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Pressure Transmitter Type 4AP-30

General application

Piezo-resistive pressure transmitters are used to measure pressure in liquids and gases. The pressure is converted into an electrical signal.

Type designation

4AP-30	-010	
4		Product group Pressure measurement
A		surface-mounting case
P		piezo-resistive
-30		case size
	-010	output 0 — 10 V
	-020	output 0 — 20 mA
	-420	output 4 — 20 mA
	-242	output 4 — 20 mA, 2-wire

Extra codes

/ 24 reduced ambient temperature error (only from 4 bar span)

/ 42 taper pressure connection with slotted union nut
DN 25 to DIN 11 851 (standard)
as above, but DN 20
as above, but DN 32
as above, but DN 40
as above, but DN 50

/ 43 clamp pressure connection
DN 25 to ISO 2852 (standard)
as above, but DN 20
as above, but DN 50

/ 44 flange pressure connection with weld-in socket

/ 45 small flange pressure connection DN 25 to DIN 28 403*

/ 64 flush diaphragm pressure connection ¾" pipe

/ 73 with cable attached

/ 91 absolute pressure

/ 93 special ranges

/115 clamping flange (without seal or mounting components)

/116 flush diaphragm pressure connection 1½" pipe B

/128 flush diaphragm pressure connection ¾" pipe A

/129 flush diaphragm pressure connection 1" pipe A

/135 Halocarbon® filling (min. ordering quantity: 10 items)

Note:
* small flange 1.6 bar max. gauge pressure

Pressure ranges

Gauge pressure (bar)	Absolute pressure /91 (bar)
-0.25 to 0	0 to 0.6
-0.4 to 0	0 to 1
-0.6 to 0	0 to 1.6
-1 to 0	0 to 2.5
-1 to 0.6	0 to 4
-1 to 1.5	0 to 6
-1 to 3	0 to 10
-1 to 5	0 to 16
-1 to 9	0 to 25
0 to 0.25	
0 to 0.4	
0 to 0.6	
0 to 1	
0 to 1.6	
0 to 2.5	
0 to 4	
0 to 6	
0 to 10	
0 to 16	
0 to 25	

Standard accessory

Operating Instructions B 40.4300

Ordering example

Piezo-resistive pressure transmitter
Type 4 AP-30-420/42
range: 0 to 4 bar

Technical data

Case

stainless steel, Mat.Ref. 1.4301

Parts in contact with medium

stainless steel, Mat.Ref. 1.4571;
stainless steel diaphragm, Mat.Ref. 1.4401
with Code /44: seal Silicon
with Code /64: seal Viton

Pressure connection

normally ½" pipe A to DIN 16 288
for other connections see outline drawings

Electrical connection

normally:
terminal box to DIN 43 650,
Form AF,
conductor cross-section up to 1.5 mm^2,
Pg9 cable gland.

Code /73

attached 4-core screened PVC cable with internal equilibration tubing, length 2 m; other lengths on request

Supply U_B

normally: 13 to 30V DC

11.5 to 30V DC on request

Residual ripple:
The voltage peaks must not go above or below the values specified for the supply voltage.

max. current drawn: ≤ 30mA

Supply voltage error
≤ 0.2% per 10V

Output signal

0 to 10 V, burden ≥ 2kΩ

0 to 20mA, burden $\leq \frac{U_B - 12V}{0.02\ A}$

4 to 20mA, burden $\leq \frac{U_B - 12V}{0.02\ A}$

4 to 20mA, burden (2-wire) $\leq \frac{U_B - 13V}{0.02\ A}$

adjustable by potentiometer

zero: 5% approx.
span: 5% approx.

Burden error

≤ 0.15%

Characteristic

linear

Deviation from characteristic after starting point calibration

≤ 0.5%, according to DIN 16 086

Zero signal deviation

≤ 0.5%

Overload limit

2 x full scale

Technical data

Permitted ambient temperature
-30 to +120°C
-30 to +100°C for Code /73

Permitted temperature of medium
-40 to +120°C

Temperature coefficient of zero signal
within range 0 — 100°C
≤ 0.02%/°C typically
≤ 0.04%/°C max.

for range 0.25 bar
≤ 0.06%/°C max.

For Code /24
(only from 4 bar span and for output -020 or -420)
zero: ≤ 0.01%/°C

Temperature coefficient of the output signal
span: ≤ 0.02%/°C typically
≤ 0.04%/°C max.

span: ≤ 0.01%/°C

Response time
≤ 3msec

Mechanical vibration
20g max. at 15 — 2000 Hz

Mechanical shock
100g/4msec

Nominal position
up to 4 bar: vertical ⊥, see outline drawing
above 4 bar: unrestricted

Protection
IP65 to EN 60 529
IP67 for Code /73

Weight
0.250 kg, with ½" pipe pressure connection

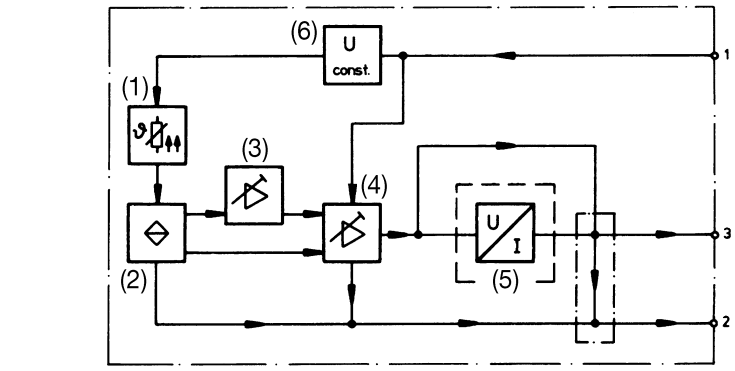
Electromagnetic compatibility
Electrostatic discharge:
IEC 801-2 / severity 4
(test voltage 15 kV)

Transient disturbance (burst):
IEC 801-3 / severity 4
(test voltage on I/O line 2 kV)

Electromagnetic fields
IEC 801-4 / severity 3
(test field strength 10 V/m)

Immunity to conductor-borne interference induced by high-frequency fields: DIN VDE 0843 Part 6 / severity 3

Block diagram



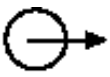
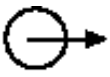
only with current output

only with 2-wire circuit

Description of function

The pressure of the medium to be measured acts on the separating diaphragm of the piezo-resistive pressure transmitter. The separating diaphragm transmits the pressure through a liquid to the silicone diaphragm with doted resistance bridge (2). This resistance bridge operates on the piezo-resistive principle. It is connected to a constant voltage supply (6) via a temperature compensation circuit (1). The output signal of the resistance bridge is amplified in a differential amplifier (4) with high input impedance. The span is adjusted with a trimmer. The amplifier (3) with adjustable gain enables zero adjustment. With current output 0 — 20 mA or 4 — 20 mA the output signal is converted into a proportional current in the U/I converter (5).

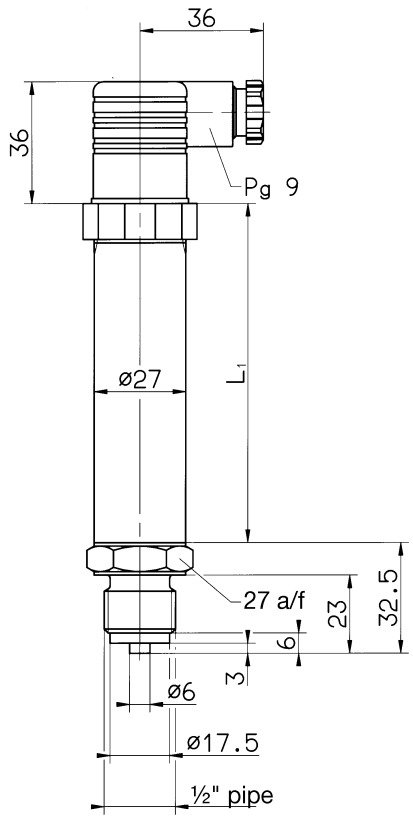
Connection chart

Connection				Termination	
				plug	cable
Supply 13 — 30 V DC			L + L -	1 2	white grey
Output 0 — 10 V	-010		- +	2 3	grey yellow
Output 0 — 20 mA	-020		- +	2 3	grey yellow
Output 4 — 20 mA	-420		- +	2 3	grey yellow
Output 4 — 20 mA (2-wire)	-242			proportional current 4 — 20 mA in supply	
Protective earth					
Screen					black

Dimensions

100 mm	/137	124 mm	/073/137
	/130		/073/130
	/127		/073/127
	/126		/073/126
	/125		/073/125
	/115		/073/115
	/114		/073/114
	standard version		/073/113
	/110		/073/110
	/109		/073/109
	/108		/073/108
	/079		/073/079
	/045		/073/045
	/043		/073/043
	/042		/073/042
	/041		/073/041
90 mm	/091/137	114 mm	/073/091/137
	/091/130		/073/091/130
	/129		/073/129
	/128		/073/128
	/091/127		/073/091/127
	/091/126		/073/091/126
	/091/125		/073/091/125
	/091/115		/073/091/115
	/091/116		/073/091/116
	/116		/073/116
	/091/114		/073/091/114
	/091/113		/073/091/113
	/091/110		/073/091/110
	/091/109		/073/091/109
	/091/108		/073/091/108
	/091/079		/073/091/079
	/064		/073/064
	/091/045		/073/091/045
	/091/044		/073/091/044
	/044		/073/044
	/091/043		/073/091/043
	/091/042		/073/091/042
	/091/041		/073/091/041
77 mm	/091/129	101 mm	/073/091/129
	/091/128		/073/091/128
	/091/064		/073/091/064
L_1	Code	L_2	Code

Standard version



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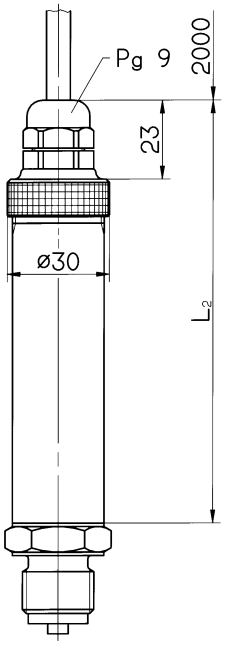
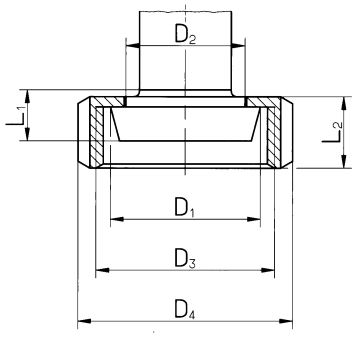
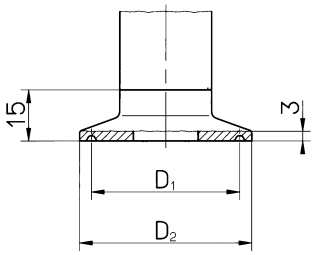


Code /042



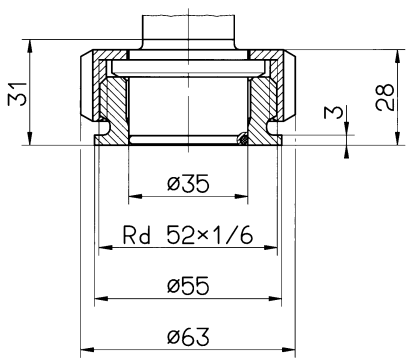
5	20	ø36.5	ø30	RD 44×1/6	ø54	13	21
4	50	ø68.5	ø61	RD 78×1/6	ø92	16	22
3	40	ø56	ø48	RD 65×1/6	ø78	15	21
2	32	ø50	ø41	RD 58×1/6	ø70		
1	25	ø44	ø35	RD 52×1/6	ø63		
Pos.	DN	D_1	D_2	D_3	D_4	L_1	L_2

Code /043



3	20	ø27.5	ø34
2	50	ø56.5	ø64
1	25	ø43.5	ø50.5
Pos.	DN	D_1	D_2

Code /044



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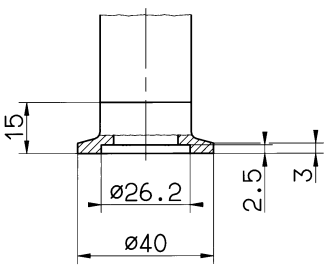

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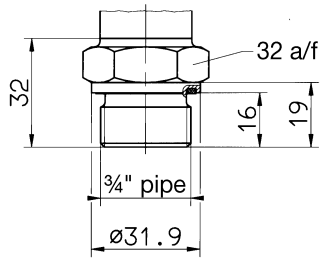

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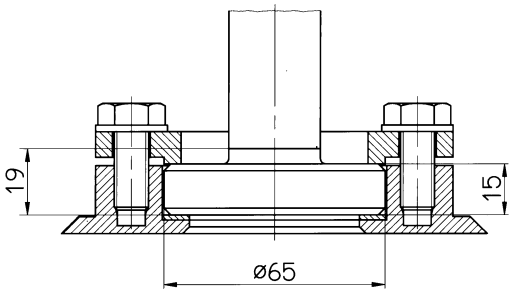

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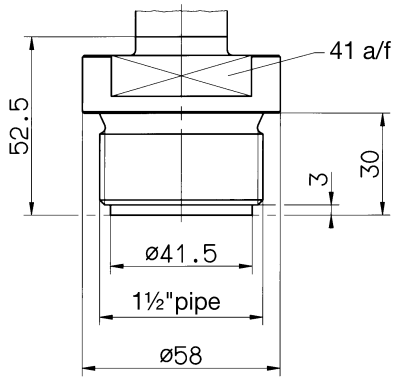

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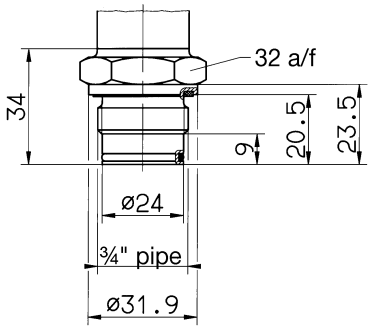

Code /129