automatyka

BD SENSORS
pressure measurement

HMP 331

Process Pressure Transmitter

- piezoresistive stainless steel sensor
- HART® protocol
- accuracy (at nominal range): 0.05 % FSO BFSL (0.1 % FSO IEC 60770)
- nominal pressure ranges from 0 ... 100 mbar up to 0 ... 600 bar

The HMP 331 connects successfully used analogue sensor technology with up-to-date microprocessor electronics.

Basic elements of the HMP 331 are the stainless steel pressure sensors DSP 401/404. The sensor signal is digitised in a 16-bit A/D converter. Thermal errors and non-linearity of the sensor are actively compensated by the microprocessor electronics. Then a D/A converter creates the standard output signal 4 ... 20 mA which is overlaid with a signal according to HART® protocol.

Pressure sensor and microprocessor electronics are mounted shock and vibration resistant in an aluminium die cast field housing with stainless steel pressure port. The electrical connection is made via terminal clamps inside the field housing. Due to the robust mechanical construction and protection class IP 67 the HMP 331 is especially suited for use in rough conditions. It can be used with all media compatible with stainless steel 1.4571 (316Ti) or 1.4435 (316L), respectively.

Preferred areas of use are:

- process engineering
- environmental technology
- budget measurement

Characteristics

- field housing, aluminium die cast
- small thermal effect
- good long term stability
- option Ex: II 1 G EEx ia IIC T4 (TÜV 03 ATEX 2006 X)
- customer specific versions:
  - special pressure ranges
  - other versions on request

CE Ex HART

HMP 331
Process Pressure Transmitter

TÜV CERT DIN EN ISO 9001

HMP 331

Process Pressure Transmitter — Technical Data

Input pressure range

Nominal pressure gauge	[bar]	-1 ... 0	0.1	0.3	1	3	7	17	40
Nominal pressure abs.	[bar]	-	0.1	0.3	1	3	7	17	40
Permissible overpressure	[bar]	3	0.5	1	3	10	20	60	100

Nominal pressure gauge. [1]	[bar]	70	170	350	600
Nominal pressure abs.	[bar]	70	170	350	600
Permissible overpressure	[bar]	140	340	600	1000

Output signal / Supply

Standard	2-wire: 4 ... 20 mA (with overlaid HART® signal) / V_S = 12 ... 36 V_{DC}	Ex-protection: V_S = 12 ... 28 V_{DC}
	for adjusting the following parameters (interface / software necessary): Offset: 0 ... 80 % FSO Span: 1:10 Damping: 0 ... 99.9 s	

Performance

Accuracy [2]	≤ ± (0.08 + 0.02 x nominal range / adjusted range) % FSO (BFSL: ≤ ± (0.04 + 0.01 x nominal range / adjusted range) % FSO)
Permissible load	min. 250 Ω (for communication)
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ
Long term stability	≤ ± (0.1 x nominal range / adjusted range) % FSO / year
Damping	response time: 300 ms additional electronic damping is adjustable up to 99.9 s

Thermal errors (Offset and Span)

Tolerance band	≤ ± (0.2 x nominal range / adjusted range) % FSO
TC, average	± (0.02 x nominal range / adjusted range) % FSO / 10 K
in compensated range	-20 ... 80 °C

Electrical protection

Short-circuit protection	permanent
Reverse polarity protection	no damage, but also function
Electromagnetic compatibility	emission and immunity according to EN 61326
Option Ex-protection DX13-HMP 331	II 1 G EEx ia IIC T4 safety technical maximum values: V_i = 28 V, I_i = 93 mA, P_i = 660 mW

Permissible temperatures

Medium	-25 ... 125 °C
Electronics / environment	-25 ... 85 °C
Storage	-40 ... 125 °C

Mechanical stability

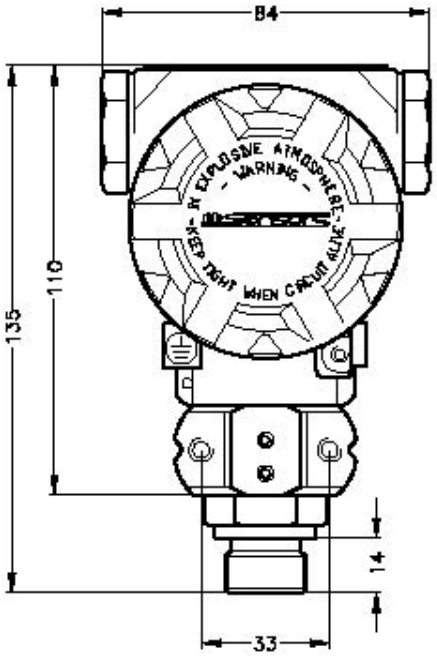
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms

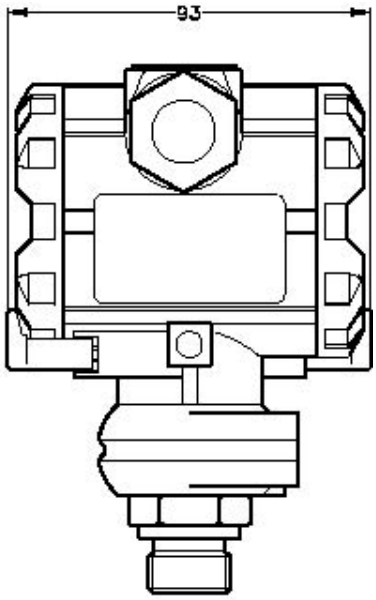
[1] measurement starts with ambient pressure

[2] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

Mechanical connection

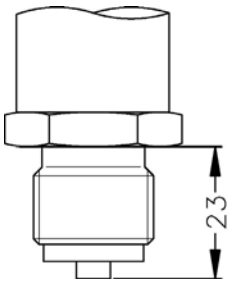
Standard



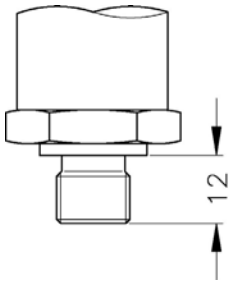


G1/2“ DIN 3852
M20x1.5

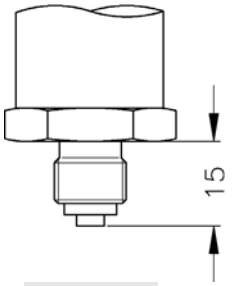
Optional



G1/2“ EN 837
M20x1.5

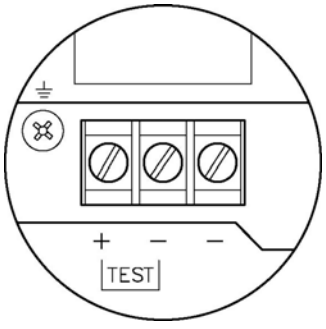


G1/4“ DIN 3852
M10x1
M12x1
M12x1.5



G1/4“ EN 837

Electrical connection



terminal clamp

Materials

Pressure port	stainless steel 1.4571 (316Ti)
Housing	aluminium die cast
Seals (media wetted)	P_N < 100 bar: FKM $P_N \geq$ 100 bar: NBR others on request
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous

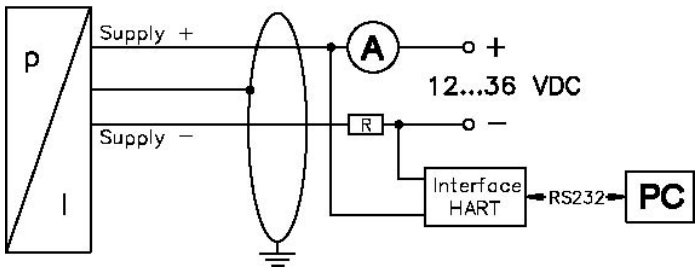
Current consumption	max. 25 mA
Weight	approx. 1 kg
Installation position	any [3]
Operational life	> 100 x 10^6 cycles

Pin configuration

Electrical connection		terminal
2-wire-system	Supply +	+
	Supply –	-
	Test [4]	- (middle)
	Ground	ground contact

Wiring diagrams

2-wire-system (current) HART®



[3] Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges $P_N \leq 1$ bar.

[4] by connecting the terminals Supply + and Test, the output signal can be measured **without** disconnecting the power supply

Ordering code HMP 331

HMP 331 □□□-□□□□-□-□-□□□-□-□□□

Pressure																	
	gauge [1]	1	5	0													
	absolut	1	5	1													
Input	[bar]																
	0,10				1	0	0	0									
	0,30				3	0	0	0									
	1,0				1	0	0	1									
	3,0				3	0	0	1									
	7,0				7	0	0	1									
	17				1	7	0	2									
	40				4	0	0	2									
	70				7	0	0	2									
	170				1	7	0	3									
	350				3	5	0	3									
	600				6	0	0	3									
	-1 ... 0				X	1	0	2									
	customer				X	X	X	X									
Output																	
	HART®-communication 4 ... 20 mA / 2-wire								H								
	HART®-communication Intrinsic safety for zone 1 / 4 ... 20 mA / 2-wire								I								
	customer								X								
Accuracy (at nominal pressure)																	
	0,1 %									1							
	0,2 %									B							
	customer									X							
Mechanical Connection																	
	G1/2" DIN 3852										1	0	0				
	G1/2" EN 837										2	0	0				
	G1/4" DIN 3852										3	0	0				
	G1/4" EN 837										4	0	0				
	customer										X	X	X				
Seals																	
for P_N < 100 bar	FKM													1			
for P_N = 100 bar	NBR													5			
	customer													X			
Special version																	
	standard														0	0	0
	customer														X	X	X

[1] measurement starts with ambient pressure

HART® is a registered trade mark of HART Communication Foundation

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