



## Pressure Transmitter HDA 4700 Ex applications

Relative pressure Accuracy 0.25 %

Flameproof enclosure  
**ATEX, IECEx, CSA, triple approval**  
HART interface  
Optional temperature measurement



### Description:

HDA 4700 with HART interface is a compact pressure transmitter with flameproof enclosure which is used to measure relative pressures in hydraulics and pneumatics. The triple approval in accordance with ATEX, IECEx and CSA enables universal, worldwide utilisation of the devices in potentially explosive atmospheres.

The pressure is measured by means of a very accurate and robust sensor cell with a thin-film strain gauge on a stainless steel membrane. In addition to the analogue 4 .. 20 mA output of the measured value, digital communication is possible by means of the HART protocol.

The instrument provides the option of a temperature sensor. The temperature signal is given out as a digital signal via the HART protocol and the pressure signal is still available as an analogue signal (4 .. 20 mA).

The main fields of application are in the oil & gas industry, e.g. in hydraulic power units, drill drives or valve actuation stations. The device is also used in mining applications as well as in locations with high dust contamination.

### Protection types and applications:

**CSA<sub>US</sub>** Explosionproof - Seal not required  
Class I Group A, B, C, D, T6, T5  
Class II Group E, F, G  
Class III  
Type 4

**ATEX** Flameproof  
I M2 Ex d I Mb  
II 2G Ex d IIC T6, T5 Gb  
II 2D Ex tb IIIC T110 .. 120 °C Db

**IECEx** Flameproof  
Ex d I Mb  
Ex d IIC T6, T5 Gb  
Ex tb IIIC T110 .. 120 °C Db

### Technical data:

#### Input data

Measuring ranges	bar	6	16	40	60	100	250	400	600	1000	1600	2000
Overload pressures	bar	12	32	80	120	200	500	800	1000	1600	2400	3000
Burst pressure	bar	100	100	200	300	500	1000	2000	2000	3000	3000	4000

Mechanical connection	G1/4 A ISO 1179-2 G1/2 B DIN EN 837
Tightening torque, recommended	20 Nm (G1/4 A), 45 Nm (G1/2 B)
Parts in contact with fluid	Stainless steel: 1.4542; 1.4571; 1.4435; 1.4404; 1.4301; 1.4548 Seal: FKM
Conduit, housing material	1.4435; 1.4404

#### Output data

Output signal, permitted load resistance	4 .. 20 mA, 2-conductor, with HART protocol $R_{Lmax} = (U_s - 12 V) / 20 \text{ mA} [\text{k}\Omega]$ for HART communication min. 250 $\Omega$
HART Communication	Acc. to HART 7 specifications
HART Common Practice Commands i.e.	Altering of measuring range limits (see table) Zero point adjustment within max. 3 % of the span
Accuracy acc. to DIN 16086, terminal based	$\leq \pm 0.25 \%$ FS typ. $\leq \pm 0.5 \%$ FS max.
Accuracy, B.F.S.L.	$\leq \pm 0.15 \%$ FS typ. $\leq \pm 0.25 \%$ FS max.
Temperature compensation	$\leq \pm 0.008 \%$ FS/°C typ.
Zero point	$\leq \pm 0.015 \%$ FS/°C max.
Temperature compensation	$\leq \pm 0.008 \%$ FS/°C typ.
Span	$\leq \pm 0.015 \%$ FS/°C max.
Non-linearity acc. to DIN 16086, terminal based	$\leq \pm 0.3 \%$ FS max.
Hysteresis	$\leq \pm 0.1 \%$ FS max.
Repeatability	$\leq \pm 0.05 \%$ FS
Rise time	$\leq 25 \text{ ms}$
Long-term drift	$\leq \pm 0.1 \%$ FS typ. / year

#### Environmental conditions

Compensated temperature range	-25 .. +85 °C
Operating/ambient temperature range <sup>1)2)</sup>	T6, T110 °C Ta = -40 .. +60 °C / -20 .. +60 °C T5 Ta = -40 .. +70 °C / -20 .. +70 °C
Storage temperature range	-40 .. +100 °C
Fluid temperature range <sup>1)2)</sup>	T6, T110 °C Ta = -40 .. +60 °C / -20 .. +60 °C T5 Ta = -40 .. +70 °C / -20 .. +70 °C

CE mark	EN 61000-6-1/ 2/ 3/ 4; EN 60079-0/1/31
Vibration resistance acc. to DIN EN 60068-2-6 at 10 .. 500 Hz	$\leq 10 \text{ g}$
Protection class acc. to DIN EN 60529	IP 65 (Vented Gauge) IP 69 (Sealed Gauge) IP 6K9K (Sealed Gauge)
ISO 20653	

#### Other data

Supply voltage	12 .. 30 V DC
Residual ripple of supply voltage	acc. to FSK Physical Layer Specification (HCF_SPEC-054)
Current consumption	$\leq 25 \text{ mA}$
Life expectancy <sup>3)</sup>	> 10 million cycles (0 .. 100 % FS)
Weight	~ 300 g

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

FS = (Full Scale) = relative to complete measuring range (default calibration)

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

<sup>1)</sup> -25 °C with FKM seal, -40 °C on request

<sup>2)</sup> T120 ° with Ta = -40 .. +70 °C / -20 .. +70 °C with electrical connection, single leads available

<sup>3)</sup> Measuring ranges  $\geq 1000 \text{ bar}$ : > 1 million cycles (0 .. 100 % FS)

## Measuring range limits:

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

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:

	Single leads Electrical connection "9"	Jacketed cable Electrical connection "G"
<b>CSA</b>	Explosionproof (seal not required)	
<b>ATEX</b>	Flameproof	
<b>IECEX</b>	Flameproof	
<b>cCSA<sub>us</sub></b>	Class I Group A, B, C, D, T6, T5 Class II Group E, F, G Class III Type 4	
<b>ATEX</b>	I M2 Ex d I Mb II 2G Ex d IIC T6, T5 Gb	
	II 2D Ex tb IIIC T110 .. 120 °C Db	II 2D Ex tb IIIC T110 °C Db
<b>IECEX</b>	Ex d I Mb Ex d IIC T6, T5 Gb	
	Ex tb IIIC T110 .. 120 °C Db	Ex tb IIIC T110 °C Db

## Model code:

**HDA 4 7 X X – F21 – XXXX – D X – 000 (2m)**

### Mechanical connection

- 1 = G1/2 B DIN EN 837  
(only for measuring ranges  $\geq$  1600 bar)
- 4 = G1/4 A ISO 1179-2

### Electrical connection

- 9 = 1/2-14 NPT Conduit, single leads
- G = 1/2-14 NPT Conduit, jacketed cable

### Output signal

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

### Measuring ranges in bar

0006; 0016; 0040; 0060; 0100; 0250; 0400; 0600; 1000  
(only with mech. connection code "4")  
1600  
(only with mech. connection code "1")

### Approval

- D = **CSA** Explosionproof (seal not required)  
**ATEX** Flameproof  
**IECEX** Flameproof

### Type of measurement cell

- S = Sealed Gauge (sealed to atmosphere)  $\geq$  40 bar
- V = Vented Gauge (vented to atmosphere)  $<$  40 bar

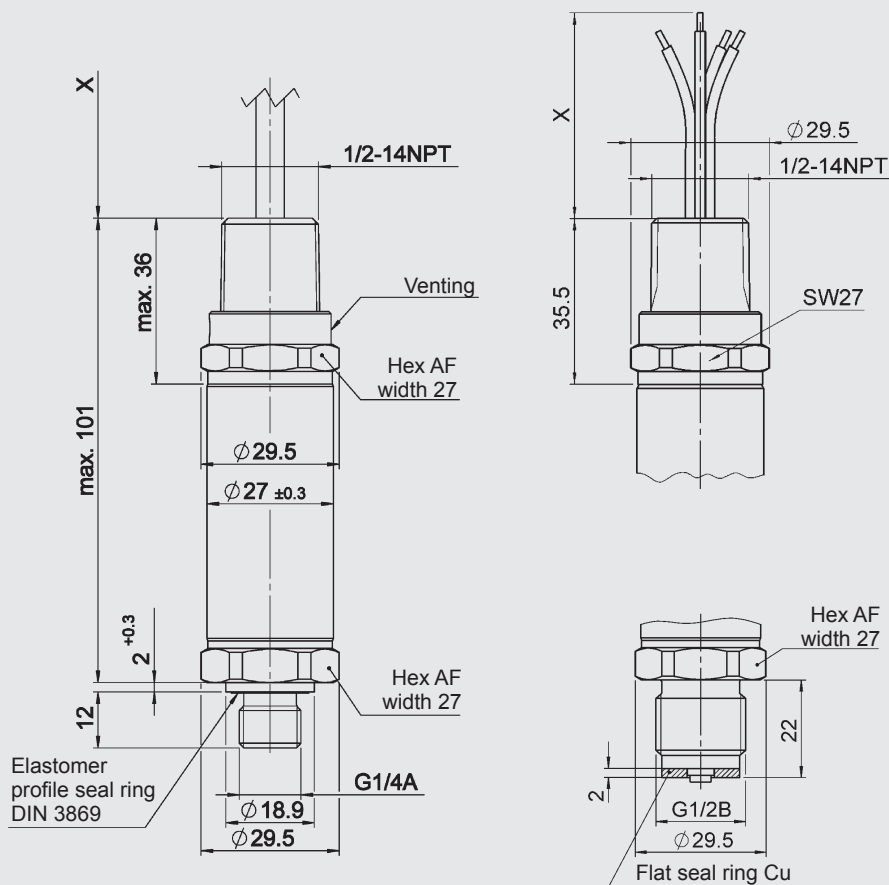
### Modification number

000 = standard

### Cable length in m

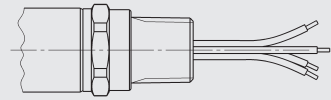
Standard = 2 m

## Dimensions:



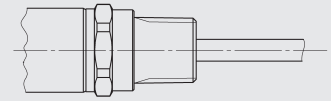
## Pin connections:

Conduit (single leads)



Lead	HDA 47x9
red	Signal +
black	Signal -
green-yellow	Housing

Conduit (jacketed cable)

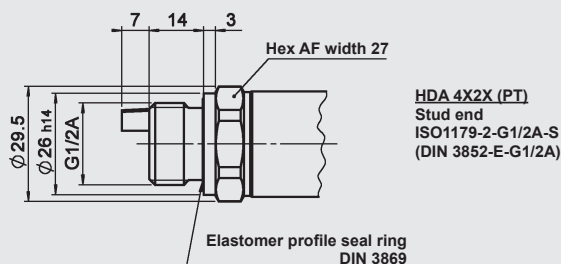


Lead	HDA 47xG
white	Signal -
brown	Signal +
green	n.c.
yellow	n.c.

## Additional technical data with temperature measurement option:

Input data							
Measuring range	-25 .. +100 °C						
Probe length	7 mm						
Mechanical connection	G1/2 A ISO 1179-2 with probe						
Tightening torque, recommended	45 Nm						
Measuring ranges pressure in bar	16	40	60	100	250	400	600
Output data							
Output signal Pressure	4 .. 20 mA with HART Protocol						
Output signal Temperature	Available via HART protocol as a digital signal						
Accuracy at room temperature	≤ ± 0.4 % FS ≤ ± 0.8 % FS						
Temperature drift (environment)	≤ ± 0.01 % FS / °C						
Reaction time acc. to DIN EN 60751	t <sub>50</sub> : ≈ 10 s t <sub>90</sub> : ≈ 15 s						

## Dimensions with temperature measurement option:



## Measuring range limits:

Additional measuring range limits of the secondary variable, temperature:

Lower measuring range limit		Upper measuring range limit		Measuring span	
min	max	min	max	min	max
-25 °C	75 °C	0 °C	100 °C	25 °C	125 °C

## Model code with temperature measurement option:

HDA 4 7 2 X – F21 – XXXX – T – 007 – D X – 000 (2m)

### Mechanical connection

2 = G1/2 A ISO 1179-2

### Electrical connection

9 = 1/2-14 NPT Conduit, single leads

G = 1/2-14 NPT Conduit, jacketed cable

### Output signal

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

### Measuring ranges in bar

0016; 0040; 0060; 0100; 0250; 0400; 0600

### With temperature measurement

### Probe length (in mm)

007 = 7 mm

### Approval

D = CSA Explosionproof (seal not required)

ATEX Flameproof

IECEX Flameproof

### Type of measurement cell

S = Sealed Gauge (sealed to atmosphere) ≥ 40 bar

V = Vented Gauge (vented to atmosphere) < 40 bar

### Modification number

000 = standard

### Cable length in m

Standard = 2 m

### 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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