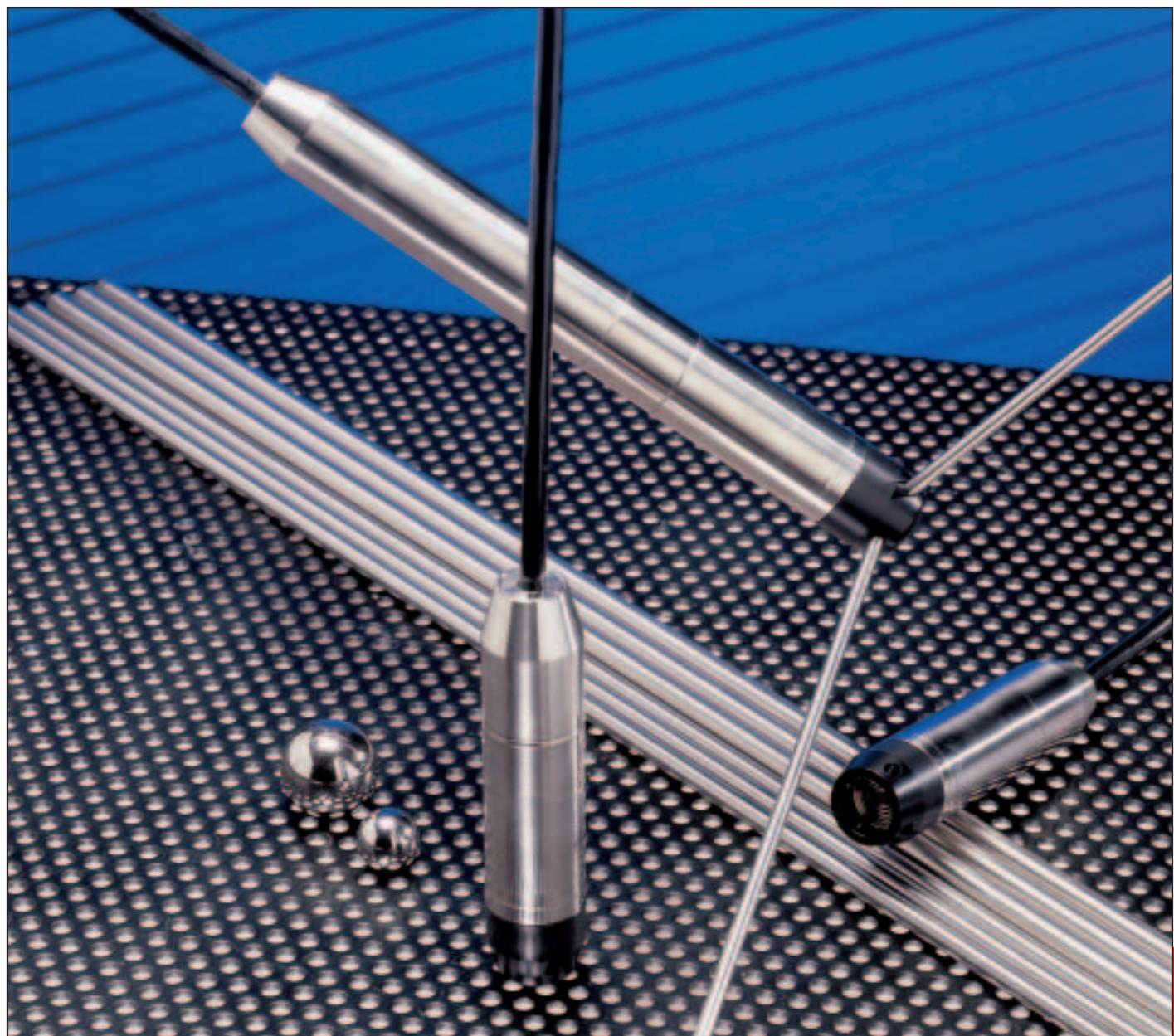


**Pressure-type
level sensing transmitter
0 to 25 bar**



EDITION 07/2002

HUBA-REGISTERED TRADE MARK

Huba Control
FOR FINE PRESSURE AND FLOW MEASUREMENT



EDITION 07/2002

Technical overview

The pressure transmitters of type series 681 with piezoresistive measuring elements have compensated, calibrated and amplified sensor signals which are available as standardized voltage or current outputs.

In the immersion-sensor version with a salt water and oil-resistant connection cable they are specially suited for level measurement, even in the presence of corrosive liquids.

The cable incorporates a tube for compensation of the ambient pressure.

All metal parts made of stainless steel are water-tight welded.

The distinct advantages

- Mechanically protected diaphragm due to special head design
- Supplementary weight (option) improves stabilization of sensor in turbulent media
- Effective overload protection due to chemically etched chip diaphragm and specially designed glass gland
- Compact construction using SMD technology, enhances operational reliability in the presence of shock and vibration
- 100 % sealed against media because fully welded

Pressure ranges

Relative pressure 0.1 to 25 bar (differential measurements to ambient pressure)

Absolute pressure as option.

DIN categories see order code selection table.

Overload

3x measurement range, min. 3 bar.

Rupture pressure

> 200 bar (0.1 ... 25 bar)

Characteristic line deviation

Acc. initial point setting DIN 16086, inclusive hysteresis and repeatability

$\leq \pm 0.5\% \text{ fs}$
 $\leq \pm 0.25\% \text{ fs}$ (option)
 $\leq \pm 0.1\% \text{ fs}$ up to pressure range 1 bar (option)

Temperature influences

Compensated temperature ranges: 0 to 70 °C, -25 to +85 °C

Temperature error

Zero point (0 to 70 °C)
0 ... < 0.5 bar $< \pm 0.06\% \text{ fs}/^\circ\text{C}$
0.5 ... < 2 bar $< \pm 0.03\% \text{ fs}/^\circ\text{C}$
2 ... 25 bar $< \pm 0.015\% \text{ fs}/^\circ\text{C}$

Zero point (-25 to +85 °C)
0 ... < 0.5 bar $< \pm 0.08\% \text{ fs}/^\circ\text{C}$
0.5 ... < 2 bar $< \pm 0.04\% \text{ fs}/^\circ\text{C}$
2 ... 25 bar $< \pm 0.02\% \text{ fs}/^\circ\text{C}$

Operating range (0 to 70 °C)
 $\pm 0.015\% \text{ fs}/^\circ\text{C}$

Operating range (-25 to +85 °C)
 $\pm 0.02\% \text{ fs}/^\circ\text{C}$

Storage -40 to +125 °C

Dynamic response

Response time < 1 msec.
Suitable for static and dynamic measurements.

Outputs and power supply

0 - 5 V	15 - 30 VDC	(3-wire)
0 - 10 V	15 - 30 VDC	(3-wire)
0 - 20 mA	9 - 33 VDC	(3-wire)
4 - 20 mA	9 - 33 VDC	(2-wire)

Short-circuit proof, with polarity reversal protection.

Other signal outputs on request.

Electromagnetic compatibility: CE conformity to EC directive 89/336 EEC (EMC) by application of harmonized standards EN 50081-2 and EN 50082-2.

Load

$$0 - 20 \text{ mA}: \frac{\text{supply voltage} - 6 \text{ V}}{0.02 \text{ A}} [\text{Ohm}]$$

max. 1 kOhm

$$4 - 20 \text{ mA}: \frac{\text{supply voltage} - 9 \text{ V}}{0.02 \text{ A}} [\text{Ohm}]$$

Intrinsically safe version

Intrinsic safety
II 16 EEx ia IIC T4 ... T6
for Fig. 1 and 2
Intrinsic safety
II 16 EEx ia IIB T4 ... T6 for Fig. 3

Output Power supply
4 - 20 mA 10 - 30 VDC

Load:
max. $\frac{\text{supply voltage} - 10 \text{ V}}{0.02 \text{ A}}$ [Ohm]

Current consumption

0 - 5 V	2.5 mA
0 - 10 V	2.5 mA
0 - 20 mA	26 mA fs (max. 30 mA)
4 - 20 mA	20 mA fs (max. 31 mA)

Electrical connections/Protection class

Test voltage 500 volts.



A



B



C



D

A – Supplementary weight

B – PVDF version, open
Fig. 6C – Steel version,
open at front, Fig. 2D – Steel version,
closed at front,
Fig. 1

Versions

Order code selection table

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X X X X X X X X X X

Pressure ranges¹ (bar)	0 – 100 mbar	0	0									
Relative pressure	0 – 160 mbar	0	1									
	0 – 250 mbar	0	2									
	0 – 400 mbar	0	3									
	0 – 600 mbar	0	4									
	0 – 1 bar	0	5									
	0 – 1.6 bar	0	6									
	0 – 2.5 bar	0	7									
	0 – 4 bar	0	8									
	0 – 6 bar	0	9									
	0 – 10 bar	1	0									
	0 – 16 bar	1	1									
	0 – 25 bar	1	2									
Outputs	0 – 5 VDC		0									
	0 – 10 VDC		1									
	0 – 20 mA		2									
	4 – 20 mA	intrinsically safe version, II 1G EEx ia IIB / IIC T4 ... T6 ⁵	3									
	4 – 20 mA	with overvoltage protection	4									
	0 – 10 VDC	with overvoltage protection	5									
			6									
Characteristic line deviation	≤ +/- 0.50 % fs		0									
	≤ +/- 0.25 % fs		1									
	≤ +/- 0.10 % fs (on request)		2									
Temperature ranges²	0 – 70 °C compensated (Medium temperature permissible 0 – 80 °C) ⁴		0									
	-25 – 85 °C compensated (Medium temperature permissible -25 – 85 °C) ⁴		1									
Temperature class	EEx T 6 (Ta: -25 ... 55 °C)		4	0								
	EEx T 4 (Ta: -25 ... 85 °C)		4	1								
Cable length	Data in meters	Example: <table border="1" style="display: inline-table;"><tr><td>2</td><td>0</td></tr></table>	2	0								
2	0											
Versions	Fig. 1 closed, short case		0									
	Fig. 1 closed, with supplementary weight		1									
	Fig. 2 open, short case		2									
	Fig. 2 open, with supplementary weight		3									
	Fig. 3 closed, short case, screwing version		4									
	Fig. 3 closed, with supplementary weight, screwing version		5									
	Fig. 4 open, short case, screwing version		6									
	Fig. 4 open, with supplementary weight, screwing version,		7									
	Fig. 5 closed, PVDF		8									
	Fig. 6 open, PVDF		9									
Medium	Diesel oil, fuel oil, kerosen	Fig. 1/2/3/4 cable Teflon	0									
	Salt water, brackish water	Fig. 1/2/3/4 cable PUR ⁴	1									
	Drinking water, potable	Fig. 1/2/3/4 cable PE ⁴	2									
	Lake / river water	Fig. 1/2/3/4 cable PUR ⁴	3									
	Benzene ³	Fig. 1/2/3/4 cable Teflon	4									
	Chlorinated water	Fig. 5/6 PVDF / cable PUR ⁴	5									
	Acids and alkaline solutions ⁵	Fig. 5/6 PVDF / cable Teflon	6									
	Other medium, precise specification		9									
All media must be specified precisely in relation to temperature and concentration.												
Standard seals with Viton. Other seals on request.												
Weight	Standard Fig. 1/2/3/4	~ 160 grams										
	with supplementary weight	~ 420 grams										
	Standard / Ex-Version Fig. 5/6	~ 270 grams										
	Cable / meter PUR	~ 50 grams										
	Cable / meter Teflon	~ 50 grams										

¹ Other pressure ranges outside the DIN categories on request.² Other temperature ranges on request.³ Specify type of benzene.⁴ For temperature > 50 °C use cable Teflon.⁵ Indicate correct medium.

Dimensions in mm / Electrical connections

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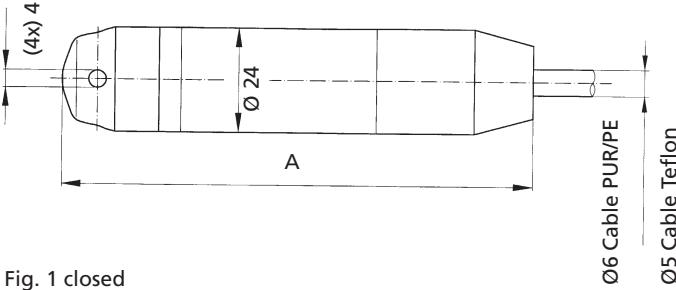


Fig. 1 closed

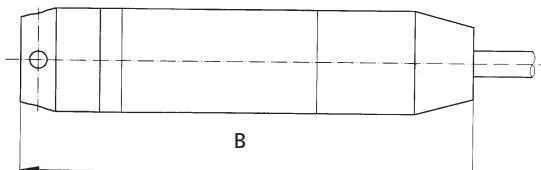


Fig. 2 open

Standard
without weight prolongation
with weight prolongation

A (mm)
108
195

Overload protection
without weight prolongation
with weight prolongation

A (mm)
157
244

Ex-version
A (mm)
118
205

B (mm)
114
201

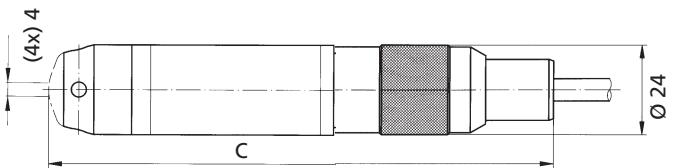


Fig. 3 closed, screwing version

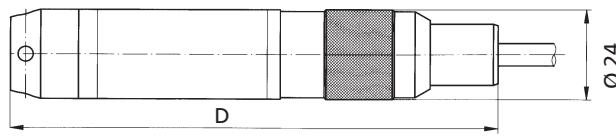


Fig. 4 open, screwing version

Standard
without weight prolongation
with weight prolongation

C (mm)
134
221

Overload protection
without weight prolongation
with weight prolongation

C (mm)
183
270

Ex-version
C (mm)
144
231

D (mm)
140
227

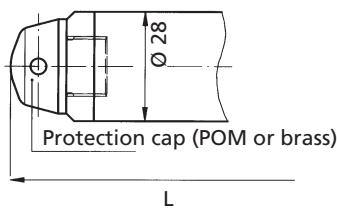


Fig. 5 closed, with protection cap

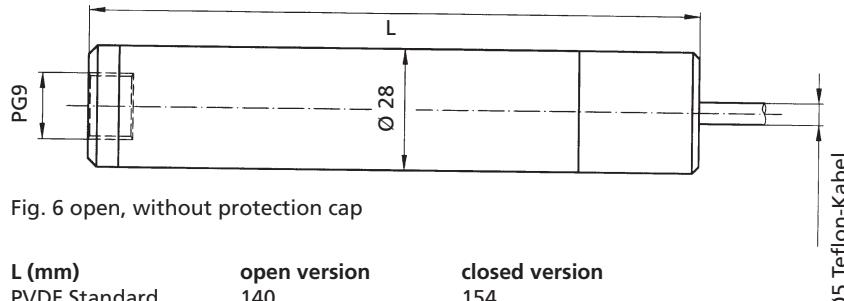


Fig. 6 open, without protection cap

L (mm)	open version	closed version
PVDF Standard	140	154
PVDF Ex-version	189	203

Electromagnetic compatibility:

CE conformity to EC directive 89/336 EEC (EMC) by application of harmonized standards EN 50081-1 (1992) and EN 50082-2 (1995).

Interference emission

Basic specification

Interference emission, class B

Interference immunity

Basic specification

Electrostatic discharge

Radiated electromagnetic field

Radiated electromagnetic field (GSM)

Fast transients (burst)

Conducted electromagnetic interference

Surge¹

4 kV contact, 8 kV air
10V/m, 80–1000 MHz, 80% AM 1 kHz
10V/m, 950 MHz, 200Hz on/off
2 kV
10 Vm 0.15–80 MHz, 80% AM 1 Hz
10 kA (8/20 µs)

Test standard	Effects
EN 50081-1 (1992)	
EN 55022 (1994)	No effect
Test standard	Effects
EN 50082-2 (1995)	
EN 61000-4-2 (1995)	No effect
ENV 50140 (1993)	No effect
ENV 50204 (1995)	No effect
EN 61000-4-4 (1995)	No effect
ENV 50141 (1993)	No effect
EN 61000-4-5 (1995)	No effect

¹ Only versions with option overvoltage protection (lightning stroke)

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