

Pressure Measurement

Transmitters for basic requirements

SITRANS P220 for gauge pressure

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Overview



The pressure transmitter SITRANS P220 measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell, fully welded
- Measuring ranges 2.5 to 600 bar (36.3 to 8702 psi) relative
- For high-pressure applications and refrigeration technology division

Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design
- Gasket-less

Application

The pressure transmitter SITRANS P220 for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a round plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

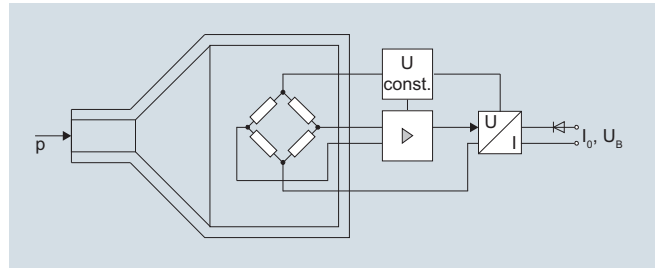
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Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

Mode of operation



SITRANS P220 pressure transmitters (7MF1567-...), functional diagram

The stainless steel measuring cell has a thick-film resistance bridge to which the operating pressure p is transmitted through a stainless steel diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

Technical specifications

Application	Gauge pressure measurement	Liquids, gases and vapors
Mode of operation	Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
Measured variable		Gauge pressure
Inputs	Measuring range	
	• Gauge pressure	
	- Metric	2.5 ... 600 bar (36 ... 8700 psi)
	- US measuring range	30... 8700 psi
Output	Current signal	4 ... 20 mA
	• Load	($U_B - 10 \text{ V}$)/0.02 A
	• Auxiliary power U_B	DC 7 ... 33 V (10 ... 30 V for Ex)
	Voltage signal	0 ... 10 V DC
	• Load	$\geq 10 \text{ k}\Omega$
	• Auxiliary power U_B	12 ... 33 V DC
	• Power consumption	< 7 mA at 10 k Ω
	Characteristic curve	Linear rising
Measuring accuracy	Error in measurement at limit setting incl. hysteresis and reproducibility	<ul style="list-style-type: none"> • Typical: 0.25 % of full-scale value • Maximum: 0.5 % of full-scale value
	Step response time T_{99}	< 5 ms
	Long-term stability	
	• Lower range value and measuring span	0.25 % of full-scale value/year
	Influence of ambient temperature	
	• Lower range value and measuring span	0.25 %/10 K of full-scale value
	• Influence of power supply	0.005 %/V
Conditions of use	• Process temperature	-30 ... +120 °C (-22 ... +248 °F)
	• Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
	• Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
	• Degree of protection (to EN 60529)	<ul style="list-style-type: none"> • IP 65 with connector per EN 175301-803-A • IP 67 with M12 connector • IP 67 with cable • IP 67 with cable quick screw connection
Electromagnetic compatibility		<ul style="list-style-type: none"> • acc. IEC 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation $\leq 1 \%$

Design	Weight	Approx. 0.090 kg (0.198 lb)
	Process connections	See dimension drawings
	Electrical connections	<ul style="list-style-type: none"> • Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11 • M12 connector • 2 or 3-wire (0.5 mm²) cable ($\varnothing \pm 5.4 \text{ mm}$) • Quickon cable quick screw connection
	Wetted parts materials	
	• Measuring cell	Stainless steel, mat.-No. 1.4016
	• Process connection	Stainless steel, mat. No. 1.4404 (SST 316 L)
	Non-wetted parts materials	
	• Enclosure	Stainless steel, mat. No. 1.4404 (SST 316 L)
	• Rack	Plastic
	• cables	PVC
Certificates and approvals	Classification according to pressure equipment directive (PED 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice)
	Lloyd's Register of Shipping (LR)	12/20010
	Germanischer Lloyd (GL)	GL19740 11 HH00
	American Bureau of Shipping (ABS)	ABS_11_HG 789392_PDA
	Bureau Veritas (BV)	BV 271007A0 BV
	Det Norske Veritas (DNV)	A 12553
	Drinking water approval (ACS)	ACS 11 ACC NY 055
	GOST	GOST-R
	Underwriters Laboratories (UL)	
	• for USA and Canada	UL 20110217 - E34453
	• worldwide	IEC UL DK 21845
Explosion protection	Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
	EC type-examination certificate	SEV 10 ATEX 0146
	Connection to certified intrinsically-safe resistive circuits with maximum values:	$U_i \leq 30 \text{ V DC}$; $I_i \leq 100 \text{ mA}$; $P_i \leq 0.75 \text{ W}$
	Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	$L_i = 0 \text{ nH}$; $C_i = 0 \text{ nF}$