Pressure Transmitter
HDA 4400 Ex applications

Relative pressure | **Accuracy 0.5 %**

Intrinsically Safe, Dustproof enclosure
Non-Sparking
ATEX, IECEx, double approval
Flush membrane
HART interface

Description:

The pressure transmitter HDA 4400 in intrinsically safe version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series. The double approval in accordance with ATEX and IECEx enables universal, almost worldwide utilisation of the devices.

The pressure port is achieved with a fully-sealed stainless steel front membrane filled internally with a pressure transfer fluid. The process pressure is transmitted hydrostatically to the measurement cell via the pressure transfer fluid. In addition to the analogue 4 .. 20 mA output of the measured value, digital communication is possible by means of the HART protocol.

This device is used for applications in which a standard pressure port could become blocked, clogged or frozen by the particular medium used or in processes where the medium changes regularly and any residues could cause mixing or contamination of the media.

Intended fields of application are, for example, in the oil and gas industry, in mining or in locations with high dust contamination, e.g. in mills.

Protection types and applications:

ATEX

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 2 G	Ex ia	IIC T6,T5 Gb
II 1D	Ex ia	IIIC T85/T95 °C Da
II 1D	Ex ta	IIIC T80/90/100 °C T_{500}90/ T_{500}100/ T_{500}110 °C Da
II 2D	Ex tb	IIIC T80/T90/T100 °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 T80/T90/T100 °C Dc
II 3D	Ex ic	IIIC T80/T90/T100 °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 T80/T90/T100 °C T_{500}90/ T_{500}100/T_{500}110 °C Da
Ex tb	IIIC T80/T90/T100 °C Db
Ex nA	IIC T6,T5,T4 Gc
Ex ic	IIC T6,T5,T4 Gc
Ex tc	IIIC T80/T90/T100 °C Dc
Ex ic	IIIC T80/T90/T100 °C Dc

Technical data:

Input data												
Measuring ranges	bar	4	6	10	16	25	40	100	250	400	600	-1..3
Overload pressures	bar	8	12	20	32	50	80	200	500	800	1000	8
Burst pressure	bar	20	30	50	80	125	200	500	1000	2000	2000	20

Mechanical connection	G1/2 A ISO 1179-2 G1/2 with additional front O-ring seal G1/4 with additional front O-ring seal	
Tightening torque, recommended	20 Nm (G 1/4); 45 Nm (G 1/2)	
Parts in contact with fluid	Stainless steel:1.4435; 1.4301 Seal: FKM, O-ring: FKM	
Pressure transfer fluid	Silicone-free oil	
Output data		
Output signal, permitted load resistance	4 .. 20 mA, 2-conductor, with HART protocol $R_{Lmax} = (U_B - 12\ V) / 20\ mA\ [k\Omega]$ for HART communication min. 250 Ω	
	HART communication acc. to HART 7 specifications	
	HART Common Practice Commands e.g. Altering of measuring range limits (see table), Zero point adjustment within max. 3 % of the span	
Accuracy acc. to DIN 16086, terminal based	≤ ± 0.5 % FS typ. ≤ ± 1.0 % 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	≤ 25 ms	
Long-term drift	≤ ± 0.3 % FS typ. / year	
Environmental conditions		
Compensated temperature range	-25 .. +85 °C	
Operating/ambient/ fluid temperature range [1) 2)]	T6, T80/T85 °C, T_{500}90 °C T5, T90/T95 °C,T_{500}100 °C T100 °C, T_{500}110 °C T4	Ta = -30 .. +60 °C/-20 .. +60 °C Ta = -30 .. +70 °C/-20 .. +70 °C Ta = -30 .. +80 °C/-20 .. +80 °C Ta = -30 .. +85 °C/-20 .. +85 °C
Storage temperature range	-40 .. +100 °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 consumption ≤1W
Connection capacitance of the sensor	Ci ≤ 22 nF	
Inductance of the sensor	Li = 0 mH	
Insulation voltage [4)]	50 V AC, with integrated overvoltage protection acc. to EN 61000-6-2	

Other data	
Residual ripple of supply voltage	acc. to FSK Physical Layer Specification (HCF_SPEC-054)
Current consumption	≤ 25 mA
Life expectancy	> 10 million cycles (0 .. 100 % FS)
Weight	180 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, -30 °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

Measuring range limits:

By means of HART Common Practice Commands, you have the opportunity to adjust the following measuring ranges:

Lower measuring range limit		Upper measuring range limit		Measuring span	
min	max	min	max	min	max
0 % FS	112.5 % FS	37.5 % FS	150 % FS	37.5 % FS	150 % FS

Fields of application:

Code no. for use in model code	1			9	A	C
ATEX DEKRA 13ATEX0031X DEKRA 13ATEX0032	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 T80/T90 °C T_{500}T90/T_{500}T100 °C Da II 2D Ex tb IIIC T80/T90 °C Db	II 3G Ex ic IIC T6, T5 Gc II 3D Ex ic IIIC T80/T90 °C Dc
IECEx DEK 14.0011X	Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIIC T85 °C Da	Ex ia IIC T6,T5 Gb	Ex nA IIC T6,T5 Gc	Ex ta IIIC T80/T90 °C T_{500}T90/T_{500}T100 °C Da Ex tb IIIC T80/T90 °C Db	Ex ic IIC T6,T5 Gc Ex ic IIIC T80/T90 °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
Electrical connection (see model code)	5, 6	5, 6	5, 6	6	6	5, 6

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

Model code:

HDA 4 4 Z X – F21 – XXXX – GXX – E N X – 000

Mechanical process connection
Z = flush membrane

Electrical connection
5 = male, EN 175301-803, 3 pole +PE (IP 67 mating connector supplied)
6 = male M12x1, 4 pole (mating connector not supplied)

Output signal
F21 = 4 .. 20 mA, 2-conductor, with HART protocol

Measuring ranges in bar
04.0; 06.0; 0010; 0016; 0025; 0040; 0060; 0100; 0250; 0400; 0600
0003 (-1 .. 3)

Mechanical connection
G01 = G1/2 A ISO 1179-2
G02 = G1/2 with additional front O-ring seal
G04 = G1/4 with additional front O-ring seal (only measuring ranges 0040; 0100; 0250; 0400 and 0600)

Approval
E = ATEX
IECEx

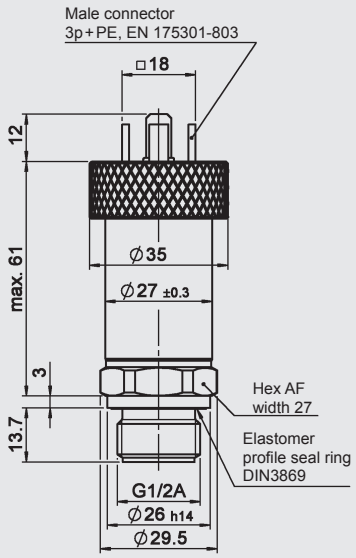
Insulation voltage
N = 50 V AC to housing

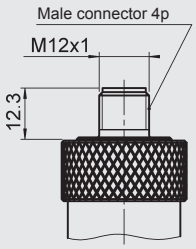
Protection types and applications (code)

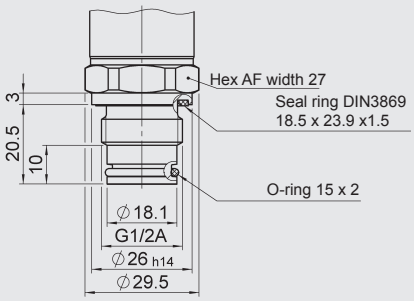
	ATEX	IECEx
1 =	I M1 Ex ia I Ma	Ex ia I Ma
	II 1G Ex ia IIC T6,T5 Ga	Ex ia IIC T6,T5 Ga
	II 1/2 G Ex ia IIC T6,T5 Ga/Gb	Ex ia IIC T6,T5 Ga/Gb
	II 2 G Ex ia IIC T6,T5 Gb	Ex ia IIC T6,T5 Gb
	II 1D Ex ia IIIC T85/T95 °C Da	Ex ia IIIC T85/T95 °C Da
9 =	II 3G Ex nA IIC T6, T5 Gc	Ex nA IIC T6, T5 Gc
	Only in conjunction with electr. connection "6" and the impact protection metal safety sleeve (see dimensions)	
A =	II 1D Ex ta IIIC T80/T90 °C T_{500}90/ T_{500}100°C Da	Ex ta IIIC T80/T90 °C T_{500}90/ T_{500}100 °C Da
	II 2D Ex tb IIIC T80/T90 °C Db	Ex tb IIIC T80/T90 °C Db
	Only in conjunction with electr. 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 T80/T90 °C Dc	Ex ic IIIC T80/T90 °C Dc

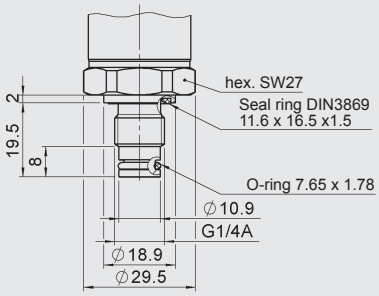
Modification number
000 = standard

Dimensions:



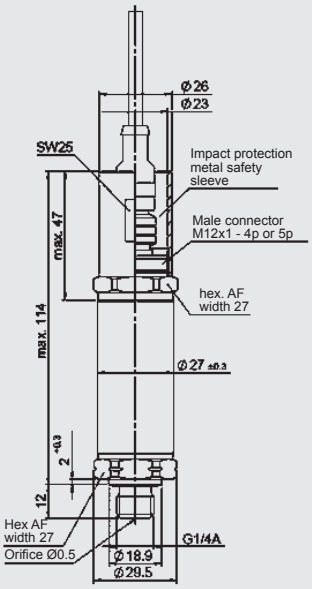






With impact protection metal safety sleeve:

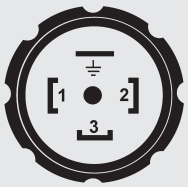
Protection types and applications (code): 9, A



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

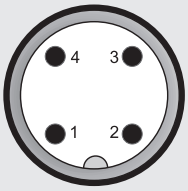
Pin connections:

EN 175301-803



Pin	HDA 4425-F21
1	Signal +
2	Signal -
3	n. c.
⊥	PE

M12x1



Pin	HDA 4426-F21
1	Signal +
2	n. c.
3	Signal -
4	n. c.

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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