

Data Sheet

# SCHISCHEK EXCOS-P

Pressure sensor 20 Pa ... 7.500 Pa



Supplied by

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

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

ExCos - P- ...  
ExCos - P- ... - A  
ExCos - ... - CT  
ExCos - ... - OCT  
ExCos - ... - VA  
ExCos - ... - OVA

Subject to change!

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

| Type            | Sensor   | Supply    | Range      | min. Setting | 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   | Types as above with additional intrinsically safe analogue output to connect an external digital indicator   |           |            |              |               |                         | (0)4...20 mA | SB 3.1         |
| ExCos-P-...-CT  | Types as above with aluminium housing and seawater resistant coating (cable glands M16 brass nickel-plated, screws in stainless steel)   |           |            |              |               |                         |              |                |
| ExCos-P-...-OCT | Types as above, offshore version with aluminium housing and seawater resistant coating (stainless steel tubes for clamping ring connection, cable glands M20 brass nickel-plated, screws in stainless steel) |           |            |              |               |                         |              |                |
| ExCos-P-...-VA  | Types as above with stainless steel housing for aggressive ambient (cable glands M20 brass nickel-plated, screws in stainless steel)   |           |            |              |               |                         |              |                |
| ExCos-P-...-OVA | Types as above, offshore version with stainless steel housing for aggressive ambient (tubes for clamping ring connection and screws in stainless steel, cable glands M20 brass nickel-plated)                |           |            |              |               |                         |              |                |

## Product views and applications

Pressure/Differential press.



...Cos-P...-CT



...Cos-P...-VA



Offshore ...-OCT



Offshore ...-OVA



## 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 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 measuring ranges are scalable within the maximum ranges. At ...Cos-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 parametrisation and an actual value indication at working mode (can be switched off as needed).

...Cos-P...-A sensors are equipped with an additional intrinsically safe (IS) output, e.g. for an external indicator.

...Cos-P...-OCT and ...-OVA offshore versions are equipped with stainless steel tubing Ø 6 mm.

## 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 analogue output, selectable 0...10 V / (0)4...20 mA
- ▶ Integrated Ex-e 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 IS-output (0)4...20 mA for external indicator in Ex-areas
- ▶ 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
- ▶ Offshore versions with pressure tube connection for clamping ring Ø 6 mm



### Technical data

|                              |   |
|------------------------------|---|
| 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 analogue in- and outputs min. 1,5 kV, supply for relay output min. 1,5 kV  |
| Electrical connection        | Terminals 0,14...2,5 mm <sup>2</sup> at integrated Ex-e terminal box, stripping length 9 mm, torque 0,4...0,5 Nm, equipotential bonding 4 mm <sup>2</sup>   |
| Cable glands                 | 2 x M16 x 1,5 mm, Ex-e approved, for cable diameter ~ $\varnothing$ 5...9 mm  |
| Cable glands ...-CT          | 2 x M16 x 1,5 mm, Ex-e approved, brass nickel-plated, for cable diameter ~ $\varnothing$ 6...10 mm  |
| ...-VA, ...-OCT, ...-OVA     | 2 x M20 x 1,5 mm, Ex-e approved, brass nickel-plated, for cable diameter ~ $\varnothing$ 6...13 mm  |
| Protection class             | Class I (grounded)  |
| Display                      | 2 x 16 digits, dot-matrix display, backlight, for configuration, user guidance, parameter and actual value indication   |
| Control elements             | 3 buttons for configuration   |
| Housing material             | Aluminium die casting, coated. Optional with seawater resistant coating (...-CT/...-OCT) or stainless steel V4A / AISI 316 Cd / DIN EN 1.4581 (...-VA/...-OVA)  |
| 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<br>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 circuit               | Internal intrinsically safe (IS) circuit  |
| Sensor                       | Piezo pressure transmitter  |
| Pressure connection          | P+ / P- sleeves $\varnothing$ 4...6 mm. OCT versions have 2 stainless steel (316L) tube connections for clamp ring fittings $\varnothing$ 6 mm  |
| 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<br>Minimum measuring range is 20 % of full range (e.g. 20 Pa at $\pm 100$ Pa sensor) |
| Response time of sensor      | T90 / 5 s   |
| Accuracy of pressure         | < $\pm 1\%$ typically, max. $\pm 2\%$ of end value $\pm 1$ Pa   |
| Non linearity and hysteresis | $\pm 0,05\%$ typically, max. 0,25 % of end value  |
| Start delay                  | 5 s   |
| Setting zero point           | Via menu. Short-circuit mechanically both tube connectors 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 on site via menu, protected against short circuit and external voltage up to 24 V and against polarity reversal   |
| Voltage output U             | 0...10 VDC adjustable, invertible, burden > 1 k $\Omega$ , influence < 0,05 %/100 $\Omega$  |
| Current output I             | 0...20 mA adjustable, invertible, burden < 500 $\Omega$ , influence < 0,1 %/100 $\Omega$ , open circuit voltage < 24 V  |
| Output in 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 1.0  |
| Scope of delivery            | Sensor, 3 self-tapping screws 4,2 x 13 mm resp. in stainless steel (with ...CT and ...VA versions), short circuit tube<br>Cos-P...-A with 1 additional plug for cable $\varnothing$ 6...8 mm                  |
| Parameter at delivery        | min./max. pressure range limits (e.g. ExCos-P-100 = -100...+100 Pa), output 4...20 mA, output in alarm mode decreasing to 0 V/0 mA  |
| ...Cos-P...-A                | as above and 1 additional intrinsically safe analogue output  |
| Ex-i analogue output         | (0)4...20 mA, intrinsically safe (IS), burden max. 400 $\Omega$   |
| Accuracy                     | $\pm 0,5\%$   |
| Wiring diagram               | SB 3.1  |

### Approbations

|                      |   |
|----------------------|---|
| ATEX directive       | 94/9/EC   |
| EC type-approved     | EPS 14 ATEX 1 655 X   |
| IECEX certified      | IECEX EPS 14.0022X  |
| Approval for gas     | II 2 (1) G Ex e ma [ja Ga] IIC T6...T4 Gb<br>Types ...-CT, ...-OCT II 2 (1) G Ex e ma [ja Ga] IIB T6 Gb |
| Approval for dust    | II 2 (1) D Ex tb [ja 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            |
| ...-OCT         | Offshore version in aluminium housing with seawater resistant coating, parts nickel-plated |
| ...-VA          | Types in stainless steel housing, parts nickel-plated                                      |
| ...-OVA         | Offshore version in stainless steel housing, parts nickel-plated                           |
| EXC-RIA-16      | LCD indicator (IS) for Ex-/RedCos... sensors in Ex-zones 1, 2, 21, 22                      |
| MKR             | Mounting bracket for round ducts up to $\varnothing$ 600 mm                                |
| Kit 2           | Flexible pressure tube, 2 m, inner $\varnothing$ 6 mm, 2 connection nipples                |
| Kit-S8-CBR      | 2 cable glands M16 x 1,5 mm, Ex-e, brass nickel-plated, for cable $\varnothing$ 5...10 mm  |
| Kit-Offs-GL-CBR | 2 cable glands M20 x 1,5 mm, Ex-d, Ms-Ni, for armoured cables                              |
| Kit-PTC-CBR     | 2 connecting tubes for tube fittings $\varnothing$ 6 mm, stainless steel 316 L             |

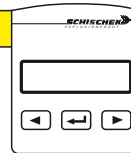




### Parametrisation and commissioning

To change from operation to parametrisation mode push the "ENTER" button (↵) for minimum 3 seconds.  
If password protected: type password and push (↵).  
Back over to menu "Save" and exit.

Operation → Parametrisation  
push (↵) for min. 3 s



**Example:** Menu language English  
Range -25...+25 Pa  
Output 4...20 mA  
Output Ex-i 0...20 mA

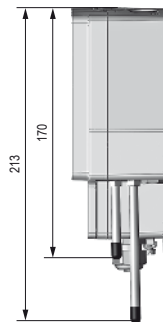
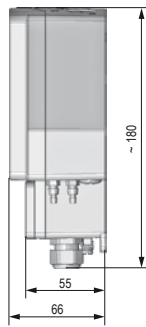
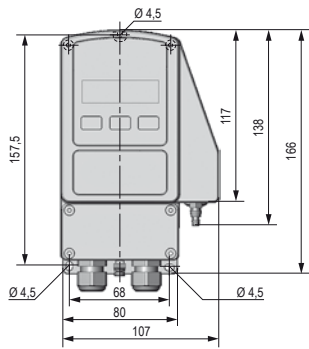
| Menu    | Function  | ENTER | Indication                         | Select  | ENTER | Next indication           | Select  | ENTER | Next menu |
|---------|---|-------|------------------------------------|---------|-------|---------------------------|---------|-------|-----------|
| Menu 1  | <b>DE, EN, FR</b><br>Select language: German, English, French   | (↵)   | DE, EN, FR<br>English              | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 2  | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 3  | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 4  | <b>Unit sensor</b><br>Select physical unit  | (↵)   | unit sensor<br>Pa                  | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 5  | <b>Range</b><br>Adjust the measuring range  | (↵)   | range<br>-25...100 Pa              | (←) (→) | (↵)   | range<br>-25...25 Pa      | (←) (→) | (↵)   | (→)       |
| Menu 6  | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 7  | <b>Output V, mA</b><br>Select output signal as V or mA  |       | output V/mA<br>mA                  | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 8  | <b>Output range</b><br>Adjust output range  |       | output range<br>4...20 mA          | (←) (→) | (↵)   | output range<br>4...20 mA | (←) (→) | (↵)   | (→)       |
| Menu 9  | <b>Sensor error</b><br>Select signal at sensor error  |       | sensor error<br>10 V/20 mA         | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 10 | <b>Output ↙↘</b><br>Select signal output behaviour  |       | output ↙↘<br>increasing            | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 11 | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 12 | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 13 | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 14 | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 15 | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 16 | <b>Output Ex-i (option, only at ...Cos-P...-A)</b><br>Select lower output signal: 0 mA resp. 4 mA (0...20 or 4...20 mA)   | (↵)   | output Ex-i<br>0...20 mA           | (←) (→) | (↵)   | output Ex-i<br>0...20 mA  | (←) (→) | (↵)   | (→)       |
| Menu 17 | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 18 | <b>Zero point compensation</b><br>After short circuit the pressure nipples P+/P- the sensor gets a zero point calibration |       | set zero point<br>yes no           | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 19 | <b>Display function</b><br>Select display settings  | (↵)   | display function<br>on illuminated | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 20 | <b>Password</b><br>Select password protection   | (↵)   | new password<br>yes no             | (←) (→) | (↵)   | password<br>0000          | (←) (→) | (↵)   | (→)       |
| Menu 21 | <b>Save and exit</b><br>Select: save data, factory setting, discard or back to menu                                       | (↵)   | save and exit<br>save data         | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 22 | <b>Set offset</b><br>Add/subtract offset from measure value   | (↵)   | set offset<br>0.00 Pa              | (←) (→) | (↵)   |                           |         |       | (→)       |
| Menu 23 | no function – menu skip   |       |                                    |         |       |                           |         |       |           |
| Menu 24 | <b>Attenuation</b><br>Damping the output signal (signal filter)   | (↵)   | attenuation<br>0                   | (←) (→) | (↵)   |                           |         |       | (→)       |



**Dimensions [mm]**

Aluminium housing

...Cos-P...-OCT



Stainless steel housing

...Cos-P...-OVA

