ExCos-D Transducer for ExPro-C... sensors (probes)
ExPro-C... Temperature / humidity sensors (°C, % rH)

Electrical, explosionproof transducers only connectable to **ExPro-C...** temperature and humidity sensors.
24 VAC/DC supply, 0…10 V / (0)4…20 mA output
PTB-certified in acc. with ATEX directive 94/9/EC for zone 1, 2, 21, 22.

Type of transducer:
ExCos - D
ExCos - D - A
ExCos - D... - CT
Type of sensor (probe):
ExPro - CT...
ExPro - CF...
ExPro - CTF...

Subject to change!

Transducer

Type	Supply	Installation area	Connectable sensors	Function of sensors	Sensor connection	Wiring diagram
ExCos - D	24 VAC/DC	zone 1, 2, 21, 22	ExPro-CT..., ExPro-CF..., ExPro-CTF...	°C, % rH, combination °C / % rH	via plug-and-socket connection	SB 2.0
ExCos - D - A	as above, but with additional intrisically safe analogue output to connect an external digital indicator (0)4...20 mA (Ex-i)					SB 3.0
ExCos - D...- CT	Type as above but with aluminium housing and Amercoat painting (sensor connection cable glands nickel-plated, screws in stainless steel)					

Connectable sensors (compulsory for ExCos-D... transducer) – see separate data sheet

Type	Function	Measuring range	Length of sensor	connectable to	Installation sensor	Installation transducer
ExPro - CT...	temperature	–40...+125 °C*	50/100/150/200 mm	ExCos-D..., RedCos-D...	zone 1, 2, 21, 22	zone 1, 2, 21, 22 (ExCos...)
ExPro - CF...	humidity	0...100 % rH	50/100/150/200 mm	ExCos-D..., RedCos-D...	zone 1, 2, 21, 22	zone 1, 2, 21, 22 (ExCos...)
ExPro - CTF...	combination temp./humidity	–40...+125 °C* / 0...100 %rH	50/100/150/200 mm	ExCos-D..., RedCos-D...	zone 1, 2, 21, 22	zone 1, 2, 21, 22 (ExCos...)

* at 50 mm length –40...**+80** °C

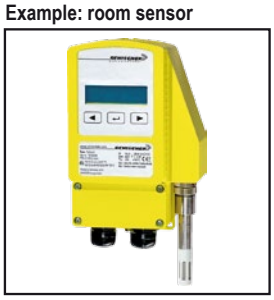
sensor length

Application

ExCos-D... transducer

ExPro-C... sensor

Example: room sensor



Example: duct sensor

ExCos-D...-CT

Description

The **ExCos-D...** transducer generation from together with direct coupled **ExPro-C... sensors** are 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 dimension, universal functions and technical data guarantee safe operation even under difficult environmental conditions.

The measuring ranges are scalable within the maxium ranges. The analogue output signal is either 0...10 VDC or (0)4...20 mA and can be selected on site. The integrated display is for actual value indication which can be switched off.

All sensors are programmable on site without any additional tools.

ExCos-D-A transducer are additionally equipped with a (0)4…20 mA IS (IS = intrinsically safe) output, e.g. for an external indicator.

Highlights transducer

- For all type of gas, mixtures, vapours and dust for use in zone 1, 2, 21 and 22
- No addional Ex-i module required
- No intrisically safe wiring / installation between panel and sensor required
- No intrisically safe wiring / installation and no space in the panel required
- Integrated Ex-e junction box
- Power supply 24 VAC/DC
- Display with backlight, can be switched off
- Scalable analogue output, selectable 0…10 V / (0)4…20 mA
- Compact design and small dimension (L × W × H = 180 × 107 × 66 mm)
- Robust aluminium housing in protection class IP66
- Down to –20°C ambient temperature applicable
- Password locking
- Optional IS-output (0)4…20 mA for external indicator in Ex-areas
- CT versions have an excellent resistance to chemicals and seawater

Highlights sensor

- For all type of gas, mixtures, vapours and dust for use in zone 1, 2, 21 and 22
- Plug-and-socket connection to ExCos-D... transducer, removable
- The ExPro-C... probe appropriates the function (temperature, humidity or combination)
- Mounting of ExPro-C... probe (front / back side) appropriates use for duct or room application

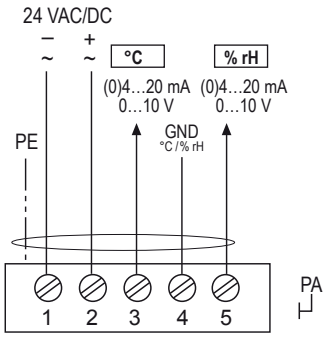
Technical data	ExCos-D...
Power supply	24 VAC/DC ± 20% (19,2 ... 28,8 VAC/DC) 50...60 Hz
Current, power consumption	150 mA, ~ 4 W, internal fuse 500 mAT, without bracket, not removable
Galvanic isolation	supply – analogue output 1,5 kV (Ex 60 V)
Electrical connection	terminals 0,14…2,5 mm² at integrated Ex-e junction box
Cable entry	M16 × 1,5 mm Ex-e approved, cable diameter ~ Ø 5...10 mm, (**...-CT** in nickel-plated)
Protection class	Class I (grounded)
Display	2 × 16 digits, dot-matrix with backlight, display for configuration, user guidance, parameter and actual value indication
Control elements	3 buttons for configuration
Housing protection	IP66 in acc. to IEC 60529
Housing material	aluminium casting, coated (**...-CT** = version in marine painting, seawater-resistant)
Dimensions / weight	L × W × H = 180 × 107 × 66 mm / ca. 950 g
Ambient temperature / -humidity	–20…+50 °C / 0…95 % rH, non condensed
Storage temperature	–40…+70°C
Sensor connection	**Only for ExPro-C... sensors!** via plug-and-socket connection at front or back side of the transducer, to appropriate the use for room or duct mounting. **Attention:** only one ExPro-C... probe can be connected to one transducer!
ExPro-C... sensors	please have a look on the separate data sheet for ExPro-C... sensors
Measuring range	measuring ranges are scalable within the maximum measuring range
Maintenance	maintenance free, nevertheless maintenance must be complied with regional standards, rules and regulations
Response time of sensor	T90 ~ 1 s
Accuracy temperature	± 0,2 % of end value + accuracy of ExPro-C... sensor ± 0,3 °C at 25 °C ± 0,025 °C/°C
Accuracy humidity	± 0,2 % of end value + accuracy of ExPro-C... sensor 10…90 % rH ± 2% and < 10 % rH and > 90 % rH ± 4% + 1% hysteresis
Non linearity and hysteresis	± 0,1 % of end value
Start delay	5 s
Stability	long term stability < 0,2 % / year, temperature influence < 0,02 % / K, supply voltage influence < 0,01 %
Output	voltage U (V) or current I (mA) selecable via menu on site (at combi sensors not separately adjustable)
Output protection	against short circuit and external voltage up to 24 V, protected against polarity reversal
Voltage output U	from 0...10 VDC adjustable, invertible, burden > 1 kΩ, influence < 0,05% / 100 Ω
Current output I	from 0...20 mA adjustable, invertible, burden < 500 Ω, influence < 0,1% / 100 Ω, open circuit voltage < 24 V
Output at alarm mode	increasing or decreasing output signal, selectable on site, down to 0 VDC/0 mA or up to 10 VDC/20 mA
Wiring diagram (SB)	SB 2.0
Delivery (changeable on site)	output 4…20 mA, output with decreasing alarm situation to 0 V / 0 mA
Included in delivery	ExCos-D... with 3 screws 4,2 × 13 mm self-tapping
Installation area transducer	in Ex-area zone 1, 2, 21, 22
Additional information for ExCos-D-A:	
Analogue output	(0)4…20 mA
Ex-i	Intrinsically Safe (IS)
Burden	max. 400 Ω
Accuracy	± 0,5 %
Plug	cable diameter Ø 6...8 mm
Delivery version ...-D-A	incl. 2 × plug

Explosion proof	ExCos-D...	
PTB-testet	PTB 07 ATEX 2061	
acc. to ATEX directive	94/9/EC (ATEX)	
Approval for gas	II2(1)G Ex e ma [ia] IIC T6	for zone 1, 2
Approval for dust	II2(1)D Ex tD A21 [iaD] IP66 T80°C	for zone 21, 22
Identification	CE No. 0158	
EMC	2004/108/EC EMC directive	
Electrical safety	2006/95/EC low voltage directive	
Protection type	IP66 in acc. to EN 60529	
Potential compensation	external PA-terminal, 4 mm²	

Accessories	
EXC-RIA-16	LCD indicator (IS), installation in Ex-areas zones 1, 2, 21, 22, connectable directly to ...Cos-... transducer
MKR	Mounting bracket for round ducts up to Ø 600 mm
MFK	Mounting flansh for probe positioning

ExCos-D... transducer require a 24 VAC/DC power supply. The supply has to be connected at terminal 1 (–/~) and 2 (+/~), the analogue output at terminal 3 (mA/V) and 4 (GND) for temperature, at terminal 5 (mA/V) and 4 (GND) for humidity. The electrical wiring must be realized via integrated Ex-e junction box in acc. to ATEX. Type of protection for the terminals is "Ex-e".
Attention! Before opening the junction box cover, the supply voltage must be shut off!
The optional analogue output at **ExCos-D-A** is intrinsically safe. Note the maximum connection values of intrinsically safe parameters (see table below).

ExCos-D... SB 2.0



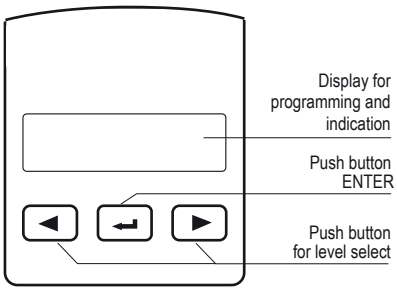
In acc. to the connected **ExPro-C... sensor** you get output signals at following terminal:

sensor	terminal	terminal
ExPro-CT...	3 - 4	
ExPro-CF...		4 - 5
ExPro-CTF...	3 - 4 und	4 - 5

It's either output mA or V adjustable.

Attention !
Humidity output below 0 °C no function

Display and Buttons



Change operation-/parametrisation mode

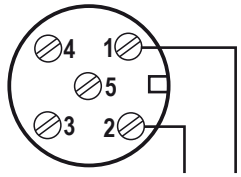
To change from operation to parametrisation mode and vice versa, push the enter button ↵ for minimum 3 seconds.

Indication of data logging

A blinking star in the display shows that data is received and the device is working.

Terminals SB 3.0

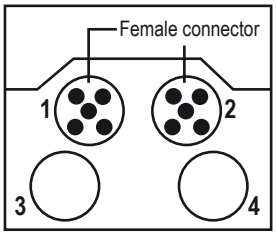
Male connector



to connect e.g.
an external LCD indicator

The ExPro-C... probe can be mounted to the front or the back side of the transducer. The protective cap must be removed. Unused connectors must be covered by a protective cap against mechanical damage and dirt.

Head side of ExCos-D-A sensor



Connector 1 for output of sensor 1 (°C)
Connector 2 for output of sensor 2 (%rH)

Values IS (optional)

Uo = 15,8 V
Io = 85 mA
Po = 336 mW
Ci = 0
Li = 0
Co(IIC) = 0,33 nF
Lo(IIC) = 2 mH

Important information for installation and operation

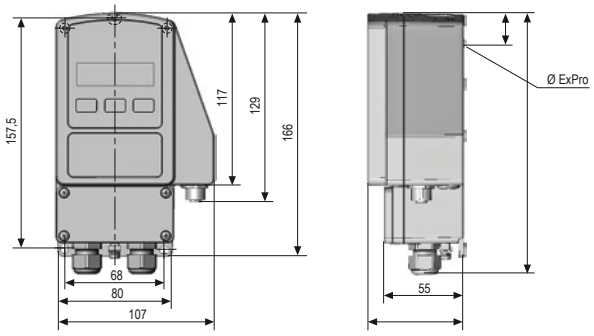
A. Installation, commissioning, maintenance
The cable has to be drawn through the cable gland. After electrical connection the cable gland must be fixed tighten. IP66 must be fulfilled.
In acc. with operation ExCos sensors are maintenance free. Nevertheless maintenance must comply with regional standards, rules and regulations.
The sensors must not be opened by the customer. For outdoor installation a protective housing against rain, snow and sun should be applied. For electrical connection use the internal approved Ex-e junction box.
Attention: Note the explosion proof rules before opening the internal junction box. Cut off the power supply.

B. ExPro-C... sensors
ExPro-C... sensors are supplied with an instrinsically safe circuit from the ExCos-D... transducer. Unused connectors must be covered by a protective cap.

C. Long cabling
For using long signal wires, shilded cables are recommended. The shield must be connected to the ExCos-D transducer inside the terminal box.

D. Separate ground wires
Use for supply and signal wires a separate ground.

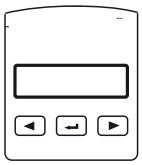
Dimensions / Drillings



Digital ExPro-C... sensor

Uo = 7,9 V
Io = 48 mA
Po = 95 mW
Ci = 0
Li = 0
Co(IIC) = 1,3 nF
Lo(IIC) = 2 mH

Preparation of parametrisation / operation



Operation ⇄ Parametrisation, push ↵ for 3 sec.
If password (PW) protection is active: put PW in, push ↵

↵

Menu	Function	Enter	Indication	Select	Enter	Next indication	Next selsction	Enter	Next menu
Menu 1	**DE, EN, FR** select language: German, English, French	↵	DE, EN, FR english deutsch, english, francais	◄ ►	↵				►
Menu 2	no function - menu skip								
Menu 3	no function - menu skip								
Menu 4	**unit sensor 1** select physical unit	↵	unit sensor 1 °C °C, °F	◄ ►	↵				►
Menu 5	**range 1** adjust the measuring range	↵	range 1 **0**..50 °C adjust lower limit	◄ ►	↵	range 1 0..**50 °C** adjust higher limit	◄ ►	↵	►
Menu 6	no function - menu skip								
Menu 7	**output V, mA** select output signal as VDC or mA	↵	output V/mA V mA, V	◄ ►	↵				►
Menu 8	**output range 1** adjust the output range	↵	output range 1 **0**..10V adjust lower limit	◄ ►	↵	output range 1 0..**10V** adjust higher limit	◄ ►	↵	►
Menu 9	**sensor error 1** select signal at sensor error	↵	sensor error 1 10V / 20 mA 10V / 20 mA or 0V / 0mA	◄ ►	↵				►
Menu 10	**output 1** ◿◺ select if signal output is increasing or decreasing	↵	output 1 ◿◺ increasing ◿◺ increasing, decreasing	◄ ►	↵				►
Menu 11	**unit sensor 2*** select physical unit	↵	unit sensor 2 %rH %rF, %rH	◄ ►	↵				►
Menu 12	**range 2*** adjust the measuring range	↵	range 2 **0**..100 %rH adjust lower limit	◄ ►	↵	range 2 0..**100 %rH** adjust higher limit	◄ ►	↵	►
Menu 13	**output range 2*** adjust the output range	↵	output range 2 **0**..10V adjust lower limit	◄ ►	↵	output range 2 0..**10V** adjust higher limit	◄ ►	↵	►
Menu 14	**sensor error 2*** select signal at sensor error	↵	sensor error 2 0V / 0 mA 10V / 20 mA or 0V / 0mA	◄ ►	↵				►
Menu 15	**output 2*** ◿◺ select if signal output is increasing or decreasing	↵	output 2 ◿◺ increasing ◿◺ increasing, decreasing	◄ ►	↵				►
Menu 16	**output Ex-i 1 (option, only at ExCos-D-A)** adjust 4...20 mA or 0...20 mA IS output signal	↵	output Exi 1 **4**..20 mA adjust lower limit	◄ ►	↵	output Exi 1 4..**20 mA** adjust higher limit	◄ ►	↵	►
Menu 17	**output Ex-i 2 (option, only at ExCos-D-A)*** adjust 4...20 mA or 0...20 mA IS output signal	↵	output Exi 2 **4**..20 mA adjust lower limit	◄ ►	↵	output Exi 2 4..**20 mA** adjust higher limit	◄ ►	↵	►
Menu 18	no function - menu skip								
Menu 19	**display function** select display on/off, illuminated or backlight off	↵	display function on illuminated on-illuminated, on, off	◄ ►	↵				►
Menu 20	**password** select password protection	↵	new password yes no	◄	↵	password 0000	◄ ►	↵	►
Menu 21	**save and exit** select save data / factory setting / discard or back to menu	↵	save and exit save data	◄ ►	↵				►
Menu 22	**Set offset 1** Add / subtract from measures value	↵	set offset 1 0.00°C	◄ ►	↵				►
Menu 23	**Set offset 2 *** Add / subtract from measures value	↵	sett offset.2 0.00%rH	◄ ►	↵				►

*only available if combination sensor type ExPro-CTF... is connected