FlowMaster 壓力傳送器

Technical overview

The pressure transmitters of type series FM6681 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

≤ +/- 0.5 % fs
≤ +/- 0.25 % fs (option)
≤ +/- 0.1 % 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 < +/- 0.06 % fs/°C
0.5 … < 2 bar < +/- 0.03 % fs/°C
2 … 25 bar < +/- 0.015 % fs/°C

Zero point (-25 to +85 °C)
0 … < 0.5 bar < +/- 0.08 % fs/°C
0.5 … < 2 bar < +/- 0.04 % fs/°C
2 … 25 bar < +/- 0.02 % fs/°C

Operating range (0 to 70 °C)
+/- 0.015 % fs/°C

Operating range (-25 to +85 °C)
+/- 0.02 % fs/°C

Storage -40 to +125 °C

Dynamic response

Response time < 5 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 mA: $\frac{\text{supply voltage - 6 V}}{0.02\ \text{A}}$ [Ohm]
max. 1 kOhm

4 – 20 mA: max. $\frac{\text{supply voltage - 9 V}}{0.02\ \text{A}}$ [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. $\frac{\text{supply voltage - 10 V}}{0.02\ \text{A}}$ [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.

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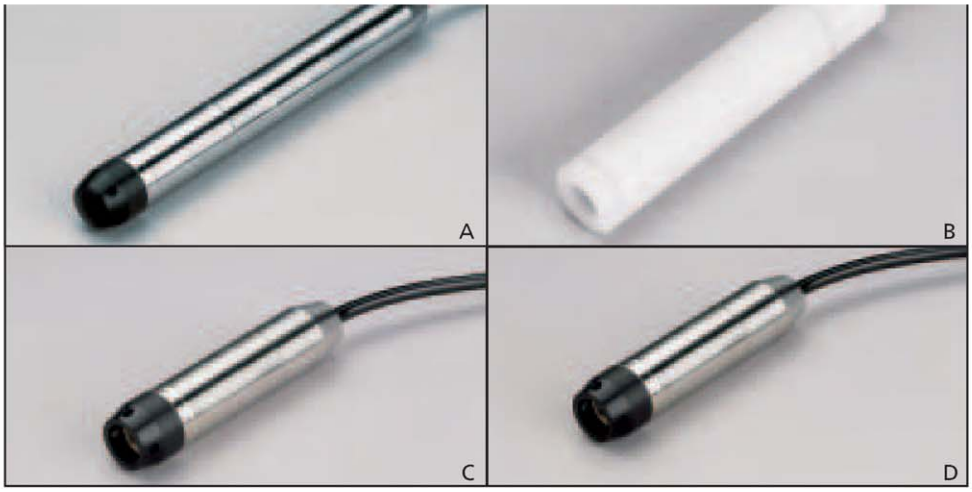

A – Supplementary weight

B – PVDF version, open Fig. 6

C – Steel version, open at front, Fig. 2

D – Steel version, closed at front, Fig. 1

Order code selection table

FM6681 . X X X X X X X X X

Pressure ranges[1] (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			3						
	4 – 20 mA	intrinsically safe version, II 1G EEx ia IIB/IIC T4 … T6[5]		4						
	4 – 20 mA	with overvoltage protection		5						
	1 – 10 VDC	with overvoltage protection		6						
Characteristic line deviation	≤ +/- 0.50 % fs				0					
	≤ +/- 0.25 % fs				1					
	≤ +/- 0.10 % fs	(on request)			2					
Temperature ranges[2]	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: 2 0								
Versions	Fig. 1 closed, short case									0
	Fig. 1 closed, short case with supplementary weight									1
	Fig. 2 open, short case									2
	Fig. 2 open, short case with supplementary weight									3
	Fig. 3 closed, short case									4
	Fig. 3 closed, short case with supplementary weight									5
	Fig. 4 open,screwing version, short case									6
	Fig. 4 open, screwing version, short case with supplementary weight									7
	Fig. 5 closed, PVDF									**8**
	Fig. 6 oben, 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.

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Dimensions in mm / Electrical connections

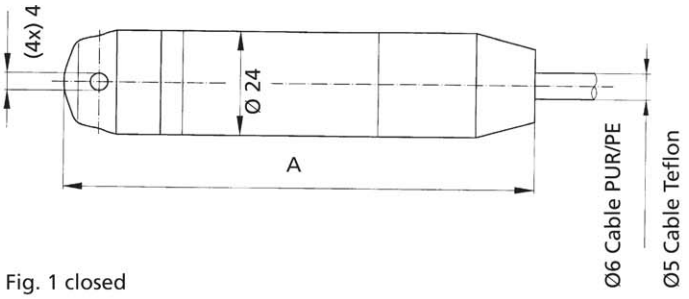

Fig. 1 closed

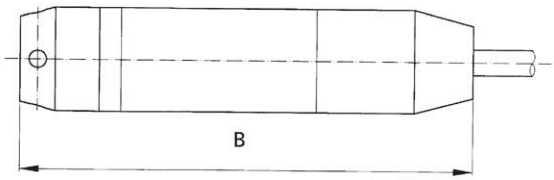

Fig. 2 open

Standard	A (mm)	B (mm)
without weight prolongation	108	104
with weight prolongation	195	191

Overload protection	A (mm)	B (mm)	Ex-version	A (mm)	B (mm)
without weight prolongation	157	153		118	114
with weight prolongation	244	240		205	201

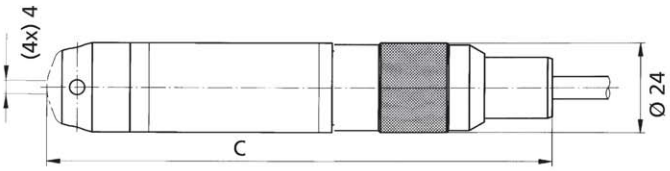

Fig. 3 closed, screwing version

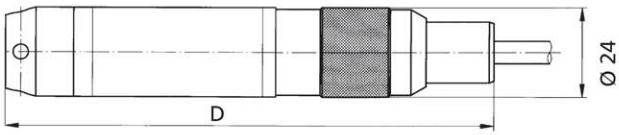

Fig. 4 open, screwing version

Standard	C (mm)	D (mm)
without weight prolongation	134	130
with weight prolongation	221	217

Overload protection	C (mm)	D (mm)	Ex-version	C (mm)	D (mm)
without weight prolongation	183	179		144	140
with weight prolongation	270	266		231	227

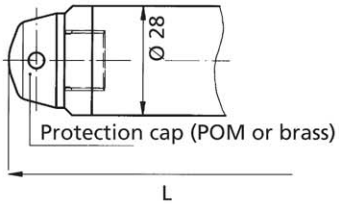

Fig. 5 closed, with protection cap

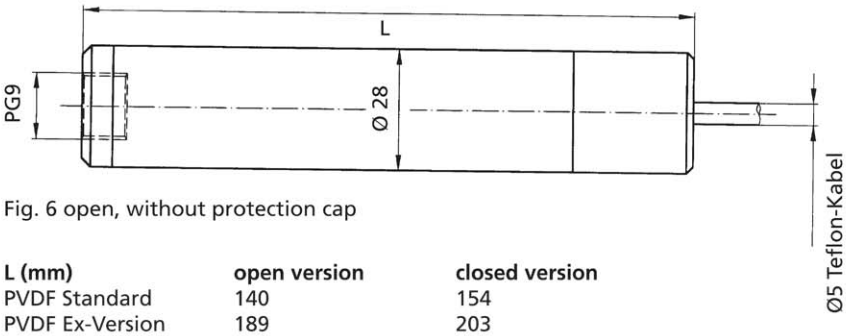

Fig. 6 open, without protection cap

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		Test standard		Effects
Basic specification		EN 50081-1	(1992)	
Interference emission, class B		EN 55022	(1994)	No effect
Interference immunity		**Test standard**		**Effects**
Basic specification		EN 50082-2	(1995)	
Electrostatic discharge	4kV contact, 8kV air	EN 61000-4-2	(1995)	No effect
Radiated electromagnetic field	10V/m, 80-1000 MHz, 80% AM 1 kHz	ENV 50140	(1993)	No effect
Radiated electromagnetic field (GSM)	10V/m, 950 MHz, 200Hz on/off	ENV 50204	(1995)	No effect
Fast transients (burst)	2 kV	EN 61000-4-4	(1995)	No effect
Conducted electromagnetic interference	10Vm 0.15-80 MHz, 80% AM 1 Hz	ENV 50141	(1993)	No effect
Surge[1]	10 kA (8/20 µs)	EN 61000-4-5	(1995)	No effect

[1] Only versions with option overvoltage protection (lightning stroke)