FD-01

Hydrostatic Level Measurement

Features

/ Capacitive sensor element with high resistance against overpressure
/ 2- or 3-wire technology
/ 39.5 mm probe diameter
/ Optionally available with ATEX-approval

Description:

Hydrostatic level sensors measure the hydrostatic pressure of the fluid column present above the sensor and therefore the fluid level. A ceramic sensor element at the sensor underside picks up this pressure so that the electronic components inside can generate a 4. . .20 mA or 0. . .10 VDC signal that is proportional to the level. The suspension on the self-supporting 10 m cable and the design in proven 2-wire technology help perceptibly minimize the cost of installation.

Application:

The FD-01 series of level meters is used at measuring points that require an accurate and stable output signal in regard to the level even under extreme conditions. The high degree of protection IP 68 and corrosion resistance enable the use of the probe universally in vessels, basins, ducts and tanks. The large surface of the membrane, that has a diameter of 25 mm, is particularly suitable for sewage applications.

Electrical Specifications:

Output signal /	4. . .20 mA, 2-wire or 0. . .10 VDC, 3-wire
Supply /	2-wire: 9. . .32 VDC, Ex-version: 14. . .28 VDC 3-wire: 12.5. . .32 VDC
Permissible load /	R_{max} = [(U_B-U_{Bmin}) / 0.02] Ohm
Current consumption /	max. 21 mA
Influence effects /	
Supply:	0.05% FSO / 10 V
Load:	0.05% FSO / kOhm
Long term stability /	≤ ± 0.1 % FSO / year at reference conditions
Turn-on time /	700 ms
avg. Response time /	< 200 ms
max. Response time /	380 ms
Measuring rate /	5/s
Electrical protection /	
Short-circuit protection:	permanent
Reverse polarity protection:	no damage, but also no function
EMC:	Emitted interference and interference immunity as per EN 61326
Option Ex-protection (only for 4...20 mA / 2-wire) /	ATEX II 1G Ex ia IIB T4 Ga (ATEX II 1G Ex ia IIC T4 Ga for version “pipe mounting“) ATEX II 1D Ex ia IIIC T85°C Ga
Safety rel. technical maximum values /	U_i = 28 VDC, I_i = 93 mA, L_i = 5µH P_i = 660 mW, C_i = 27 nF, C_{gnd} = 27 nF
Recommended Ex-amplifier /	KFD2-STC4-EX1
Permissible media temperature in Ex-Zones /	Zone 0 (-10. . .+60°C) for $p_{atm.}$ 0.8. . .1.1 bar from Zone 1 (-10. . .+70°C)
Connecting cables /	capacitance signal line/shield also signal line/signal line 160 pF/m inductance signal line/shield also signal line/signal line 1 mikroH/m
CE-Conformity /	EMC-Guideline 2014/30/EU

Technical Specifications:

Accuracy /	standard: ≤ ± 0.35% FSO option: ≤ ± 0.25% FSO acc. to IEC 60770 - limit point adjustment (non-linearity, hysteresis, repeatability)
Thermal effects (offset and span) /	
Tolerance band in compensated range	≤ ± 0.1 % FSO -20. . .+80°C
Storage temperature /	-25. . .+125°C
Media temperature /	-25. . .+125°C (-10. . .+60°C Ex-version Zone 0, -10. . .+70°C Ex-version Zone 20)
Materials /	
Housing:	stainless steel 1.4404 (316L)
Seals:	FKM (Viton), EPDM or FFKM (other materials on request)
Diaphragm:	standard: ceramic Al_2O_3 96% option: ceramic Al_2O_3 99.9%
Cable coating /	PVC (-5. . .+70°C) grey PUR (-25. . .+70°C) black FEP (-25. . .+70°C) black TPE (-25. . .+125°C) blue (cable with integrated air tube for atmospheric pressure reference)
Protection cap /	POM-C
Wetted parts /	housing, gasket, diaphragm, cable coating and nose cone (if necessary)
Weight /	aprox. 400 g (without cable)
Protection class /	IP 68

address Schleusenstraße 3 | D-27568 Bremerhaven | Germany | **tel** +49 (0)471 98 24 151
fax +49 (0)471 98 24 152 | **mail** info@profimess.de | **web** profimess.com

Ordering Codes:

Order number	FD-01.	1a.	0.	1.	1.	1.	2.	1.	A.	1

FD-01 Hydrostatic Level Meter

Operating range /

0a = 0.4 m water column, overload 2 bar
0b = 0.6 m water column, overload 2 bar
1 = 1.0 m water column, overload 4 bar
1a = 1.6 m water column, overload 4 bar
2a = 2.5 m water column, overload 6 bar
3 = 4.0 m water column, overload 6 bar
4 = 6.0 m water column, overload 8 bar
5 = 10 m water column, overload 8 bar
5a = 16 m water column, overload 15 bar
6a = 25 m water column, overload 25 bar
6b = 40 m water column, overload 25 bar
7a = 60 m water column, overload 35 bar
8 = 100 m water column, overload 35 bar
9 = 160 m water column, overload 45 bar
10 = 200 m water column, overload 45 bar

Output version /

0 = 4. . .20 mA, 2-wire
1 = 4. . .20 mA, 2-wire with ATEX-approval
2 = 0. . .10 VDC, 3-wire

Seals /

1 = FKM
2 = EPDM
3 = FFKM

Diaphragm /

1 = ceramic Al_2O_3 96%
2 = ceramic Al_2O_3 99.9% (only for meas. ranges 1 to 5)

Cable coating /

1 = PVC (-5. . .+70°C) grey
2 = PUR (-25. . .+70°C) black
3 = FEP (-25. . .+70°C) black
4 = TPE (-25. . .+125°C) blue

Cable length in m /

1 = 10 m (standard)
2 = please specify in detailed text

Mounting connection /

1 = none (directly by cable)
2 = R 1"- male (for mounting in a stainless steel pipe)
3 = probe flange
4 = mounting flange

Flange /

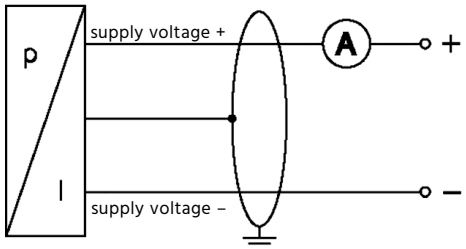
A = none
B = DN25 - PN40
C = DN40 - PN40 (only probe)
D = DN50 - PN40
E = DN80 - PN16

Accuracy /

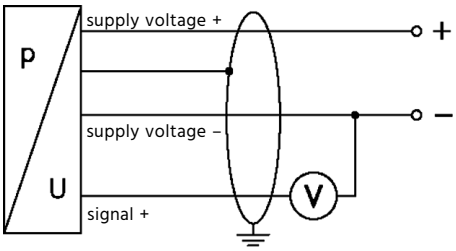
1 = ≤ ± 0.35% FSO
2 = ≤ ± 0.25% FSO

Wiring Diagrams:

2-wire system (power):



3-wire system (voltage):



El. Connection table:

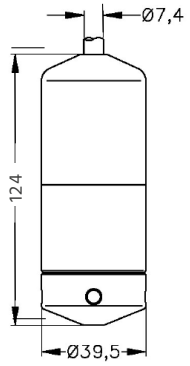
El. Connection		Cable (DIN 47100)
2-wire	supply +	white
	supply –	brown
3-wire	signal +	green
	shield	yellow/green

Ranges & Overpressure:

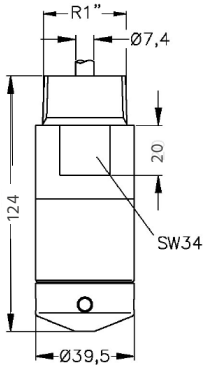
Value															
Nom. pressure [bar]	0,04	0,06	0,1	0,16	0,25	0,4	0,6	1	1,6	2,5	4	6	10	16	20
Level [mH2O]	0,4	0,6	1	1,6	2,5	4	6	10	16	25	40	60	100	160	200
Perm. overpressure [bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45

Dimensions in mm:

standard:

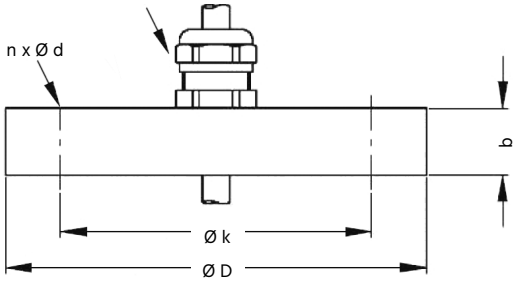


prepared for mounting inside a stainless steel pipe:



Mounting flange with threaded cable connection for probes (DIN 2501 EN 1092-1):

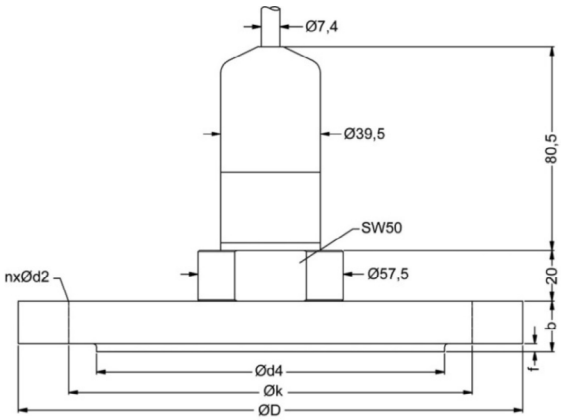
cable connection M16x1.5 with seals
(for cables-Ø 4. . .11 mm)



Flange	Dimensions [mm]				
	ØD	**Øk**	**b**	**n**	**Ød**
DN25 / PN40	115	85	18	4	14
DN50 / PN40	165	125	20	4	18
DN80 / PN16	200	160	20	8	18

DN80/PN16 possible for nom. pressure ranges PN ≤ 16 bar

Probe-flange for flange-probes (DIN 2501 EN 1092-1):



Flange	Dimensions [mm]						
	ØD	**Øk**	**Ød4**	**b**	**f**	**n**	**Ød2**
DN25 / PN40	115	85	68	18	2	4	14
DN40 / PN40	150	110	88	18	3	4	18
DN50 / PN40	165	125	102	20	3	4	18
DN80 / PN16	200	160	138	20	3	8	18

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