HYDAC INTERNATIONAL

Pressure Transmitter

HDA 4700

HART interface

Temperature measurement as an option

Relative pressure | **Accuracy 0.25 %**

Features

- Accuracy ≤ ± 0.25 % FS typ.
- With HART protocol
- Excellent EMC characteristics

Description

HDA 4700 with HART interface is a digital pressure transmitter which is used to measure relative pressures in hydraulics and pneumatics. In addition to the analogue output of measured values, digital communication is possible by means of the HART protocol.

The pressure transmitter, based on the design of HDA 4700, has a highly precise and robust sensor cell with a thin-film strain gauge on a stainless steel membrane.

Thanks to exceptional temperature and EMC characteristics as well as its small and compact design, this device series can be used in a wide field of applications.

A device variant with a temperature sensor is available as an option. In this version, the temperature signal is output exclusively as a digital signal via the HART protocol. The pressure signal is still provided as an analogue signal (4 .. 20 mA).

Fields of application

Applications are mainly found in the mobile or industrial sector in hydraulics and pneumatics.

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	1250	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); 45 Nm (G1/2B)							
Parts in contact with fluid					Connector: Stainless steel Seal ring: FKM							
Output data												
Output signal					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.					Modification of the measuring range limits (see table) Zero-point offset in the range max. 3 % of the span							
Accuracy acc. to DIN 16086, Terminal based [1]					≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.							
Accurracy acc. to minimum value setting (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.							
Rise time					≤ 25 ms							
Long-term drift					≤ ± 0.1 % FS typ. / year							
Environmental conditions / Approvals / Tests												
Compensated temperature range					-25 .. +85 °C							
Operating temperature range [2]					-40 .. +85 °C / -25 .. +85 °C							
Storage temperature range					-40 .. +100 °C							
Fluid temperature range [2]					-40 .. +100 °C / -25 .. +100 °C							
EMC					2014/30/EC EN 61006-6-1 / 2 / 3 / 4							
Vibration resistance					DIN EN 60068-2-6				≤ 200 m/s² (10 .. 500 Hz)			
Shock resistance					DIN EN 60068-2-27				≤ 100 g / 6 ms			
Protection type [3]					DIN EN 60529				IP 65 (plug EN 175301-803) IP 67 (plug M12x1)			
CE / UKCA conformity					Provided							
cULus approval [4]					Provided							
Other data												
Supply voltage					9 .. 35 V DC - limited energy – acc. to 9.3 UL 61010; Class 2 UL 1310/1585; LPS UL 60950							
Residual ripple of supply voltage					46 to 125 Hz: < 0.2 V_{PP} 125 Hz): < 1.2 mV RMS							
Current consumption					≤ 25 mA							
Life expectancy [5]					> 10 million load cycles (0 .. 100 % FS)							
Weight					~ 150 g							

Note: Reverse polarity protection of the supply voltage, overvoltage, 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] Including non-linearity, hysteresis, offset and final value deviation

[2] In the standard up to -25 °C with FKM seal, -40 °C on request

[3] With mounted mating connector in corresponding protection type

[4] Environmental conditions acc. to 1.4.2 UL 61010-1; C22.2 no. 61010-1

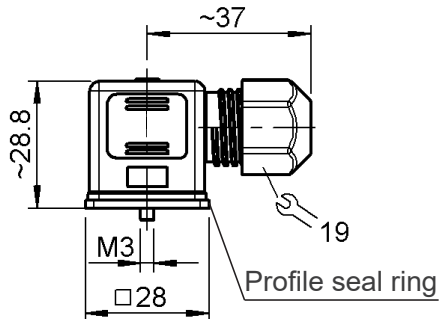
[5] Measuring ranges ≥ 1000 bar: > 1 million load cycles (0 .. 100 % FS)

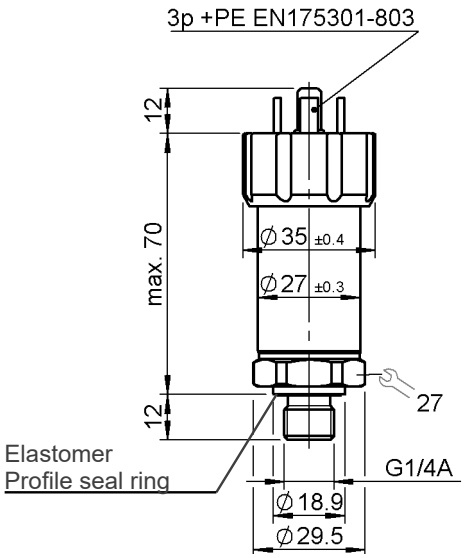
Measuring range limits

Via HART Common Practice Commands you have the opportunity of adjusting the following measuring range limits.
Measuring range limits of the primary variable of pressure:

Lower measuring range limit		Upper measuring range limit		Measurement span	
Min	Max	Min	Max	Min	Max
0 % FS	112.5 % FS	37.5 % FS	150 % FS	37.5 % FS	150 % FS

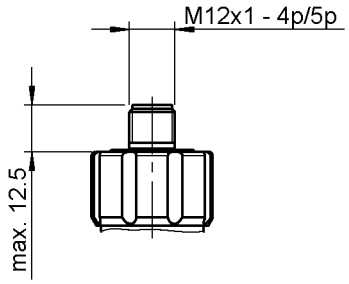
Dimensions



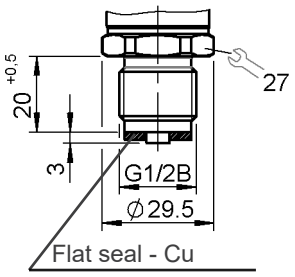
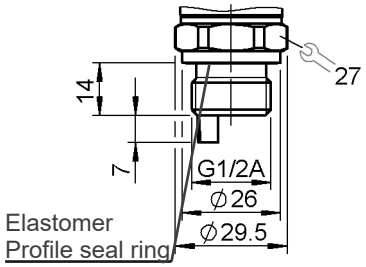


Electrical connection variants

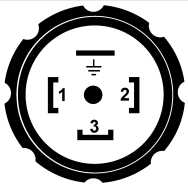
Plug connector M12x1, 4 pole

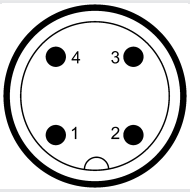


Mechanical connection variants

G1/2 B DIN EN 837 Male thread Tightening torque, recommended: 45 Nm	**With temperature measurement as an option:** G1/2 A ISO 1179-2 with measurement probe Male thread Tightening torque, recommended: 45 Nm
	

Pin connections

EN 175301-803, 3 pole + PE	Pin	Output signal: F21
	1	Signal +
	2	Signal -
	3	n.c.
	⊥	PE

M12x1, 4 pole	Pin	Output signal: F21
	1	Signal +
	2	n.c.
	3	Signal -
	4	n.c.

Model code

HDA 4 7 X X - F21 - XXXX - 000

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

Electrical connection
5 = Plug connector EN175301-803, 3 pole + PE (with mating connector IP67)
6 = Plug connector M12x1, 4 pole (without mating connector)

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 type "4")
1600; 2000 bar (only with mech. connection type "1")

Modification number
000 = Standard

Accessories:
Appropriate accessories, such as mating connectors, can be found in the Accessories brochure.

Additional technical data with temperature measurement option

Input data								
Measurement ranges		-25 .. +100 °C						
Probe length		7 mm						
Mechanical connection		G1/2 A ISO 1179-2 with measurement probe						
Tightening torque, recommended		45 Nm						
Measuring ranges	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 typ. ≤ ± 0.8 % FS max.						
Temperature drift (environment)		≤ ± 0.01 % FS / °C						
Rise time acc. to DIN EN 60751		t_{50} ~ 10 s t_{90} ~ 15 s						

Additional measuring range limits

Additional measuring range limits of the secondary variable of temperature:

Lower measuring range limit		Upper measuring range limit		Measurement span	
Min	Max	Min	Max	Min	Max
-25 °C	75 °C	0 °C	100 °C	25 °C	125 °C

Model code with optional temperature measurement

HDA 4 7 2 X - F21 - XXXX - T - 007 - 000

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

Electrical connection
5 = Plug connector EN175301-803, 3 pole + PE (with mating connector IP67)
6 = Plug connector M12x1, 4 pole (without mating connector)

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

Rod length in mm
007 = 7 mm

Modification number
000 = Standard

Accessories:
Appropriate accessories, such as mating connectors, can be found in the Accessories brochure.

Note

The information in this brochure relates to the operating conditions and applications described.
For applications and operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

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