PFSX
Industrial digital pressure switch for safety applications

Main features

- **Measures vacuum or pressure with absolute or gauge ranges**
- **2 independently programmable, gavanically isolated relay switch outputs**
- **4-20 mA output signal**
- **4-digit LED display**
- **Rugged stainless steel construction for harsh environmental conditions**
- **SIL2 (Safety Integrity Level) applications**
- **LCIE 11 ATEX 3022 X**
  CE **0081**
  Ⓔx **II 1 G D**
  Ex ia IIC T5 or T6
  Ex iaD 20 T°80C or T95°C
  Ex tD A20 IP6X T80°C or T95°C



Applications

■ **Process technic**	□ Health care
■ **Hydraulic**	□ Biotechnology
■ **Pneumatic**	■ **Food**
□ Refrigeration	■ **Beverage**
■ **Water treatment**	■ **Pharmaceutical**
■ **Car industry**	■ **Petro-chemical**
■ **Test benches**	■ **Chemical**
■ **Safety**	■ **HVAC**
□ Aerospace	■ **Energy**
□ Railways	■ **Medical gas**
□ Shipbuilding	□ Agriculture vehicules
□ Heavy vehicule	■ **Pumps and compressors**

Main characteristics (20° C)

These characteristics are given for a "basic" PFSX, as featured on this documentation. When mornting on a chemical seal or any other intermediate part in relation to the process, each component shorld be taken into accornt to determine the overall characteristics.

Pressure range	-1 ... 0 to 0 ... 400 bar
Output signal	4 ... 20 mA
Accuracy (linearity, hysteresis and repeatability)	± 0.5% FS

Ordering details - PFSX

PFSX x 3 x xx x G1 18 0x 2 x 0 1 0 x

Horsing material				
Stainless steel		1.4404	AISI 316L	2
Others				9
Accuracy				
0.50% FS				3
Unit of measurement				
bar				B
kPa				D
kg/cm²				F
psi				H
Pressure ranges				
-1 ... 0 bar or kg/cm²	-100 ... 0 kPa	-30"Hg ... 0 psi		59
-1 ... 0.6 bar or kg/cm²	-100 ... 60 kPa			72
		-30"Hg ... 15 psi		73
-1 ... 1.5 bar or kg/cm²	-100 ... 150 kPa			74
		-30"Hg ... 30 psi		75
-1 ... 3 bar or kg/cm²	-100 ... 300 kPa			76
		-30"Hg ... 60 psi		2C
-1 ... 5 bar or kg/cm²	-100 ... 500 kPa			77
		-30"Hg ... 100 psi		78
-1 ... 9 bar or kg/cm²	-100 ... 900 kPa	-30"Hg ... 150 psi		79
-1 ... 15 bar or kg/cm²	-100 ... 1500 kPa	-30"Hg ... 220 psi		81
-1 ... 24 bar or kg/cm²	-100 ... 2400 kPa	-30"Hg ... 300 psi		82
-1 ... 39 bar or kg/cm²	-100 ... 3900 kPa	-30"Hg ... 600 psi		1L
0 ... 1 bar or kg/cm²	0 ... 100 kPa	0 ... 15 psi		15
0 ... 1.6 bar or kg/cm²	0 ... 160 kPa			16
		0 ... 20 psi		1C
		0 ... 30 psi		17
0 ... 2.5 bar or kg/cm²	0 ... 250 kPa			18
0 ... 4 bar or kg/cm²	0 ... 400 kPa	0 ... 60 psi		19
0 ... 6 bar or kg/cm²	0 ... 600 kPa			20
		0 ... 100 psi		21
0 ... 10 bar or kg/cm²	0 ... 1000 kPa	0 ... 160 psi		22
		0 ... 200 psi		23
0 ... 16 bar or kg/cm²	0 ... 1600 kPa			24
		0 ... 300 psi		25
0 ... 25 bar or kg/cm²	0 ... 2500 kPa	0 ... 400 psi		26
0 ... 40 bar or kg/cm²	0 ... 4000 kPa	0 ... 600 psi		27
0 ... 60 bar or kg/cm²	0 ... 6000 kPa			29
		0 ... 1000 psi		30
0 ... 100 bar or kg/cm²		0 ... 1500 psi		31
0 ... 160 bar or kg/cm²				33
		0 ... 3000 psi		34
0 ... 250 bar or kg/cm²				35
0 ... 400 bar or kg/cm²		0 ... 6000 psi		38
Pressure type				
Relative				R
Absolute				A
Output signal				
4 ... 20 mA with two static relays				G1
Electrical connections				
M12, 8 pins				18
Process connection				
G1/4 EN 837				02
G1/2 EN 837				03
G1/4 DIN 3852 (1)				06
Material for pressure connection				
Stainless steel		1.4404	AISI 316L	2
O'ring				
NBR				1
EPDM				2
FKM (Viton®) (2)				3
Oil filling				
Without				0
Affichage				
With display				1
ATEX				
Without (3)				0
Ex ia IIC T5/T6, Ex iaD 20T°80C or T95°C, Ex tD A20 IP6X T80°C or T95°C, Ex II 1 G D				1
Approvals				
Without (3)				0
SIL2				1

(1) Except drinking water option (code 0619)
(2) Mandatory for use on oxygen code (0765) and P≥30 bar
(3) Without ATEX and without SIL2 see standard version PFSN

Model / type PFSX

Technical data

Measuring ranges	0…1 to 0…400 bar
Pressure type	Relativ, absolute
Display	-1999 to 9999 points 4 red LED digits (8mm high)
Threshold adjustment range	From 2% to 98% of FS
Response time	≤20ms
Accuracy (20°C)	± 0.5% FS (linearity, hysteresis, repeatability))
Pressure connection	G1/4 EN 837, G1/2 EN 837, G1/4 DIN 3852

Approvals

CE conformity	EMC directive 2004/108/CE Pressure directive 97/23/CE ATEX directive 94/9/CE
SIL	2 according to CEI 61508

*SIL2 is assessed for the PFSX alone, used as recommended in the **Safety Manual**. Mounting on a chemical seal or other accessories leads to a change in failure rates. In this case, the user is responsible for checking the SIL rating.*

Environment

Temperature	
Storage	-40…+85 °C
Fluids	-25…+100 °C
ATEX model	-25…+70 °C -25 °C ≤ Ta ≤ +40°C, T6 or T80°C -25 °C ≤ Ta ≤ +70°C, T5 or T95°C
Others	-25 °C...+85 °C
Thermal drift	± 0.015 % EM/°C max
Protection class (EN60529)	IP65 and IP67
Vibration resistance (EN 600068-2-6)	1.5 mm (10Hz...55Hz) / 20g (55Hz ...2kHz)
Shock resistance (EN 600028-2-32)	25 drops from 1m on a concrete floor

Electrical characteristics

To ensure safety, the PFSX must be connected via a shielded cable supplied by Baumer as an option (codes 0607, 0608 or 0609).

Supply voltage	11-28 Vdc, non-regulated against polarity reversal
Consumption	50mA max
Load impedance	Rc ≤ 400 Ω
Output signal	4-20 mA (3-wire)
Threshold outputs	
ATEX model	40mA under 28Vdc solid state relays
Others	400mA under 24Vac 50Hz or 40Vdc-solid state relays
Electric connection	M12-8 male contacts connector

Materials

Pressure connections	Stainless steel AISI 316L (1.4404)
Sensor	Ceramic
Sealing	NBR gasket standard, EPDM, FKM (viton®)
Horsing	Stainless steel 1.4404 (316L)

Options

Use on drinking water	Code 0619
Use on oxygen	Code 0765
Specific cleaning (use on gas)	Code 0829
Ø10mm hole in connection (for G1/2 connectors)	Code 9022

Measuring Ranges

F.S.	-1 +0	-1 +0,6	-1+1,5	-1+3	-1+5	-1+9	-1+15	-1+24	-1+39
Permissible overpressure	3	3	4	8	12	20	32	50	80
Burst pressure	6	6	7	12	18	30	48	75	120
Display of the FS	-1.000 / 0	-1.000 / 0.600	-1.000 / 1.500	-1.000 / 3.000	-1.000 / 5.000	-1.000 / 9.000	-1.00 / 15.00	-1.00 / 24.00	-1.00 / 39.00

F.S.	0 +1	0 + 1,6	0 +2,5	0 +4	0 +6	0 +10	0 +16	0 +25	0 +40	0 +60	0 + 100	0 + 160	0 +250	0 +400
Permissible overpressure	3	3	4	8	12	20	32	50	80	120	200	320	500	600
Burst pressure	7	7	7	12	18	30	48	75	120	180	300	480	600	800
Display of the FS.	0 / 1.000	0 / 1.600	0 / 2.500	0 / 4.000	0 / 6.000	0 / 10.00	0 / 16.00	0 / 25.00	0 / 40.00	0 / 60.00	0 / 100.0	0 / 160.0	0 / 250.0	0 / 400.0

Parameter configuration and display

Parameter configuration mode

The three buttons on the front configure the following operating parameters:

Switching point value for each threshold

Switch-over hysteresis value for each threshold

Active state of each threshold: (NO or NC)

Switch-over delay from 0 sec to 25 sec by 0.1 sec steps

Auto-zero function

Parameter self-checking and protection by 4-digit code

Parameter display mode

It is possible to display the configured parameters for each threshold without entering access code

Display of maximum and minimum values

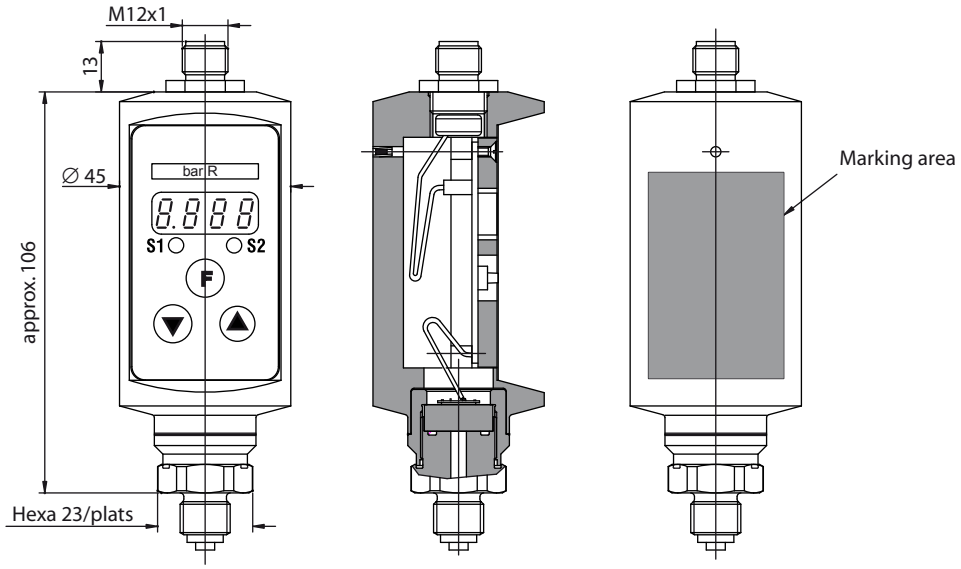
With the pressure switch in measuring mode, it is possible at any time to display or initialise any max and min pressure values saved since operation start..

Auto-diagnostic information display

Warning messages can be displayed whilst the pressure switch is operational (see safety manual and instruction note).

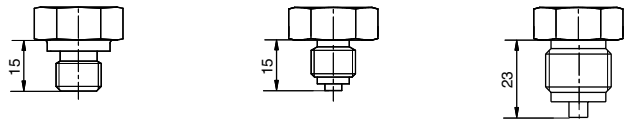
Model / type PFSX

Dimensions and connection



620 g

Pressure connections



G 1/4 DIN 3852-E G 1/4 EN837 G 1/2 EN837

Accessories

Type	Description	Code
	Moulded screened cable M12-8 pin. Length 2 m	**0607**
	Moulded screened cable M12-8 pin. Length 5 m	**0608**
	Moulded screened cable M12-8 pin. Length 10 m	**0609**
	Moulded screened cable M12-8 pin. Length 20 m	**0595**

Important: The cable shield assures the earthing of the PFSX.

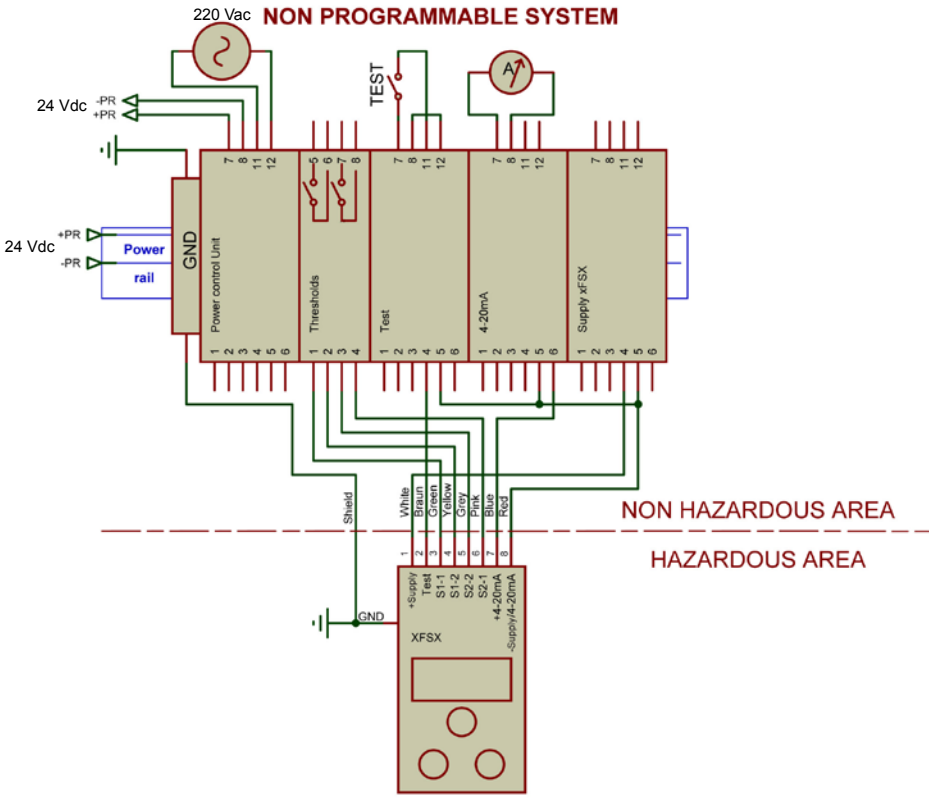
Setting up ATEX

Electrical parameters for PFSX for ia, iaD and tD

Terminals 1 and 8		Ui ≤ 28V	I_i ≤ 120mA	P_i ≤ 0.8W
		Li ≤ 5.5µH	C_i ≤ 72nF	
Terminal 2		Ui ≤ 30V	I_i ≤ 3mA	P_i ≤ 0.05W
		Li ≈ 0	C_i ≈ 0	
Terminals 3 and 4, 5 and 6		Ui ≤ 30V	I_i ≤ 50mA	P_i ≤ 0.37W
		Li ≈ 0	C_i ≈ 0	
Terminals 7 and 8	Uo ≤ 6V	Io ≤ 120mA	Po≤ 0.180W	

In area 0 or 20, the loop calculation of the association transmitter with safety barrier must be approved by notified organism.

SIL2 barriers recommended



Modules	Non programmable system code
Supply 24 Vdc	**11079100** Input : 115/230 Vac Output : 24 Vdc, 500 mA
Power rail supply	
Power rail (DIN 32 mm)	**11079079**
Grounding terminal block (GND)	**11079071**
Power control unit	
Supply xFSx	**11079078**
Test	**11079077**
4-20 mA	**11079076**
Thresholds 1 and 2	**11079074**

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