Data Sheet

SCHISCHEK EXBIN-D TRANSMITTER

for ExPro-B... Temperature / humidity sensors

Supplied by

247able.com

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ExBin-D Transmitter for
ExPro-B... Temperature / humidity sensors

Electrical, explosion-proof transmitters with ExPro-B... sensors
24 VAC/DC supply voltage, potential free relay output
EC type-approved in acc. with ATEX directive 94/9/EC for zone 1, 2, 21, 22

Compact. Easy installation. Universal. Cost effective. Safe.

Type	Sensors (compulsory)	Function of sensors	Supply	Output	Wiring diagram	Installation area
ExBin- D	ExPro-B... (see below)	°C, % rH, °C+% rH	24 VAC/DC	Relay contact	SB 1.0	Zone 1, 2, 21, 22
ExBin- D - 2	as above with additional relay switching output			2 × Relay contact	SB 2.0	Zone 1, 2, 21, 22
ExBin- D... - CT	Types as above with aluminium housing and seawater resistant coating (cable glands M16 brass nickel-plated, screws in stainless steel)					
ExBin- D... - VA	Types as above with stainless steel housing for aggressive ambient (cable glands M20 brass nickel-plated, screws in stainless steel)					

Type	Function	Range	Probe/sensor length	Connection	Installation area sensor
ExPro-BT-...	Temperature sensor	−40...+125 °C*	50 / 100 / 150 / 200 mm	Plug and socket to ExCos-D..., RedCos-D...	Zone 1, 2, 21, 22
ExPro-BF-...	Humidity sensor	0...100 % rH	50 / 100 / 150 / 200 mm	Plug and socket to ExCos-D..., RedCos-D...	Zone 1, 2, 21, 22
ExPro-BTF-...	Combination sensor	−40...+125 °C* / 0...100 % rH	50 / 100 / 150 / 200 mm	Plug and socket to ExCos-D..., RedCos-D...	Zone 1, 2, 21, 22

Sensor length   * at 50 mm length −40...+80 °C

Product views and applications

Figures ...Bin-D-2

...Bin-D... transmitter	ExPro-B... sensors	...Bin-D...-CT	...Bin-D...-VA	Duct or room sensor

Fig.: Humidity sensors

Description

The ExBin-D... transmitter generation with directly coupled ExPro-B... sensors is a revolution for measuring temperature and/or humidity in HVAC systems, in chemical, pharmaceutical, industrial and offshore/onshore plants, for use in hazardous areas zone 1, 2 (gas) and zone 21, 22 (dust).

Highest protection class (ATEX) and IP66 protection, small dimensions, universal functions and technical data guarantee safe operation even under difficult environmental conditions.

All sensors are programmable on site without any additional tools. The switching points are scalable within the maximum ranges. The integrated display (can be switched off as needed) is for parametrisation and an actual value indication at working mode.

...Bin-D-2 transmitter are additionally equipped with a second switching output, which can be parameterized independently.

Highlights

► For all types of gases, mists, vapours and dust for use in zone 1, 2, 21 and 22
► Power supply 24 VAC/DC
► Scalable, potential free switching contact
► Integrated Ex-e terminal box
► No addional Ex-i module required
► No intrinsically safe wiring/installation between panel and sensor required
► No intrinsically safe wiring/installation and no space in the panel required
► Optional second switching output
► Display with backlight, can be switched off
► Password locking
► Down to −20 °C ambient temperature applicable
► Compact design and small dimension
► Robust aluminium housing (optional with seawater resistant coating) or in stainless steel
► IP66 protection

ExPro-B – see additional data sheet

ExBin-D_en
V02 – 23-Mar-2016

Technical data	...Bin- D	...Bin- D- 2
Supply voltage, frequency	24 VAC/DC ±20 % (19,2...28,8 VAC/DC), 50/60 Hz	
Current, power consumption	150 mA, ~ 4 W, internal fuse 500 mAT, without bracket, not removable	
Galvanic isolation	Supply for relay output min. 1,5 kV	
Electrical connection	Terminals 0,14...2,5 mm² at integrated Ex-e terminal box, stripping length 9 mm, torque 0,4...0,5 Nm, equipotential bonding 4 mm²	
Cable glands	2 × M16 × 1,5 mm, Ex-e approved, for cable diameter ~ Ø 5...9 mm	
Cable glands ...-CT	2 × M16 × 1,5 mm, Ex-e approved, brass nickel-plated, for cable diameter ~ Ø 6...10 mm	
...-VA	2 × M20 × 1,5 mm, Ex-e approved, brass nickel-plated, for cable diameter ~ Ø 6...13 mm	
Protection class	Class I (grounded)	
Display	Matrix LCD, backlit, for configuration, user guidance, parameter and actual value indication. Status indicator via LEDs	
Control elements	3 buttons for configuration	
Housing material	Aluminium die casting, coated. Optional with seawater resistant coating (...-CT) or	
	stainless steel V4A / AISI 316 Cd / DIN EN 1.4581 (...-VA)	
Dimensions (L × W × H)	Aluminium housing ~ 180 × 107 × 66 mm, stainless steel housing ~ 195 × 127 × 70 mm (each without connectors)	
Weight	~ 950 g aluminium housing, stainless steel version ~ 2,5 kg	
Ambient temperature	−20...+50 °C, storage temperature −35...+70 °C	
Temperature class	Aluminium housing T6 (T80 °C) at −20...+50 °C	
	Stainless steel housing T5 (T95 °C) at −20...+40 °C, T4 (T130 °C) at −20...+50 °C	
Ambient humidity	0...95 % rH, non condensing	
Sensor connection	**For ExPro-B... sensor only !** Via plug-and-socket connection at front side (for room mounting) or at back side (for duct mounting).	
	Attention: Only 1 ExPro-B... sensor per transmitter can be connected !	
ExPro-B... sensors	More information of connectable ExPro-B... sensors see separate data sheet	
Measuring range	−40...+125 °C / 0...100 % rH, non condensed	
Response time of sensor	T90 / ~ 3 s	
Relay output accuracy Temperature	± 0,1 °C resolution + accuracy of ...Pro-B... sensor	
Humidity	± 0,05 % resolution + accuracy of ...Pro-B... sensor	
Setting range hysteresis	+0,5...+20,0 °C (factory setting +1,0 °C) / 0,5...20,0 % rH (factory setting 5,0 % rH)	
Start delay	5 s	
Stability	Long term stability < 0,2 %/year, temperature influence < 0,02 %/K, supply voltage influence < 0,01 %	
Output	Potential free switching contact – breaking/making contact, adjustable per menu	
max. rating load	0,5 A (30 VAC/DC) – 0,1 A (250 VAC) – 0,1 A (220 VDC). Power 40 W, 10 W per channel	
min. rating load	10 mW / 0,1 V / 1 mA	
Additional relay output (Type ...-2)	–	as above
Duration of life Mechanical	10×10^6	
Electrical (rated load)	100×10^3	
Wiring diagram	SB 1.0	SB 2.0
Scope of delivery	Transmitter, 3 self-tapping screws 4,2 × 13 mm resp. in stainless steel (with ...CT and ...VA versions)	

Approbations

ATEX directive	94/9/EC
EC type-approved	EPS 14 ATEX 1 657
IECEx certified	IECEx EPS 14.0074
Approval for gas	II 2 (1) G Ex e mb [ia Ga] IIC T6...T4 Gb
Types ...-CT	II 2 (1) G Ex e mb [ia Ga] IIB T6 Gb
Approval for dust	II 2 (1) D Ex tb [ia Da] IIIC T80°C...T130°C Db IP66
CE identification	CE № 0158
EMC directive	2004/108/EC
Enclosure protection	IP66 in acc. with EN 60529
EAC	TC RU C-DE.ГБ08.B.01510

Special solutions and accessories

...-CT	Types in aluminium housing with seawater resistant coating, parts nickel-plated
...-VA	Types in stainless steel housing, parts nickel-plated
MKR	Mounting bracket for round ducts up to Ø 600 mm
Kit-S8-CBR	2 cable glands M16 × 1,5 mm, Ex-e, brass nickel-plated, for cable Ø 5...10 mm

Electrical connection

All transmitters require a 24 VAC / DC power supply. The electrical wiring must be realized via the integrated Ex-e terminal box acc. to ATEX. The terminals' type of protection is "Increased safety Ex-e".
Attention: Before opening the terminal box cover, the supply voltage must be shut off !
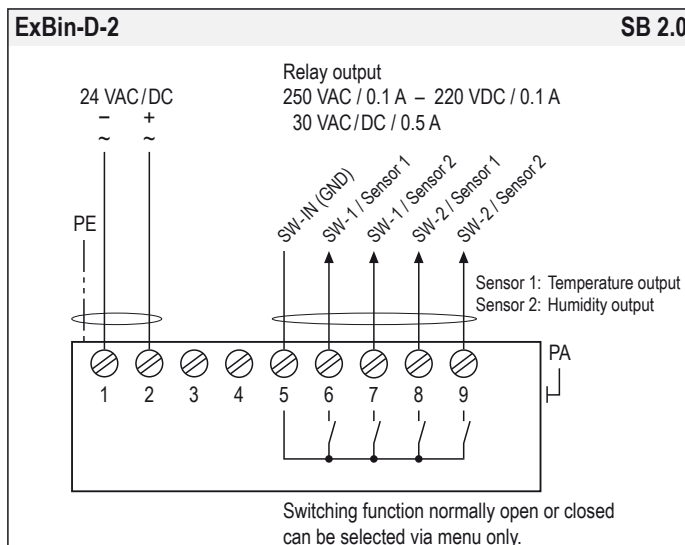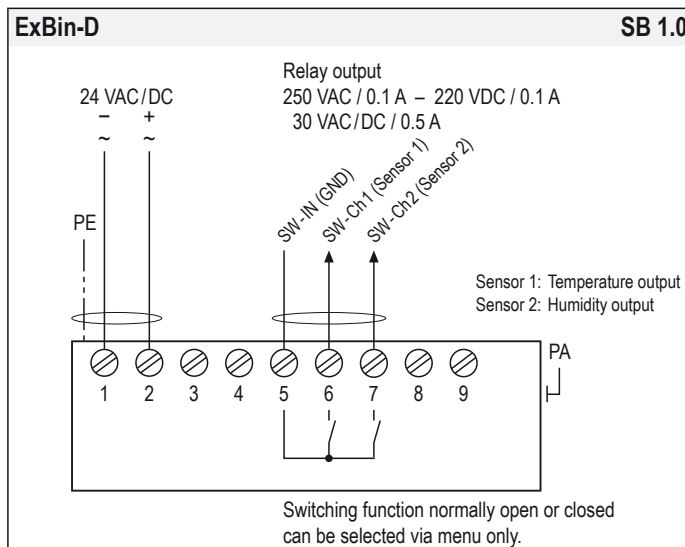The supply has to be connected at terminals 1 (− / ~) and 2 (+ / ~).

> ⚠ At different relay and supply voltages (24 VAC / DC) the cable installation must be considered (see "Information for Installation") ! ⚠

Depending on the ...Pro-B-... sensor's type you can measure either temperature (...Pro-BT...) or humidity (...Pro-BF...) at the time or combined with a ...Pro-BTF... Simultaneous measurings are not possible, use only one transmitter at the time.
Before starting parametrisation of ...Bin-D... transmitter a ...Pro-B... sensor must be connected, which can be mounted either to the front or the back side of the transmitter. The protective cap must be removed.
Unused connectors must be covered with the original protective cap to avoid mechanical damage and dirt !
Depending on the sensor's type you need to set parameters for one or two measuring ranges and their related data.

ExBin-D **SB 1.0**

Relay output
250 VAC / 0.1 A – 220 VDC / 0.1 A
30 VAC / DC / 0.5 A

24 VAC / DC
− +
~ ~

PE

SW-IN (GND)
SW-Ch1 (Sensor 1)
SW-Ch2 (Sensor 2)

Sensor 1: Temperature output
Sensor 2: Humidity output

PA

1 2 3 4 5 6 7 8 9

Switching function normally open or closed can be selected via menu only.

ExBin-D-2 **SB 2.0**

Relay output
250 VAC / 0.1 A – 220 VDC / 0.1 A
30 VAC / DC / 0.5 A

24 VAC / DC
− +
~ ~

PE

SW-IN (GND)
SW-1 / Sensor 1
SW-1 / Sensor 2
SW-2 / Sensor 1
SW-2 / Sensor 2

Sensor 1: Temperature output
Sensor 2: Humidity output

PA

1 2 3 4 5 6 7 8 9

Switching function normally open or closed can be selected via menu only.

Intrinsically safe parameters (IS) – Internal values

			IIC	IIB	IIA
U_o = 7.9 V	$C_i \rightarrow 0$				
I_o = 6.4 mA	$L_i \rightarrow 0$	L_o	5 mH	10 mH	20 mH
P_o = 12.7 mW		C_o	1.5 µF	6.7 µF	8.6 µF

Important information for installation and operation

A. Installation, commissioning, maintenance

All national and international standards, rules and regulations must be complied with. Certified apparatus must be installed in accordance with manufacturer instructions. If the equipment is used in a manner not specified by the manufacturer, the safety protection provided by the equipment may be impaired. For electrical installations design, selection and erection, EN / IEC 60079-14 can be used.

> ⚠ **Attention:** Apply all Ex rules and regulation before opening the internal terminal box. Do not open cover when circuits are live !

Draw the wiring cables through the cable glands. For connection use the internal Ex-e approved terminal box and connect equipotential bonding.
After connection install the cables in a fixed position and protect them against mechanical and thermical damage. Close all openings and ensure IP protection (min. IP66).
Avoid temperature transfer and ensure not to exceed max. ambient temperature ! For outdoor installation a protective shield against sun, rain and snow should be applied.
Sensors are maintenance free. An annual inspection is recommended. For electrical installations inspection and maintenance, EN / IEC 60079-17 can be used.
Clean with damp cloth only.
Ex sensors must not be opened and repaired by the end user.

B. Long cabling

We recommend using shielded signal wires and to connect one end of the shield to the ...Bin-... terminal box.

C. Separate ground wires

For supply and signal wires use separate grounds.

D. Relay output

Wires for safety extra-low voltage must be installed separately from other circuits. At 24 VAC / DC only supply and signal wires are permitted in one cable, in all other cases use separate or double isolated cables. An over-current protection fuse < 10 A has to be provided by the installer.

E. ExPro-B... sensors

The ExPro-B... sensor is supplied by the transmitter's intrinsically safe circuit. Unused connectors must be covered with a protective cap.

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Display, buttons and parameters

Display for programming and indication

Push button ENTER

Push button for level selection

Fig. ...Bin-D-2

Change operation – parametrisation mode

To change from operation to parametrisation mode and vice versa, push ⏎ ENTER button for minimum of 3 seconds. Back to operation mode with menu "save".

Indication of data logging

The flashing unit symbol (°C) shows that data is received and the device is working.

Sensor malfunction

A sensor malfunction is indicated by a red flashing LED and the text "SENS" in the display. The switching outputs will indicate that, too. In this case the connection between the tranducer and the sensor should be checked first.

Password input

The default/delivery setup is 0000. In this configuration the password input is not activated. To activate the password protection (menu 15) change the 4 digits into your choosen numbers (e.g. 1234) and press ENTER.

Please keep your password in mind for next parameter change! Due to a new parameter setup the password is requested.

Parametrisation and commissioning

To change from operation to parametrisation mode push the "ENTER" button ⏎ for minimum 3 seconds.
If password protected: type password and push ⏎.
Skip menu with ▶, back to operation mode with menu "save".
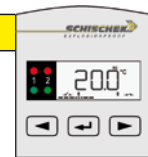
Operation → Parametrisation push ⏎ for min. 3 s

Menu	Function		ENTER	Indication	Select	ENTER	Next indication	Select	ENTER	Next menu
Menu 1	no function – menu skip									
Menu 2	Unit sensor — Select physical unit	Unit	⏎	Menu 2 °C / °C, °F	◀ ▶	⏎				▶
Menu 3	set 1, sensor 1 — Select switching point 1 (temperature)	SEt1	⏎	Menu 3 20.0°C / enter temperature	◀ ▶	⏎				▶
Menu 4	set 2, sensor 1 (optional) * — Select switching point 2 (temperature)	SEt2	⏎	Menu 4 30.0°C / enter temperature	◀ ▶	⏎				▶
Menu 5	hysteresis, sensor 1 — Select hysteresis	HYSt	⏎	Menu 5 1.0°C / enter degrees	◀ ▶	⏎				▶
Menu 6	mode, sensor 1 — Select switching properties (break contact, make contact)	ModE	⏎	Menu 6 UP / Up, Down, Mid *	◀ ▶	⏎	Menu 6 NC / nc, no	◀ ▶	⏎	▶
Menu 7	Unit sensor — Select physical unit	Unit	⏎	Menu 7 %rF / % rF, % rH	◀ ▶	⏎				▶
Menu 8	set 1, sensor 2 — Select switching point 1 (humidity)	SEt1	⏎	Menu 8 50.0%rF / enter humidity %	◀ ▶	⏎				▶
Menu 9	set 2, sensor 2 (optional) * — Select switching point 2 (humidity)	SEt2	⏎	Menu 9 80.0%rF / enter humidity %	◀ ▶	⏎				▶
Menu 10	hysteresis, sensor 2 — Select hysteresis	HYSt	⏎	Menu 10 5.0%rF / enter humidity %	◀ ▶	⏎				▶
Menu 11	mode, sensor 2 — Select switching properties (break contact, make contact)	ModE	⏎	Menu 11 Mid / Up, Down, Mid *	◀ ▶	⏎	Menu 11 NC / nc, no	◀ ▶	⏎	▶
Menu 12	no function – menu skip									
Menu 13	display setting — Select display	LAMP	⏎	Menu 13 ON / on, off	◀ ▶	⏎				▶
Menu 14	no function – menu skip									
Menu 15	security — Select password protection	SECU	⏎	Menu 15 0000 / enter password	◀ ▶	⏎				▶
Menu 16	save — Select: save data, discard, back to menu, factory setting	SAVE	⏎	Menu 16 YES / Yes, no, menu, dset (default setting)	◀ ▶	⏎	(operation mode after "save")			

* for ...Bin-D-2 only (2-stage)

ExBin-D_en
V02 – 23-Mar-2016

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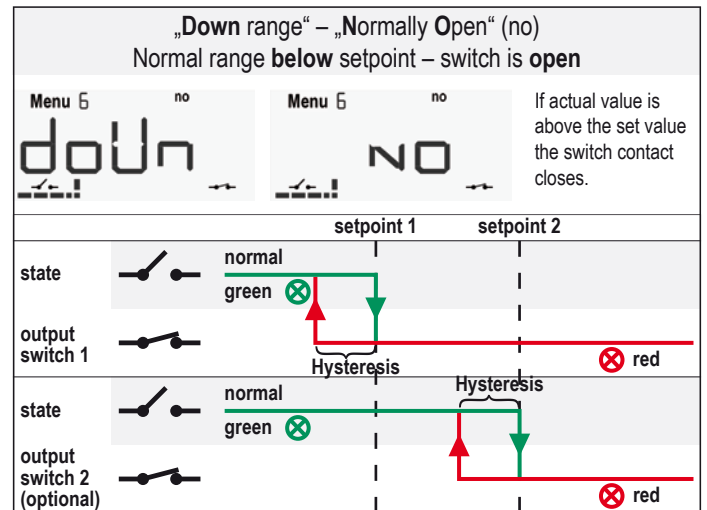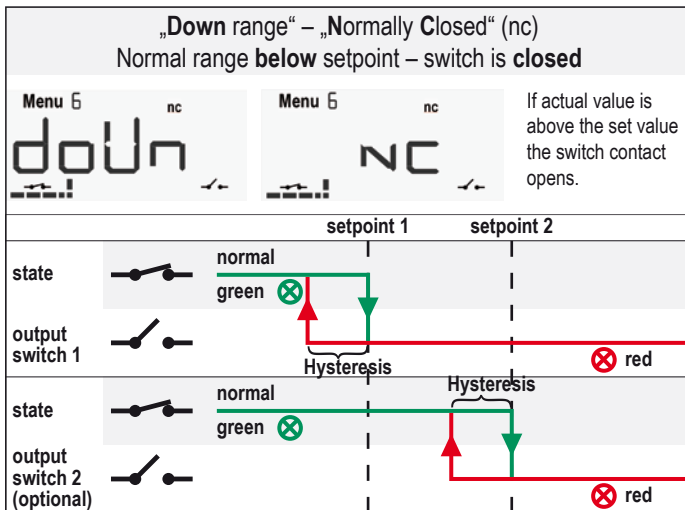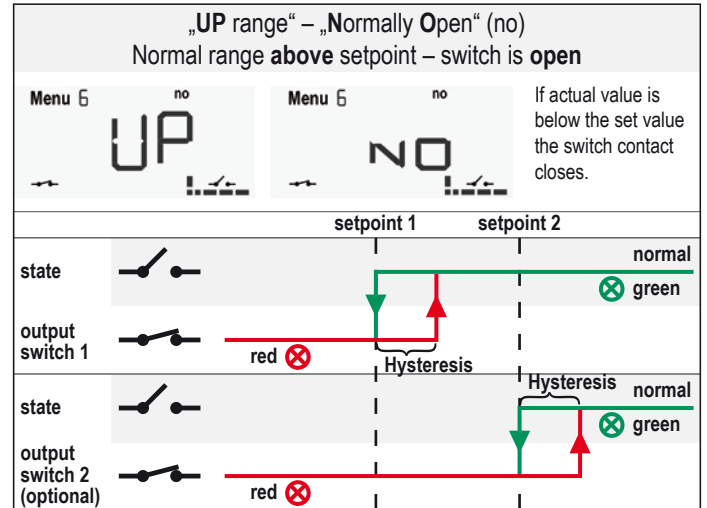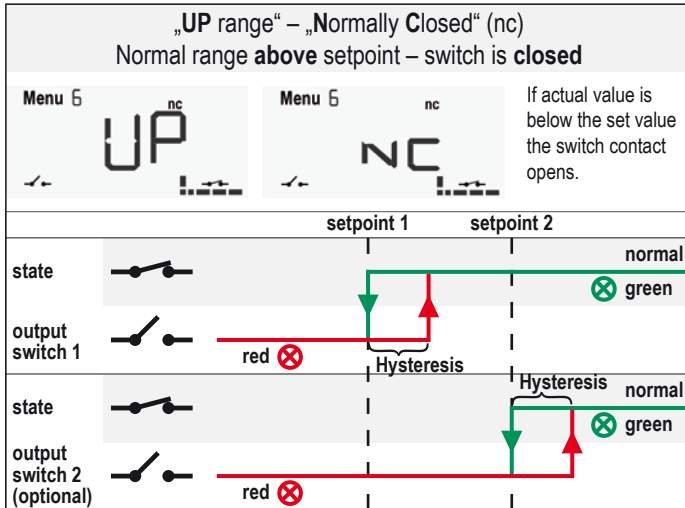
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Menu 6 "mode" – Switching properties

1. Define the device's normal range first:
   The device should indicate (green LED) when the temperature / humidity is
   - above the setpoints – mode „up-range" has to be selected.
   - below the setpoints – mode „down-range" has to be selected.
   - between the setpoints – mode „mid-range" has to be selected.
     This mode is available for 2-stage devices only (...Bin-D-2).

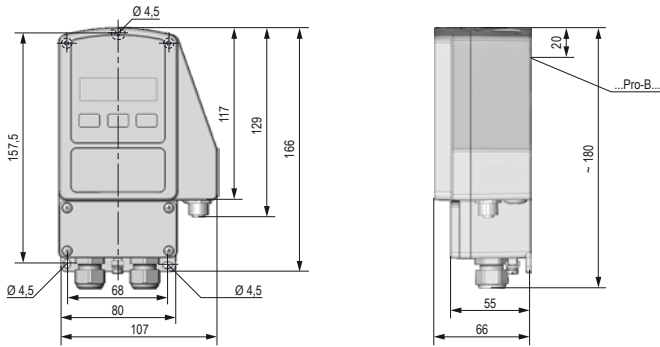2. Select the switching charateric of the output relay:
   When the measured value is in normal range, the corresponding relays shall
   - close – select "normally closed" (nc)
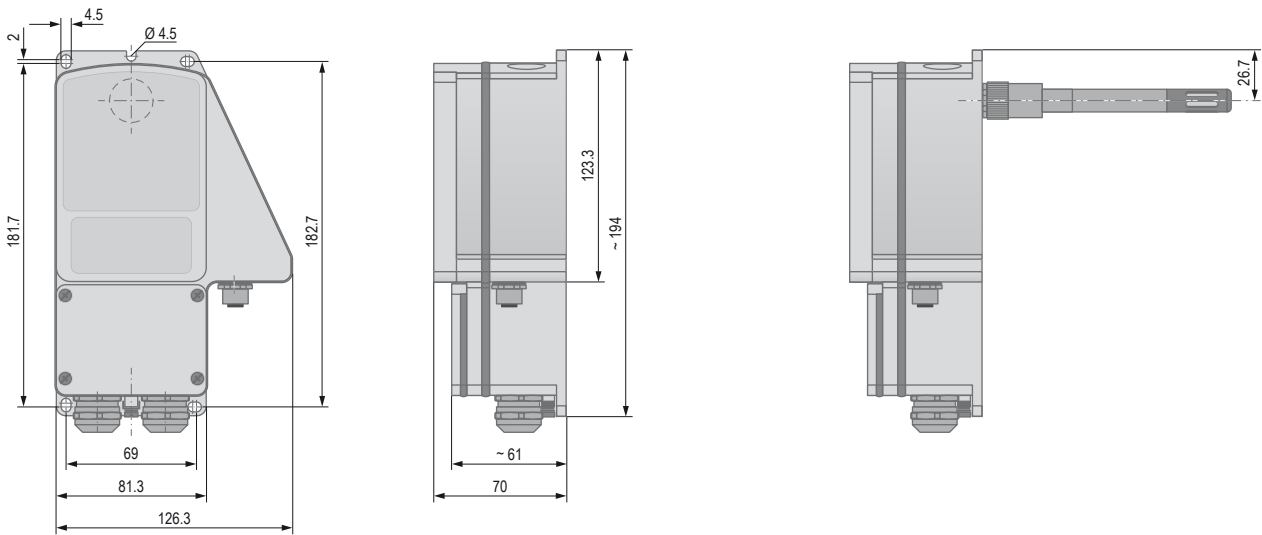   - open – select "normally open" (no)

„**UP** range" – „**N**ormally **C**losed" (nc)
Normal range **above** setpoint – switch is **closed**

If actual value is below the set value the switch contact opens.

„**UP** range" – „**N**ormally **O**pen" (no)
Normal range **above** setpoint – switch is **open**

If actual value is below the set value the switch contact closes.

„**Down** range" – „**N**ormally **C**losed" (nc)
Normal range **below** setpoint – switch is **closed**

If actual value is above the set value the switch contact opens.

„**Down** range" – „**N**ormally **O**pen" (no)
Normal range **below** setpoint – switch is **open**

If actual value is above the set value the switch contact closes.

„**Mid** range" – „**N**ormally **C**losed" (nc)
Normal range **between** setpoints – switch is **closed**

2-stage devices only

„**Mid** range" – „**N**ormally **O**pen" (no)
Normal range **between** setpoints – switch is **open**

2-stage devices only

ExBin-D_en
V02 – 23-Mar-2016

Dimensions   [mm]

Aluminium housing

Stainless steel housing

ExPro-B Temperature / humidity sensor
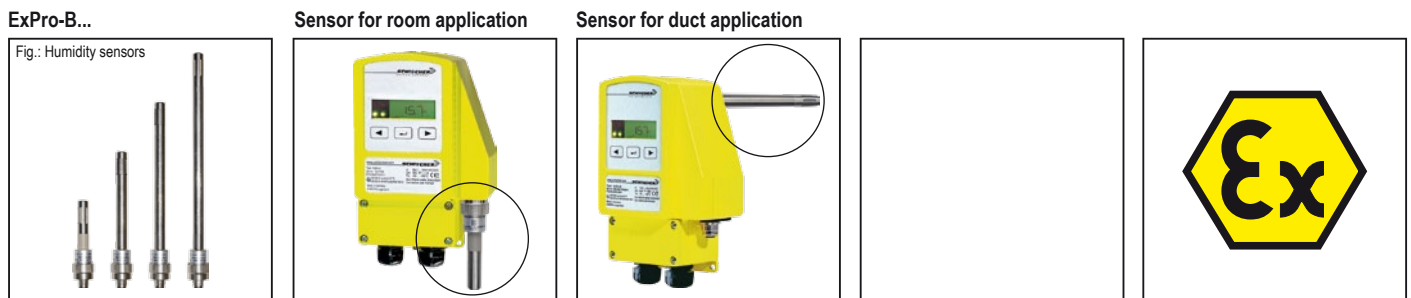
connectable exclusively to transmitters **ExBin-D** and **RedBin-D** for measuring of temperature and / or humidity

<div align="right">Subject to change !</div>

Type	Function	Range	Sensor length	Connection	Installation area sensor
ExPro-BT-...	Temperature sensor	−40...+125 °C *	50 / 100 / 150 / 200 mm	Plug and socket to ExCos-D..., RedCos-D...	Zone 1, 2, 21, 22
ExPro-BF-...	Humidity sensor	0...100 % rH	50 / 100 / 150 / 200 mm	Plug and socket to ExCos-D..., RedCos-D...	Zone 1, 2, 21, 22
ExPro-BTF-...	Combination sensor	−40...+125 °C * / 0...100 % rH	50 / 100 / 150 / 200 mm	Plug and socket to ExCos-D..., RedCos-D...	Zone 1, 2, 21, 22
↑ Sensor length		* at 50 mm length −40...**+80** °C			

Product views and applications

ExPro-B...

Fig.: Humidity sensors

Sensor for room application

Sensor for duct application

Technical data	ExPro- BT -...	ExPro- BF -...	ExPro- BTF -...
	Temperature sensor	**Humidity sensor**	**Temperature / humidity sensor**
Measuring range	−40...+125 °C *	0...100 % rH	−40...+125 °C * / 0...100 % rH
	* −40...+80 °C at 50 mm length		* −40...+80 °C at 50 mm length
Sensort types and length	ExPro-BT- 50 = 50 mm	ExPro-BF- 50 = 50 mm	ExPro-BTF- 50 = 50 mm
	ExPro-BT-100 = 100 mm	ExPro-BF-100 = 100 mm	ExPro-BTF-100 = 100 mm
	ExPro-BT-150 = 150 mm	ExPro-BF-150 = 150 mm	ExPro-BTF-150 = 150 mm
	ExPro-BT-200 = 200 mm	ExPro-BF-200 = 200 mm	ExPro-BTF-200 = 200 mm
Response time sensor	T90 / 20 s	T90 / 4 s	T90 / 20 s, T90 / 4 s
Accuarcy temperature (max.)	±1,5 °C at −25...+85 °C (−25...+80 °C at 50 mm length), ±2,0 °C at −40...−25 °C and 85...+125 °C		
Accuarcy humidity	±3 % at 10...90 % rH, ±5 % at < 10 % rH and > 90 % rH		
Accuarcy ...Pro-BTF...	Temperature: ±0,4 °C at 25 °C ±0,02 °C/°C		
	Humidity: ±3 % at 10...90 % rH, ±5 % at < 10 % rH and > 90 % rH		
Housing protection	IP66 acc. to EN 60529		
Material **Adapter**	Stainless steel № 1.4305, length 50 mm in plastic PEEK-GF30 (max. room temperature +80 °C)		
Protection sleeve	Stainless steel № 1.4301 / AISI 304		
End cap	AISI 316		
Plug-in connector	Zinc die-cast nickel-plated, screw sleeve brass nickel-plated		
Filter element humidity sensor	Mesh size 100 µm		
Ambient temperature / humidity	−40...+125 °C (−40...+80 °C at 50 mm length) / 0...100 % rH		
Storage temperature	−40...+125 °C (−40...+80 °C at 50 mm length)		
Installation area sensor	in Ex areas zone 1, 2, 21, 22		
Scope of delivery	ExPro-B... sensor with plug connector and gasket (EPDM) for duct installation		

Description

ExPro-B... sensor is a measuring element which is in combination with an ...Bin-D... transmitter for temperature, humidity or combination of temperature and humidity measuring. **ExPro-B... sensors are only for use with ExBin-D.../RedBin-D... transmitters.**
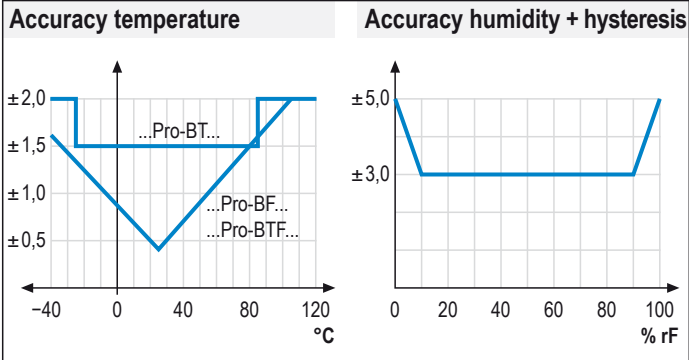The electromechanical connection is done with a socket on the front resp. on the back side of the transmitter, but only 1 ExPro-B... per module is allowed and can be used.
Warning: Aggressive gases can destroy the sensor element.

Accessories

MFK	Mounting flange for duct mounting for variable immersion depth in ducts
MKR	Mounting bracket for round ducts up to Ø 600 mm
TH-VA	Immersion sleeve in stainless steel V4A / DIN EN 1.4571, length 120 mm.
	Other length on request.
Kit-FA-VA	Stainless steel sinter filter cap for humidity sensors, pore size 10 µm.
	Not for high humidity measurements !

SCHISCHEK
EXPLOSIONPROOF

Accuracy temperature and humidity incl. hysteresis

Accuracy temperature

±2,0
±1,5 ...Pro-BT...
±1,0
±0,5 ...Pro-BF...
...Pro-BTF...

−40 0 40 80 120
°C

Accuracy humidity + hysteresis

±5,0

±3,0

0 20 40 60 80 100
% rF

Max. Medium temperature – Temperature class (surface temp.)

Temperature class	T6	T5	T4	T3	T2	T1
Max. medium temperature [°C]	60	75	110	125	125	125

Important information for installation and operation

A. ExPro-B... sensor
The power for ExPro-B... sensor is supplied via an instrinsically safe (IS) circuit from the transmitter. Unused sensor entries have to be closed with the black caps.

B. Temperature flow
When measuring temperature over the max. allowed environmental temperature of the transmitter of +50 °C regard that no temperature flow over the sensor takes place.
The mounting of the sensor has to ensure that errors due to heat dissipation are within the tolerance limits and the max. allowed environmental temperature is not exceeded.

C. Mounting
Screw the sensor into the socket of the transmitter. The sensor cannot be opened as parts of the element are moulded. A small distance tolerance between transmitter and sensor has to be accepted due to production conditions.

Intrinsically safe parameters

U_i = 9,6 V C_i = 120 nF
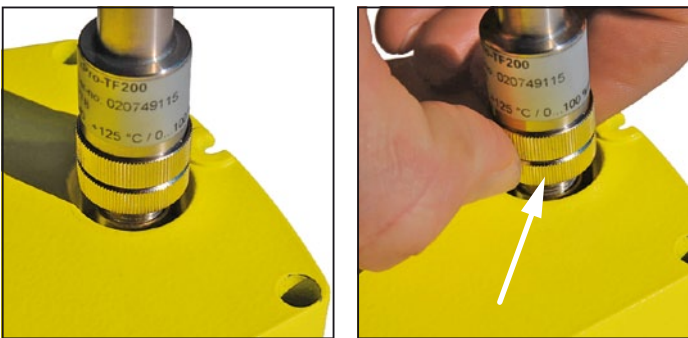I_i = 9,7 mA L_i = 0

Mounting room sensor (at terminal box side)
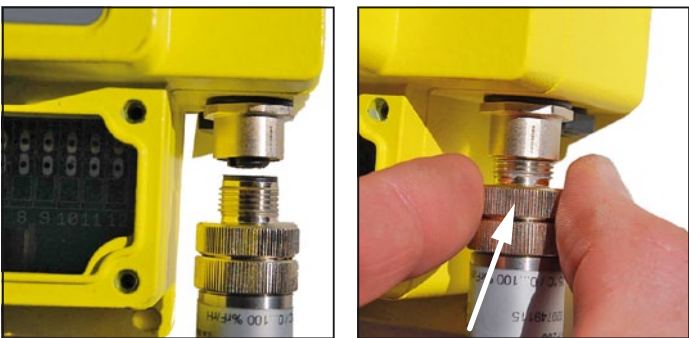
For mounting the sensor must be plugged into the socket and screwed on the sensor by turning the lower knurled screw clock-wise. Tighten hand-screwed only.
A small clearance between transmitter and sensor has to be accepted due to production conditions.
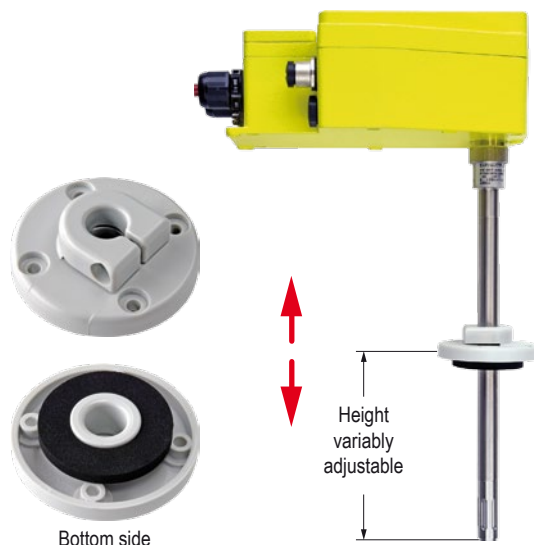
Mounting duct sensor (back side)

For mounting the sensor must be plugged into the socket and screwed on the sensor by turning the lower knurled screw clockwise. Tighten hand-screwed only.
A small clearance between transmitter and sensor has to be accepted due to production conditions.

MFK mounting flange for duct installation

The flange is to be moved over the sensor and fixed with the adjusting screw on the side. The flange can be mounted with 4 screws directly to the duct.

Height variably adjustable

Bottom side

Dimensions [mm]

End cap

Protection sleeve

Ø 12

Adapter

Plug-in connector with screw sleeve

Ø 23

ExPro-B... -50 ...-100 ...-150 ...-200

200
150
100
50
31
15