

Flush-mounted pressure and level transmitter - Type TPF 050 - hygienic applications



Version examples: for various hygienic process connections



CHARACTERISTICS

- **FLUSH-MOUNTED, HYGIENIC VERSIONS WITH DIRECTLY WELDED METAL SENSOR**
- **STAINLESS STEEL FIELD HOUSING: SMOOTH SURFACE, EASY TO CLEAN, HIGH PROTECTION CLASS**
- **UTILISATION OF MATERIALS SUITABLE FOR FOOD AND PHARMACEUTICALS**
- **MEASURING RANGES BETWEEN 100 MBAR AND 100 BAR**
- **OPTIONALLY FOR HIGH TEMPERATURES UP TO A MAXIMUM OF 200°C**

DESCRIPTION

The design of the flush-mounted **TPF 050** pressure and level transducers, which are designed for pressure and level measurements without dead spaces, renders them suitable for use under strict hygiene-controlled conditions, as well as for crystallising or viscous media. The robust stainless steel housing in protective class IP 67 or IP 69K renders it suitable for all extreme and non-residue cleaning processes, such as those required in the food and pharmaceutical industries.

The design of the measuring transducers in the field housing protects them against water splashes, internal humidity and other adverse atmospheric influences such as foam-cleaning.

The pressure sensor is separated from the measuring medium by a stainless steel membrane. The pressure is transmitted via an oil filling that is safe for use with food. All parts that come into contact with the medium have been welded.

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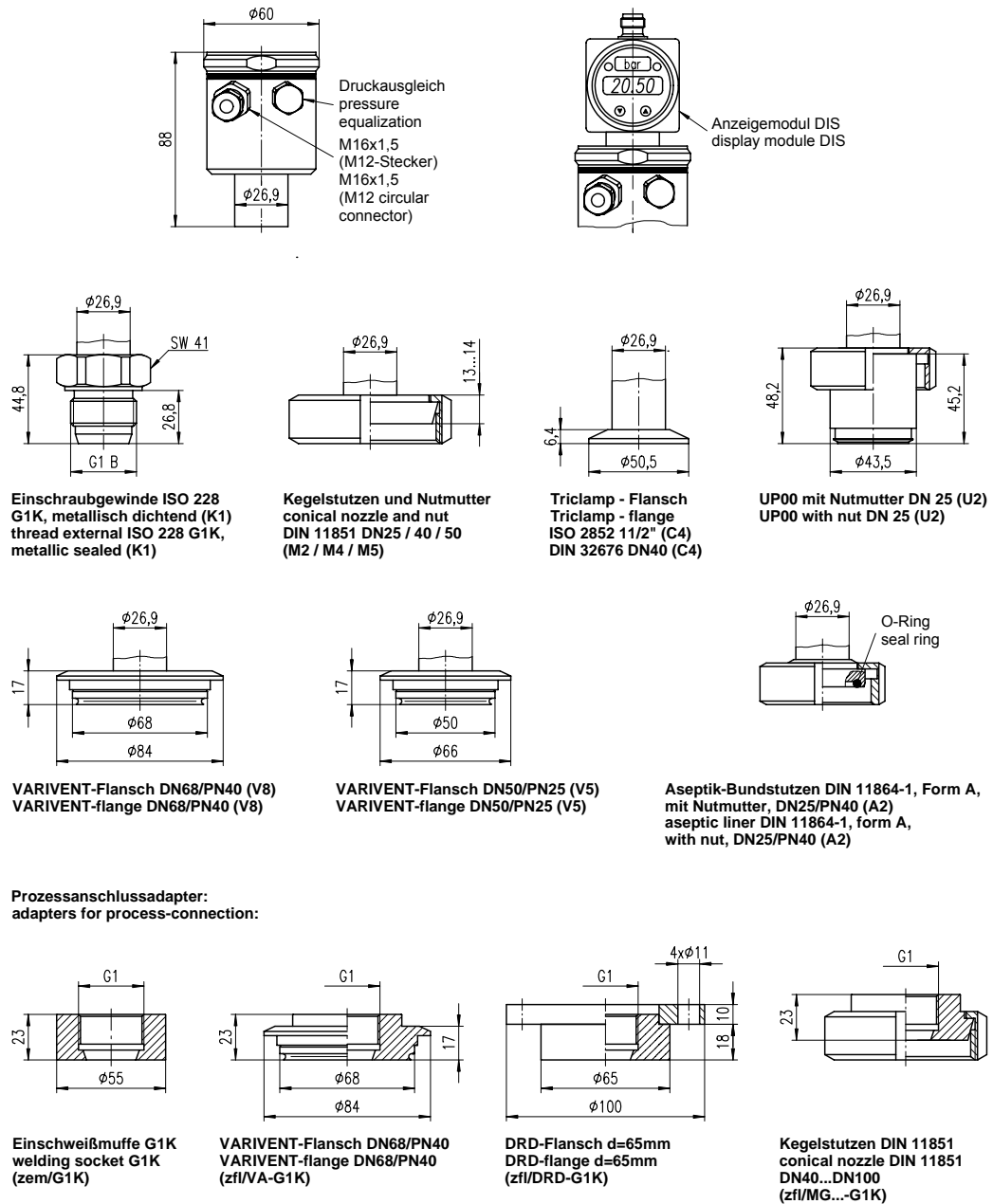
TECHNICAL DATA

General information				
Manufacturer / device	Hengesbach / Pressure transmitter series 050			
Measuring principle / device type	TPF 050: Piezoresistive - for pressure and level measurements			
Input				
Measuring ranges	TPF 050			
Nominal measuring ranges (bar)	relative	OPS	absolute	OPS
	0.35 bar	1	0.35 bar	1
	1 bar	3	1 bar	3
	2.5 bar	8	2.5 bar	8
	5 bar	15	5 bar	15
	10 bar	30	10 bar	30
	30 bar	90	30 bar	90
	100 bar	250	100 bar	250
*) = special				
Adjustable ranges (via potentiometer)	zero $\pm 10\%$ (FS) span $\pm 20\%$ (FS)			
Overload pressure safety (OPS)	-1 bar and triple max. measuring value, higher overload safety on request			
Bursting pressure	10 times the max. measuring value, depending on the type of device and the nominal measuring range			
Output				
Output signal	4... 20 mA, 2-wire		Working resistance: $\leq \frac{V_B - 12 V}{0.02 \text{ mA}}$	
Influence of working resistance	$\leq \pm 0.15\%$ max			
Current limit	25 mA typ., 32 mA max.			
Integration time	0 ... 20 s			
Test output	uninterruptible output current measurement			
Measuring accuracy				
Reference conditions	according to DIN IEC 60770			
Linearity, incl. hysteresis and repeatability according to limit point method DIN IEC 770	for TPF 050: $\leq 0.3\%$ of the max. value for the nominal measuring range, optional $\leq 0.2\%$ FS * special linearity information is required for small absolute pressure measuring ranges			
Warm-up time	1 s			
Adjustment time (without attenuation)	320 ms (supply frequency 50 Hz selected) or 266 ms (supply frequency 60 Hz selected)			
Long-term drift	$\leq 1\%$ of max. value			
Repeatability	$\leq 0.05\%$ of max. value			
Hysteresis	$\leq 0.1\%$ of max. value			
Thermal hysteresis	zero point and measuring range within the compensated temperature range 0 ... 80°C $\leq \pm 0.2\%$ of max. value / 10 K for nominal measuring range from 4 bar onwards $\leq \pm 0.3\%$ of max. value / 10 K for nominal measuring range up to 0.6 bar			
Nominal position	> 1 bar optional			
Auxiliary energy				
Supply voltage	13-36 VDC, max. permissible residual ripple 1 V _{ss}			
Effect of supply voltage	$\leq \pm 0.03\%$ change in supply voltage			
Conditions for use				
Medium temperature	-30°C... +125°C, 140°C max. for 1 h (=> take environmental temperature into account) for high temperature: -30°C... +200°C			
Environmental temperature	-40°C... + 80°C			
Storage temperature	-40°C... + 80°C			
Protection type EN 60529	IP 67 (pressure equalisation via Gore-Tex membrane) IP 69K IP 67 with fixed reference cable connection IP 69 K with M12 x 1 plug and specified socket cable			
Electromagnetic compatibility	CE conformity			
Design configuration				
Electrical connection	- threaded cable connection M16 x 1.5 terminal strip (standard) or with a fixed reference cable connection (can be connected on the user side) - round plug M12 x 1 optional			
Process connections	CrNiSt 1.4435, 316 L			
Materials	field housing CrNiSt 1.4301 process connection 1.4404, process membrane 1.4435/1.4404			
Filling liquid	operating medium = silicon oil (poses no health hazard)			
Weight	1.2 kg or depending on the type of connection			
Authorisation				
	EHEDG certificate, FDA certificate (depending on the type of device)			

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DIMENSIONAL DRAWINGS



ELECTRICAL CONNECTION

The electrical connection is made via screw clamps after the screw-type lid has been removed. The cable insertion usually takes place via an M16 x 1.5 threaded connection, or optionally by means of an M12 x 1 round plug. The test circuit connection ensures an uninterrupted output current measurement. We recommend the use of a cable with an air-equalisation tube in areas, especially in areas with high humidity levels.

	Cable connection M16 x 1.5 4-20 mA (2-wire)	M16 x 1.5 4-20 mA (2-wire)	M 12 plug 4-20 mA (2-wire)
GND	white	GND	
+ supply	red	1	1
- supply	black	2	3

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ORDER INFORMATION

Electronics	
050	4-20 mA

Process connection (material 1.4404, 316 L)	
K1	Threaded connection ISO 228 G1K, metal seal, flush-mounted in front
M2	DIN 11851, DN 25 / PN 40, flush-mounted (conical connection with grooved nut)
M4	DIN 11851, DN 40 / PN 40, flush-mounted (conical connection with grooved nut)
M5	DIN 11851, DN 50 / PN 25, ceramics, flush-mounted (conical connection with grooved nut)
C4	Triclamp ISO 2852, DN 25-40 / 1 1/2", DIN 32676, flush-mounted
V5	VARIVENT flange DN 50 / PN 25, for pipe DN 25-32, flush-mounted
V8	VARIVENT flange DN 68 / PN 40, for pipe DN 40-125, flush-mounted
U2	Flush-mounted process connection UP-- with grooved nut DN 25, flush-mounted
I1	Ingold connection DN 25, union nut 1 1/4", flush-mounted
A2	Aseptic flanged connection DIN 11864-1, form A, with grooved nut
S9	Other process connection
99	Special material for process connection

Type of pressure / measuring range (R = relative pressure or A = absolute pressure) - all vacuum ranges also possible -		
0.35	bar R	max. Overload 1 bar
1	bar R	max. Overload 3 bar
2.5	bar R	max. Overload 8 bar
5	bar R	max. Overload 15 bar
10	bar R	max. Overload 30 bar
30	bar R	max. Overload 90 bar
100	bar R	max. Overload 250 bar
0.35	bar A	max. Overload 1 bar
1	bar A	max. Overload 3 bar
2.5	bar A	max. Overload 8 bar
5	bar A	max. Overload 15 bar
10	bar A	max. Overload 30 bar
30	bar A	max. Overload 90 bar
100	bar A	max. Overload 250 bar
CC	Set measuring range (in the event of a deviation from the nominal measuring range, please state in plain text and in bar)	

Electrical connection	
K	Cable connection M 16 x 1.5
M	Round plug M 12 x 1
W	Right-angle plug connection EN 175301-803 (not for 100)
R	Reference cable, 1 m, permanent connection other lengths to be specified in plain text (max. 80 m)

Accessories	
T1	Normal temperature version
T2	High-temperature version up to 200°C

TPF	050				
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Accessories / assembly parts for type TPF *1 *2	(Order reference)
Sealing stopper for G1K / VRM, 1.4404 (316 L)	ZVK
Weld-on dummy for G1K, MS 58	ZDK
DIS indicator on housing cover (see data sheet A-DIS-50-D-08-1)	DIS
Reference cable with pressure equalisation capillaries per metre or part thereof, made from PUR	ZKP
Pressure equalisation casing with ventilation filter - Wall mounting, can be used for all pressure transducers -	ZDA
Approval certificate according to EN 10204 for weld-on accessories - per order -	WZ 31 (3.1)

Process connection adaptor for connection form K1 *1 *2	(Order reference)
G1K welded socket for type K1, 1.4404 (316L)	ZEM / G1K
VARIVENT flange d=68mm, 1.4404 (316L)	Zf/VA-G1K
DRD flange d=65mm, d=100mm, 1.4404 (316L)	Zf/DRD-G1K
Conical connection with grooved nut DIN11851, DN50, 1.4404 (316L)	Zf/MG50.G1K

Other adaptors on request

*1 please order separately

*2 seals not included in delivery

Our products are constantly in further development. therefore subjects to modifications.

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