



## Pressure Transmitter HDA 4100 Ex applications

Absolute pressure Accuracy 0.5 %

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



### Description:

The pressure transmitter HDA 4100 with HART interface is a compact pressure transmitter (intrinsically safe version) which is used to measure absolute pressures in hydraulics and pneumatics. The double approval in accordance with ATEX and IECEx enables universal, almost worldwide utilisation of the devices in potentially explosive atmospheres.

As with the industry model, the ATEX/IECEx version HDA 4100 has a ceramic measurement cell with thick-layer strain gauge.

In addition to the analogue 4 .. 20 mA output of the measured value, digital communication is possible by means of the HART protocol.

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

### Protection types and applications:

#### ATEX

II 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	T80/90/100 °C
			T <sub>500</sub> 90/T <sub>500</sub> 100/T <sub>500</sub> 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 <sub>500</sub> 90/T <sub>500</sub> 100/T <sub>500</sub> 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	1	2.5
Overload pressures	bar	3	8
Burst pressure	bar	5	12
Mechanical connection	G1/4 A ISO 1179-2		
Tightening torque, recommended	20 Nm		
Parts in contact with fluid	Sensor: Ceramic Mech. connection: 1.4301 Seal: FKM / EPDM		

#### Output data

Output signal, permitted load resistance	4 .. 20 mA, 2-conductor, with HART protocol $R_{L,max} = (U_B - 12 V) / 20 mA [k\Omega]$ for HART communication min. 250 $\Omega$		
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	$\leq \pm 0.5 \% FS$ typ. $\leq \pm 1 \% FS$ max.		
Accuracy, B.F.S.L.	$\leq \pm 0.25 \% FS$ typ. $\leq \pm 0.5 \% FS$ max.		
Temperature compensation Zero point	$\leq \pm 0.02 \% FS / ^\circ C$ typ. $\leq \pm 0.03 \% FS / ^\circ C$ max.		
Temperature compensation Span	$\leq \pm 0.02 \% FS / ^\circ C$ typ. $\leq \pm 0.03 \% FS / ^\circ C$ max.		
Non-linearity acc. to DIN 16086, terminal based	$\leq \pm 0.5 \% FS$ max.		
Hysteresis	$\leq \pm 0.4 \% FS$ max.		
Repeatability	$\leq \pm 0.1 \% FS$		
Rise time	$\leq 25 ms$		
Long-term drift	$\leq \pm 0.3 \% FS$ typ. / year		

#### Environmental conditions

Compensated temperature range	-25 .. +85 °C		
Operating/ambient temperature range <sup>1)2)</sup>	T6, T80/T85 °C, T <sub>500</sub> 90 °C T5, T90/T95 °C, T <sub>500</sub> 100 °C T100, T <sub>500</sub> 110 °C T4	Ta = -20 .. +60 °C Ta = -20 .. +70 °C Ta = -20 .. +80 °C Ta = -20 .. +85 °C	
Storage temperature range	-40 .. +100 °C		
Fluid temperature range <sup>1)2)</sup>	T6, T80/T85 °C, T <sub>500</sub> 90 °C T5, T90/T95 °C, T <sub>500</sub> 100 °C T100 °C, T <sub>500</sub> 110 °C T4	Ta = -20 .. +60 °C Ta = -20 .. +70 °C Ta = -20 .. +80 °C Ta = -20 .. +85 °C	

#### CE mark

Vibration resistance acc. to DIN EN 60068-2-6 at 10 .. 500 Hz	$\leq 20 g$	
Protection class acc. to DIN EN 60529 <sup>3)</sup>	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	li = 100 mA	
Max. input power	Pi = 0.7 W	Max. power consumption $\leq 1 W$
Connection capacitance of the sensor	Ci $\leq 22 nF$	
Inductance of the sensor	Li = 0 mH	
Insulation voltage <sup>4)</sup>	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	$\leq 25 mA$
Life expectancy	> 10 million cycles (0 .. 100 % FS)
Weight	$\sim 150 g$

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

FS (Full Scale) = relative to complete measuring range

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

<sup>1)</sup> -20 °C with FKM seal or EPDM seal, -40 °C on request

<sup>2)</sup> With M12x1 male connector, only up to -25 °C

<sup>3)</sup> With mounted mating connector in corresponding protection class

<sup>4)</sup> 500 V AC on request

## Measuring range limits:

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

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 <sub>500</sub> T90/T <sub>500</sub> T100°C Da II 2D Ex tb IIIC T80/T90°C Db
IECEX DEK 14.0011X	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 T80/T90°C T <sub>500</sub> T90/T <sub>500</sub> T100°C Da Ex tb IIIC T80/T90°C Db
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
Electrical connection (see model code)	5, 6	5, 6	5, 6	6	5, 6

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

## Model code:

**HDA 4 1 4 X - F21 - XXXX - ENX - 000 - X 1**

### Mechanical connection

4 = G1/4 A ISO 1179-2

### Electrical connection

5 = male, EN175301-803, 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

01.0; 02.5

### 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 Ga
	II 1/2 G Ex ia IIC T6, T5 Ga/Gb	Ex ia IIC T6 Ga/Gb
	II 2 G Ex ia IIC T6, T5 Gb	Ex ia IIC T6 Gb
	II 1D Ex ia IIIC T85/T95 °C Gb Da	Ex ia IIIC T85/T95 °C Gb
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 T80/T90 °C Da T <sub>500</sub> T90/T <sub>500</sub> T100 °C Da	Ex ta IIIC T80/T90 °C Da T <sub>500</sub> T90/T <sub>500</sub> T100 °C Da
	II 2D Ex tb IIIC T80/T90 °C Db	Ex tb IIIC T80/T90 °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 T80/T90 °C Dc	Ex ic IIIC T80/T90 °C Dc

### Modification number

000 = standard

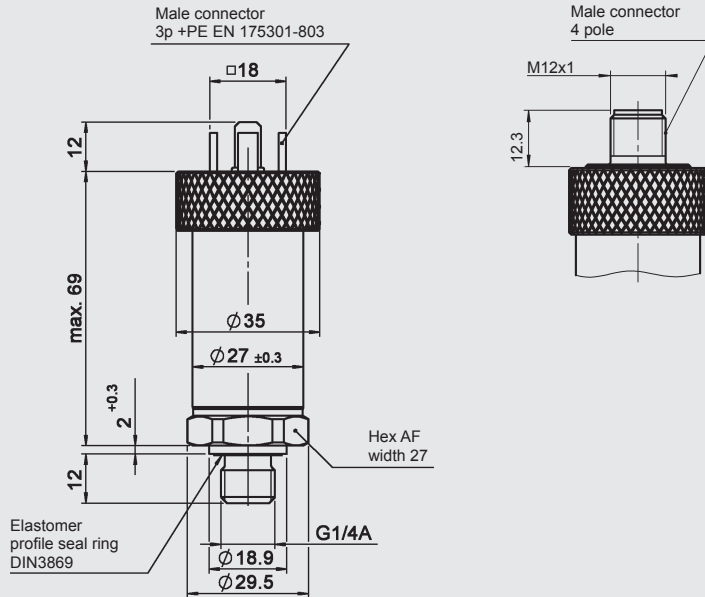
### Sealing material (in contact with fluid)

F = FKM seal (e.g. for hydraulic oils)  
E = EPDM seal (e.g. for refrigerants)

### Connection material (in contact with fluid)

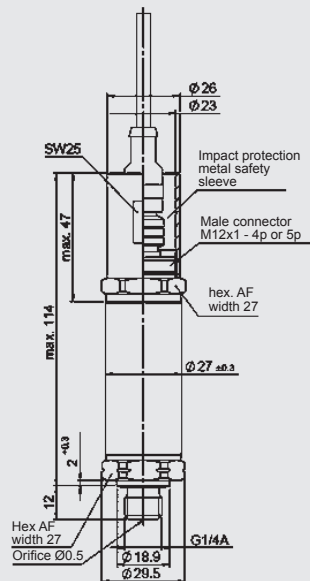
1 = stainless steel

## Dimensions:



## With impact protection metal safety sleeve:

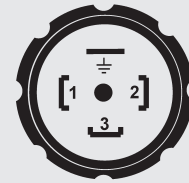
Protection types and applications (code): 9, A



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:

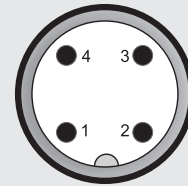
EN175301-803



Pin HDA 4145-F21

1	Signal +
2	Signal -
3	n.c.
L	PE

M12x1



Pin HDA 4146-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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