probe length	200mm (7.9")	5	5	5	5
	400mm (15.8")	6	6	6	6
	600mm (23.6")	7	7	7	7
Cable length	2m (6.6ft)			K200	K200
	5m (16.4ft)			K500	K500
	10m (32.8ft)			K1000	K1000
Display	without display				
	with display	D06	D06	D06	D06
Pressure tight feedthrough	1/2" ISO thread				HA03
	1/2" NPT thread				HA07
Plug	cable glands				
	1 plug for power supply and outputs	C12	C12	C12	C12
	2 plug for power supply / outputs and USB	C13	C13	C13	C13
	1 plug for USB	C14	C14	C14	C14

Software Configuration									
Physical parameters of outputs	Temperature		T [°C]	(B)			output 1	Select according to Ordering Guide (B, N, O)	
	Velocity		v [m/s]	(N)			output 2	Select according to Ordering Guide (B, N, O)	
	Volume[1]		$\overline{v}$ [m³/min]	(O)					
Measured value units	metric / SI							E01	E01	E01	E01
	non metric / US										
Scaling of v-output in m/s or ft/min	0...0,5	(V01)	0...30	(V10)	0...2000	(V18)		Select according to Ordering Guide (Vxx)	
	0...1	(V02)	0...35	(V11)	0...3000	(V19)			
	0...1,5	(V03)	0...40	(V12)	0...4000	(V20)			
	0...2	(V04)	0...100	(V13)	0...5000	(V21)			
	0...5	(V05)	0...200	(V14)	0...6000	(V22)			
	0...10	(V06)	0...300	(V15)	0...7000	(V23)			
	0...15	(V07)	0...400	(V16)	0...7800	(V24)			
	0...20	(V08)	0...1000	(V17)	0...8000	(V25)			
	0...25	(V09)							
Scaling of T-output in °C or °F	-40...60	(T02)	-30...120	(T09)	0...80	(T21)		Select according to Ordering Guide (Txx) Other T scaling refer to page 165	
	-10...50	(T03)	-20...120	(T10)	-40...80	(T22)			
	0...50	(T04)	-10...70	(T11)	-20...80	(T24)			
	0...100	(T05)	-40...120	(T12)	-20...60	(T25)			
	0...60	(T07)	20...120	(T15)	-30...50	(T45)			
	-30...70	(T08)	-30...60	(T20)	-20...50	(T48)			
Measurement media	Air							B C	B C	B C	B C
	Nitrogen	N									
	Carbon dioxide	CO_2									

1) Please declare the duct cross-section [m²] with your order.

Order Example

HLX75-VTB325C12/BN-V05-T07

Model:	duct mounting
Output:	0...10V
Working range:	0...10m/s (0...2000ft/min)
Probe length:	200mm (7.9")
Display:	without
Plug:	1 plug for power supply and outputs
Output 1:	T
Output 2:	v
Measured value units:	metric / SI
v-Scaling:	0...5m/s
T-Scaling:	0...60°C
Measurement media:	air

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Digitron

HLX776

Insertion Flowmeter for compressed air and gases DN50 - DN300 (2” - 12”)

The HLX776 flow meter is based on the thermal mass flow measurement and is ideal for measuring the flow of compressed air and gases in pipes from DN50 (2”) to DN300 (12”). With the HLX776, the consumption of compressed air, nitrogen, CO2 or other non-corrosive and non-flammable gases can be measured up to a pressure of 16 bar (232 PSI), for example.

Patented non-return protection for secure mounting

The HLX776 flow meter set new standards in terms of safety and easy assembly. The patented non-return protection combines three functions in one device:

- **Non-return protection**
  The sensor can only be pushed in one direction during installation. The sensor cannot return at all, even if it is released.
- **Seal**
  By means of an encapsulated O-ring, no compressed air can escape under pressure during assembly.
- **Precise positioning**
  The precise positioning with respect to immersion depth and orientation is easy to perform, guaranteeing accurate measurement results.

The high measurement accuracy of 2.5% from reading results from the application-oriented factory adjustments, which are undertaken at 9 bar (130 PSI) pressure. For optimum adaptation to different measurement tasks, you can choose between two measuring ranges 0.2...100 Nm/s (40...19685 SFPM) or 0.2...200 Nm/s (40...39370 SFPM) and two different probe lengths with a maximum immersion depth of 165 mm (6.5”) or 315 mm (12.4”).
The inner diameter of the distribution pipe which is measured can be entered via the USB port and the included configuration software.

Two signal outputs are available to output the measured values. Depending on the application, these can be configured as an analogue output (current or voltage), switching output or pulse output for consumption measuring.

An optional tapping sleeve allows the subsequent assembly of the sensor into existing pipelines, and this without interrupting the supply systems.

Typical Applications

Measurement of consumption of compressed air

Compressed air counter

Mass flow measurement of industrial gases

Features

Non-return protection for secure mounting

Assembly/disassembly under pressure without flow interruption

easy and accurate positioning

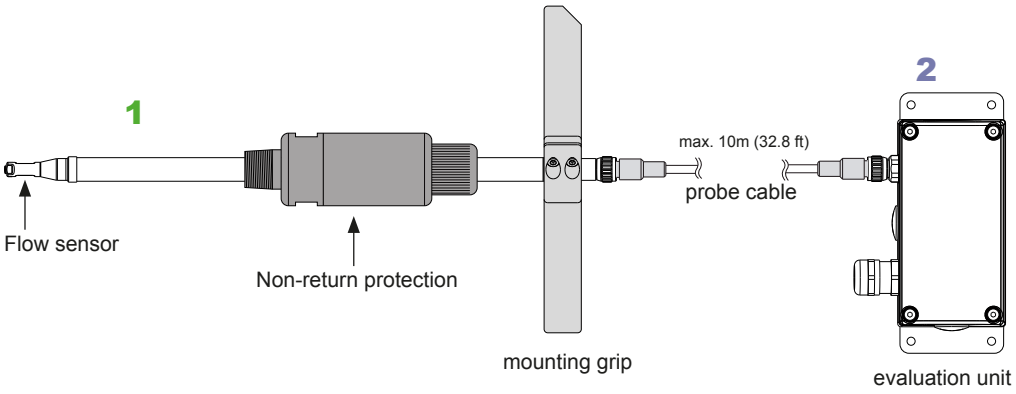
Pipe diameters DN50 (2”) to DN300 (12”)

Pressure range up to 16 bar (232 PSI)

Wide measuring range up to 200 Nm/s (39370 SFPM)

Design

The HLX776 flow meter has a modular design and consists of probes (1) and evaluation electronics (2). The probe includes sensor and measuring electronics, in which the factory adjustment data is stored. The evaluation electronics communicates digitally with the probe and can be located up to 10 m (32.8 ft) from the probe.



Assembly

With the right accessories, the HLX776 flow meter can be easily integrated into any measurement task.
An assembly without welding and drilling into the pressurised supply line and without flow interruption can be implemented very easily with the tapping sleeve.
An optional ½“ ball valve on the tapping sleeve enables the installation and removal of the sensor without interrupting the flow in the compressed air line.
The ball valve on the tapping sleeve closes the measuring point pressure-tight after removing the flow meter. Regular calibration, without taking into account the device downtime, is therefore always an option.


Tapping sleeve

Measurement of consumption (totalizer)

The HLX776 holds an integrated counter for the usage. The amount is stored and the data will not be lost due to a power outage. The availability of the consumption amount as a free configurable pulse output is another helpful feature.

Configuration software

The HLX776 flowmeter can be configured conveniently, to meet the requirements of the application with the standard configuration software and the integrated USB interface.

Functionality:

- Configuration of the output (scale / set point)
- Setting the pipe diameter
- 2-point user calibration for flow and temperature
- Readout of the counter values
- Reset of min / max values and counter
- Indication of the measurement value

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Digitron

HLX80

HVAC Room Transmitter and Switches for CO_2, Relative Humidity and Temperature

HLX80 series set new standards in CO_2 measurements for HVAC. The transmitters resp. switches combine CO_2, relative humidity (RH) and temperature (T) measurement in one modern and user-friendly housing.The basic HLX80 version for CO_2 and T can be easily extended with a RH plug-in module.
The CO_2 measerument is based on the infrared principle. A patented auto-calibration procedure compensates for the aging of the infrared source and ensures outstanding long term stability. HLX80 provides analogue outputs (in V or mA). The optional display indicates sequentially the actual measuring data. As one more option a switching output with adjustable switching point and hysteresis is available.
A wide variety of models ensures an optimal adjustment for customised requirements.Two different housing designs ensure professional appearance according to regional standards.

Typical Applications

building management for residential and office areas
ventilation control

Features

CO_2 / RH / T measurement in one device
RH output with plug-in module
analogue or switching output
modern design
optional display
easiest installation
long-term stable

Technical Data

Measuring values

CO_2

Measurement principle	Non-Dispersive Infrared Technology (NDIR)	
Sensor	Dual Source Infrared System	
Working range	0...2000 / 5000ppm	
Accuracy at 25°C (77°F)	0...2000ppm:	< ± (50ppm +2% of measuring value)
and 1013mbar	0...5000ppm:	< ± (50ppm +3% of measuring value)
Response time t_{63}	< 195s	
Temperature dependence	typ. 2ppm CO_2/°C	
Long term stability	typ. 20ppm / year	
Sample rate	approx. 15s	

Temperature

Accuracy[1] at 20°C (68°F)	±0.3°C (±0.54°F)	version with current output 4 - 20mA: ±0.7°C (±1.26°F)

Relative Humidity

Measurement principle	capacitive	
Sensor element	HC103	
Working range[2]	10...90% RH	
Accuracy[1] at 20°C (68°F)	±3% RH (30...70% RH)	±5% (10...90% RH)

Temperature (passive output)

Type of T-Sensor	please see ordering guide

Outputs

Analogue Output

0...2000 / 5000ppm /	0 - 5V	-1mA < I_L < 1mA
0...100% RH / 0...50°C (32...122°F)	0 - 10V	-1mA < I_L < 1mA
	4 - 20mA	R_L < 500 Ohm

Switching Output

Max. switching voltage	50V AC / 60V DC	
Max. switching load	0.7A at 50V AC	1A at 24V DC
Min. switching load	1mA at 5V DC	
Contact material	Ag+Au clad	

General

Supply voltage	24V AC ±20%	15 - 35V DC
Current consumption	typ. 10mA + output current	
	max. 0.5A for 0.3s	
Warm up time[3]	< 5 min	

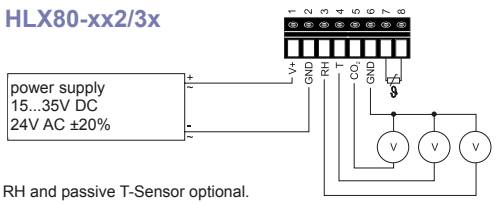
Housing / Prodection class	PC / IP30
Display	LC display: alternating CO_2 (ppm) / T (°C or °F) / RH (% RH)
Electrical connection	screw terminals max. 1.5 mm² (AWG16)
Electromagnetic compatibility	EN61326-1 FCC Part 15 EN61326-2-3 ICES-003 ClassB
Working temperature range	0...90% RH (non condensing) / -20...60°C (-4...140°F)
Storage temperature range	0...90% RH (non condensing) / -20...60°C (-4...140°F)

1) U_V=24V DC and R_L=250 Ω for version with current output 2) refer to the working range of the humidity sensor HC103!
3) warm up time for performance according specification

Connection Diagram

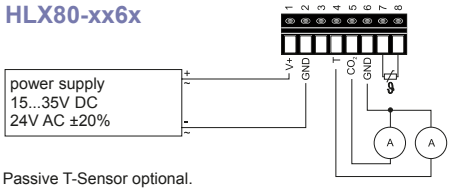
Analogue Output

HLX80-xx2/3x



RH and passive T-Sensor optional.

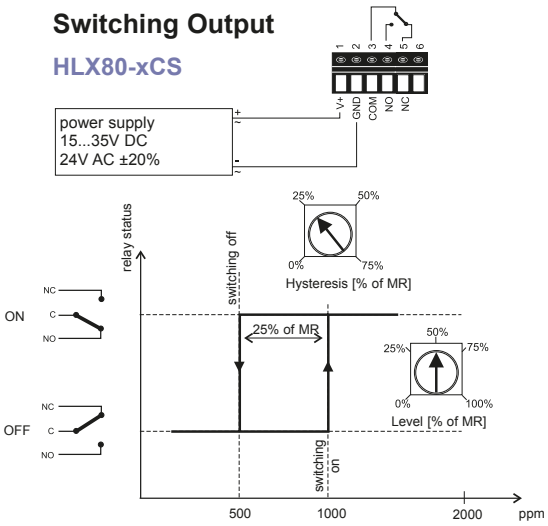
HLX80-xx6x



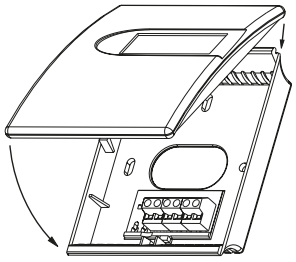
Passive T-Sensor optional.

Switching Output

HLX80-xCS



Housing Dimensions (mm)



Colour of housing: Cover: RAL 9003 (signal white)
Back: RAL 7035 (light grey)

Europe: W x H x D = 85 x 100 x 26mm (3.3 x 3.9 x 1")
USA: W x H x D = 85 x 136 x 26mm (3.3 x 5.4 x 1")

Ordering Guide

HLX80 voltage / current output:

WORKING RANGE	MODEL	OUTPUT	T-SENSOR (only passive)	DISPLAY	HOUSING	T-UNIT	T-SCALE
0...2000ppm (2)	CO_2 + T (CT)	0-5V (2)	Pt 100 DIN A (A)	without Display (--)	Europe (--)	°C (--)	0...50 (T04)
0...5000ppm (5)	CO_2 + $T_{passive}$ (CP)	0-10V (3)	Pt 1000 DIN A (C)	with Display (D04)	USA (US)	°F (E01)	-5...55 (T31)
	CO_2 + T + rF (CTF)	4-20mA[3] (6)					32...122 (T76)
							other (Txx)

HLX80-

3) current output (6) not available for model CTF

HLX80 switching output:

WORKING RANGE	MODEL	OUTPUT	DISPLAY	HOUSING
0...2000ppm (2)	CO_2 (C)	switching output (S)	without Display (--)	Europa (--)
0...5000ppm (5)			with Display (D04)	USA (US)

HLX80-

Order Example

HLX80-2CT3D04-T04

Version with voltage output:
Working range: 0...2000ppm
Model: CO_2 + T
Output: 0-10V
Display: with display
T-Unit: °C
T-Scale: 0...50°C (32...122°F)

Accessories

- humidity plug-in module (HA011003)

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Digitron
HLX82 Series

CO_2 Transmitters and Switches for demanding applications

Measuring instruments in green houses or life stock barns are exposed to a very demanding environment: high humidity levels, pollutants like fertilizers, herbicides and high ammonia concentrations are just a few of the many hazards.
The robust, functional housing of the HLX82 with integrated special filter has been designed for such applications.


HLX82

The air diffuses through the filter into the instrument enclosure. Then the air diffuses further through a second membrane filter integrated in the CO_2 measuring cell.

The CO_2 measurement is based on the non-dispersive infrared (NDIR) technology. The patented auto-calibration procedure compensates for aging of the infrared source and guarantees high reliability, long term stability and eliminates the need of periodical recalibration in the field.

Measuring ranges of 0...2000/5000/10000ppm correspond to an analogue interface of 0 - 5/10V or 4 - 20mA. Selectively a switching output with adjustable switching point and hysteresis is available.

The very practical snap-in mounting flange and connector for the supply voltage and outputs allow quick and easy installation of the HLX82 without ever opening the housing.

Typical Applications

green houses
fruit and vegetable storage
life stock barns

Features

easy installation
compact housing
auto-calibration
measuring range 0...10000ppm
analogue or switching output

Technical Data

Measuring Values

Measuring principle	Non-Dispersive Infrared Technology (NDIR)	
Sensing element	Dual Source Infrared System	
Measuring range	0...2000 / 5000 / 10000ppm	
Accuracy at 25°C (77°F) and 1013mbar	0...2000ppm:	< ± (50ppm +2% of measuring value)
	0...5000ppm:	< ± (50ppm +3% of measuring value)
	0...10000ppm:	< ± (100ppm +5% of measuring value)
Response time τ_{63}	< 195s	
Temperature dependence	typ. 2ppm CO_2/°C	
Long term stability	typ. 20ppm / year	
Sample rate	approx. 15s	

Output

Analogue Output

0...2000 / 5000 / 10000ppm	0 - 5 / 0 - 10V	-1mA < I_L < 1mA
	4 - 20mA	R_L < 500 Ohm

Switching Output

Max. switching voltage	50V AC / 60V DC	
Max. switching load	0.7A at 50V AC	1A at 24V DC
Min. switching load	1mA at 5V DC	
Contact material	Ag+Au clad	

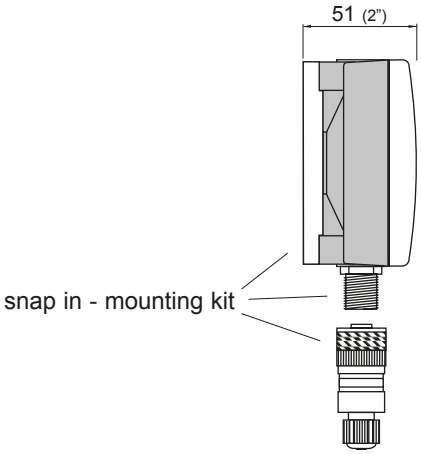
General

Supply voltage	24V AC ±20%	15 - 35V DC
Current consumption	typ. 10mA + output current	
	max. 0.5A for 0.3s	
Warm up time[1)]	< 5 min	
Housing / protection class	PC / IP54	
Electrical connection	M12 plug	
Electromagnetic compatibility	EN61326-1	FCC Part 15
	EN61326-2-3	ICES-003 ClassB
Working temperature and conditions	-20...60°C (-4...140°F)	0...100% RH
Storage temperature and conditions	-20...60°C (-4...140°F)	0...95% RH (not condensating)

1) warm up time for performance according specification

CE

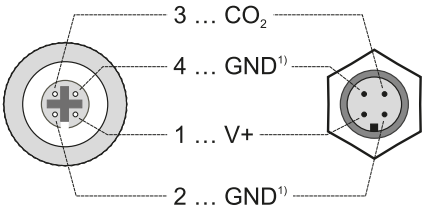
Dimensions (mm)



Connection Diagram

Analogue Output

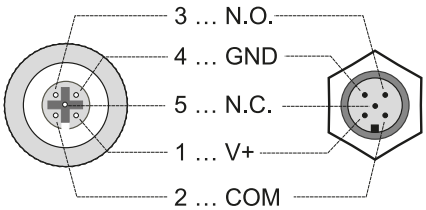
HLX82-xC2/3/6

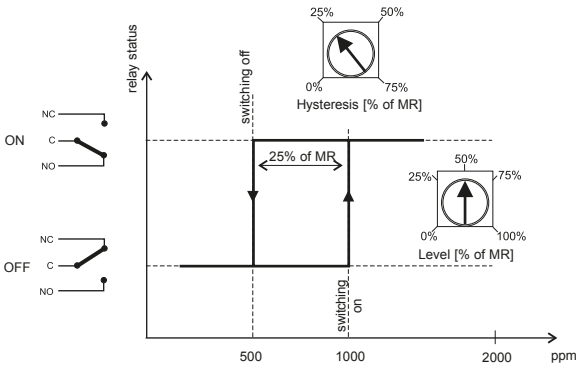


1) GND internally conected

Switching Output

HLX82-xCS





Ordering Guide

MEASURING RANGE		MODEL		OUTPUT	
0...2000ppm	(2)	CO_2	(C)	0 - 5V	(2)
0...5000ppm	(5)			0 - 10V	(3)
0...10000ppm	(10)			4 - 20mA	(6)
				switching output	(S)

HLX82-

Order Example

HLX82-5C3

Measuring range:	0...5000ppm
Model:	CO_2
Output:	0 - 10V

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HLX85 Series

CO_2 Transmitter and Switches for Duct Mounting

Duct mounted CO_2 transmitters and switches of the HLX85 series are designed for HVAC applications. The CO_2 sensing element uses the Non-Dispersive Infrared Technology (NDIR). A patented auto-calibration procedure compensates for drift caused by the aging of the sensing element and guarantees outstanding long term stability.
Installed into a duct a small flow of air will be established by convection through the probe into the transmitter housing and back into the duct. Inside the transmitter housing the air will diffuse through a membrane into the CO_2 sensing element.
The operation in closed loop air stream avoids pollution of the CO_2 sensor.
Measuring ranges of 0...2000/5000/10000ppm correspond to an analogue interface of 0 - 5/10V or 4 - 20mA. Selectively a switching output with adjustable switching point and hysteresis is available. The instruments can be easily positioned in the duct with the standard mounting flange.

Typical Applications

building management for residental and office areas
ventilation control

Features

very simple installation
compact housing
auto-calibration
measuring ranges: 0...10000ppm
analogue or switching output

Technical Data

Measuring Values

CO_2

Measurement principle	Non-Dispersive Infrared Technology (NDIR)	
Sensing element	Dual Source Infrared System	
Measuring range	0...2000 / 5000 / 10000ppm	
Accuracy at 25°C (77°F)	0...2000ppm:	< ± (50ppm +2% of measuring value)
and 1013mbar	0...5000ppm:	< ± (50ppm +3% of measuring value)
	0...10000ppm:	< ± (100ppm +5% of measuring value)
Response time τ_{63} [1]	< 195s	
Temperature dependence	typ. 2ppm CO_2/°C	
Long term stability	typ. 20ppm / year	
Sample rate	approx. 15s	

Temperature (passive output)

Type of T-Sensor	please see ordering guide

Outputs[2]

Analogue Output

0...2000 / 5000 / 10000ppm	0 - 5V	-1mA < I_L < 1mA
	0 - 10V	-1mA < I_L < 1mA
	4 - 20mA	R_L < 500 Ohm

Switching Output

Max. switching voltage	50V AC / 60V DC	
Max. switching load	0.7A at 50V AC	1A at 24V DC
Min. switching load	1mA at 5V DC	
Contact material	Ag+Au clad	

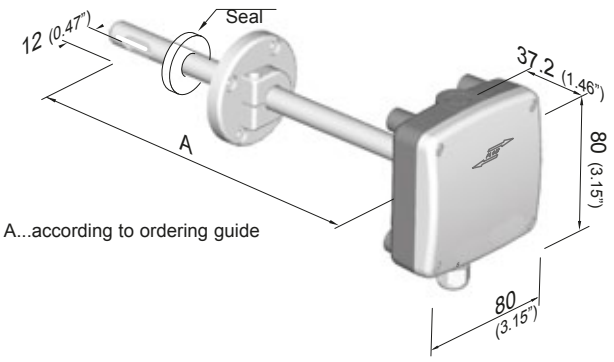
General

Supply voltage	24V AC ±20%	15 - 35V DC
Current consumption	typ. 10mA + output current	
	max. 0.5A for 0.3s	
Warm up time[3]	< 5 min	
Housing / protection class	PC / housing: IP65, probe: IP20	
Cable gland	M16 x 1.5	cable Ø 4.5 - 10 mm (0.18 - 0.39")
Electrical connection	screw terminals max. 1.5 mm^2 (AWG 16)	
Electromagnetic compatibility	EN61326-1	FCC Part 15
	EN61326-2-3	ICES-003 ClassB
Working temperature and conditions	-20...60°C (-4...140°F)	0...95% RH (not condensating)
Storage temperature and conditions	-20...60°C (-4...140°F)	0...95% RH (not condensating)

CE

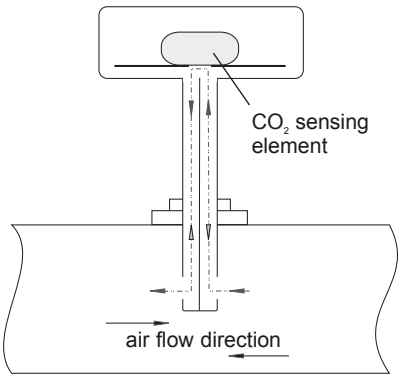
1) minimum flow speed 1m/s (200ft/min)
2) Versions with analog output can be provided with a passive temperature sensor. This is fitted in the filter cap.
3) warm up time for performance according to specification

Dimensions (mm)



A...according to ordering guide

Operation Principle

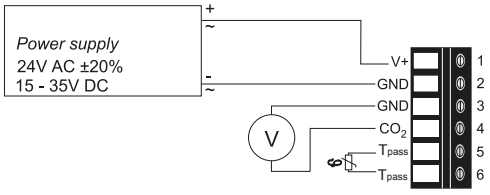


Connection Diagram

Analogue Output

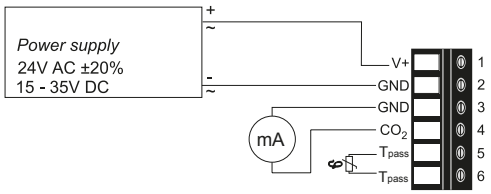
Analog Ausgang

HLX85-xC2/3x



Passive T-Sensor optional.

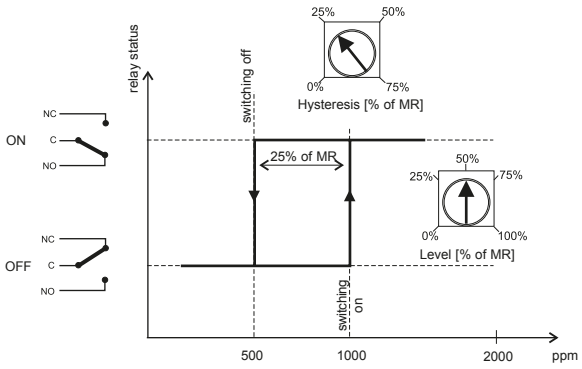
HLX85-xC6x



Passive T-Sensor optional.

Switching Output

HLX85-xCSx



Ordering Guide

MEASURING RANGE	MODEL	OUTPUT	T-SENSOR (only passive)	PROBE LENGTH (see dimensions "A")
0...2000ppm (2)	CO_2 (C)	0 - 5V (2)	Pt 100 DIN A (A)	50mm (2)
0...5000ppm (5)	CO_2 + $T_{passive}$ (CP)	0 - 10V (3)	Pt 1000 DIN A (C)	200mm[2] (5)
0...10000ppm (10)		4 - 20mA (6)		
		switching output[1] (S)		
HLX85-				

1) Switching output (S) only available for model C
2) Version CP only possible with 200mm (7.87").

Order Example

HLX85-5C35

measuring range:	0...5000ppm
model:	CO_2
output:	0 - 10V
probe length:	200mm

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Digitron
Series HLX871

CO_2 Probe for OEM / HVAC Applications

The offset CO_2 sensor HLX871 features a large measurement range up to 10000ppm and the smallest housing dimensions.

The digital E2 interface facilitates a simple querying and processing of the measured values and an individual configuration of the sensing head. The measurement is based on infrared technology (NDIR).

The patented auto calibration process makes the HLX871 maintenance-free, aging effects are compensated for and an outstanding long-term stability is also ensured. Calibration data and other important functions such as linearisation or temperature compensation are stored in the electronics in the sensor tube. In combination with the integrated flange coupling, a rapid replaceability of the sensing head is possible without the need for readjusting the end device.

Moreover, the low current consumption of the HLX871 is unique! The adjustable measurement interval allows the average current consumption to be reduced to less than 60µA. The perfect solution for battery-operated devices.

Typical applications

- **Greenhouses**
- **Fruit and vegetable storage**
- **Stables**
- **Data loggers**
- **OEM applications**

Properties

- **maintenance-free through auto-calibration**
- **very low current consumption**
- **digital interface**
- **highest accuracy**
- **outstanding long-term stability**
- **adjustable measurement interval**

Technical data

Measured values

CO_2

Measuring principle	non-dispersive infrared technology (NDIR)	
Sensor	2 beam infrared cell	
Measurement range	0...2000 / 5000 / 10000ppm	
Accuracy at 25°C and 1013mbar	0...2000ppm:	< ± (50ppm +2% from the measured value)
	0...5000ppm:	< ± (50ppm +3% from the measured value)
	0...10000ppm:	< ± (100ppm +5% from the measured value)
Response time t_{90}	< 195s	
Temperature dependency	type 2ppm CO_2/°C (0...50°C)	
Long-term stability	type 20ppm / a	
Measurement interval [1]	adjustable from 15s to 1h	

Output

Measurement range	0...2000 / 5000 / 10000ppm
Interface	digital E2
max. cable length	up to 10m allowable

General

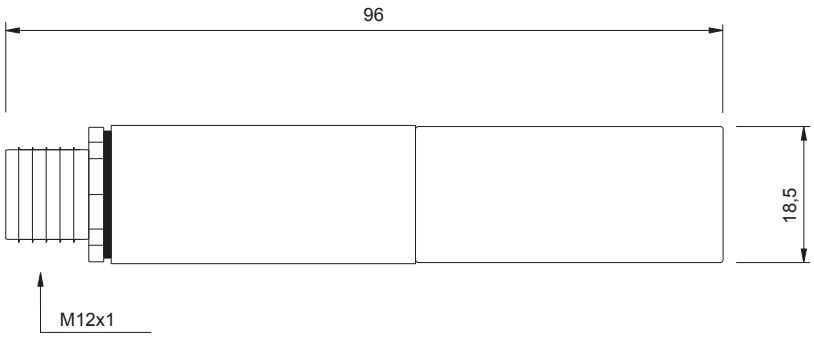
Supply voltage	4.75 - 7.5V DC		
average current consumption [2]	3.7mA at 15sec. measurement interval		
	58µA at 1h measurement interval		
Current peak	max. 500mA for 0.05s		
Housing / Protection class	Plastic PC / Housing IP65		
Electrical connection	Connector M12 x 1		
Electromagnetic compatibility	EN61326-1		
	EN61326-2-3		
Operating temperature and conditions	-40...60°C	0...100% rF (non-condensing)	85...110kPa
Storage temperature and condition	-40...60°C	0...100% rF (non-condensing)	70...110kPa
Dimensions	96 x Ø18.5mm		
Weight	approx. 40g		

CE

1) Factory setting = 15sec.

2) The average current consumption depends on the measurement interval set

Connection / Dimensions (mm)

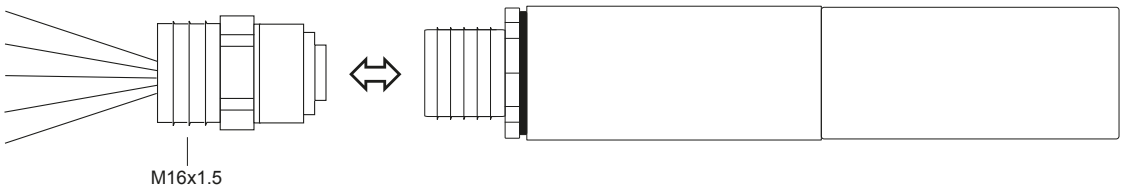


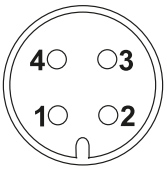
Connection

HLX871:

M12x1 flanged mounting with 50mm stranded wire (HA010705):

brown.....GND
white.....+UB
blue.....DATA
black...CLOCK
grey.....Shielding





1...GND
2...+UB
3...DATA
4...CLOCK

Ordering information

MEASUREMENT RANGE		TYPE		OUTPUT		FILTER	
0...2000ppm	(2)	CO_2	(C)	E2 interface	(9)	PTFE filter	(5)
0...5000ppm	(5)						
0...10000ppm	(10)						

HLX871-

Order example

HLX871-2C95

Measurement range: 0...2000ppm
Type: CO_2
Output: digital interface
Filter: PTFE filter

Accessories

HLX87x test board (HA011010)
mounting flange (HA010212)

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HLX99-1 Series

OEM - Humidity / Temperature Modules

The HLX99-1 OEM - RH/T modules are designed to meet the specific requirements of RH/T monitoring in climate chambers.
High-end humidity sensor elements of the HC series and accurate temperature compensation of the humidity reading result in an excellent accuracy over a broad measurement range.
The analogue output for relative humidity is 4 - 20mA / 3-wire. The passive temperature output can be connected via 3-wire to an external readout.
Easy mounting and service is possible with a plug-in screw terminals block and by push buttons for field calibration.


HLX99-1

Sensor Coating

Operation in heavily polluted and/or corrosive environments is typical for many industrial processes and can lead to drift or damage of the humidity sensor and therefore to incorrect measurements. The unique protective coating developed for the sensing probe (ordering code: - HC01) means a significant improvement of the long-term stability of the transmitter in very dirty and aggressive environments.

Typical Applications

climate chambers
drying chambers

Features

remote sensing probe up to 10m (32.8ft)
accuracy ±2% RH
traceable calibration
working range humidity 0...100% RH
working range temperature -50...180°C (-58...356°F) / up to 200°C (392°F) short term
passive 3-wire temperature output
easy field calibration

Technical Data

Measured quantities

Relative humidity

Humidity sensor[1)]	HC1000-400
Working range	0…100% RH
Accuracy incl. hysteresis and nonlinearity with	
- special calibration against certified standards	±1% (0…90% RH) ±2% (90…100% RH)
- standard calibration	±2% (0…90% RH) ±3% (90…100% RH)
	Traceable to intern. standards, administrated by NIST, PTB, BEV...
Output signal	4 - 20mA (3-wire)
Response time with filter at 20°C (68°F) / t_{90}	< 15 sec.

Temperature

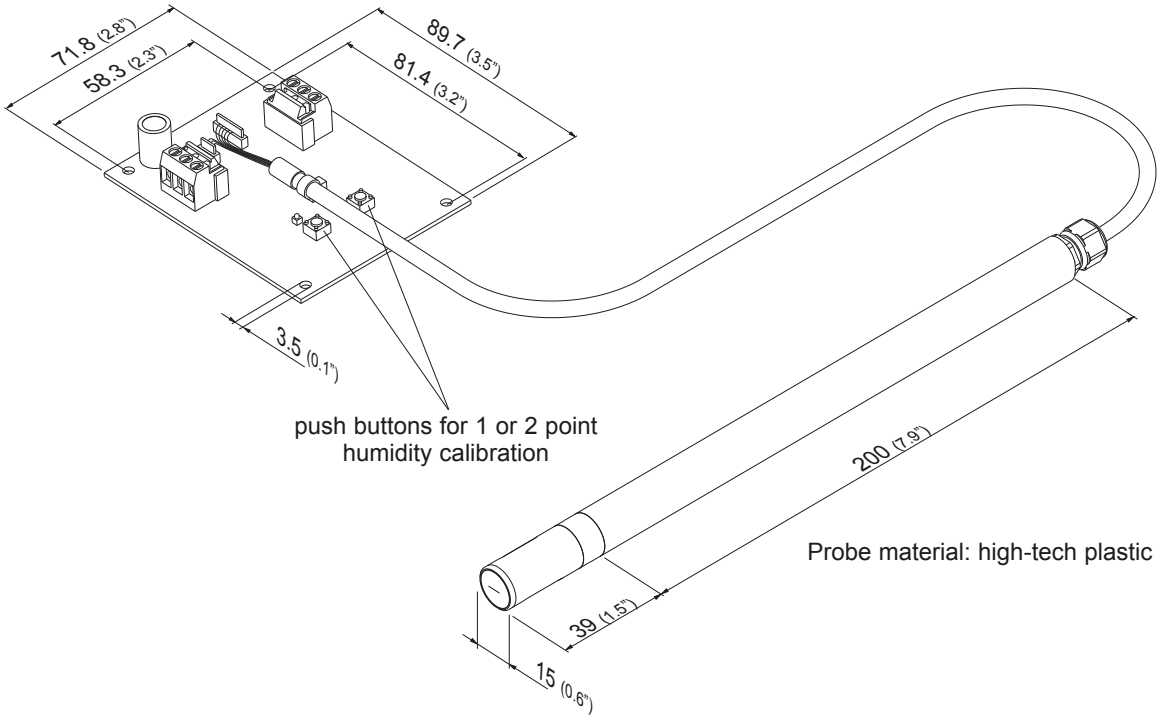
Temperature sensor element[2)]	Pt100 resp. Pt1000 (class A, DIN EN 60751) see Ordering Guide
Working range	-50...180°C (-58...356°F) / up to 200°C (392°F) short term

General Data

Supply voltage	10 - 35V DC or 10 - 28V AC
Load resistor for 4 - 20 mA output	10 - 35V DC $R_L < \frac{U_V - 5V}{0.02\ A}$ [Ω] (max. 350 Ω)
	10 - 28V AC R_L < 350 Ω
Current consumption	for DC supply < 32mA for AC supply < 60mA_{eff}
Working temperature range electronics	-40…60°C (-40...140°F)
Storage temperature range	-40…60°C (-40...140°F)
Electrical connection	pluggable screw terminals up to max. 1.5mm² (AWG 16)
Sensor protection	stainless steel grid filter
Electromagnetic compatibility	Designed for installment in and with other equipment (OEM)
	Measurements according to EN61000-4-3 and EN61000-4-6
	FCC Part15 ClassB ICES-003 ClassB

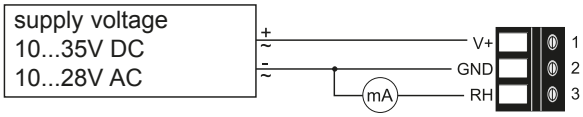
1) Refer to the working range of the humidity sensor
2) max. power dissipation 1mW

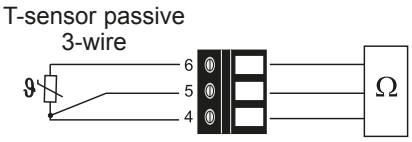
Mounting Dimensions (mm)



Probe material: high-tech plastic PPS-GF40

Connection Diagram





Ordering Guide

MODEL	OUTPUT	T-SENSOR	VERSION	FILTER	CABLE LENGTH
Humidity + Temperature passive (FP)	4 - 20 mA (6)	Pt100 DIN A (A) Pt1000 DIN A (C)	remote sensing probe (D)	stainless steel grid filter (8)	2m (6.6ft) (02) 5m (16.4ft) (05) 10m (32.8ft) (10)
HLX99-1-					

PROBE LENGTH	SENSOR COATING
200mm (7.9") (5)	without coating (--) with coating (HC01)

Order Example

HLX99-1-FP6AD8025

Model:	Humidity + Temperature passive
Output:	4 - 20mA
T-Sensor:	Pt100 DIN A
Version:	remote sensing probe
Filter:	stainless steel grid filter
Cable length:	2m (6.6ft)
Probe length:	200mm (7.9")
Coating sensor:	without coating

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