HYDAC INTERNATIONAL

Differential pressure transmitter HPT 500

Ex Applications
ATEX / IECEx / CSA, triple approval
Flameproof enclosure

Differential pressure	Accuracy 3 %

Features

- Ideally suited for monitoring the contamination degree of a filter element in pressure filters.
- ATEX, IECEx, $_{c}CSA_{US}$ triple approval
- Ignition protection type: Flameproof enclosure

Description

HPT 500 was specially developed to provide a cost-efficient solution for the measurement of differential pressure. A piston movement inside of the device is evaluated by means of a Hall sensor, which enables to determine the occurring differential pressure and makes available an analogue output signal for the integration into a controller. The particularity about this measuring principle is that even with high pressures, e.g. in a 350 bar system, high-precision measurement of very low differential pressures (i.e. < 2 bar) is possible.

The differential pressure transmitters with the ignition protection type "flameproof enclosure" combine ATEX, IECEx and $_{c}CSA_{US}$ approval for the North American market. This allows universal world wide use of the sensor in potentially explosive atmospheres.

Application fields

HPT 500 is ideally suited for integration in condition monitoring systems. This enables a continuous tracing on the filter element's contamination degree via intelligent monitoring of the differential pressure at a pressure filter. Consequently, the filter element change can be planned in dependence of its condition and also events of sudden dirt ingress into the system, i.e. due to mechanical defect, can be recognised.

ATEX I M2 Ex db I Mb
II 2G Ex db IIC T6, T5 Gb
II 2D Ex tb IIIC T110 °C, T120 °C, T130 °C Db

IECEx Ex db I Mb
Ex db IIC T6, T5 Gb
Ex tb IIIC T110 °C, T120 °C, T130 °C Db

$_{c}CSA_{US}$ Explosion Proof - Seal not required
Class I Groups A, B, C, D, T6, T5
Class I Zone 1 AEx db IIC T6, T5 Gb [US]
Ex db IIC T6, T5 Gb [C]

Class II Groups E, F, G T110 °C, T120 °C, T130 °C
Zone 21 AEx tb IIIC T110 °C, T120 °C, T130 °C Db [US]
Ex tb IIIC T110 °C, T120 °C, T130 °C Db [C]

Class III

Type 4

Technical Data

Input data		
Measuring ranges in bar	Differential pressure 2; 3; 5; 8 bar	
Measuring ranges in psi	Differential pressure 30, 35, 75, 120 psi	
Maximum Working Pressure (MWP)	420 bar	6090 psi
Burst pressure	1600 bar	23200 psi
Mechanical connection	G 1/2 HN 28-22	
Tightening torque, recommended	100 Nm	
Parts in contact with the fluid	Mechanical connection: Stainless steel Seals: O-Ring: FKM Profile seals: PTFE	
Fluid compatibility	Hydraulic oils: H, HL, HLP, HVLP, HLPD acc. to DIN 51524 Biodegradable operating fluids acc. to VDMA 24568 (HETG, HEES, HEPG)	
Viscosity range	Max. 250 cSt	
Output data		
Output signal, permitted load resistance	4 .. 20 mA, 3 conductor $R_{Lmax} = (U_B - 3\ V) / 20\ mA\ [k\Omega]$	
Accuracy acc. to DIN 16086, terminal based [1]	≤ ± 3 % FS typ. ≤ ± 5 % FS max. (in relation to ΔP measuring range)	
Temperature compensation	≤ ± 0.05 % FS / °C max. zero point ≤ ± 0.05 % FS / °C max. range	
Long-term drift	≤ ± 0.5 % FS typ. / year	
Environmental conditions		
Compensated temperature range	+20 .. +70 °C	
Operating / ambient / fluid temperature range [2]	T6, T110 °C T120 °C T5, T130 °C	Ta = -20 .. +60 °C Ta = -20 .. +70 °C Ta = -20 .. +80 °C
Storage temperature range	-40 .. +100 °C	
CE mark	EN 61006-6-1 / 2 / 3 / 4; EN 60079-0 / 1 / 31	
Vibration resistance to DIN EN 60068-2-6 at 10 .. 500 Hz	≤ 10 g ≤ 5 g with connection head	
Protection type — acc. to DIN EN 60529 [3]	IP 68 (versions with connection head) IP 69	
Protection type — acc. to ISO 20653	IP 6K9K	
Other data		
Supply voltage [4]	8 .. 30 V DC	
Residual ripple of supply voltage	≤ 5 %	
Current consumption	≤ 25 mA	
Life expectancy	> 1 million cycles, 0 .. 100 % FS	
Weight (without Junction Box)	~ 450 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

[1] The accuracy is valid if the transmitter is installed inside of a steel or a stainless steel block.

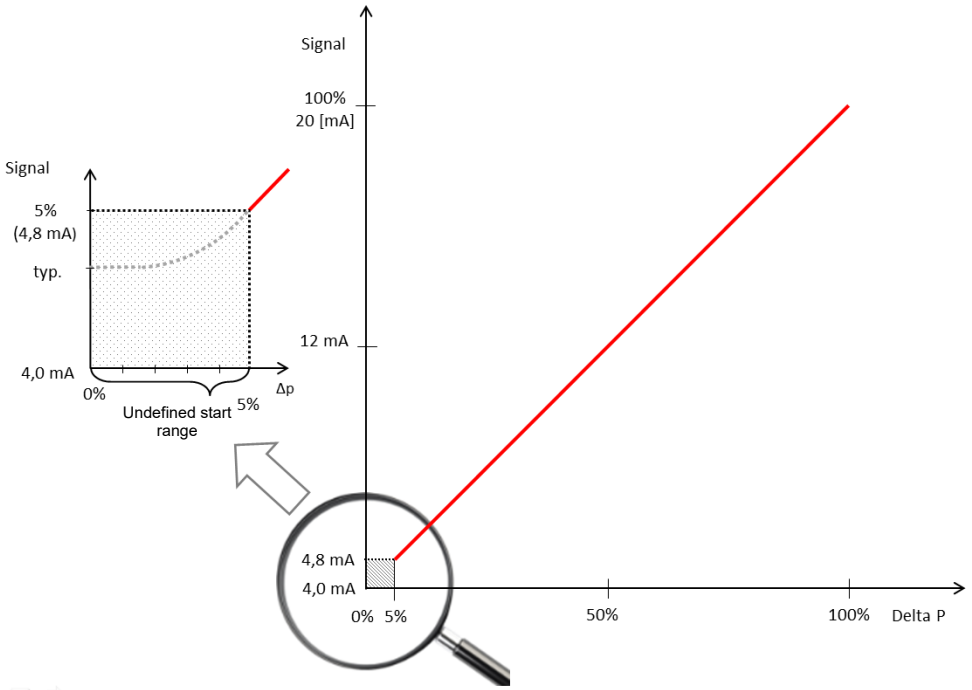
[2] Temperature limitations of the individual electrical connections see table "Fields of application for the individual electrical connections" at model code

[3] For connection head: The cable gland must also meet IP 68 and the 1/2-14 NPT thread of the cable gland has to be sealed by means of a thread sealing compound.

[4] "Limited energy" powered according to CAN/UL 61010 (Clause 9.4), Class 2 UL1310, LPS (CAN/UL 60950)

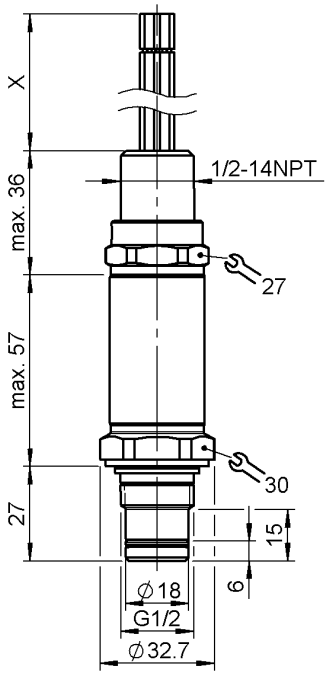
Functionality

The pressure signal measured by the pressure transmitter is converted into an analogue output signal, proportional with the differential pressure. The range between 0 % and 5 % differential pressure is undefined. This means, if there is no Δp, the signal can be between 4 mA and 4.8 mA as shown below.

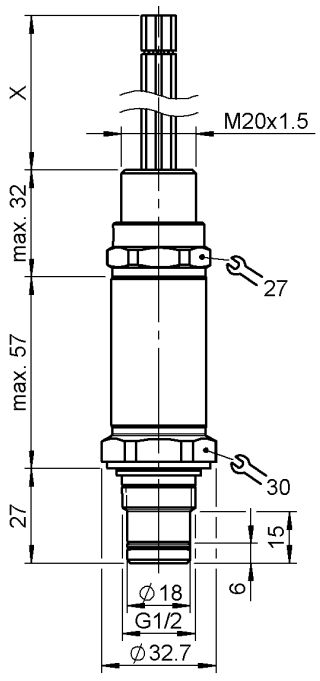


Dimensions

With 1/2-14 NPT Conduit, single leads

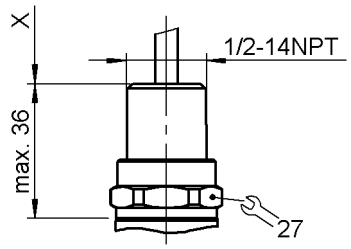


With M20 x 1.5 Conduit, single leads

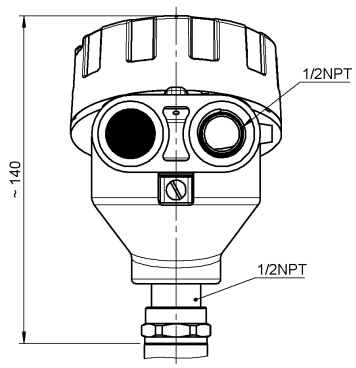


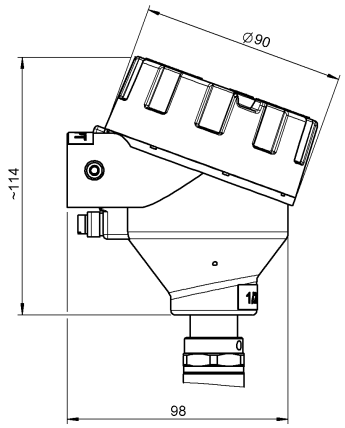
Electrical Connection Variants

M20 x 1.5 Conduit, jacketed cable

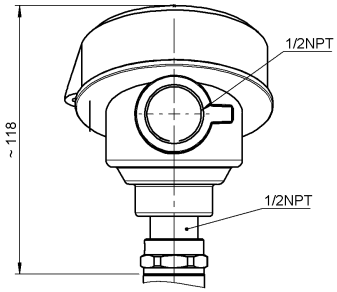


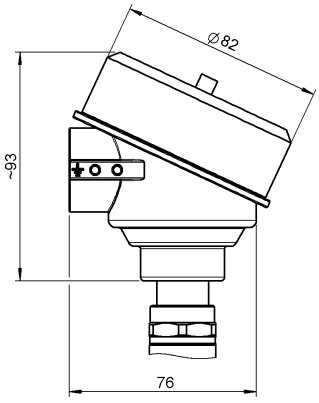
Connection head aluminum



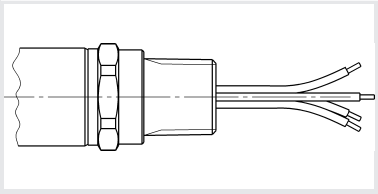


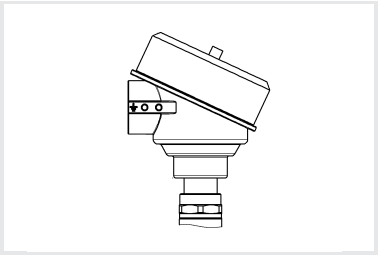
Connection head stainless steel

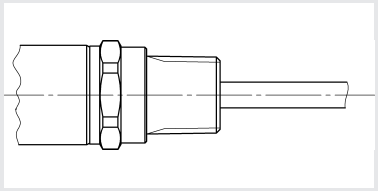




PIN connection

Conduit (single leads)	Lead	Output signal:
	Red	$+U_B$
	White	Signal
	Black	0 V
	Green-yellow	PE / housing

Connection head aluminum / stainless steel	Lead	Output signal:
	Red	$+U_B$
	White	Signal
	Black	0 V
	Green-yellow	PE / housing

Conduit (jacketed cable)	Lead	Output signal:
	Brown	$+U_B$
	White	Signal
	Yellow	0 V
	Green	n.c.

Model code

HPT 5 0 X - X - XXXX - S - D - XXX - (psi) - 2 m

Electrical connection (details to the fields of application, please see table below)

9 = 1/2-14 NPT Conduit (male thread), single leads
G = 1/2-14 NPT Conduit (male thread), jacketed cable
J = Connection head (aluminum)
Q = Connection head (stainless steel)
W = M20 x 1.5 Conduit (male thread), single leads

Output signal

C = 4 .. 20 mA, 3 conductor

Measuring ranges

In bar: 02.0; 03.0; 05.0; 08.0
In psi: 0030; 0035; 0075; 0120

Housing material

S = Stainless steel

Approval

D = ATEX-Flame Proof
IECEx-Flame Proof
CSA-Explosion Proof - Seal not required

Modification number

000 = Standard

(psi)

Additional declaration for psi versions (not applicable for bar version)

Cable length

Standard = 2 m (not applicable for versions with connection head)

Fields of application for the individual electrical connections

	ATEX	IECEx	CSA
9, W	I M2 Ex db I Mb II 2G Ex db IIC T6, T5 Gb II 2D Ex tb IIIC T110/T120/T130 °C Db	Ex db I Mb Ex db IIC T6, T5 Gb Ex tb IIIC T110/T120/T130 °C Db	Class I Groups A, B, C, D, T6, T5 Class I Zone 1 AEx db IIC T6, T5 Gb [US] Ex db IIC T6, T5 Gb [C] Class II Groups E, F, G T110/T120/T130 °C Zone 21 AEx tb IIIC T110/T120/T130 °C Db [US] Ex tb IIIC T110/T120/T130 °C Db [C] Class III Type 4
G	I M2 Ex db I Mb II 2G Ex db IIC T6, T5 Gb II 2D Ex tb IIIC T110 °C Db	Ex db I Mb Ex db IIC T6, T5 Gb Ex tb IIIC T110 °C Db	Class I Groups A, B, C, D, T6, T5 Class I Zone 1 AEx db IIC T6, T5 Gb [US] Ex db IIC T6, T5 Gb [C] Class II Groups E, F, G T110 °C Zone 21 AEx tb IIIC T110°C Db [US] Ex tb IIIC T110 °C Db [C] Class III Type 4
J	II 2G Ex db IIC T6, T5 Gb II 2D Ex tb IIIC T110/T120/T130 °C Db	Ex db IIC T6, T5 Gb Ex tb IIIC T110/T120/T130 °C Db	Class I Groups A, B, C, D, T6, T5 Class I Zone 1 AEx db IIC T6, T5 Gb [US] Ex db IIC T6, T5 Gb [C] Class II Groups E, F, G T110/T120/T130 °C Class III Type 4
Q	II 2G Ex db IIC T6, T5 Gb II 2D Ex tb IIIC T110/T120/T130 °C Db	Ex db IIC T6, T5 Gb Ex tb IIIC T110/T120/T130 °C Db	Class I Groups B, C, D, T6, T5 Class II Groups E, F, G T110/T120/T130 °C Class III

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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