

Data Sheet

SCHISCHEK REDBIN-D TRANSMITTER

for ExPro-B... Temperature / humidity sensors



Supplied by

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

RedBin - D
RedBin - D - 2
RedBin - ... - CT
RedBin - ... - VA

Subject to change!

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 2, 22

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

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



Description Highlights

The RedBin-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 2 (gas) and zone 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.

- ▶ For all types of gases, mists, vapours and dust for use in zone 2 and 22
- ▶ Power supply 24 VAC/DC
- ▶ Scalable, potential free switching contact
- ▶ Integrated Ex terminal box
- ▶ No additional 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



Technical data	...Bin- D	...Bin- D- 2
Supply voltage, frequency	24 VAC/DC $\pm 20\%$ (19,2...28,8 VAC/DC), 50/60 Hz	
Current, power consumption	150 mA, ~ 4 W, internal fuse 500 mA, without bracket, not removable	
Galvanic isolation	Supply for relay output min. 1,5 kV	
Electrical connection	Terminals 0,14...2,5 mm ² at integrated Ex terminal box, stripping length 9 mm, torque 0,4...0,5 Nm, equipotential bonding 4 mm ²	
Cable glands	2 x M16 x 1,5 mm, Ex approved, for cable diameter ~ \varnothing 5...9 mm	
Cable glands ...-CT	2 x M16 x 1,5 mm, Ex approved, brass nickel-plated, for cable diameter ~ \varnothing 6...10 mm	
...-VA	2 x M20 x 1,5 mm, Ex approved, brass nickel-plated, for cable diameter ~ \varnothing 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 x W x H)	Aluminium housing ~ 180 x 107 x 66 mm, stainless steel housing ~ 195 x 127 x 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	$\pm 0,1$ °C resolution + accuracy of ...Pro-B... sensor	
Humidity	$\pm 0,05\%$ 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 x 13 mm resp. in stainless steel (with ...CT and ...VA versions)	

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 \varnothing 600 mm
Kit-S8-CBR	2 cable glands M16 x 1,5 mm, Ex-e, brass nickel-plated, for cable \varnothing 5...10 mm

CSA:



This equipment is suitable for installation in Class I, Division 2, Group A, B, C, D hazardous locations or nonhazardous locations only.



WARNING – EXPLOSION HAZARD:
Substitution of components may impair suitability for Class I, Division 2.



WARNING – EXPLOSION HAZARD:
Do not connect or disconnect this equipment unless power has been removed or the area is known to be nonhazardous.



Electrical connection

All transmitters require a 24 VAC/DC power supply. The electrical wiring must be realized via the integrated terminal box acc. to ATEX.

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 (+/~).

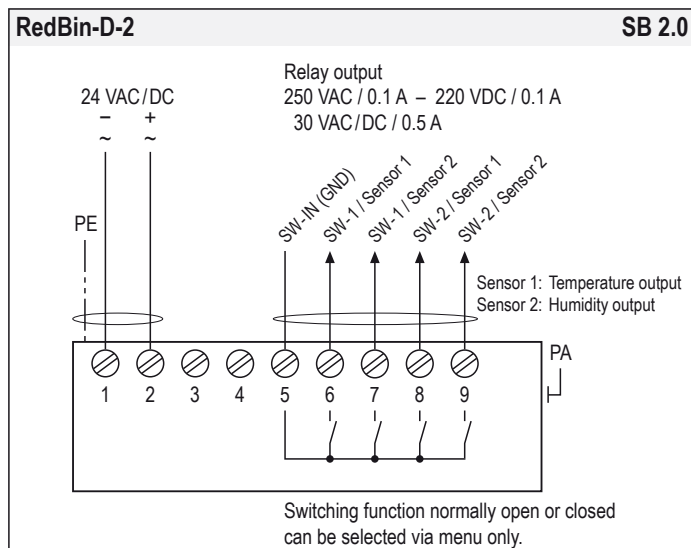
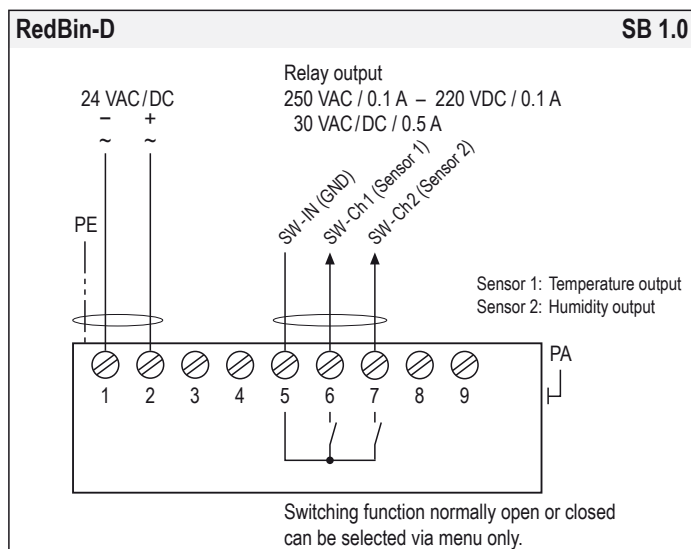
Warning icon: At different relay and supply voltages (24 VAC/DC) the cable installation must be considered (see "Information for Installation")!

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.



Intrinsically safe parameters (IS) – Internal values

Table with 4 columns: Uo, Io, Po, and IIC/IIB/IIA. Values: Uo = 7.9 V, Io = 6.4 mA, Po = 12.7 mW, IIC = 5 mH, IIB = 10 mH, IIA = 20 mH.

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.

Canada: Install per Canadian Electrical Code (CEC). USA: Install per National Electrical Code (NEC).

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 terminal box and connect equipotential bonding. After connection install the cables in a fixed position and protect them against mechanical and thermal damage.

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.

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.



Display, buttons and parameters



Display for programming and indication

Push button ENTER

Push button for level selection

Fig. ...Bin-D-2

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 transducer 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.

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".

Parametrisation and commissioning

To change from operation to parametrisation mode push the "ENTER" button [ENTER] for minimum 3 seconds.

If password protected: type password and push [ENTER].

Skip menu with [SKIP], back to operation mode with menu "save".

Operation → Parametrisation push [ENTER] for min. 3 s

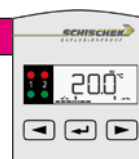


Table with 10 columns: Menu, Function, ENTER, Indication, Select, ENTER, Next indication, Select, ENTER, Next menu. Rows include settings for sensor units, switching points, hysteresis, modes, display, and security.

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



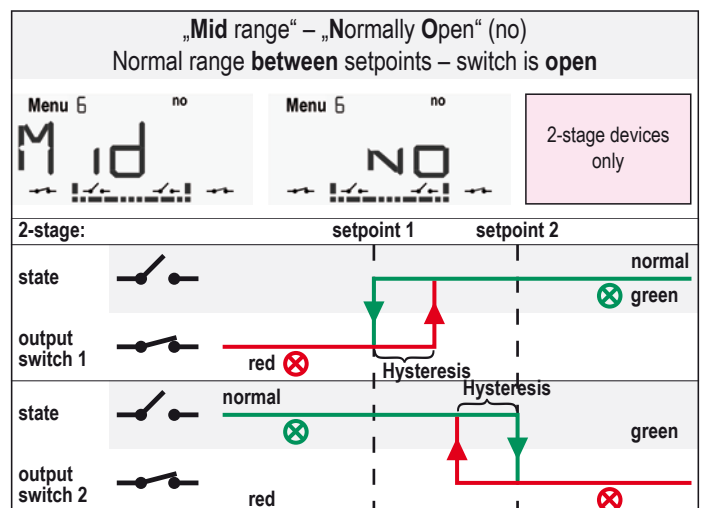
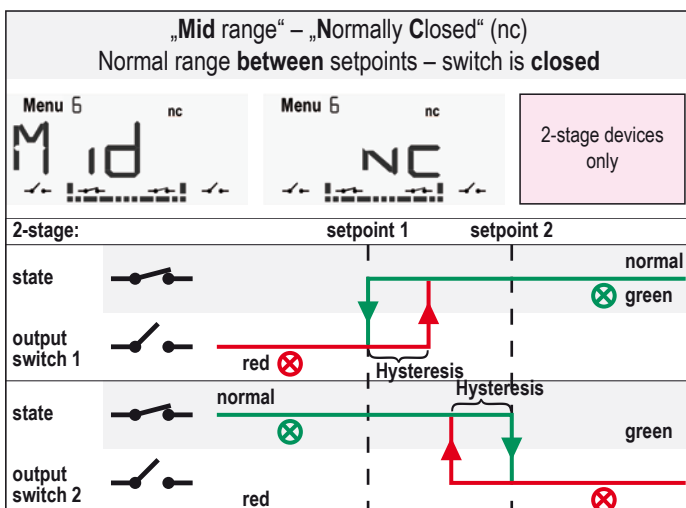
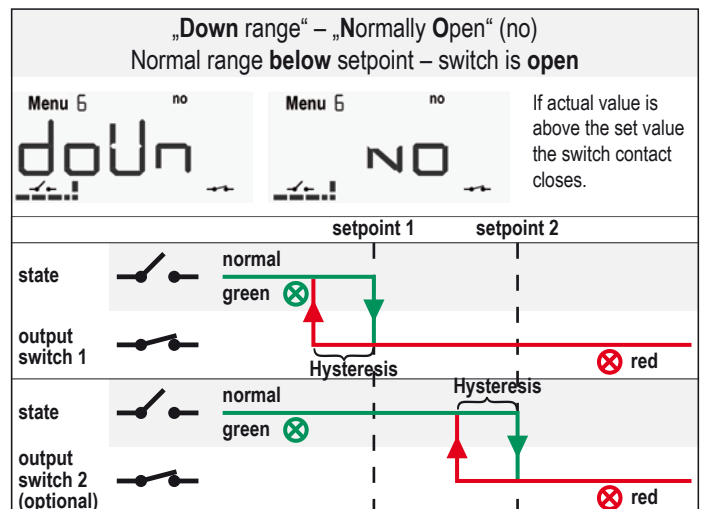
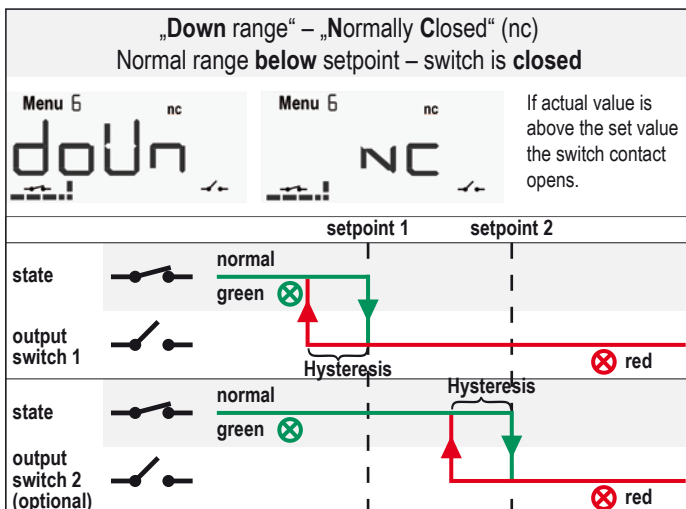
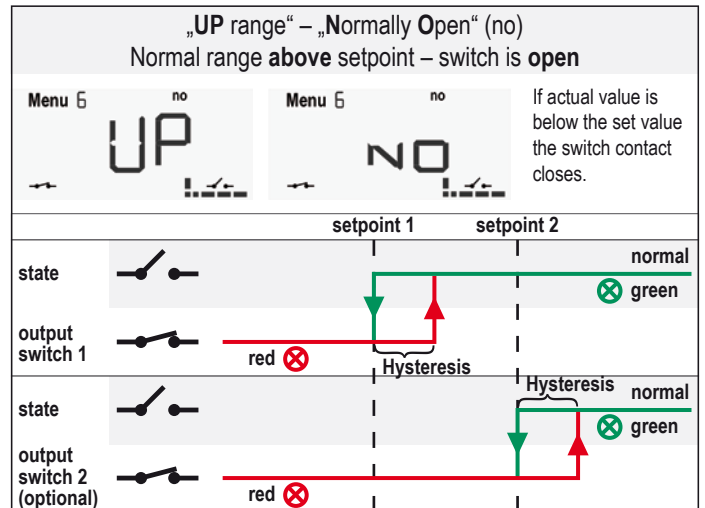
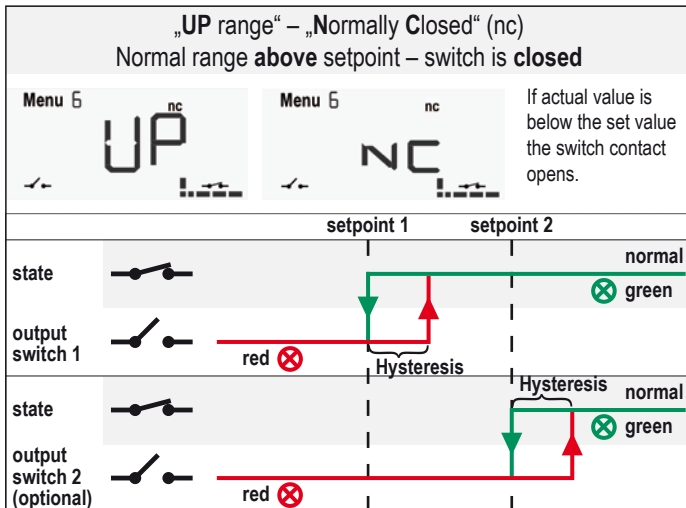
Menu 6 "mode" – Switching properties

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 characteristic of the output relay:

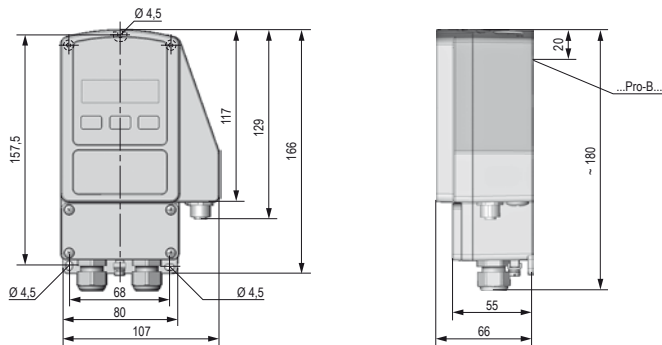
- When the measured value is in normal range, the corresponding relays shall
 - close – select "normally closed" (nc)
 - open – select "normally open" (no)



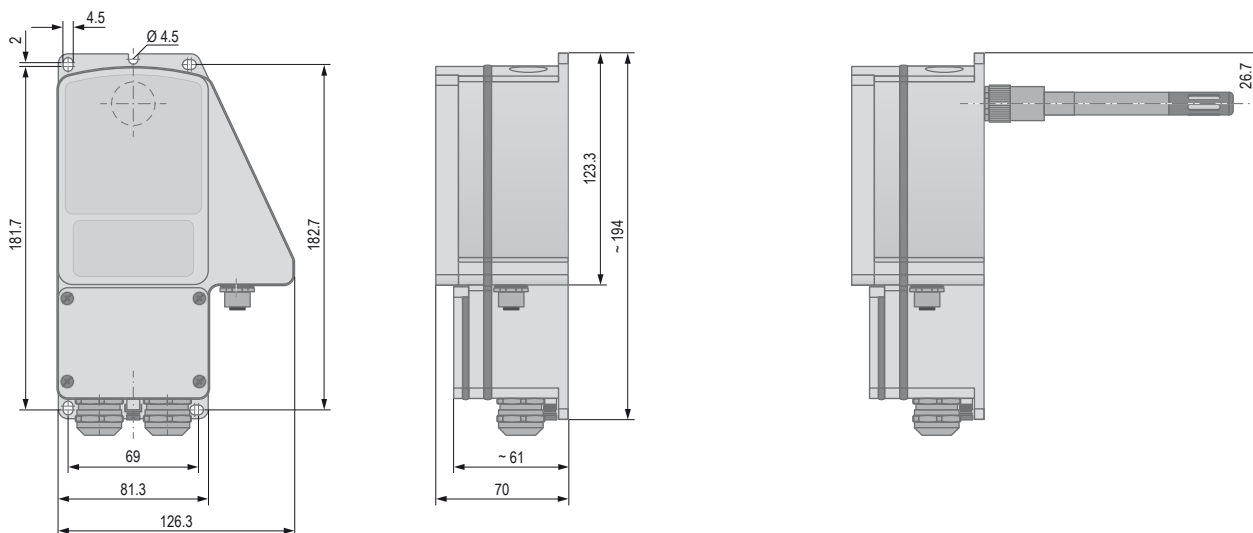


Dimensions [mm]

Aluminium housing



Stainless steel housing



Approbations

ATEX directive	94/9/EG
EC type-approved	EPS 14 ATEX 1 658
IECEx certified	IECEx EPS 14.0075
Approval for gas	II 3 (1) G Ex nC [ja Ga] IIC T6...T4 Gc
Types ...-CT	II 3 (1) G Ex nC [ja Ga] IIB T6 Gc
Approval for dust	II 3 (1) D Ex tc [ja Da] IIIC T80°C...T130°C Dc IP66
CE identification	CE № 0158
EMC directive	2004/108/EC
Enclosure protection	IP66 in acc. with EN 60529

EAC	TC RU C-DE.ГБ08.В.01510
CSA	13.2672226 Aluminium housing
Class Division	Class I, Division 2, Groups ABCD, T6, IP66
	Ex nA [ja Ga] IIC Gc
Types ...-CT	Ex nA [ja Ga] IIB Gc
Class Zone	Class I, Zone 2, AEx nA [ja Ga] IIC T6 Gc, IP66
Types ...-CT	Class I, Zone 2, AEx nA [ja Ga] IIB T6 Gc, IP66



ExPro-B Temperature/humidity sensor

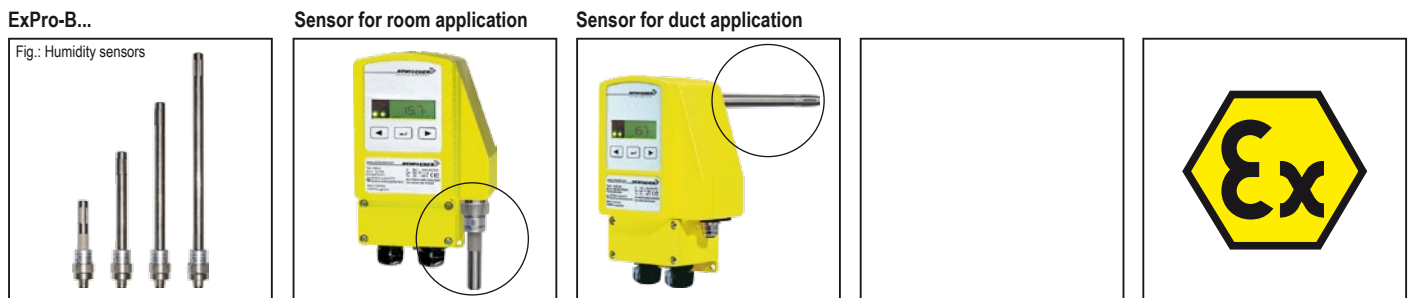
connectable exclusively to transmitters **ExBin-D** and **RedBin-D** for measuring of temperature and/or humidity

Subject to change!

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



Technical data	ExPro- BT -...	ExPro- BF -...	ExPro- BTF -...
	Temperature sensor	Humidity sensor	Temperature / humidity sensor
Measuring range	-40...+125 °C * * -40...+80 °C at 50 mm length	0...100 % rH	-40...+125 °C * / 0...100 % rH * -40...+80 °C at 50 mm length
Sensort types and length	ExPro-BT- 50 = 50 mm ExPro-BT-100 = 100 mm ExPro-BT-150 = 150 mm ExPro-BT-200 = 200 mm	ExPro-BF- 50 = 50 mm ExPro-BF-100 = 100 mm ExPro-BF-150 = 150 mm ExPro-BF-200 = 200 mm	ExPro-BTF- 50 = 50 mm ExPro-BTF-100 = 100 mm ExPro-BTF-150 = 150 mm ExPro-BTF-200 = 200 mm
Response time sensor	T90 / 20 s	T90 / 4 s	T90 / 20 s, T90 / 4 s
Accuracy 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		
Accuracy humidity	± 3 % at 10...90 % rH, ± 5 % at < 10 % rH and > 90 % rH		
Accuracy ...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.**

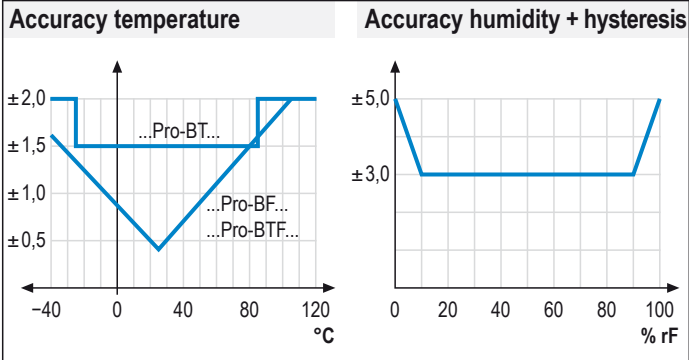
The electromechanical connection is done with a socket on the front resp. on the back side of the transmitter, but only 1 ExPro-B... per module is allowed and can be used.

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!	

Accuracy temperature and humidity incl. hysteresis



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 intrinsically safe (IS) circuit from the transmitter. Unused sensor entries have to be closed with the black caps.

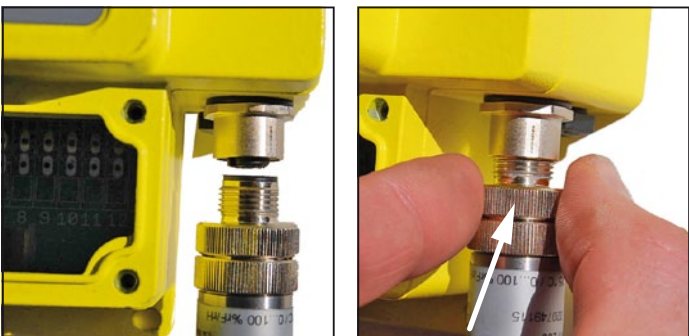
B. Temperature flow
When measuring temperature over the max. allowed environmental temperature of the transmitter of +50 °C regard that no temperature flow over the sensor takes place. The mounting of the sensor has to ensure that errors due to heat dissipation are within the tolerance limits and the 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

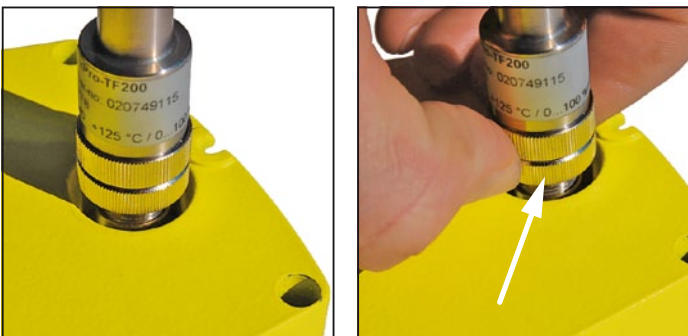
Mounting room sensor (at terminal box side)



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



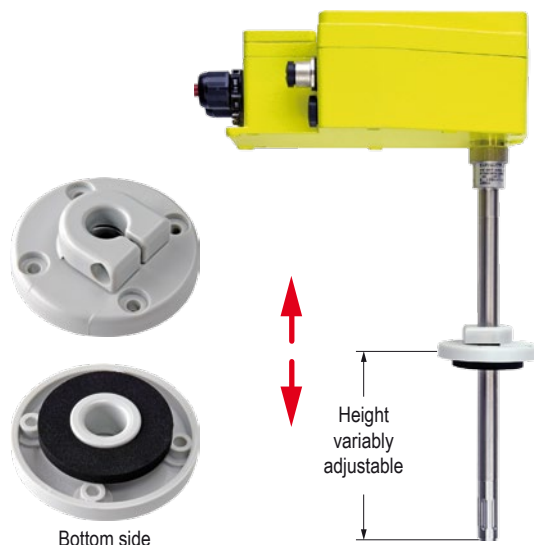
Mounting duct sensor (back side)



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.



Dimensions [mm]

