



ExCos-P Pressure sensor from 20 Pa ... 7.500 Pa

Electrical, explosion proof pressure or differential pressure sensor
24 VAC/DC supply voltage, 0...10 V / (0)4...20 mA analogue output
PTB-certified in acc. with ATEX directive 94/9/EC for zone 1, 2, 21, 22.

ExCos - P- ...
ExCos - P- ... - A
ExCos - P- ... - CT
ExCos - P- ... - OCT

Subject to change!

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

Type	Sensor	Supply	Range	Min. range	max. Pressure	Output	Ex-i output	Wiring diagram
ExCos - P-100	Pressure-/Diff. press.	24 VAC/DC	± 100 Pa	20 Pa	25.000 Pa	(0)4...20 mA / 0...10 V	-	SB 1.0
ExCos - P-250	Pressure-/Diff. press.	24 VAC/DC	± 250 Pa	50 Pa	25.000 Pa	(0)4...20 mA / 0...10 V	-	SB 1.0
ExCos - P-500	Pressure-/Diff. press.	24 VAC/DC	± 500 Pa	100 Pa	50.000 Pa	(0)4...20 mA / 0...10 V	-	SB 1.0
ExCos - P-1250	Pressure-/Diff. press.	24 VAC/DC	± 1.250 Pa	250 Pa	50.000 Pa	(0)4...20 mA / 0...10 V	-	SB 1.0
ExCos - P-2500	Pressure-/Diff. press.	24 VAC/DC	± 2.500 Pa	500 Pa	50.000 Pa	(0)4...20 mA / 0...10 V	-	SB 1.0
ExCos - P-5000	Pressure-/Diff. press.	24 VAC/DC	± 5.000 Pa	1.000 Pa	75.000 Pa	(0)4...20 mA / 0...10 V	-	SB 1.0
ExCos - P-7500	Pressure-/Diff. press.	24 VAC/DC	± 7.500 Pa	1.500 Pa	120.000 Pa	(0)4...20 mA / 0...10 V	-	SB 1.0
ExCos - P- ... - A	as above, with additional intrinsically safe analogue output to connect an external digital indicator						(0)4...20 mA	SB 3.0
ExCos - P- ... - CT	as above, with Al housing and seawater resistant painting (sensor connection and cable glands nickel-plated, screws in stainless steel)							
ExCos - P- ... - OCT	as above, offshore version seawater-resistant, with aluminium housing and Amercoat painting (stainless steel tubes for clamping ring connection, cable glands M20 × 1,5 mm nickel-plated, screws in stainless steel)							

Application

Pressure or diff.pressure sensor

ExCos-...CT (Amercoat version)

ExCos-...OCT (Offshore version)

Accessory: external indicator Ex-i



Description

The **ExCos-P-...** pressure sensor generation from ±100 Pa to ±7.500 Pa (acc. to type) is a revolution for differential pressure measuring 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 maximum ranges. At ExCos-P-100 the smallest ΔP range is 20 Pa. 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-P-...-A sensors are additionally equipped with a (0)4...20 mA IS (IS = intrinsically safe) output, e.g. for an external indicator.

ExCos-P-...-OCT is equipped with stainless steel 316L tubing Ø 6 mm.

Highlights

- ▶ For all type of gas, mixtures, vapours and dust for use in zone 1, 2, 21 and 22
- ▶ 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
- ▶ 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 × B × 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
- ▶ OCT as CT version plus pressure tube connection for clamping ring Ø 6 mm



Technical data

Power supply	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 – analogue output 1,5 kV (Ex 60 V)
Electrical connection	terminals 0,14...2,5 mm ² at integrated Ex-e junction box, stripping length 9 mm, torque 0,4...0,5 Nm
Cable entry	2 \times M16 \times 1,5 mm Ex-e approved, cable diameter ~ \varnothing 5...10 mm (...-CT in nickel-plated)
Cable entry OCT	2 \times M20 \times 1,5 mm Ex-e approved, cable diameter ~ \varnothing 6...13 mm (...-OCT in nickel-plated)
Protection class	Class I (grounded)
Display	2 \times 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/...-OCT = version in Amercoat, marine painting, seawater-resistant ...-OCT = Offshore version)
Dimension / weight	L \times W \times H = 180 \times 107 \times 66 mm / ~ 950 g
Ambient temperature/-humidity	-20...+50 °C / 0...95 % rH, non condensed
Storage temperature	-40...+70 °C
Measuring range	\pm 100 Pa, \pm 250 Pa, \pm 500 Pa, \pm 1.250 Pa, \pm 2.500 Pa, \pm 5.000 Pa, \pm 7.500 Pa in acc. to type
Range scalable on site	minimum measuring range is 10 % of full range (e.g. 20 Pa at \pm 100 Pa sensor)
Maintenance	maintenance free, nevertheless maintenance must be complied with regional standards, rules and regulations
Sensor circuit	internal IS circuit
Sensor	Piezo-pressure-transmitter
Pressure connection	P+ / P- sleeves \varnothing 4...6 mm, OCT-version has a \varnothing 6 mm stainless steel tube connection for clamp ring fittings
Response time of sensor	T90 / 5 sec.
Accuracy of pressure	< \pm 1 % typically, max. 2 % of end value \pm 1 Pa
Non linearity and hysteresis	\pm 0,05 % typically, max. 0,25 % of end value
Start delay	5 sec.
Setting zero point	via menu, mechanical short circuit of P+ / P- for the moment of zero point setting
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) selectable via menu on site
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 k Ω , 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 1.0
Delivery (changeable on site)	min./max. pressure range limits (e.g. ExCos-P-100 = -100...+100 Pa), output 4...20 mA, output with decreasing alarm situation to 0 V/0 mA
Included in delivery	ExCos-P-... with 3 screws 4,2 \times 13 self-tapping and short circuit tube, ~ 140 mm length (by ExCos-P-...-OCT ~ 250 mm length)
Installation sensor / tubing	in Ex-area zone 1, 2, 21, 22

Additional information for ExCos-P-...-A:

Analogue output	(0)4...20 mA
Ex-i	Intrinsically safe (IS)
Burden	max. 400 Ω
Accuracy	\pm 0,5 %
Plug	cable diameter \varnothing 6...8 mm
Delivery ExCos-P-...-A	incl. 2 \times plug

Explosion proof

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
Low voltage	2006/95/EC
Protection type	IP66 in acc. to EN 60529
Potential compensation	external PA-terminal, 4 mm ²

Accessories

EXC-RIA-16	LCD indicator (IS), installation in Ex-areas zones 1, 2, 21, 22, connectable directly to ...Cos-... sensors
MKR	Mounting bracket for round ducts up to \varnothing 600 mm
Kit 2	consists of 2 m flexible pressure tube \varnothing 6 mm, 2 connection nipples
Kit PTC	consisting of 2 connecting tubes \varnothing 6 mm for tube fittings

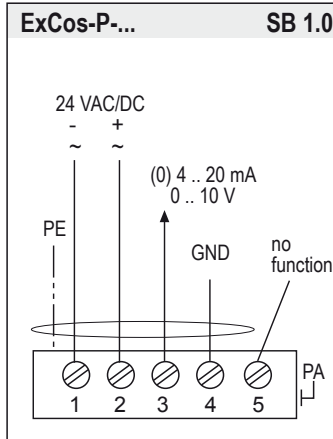


Electrical connection

ExCos-P-... sensors 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). 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-P-...-A is intrinsically safe. Note the maximum connection values of intrinsically safe parameters (see table below).

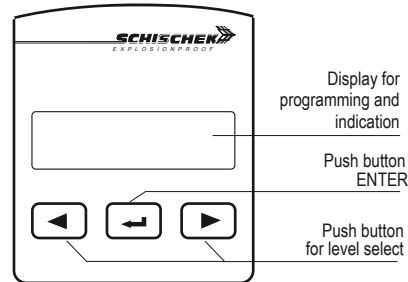
Wiring diagram



Zero point compensation for pressure transmitter

ExCos-P-... pressure sensor is equipped with a zero point compensation, to adjust the module to the installation position. The pressure nipples P+ / P- must be connected with a short circuit tube. To make compensation please follow the menu. In menu point 18 zero point compensation is done by push button. Before starting the zero point compensation, the device should be connected to the power supply for minimum of 15 minutes, to reach the working temperature!

Display and buttons



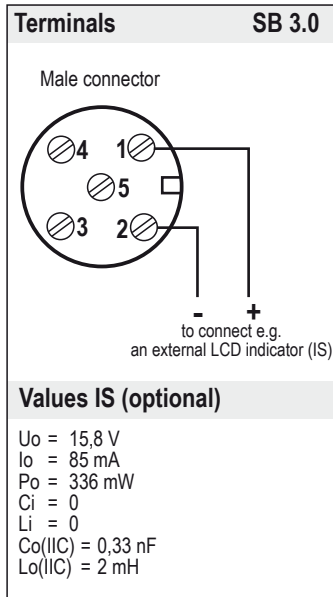
Change operation- / parametrisation mode

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

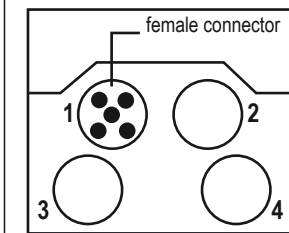
Indication of data logging

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

Wiring Ex-i (IS) output (optional) at ExCos-P-...-A



Head side of ExCos-P-...-A



Password input

The default/delivery setup is **0000**. In this configuration the password input is not activated. To activate a password, go to menu point 20, change the 4 digits into your chosen 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.

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. Pressure sensors

After mounting and installation, a zero point compensation must be done, because the offset value depends on the installation position. Have a look to parametrisation.

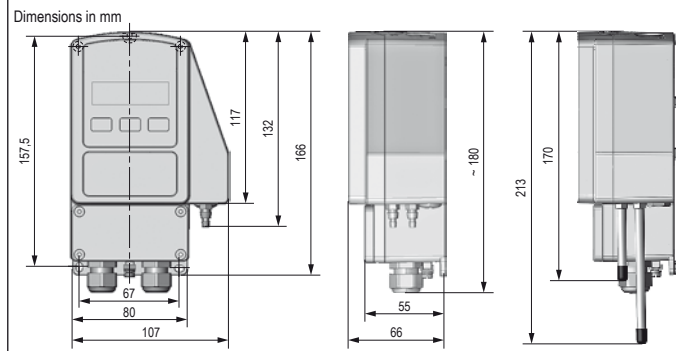
C. Long cabling

For using long signal wires, shielded cables are recommended. The shield must be connected to the ExCos-P sensor inside the terminal box.

D. Separate ground wires

Use for supply and signal wires a separate ground.

Dimensions/Drillings



Values intrinsically safe (IS) pressure sensor

Internal sensor values

U_o = 7,9 V
 I_o = 48 mA
 P_o = 95 mW
 C_i = 0
 L_i = 0

Internal sensor IS values are corresponding to the internal pressure sensor. Due to the matter of fact that there is no external sensor connected, these IS values are not relevant for the customer but shown for the sale of completeness.

C_o (IIC) = 1,3 nF
 L_o (IIC) = 2 mH



Parametrisation and commissioning of ExCos-P... transducers

Preparation of parametrisation/operation



Operation ↔ Parametrisation, push [↔] for 3 sec.
If password (PW) protection is active: put PW in, push [↔]

Change operation- / parametrisation mode

To change from operation to parametrisation mode push „Enter“ button [↔] for minimum 3 seconds. Back over the menu save and exit.

Example

Menu language English
Range -25...+25 Pa
Output 4...20 mA
Output Ex-i 4...20 mA

Table with 10 columns: Menu, Function, Enter, Indication, Select, Enter, Next indication, Next selection, Enter, Next menu. It lists 24 menu items for configuring the transducer, such as language selection, range adjustment, and output signal configuration.