Pressure Transmitter
HDA 4700 Ex applications

Relative pressure | **Accuracy 0.25 %**

Intrinsically Safe, Dustproof enclosure
Non-Sparking
ATEX, IECEx, double approval
redundant

Description:

This version of the pressure transmitter HDA 4700 has been specially developed to increase availability in units and systems in potentially explosive atmospheres.

Thanks to the use of two highly accurate and robust sensor cells with thin-film strain gauge on a stainless steel membrane in combination with redundant electronics, the device has a fully redundant architecture.

The two output signals are output in inverted form (signal 1: 4 .. 20 mA, signal 2: 20 .. 4 mA). This means that the energy in the intrinsically safe current circuit is kept low as the total current of the output signals at any pressure is 24 mA.
Connection is via a two-channel barrier.

The double approval in accordance with ATEX and IECEx enables universal, almost worldwide utilisation of the devices in potentially explosive atmospheres.

Thanks to the redundant structure, the sensor is also suitable for safety circuits/safety functions in the oil and gas industry. The device is also used in mining applications as well as in locations with high dust contamination.

Protection types and applications:

ATEX

I M1 Ex ia I Ma
II 1G Ex ia IIC T6,T5 Ga
II 1/2 G Ex ia IIC T6,T5 Ga/Gb
II 2 G Ex ia IIC T6,T5 Gb
II 1D Ex ia IIIC T85 °C/T95 °C Da
II 1D Ex ta IIIC T85/95/105 °C
T_{500}T120/ T_{500}T130/ T_{500}T140 °C Da
II 2D Ex tb IIIC T85/T95/T105 °C Db
II 3G Ex nA IIC T6, T5, T4 Gc
II 3G Ex ic IIC T6, T5, T4 Gc
II 3D Ex tc IIIC T85/T95/T105 °C Dc
II 3D Ex ic IIIC T85/T95/T105 °C Dc

IECEx

Ex ia I Ma
Ex ia IIC T6,T5 Ga
Ex ia IIC T6,T5 Ga/Gb
Ex ia IIC T6,T5 Gb
Ex ia IIIC T85/T95 °C Da
Ex ta IIIC T85/T95/T105 °C Da
T_{500}T120/ T_{500}T130/T_{500}T140 °C Da
Ex tb IIIC T85/T95/T105 °C Db
Ex nA IIC T6,T5,T4 Gc
Ex ic IIC T6,T5,T4 Gc
Ex tc IIIC T85/T95/T105 °C Dc
Ex ic IIIC T85/T95/T105 °C Dc

Technical data:

Input data								
Measuring range Signal 1	bar	40	60	100	160	250	400	600
Measuring range Signal 2	bar	40/60	60/100	100/160	160/250	250/400	400/600	600/1000
Overload pressures	bar	80	120	200	320	500	800	1200
Burst pressure	bar	200	300	500	800	1250	2000	2000
Mechanical connection		G1/4 A ISO 1179-2						
Tightening torque, recommended		20 Nm						
Parts in contact with fluid		Stainless steel: 1.4542; 1.4571; 1.4435; 1.4404; 1.4301; 1.4548 Seal: FKM						
Housing material		1.4404						
Output data								
Output signal 1 Output signal 2 Permitted load resistance, each		4 .. 20 mA, 2-conductor 20 .. 4 mA, 2-conductor $R_{Lmax} = (U_B - 12\ V) / 20\ mA\ [k\Omega]$						
Accuracy acc. to DIN 16086, terminal based		≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.						
Accuracy, B.F.S.L.		≤ ± 0.15 % FS typ. ≤ ± 0.25 % FS max.						
Temperature compensation Zero point		≤ ± 0.008 % FS / °C typ. ≤ ± 0.015 % FS / °C max.						
Temperature compensation Span		≤ ± 0.008 % FS / °C typ. ≤ ± 0.015 % FS / °C max.						
Non-linearity acc. to DIN 16086 terminal based		≤ ± 0.3 % FS max.						
Hysteresis		≤ ± 0.1 % FS max.						
Repeatability		≤ ± 0.05 % FS						
Rise time		≤ 2 ms						
Long-term drift		≤ ± 0.1 % FS typ. / year						
Environmental conditions								
Compensated temperature range		-25 .. +85 °C						
Operating/ambient temperature range [1) 2)]		T6, T85 °C, T_{500}T120 °C T5, T95 °C, T_{500}T130 °C T105 °C, T_{500}T140 °C T4			Ta = -25 .. 60 °C / -20 .. 60 °C Ta = -25 .. 70 °C / -20 .. 70 °C Ta = -25 .. 80 °C / -20 .. 80 °C Ta = -25 .. 85 °C / -20 .. 85 °C			
Storage temperature range		-40 .. +100 °C						
Fluid temperature range [1) 2)]		T6, T85 °C, T_{500}T120 °C T5, T95 °C,T_{500}T130 °C T105 °C, T_{500}T140 °C T4			Ta = -25 .. 60 °C / -20 .. 60 °C Ta = -25 .. 70 °C / -20 .. 70 °C Ta = -25 .. 80 °C / -20 .. 80 °C Ta = -25 .. 85 °C / -20 .. 85 °C			
CE mark		EN 61000-6-1/2/3/4; EN 60079-0/11/15/26/31; EN 50303						
Vibration resistance acc. to DIN EN 60068-2-6 at 10 .. 500 Hz		≤ 20 g						
Protection class acc. to DIN EN 60529 [3)]		IP 67						
Relevant data for Ex applications		**Ex ia, ic**				**Ex nA, ta, tb, tc**		
Supply voltage		12 .. 28 V DC				12 .. 28 V DC		
Max. input current		Ii = 100 mA						
Max. input power		Pi = 0.7 W				Max. power consuption ≤ 1 W		
Connection capacitance of the sensor		Ci ≤ 22 nF						
Inductance of the sensor		Li = 0 mH						
Intrinsic safety barrier		2-channel, R_{min} = 280 Ω (e.g. Pepperl & Fuchs Z789)						
Insulation voltage [4)]		50 V AC, with integrated overvoltage protection acc. to EN 61000-6-2						
Other data								
Residual ripple of supply voltage		≤ 5 %						
Current consumption		≤ 25 mA						
Life expectancy		> 10 million cycles (0 .. 100 % FS)						
Weight		~ 300 g						

Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.
FS (**F**ull **S**cale) = relative to complete measuring range; **B.F.S.L.** = **B**est **F**it **S**traight **L**ine

[1)] -20 °C with FKM seal, -25 °C on request
[2)] With M12x1 male connector, only up to -25 °C
[3)] With mounted mating connector in corresponding protection class
[4)] 500 V AC on request

Fields of application:

Code no. for use in model code	1			9	A	C
ATEX KEMA 05 ATEX 1016X	I M1 Ex ia I Ma	II 1G Ex ia IIC T6, T5 Ga II 1/2G Ex ia IIC T6, T5 Ga/Gb II 1D Ex ia IIIC T85/T95 °C Da	II 2G Ex ia IIC T6, T5 Gb	II 3G Ex nA IIC T6, T5 Gc	II 1D Ex ta IIIC T85/T95 °C II 2D Ex tb IIIC T85/T95 °C Db	II 3G Ex ic IIC T6, T5 Gc II 3D Ex ic IIIC T85/T95 °C Dc
IECEx KEM 08.0014X	Ex ia I Ma	Ex ia IIC T6, T5 Ga Ex ia IIC T6, T5 Ga/Gb Ex ia IIIC T85/T95 °C Da	Ex ia IIC T6, T5 Gb	Ex nA IIC T6, T5 Gc	Ex ta IIIC T85/T95 °C Ex tb IIIC T85/T95 °C Db	Ex ic IIC T6, T5 Gc Ex ic IIIC T85/T95 °C Dc
Application fields	Mining Protection type: intrinsically safe ia with barrier	Gases/conductive dust Protection type: intrinsically safe ia with barrier	Gases Protection type: intrinsically safe ia with barrier	Gases Protection type: non-sparking nA	Conductive dust Protection type: dustproof enclosure	Gases/conductive dust Protection type: intrinsically safe ic with barrier

Instruments for other protection types and zones (see cover) are available upon request.

Model code:

HDA 4 7 X 6 – AA – XXXX – XXXX – E X X – 000

Mechanical connection
4 = G1/4 A ISO 1179-2

Electrical connection
6 = male M12x1, 4 pole

Output signal
AA = signal 1: 4 .. 20 mA, 2-conductor
signal 2: 20 .. 4 mA, 2-conductor

Measuring ranges signal 1 in bar (max. operating pressure)
0040; 0060; 0100; 0160; 0250; 0400; 0600

Measuring ranges signal 2 in bar
0040; 0060; 0100; 0160; 0250; 0400; 0600; 1000

Approval
E = ATEX / IECEx

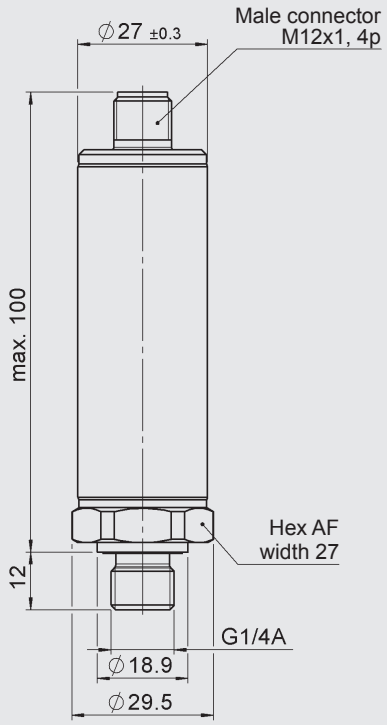
Isolation voltage
N = 50 V AC to housing

Protection types and applications (code)

	ATEX	IECEx
1 =	I M1 Ex ia I Ma	Ex ia I Ma
	II 1G Ex ia IIC T6, T5 Ga	Ex ia IIC T6, T5 Ga
	II 1/2 G Ex ia IIC T6, T5 Ga/Gb	Ex ia IIC T6, T5 Ga/Gb
	II 2 G Ex ia IIC T6, T5 Gb	Ex ia IIC T6, T5 Gb
	II 1D Ex ia IIIC T85/T95 °C Da	Ex ia IIC T85/T95 °C Da
9 =	II 3G Ex nA IIC T6, T5 Gc	Ex nA IIC T6, T5 Gc
	Only in conjunction with electrical connection "6" and the impact protection metal safety sleeve (see dimensions)	
A =	II 1D Ex ta IIIC T85/T95 °C	Ex ta IIIC T85/T95 °C
	II 2D Ex tb IIIC T85/T95 °C Db	Ex tb IIIC T85/T95 °C Db
	Only in conjunction with electrical connection "6" and the impact protection metal safety sleeve (see dimensions)	
C =	II 3G Ex ic IIC T6, T5 Gc	Ex ic IIC T6, T5 Gc
	II 3D Ex ic IIIC T85/T95 °C Dc	Ex ic IIIC T85/T95 °C Dc

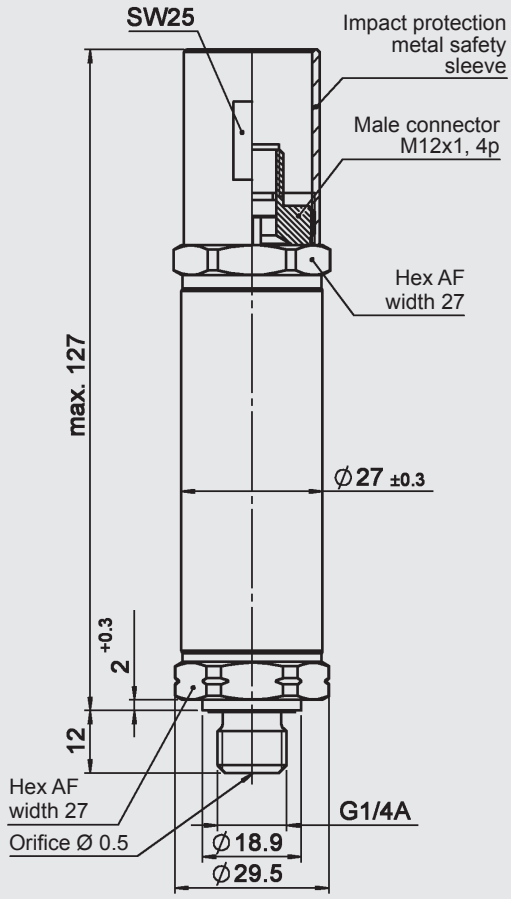
Modification number
000 = standard

Dimensions:



With impact protection metal safety sleeve:

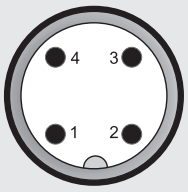
Protection types and applications (code): 9, A



The impact protection metal safety sleeve is included. 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



Pin	HDA 4746-AA
1	+ signal 1 (for output signal 1)
2	- signal 1 (for output signal 1)
3	+ signal 2 (for output signal 2)
4	- signal 2 (for output signal 2)

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.

HYDAC ELECTRONIC GMBH
Hauptstr. 27, 66128 Saarbrücken
Germany
Phone +49 (0)6897 509-01
Fax +49 (0)6897 509-1726
e-mail: electronic@hydac.com
Internet: www.hydac.com