

Intelligent differential pressure transmitter - Type KERADIFF 100 / 140 / 150 -



- FOR MEASURING DIFFERENTIAL PRESSURE, FILLING LEVELS AND FLOW
- RAPID USE AS A RESULT OF COMFORTABLE AND SIMPLE OPERATION
- 4...20 MA, HART® OR PROFIBUS OUTPUT
- MEASURING RANGES FROM 1 MBAR TO 40 BAR
- HIGH MEASURING ACCURACY < 0.1%
- TURNDOWN 100 : 1
- VARIOUS PROCESS CONNECTIONS

Version example: KERADIFF 100 with flange DIN 19213

Description

The KERADIFF 100 has a robust, highly overload-resistant silicon sensor with an outstanding capacity for high measuring accuracy, vacuum resistance and reliability for all long-term stable measurements. The high-performance measuring system is used to measure differential pressure, filling levels and flow, in connection with differential pressure transmitters, for gases, vapours and liquids. The devices are suitable for differential pressure as well as for positive and negative overpressure.

Medium- and process-suitable materials as well as different design variants allow the use of these devices with corrosive or abrasive media, as well as for processes with high aseptic requirements (e.g. in the food or pharmaceutical industry). Flush-mounted versions and pressure transmitters for almost all process connections are available for filling level applications.

Various types of measuring cells for graded measuring ranges ranging from 10 mbar, PN 160 bar, to 40 bar, PN 420 bar, thus allowing for optimal adaptation to the process conditions.

The digital communication signal (HART® protocol) can be superimposed onto the 4...20 mA signal and offers all information required for teleparametrisation (smart technology), as well as the version with the Profibus PA.

VERSIONS

Type	KERADIFF 100	KERADIFF 140	KERADIFF 150
Selection criterion	<ul style="list-style-type: none"> • Static pressures up to 420 bar • Differential pressures up to 40 bar 	<ul style="list-style-type: none"> • Filling level measurement in pressurised containers 	<ul style="list-style-type: none"> • Flanges from DN 50...DN • for high medium temperatures
Process connection	¼" – 18 NPT, RC ¼"	Bilaterally via a capillary tube with pressure transmitters in standard industrial forms	Flange on plus side, minus side according to DIN 19213
Standard application	<ul style="list-style-type: none"> - Flow measurement in connection with differential pressure transmitter - Filling level measurement on containers - Differential pressure measurement for filter monitoring and pump control 	Filling level and differential pressure measurement of corrosive, highly viscous and hot media in the event of pressurisation, e.g. food and pharmaceuticals.	Filling level and pressure measurement of corrosive and high-temperature media

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TECHNICAL DATA

General information	
Device type	KERADIFF
Application	Differential pressure measurement
Measuring sensor	Silicon sensor
Output	
Output signal	4...20 mA with superimposed HART® protocol or PROFIBUS PA
Breakdown signal	3.6 mA minimum alarm, 21 mA maximum alarm
Current limit	3.8 mA; 20.5 mA
Resolution	Current output: 1µA Display: adjustable
Measuring accuracy	
Influence of the system pressure on the zero point and range	0.2% / 100bar
Thermal change	± 0.2% for -40...-10°C or +60...+85°C
Temperature coefficient for zero signal or output range	0.02% / 10K (-10...+60 °C) and 0.1% / 10K (-40...-10 °C or +60...85°C)
Temperature coefficient of the pressure transmitter	see pressure transmitter table for T _K of the zero point
Deviation from the characteristic curve:	max. 0.1% max. 0.2% for the measuring limit range
Hysteresis:	0.1% of the set range
Repeatability:	0.1% of the set range
Heating time:	4...20 mA HART® < 10s, PROFIBUS PA 6s
Setting time:	between 0.5 and 2s, depending on the measuring range
Rise:	between 0.4 - 1.6s, depending on the measuring range
Long-term drift	0.2% / a
Adjustable attenuation	0...999s, adjustable via on-site operating field or PC (factory setting: 2s)
Conditions for use	
Medium temperature	-40...+85 °C
Nominal temperature	-40...+85 °C
Operating temperature	-40...+85 °C -20...+70 °C with on-site display
Storage temperature	-40...+100 °C -40...+85 °C on-site display
Protective class according to EN 60529	IP 67
Electromagnetic compatibility (EMV)	Electromagnetic compatibility according to EN 61326 and NAMUR recommendation EMV (NE21)
Vibration strength	± 0.1% according to DIN/IEC 68, Part 2-6, based on sensor range, measured on a 6000 mbar sensor
Installation position	Any, compensation when calibrating the measuring start
Auxiliary energy	
Supply voltage	11.5...45V
Residual ripple	No influence for 4...20 mA signal up to ± 5% residual ripple
Design configuration	
Materials	Housing: Copper-free die-cast aluminium housing with a protective coating on a polyester basis, grey, resistant to seawater, salt-spray test DIN 50 021 (504 hours) passed, optional process connection, O-rings made from NBR for cover sealing, assembly bracket made from C22.8 Membrane: AISI 316 L Flange: DIN 19213 from AISI 316 L For KERADIFF 140, 150: Pressure transmitter from AISI 316 L, see corresponding data sheets, special materials a..A: Capillary tube and holding pipe made of AISI 316 L KERADIFF 150: Installation of the pressure transmitter: rigid connection via holding flange (see diagram) or via a capillary tube (max. 8 m), to be specified if required
Process connections	All standard and common connections (see dimensional drawings)
Electrical connection	M20x1,5 Terminal connection with built-in inter-clock diode for cable diameters of 0.5 to 2.5 mm ² , two-wire connection cable with a standard installation cable.
Climate class	Class 4K4H (air temperature: -20...+55°C, relative humidity: 4...100%) according to DIN EN 60721-3-4 fulfilled (condensation possible)

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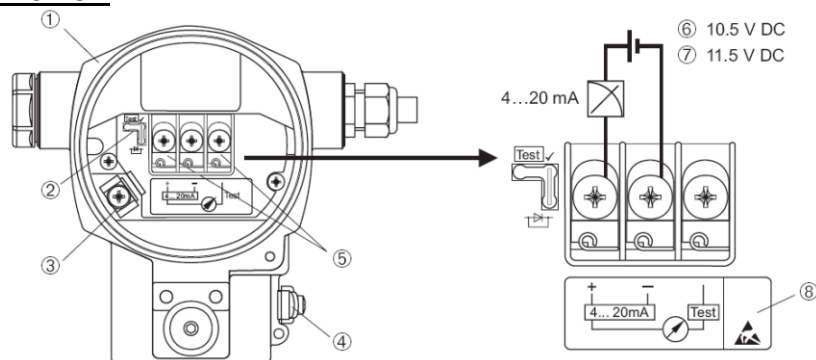
MEASURING RANGES

Nominal value [mbar]	Measuring limit		Smallest calibratable measuring range [mbar]	Maximum operating pressure [bar]	Overload		Minimum system pressure [mbar _{abs}]
	lower (LRL) [mbar]	upper (URL) [mbar]			unilateral [bar]	bilateral [bar]	
10'	-10	+10	0.25	160	160	240	0.1
30'	-30	+30	0.3	160	160	240	0.1
100	-100	+100	1	160	160	240	0.1
500	-500	+500	5	160/420*	160/420	240/630	0.1
3000	-3000	+3000	30	160/420*	160/420	240/630	0.1
16000	-16000	+16000	160	160/420*	160/420	240/630	0.1
40000	-40000	+40000	400	160/420*	"+" side: 160/420 "- " side: 100	240/630	0.1

* for KERADIFF with CRN-approved process connection 315 bar

ELECTRICAL CONNECTION




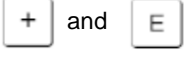
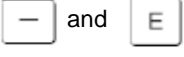
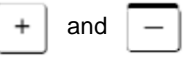
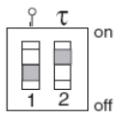
4...20 mA HART



1. Housing
2. Jumper for 4...20 mA test signal
3. Internal earth terminal
4. External earth terminal
5. 4...20 mA test signal between the plus and test terminal

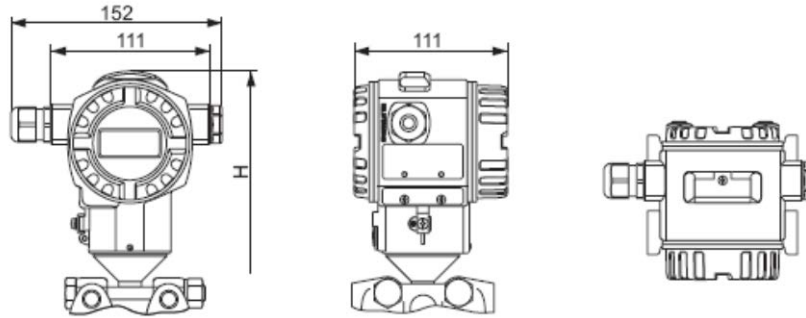
6. Minimum voltage supply = 10.5 V DC, jumper is attached according to diagram
 7. Minimum voltage supply = 11.5 V DC, jumper is attached in "test" position
- Devices with integrated overvoltage protection are labelled with "OVP" (overvoltage protection) at this point.

OPERATING ELEMENTS - on-site display

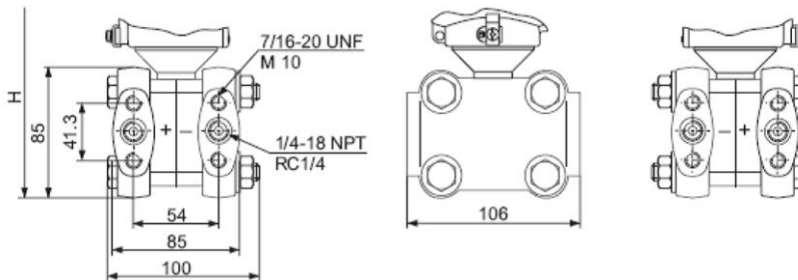
Button	Significance
	<ul style="list-style-type: none"> - Scroll up in the selection list - Editing the values or symbols of a function
	<ul style="list-style-type: none"> - Scroll down in the selection list - Editing the values or symbols of a function
	<ul style="list-style-type: none"> - Confirm entry - Jump to next menu point
	Contrast setting of the on-site display: stronger
	Contrast setting of the on-site display: weaker
	<p>ESC functions:</p> <ul style="list-style-type: none"> - Exit editing mode without saving the amended value - You are in the menu within one group of functions: By simultaneously pressing the buttons once, you will jump back on parameter within the functional group. By simultaneously pressing the buttons again, you will jump up one level in the menu - You are on a selection level in the menu: Each time you simultaneously press the buttons, you will jump one level up in the menu
	<ul style="list-style-type: none"> - DIP switch 1: Used to lock/unlock parameters relevant for the measuring value. Factory setting: off (unlocked) - DIP switch 2: Attenuation on/off Factory setting: on (attenuation on)

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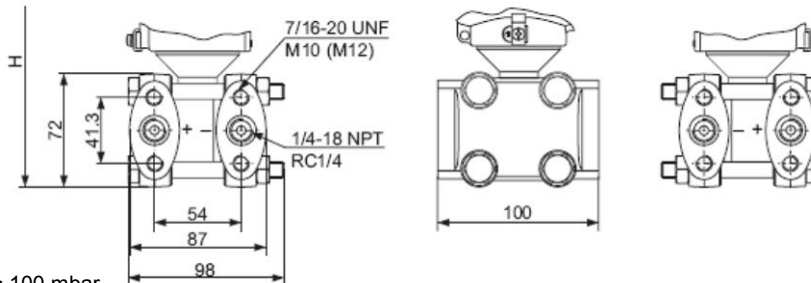
DIMENSIONAL DRAWINGS



KERADIFF 100: Oval flange, connection 1/4-18 NPT or RC 1/4

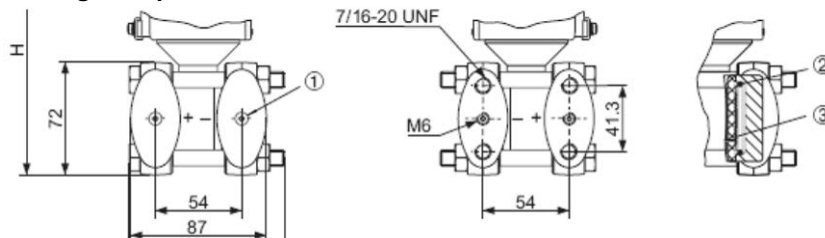


10 mbar and 30 mbar measuring cell

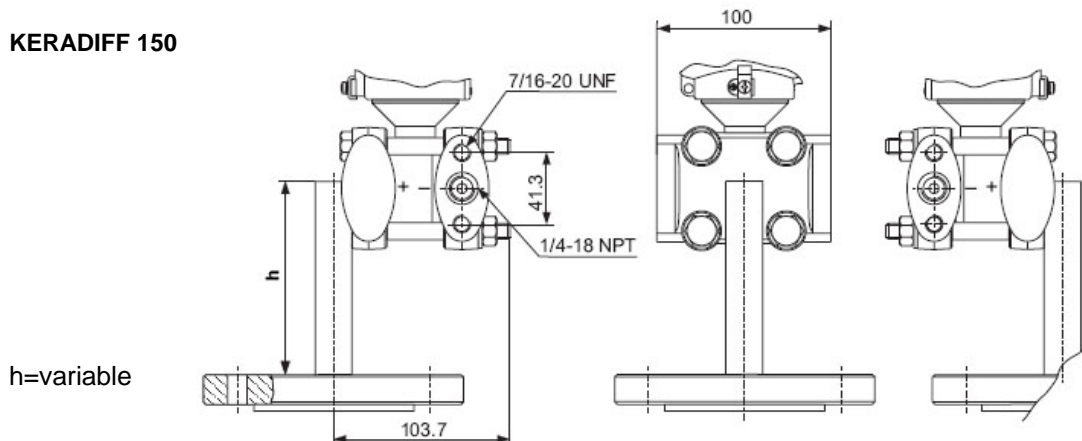


Measuring cell ≥ 100 mbar

KERADIFF 140: Oval flange, for pressure transmitter installation



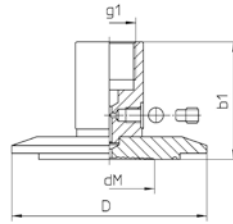
KERADIFF 150



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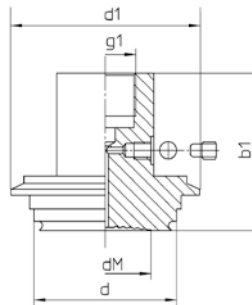
Pressure transmitter connections

Tri-Clamp, ISO 2852 DN 51 (2"), DIN 32676 DN 50, AISI 316L product key HA
Tri-Clamp, ISO 2852 DN 76.1 (3"), AISI 316L product key TF



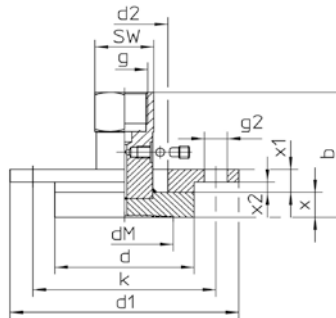
Type	DN	PN	D	dM	b1	g1	MA	Mass (approx.)
HA	2"	40	64	45	45	G ½	0 – 1 bar	0.70
TF	3"	25	91	72	45	G ½	0 – 0.6 bar	1.30

Varivent® d = 68mm, AISI 316L product key TR



Type	DN	For pipes with ø	PN	d	d1	dM	b1	g1	MA	Mass (approx.)
TR	68	Ø 40 to 125 mm	16	68	84	46	55	G ½	0 – 1 bar	0.82

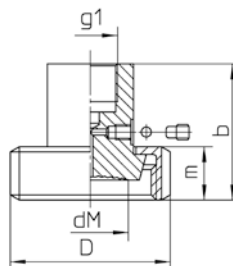
DRD DN 50 (65mm), PN 25, AISI 316L product key KE



Dimensions (mm) and mass (kg), minimum display range (MA)

Type	DN	PN	b	d	d1	d2	dM	g	g2	k	SW	x	x1	x2	MA	Mass (approx.)
KE	50	40	61	65	105	40	46	G ½	4 X 10.5	84	27	12	11	5	0-1 bar	0.90

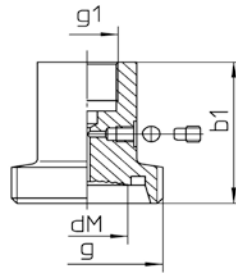
DIN 11851 DN 50 PN 25, grooved nut, AISI 316L product key FA
DIN 11851 DN 65 PN 25, grooved nut, AISI 316L product key FE



Type	DN	PN	D	dM	b	m	g1	MA	Mass (approx.)
FA	50	25	92	46	48	22	G ½	0 - 1 bar	1.10
FE	65	25	112	52	54	25	G ½		2.00

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DIN 11851 DN 50 PN 25 threaded connection, AISI 316L product key GA
DIN 11851 DN 65 PN 25, threaded connection, AISI 316L product key GE

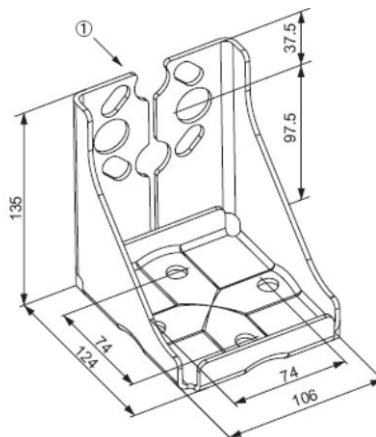


Type	DN	PN	dM	b1	g	g1	MA	Mass (approx.)
GA	50	25	46	55	Rd 78 x 1/6	G 1/2	0 - 1 bar	0.90
GE	65	25	59	55	Rd 95 x 1/6	G 1/2	0 - 1 bar	1.95

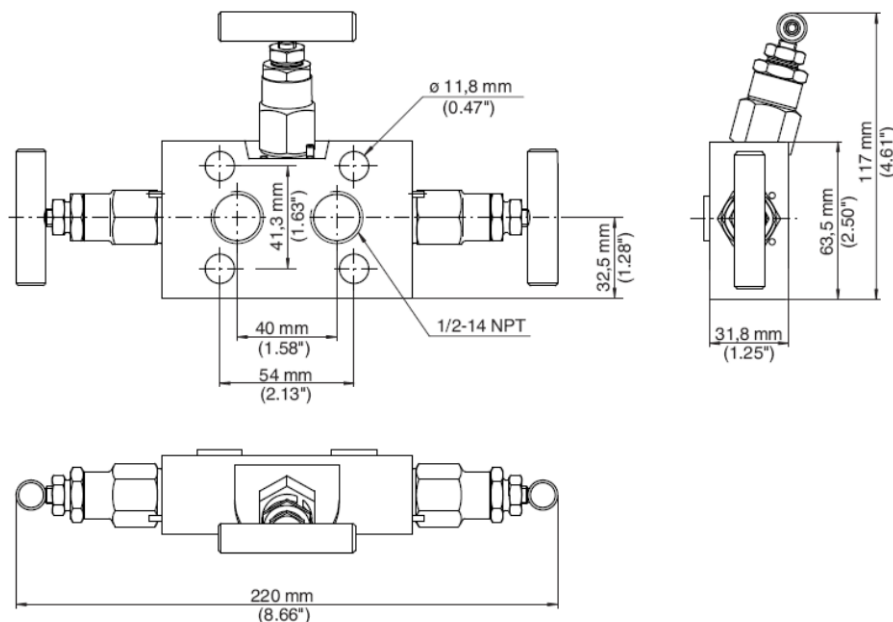
Other pressure transmitters on request

Options / accessories

Wall-mounting bracket, product key MRW



Triple valve block, DIN 19213
for a direct flange connection to the KERADIFF 100, stainless steel 1.4571 product key 3VB



Intelligent differential pressure transmitter

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KERADIFF ORDER INFORMATION

Version	
100	Differential pressure transmitter
140	Differential pressure transmitter with pressure transmitter connection and capillary tube for high- and low-pressure side
150	Differential pressure transmitter with flush-mounted membrane, unilaterally fitted for the high-pressure side

Output	
B	4...20 mA HART, SIL, internal operation, LCD
C	4...20 mA HART, SIL, internal operation
N	PROFIBUS PA, internal operation, LCD
O	PROFIBUS PA, internal operation

Housing	
Y	Aluminium housing, optional lateral display, IP 66/67/NEMA 4X 6P, painted grey, threaded connection M20x1.5

Nominal measuring range/PN		
7B	10 mbar ^{*1}	PN 160 bar
7C	30 mbar ^{*1}	PN 160 bar
7D	100 mbar	PN 160 bar
7F	500 mbar	PN 160 bar
7H	3 bar	PN 160 bar
7L	16 bar	PN 160 bar
7M	40 bar ^{*2}	PN 160 bar
8F	500 mbar ^{*1}	PN 420 bar
8H	3 bar ^{*1}	PN 420 bar
8L	16 bar ^{*1}	PN 420 bar
8M	40 bar ^{*1}	PN 420 bar

Measuring unit	
1	Nominal value in mbar / bar
2	Nominal value in kPa / MPa
3	Nominal value in mmH ₂ O
9	according to specifications

Membrane material	
1	AISI 316L
99	other material

KERADIFF

^{*1} nominal measuring range only available for KERADIFF 100

^{*2} nominal measuring range not available for KERADIFF 150

KERADIFF 100

Process connection / material	
2	¼ - 18 NPT, attachment: PN 160: M10, PN 420: M12, AISI 316L (CRN), incl. 2 venting valves (AISI 316L)
99	Other process connection

Seal	
A	FKM Viton
Y	other seal

KERADIFF 100

Intelligent differential pressure transmitter

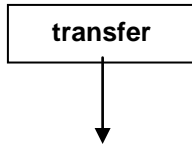
- Type KERADIFF 100 / 140 / 150 -

KERADIFF 140 with pressure transmitter connection and capillary tube



Process connection (high- and low- pressure side), material	
UA	Flange DN 50 PN 40, AISI 316L
UE	Flange DN 80 PN 40, AISI 316L
HA	Tri-Clamp, ISO 2852 DN 51 (2"), DIN 32676 DN 50, AISI 316L
TF	Tri-Clamp, ISO 2852 DN 76.1 (3"), AISI 316L
TR	Varivent d = 68mm, AISI 316L
KE	DRD DN 50 (65mm), PN 25, AISI 316L
FA	DIN 11851 DN 50 PN 25, grooved nut, AISI 316L
FE	DIN 11851 DN 65 PN 25, grooved nut, AISI 316L
GA	DIN 11851 DN 50 PN 25 threaded connection, AISI 316L
GE	DIN 11851 DN 65 PN 25, threaded connection, AISI 316L
YY	Other process connection

Capillary tube length (8 m max.) / filling medium	
1	...m capillary tube, white oil
2	...m capillary tube, vegetable oil
3	...m capillary tube, high-temperature oil
4	...m capillary, oil for O ₂ use



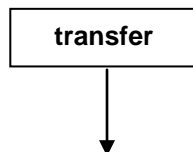
KERADIFF 140

KERADIFF 150 with flush-mounted membrane, unilaterally fitted (rigid connection)

Process connection on low-pressure side, material	
B	¼ - 18 NPT IEC 61518, C22.8, FKM-Viton (CRN)
Y	Other process connection

Process connection on high-pressure side, material	
UA	Flange DN 50 PN 40 B1, AISI 316L
UE	Flange DN 80 PN 40 B1, AISI 316L
TA	Sanitary tank flange, AISI 316L with 2" hygiene connection tube
YY	Other process connection

Filling medium	
A	Silicon oil
D	Vegetable oil
V	High-temperature oil
F	Oil for O ₂ use



KERADIFF 150

Options / accessories (please order separately reference)	(Order reference)
Pipe / wall-mounting installation kit, 316L with rust-proof M10 screws	MRW
Triple valve block, DIN 19213	3VB
For a direct flange connection to the KERADIFF 100, stainless steel 1.4571	
Approval certificate according to EN 10204 for weld-on accessories - per order -	WZ 31 (3.1)

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

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