Pressure Transmitter
HDA 4700 Ex applications

Relative pressure | **Accuracy 0.25 %**

Flameproof enclosure
ATEX, IECEx, CSA, triple approval
With junction box
HART interface
Optional temperature measurement

Description:

HDA 4700 with HART interface is a 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:

$_{c}$CSA$_{US}$ Explosionproof - Seal not required
Class I Group B, C, D, T6, T5
Class II Group E, F, G
Class III
Type 4

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

IECEx Flameproof
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 A)
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 $R_{Lmax.} = (U_B - 12\ V) / 20\ mA\ [k\Omega]$ for HART communication min. 250 Ω
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	≤ ± 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	≤ 25 ms
Long-term drift	≤ ± 0.1% FS typ. / year
Environmental conditions	
Compensated temperature range	-25 .. +85 °C
Operating/ambient temperature range [1) 2)]	T6, T110: Ta = -40 .. +60 °C / -20 .. +60 °C T5: Ta = -40 .. +70 °C / -20 .. +70 °C
Storage temperature range	-40 .. +100 °C
Fluid temperature range [1) 2)]	T6, T110: 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	≤ 5 g
Protection class acc. to DIN EN 60529[3)]	IP 65
Other data	
Supply voltage	12 .. 30 V DC
Residual ripple of supply voltage	acc. to FSK Physical Layer Specification (HCF_SPEC-054)
Current consumption	≤ 25 mA
Life expectancy[4)]	> 10 million cycles (0 .. 100 % FS)
Weight	~ 1000 g (aluminium junction box) ~ 1500 g (stainless steel junction box)

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

1) -25 °C with FKM seal, -40 °C on request
2) T120° with Ta = -40 .. +70 °C / -20 .. +70 °C with electrical connection, single leads available
3) With mounted 1/2 NPT Conduit screwed fitting in corresponding protection class at junction box
4) Measuring ranges ≥ 1000 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:

	Junction box Aluminium "J"	Junction box Stainless steel "Q"
CSA	Explosionproof (seal not required)	
ATEX	Flameproof	
IECEx	Flameproof	
$_{c}CSA_{us}$	Class I Group B, C, D, T6, T5 Class II Group E, F, G Class III Type 4	Class I Group B, C, D, T6, T5 Class II Group E, F, G Type 4
ATEX	II 2G Ex d IIC T6, T5 Gb II 2D Ex tb IIIC T110 .. 120 °C Db	
IECEx	Ex d IIC T6, T5 Gb Ex tb IIIC T110 .. 120 °C Db	

Model code:

HDA 4 7 X X – F21 – XXXX – D X – 000

Mechanical connection
1 = G1/2 B DIN EN 837
(only for measuring ranges ≥ 1600 bar)
4 = G1/4 A ISO 1179-2

Electrical connection
J = aluminium junction box
Q = stainless steel junction box

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

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

Approval
D = **CSA** Explosionproof (seal not required)
ATEX Flameproof
IECEx Flameproof

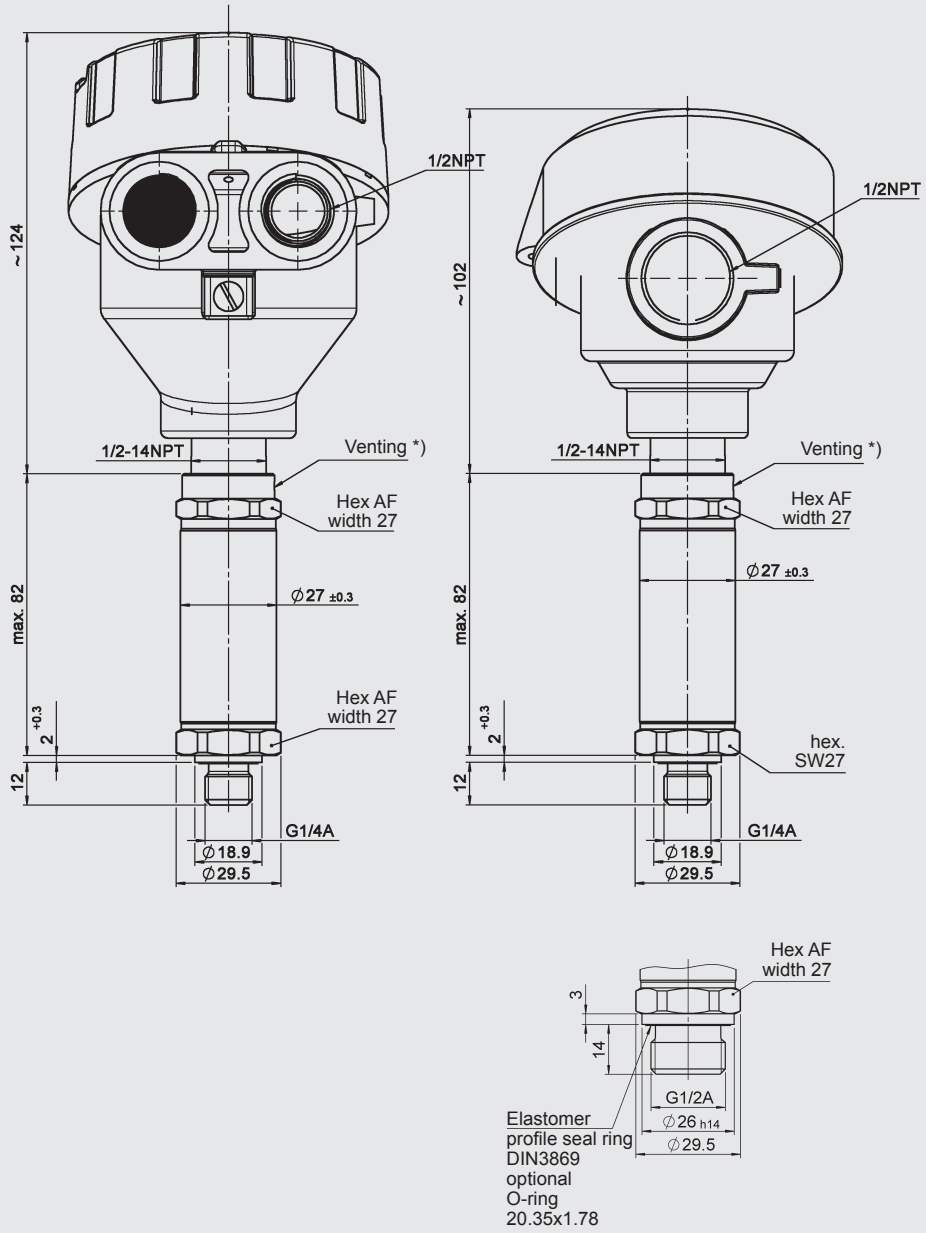
Type of measurement cell
S = Sealed Gauge (sealed to atmosphere) ≥ 40 bar
V = Vented Gauge (vented to atmosphere) < 40 bar

Modification number
000 = standard

Dimensions:

With aluminium junction box:

With stainless steel junction box:



Pin connections:

Single leads in junction box

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

Additional technical data with temperature measurement option:

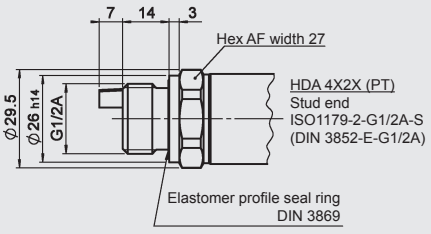
Input data							
Measuring range	-25 .. +100 °C						
Probe length	7 mm						
Mechanical connection	G1/2 A ISO 1179-2 with probe						
Tightening torque, recommended	45 Nm						
Measuring ranges pressure in bar	16	40	60	100	250	400	600
Output data							
Output signal Pressure	4 .. 20 mA with HART Protocol						
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_{50}: ≈ 10 s t_{90}: ≈ 15 s						

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

Dimensions with temperature measurement option:



Model code with temperature measurement option:

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

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

Electrical connection
J = aluminium junction box
Q = stainless steel junction box

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

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
Hauptstraße 27, 66128 Saarbrücken
Germany
Telephone +49 (0)6897 509-01
Fax +49 (0)6897 509-1726
E-mail: electronic@hydac.com
Internet: www.hydac.com