Flush-mounted pressure and level transmitter
- Modularsystem PZT series 100/101 -

Hengesbach
Prozessmesstechnik

Characteristics

- MODULAR PROCESS CONNECTION SYSTEM WITH SEALING CONE FREE OF ELASTOMERS
- PRECISE MEASUREMENT WITH ≤ ± 0,15% FS
- TURN-DOWN 10
- INTEGRATED ONSITE DISPLAY OR EXTERNAL OPERATING MODUL OPUS*M* FOR PARAMETRISATION AND DISPLAY OF MEASURED VALUES
- HIGH PROTECTION CLASSES IP 67 UND IP 69K
- VACUUM TIGHT MEASURING CELL
- APPLICATIONS STRENGTHS: VOLUME MEASUREMENTS ON PRESSURIZED TANKS / VACUUM MEASUREMENTS EVEN AT HIGH TEMPEARATURES

DESCRIPRTION

The pressure transmitters PZT are applicable for pressure and level measurements in pipes and vessels. The modular process connection system offers a huge variety of connection adapters and adds a sustainable cost reduction. The flush mounted process connection with its sealing cone free of elastomers and its stainless steel membrane is applicable for measurements with highest hygienic requirements.

The vacuum tight measuring cell with stainless steel membrane works with the piezoresistive measruning principle. The pressure transmitters PZT are designed for measuring ranges of -1/0...0,35bar up to -1/0...100bar. Special measuring ranges are also available. Due to the construction for permanent temperatures up to 125°C or 200°C respectively the transmitter are CIP and SIP cleanable. In addition the high protection classes IP67 and IP69K allow an accurate outside cleaning with foam and power washer and prevent the permeation of humidity into the instrument. As an additional protection against humidity the electronics in the housing are completely casted.

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All pressure transmitters of the series 200/201 are developed for universal applications, also for applications with permanently high temperatures up to 200°C. Furthermore the pressure transmitters can easily be read or configured via the onsite display on series 100 or the operating modul OPUS*M* on series 101.

TECHNICAL DATA

General inforamtion				
device type/measuring principle	PIEZOTEC PZT 100/101/: piezoresistive			
Input				
measuring ranges	PZT 100/101			
standard-range [bar]	relative	OSD	absolute	OSD
OSD=Over Load Safety [bar]	0...0,35	1		
	0...1	3	0...1	3
	-1/0...2,5	8	0...2,5	8
	-1/0...5	15	0...5	15
	-1/0...10	30	0...10	30
all measuring cells are vacuum tight	-1/0...30	90	0...30	90
	-1/0...100	250	0...100	250
setting of measuring ranges	via keybord of the onsite display / operating modul OPUS*M*			
adjustable ranges	measuring start zero: 0.....90% of the sensor range measuring range span: 10...100% of the sensor range			TD=10
bursting pressure acc. to DIN16086	≥ 4x sensor range			
Output				
output signal	2-wire: 4...20mA with test circuit connection inside the device			
breakdown signal	optionally: 3,8mA, 22mA, hold (hold the last measuring)			
current limit	3,85mA and 21,5mA (standard operation)			
integration timt	0...300s infinitly variable (respone time after pressure jump)			
Measuring accuracy				
reference conditions	acc. to DIN IEC 770			
linearity, hysteresis and repeatybility acc. to limit point-method DIN IEC 770	≤ ± 0,15% to the sensor range			
warm-up time	< 5s (device is self-testing)			
adjustment time (without damp)	< 200ms			
long term drift	≤ 0,2% FS per year			
thermical hysteresis	≤ ± 0,2% of the sensor range / 10K (-20...+80°C) form 4bar (PZT) ≤ ± 0,3% of the sensor range / 10K (-20...+80°C) up to 0,6bar (PZT)			
Operating conditions				
installation- / calibration-position	any / vertical (position-depending zero drift)			
media temperature	T1: -40...+125°C (140°C max. 1h) T2: -40...+200°C (high temperature construction)			
ambience- / storage temperature	type 101: -40...+85°C type 100: -30...+75°C (under -20°C is an increased risk of cable breaks / the display may have limited functions)			
protection class acc. to EN60529	IP 67 and IP 69K			
electromagnetic compatibility	susceptibility: acc. to DIN IEC 61000-6-2 spurious radiation: acc. to DIN IEC 61000-6-4			
Construction				
electrical connection	- standard: cable gland M16x1,5 nickel-plated brass (stainless steel on request) - optional: round plug M12x1 nickel-plated brass(stainless steel on request) - optional: angle plug gemäß EN 175301-803 - optional: reference cable			
process connection	- membrane flush mounted welded, CrNiSt (other on request) - lock-screw M38x1,5 and sealing cone free of elastomers - sealing EPM (FDA) (temperature range: -20...+150°C) - sealing FPM (FDA) (temperature range: -40...+200°C)			

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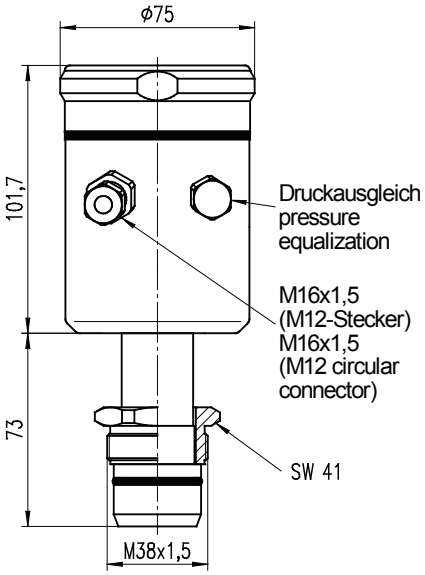
TECHNICAL DATA

Construction		
materials	- fieldhousing / cap:	CrNiSt 1.4301 (304)
	- housing seal:	FPM (Viton®)
	- pressure equalization:	Polyamid
	- window (type 100):	Polycarbonat
	- process-connection / connection-adapters:	CrNiSt 1.4404 (316L)
	- process-membrane:	CrNiSt 1.4435/1.4404 (316L)
	- screw (type 101):	CrNiSt 1.4301 (304)
	- reference cable: 5-wire with reference-tube:	PUR (recommendation: max. 80m)
filling liquids	- silicone-oil (FDA)	
Display and operation		
display	LCD, 4-digit numerical and 5-digit alphanumerical type 100: integrated on-site-display (not removable from the device) type 101: external display and operating modul OPUS*M*	
displayable units	pressure: mbar, bar, psi, Pa, mH2O, mmHg, Torr, atm, at, kg/cm² temperature: °C, °F, K, °R, °Ré	
additional units	output current in mA or % (based on span)	
operation	100: via configurationmenu with integrated on-site-display 101: via configurationmenu with external display and operating modul OPUS*M*	
Power supply		
power supply/burden	12-36V DC, max. burden: (Vsupply – 12V) / 24mA	
Accessories series 100		
display and operating modul OPUS*M*	external display and operating modul, CrNiSt, IP 67, 41x70mm, 1m connection cable and round plug M12x1	
certificates	calibration-certificate certificate of conformitation material certificate acc. to EN 10204	
process connection adapters	see orderinformations	

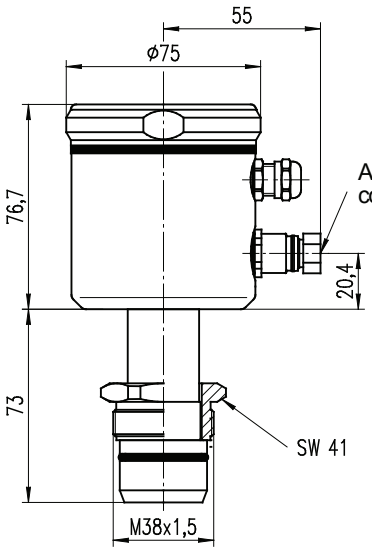
DIMENSIONAL DRAWINGS (dimensions in mm)

PIEZOTEC 100 ... _K(M)

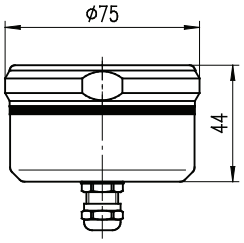


Feldgehäuse mit integrierter Anzeige (Edelstahl, IP67 + IP69K EN 60529)
field-housing with integrated display (stainless steel, IP67 + IP69K EN 60529)

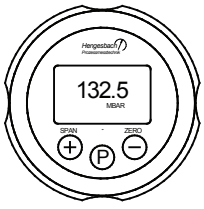
PIEZOTEC 101 ... _K(M)



Feldgehäuse für OPUS (Edelstahl, IP67 EN 60529)
field-housing for OPUS (stainless steel, IP67 EN 60529)



OPUS



Anzeige
display

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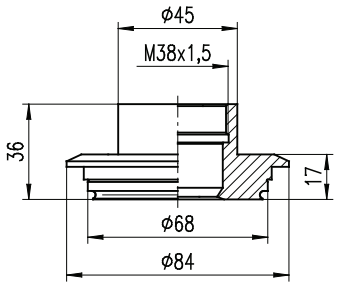
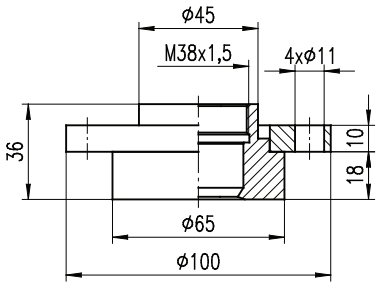
DIMENSIONAL DRAWINGS (dimensions in mm)

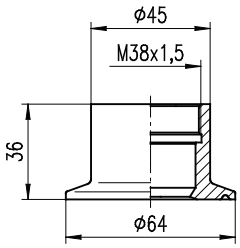
Prozessanschlussadapter: (weitere Ausführungen auf Anfrage)
adapters for process-connection: (other constructions on request)



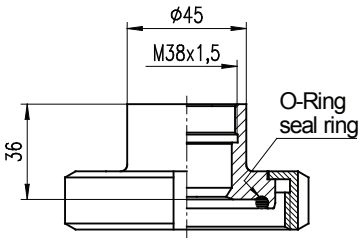
PVA6FPZT
VARIVENT-Flansch Ø68
VARIVENT-flange Ø68



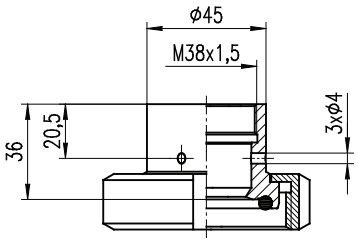
PDR6FPZT
DRD-Flansch Ø65
DRD-flange Ø65



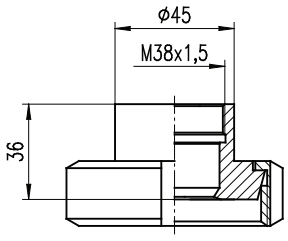
PCL5FPZT
Clamp DIN 32676 - DN50



PBS...FPZT
Bundstutzen DIN 11864-1
Form A; DN40, DN50
collar nozzle DIN 11864-1
form A; DN40, DN50



PBS4LPZT
Bundstutzen DIN 11864-1
DN40, mit 3 Leckagebohrungen
collar nozzle DIN 11864-1
DN40, with 3 leakage drills



PMN...FPZT
Kegelstutzen DIN 11851
conical nozzle DIN 11851
DN40, DN50

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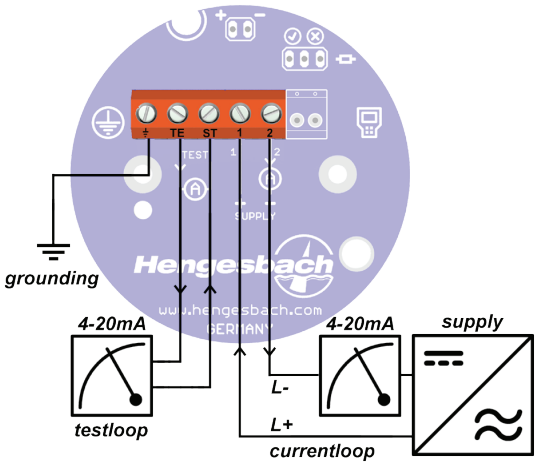
ELECTRICAL CONNECTION

The standard electrical connection is a cable gland M16x1,5. After the opening of the device cover the connection is made via screw terminals. The following drawing shows the connetion plan in the head of the transmitter:

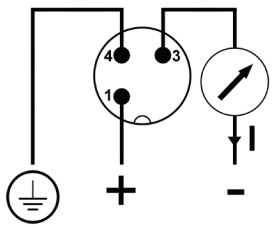
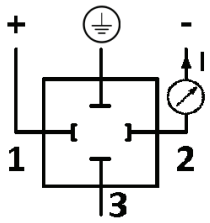


The connection of the supply voltage is made via the srew terminals 1 (+) and 2 (-). The current flowing in the loop current represents the present value measurement.

The terminals **TE** and **ST** provide a test circuit connection to available at the current with an ammeter of loop current can be measured without interruption.

The ground terminal is for potential equalisation between device and measuring point.

Alternative electrical connections are circular plug M12x1, anle plug acc. to EN 175301-803 or an attached reference cable with integrated vent capillary. The reference cable is available with a length from 5 up to 80m.

circular plug M12x1	angle plug acc. to EN 175301-803	reference cable
		

brown	supply +
black	supply -
white	ground
shielding	ground

CALIBRATION / SETTINGS

factory settings	
range calibrated:	nominal range, respectively acc. to ordering data
current output:	4...20mA with extended span 3,9...21mA
damping:	0s
mains:	50Hz
measuring value/unit:	pressure/mbar
current output at error:	hold (last value will be holded)

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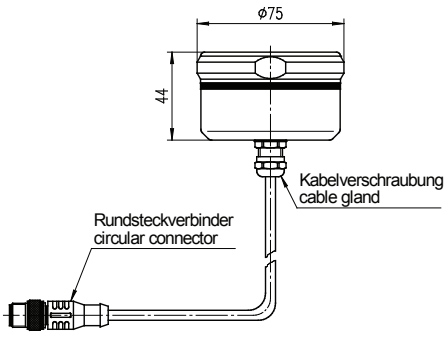
Configuration menu / List of Parameters (Basic settings of the first parameter level)

Nr.	Parameter	Description
P-0 OFSET	Offset	This parameter is used for setting the beginning of the measuring range. The value, which is set here, is assigned the output current of 4mA. The adjustable range is within 0 to 90 % of the nominal measuring range.
P-1 SPAN	Span	The span sets the end value for the measuring range. The value, which is set here, represents an output current of 20mA. The adjustable range is within 10 to 100 % of the nominal measuring range.
P-2 I OUT	Output current	The current range of 4...20mA can by inverted if required. The beginning of the measuring range, in its inverted state, corresponds to a current of 20mA, and the end of the measuring range to 4mA accordingly.
P-3 DAMP	Damping	If the pressure conditions vary heavily, the measuring value can be settled by activating the damping function. However, because this will slow down the reaction time of the device, this setting should only be activated if required.
P-4 MAINS	Mains frequency	The setting of the mains frequency, which is used at the respective operating location, serves to suppress any interference inside the device. This way, the mains noise of the power supply unit can be cut out to a large extent.
P-5 UNIT	Measuring unit	This setting is used for selecting between different measuring units depending on the measuring value (pressure, temperature, volume, mass), which is currently displayed.
P-6 DISPL	Display value	This parameter allows the selection of the displayed measuring value. Depending on the device configuration, you can choose between the pressure, temperature, current, percentage, volume or mass.
P-7 BIAS	Bias	A possible offset pressure, which should not be included in the measuring result, can be hidden by entering an inlet pressure / bias. This is particularly useful for volume measurements in pressurised tanks.
P-8 LIMIT	Limit	The device continuously writes the minimum and maximum values of the recorded measuring data, and these trailing pointers are provided both as a continuous and non-deletable version as well as a resettable version.
P-9 LOCK	Device lock	It is possible to set a lock for parameters which are used for special adjustments of the instrument. This is to avoid unsolicitous changes of the ionstrument.
P-10 I ERR	Current in error case	If the transmitter is faulty, the output current can either assume the lower limit (3.8mA), upper limit (22mA) or the last valid value (hold).
P-11 VERSN	Version	Both the version of the installed hardware (electronics) and the software (firmware) in the device can be viewed under this parameter. In the event of a fault it is possible to draw conclusions regarding the revision of the device.

Configuration menu / List of Parameters (Basic settings of the first parameter level)



externes Bedienmodul OPUS
external operation module OPUS

The parametrisation of the transmitters and the display resulting by the integrated onsite display (type 100) repectively the external display and operating modul OPUS*M* (type 101).

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ORDERINFORMATIONS for PIEZOTEC (PZT)

Elektronics

100	4...20mA, LC-Display, TD 10
101	4...20mA, operated with OPUS*M*, TD 10

Sensor measuring range / type of pressure

C		0,35bar max. Overload 1bar
E		1bar max. Overload 3bar
G		2,5bar max. Overload 8bar
J		5bar max. Overload 15bar
K		10bar max. Overload 30bar
M		30bar max. Overload 90bar
Q		100bar max. Overload 250bar
	R	Relative pressure, excess pressure (0...xxxbar)
	N	Relative pressure, vacuum (-1...xxxbar)
	A	Absolute pressure

Electrical Connection

K	Cable gland M16x1,5
M	Circular plug M12x1
R05	Reference cable, 5m, permanent connection
R10	Reference cable, 10m, permanent connection
R15	Reference cable, 15m, permanent connection
R20	Reference cable, 20m, permanent connection
R25	Reference cable, 25m, permanent connection
RXX	Reference cable, length over 20m, specify in plaintext (max. 80m)

Constructionoptions

T1	Standard-temperature construction
T2	High-temperature construction, media-temperatures up to 200°C

PZT [ ] [ ] [ ] [ ] [ ]

Nominal range if different from sensor measuring range

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ORDER INFORMATION for accessories PIEZOTEC PZT

Process connection adapters (please order separately)	**model**
Clamp DIN 32676, DN50, 1.4404 (316L)	Z-PCL5FPZT
DRD-flange Ø 65mm; 1.4404 (316L)	Z-PDR6FPZT
Conical nozzle with slotted nut DIN 11851, DN40, 1.4404 (316L)	Z-PMN4FPZT
Conical nozzle with slotted nut DIN 11851, DN50, 1.4404 (316L)	Z-PMN5FPZT
Conical nozzle with slotted nut DIN 11851, DN65, 1.4404 (316L)	Z-PMN6FPZT
thread nozzle DIN 11851, DN40, 1.4404 (316L)	Z-PMG4FPZT
thread nozzle DIN 11851, DN50, 1.4404 (316L)	Z-PMG5FPZT
Collar nozzle with slotted nut DIN 11864-1, DN40, 1.4404 (316L)	Z-PBS4FPZT
Collar nozzle with slotted nut DIN 11864-1, DN40, with 3 leakage drills, 1.4404 (316L)	Z-PBS4LPZT
Collar nozzle with slotted nut DIN 11864-1, DN50, 1.4404 (316L)	Z-PBS5FPZT
VARIVENT®-flange Ø 68mm, DN40-125, 1.4404 (316L)	Z-PVA6FPZT
VARIVENT®-flange Ø 68mm, DN40-125, with 3 leakage drills, 1.4404 (316L)	Z-PVA6LPZT
Other process connection	on request

Accessories/mounting parts (please order separately)	**model**
External operating modul OPUS*M* , for elektronic 101, 1.4301 (304)	OPUS*M*
O-Ring 28x2,5 EPDM (FDA)	Z-POR1FPZM
Welded block flange DRD, 1.4435 (316L)	Z-PBF9FDRD
Flat seal ePTFE for DRD-flange (FDA)	Z-FLD ePTFE DRD
4 piece of fastening screws for DRD-flange, 1.4301 (304)	Z-ZDRDSK10/20
Reference cable PUR with venting capillary tube (please specify length in m)	BT-RK DTM
Approval certificate 3.1 according to EN 10204 for material	Z-WZ31-3.1_M01
Approval certificate 3.1 according to EN 10204 for surface quality ≤0,8µm (standard)	Z-WZ31-3.1_OF1
certificate of compliance 2.1 according to EN 10204	Z-WZ21-2.1
certificate of compliance 2.2 according to EN 10204	Z-WZ22-2.2

Please observe the permissible nominal pressure of the process connection selected.
All specifications and certifications specified are only guaranteed when Hengesbach original components are used.
Our devices are subject to constant development; subject to technical modification.

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