Technical manual BA 0410

Pressure

Precont S

Pressure transmitter

for continuous measuring and surveillance of pressures
in gases, vapors, liquids and dusts

Pressure ranges 0...0,1 bar to 0...1000 bar / -0,1...0/+0,1 bar / -1...0/+1 bar

Ceramic or metallic membrane with various process connections

Suitable for wide process temperature range from – 40 °C to +370 °C

Various usability, especially for hygienic applications

ATEX II 1/2 G Ex ia IIC T4 resp. ATEX II 1/2 D Ex iaD 20/21 T60°C/T102°C
Certification for the use in explosion hazardous areas

Excellent accuracy up to ≤ 0,1%

Programmable evaluation electronic with high brightness LED-display

- in 2-wire-technology with current signal 4...20 mA or
- in 3-wire-technology with voltage signal 0...10 V
- with two PNP switching outputs

ACS-CONTROL-SYSTEM
know how mit system

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Application description

The devices of the series **Precont S** with integrated digital evaluation electronic are compact pressure transmitter for continuous measuring and surveillance of pressures from –1 up to 1000 bar within gases, vapors, liquids and dusts within closed container or pipelines, also in explosive hazardous areas, at process temperatures from – 40°C to +370°C.

The use of a capacitive measuring sensor with ceramic membrane or of a strain gauge with metallic membrane, by use of various, also front flush process connections resp. process diaphragm seals, allows the use in nearly all fields of industry, especially also in hygienic applications.

Function

The device is used for pressure measurement.

Characteristics of the ceramic measuring membrane – Precont S10 / S40 / S60 / S70

The system pressure is applied to the ceramic membrane and causes there a variation of the capacity at the back side of the membrane.
A pressure transmitting liquid is not used.

The ceramic membrane offers excellent characteristics like highest pressure and pressure blow strength up to forty times the nominal pressure, vacuum resistance, very high resistance against chemicals, corrosion and abrasion as well as very good insensitiveness against temperature shocks, highest accuracy and reproducibility, good long term stability and a very low temperature influence.

Characteristics of the metallic measuring membrane – Precont S20 / S30 / S70

The system pressure is applied to the metallic membrane and causes there a deflection of the strain gauge at the back side of the membrane.
A pressure transmitting liquid is only used at pressure ranges lower than 0...25 bar.

The metallic membrane offers excellent characteristics like high pressure and pressure blow strength up to six times the nominal pressure, vacuum resistance, good reproducibility and hysteresis and also good long term stability and a low temperature influence.

Characteristics of the process diaphragm seal – Precont S60 / S70

The system pressure is applied to the metallic membrane of the process diaphragm seal and is transmitted by a pressure transmitting liquid to the respective ceramic or metallic measuring membrane that is placed behind. This leads among others to a extension of the permissible medium temperature up to +370°C and to an essential increase of the temperature stability of the device.

Signal processing

The pressure dependent variation of capacity resp. the variation of the strain gauge output voltage is recorded in high resolution by a processor, adjusted acc. to the settings and converted in high resolution into an output signal of 4...20mA or 0...10V.

According to the resp. settings the PNP switching outputs are driven.
The switching state of the two PNP switching output are indicated by each an LED.

By 3 keys and the four digit LED display all settings for the display, the analogue output as well as the PNP switching outputs can be set resp. adjusted.
A transmitter fast adjustment per key combinations is also possible.

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Variant differences

	Precont S10	Precont S20	Precont S30	Precont S40	Precont S60	Precont S70
Measuring range limits	-1 bar to 60 bar	-1 bar to 1000 bar	-1 bar to 25 bar	-1 bar to 60 bar	-1 bar to 60 bar	-1 bar to 400 bar
Hygienic applications			X	X	X	
Use in explosion hazardous areas – ATEX	X	X	X	X	X	X
Process diaphragm seal					X	X
Process temperature -40...+100°C	X	X		X		
Process temperature -40...+125°C Temperature decoupler	X	X		X		
Process temperature -20...+150°C			X			
Process temperature -10...+100°C -10...+200°C					X	
Process temperature -10...+100°C -10...+200°C -20...+275°C -40...+370°C						X
Ceramic membrane with accuracy ≤ 0,1% / ≤ 0,2% FS [2)]	X			X	X	X
Metallic membrane with accuracy ≤ 0,5% FS [2)]		X	X			X

2) Referring to nominal measuring span resp. full scale (FS)

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Available pressure ranges – permissible overload resp. burst pressure

	S10	S20	S30	S40	S60	S70	
ceramic membrane	X			X	X	X	
metallic membrane		X	X				X
pressure range	**burst pressure in bar**	**overload / burst pressure in bar**	**overload / burst pressure in bar**	**burst pressure in bar**	**burst pressure in bar**	**burst pressure in bar**	**overload / burst pressure in bar**
-0,1...0 bar	4	n. a.[1)]	n. a.[1)]	4	4	4	n. a.[1)]
-0,1...+0,1 bar	6	n. a.[1)]	n. a.[1)]	6	6	6	n. a.[1)]
-1...0 bar	10	5 / 6	5 / 6	10	10	10	n. a.[1)]
-1...+1 bar	18	12 / 12	10 / 12	18	18	18	n. a.[1)]
0...0,1 bar	4	n. a.[1)]	1 / 2	4	4	4	n. a.[1)]
0...0,2 bar	6	n. a.[1)]	n. a.[1)]	6	6	6	n. a.[1)]
0...0,25 bar	n. a.[1)]	n. a.[1)]	1,5 / 2	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]
0...0,4 bar	6	2 / 2,4	2 / 2,4	6	6	6	n. a.[1)]
0...0,6 bar	10	4 / 4,8	4 / 4,8	10	10	10	n. a.[1)]
0…1 bar	10	5 / 6	5 / 6	10	10	10	n. a.[1)]
0…1,6 bar	18	n. a.[1)]	n. a.[1)]	18	18	18	n. a.[1)]
0…2,5 bar	25	n. a.[1)]	10 / 12	25	25	25	n. a.[1)]
0…4 bar	25	17 /20,5	17 /20,5	25	25	25	n. a.[1)]
0…6 bar	40	35 / 42	35 / 42	40	40	40	n. a.[1)]
0…10 bar	40	35 / 42	35 / 42	40	40	40	n. a.[1)]
0…16 bar	40	35 / 42	80 / 96	40	40	40	n. a.[1)]
0…20 bar	40	n. a.[1)]	n. a.[1)]	40	40	40	n. a.[1)]
0…25 bar	n. a.[1)]	80 / 96	80 / 96	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]
0…40 bar	60	80 / 400	n. a.[1)]	60	60	60	n. a.[1)]
0…60 bar	105	80 / 400	n. a.[1)]	105	105	105	n. a.[1)]
0…100 bar	n. a.[1)]	200/800	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	200/800
0…160 bar	n. a.[1)]	200/800	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	200/800
0…250 bar	n. a.[1)]	200/800	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	200/800
0…320 bar	n. a.[1)]	200/800	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	200/800
0…400 bar	n. a.[1)]	800 / 1700 [11)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	800 / 1700 [11)]
0…600 bar	n. a.[1)]	1200 / 2400 [11)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]
0…1000 bar	n. a.[1)]	1500 / 3000	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]	n. a.[1)]

[1)] Not available (n. a.)

[11)] At front flush metallic membrane: The value in the table is only valid at sealing with ring gasket below the hexagon. Otherwise the value of max. 1500 bar is valid.

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Safety notes

Each person that is engaged with inauguration and operation of this device, must have read and understood this technical manual and especially the safety notes.

Installation, electrical connection, inauguration and operation of the device must be made by a qualified employee according to the informations in this technical manual and the relevant standards and rules.

The device may only be used within the permitted operation limits that are listed in this technical manual. Every use besides these limits as agreed can lead to serious dangers.

The materials of the device must be chosen resp. checked for suitability to the respective application requirements (contacting substances, process temperature). An unsuitable material can lead to damage, abnormal behavior or destruction of the device and to the resulting dangers.

The device may not used as sole device for prevention of dangerous conditions in machines and plants.

This device meets article 3 (3) of the EC directive 97/23/EC (pressure equipment device directive) and is designed and produced in good engineer practice.

The device meets the legal requirements of all relevant EC directives. CE **0158**

Safety notes for electrical operating supplies for explosive hazardous areas

If a device is installed and operated in explosive hazardous areas, the general Ex construction standards (EN/IEC 60079-14, EN/IEC 61241-14, VDE 0165), this safety notes and the enclosed EC conformity certificate incl. supplements must be observed.
The installation of explosive hazardous systems must be carried out principally by specialist staff.

The device meets the classification	$T_{a\ Medium}$	$T_{a\ Housing}$
II 1/2 G Ex ia IIC T4	**-20... +60 °C**	**-20…+85 °C**
II 1/2 D Ex iaD 20/21 T60°C / T102°C (T57°C)	**-20... +60 °C**	**-20…+85 °C (+40 °C)**
II 2 G Ex ib IIC T4	**-20…+85 °C**	**-20…+85 °C**
II 2 D Ex ibD 21 T102°C	**-20…+85 °C**	**-20…+85 °C**
II 2 G Ex ib IIC T4	**-20…+125 °C**	**-20…+50 °C**
II 2 D Ex ibD 21 T125°C	**-20…+125 °C**	**-20…+50 °C**

The highest surface temperature is determined inside the housing at complete fill up, that means thermal isolation. The power at the sensor is negligible.

The devices are conceived for measuring of pressures in explosive hazardous areas.
The measured medium may also be combustible gases, vapors, liquids and dusts.

The permitted operating temperatures and pressures are type and variant dependent and can be found in this technical manual.

For applications, which require devices of category 1/2 or category 1, the process pressure and temperature range of the medium has to be between 0,8 bar and 1,1 bar and between -20 °C and 60 °C.

The permissible maximum values for U_i, I_i and P_i are equal for variants A/B/C/D/E/F/G/H. To this there must be paid especially attention in the case of combining more intrinsically safe circuits at the variants with voltage output 0...10V (variants E/F/G/H) and at the variants with PNP switching outputs (variants A/E). The rules for combination of intrinsically safe circuits must be applied.

The PA terminal inside the connection housing resp. the process connection must be connected to the potential compensation of the explosive hazardous area.

At variants of the devices with chargeable plastic parts (e.g. cable resp. connection housing), a warning marking points out to the safety measures, that must be applied because of the electrostatic charging in operation and especially in the case of maintenance activities.
avoid friction - no dry cleaning - no assembling in pneumatic conveying stream

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Installation

The installation of the device at a position, where high pressure pulses can occur, should be avoided.
Adjustment and function control can be made easier, if the device is mounted behind a stop fitting.

The installation of the device should be made if possible at temperature calmed places to get a reliable measuring result. Large temperature steps, e.g. at filling of a hot liquid into a cold system, can produce a short-time higher measuring signal deviation at the variant with ceramic measuring membrane. At a large amplification of the measuring signal this deviation will be also amplified accordingly. The deviation will be completely neutralized after the adaptation of the measuring membrane of the pressure transmitter to the temperature.
At a step from +20°C ...+80°C this neutralization can wile up to 3 minutes.
The use of a process diaphragm seal can cause an essential improvement.

The installation position has influence on the measuring result of the kind of a zero value shift because of the deadweight of the measuring membrane and a possible pressure transmitting liquid. This deviation can be eliminated by an offset adjustment. Zero and end value must be shifted by the same amount.

Drive the system pressure free prior installation resp. deinstallation of the sensor.

The tightening of the process connection with screw-in thread may only be done at the hexagon by a suitable spanner.
The maximum permitted torque strength is 50 Nm.
The screw in of the process connection by using the connection housing is not permitted.

The housing can be rotated every time, also at operation, by 330°.

Avoid the pollution of the pressure compensation vent. The hindrance of the pressure compensation can lead to faulty measuring results.

The correct function of the device within the specific technical data can only be guaranteed, if the permitted temperature in the area of the connection housing (see technical data) will not be exceeded.
This can be achieved by the using of the temperature decoupler, a process diaphragm seal (variants S60 resp. S70) or also by isolation of the medium carrying part of the plant or by other constructive measures to reduce the transferring of an extreme temperature to the connection housing.

A process diaphragm seal (variants S60 resp. S70) together with the measuring transmitter forms a closed, calibrated system, that is filled by openings in the process diaphragm seal and in the measuring system of the measuring transmitter. These openings are sealed and may not be opened.

Maintenance

The device is free of maintenance.

Special substances can lead to solid coatings on the membrane.
Such depositions can lead to faulty measurement results of the device.
In the case of coat forming liquids the membrane must be regularly cleaned e.g. with clear water.
Don't use sharp tools or aggressive chemicals for cleaning.

Repair

A repair may only be carried out by the manufacturer.

If the device must be sent back for repair, the following informations must be enclosed:

- An exact description of the application.
- The chemical and physical characteristics of the product.
- A short description of the occurred error.

Before returning the device for repair, the following measures must be proceeded:

- All stick product residues must be removed. This is especially important, if the product is unhealthily, e.g. caustic, toxic, carcinogenic, radioactive etc.
- A returning must be refrained, if it is not possible by 100% to remove the unhealthily product completely, because e.g. it is penetrate into cracks or is diffused through plastic.

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Electrical connection

The electrical connection of the device must be carried out according to the respective country specific standards. Incorrect installation or adjustment could cause applicationally conditioned risks.

Use only twisted shielded signal and measurement wires and install these wires separated from power leading wires. Connect the cable shield only at one side to earth, ideally at the installation place of the device. The metallic parts of the device with connection housing plug - type S resp. cable - type K are electrically connected with the earthing connection screw. At the variant with connection housing terminal box – type A all metallic parts are connected with terminal 1 - PE/shield.
The device must be grounded, e.g. by the earth terminal screw or by the process connection.

At the housing variant with terminal box, the terminals for wire cross-section from 0,5...2,5mm^2, for the connection of a cable are placed below the electronic module. This is plugged and can be pushed easily. After the connection of the cable, the module must be correctly inserted again.
The cable gland is suitable für cable diameter from 4,5 to 10 mm.
After the installation of the cable the cable gland must be firmly screwed to ensure the tightness of the connection housing. The same is valid for the screw cap of the housing.

The voltage applied to the terminal contacts may not exceed 45 V to avoid damage of the electronic. All connections are polarity protected.

The minimum resp. maximum supply voltage depends on the respective variant:

Variant	not Ex	Ex
type A/B/E/F/G/H	14,5...45V DC	14,5...30V DC
type C/D	10,5...45V DC	10,5...30V DC

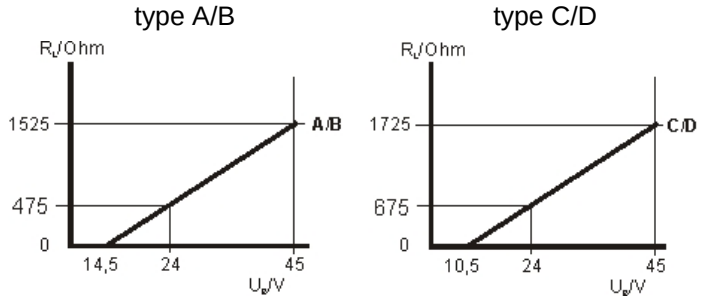
A load, e.g. the measuring shunt of an evaluation device, in series with a sensor of the variant A/B/C/D with 4...20 mA current signal in 2-wire-technology reduces the supply voltage available at the sensor. Dependent on version resp. minimum supply voltage, it results in a maximum value for this resistor, where a correct function is still possible.

The maximum load at signal current 20mA can be calculated by the equation:

$$R_L \text{ max} = (V_{S\ act.} - V_{S\ min}) / 20\text{mA}$$

with $V_{S\ act.}$ = applying supply voltage and $V_{S\ min}$ = minimum supply voltage.

The following graph shows the characteristics for the resistor values at 24 V and 45 V.



Inductive loads at the pnp switching outputs, e.g. relays or contactors may only be used with a free-wheeling diode or a RC protection circuit to avoid high voltage peaks.

The load at the PNP switching output will be connected to the terminal +terminal of the supply voltage by a semiconductor switch contactless and by this bounce-free. At an activated switching state a positive signal near supply voltage is feed to the output.
At deactivated switching state and at failure of supply voltage the semiconductor switch is shut off.
The PNP switching output is current limited to 0,2...0,25 A and is overload and short circuit protected.

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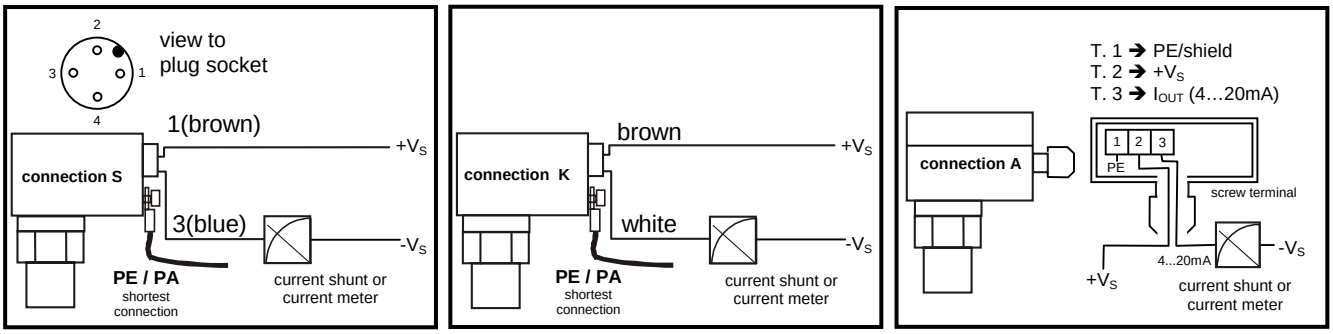
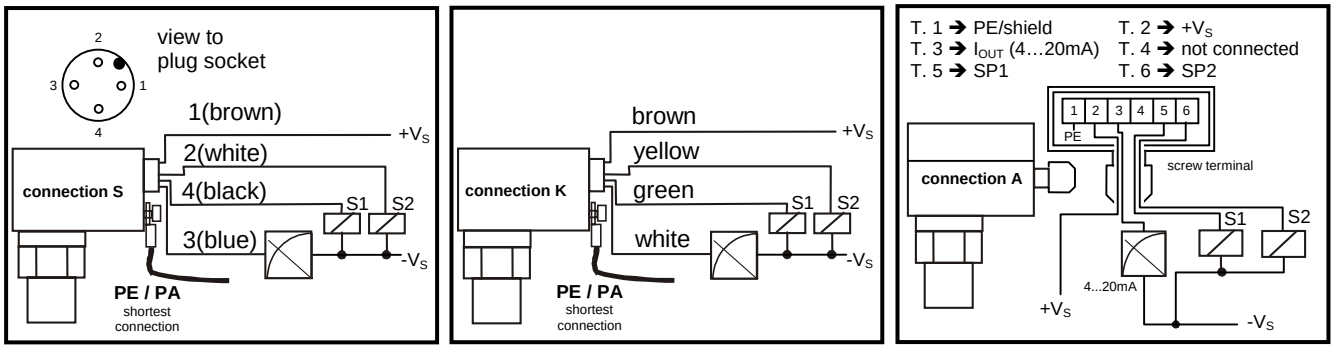
Assignment

connection type S plug M12x1	connection type K cable	connection type A terminal box

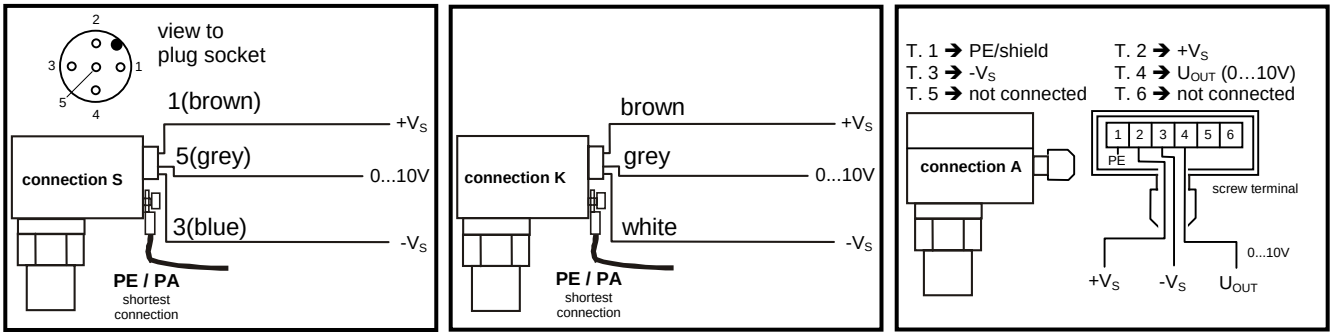
2 – wire – technology / signal 4...20 mA — variant B/C/D



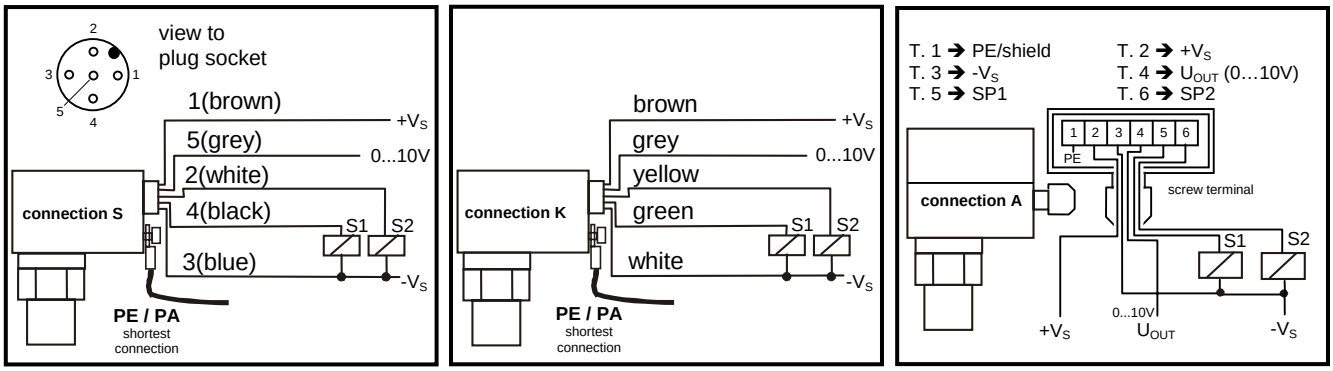
2 – wire – technology / signal 4...20 mA / 2x PNP switching output — variant A



3 – wire – technology / signal 0...10 V — variant F/G/H



3 – wire – technology / signal 0...10 V / 2x PNP switching output — variant E



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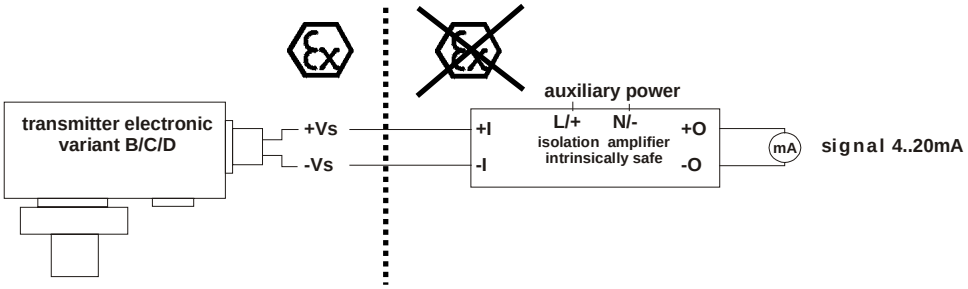
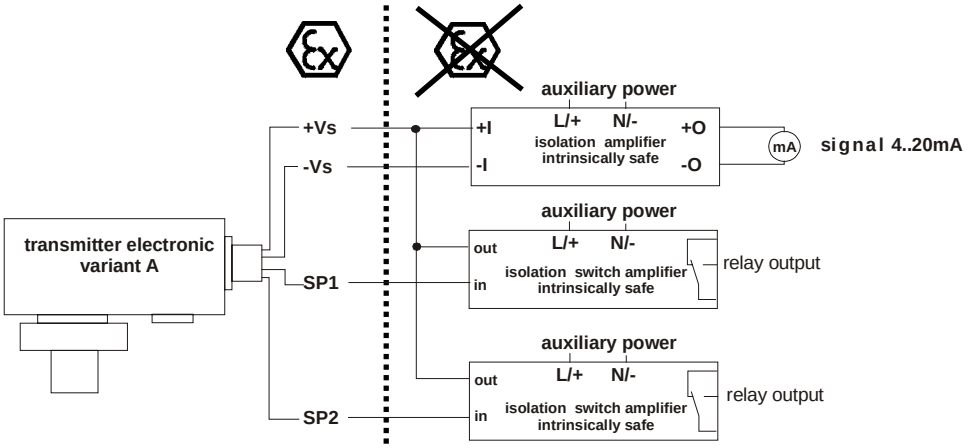
Electrical connection in an explosion hazardous area

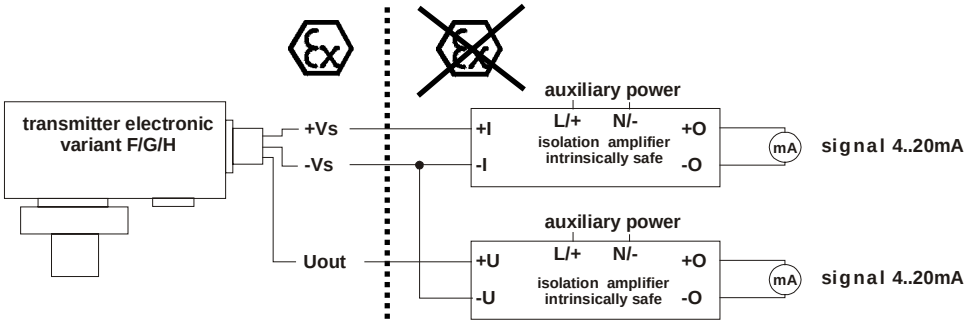
2 – wire – technology / signal 4...20 mA — variant B/C/D



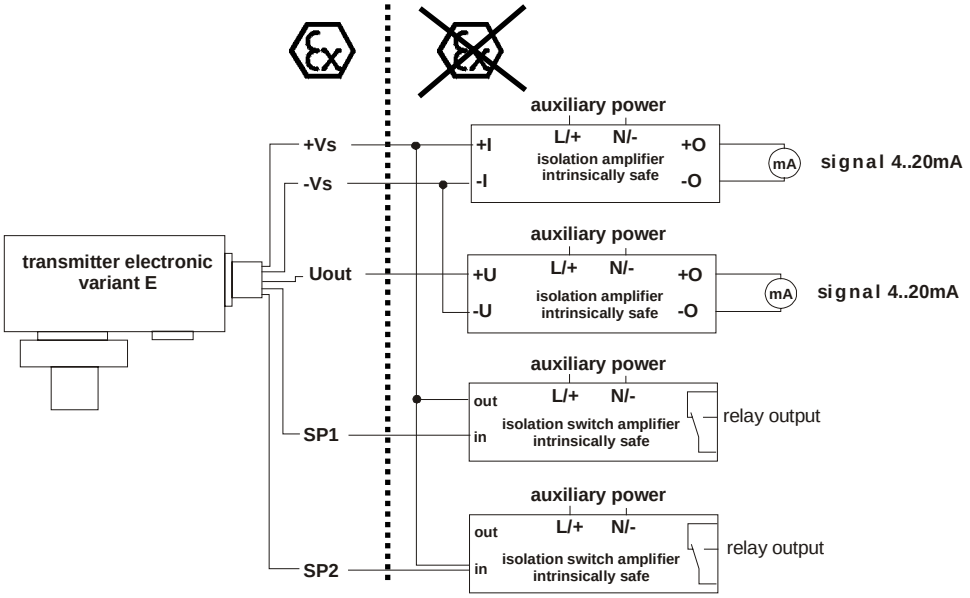
2 – wire – technology / signal 4...20 mA / 2x PNP switching output — variant A



3 – wire – technology / signal 0...10 V — variant F/G/H



3 – wire – technology / signal 0...10 V / 2x PNP switching output — variant E



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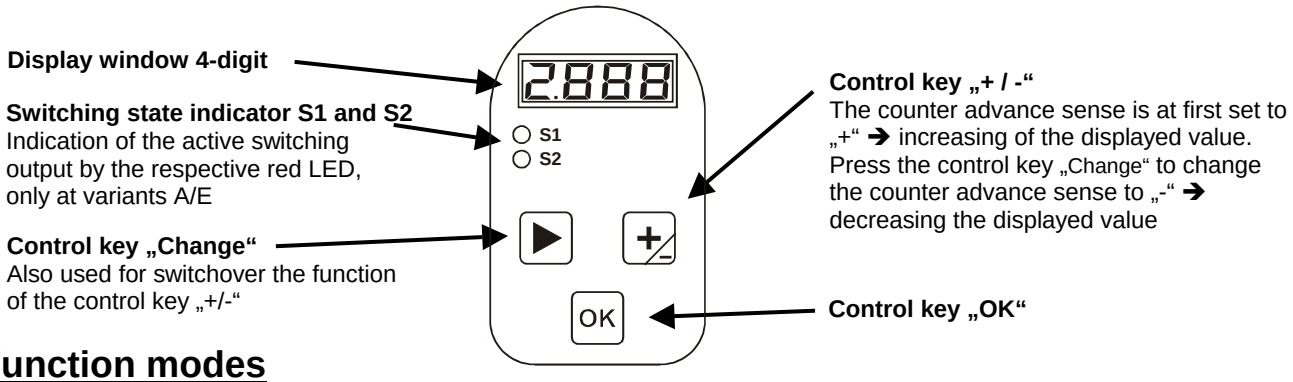
Operation and display elements



Function modes

run mode

The pressure transmitter records the applied system pressure and proceeds the chosen functions according to the set parameter. The measuring value is displayed in the display window.

The analogue output and the switching outputs are driven. A switched-on switching output is signaled by the come on of the respective red switching condition light-emitting diode.

The exceeding of the frame specifications, abnormal behavior conditions or also device malfunctions are displayed by the display values EEEE resp. -EEE.

By pushing the control key „+ / -“ the software version will be displayed

Programming mode

To access to the adjustment menu push the control key „OK“ and enter the **password 3009**.

Fast adjustment mode

By pushing of key combinations in the run mode the transmitter can be operated without using the adjustment menu.

Zero value adjustment with applied pressure signal:
Short pushing the key's „Change“ and „OK“ in succession and hold approx. 6 seconds.
The output signal 4mA / 0V is generated that can be varied by „+ / -“ resp. „Change“ and „+ / -“.
By pushing the key „OK“, the current pressure value is captured as lower pressure reference value, assigned to the previously adjusted output signal and the changed settings are stored loss protected (duration approx. 3 s).
A jump back to the run mode is carried out.

End value adjustment with applied pressure signal:
Short pushing the key's „+ / -“ and „OK“ in succession and hold approx. 6 seconds.
The output signal 20mA / 10V is generated that can be varied by „+ / -“ resp. „Change“ and „+ / -“.
By pushing the key „OK“, the current pressure value is captured as upper pressure reference value, assigned to the previously adjusted output signal and the changed settings are stored loss protected (duration approx. 3 s).
A jump back to the run mode is carried out.

Damping adjustment:
Short pushing the key's „Change“ and „+ / - “ in succession and hold approx. 6 seconds.
The damping value can now be varied. This value can be varied arbitrary by „+ / -“ resp. „Change“ and „+ / -“ from 0,3 to 30 seconds in 100 steps of each 0,3 seconds (variants C / G in 10 steps of each 3 seconds).
By pushing the key „OK“, the value is captured and stored loss protected (duration approx. 3 s).
A jump back to the run mode is carried out.

Reset to factory values:
At devices of variants C / G, a reset to factory values will be carried out by pushing the key „OK“ for approx. 5 seconds at a restart after removing the supply voltage. All customer specific adjustment values will be lost.

Attention:
If the lower pressure reference value (zero) is adjusted higher than the upper pressure reference value (span), the output signal falls **below** 3,8mA resp. to 0V. The display shows EEEE as long as the key „OK“ is pushed.
A readjustment has to be done correctly (zero < span).

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Function description

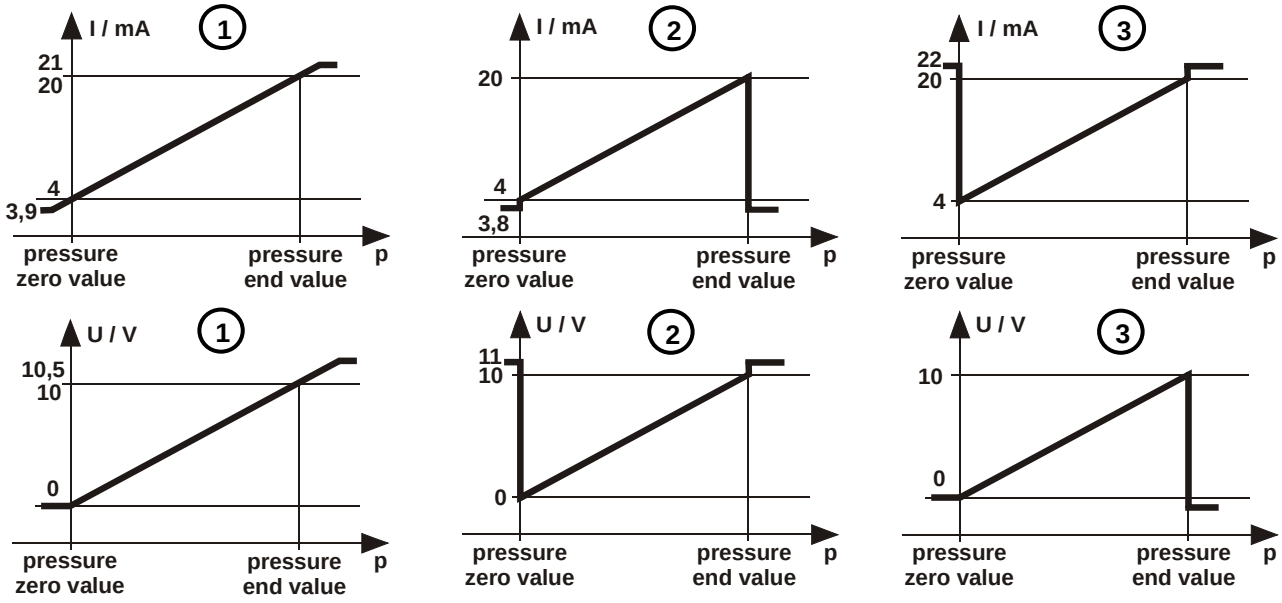
Analogue output

The pressure signal is transmitted to the analogue output, in which the adjusted pressure zero value equals an output current of 4 mA resp. an output voltage of 0 V and the adjusted pressure end value equals an output current of 20 mA resp. an output voltage of 10 V.

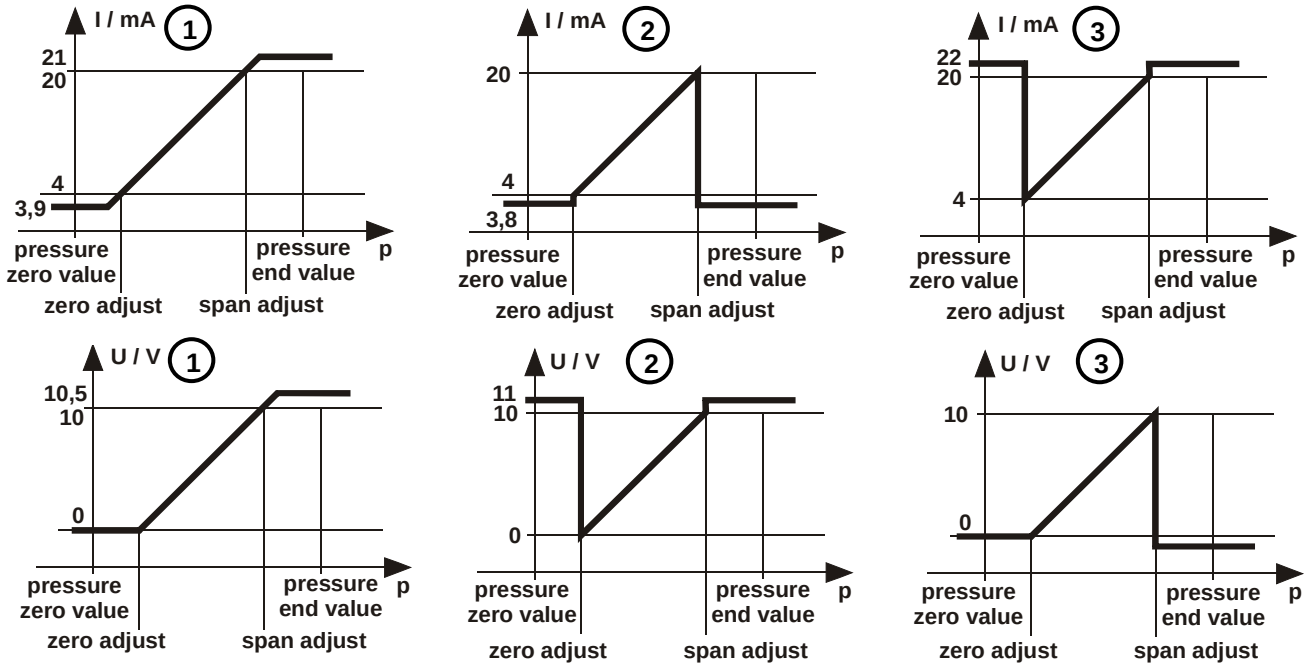
At an adjustment by *Zero resp. Span,* the pressure zero value resp. the pressure end value and thus the zero value (4 mA / 0 V) resp. the end value (20 mA / 10 V) of the analogue output can be shifted.

The output signal behaves depending on the set mode in three different possibilities:

1. Linear signal transmission in the range from 3,9 mA to 21 mA resp. 0 V to 10,5 V.
   The limit values are kept at exceeding or underrun.
2. Linear signal transmission in the range from 4 mA to 20 mA resp. 0 V to 10 V. At exceeding or underrun of these limit values a jump to 3,8 mA resp. 0 V is proceeded for an error evaluation.
3. Linear signal transmission in the range from 4 mA to 20 mA resp. 0 V to 10 V. At exceeding or underrun of these limit values a jump to 22 mA resp. 11 V is proceeded for an error evaluation.



At an adjustment by *Zero – with signal resp. Span – with signal,* in addition to the shift of pressure zero value resp. the pressure end value, there can be arbitrarily shift the zero value (4 mA / 0 V) resp. the end value (20 mA / 10 V) of the analogue output in the range from 3,9 to 21 mA resp. 0...10,5 V.
Doing this an inverting of the analogue output signal is not possible.



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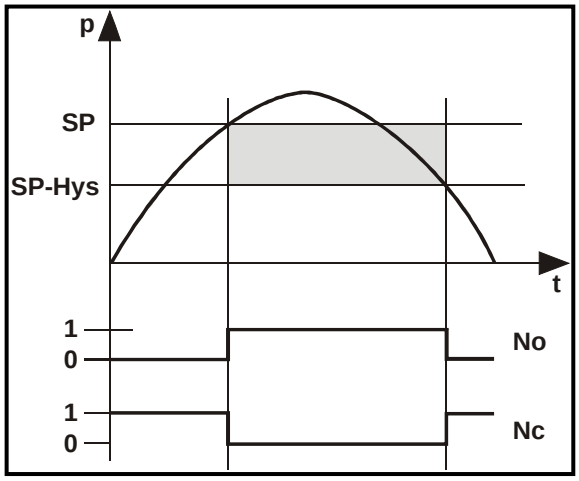
PNP – switching output

The switching function realizes a stable switching condition, independent from system conditioned pressure fluctuations around the adjusted set point.
It can also be used for realizing a pressure controlled two-position control.



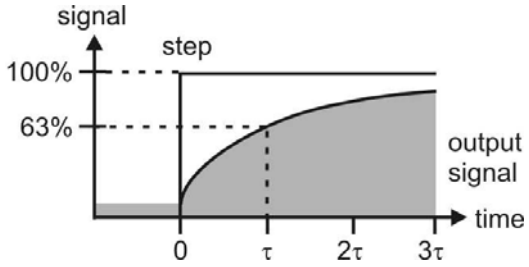
The switching range is determined separately by the switch point – SP – and hysteresis – HYS – for the respective switching output.
For the switch point as well as for the hysteresis an arbitrary value referring to the display scaling can be input.
The switch back point result from switch point deducting hysteresis, as equation SP – Hys.
There is no default minimum value for hysteresis, that means the distance between switch resp. switch back point.

The working principle can be set separately for each switching output to:
open-circuit principle resp. no normally open or to closed-circuit principle resp. nc normally closed

The switching output S1 can be also used for error indication function alternatively to the limit value function. Doing this a switching action happens, if the output signal becomes higher than 20mA/10V resp. lower than 4mA/0V.

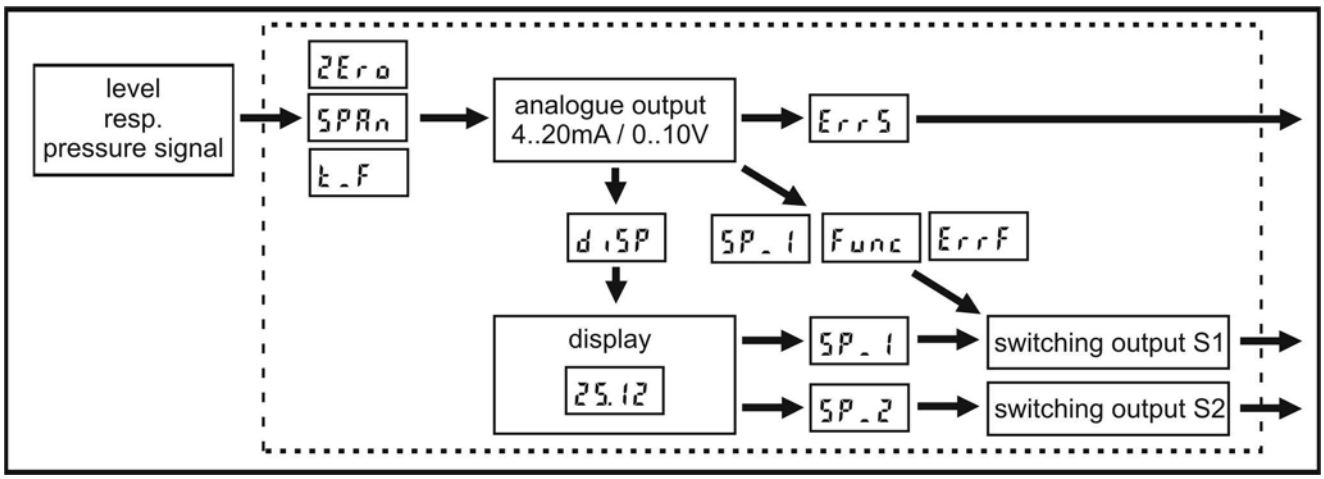
Damping

The damping influences the reaction speed of display, output signal and switching output at a change of the pressure.
The behaviour of display and output signal follows an exponential characteristic with the damping time constant τ.
Within the time period τ the output signal increases respectively by 63% of the existing deviation.
With 99,3%, the end value is nearly achieved after 5 τ.



At the variants A / B / E / F the damping can be adjusted from 0,3...30 seconds in 100 steps from 1...100, whereby one step equals 0,3 seconds.
The set time (value x 0,3 seconds) equals 5 τ.
At the variants type C and G the damping can be adjusted from 0,3...30 seconds in 100 steps from 0...10, whereby one step equals 3 seconds.
The set time (value x 3 seconds) equals 5 τ.

Function scheme



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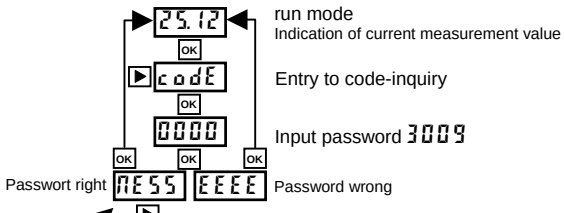
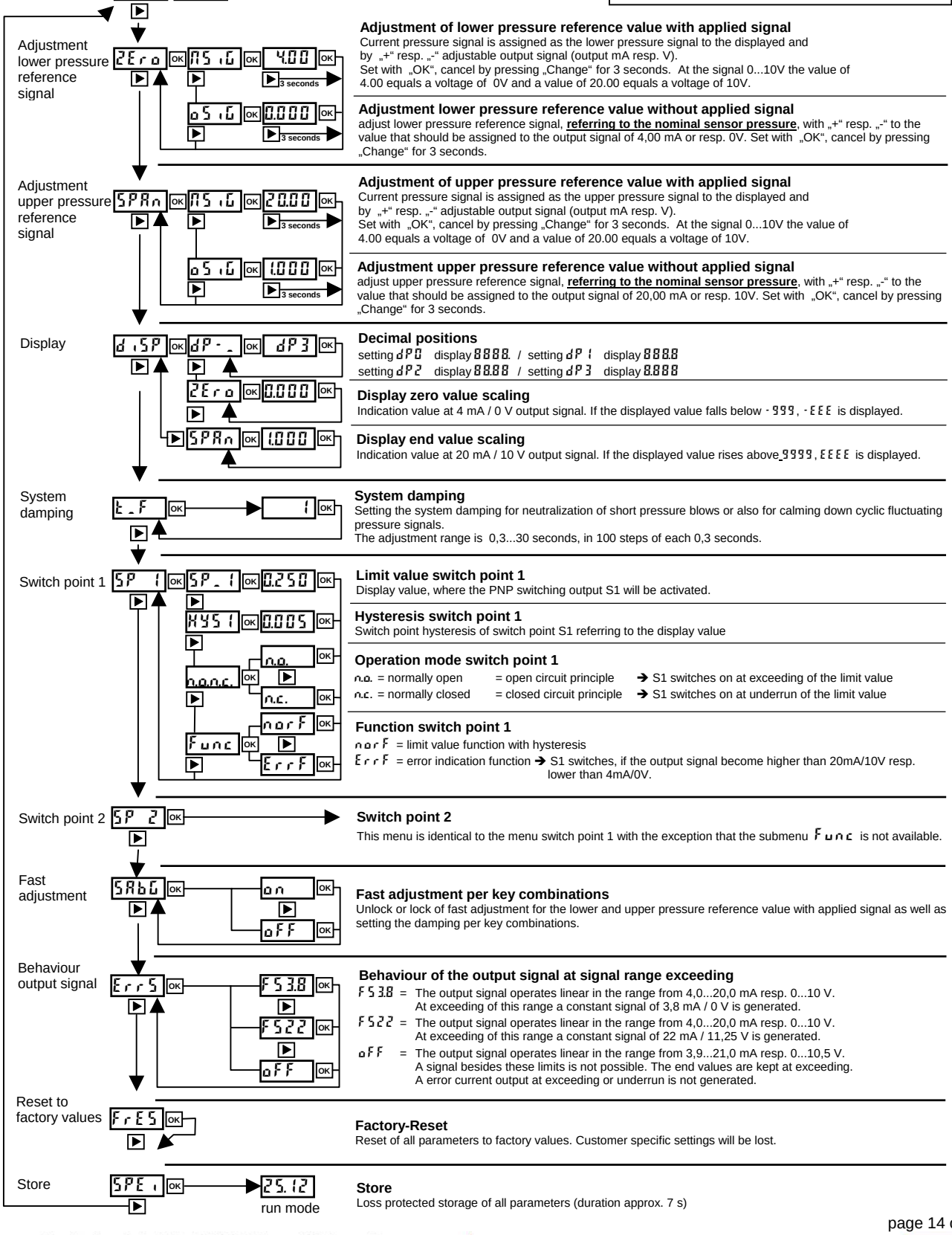
Adjustment menu – password 3009



OK	Enter the respective submenu and capturing the set values
▶	Jump from menu to menu / changing the direction of the „+/-„ key / changing between the different possibilities in selection menu
+/-	Change the indicated values. The longer the key will be pressed, the faster the value will increase or decrease. Function direction (higher or lower) can be changed by the key „Change“. Pressing this key in the run mode will display the software version



Adjustment of lower pressure reference value with applied signal
Current pressure signal is assigned as the lower pressure signal to the displayed and by „+“ resp. „-“ adjustable output signal (output mA resp. V).
Set with „OK“, cancel by pressing „Change“ for 3 seconds. At the signal 0...10V the value of 4.00 equals a voltage of 0V and a value of 20.00 equals a voltage of 10V.

Adjustment lower pressure reference value without applied signal
adjust lower pressure reference signal, **referring to the nominal sensor pressure**, with „+“ resp. „-“ to the value that should be assigned to the output signal of 4,00 mA or resp. 0V. Set with „OK“, cancel by pressing „Change“ for 3 seconds.

Adjustment of upper pressure reference value with applied signal
Current pressure signal is assigned as the upper pressure signal to the displayed and by „+“ resp. „-“ adjustable output signal (output mA resp. V).
Set with „OK“, cancel by pressing „Change“ for 3 seconds. At the signal 0...10V the value of 4.00 equals a voltage of 0V and a value of 20.00 equals a voltage of 10V.

Adjustment upper pressure reference value without applied signal
adjust upper pressure reference signal, **referring to the nominal sensor pressure**, with „+“ resp. „-“ to the value that should be assigned to the output signal of 20,00 mA or resp. 10V. Set with „OK“, cancel by pressing „Change“ for 3 seconds.

Decimal positions
setting dP0 display 8888. / setting dP1 display 888.8
setting dP2 display 88.88 / setting dP3 display 8.888

Display zero value scaling
Indication value at 4 mA / 0 V output signal. If the displayed value falls below -999, -EEE is displayed.

Display end value scaling
Indication value at 20 mA / 10 V output signal. If the displayed value rises above 9999, EEEE is displayed.

System damping
Setting the system damping for neutralization of short pressure blows or also for calming down cyclic fluctuating pressure signals.
The adjustment range is 0,3...30 seconds, in 100 steps of each 0,3 seconds.

Limit value switch point 1
Display value, where the PNP switching output S1 will be activated.

Hysteresis switch point 1
Switch point hysteresis of switch point S1 referring to the display value

Operation mode switch point 1
n.o. = normally open = open circuit principle ➔ S1 switches on at exceeding of the limit value
n.c. = normally closed = closed circuit principle ➔ S1 switches on at underrun of the limit value

Function switch point 1
norF = limit value function with hysteresis
ErrF = error indication function ➔ S1 switches, if the output signal become higher than 20mA/10V resp. lower than 4mA/0V.

Switch point 2
This menu is identical to the menu switch point 1 with the exception that the submenu Func is not available.

Fast adjustment per key combinations
Unlock or lock of fast adjustment for the lower and upper pressure reference value with applied signal as well as setting the damping per key combinations.

Behaviour of the output signal at signal range exceeding
FS3.8 = The output signal operates linear in the range from 4,0...20,0 mA resp. 0...10 V. At exceeding of this range a constant signal of 3,8 mA / 0 V is generated.
FS22 = The output signal operates linear in the range from 4,0...20,0 mA resp. 0...10 V. At exceeding of this range a constant signal of 22 mA / 11,25 V is generated.
oFF = The output signal operates linear in the range from 3,9...21,0 mA resp. 0...10,5 V. A signal besides these limits is not possible. The end values are kept at exceeding. A error current output at exceeding or underrun is not generated.

Factory-Reset
Reset of all parameters to factory values. Customer specific settings will be lost.

Store
Loss protected storage of all parameters (duration approx. 7 s)

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Technical data

Auxiliary supply

Permitted supply voltage:	reverse polarity protected			
	Variant A/B/E/F/G/H	14,5...45 V DC	Ex	14,5...30 V DC
	Variant C/D	10,5...45 V DC	Ex	10,5...30 V DC
Ripple voltage:	≤ 2 V_{PP}	condition:	within the permitted supply voltage range	
Supply current:	2-wire 4...20 mA	≤ 22 mA	PNP switching outputs no load	
	3-wire 0...10 V	≤ 10 mA	PNP switching outputs no load	

Analogue output 4...20 mA

Signal range:	linear characteristic from 3,9 mA resp. 21 mA, error 3,8 mA / 22 mA inverted output characteristic 20...4 mA only possible by manufacturer	
Permitted load:	R_L max = ($V_{S\ act.}$ - $V_{S\ min}$) / 20mA	$V_{S\ min}$ = 10,5 / 12,5 / 14,5 / 16,5 V
Resolution:	≤ 1 µA	
Minimum delay time:	≤ 310 ms (typ. 260 ms)	at set system damping 1
Influence of supply voltage:	≤ ±0,02% FS [2] / 10V	

Analogue output 0...10 V

Signal range:	linear characteristic from ≤ 0,07...10,5 V, error ≤ 0,07 V / 11,25 V inverted output characteristic 10...0 V only possible by manufacturer	
Permitted load:	R_L ≥ 2000 Ω, equals 5 mA at signal 10 V, current limited	
Resolution:	≤ 0,5 mV	
Minimum delay time:	≤ 310 ms (typ. 260 ms)	at set system damping 1
Influence of supply voltage:	≤ ±0,02% FS [2] / 10V	

PNP switching output

Function:	PNP switching to +Vs	
Output voltage:	V_{OUT} ≥ +Vs – 2 V	
Output current:	≤ 250 mA, min. 200 mA	current limited, short circuit protected
Rise up time:	≤ 700 µs	output load ≤ 3000 Ω resp. ≥ 4,5 mA
Delay time:	≤ 330 ms (typ. 280 ms)	at set system damping 1
Switching cycles:	≥ 100.000.000	

[2] Referring to nominal measuring span resp. full scale (FS)

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Measuring accuracy

Characteristic deviation [3) 5) 6) 12)]:	Membrane ceramic	≤ ±0,1% / 0,2% FS [2)]
	Membrane metallic	≤ ±0,5% FS [2)]
	Membrane metallic	≤ ±1,0% FS [2)] at pressure range 0..0,1 / 0,25 bar
Nonlinearity [6) 12)]:	Membrane ceramic	≤ ±0,1% / 0,2% FS [2)]
	Membrane metallic	≤ ±0,3% FS [2)]
	Membrane metallic	≤ ±0,6% FS [2)] at pressure range 0..0,1 / 0,25 bar
Hysteresis [6) 12)]:	Membrane ceramic	negligible
	Membrane metallic	≤ ±0,1% FS [2)]
Long term drift [6) 12)]:	Membrane ceramic	≤ ±0,1% FS [2)] / year not cumulative
	Membrane metallic	≤ ±0,15% FS [2)] / year not cumulative
Temperature deviation [6) 12)]:	Membrane ceramic (*-20..80°C)*	T_k [4)] Zero ≤ ±0,10% FS [2)] / 10 K max. ≤ ±0,75 % FS [2)] (-20...+80°C) T_k [4)] Span ≤ ±0,10% FS [2)] / 10 K max. ≤ ±0,5 % FS [2)] (-20...+80°C) max. ≤ ±0,8 % FS [2)] (-20...+80°C) ≤ 0..0,4 bar besides -20...+80°C with factor 2 for T_k
	Membrane metallic (*≥ 40 bar / -40..+100°C)*	T_k [4)] Zero ≤ ±0,20% FS [2)] / 10 K T_k [4)] Span ≤ ±0,20% FS [2)] / 10 K max. ≤ ±1,0 % FS [2)] (-20...+80°C) besides -40...+100°C with factor 2 for T_k
	Membrane metallic (*≤ 25 bar / 0..80°C)*	T_k [4)] Zero ≤ ±0,20% FS [2)] / 10 K Range 0..0,4 bar ≤ ±0,25% FS [2)] / 10 K Range 0..0,25 bar ≤ ±0,4% FS [2)] / 10 K Range 0..0,1 bar ≤ ±1,0% FS [2)] / 10 K T_k [4)] Span ≤ ±0,20% FS [2)] / 10 K besides 0...+80°C with factor 2 for T_k

Precont S60 / S70
A change in temperature produces a change of the volume of the pressure transmitting liquid and thus results in an additional zero value shift, whose amount depends on the style of the process diaphragm seal. The influence of the temperature can be minimized by a process diaphragm seal with a wider membrane diameter.

Mounting position

Maximum deviation [10)]:	*Precont S10/S40*	≤ 0,18 mbar
	Precont S20 / S30	Process connection G ¼“ / G ½“ ≤ 4 mbar
		Process connection G 1“ ≤ 10 mbar

Precont S60 / S70
At versions with process diaphragm seal the deadweight of the membrane and of the pressure transmitting liquid produces an additional zero value shift, whose amount depends on the style of the process diaphragm seal.

2) Referring to nominal measuring span resp. full scale (FS)
3) Nonlinearity + Hysteresis + Reproducibility
4) T_k = Temperature coefficient
5) Limit value adjustment
6) Specification valid, if adjusted measuring range = nominal measuring range, i.e. for TD [7)] = 1
At TD [7)] ≥ 1 (adjusted measuring range ≤ nominal measuring range):
Specification at adjusted measuring range = specification at nominal measuring range x TD [7)]
7) Turn-Down TD = nominal measuring range (FS [2)]) / adjusted measuring range)
10) Device rotated by 180°, process connection upside.
12) Higher values for special measuring range

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Materials

Membrane: (medium contact)	Precont S10 / S40		Ceramic AL_2O_3 96% resp. 99,9%
	Precont S20 *front flush*		Steel 1.4571 (AISI 316Ti)
		≥ 40 bar	Steel 1.4571 (AISI 316Ti)
		< 40 bar	Steel 1.4542 (AISI 630) / 1.4534
	Precont S30		Steel 1.4435 (AISI 316L)
	Precont S60 / S70		Steel 1.4404 (AISI 316L)
Process connection: (medium contact)	Precont S10 / S40		Steel 1.4404 (AISI 316L) / Steel 1.4571 (AISI 316Ti)
	Precont S20		Steel 1.4571 (AISI 316Ti)
	Precont S30		Steel 1.4435 (AISI 316L)
	Precont S60 / S70		Steel 1.4404 / 1.4435 (AISI 316L)
Temperature decoupler:	CrNi-steel		
Connection housing:	CrNi-steel / PBT polybutyleneterephthalat / PP – polypropylene / POM – polyoxymethylene (Delrin®)		
Display window:	PC – polycarbonate (Makrolon®)		
Device plug M12x1:	Socket CrNi-steel, insert PUR, contacts gold-plated		
Connection cable:	PE – polyethylene		
Cable gland:	Housing PA – polyamide, gasket CR / NBR		
Pressure compens. element:	Housing PA – polyamide, membrane ePTFE		
Membrane keyboard:	PES – polyester		
Gaskets:	medium contact	➔	FPM – fluorelastomere (Viton®) EPDM – etylene-propylene-dienmonomere CR – chloroprene-rubber (Neopren®) FFKM – perfluorelastomere (Kalrez®) NBR – nitril-butadien-rubber
	others	➔	FPM – fluorelastomere (Viton®) Silicone

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Environmental conditions

Environmental temperature: – 40°C...+85°C, limitation at Ex variants

additional limitations by material	Environmental temperature range
Connection housing PBT	-25...+85°C
Connection housing PP	-10...+85°C
Connection cable PE	-40...+70°C

Process temperatures: – 40°C...+100°C, limitation at Ex variants

Limitations by variant	Process temperature range
Temperature decoupler at S10 / S40	-40...+125°C
Precont S30	-20...+150°C
Precont S60 / S70	-10...+100°C
Temperature decoupler B at S60 / S70	-10...+200°C
Temperature decoupler C at S70	-20...+275°C
Capillary tube at S70	-40...+370°C
additional limitations by material	**Process temperature range**
Gasket FPM	-25...+140°C
Gasket EPDM	-40...+130°C
Gasket CR	-40...+120°C
Gasket FFKM	-25...+140°C
Gasket NBR	-30...+110°C

Process pressure ranges: depends on variant, maximum – 1 bar ...1000 bar

Overload / burst strength: depends on measuring range, see table overload pressure / burst pressure

Vacuum strength: 0 $mbar_{abs}$

Ceramic membrane –0,1...0 bar resp. 0...0,1 bar ➔ 700$mbar_{abs}$
(at S40 process connection 8 / R ➔ 0 $mbar_{abs}$)

Ceramic membrane –0,1...+0,1 bar resp. 0...0,2 bar ➔ 500$mbar_{abs}$
(at S40 process connection 8 / R ➔ 0$mbar_{abs}$)

Pressure transmitting liquid:

Precont S20	Synthetic oil	ranges ≤ 0...25 bar
Precont S30	Synthetic oil	FDA listed
Precont S60	Vegetable oil	food applications
Precont S70	Food oil / Silicone oil / high temperature oil	

Weight: depends on variant

Torque strength:	≤ 50 Nm	at process connections with screw-in thread	
Protection classification:	IP67	EN/IEC 60592	IP65 at Ex variant
Climatic classification:	4K4H	EN/IEC 60721-3	
Vibration classification	4 g	5 - 100 Hz	
EM – compatibility:	emission	EN/IEC 61326-1	operation device class B
	immunity	EN/IEC 61326-1	industrial range
Reference conditions:	EN/IEC 60770-1	T = 15...35 °C, relative humidity 45...75 %, environmental air pressure 860...1060 kPa	

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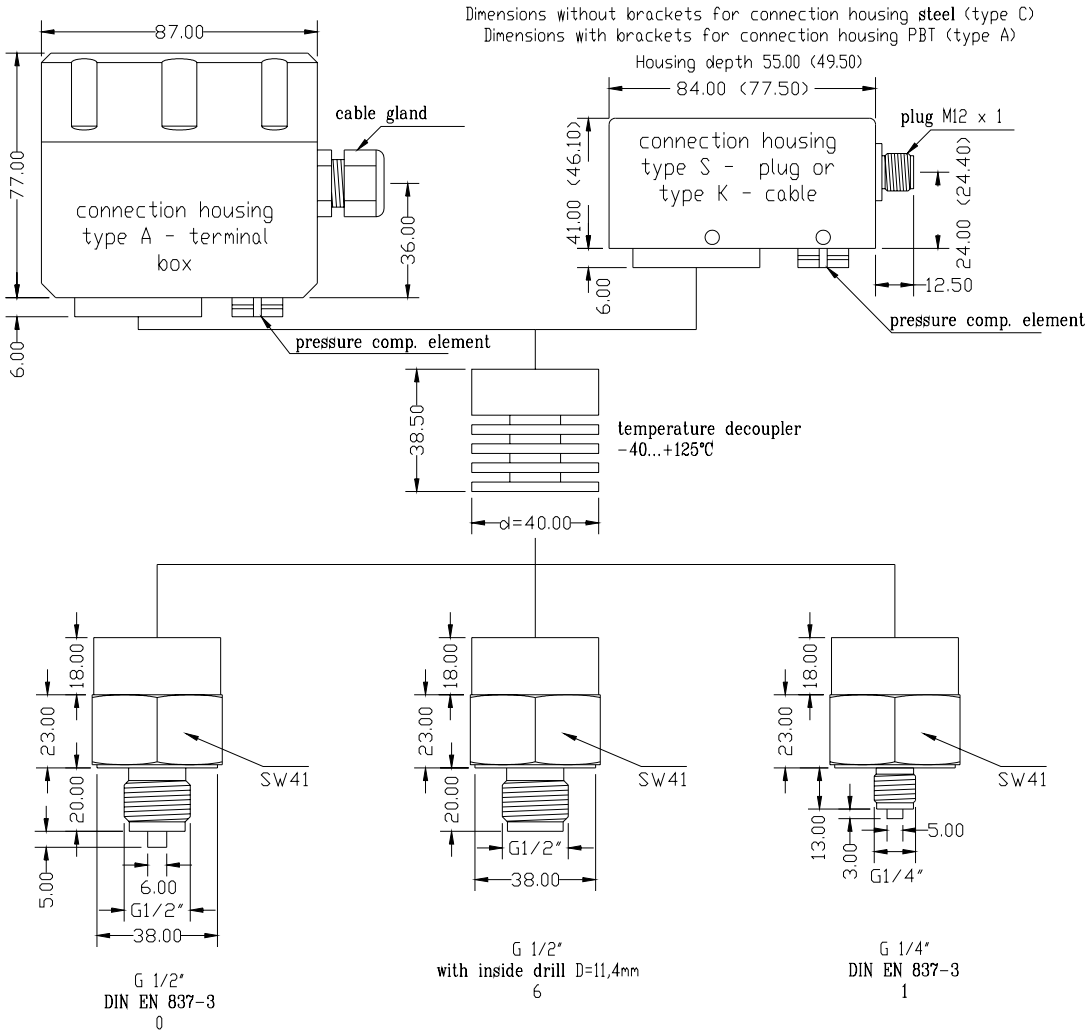
Dimension drawings Precont S10



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Order code overview Precont S10

Digital pressure transmitter with **inside placed ceramic capacitive membrane** from –1 to 60 bar

Type:

S10	Standard	
ExS10	ATEX II 1/2 G Ex ia IIC T4	
XDS10	ATEX II 1/2 D Ex iaD 20/21 T60°C/T102°C	only with material connection housing type C - steel

Process connection:

0	G ½“ A	ISO228-1	DIN EN 837-3	manometer connection
6	G ½“ A	ISO228-1		inside drill 11,4 mm
1	G ¼“ A	ISO228-1	DIN EN 837-3	manometer connection

Electronic - output:

A	2-wire-technology	signal 4...20 mA	2x PNP switching output	LED display, 3 key’s
B	2-wire-technology	signal 4...20 mA		LED display, 3 key’s
C	2-wire-technology	signal 4...20 mA		3 key’s
D	2-wire-technology	signal 4...20 mA		fix adjusted
E	3-wire-technology	signal 0...10 V	2x PNP switching output	LED display, 3 key’s
F	3-wire-technology	signal 0...10 V		LED display, 3 key’s
G	3-wire-technology	signal 0...10 V		3 key’s
H	3-wire-technology	signal 0...10 V		fix adjusted

Material process connection (medium contact):

V Steel 1.4404 (AISI 316L) / 1.4571 (AISI 316Ti)

Material connection housing:

A	PBT – polybutyleneterephthalat	not for electrical connection type A
C	CrNi-steel	
E	PP – polypropylene	not for electrical connection type S / K
D	POM – polyoxymethylene (Delrin®)	not for electrical connection type S / K

Measuring range:

01	0...0,1 bar	10	0...10 bar
02	0...0,2 bar	11	0...16 bar
03	0...0,4 bar	12	0...20 bar
04	0...0,6 bar	13	0...40 bar
05	0...1 bar	14	0...60 bar
06	0...1,6 bar	15	-0,1...0 bar
07	0...2,5 bar	16	-1...0 bar
08	0...4 bar	17	-1...+1 bar
09	0...6 bar	18	-0,1...+0,1 bar
		YY	special measuring range separate spec. necessary

Gaskets (medium contact):

1	FPM	fluorelastomere (Viton®)	
2	CR	chloroprene-rubber (Neopren®)	
3	EPDM	etylene-propylene-dienmonomere	for food applications
4	FFKM	perfluorelastomere (Kalrez®)	
6	FFKM	perfluorelastomere high density	for gas applications

Process temperature:

0	Standard	-40°C to +100°C	
1	Extended	-40°C to +125°C	with temperature decoupler

Pressure type:

R Relative pressure
A Absolute pressure

Accuracy measuring system *) – material measuring membrane (medium contact):

2	0,2%		ceramic AL_2O_3	96%
1	0,2%		ceramic AL_2O_3	99,9% (highly clean)
0	0,1%	Linearization protocol	ceramic AL_2O_3	96%
3	0,1%	Linearization protocol	ceramic AL_2O_3	99,9% (highly clean)

Electrical connection:

S Plug M12x1
K Cable 2m
A Terminal box

Precont _ _ _ V _ _ _ _ _ _ _

*) Higher values for special measuring range

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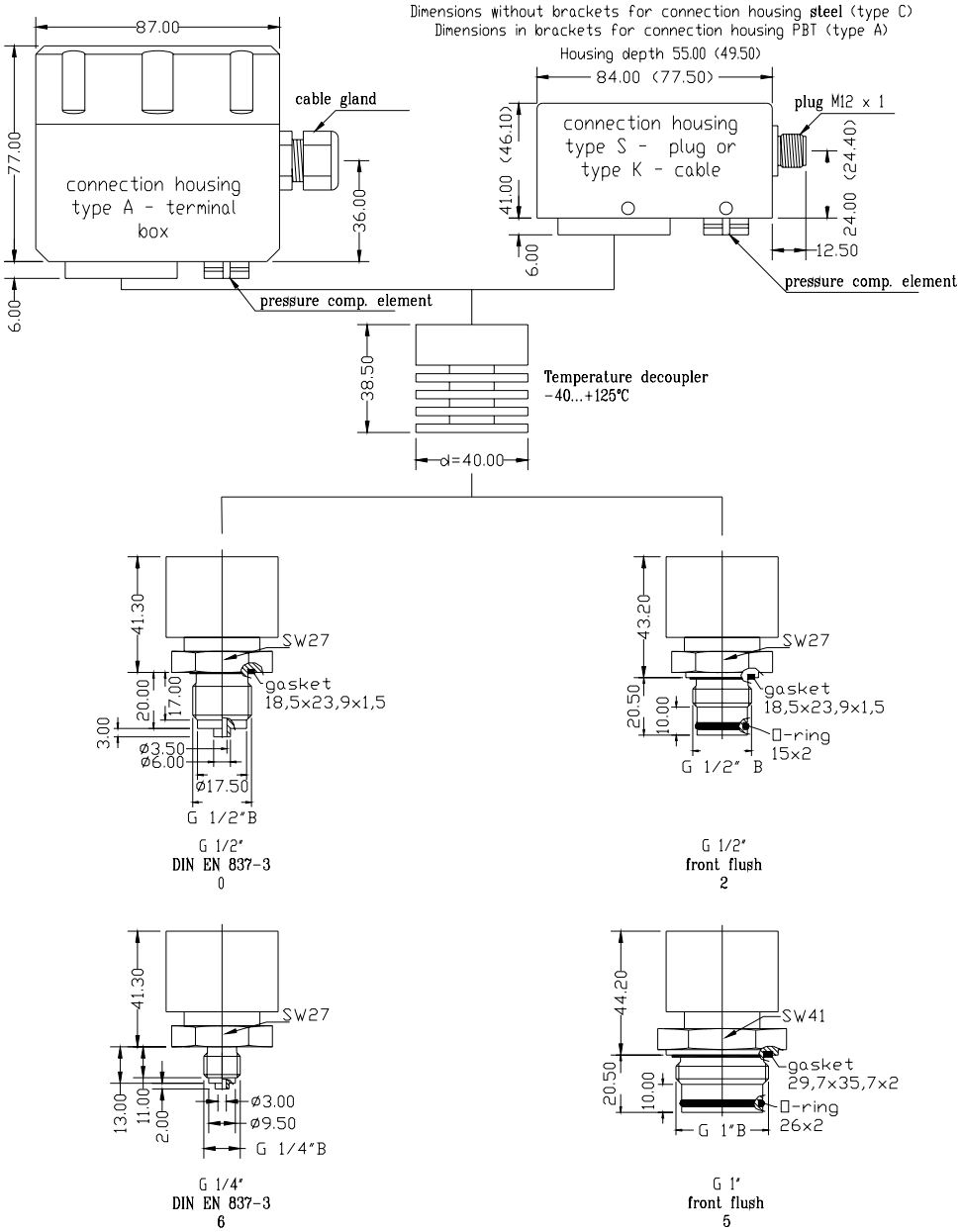
Dimension drawings Precont S20



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Order code overview Precont S20

Digital pressure transmitter with **metallic strain gauge membrane** from –1 to 1000 bar

Type:

S20	Standard	
ExS20	ATEX II 1/2 G Ex ia IIC T4	
XDS20	ATEX II 1/2 D Ex iaD 20/21 T60°C/T102°C	only with material connection housing type C – CrNi-steel

Process connection:

0	G ½“ B	ISO228-1	DIN EN 837-3	manometer connection
2	G ½“ B	ISO228-1		front flush, with radial O-ring, up to max. 600 bar not for ranges 0.. 0,4 bar, 0..1 bar and –1…0 bar
5	G 1“ B	ISO228-1		front flush, with radial O-ring for ranges 0.. 0,4 bar, 0..1 bar and –1…0 bar
6	G ¼“ A	ISO228-1	DIN EN 837-3	manometer connection

Electronic - output:

A	2-wire-technology	signal 4...20 mA	2x PNP switching output	LED display, 3 key’s
B	2-wire-technology	signal 4...20 mA		LED display, 3 key’s
C	2-wire-technology	signal 4...20 mA		3 key’s
D	2-wire-technology	signal 4...20 mA		fix adjusted
E	3-wire-technology	signal 0...10 V	2x PNP switching output	LED display, 3 key’s
F	3-wire-technology	signal 0...10 V		LED display, 3 key’s
G	3-wire-technology	signal 0...10 V		3 key’s
H	3-wire-technology	signal 0...10 V		fix adjusted

Material process connection (medium contact):

V Steel 1.4571 (AISI 316Ti)

Gaskets (medium contact):

0	NBR	nitril-butadien-rubber	
1	FPM	fluorelastomere (Viton®)	
3	EPDM	etylene-propylene-dienmonomere	for food applications

Measuring range:

03	0...0,4 bar	20	0...160 bar	
05	0...1 bar	21	0...250 bar	
08	0...4 bar	22	0...320 bar	
09	0...6 bar	23	0...400 bar	
10	0...10 bar	24	0...600 bar	
11	0...16 bar	25	0…1000 bar	not for front flush G ½“ B - type 2
12	0...25 bar	16	-1...0 bar	
13	0...40 bar	17	-1...+1 bar	
14	0...60 bar	YY	special measuring range	separate spec. necessary
19	0...100 bar			

Material connection housing:

A	PBT – polybutyleneterephthalat	not for electrical connection type A
C	CrNi-steel	
E	PP – polypropylene	not for electrical connection type S / K
D	POM – polyoxymethylene (Delrin®)	not for electrical connection type S / K

Process temperature:

0	Standard	-40°C to +100°C	
1	Extended	-40°C to +125°C	with temperature decoupler

Pressure type:

R	Relative pressure	
A	Absolute pressure	not for measuring ranges ≥ 40 bar

Accuracy measuring system *) – material measuring membrane (medium contact):

4	0,5%	Process connection type 2 / 5	Steel 1.4571 (AISI 316Ti)
		Measuring range ≥ 40 bar	Steel 1.4571 (AISI 316Ti)
		Measuring range < 40 bar	Steel 1.4542 (AISI 630) / 1.4534

Electrical connection:

S	Plug M12x1
K	Cable 2m
A	Terminal box

Precont _ _ _ V _ _ _ _ _ 4 _

*) Higher values for special measuring range

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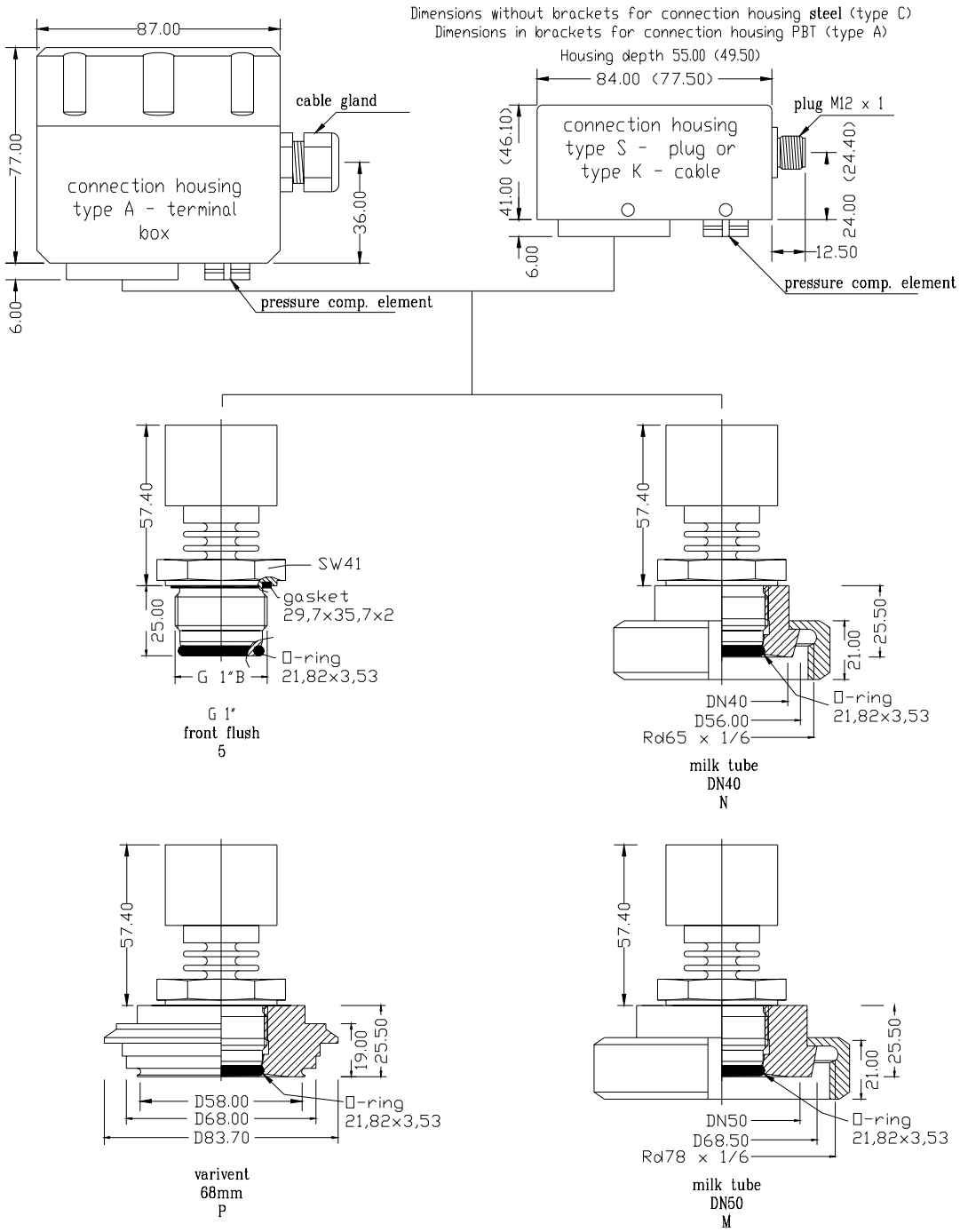
Dimension drawings Precont S30



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Order code overview Precont S30

Digital pressure transmitter with **front flush metallic strain gauge membrane** from –1 to 25 bar

Type:

S30	Standard	
ExS30	ATEX II 1/2 G Ex ia IIC T4	
XDS30	ATEX II 1/2 D Ex iaD 20/21 T60°C/T102°C	only with material connection housing type C – CrNi-steel

Process connection:

5	G 1“ B	ISO228-1		front flush, with radial O-ring, EHEDG conform	
N	Milk tube	DN 40, PN 40	DIN 11851		
M	Milk tube	DN 50, PN 40	DIN 11851		
P	Varivent	68 mm	DN40-80 / DN1½“..6“, PN25	DN100 / DN4“, PN20	DN125 / DN6“, PN10

Electronic - output:

A	2-wire-technology	signal 4...20 mA	2x PNP switching output	LED display, 3 key’s
B	2-wire-technology	signal 4...20 mA		LED display, 3 key’s
C	2-wire-technology	signal 4...20 mA		3 key’s
D	2-wire-technology	signal 4...20 mA		fix adjusted
E	3-wire-technology	signal 0...10 V	2x PNP switching output	LED display, 3 key’s
F	3-wire-technology	signal 0...10 V		LED display, 3 key’s
G	3-wire-technology	signal 0...10 V		3 key’s
H	3-wire-technology	signal 0...10 V		fix adjusted

Material process connection (medium contact):

V Steel 1.4435 (AISI 316L)

0

Measuring range:

03	0...0,1 bar	
05	0...0,25 bar	
08	0...0,4 bar	
09	0...0,6 bar	
10	0...1 bar	
11	0...2,5 bar	
12	0...4 bar	
20	0...6 bar	
21	0...10 bar	
22	0...16 bar	
23	0...25 bar	
16	-1...0 bar	
17	-1...+1 bar	
YY	special measuring range	separate spec. necessary

Material connection housing:

A	PBT – polybutyleneterephthalat	not for electrical connection type A
C	CrNi-steel	
E	PP – polypropylene	not for electrical connection type S / K
D	POM – polyoxymethylene (Delrin®)	not for electrical connection type S / K

Process temperature:

1 Standard -40°C to +150°C

Pressure type:

R Relative pressure
A Absolute pressure

Accuracy measuring system *) – material measuring membrane (medium contact):

4 0,5% Steel 1.4435 (AISI 316L)

Electrical connection:

S Plug M12x1
K Cable 2m
A Terminal box

Precont _ _ _ V 0 _ _ 1 _ 4 _

*) Higher values for special measuring range

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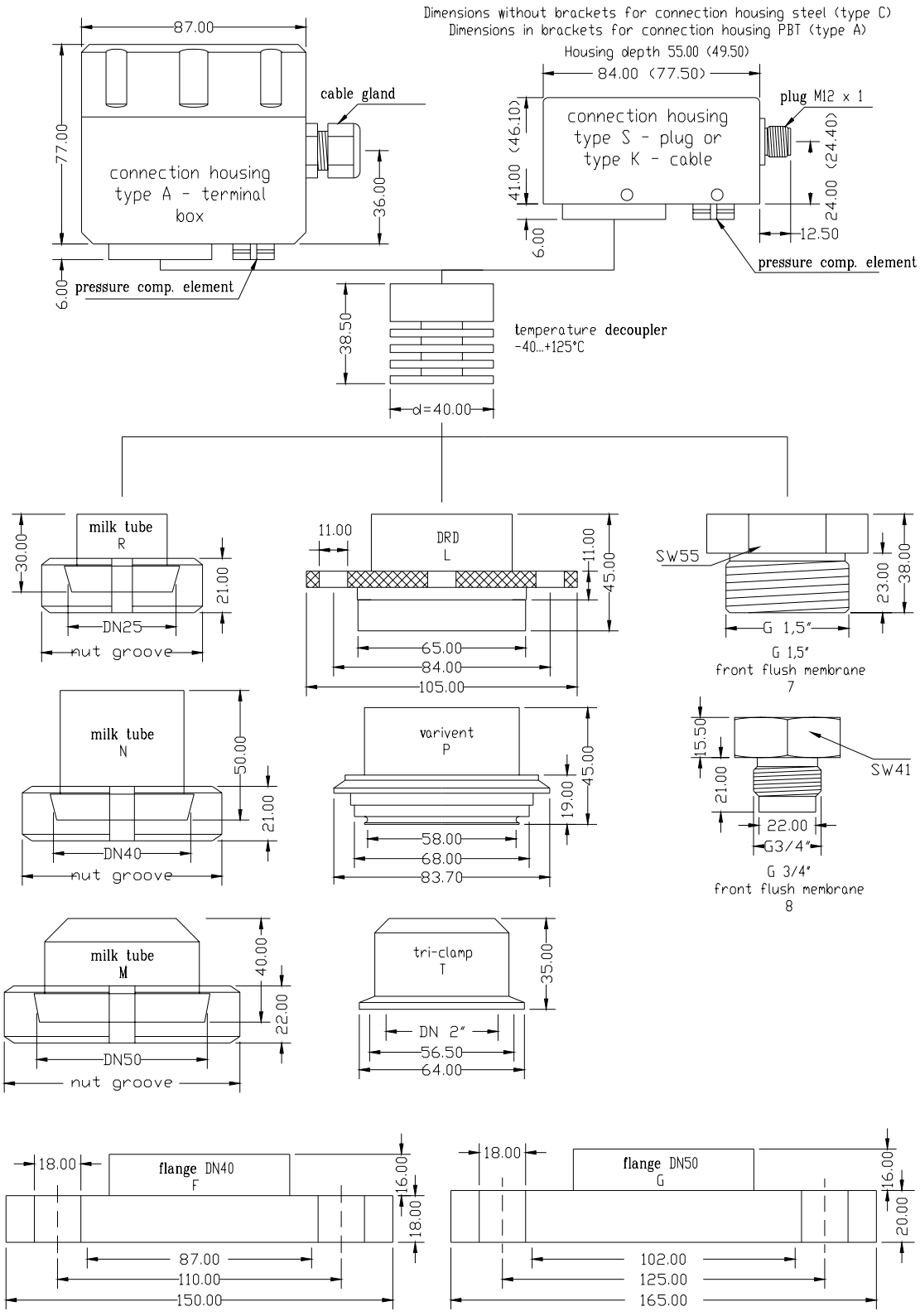
Dimension drawings Precont S40



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Order code overview Precont S40

Digital pressure transmitter with **front flush ceramic capacitive membrane** from –1 to 60 bar

Type:

S40	Standard	
ExS40	ATEX II 1/2 G Ex ia IIC T4	
XDS40	ATEX II 1/2 D Ex iaD 20/21 T60°C/T102°C	only with material connection housing type C – CrNi-steel

Process connection:

7	G 1½“ A	ISO228-1	front flush membrane		
8	G ¾“ A	ISO228-1	front flush membrane	not for variant membrane 1 / 3	99,9%
R	Milk tube	DN 25, PN 40	DIN 11851	not for variant membrane 1 / 3	99,9%
N	Milk tube	DN 40, PN 40	DIN 11851		
M	Milk tube	DN 50, PN 40	DIN 11851		
P	Varivent	68 mm	DN40-80 / DN1½“..6“, PN25	DN100 / DN4“, PN20	DN125 / DN6“, PN10
L	DRD	65 mm	DN 50, PN 40		
T	Tri-Clamp	DN 2“, PN 16	ISO 2852		
F	Flange	DN 40, PN 10-40	DIN EN 1092-1	sealing surface DIN 2527-D	
G	Flange	DN 50, PN 10-40	DIN EN 1092-1	sealing surface DIN 2527-D	

Electronic - output:

A	2-wire-technology	signal 4...20 mA	2x PNP switching output	LED display, 3 key’s
B	2-wire-technology	signal 4...20 mA		LED display, 3 key’s
C	2-wire-technology	signal 4...20 mA		3 key’s
D	2-wire-technology	signal 4...20 mA		fix adjusted
E	3-wire-technology	signal 0...10 V	2x PNP switching output	LED display, 3 key’s
F	3-wire-technology	signal 0...10 V		LED display, 3 key’s
G	3-wire-technology	signal 0...10 V		3 key’s
H	3-wire-technology	signal 0...10 V		fix adjusted

Material process connection (medium contact):

V Steel 1.4404 (AISI 316L) / 1.4571 (AISI 316Ti)

Material connection housing:

A	PBT – polybutyleneterephthalat	not for electrical connection type A
C	CrNi-steel	
E	PP – polypropylene	not for electrical connection type S / K
D	POM – polyoxymethylene (Delrin®)	not for electrical connection type S / K

Measuring range:

01	0...0,1 bar	10	0...10 bar		
02	0...0,2 bar	11	0...16 bar		
03	0...0,4 bar	12	0...20 bar		
04	0...0,6 bar	13	0...40 bar	not for process connection 8 / R	
05	0...1 bar	14	0...60 bar	not for process connection 8 / R	
06	0...1,6 bar	15	-0,1...0 bar		
07	0...2,5 bar	16	-1...0 bar		
08	0...4 bar	17	-1...+1 bar		
09	0...6 bar	18	-0,1...+0,1 bar		
		YY	special measuring range	separate spec. necessary	

Gaskets (medium contact):

1	FPM	fluorelastomere (Viton®)	
2	CR	chloroprene-rubber (Neopren®)	
3	EPDM	etylene-propylene-dienmonomere	for food applications
4	FFKM	perfluorelastomere (Kalrez®)	
6	FFKM	perfluorelastomere high density	for gas applications

Process temperature:

0	Standard	-40°C to +100°C	
1	Extended	-40°C to +125°C	with temperature decoupler

Pressure type:

R Relative pressure

A Absolute pressure

Accuracy measuring system *) – material measuring membrane (medium contact):

2	0,2%		ceramic AL_2O_3	96%
1	0,2%		ceramic AL_2O_3	99,9% (highly clean)
0	0,1%	Linearization protocol	ceramic AL_2O_3	96%
3	0,1%	Linearization protocol	ceramic AL_2O_3	99,9% (highly clean)

Electrical connection:

S	Plug M12x1
K	Cable 2m
A	Terminal box

Precont _ _ _ V _ _ _ _ _ _ _ _

*) Higher values for special measuring range

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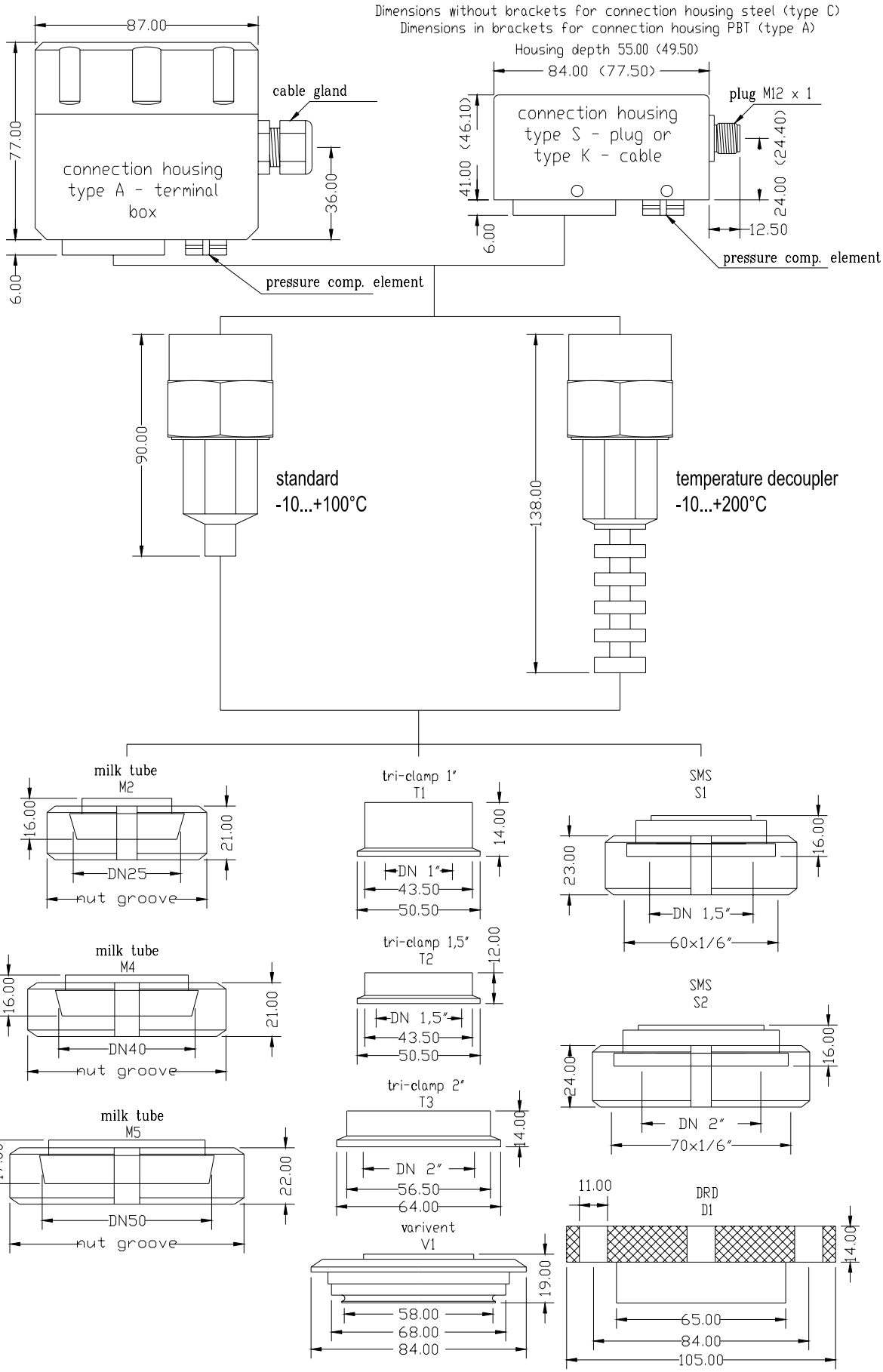
Dimension drawings Precont S60



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Order code overview Precont S60

Digital pressure transmitter with **diaphragm seal for hygienic applications to 200 °C** from –1 to 60 bar

Type

S60	Standard	
ExS60	ATEX II 1/2 G Ex ia IIC T4	
XDS60	ATEX II 1/2 D Ex iaD 20/21 T60°C/T102°C	only with material connection housing type C – CrNi-steel

Process connection:

M2	Milk tube	DN 25, PN 40	DIN 11851		
M4	Milk tube	DN 40, PN 40	DIN 11851		
M5	Milk tube	DN 50, PN 40	DIN 11851		
V1	Varivent	68 mm	DN40-80 / DN1½"..6", PN25	DN100 / DN4", PN20	DN125 / DN6", PN10
D1	DRD	65 mm	DN 50, PN 40		
T1	Tri-Clamp	DN 1", PN 16	ISO 2852		
T2	Tri-Clamp	DN 1½", PN 16	ISO 2852		
T3	Tri-Clamp	DN 2", PN 16	ISO 2852		
S1	SMS	DN 1½", PN 40			
S2	SMS	DN 2", PN 25			

Process temperature:

D	Standard	-10°C to +100°C	vegetable oil FP	
E	Extended	-10°C to +200°C	vegetable oil FP	with temperature decoupler

Electronic - output:

A	2-wire-technology	signal 4...20 mA	2x PNP switching output	LED display, 3 key's
B	2-wire-technology	signal 4...20 mA		LED display, 3 key's
C	2-wire-technology	signal 4...20 mA		3 key's
D	2-wire-technology	signal 4...20 mA		fix adjusted
E	3-wire-technology	signal 0...10 V	2x PNP switching output	LED display, 3 key's
F	3-wire-technology	signal 0...10 V		LED display, 3 key's
G	3-wire-technology	signal 0...10 V		3 key's
H	3-wire-technology	signal 0...10 V		fix adjusted

Material process connection resp. diaphragm seal membrane (medium contact):

V Steel 1.4404 / 1.4435 (AISI 316L)

Material connection housing:

A	PBT – polybutyleneterephthalat	not for electrical connection type A
C	CrNi-steel	
E	PP – polypropylene	not for electrical connection type S / K
D	POM – polyoxymethylene (Delrin®)	not for electrical connection type S / K

Measuring range:

01	0...0,1 bar	10	0...10 bar
02	0...0,2 bar	11	0...16 bar
03	0...0,4 bar	12	0...20 bar
04	0...0,6 bar	13	0...40 bar
05	0...1 bar	14	0...60 bar
06	0...1,6 bar	15	-0,1...0 bar
07	0...2,5 bar	16	-1...0 bar
08	0...4 bar	17	-1...+1 bar
09	0...6 bar	18	-0,1...+0,1 bar
		YY	special measuring range — separate spec. necessary

Pressure type:

R	Relative pressure
A	Absolute pressure

Accuracy measuring system *) – variant measuring membrane:

2	0,2%		capacitive ceramic membrane
0	0,1%	Linearization protocol	capacitive ceramic membrane

Electrical connection:

S	Plug M12x1
K	Cable 2m
A	Terminal box

Precont _ _ _ V _ _ _ _ _ _

*) Higher values for special measuring range

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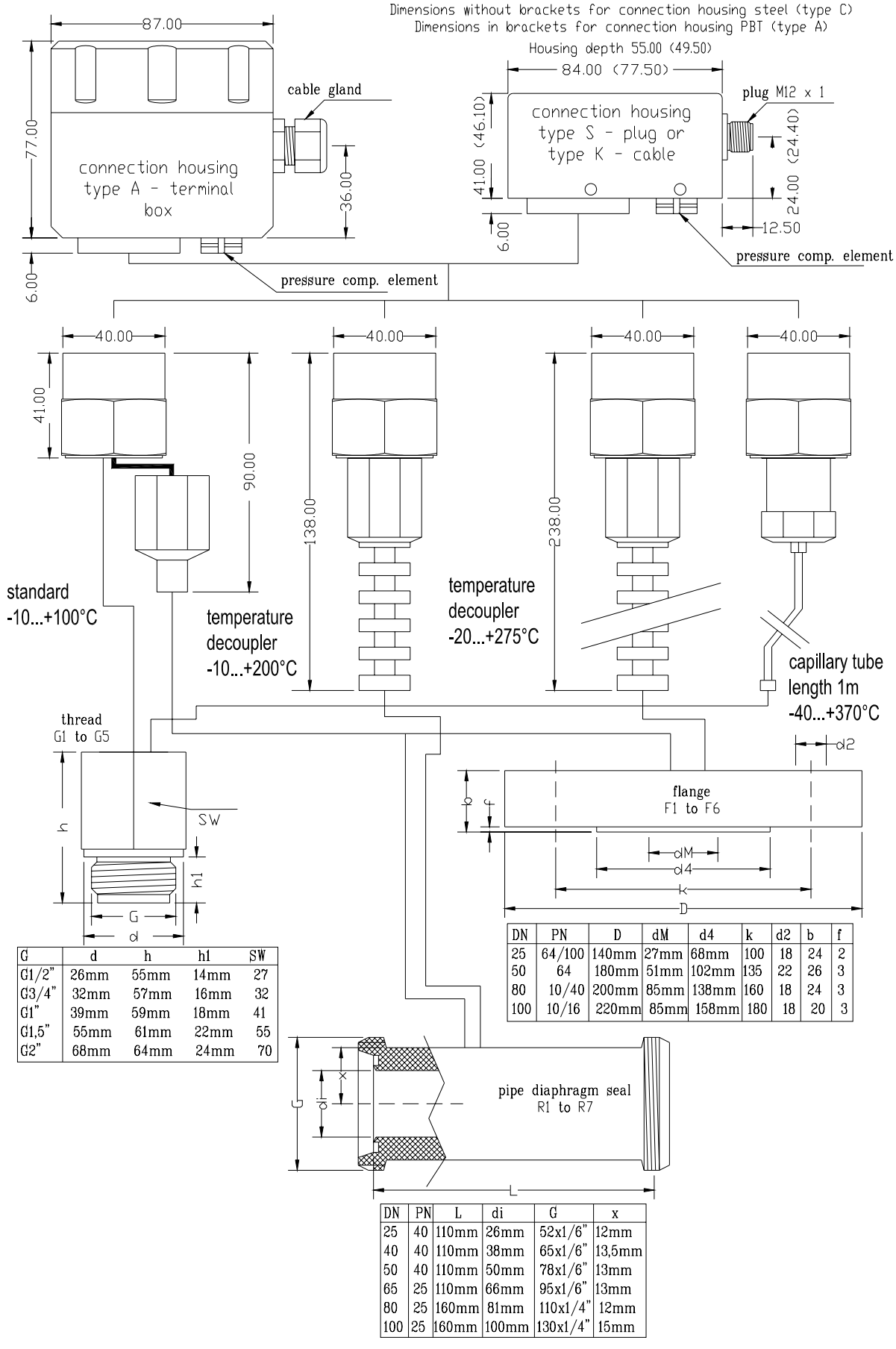
Dimension drawings Precont S70



G	d	h	h1	SW
G1/2"	26mm	55mm	14mm	27
G3/4"	32mm	57mm	16mm	32
G1"	39mm	59mm	18mm	41
G1,5"	55mm	61mm	22mm	55
G2"	68mm	64mm	24mm	70

DN	PN	D	dM	d4	k	d2	b	f
25	64/100	140mm	27mm	68mm	100	18	24	2
50	64	180mm	51mm	102mm	135	22	26	3
80	10/40	200mm	85mm	138mm	160	18	24	3
100	10/16	220mm	85mm	158mm	180	18	20	3

DN	PN	L	di	G	x
25	40	110mm	26mm	52x1/6"	12mm
40	40	110mm	38mm	65x1/6"	13,5mm
50	40	110mm	50mm	78x1/6"	13mm
65	25	110mm	66mm	95x1/6"	13mm
80	25	160mm	81mm	110x1/4"	12mm
100	25	160mm	100mm	130x1/4"	15mm

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Order code overview Precont S70

Digital pressure transmitter with **diaphragm seal for applications to 370 °C** from –1 to 400 bar

Type:

S70	Standard	
ExS70	ATEX II 1/2 G Ex ia IIC T4	
XDS70	ATEX II 1/2 D Ex iaD 20/21 T60°C/T102°C	only with material connection housing type C – CrNi-steel

Process connection:

G1	G ½“ A	ISO228-1	DIN 3852-2-A		
G2	G ¾“ A	ISO228-1	DIN 3852-2-A		
G3	G 1“ A	ISO228-1	DIN 3852-2-A		
G4	G 1½“ A	ISO228-1	DIN 3852-2-A		
G5	G 2“ A	ISO228-1	DIN 3852-2-A		
F1	Flange	DN 25, PN 64-100	DIN 2526-E		
F3	Flange	DN 50, PN 64	DIN 2526-E		
F5	Flange	DN 80, PN 10-40	DIN 2526-E		
F6	Flange	DN 100, PN 25-40	DIN 2526-E		
R1	Pipe diaphragm seal	DN 25, PN 40	DIN 11851	double sided thread	Ex variant on request
R3	Pipe diaphragm seal	DN 40, PN 40	DIN 11851	double sided thread	Ex variant on request
R4	Pipe diaphragm seal	DN 50, PN 40	DIN 11851	double sided thread	Ex variant on request
R5	Pipe diaphragm seal	DN 65, PN 25	DIN 11851	double sided thread	Ex variant on request
R6	Pipe diaphragm seal	DN 80, PN 25	DIN 11851	double sided thread	Ex variant on request
R7	Pipe diaphragm seal	DN 100, PN 25	DIN 11851	double sided thread	Ex variant on request

Process temperature:

A	Standard	-10°C to +100°C	silicone oil FS20	
B	Extended	-10°C to +200°C	food oil FD1	with temperature decoupler
C	Extended	-20°C to +275°C	silicone oil FS100	with temperature decoupler
D	Extended	-40°C to +370°C	high temperature oil FH	with capillary tube 1m

Electronic - output:

A	2-wire-technology	signal 4...20 mA	2x PNP switching output	LED display, 3 key’s
B	2-wire-technology	signal 4...20 mA		LED display, 3 key’s
C	2-wire-technology	signal 4...20 mA		3 key’s
D	2-wire-technology	signal 4...20 mA		fix adjusted
E	3-wire-technology	signal 0...10 V	2x PNP switching output	LED display, 3 key’s
F	3-wire-technology	signal 0...10 V		LED display, 3 key’s
G	3-wire-technology	signal 0...10 V		3 key’s
H	3-wire-technology	signal 0...10 V		fix adjusted

Material process connection resp. diaphragm seal membrane (medium contact):

V Steel 1.4404 / 1.4435 (AISI 316L)

Material connection housing:

A	PBT – polybutyleneterephthalat	not for electrical connection type A
C	CrNi-steel	
E	PP – polypropylene	not for electrical connection type S / K
D	POM – polyoxymethylene (Delrin®)	not for electrical connection type S / K

Measuring range:

01	0...0,1 bar		13	0...40 bar	
02	0...0,2 bar		14	0...60 bar	
03	0...0,4 bar		19	0...100 bar	
04	0...0,6 bar		20	0...160 bar	
05	0...1 bar		21	0...250 bar	
06	0...1,6 bar		22	0...320 bar	
07	0...2,5 bar		23	0...400 bar	
08	0...4 bar		15	-0,1...0 bar	
09	0...6 bar		16	-1...0 bar	
10	0...10 bar		17	-1...+1 bar	
11	0...16 bar		18	-0,1...+0,1 bar	
12	0...20 bar		YY	special measuring range	separate spec. necessary

Pressure type:

R	Relative pressure	
A	Absolute pressure	not for measuring ranges ≥ 100 bar

Accuracy measuring system *) – variant measuring membrane:

2	0,2%		capacitive ceramic membrane	ranges ≤ 60 bar
0	0,1%	Linearization protocol	capacitive ceramic membrane	ranges ≤ 60 bar
4	0,5%		strain gauge metallic membrane	ranges ≥ 100 bar

Electrical connection:

S	Plug M12x1
K	Cable 2m
A	Terminal box

Precont _ _ _ V _ _ _ _ _ _

*) Higher values for special measuring range

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