



Pressure transmitter

HDA 4400

Hydrogen, Ex applications
ATEX, IECEx, dual approval
Intrinsically safe, Non-sparking

Relative pressure

Accuracy 0.5 %



Features

- Specially designed for the measurement of hydrogen
- Parts in contact with the fluid: 1.4435 with a Ni content $\geq 13\%$ (316L)
- ATEX, IECEx, dual approval
- Ignition protection type: Intrinsically safe, Non-sparking

Description

The pressure transmitter series HDA 4400 has been specially developed for measuring tasks with hydrogen. The transmitters are based on a robust, long-life sensor cell with a thin-film strain gauge on a stainless steel membrane. The sensor cell is welded to the process connection, there are no internal seals. The compatibility with hydrogen is ensured by using a particular material. All hydrogen-wetted parts are made of stainless steel 1.4435 with a Ni content of $\geq 13\%$.

The pressure transmitters are applicable in potentially explosive atmospheres, and for this purpose, they are approved for the ignition protection types "intrinsically safe" and "non-sparking" according to ATEX and IECEx.

Application fields

The applications can be found throughout the hydrogen cycle, beginning with systems for hydrogen production (i.e. electrolysers) through to systems for hydrogen fueling stations, but also in test stands for hydrogen system components etc.

ATEX	I M2	Ex ia I Ma
	II 1G	Ex ia IIC T6 Ga
	II 1/2G	Ex ia IIC T6 Ga/Gb
	II 2G	Ex ia IIC T6 Gb
	II 1D	Ex ia IIIC T85 °C Da
	II 3G	Ex nA IIC T6, T5, T4 Gc
	II 3G	Ex ic IIC T6, T5, T4 Gc
	II 3D	Ex ic IIIC T80 °C, T90 °C, T100 °C Dc

IECEx	Ex ia I Ma
	Ex ia IIC T6 Ga
	Ex ia IIC T6 Ga/Gb
	Ex ia IIC T6 Gb
	Ex ia IIIC T85 °C Da
	Ex nA IIC T6, T5, T4 Gc
	Ex ic IIC T6, T5, T4 Gc
Ex ic IIIC T80 °C, T90 °C, T100 °C Dc	

Technical details

Input data												
Measuring ranges	bar	16	25	40	60	100	200	250	400	500	600	1050
Overload pressures	bar	50	50	80	120	200	500	500	800	1000	1000	1400
Burst pressure	bar	125	125	200	300	500	1250	1250	2000	3000	3000	3000
Mechanical connection (Tightening torque, recommended)	SF250CX20, Autoclave (7/16-20 UNF 2B) (15 Nm for measuring range ≤ 600 bar; 20 Nm for measuring range 1050 bar) G 1/4 B DIN EN 837 (20 Nm for measuring range ≤ 600 bar; 40 Nm for measuring range 1050 bar)											
Parts in contact with the fluid	Stainless steel	1.4435 (Ni content ≥ 13 %)										
	Measurement cell	gold-plated										
	Seal	Copper (Cu-DHP) (G 1/4 B)										
Output data												
Output signal, permitted load resistance	4 .. 20 mA, 2-conductor, $R_{Lmax} (U_B - 12 V) / 20 mA [k\Omega]$											
Accuracy acc. to DIN 16086, terminal based	≤ ± 0.5 % FS typ. ≤ ± 1 % FS max.											
Accuracy, B.F.S.L	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.											
Temperature compensation zero point	≤ ± 0.015 % FS / °C typ. ≤ ± 0.025 % FS / °C max.											
Temperature compensation span	≤ ± 0.015 % FS / °C typ. ≤ ± 0.025 % FS / °C max.											
Non-linearity acc. to DIN 16086, terminal based	≤ ± 0.3 % FS max.											
Hysteresis	≤ ± 0.4 % FS max.											
Repeatability	≤ ± 0.1 % FS											
Rise time	≤ 2 ms											
Long-term drift	≤ ± 0.3 % FS typ. / year											
Environmental conditions												
Compensated temperature range	-25 .. +85 °C											
Operation / ambient / fluid temperature range ¹⁾	T6, T80/T85 °C	Ta = -40 to +60 °C										
	T5, T90 °C	Ta = -40 to +70 °C										
	T100 °C	Ta = -40 to +80 °C										
	T4	Ta = -40 to +85 °C										
Storage temperature range	-40 .. +100 °C											
CE mark	EN 61006-6-1 / 2 / 3 / 4; EN 60079-0 / 11 / 15 / 26; EN 50303											
Vibration resistance to DIN EN 60068-2-6 at 10 .. 500 Hz	≤ 20 g											
Protection type to DIN EN 60529 ²⁾	IP 67											
Relevant data for Ex applications					Ex ia, ic				Ex nA			
Supply voltage	12 ..28 V DC				12 ..28 V DC							
Max. input current	Ii = 100 mA											
Maximum input power	Pi = 1 W								max. power consumption ≤ 1 W			
Connection capacitance of the sensor	Ci ≤ 22 nF											
Inductance of the sensor	Li = 0 mH											
Insulation voltage	50 V AC, with integrated overvoltage protection to EN 61000-6-2											
Other data												
Residual ripple of supply voltage	≤ 5 %											
Current consumption	≤ 25 mA											
Life expectancy	> 10 million load cycles (0 .. 100 % FS)											
Weight	~ 150 g											

Note: Reverse polarity protection of the supply voltage, overvoltage, override and short circuit protection are provided.

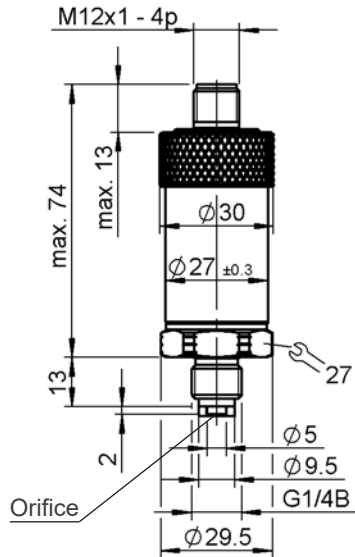
FS (Full Scale) = relative to complete measuring range

B.F.S.L. = Best Fit Straight Line

¹⁾ For instruments with an M12x1 connector the temperature at the electrical connection may not be lower than -25 °C.

²⁾ With mounted mating connector in corresponding protection type

Dimensions



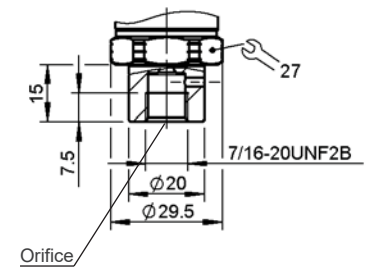
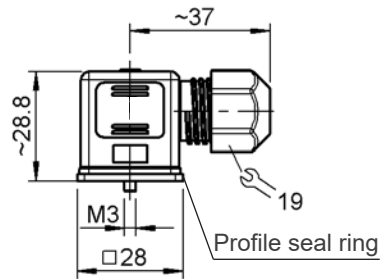
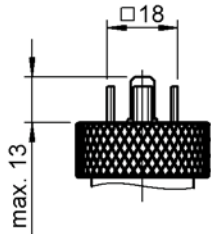
Electrical Connection Variants

Male connector EN175301-803, 3 pole + PE

Related mating connector ZBE01
(included in delivery)

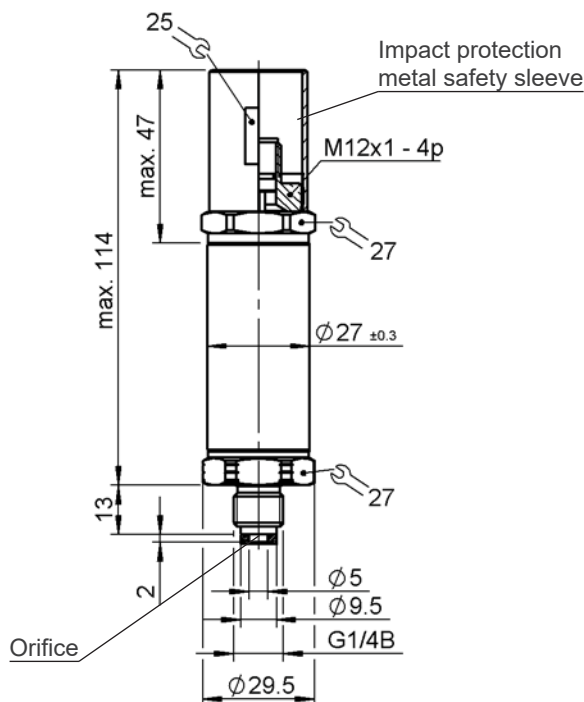
Mechanical Connection Variants

SF250CX20 Autoclave
(7/16-20 UNF 2B female thread)



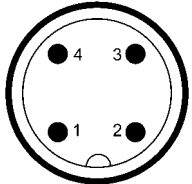
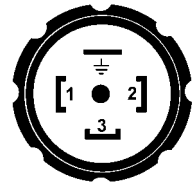
With impact protection metal safety sleeve:

Protection types and applications (code): 9



The impact protection metal safety sleeve is included in delivery. A straight mating connector is required for electrical connection. E.g. mating connector M12x1, 4 pole, straight, with 3 m shielded cable: ZBE 06S-03, Part.no. 6098243

Pin connections

M12x1, 4 pole	Pin	Output signal: A	EN 175301-803, 3 pole + PE	Pin	Output signal: A
	1	Signal +		1	Signal +
	2	n.c.		2	Signal -
	3	Signal -		3	n.c.
	4	n.c.		┴	Housing

Model code

HDA 4 4X X - A - XXXX - E N X - H00

Mechanical connection

C = SF250CX20, Autoclave (7/16-20 UNF 2B)
G = G1/4 B DIN EN 837

Electrical connection

5 = Male connector EN 175301-803, 3 pole + PE (IP 67 mating connector included)
6 = Male connector M12X1, 4 pole (mating connector not included)

Output signal

A = 4 .. 20 mA, 2 -conductor

Measuring ranges in bar

0016; 0025; 0040; 0060; 0100; 0200; 0250; 0400; 0500; 0600; 1050

Approval

E = ATEX; IECEx

Insulation voltage

N = 50 V AC to housing

Protection types and application fields (code)

(see table below)

Modification number

H00 = for hydrogen applications

Code no. - Model Code	ATEX KEMA 05 ATEX 1016X	IECEX KEM 08.0014X	Application fields	Electrical connection (see model code)
1 =	I M1 Ex ia I Ma II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 1D Ex ia IIIC T85 °C Da	Ex ia I Ma Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex ia IIIC T85 °C Da	Mining protection type: intrinsically safe ia with barrier Gases / conductive dusts protection type: intrinsically safe ia with barrier	5, 6
9¹⁾ =	II 3G Ex nA IIC T6,T5 Gc	Ex nA IIC T6,T5 Gc	Gases protection type: non-sparking nA	6
C =	II 3G Ex ic IIC T6,T5 Gc II 3D Ex ic IIIC T80 °C, T90 °C Dc	Ex ic IIC T6,T5 Gc Ex ic IIIC T80 °C, T90 °C Dc	Gases / conductive dusts protection type: intrinsically safe ic with barrier	5, 6

Note:

¹⁾ Only in conjunction with electric output "6" and the impact protection metal safety sleeve (see also dimensions).
Devices for other protection types are available on request.

Note

The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

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