



Level measurement device with guided radar

- Universal level measurement device for liquids
- Liquid interface measurement
- Insensitive to dust and steam
- 4...20 mA/HART, 2 wires
- ATEX/IECEX certifications

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

	Type 8619 ▶ multiCELL - Multi-channel and multi-function transmitter/controller
	Type 8611 ▶ eCONTROL - Universal controller
	Type 8802 ▶ ELEMENT continuous control valve systems - overview
	Type 8644 ▶ Remote Process Actuation Control System AirLINE
	Type 8793 ▶ Digital electropneumatic Process Controller SideControl

Type description

The Type 8188 is a level measurement device with cable, rod, both interchangeable probe or with coax probe, designed for continuous level measurement.

The unit is suitable for liquids, for industrial use in all areas of process technology. With a measuring range up to 75 m, the 8188 is best suited for tall vessels.

Even process conditions such as strong steam generation, density fluctuations or changes of the dielectric constant do not influence the accuracy of the measurement. Build-up or condensation on the probe or vessel wall do not influence the measuring result.

A liquid interface measurement is also possible with the Type 8188, typically an oil/water interface.

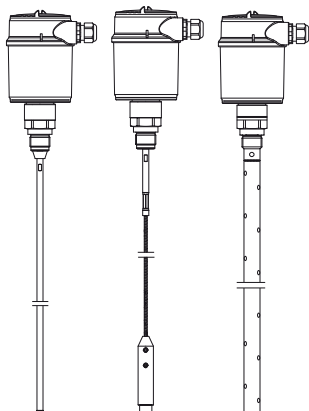
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1. General technical data

1.1. About the device:

The device is available with a rod, cable or coaxial measuring probe. The technical data depends on the variant of the level measurement device with guided radar.



1.2. All variants

Product properties

Material

Please make sure the device materials are compatible with the fluid you are using. Detailed information can be found in chapter [“3.1. Chemical Resistance Chart – Bürkert resistApp”](#) on page 6.

Non wetted parts

Cover	PC transparent
Housing	Plastic PBT (Polyester), PPS and stainless steel 316L (1.4404)
Grounding terminal and screw	Stainless steel 316L
Seal	Between housing and cover: EPDM
Cable gland	PA
Blind plug	PA

Wetted parts

Process seal	NBR with aramid fibres
Dimensions	Detailed information can be found in chapter “4. Dimensions” on page 7.
Measured quantity	Level of liquids. For solids applications, please contact your local Bürkert Sales Center.
Measuring range	Detailed information can be found in chapter “5.1. Measuring range and blocking distance diagram” on page 10.
Damping (63 % of the input variable)	0...999 s, adjustable

Product accessories

Display/configuration module	LCD in full dot matrix. Detailed information can be found in chapter “7.4. Ordering chart accessories” on page 16
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Performance data

Blocking distance	Detailed information can be found in chapter “5.1. Measuring range and blocking distance diagram” on page 10.
Measuring range resolution	< 1 mm
Measurement deviation ^{1,2,3)}	According to DIN EN 60770-1: ±2 mm Detailed information can be found in chapter “5.2. Measurement deviation diagram” on page 11.
Non-repeatability	≤ ±1 mm (max.)
Measuring cycle time	< 500 ms
Step response time ³⁾	≤ 3 s
Temperature drift	<ul style="list-style-type: none"> Digital output: ±3 mm/10 K relating to the max. measuring range or max. 10 mm Current output: < 0.03 %/10K relating to the 16 mA span or ≤ 0.3 %
Filling/emptying speed	Max. 1 m/min

Electrical data

Operating voltage (U_n)	<ul style="list-style-type: none"> Without display/configuration module: <ul style="list-style-type: none"> – 9.6...35 V DC – 9.6...30 V DC (Ex ia instrument) With display/configuration module: <ul style="list-style-type: none"> – 16...35 V DC – 16...30 V DC (Ex ia instrument)
Power source (not supplied)	Limited power source according to UL/EN 60950-1 standards or limited energy circuit according to UL/EN 61010-1 §9.4
DC reverse polarity protection	Yes
Residual ripple (for DC)	For $9.6\text{ V} < U_n < 18\text{ V}$: $\leq 0.7\text{ V}_{\text{eff}}$ (16...400 Hz) For $18\text{ V} < U_n < 35\text{ V}$: $\leq 1.0\text{ V}_{\text{eff}}$ (16...400 Hz)
Overvoltage category according to IEC 61010-1	Category III
Protection class according to IEC 61010-1	Class III
Starting current	$\leq 3.6\text{ mA}$, $\leq 10\text{ mA}$ for 5 ms after the switching on
Load resistor	$(U_n - U_{\text{min}})/0.022\text{ A}$
Output	4...20 mA/HART
Range of the output signal	3.8...20.5 mA/HART (default setting)
Signal resolution	0.3 μA
Max. output current	21.5 mA
Fault signal	Current output: last valid measured value, $\geq 21\text{ mA}$ or $< 3.6\text{ mA}$ (adjustable)
Voltage supply cable	<ul style="list-style-type: none"> Cable diameter: 5...9 mm Wire cross-section (spring-loaded terminals): <ul style="list-style-type: none"> – Massive wire, stranded wire: 0.2...2.5 mm² (AWG 24...14) – Stranded wire with end sleeve: 0.2...1.5 mm² (AWG 24...16)

Process/Port connection & communication

Process connection	Thread G or NPT - 3/4", 1"
Electrical connection	Cable gland M20x 1.5

Approvals and Certificates**Directives**

CE directive	The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable)
NAMUR recommendation	<ul style="list-style-type: none"> NE21 – Electromagnetic compatibility of equipment NE43 – Signal level for fault information from measuring transducers NE53 – Compatibility of field devices and display/adjustment components NE107 – Self-monitoring and diagnosis of field devices
Certification	ATEX/IECEx: EN IEC 60079-0, EN 60079-11, EN 60079-26 Detailed information can be found in chapter "2.1. Certifications" on page 6.

Environment and installation

Ambient temperature	Operation and storage: -40...+80 °C (-40...+176 °F) (with display/configuration module)
Temperature derating	Depending on the device variant. Detailed information can be found in chapter "5.3. Temperature derating diagram" on page 13.
Relative air humidity	20...85 %, without condensation
Height above sea level	Max. 2000 m (by default; max. 5000 m with connected overvoltage protection)
Degree of protection according to IEC/EN 60529	IP66/IP67 with cable plug mounted and tightened M20x 1.5
Pollution degree	Degree 4 (when used with fulfilled housing protection)

1.) Depending on the mounting conditions, deviations can occur which can be rectified by adapting the adjustment or changing the measured value offset in the DTM service mode.

2.) The blocking distances can be optimized by a false signal suppression.

3.) Time span, after a sudden change in the measuring distance of max. 0.5 m in liquid applications, until the output signal has assumed for the first time 90 % of the final value (IEC 61298-2).

1.3. Variant with rod probe

Product properties

Materials

Wetted parts

Process connection	<ul style="list-style-type: none"> Stainless steel 316L (1.4404 or 1.4435) and PPS (variant up to 6 bar) Stainless steel 316L (1.4404 or 1.4435) and PEEK (variant up to 40 bar)
Probe	Rod-Ø 8 mm in stainless steel 316L (1.4404 or 1.4435)
Seal	Process seal on the instrument side (rod lead-through) in EPDM
Weight	Housing: 890 g Rod-Ø 8 mm: approx. 400 g/m
Probe length	0.3...6 m (lateral load: 10 Nm)

Medium data

Process temperature	<ul style="list-style-type: none"> -40...+80 °C (-40...+176 °F) (for variant up to 6 bar) -40...+150 °C (-40...+302 °F) (for variant up to 40 bar)
Process pressure	<ul style="list-style-type: none"> -1...+6 bar (-100...+600 kPa/-14.5...+87 psig) (for process connection in stainless steel 316L (1.4404 or 1.4435) and PPS) -1...+40 bar (-100...+4000 kPa/-14.5...+580 psig) (for process connection in stainless steel 316L (1.4404 or 1.4435) and PEEK)
Dielectric constant (min.)	$\epsilon_r > 1.6$

1.4. Variant with cable version and gravity weight

Product properties

Materials

Wetted parts

Process connection	<ul style="list-style-type: none"> Stainless steel 316L (1.4404 or 1.4435) and PPS (variant up to 6 bar) Stainless steel 316L (1.4404 or 1.4435) and PEEK (variant up to 40 bar)
Inner conductor	Up to separation cable: stainless steel 316L (1.4404 or 1.4435)
Probe	Cable-Ø 4 mm with gravity weight in stainless steel 316L (1.4404 or 1.4435)
Seal	Process seal on the instrument side (cable lead-through) in EPDM
Weight	<ul style="list-style-type: none"> Housing: 890 g Cable-Ø 4 mm: approx. 60 g/m Gravity weight: approx. 200 g
Probe length	0.5...75 m (max. tensile load: 2.5 kN)

Medium data

Process temperature	<ul style="list-style-type: none"> -40...+80 °C (-40...+176 °F) (for variant up to 6 bar) -40...+150 °C (-40...+302 °F) (for variant up to 40 bar)
Process pressure	<ul style="list-style-type: none"> -1...+6 bar (-100...+600 kPa/-14.5...+87 psig) (for process connection in stainless steel 316L (1.4404 or 1.4435) and PPS) -1...+40 bar (-100...+4000 kPa/-14.5...+580 psig) (for process connection in stainless steel 316L (1.4404 or 1.4435) and PEEK)
Dielectric constant (min.)	$\epsilon_r > 1.6$

1.5. Variant with coaxial probe

Product properties

Materials

Wetted parts

Process connection	Stainless steel 316L (1.4404 or 1.4435) and PEEK
Inner conductor	Up to separation rod: stainless steel 316L (1.4404 or 1.4435)
Probe	Coaxial-Ø 21.3 mm (tube) in stainless steel 316L (1.4404 or 1.4435)
Seal	Process seal on the instrument side (rod lead-through) in EPDM



Weight	<ul style="list-style-type: none"> Housing: 890 g Coaxial-Ø 21.3 mm: approx. 1110 g/m
Probe length	0.3...6 m (lateral load: 60 Nm)
Medium data	
Process temperature	-40...+150 °C (-40...+302 °F)
Process pressure	-1...+40 bar (-100...+4000 kPa/-14.5...+580 psig)
Dynamic viscosity η	0.1...500 mPa s (requirement: with density 1)
Dielectric constant (min.)	$\epsilon_r > 1.4$

2. Approvals

2.1. Certifications

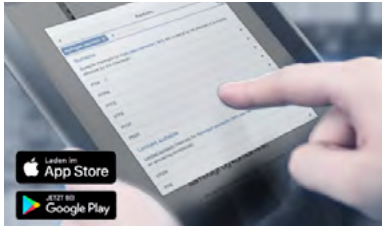
Note:

Devices with Ex certification have different technical data, see **Supplement ATEX/IECEX Type 8188** ▶ under user manual.

Certification	Description
 	<p>Explosion proof EU-Type Examination Certificate Number: TÜV 19 ATEX 260229X / IECEX TUN 19.0021X</p> <p>ATEX</p> <ul style="list-style-type: none"> II 1G Ex ia IIC T6...T1 Ga resp. II 1/2G Ex ia IIC T6...T1 Ga/Gb resp. II 2G Ex ia IIC T6...T1 Gb <p>IECEX</p> <ul style="list-style-type: none"> Ex ia IIC T6...T1 Ga resp. Ex ia IIC T6...T1 Ga/Gb resp. Ex ia IIC T6...T1 Gb <p>Measures to comply with ATEX/IECEX requirements: refer to the Supplement ATEX/IECEX Type 8188 ▶ under user manual. The Ex. certification is only valid if the Bürkert device is used as described in the supplement ATEX/IECEX. If unauthorized changes are made to the device, the Ex. certification becomes invalid.</p>

3. Materials

3.1. Chemical Resistance Chart – Bürkert resistApp



Bürkert resistApp – Chemical Resistance Chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

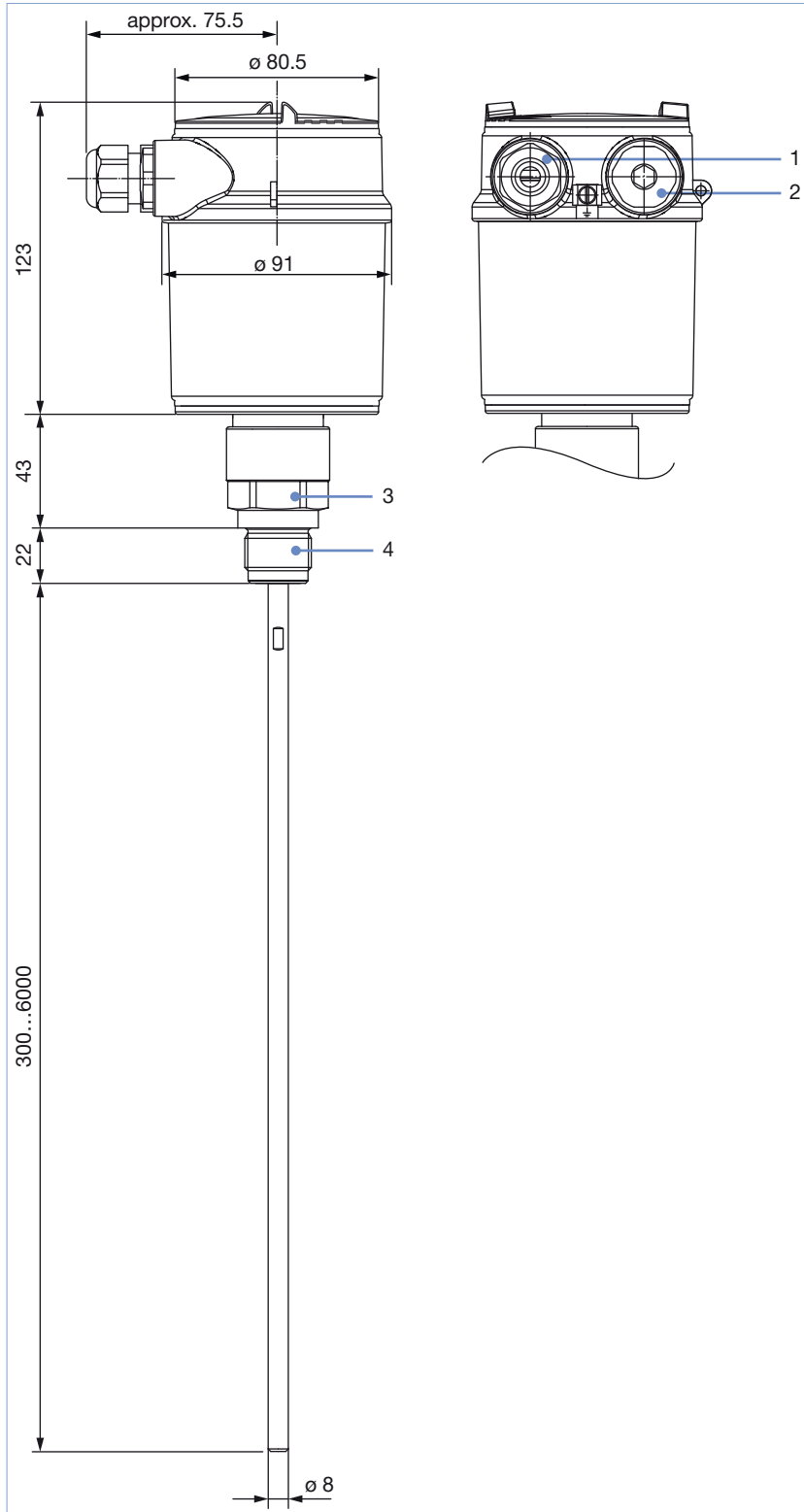
[Start Chemical Resistance Check](#)

4. Dimensions

4.1. Variant with rod probe

Note:

Dimensions in mm (unless specified differently)

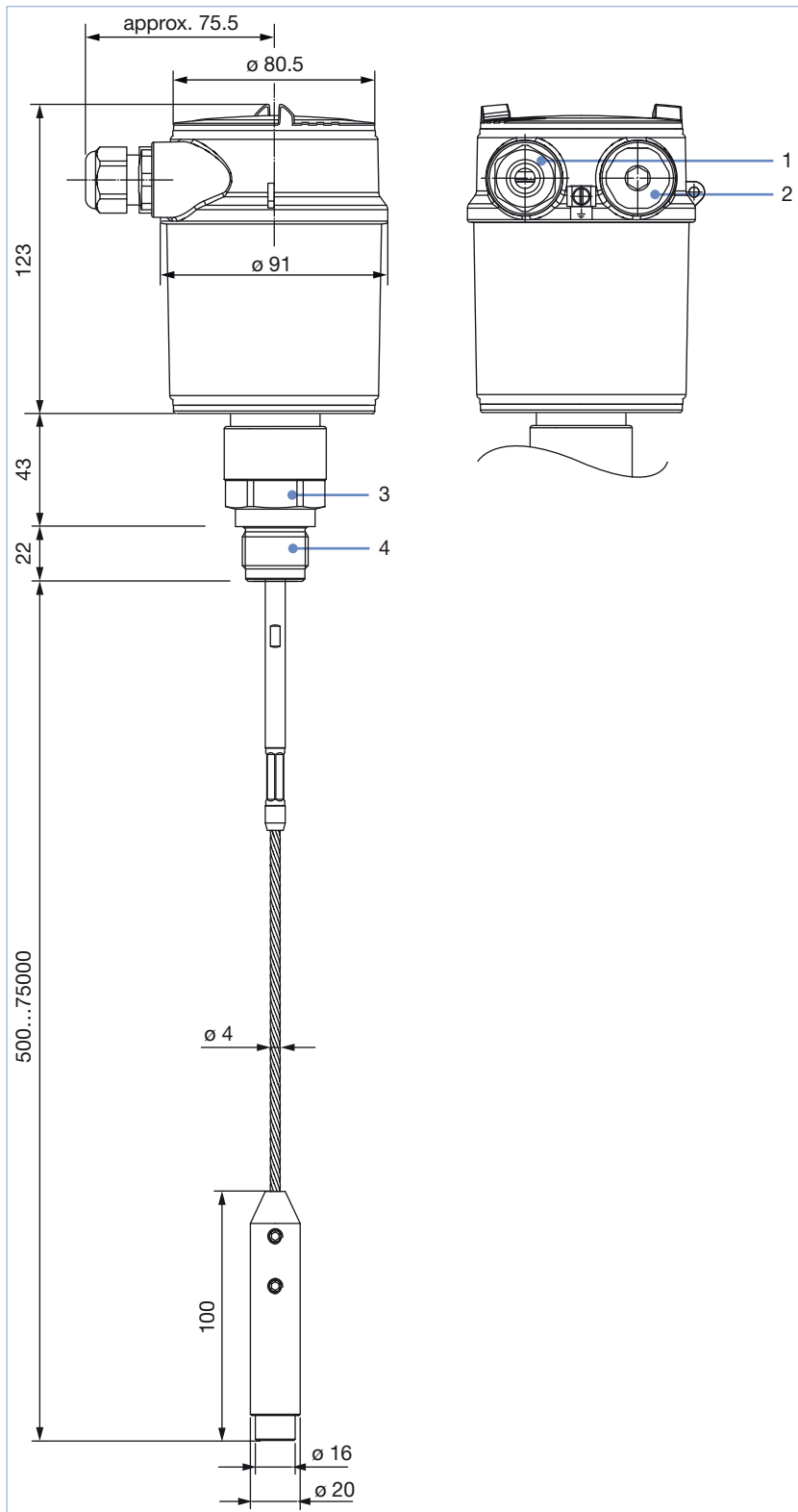


No.	Element
1	Cable gland M20 × 1.5
2	Blind plug M20 × 1.5
3	AF36 for G or NPT ¾"
4	AF41 for G or NPT 1"
	G or NPT ¾"
	G or NPT ¾"

4.2. Variant with cable probe and gravity weight

Note:

Dimensions in mm (unless specified differently)

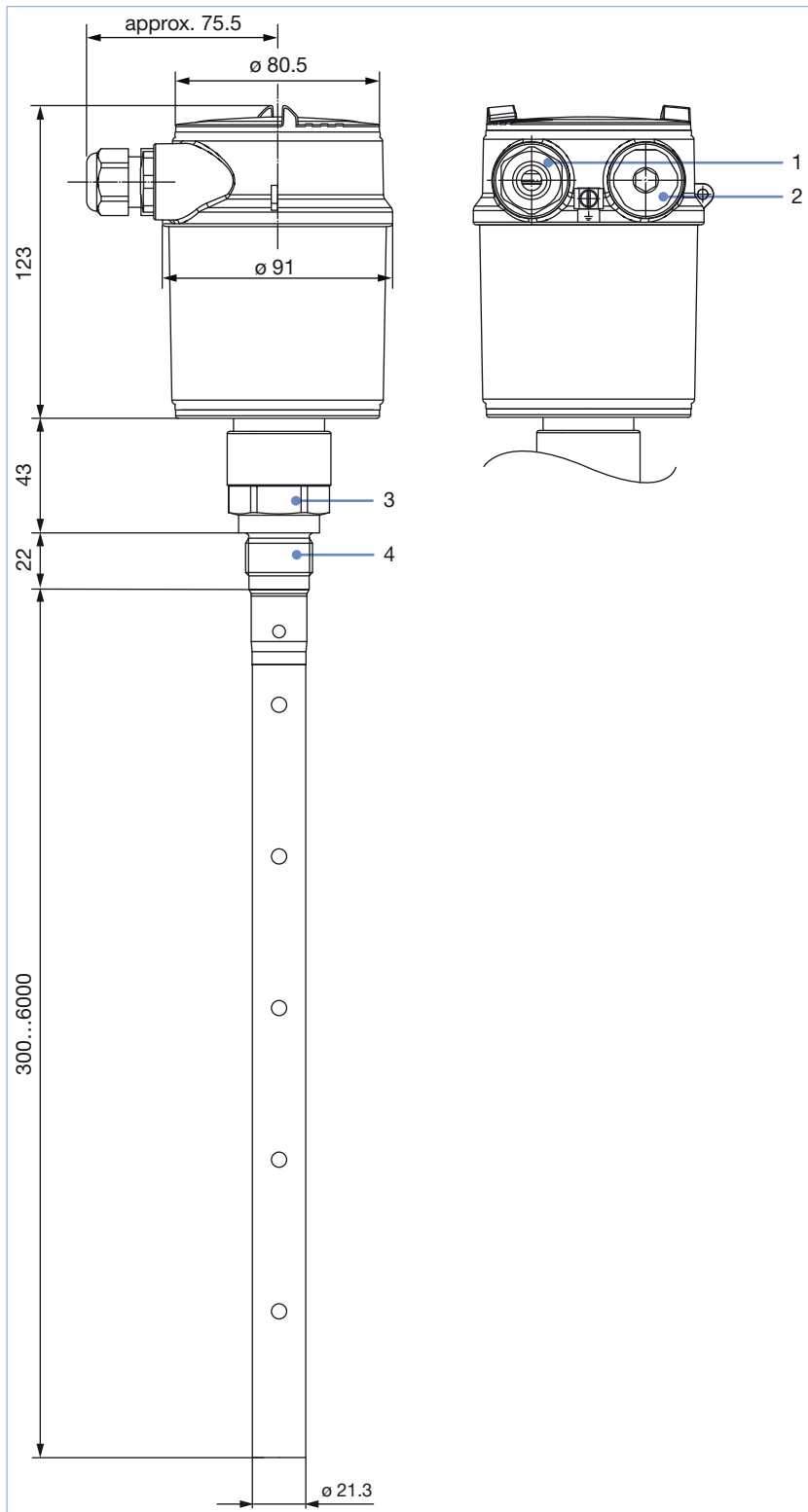


No.	Element
1	Cable gland M20 x 1.5
2	Blind plug M20 x 1.5
3	AF36 for G or NPT 3/4" AF41 for G or NPT 1"
4	G or NPT 3/4" G or NPT 3/4"

4.3. Variant with coaxial probe

Note:

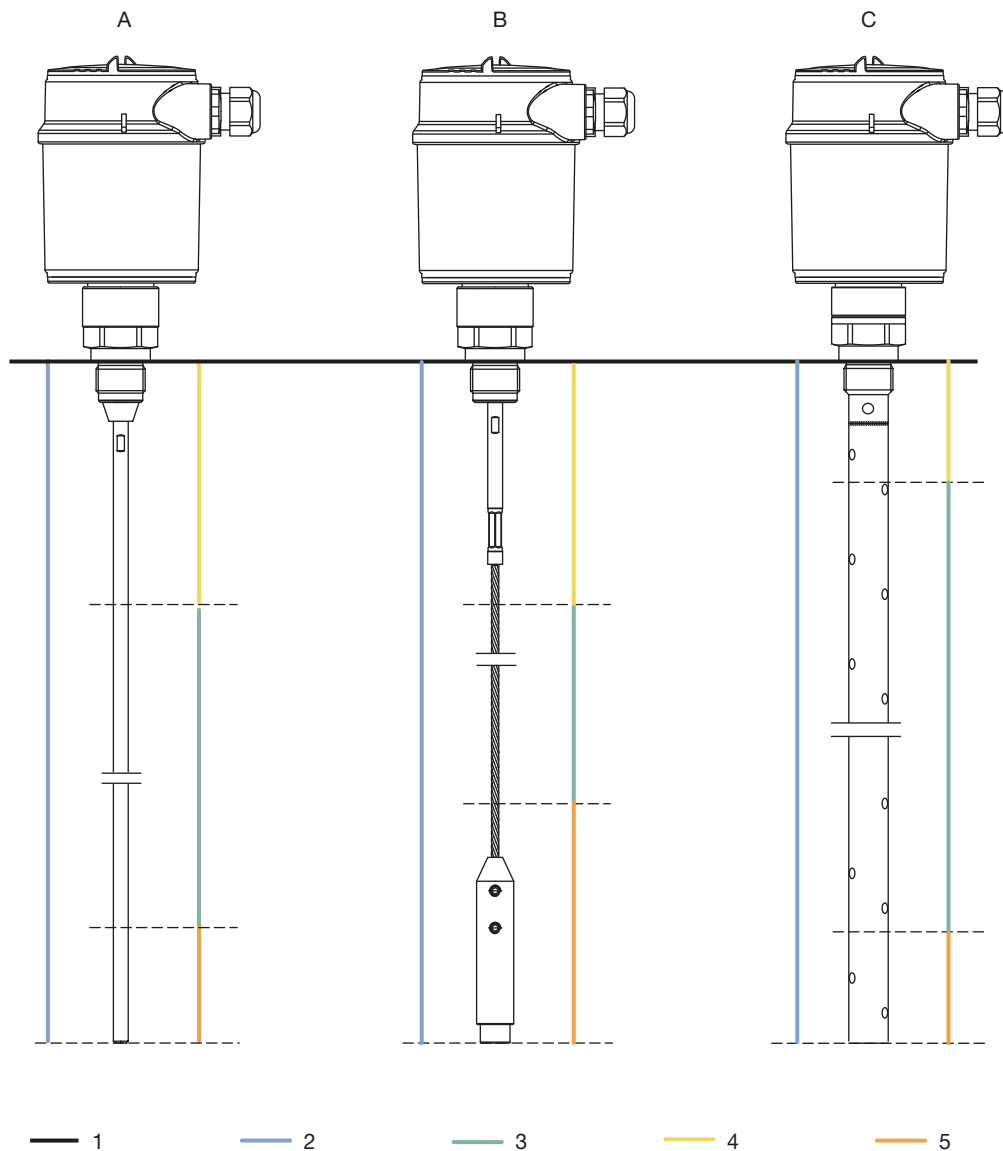
Dimensions in mm (unless specified differently)



No.	Element
1	Cable gland M20 x 1.5
2	Blind plug M20 x 1.5
3	AF36 for G or NPT 3/4" AF41 for G or NPT 1"
4	G or NPT 3/4" G or NPT 3/4"

5. Performance specifications

5.1. Measuring range and blocking distance diagram



Range length				
No.	Description	A: rod variant	B: cable variant	C: coaxial variant
1	Reference plane	–	–	–
2	Measuring probe length	0.3...6 m	0.5...75 m	0.3...6 m
3	Measurement range	In water: 0.08...6 m In oil: 0.15...5.95 m	In water: 0.08...75 m In oil: 0.15...74.85 m	In water: 0.03...6 m In oil: 0.10...5.95 m
4	Upper blocking distance	In water: 0.08 m In oil: 0.15 m	In water: 0.08 m In oil: 0.15 m	In water: 0.03 m In oil: 0.10 m
5	Lower blocking distance	In water: 0 m In oil: 0.05 m	In water: 0 m In oil: 0.15 m	In water: 0 m In oil: 0.05 m

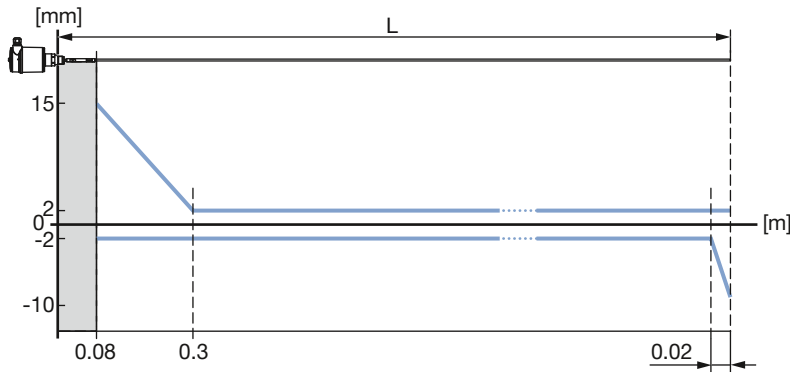
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5.2. Measurement deviation diagram

Variant with rod probe in water

Note:

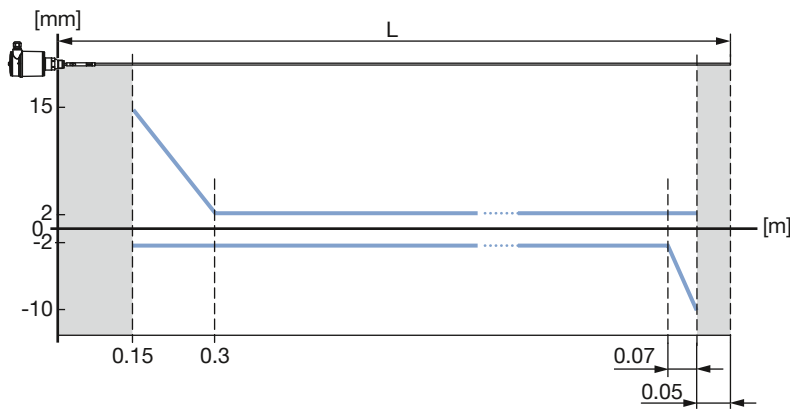
- The blocking distance is indicated by the grey area in the diagram. No measurement is possible in this area.
- The length L represents the length of the probe.



Variant with rod probe in oil

Note:

- The blocking distance is indicated by the grey area in the diagram. No measurement is possible in this area.
- The length L represents the length of the probe.

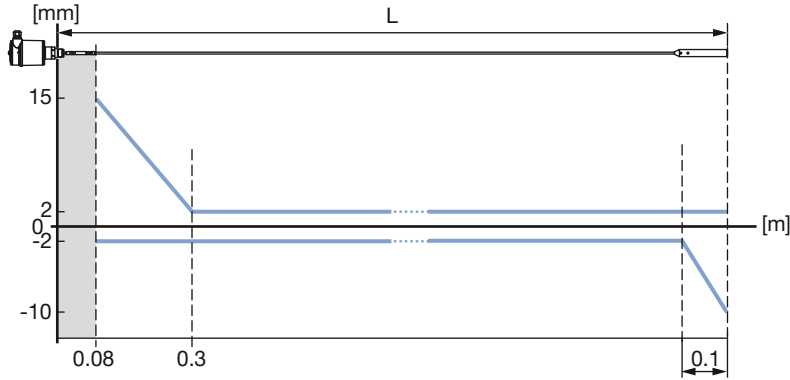


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Variant with cable probe in water

Note:

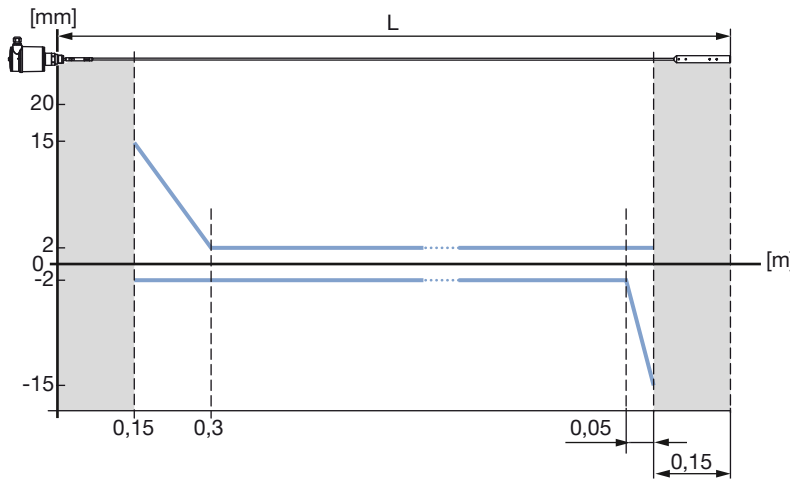
- The blocking distance is indicated by the grey area in the diagram. No measurement is possible in this area.
- The length L represents the length of the probe.



Variant with cable probe in oil

Note:

- The blocking distance is indicated by the grey area in the diagram. No measurement is possible in this area.
- The length L represents the length of the probe.

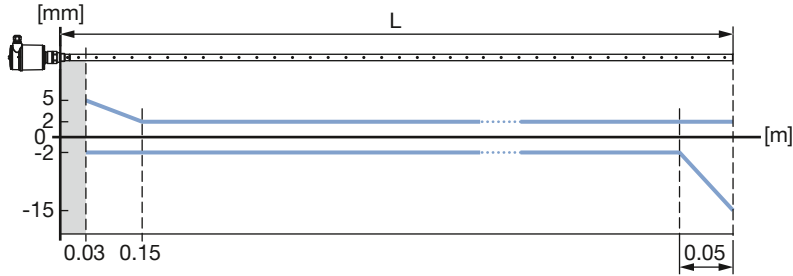


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Variant with coaxial probe in water

Note:

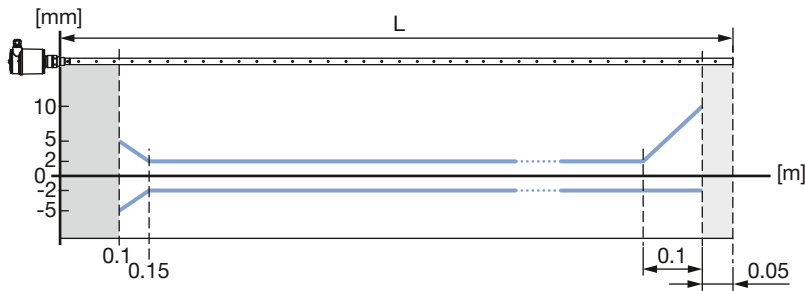
- The blocking distance is indicated by the grey area in the diagram. No measurement is possible in this area.
- The length L represents the length of the probe.



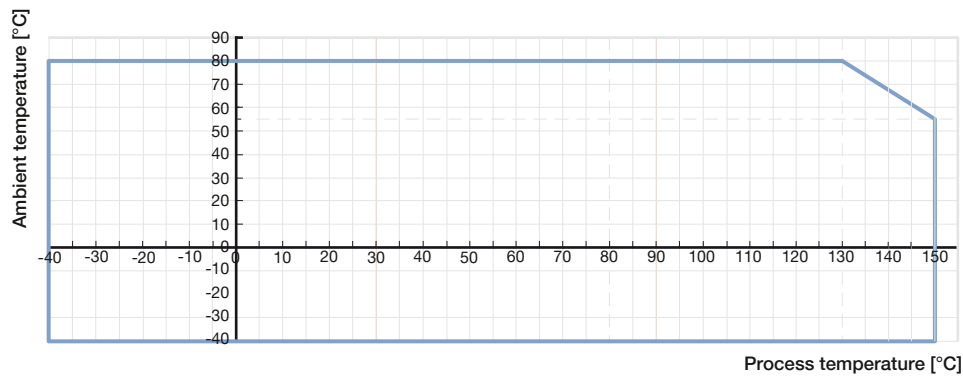
Variant with coaxial probe in oil

Note:

- The blocking distance is indicated by the grey area in the diagram. No measurement is possible in this area.
- The length L represents the length of the probe.



5.3. Temperature derating diagram



6. Product operation

6.1. Measuring principle

High frequency microwave pulses are guided along a steel cable, a rod or a coaxial cable. When they reach the product surface, the microwave pulses are reflected and received by the processing electronics. The running time is evaluated by the instrument and outputted as distance. Time consuming adjustment with medium is not necessary. The instruments are pre-set to the ordered probe length.

The shortenable cable, rod and coaxial variants can be adapted individually to the local requirements.

6.2. Product operation notes

Note:

The measuring device can be adjusted with:

- The display/configuration module
- The suitable Bürkert DTM in conjunction with a software according to the FDT/DTM standard, e.g. PACTware™ and PC
- With a HART handheld

The entered parameters are generally saved in the measuring device Type 8188. Optionally, parameters may also be uploaded and downloaded with the display/configuration module or saved in a file by using PACTware™/8188-DTM.

Set up with display/configuration module

Display/configuration module	Description
	The display/configuration module can be inserted into the measuring device and removed again at any time. It is not necessary to interrupt the power supply. The measuring device is adjusted via the four keys of the display/configuration module.

Set up with PACTware™/DTM and HART communication

Assembly	Description								
	The measuring device can be operated thanks to PACTware™, via HART communication. An interface adapter is necessary for the adjustment with PACTware™. For the setup of the Type 8188, the DTM in the actual version must be used. The basic version of DTM incl. PACTware™ is available as a free-of-charge download from the internet at www.burkert.com ▶.								
Connecting the PC via HART									
<table border="1"> <thead> <tr> <th>No.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Measuring device Type 8188</td> </tr> <tr> <td>2</td> <td>HART-USB Modem</td> </tr> <tr> <td>3</td> <td>Resistance 250 Ω</td> </tr> </tbody> </table>		No.	Description	1	Measuring device Type 8188	2	HART-USB Modem	3	Resistance 250 Ω
No.	Description								
1	Measuring device Type 8188								
2	HART-USB Modem								
3	Resistance 250 Ω								
Necessary components:									
<ul style="list-style-type: none"> • Measuring device Type 8188 • PC with PACTware™ and suitable Bürkert DTM • HART-USB Modem • Resistance approx. 250 Ω • Power supply unit 									

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7. Ordering information

7.1. Bürkert eShop – Easy ordering and quick delivery



Bürkert eShop – Easy ordering and fast delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

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7.2. Bürkert product filter



Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements? Use the Bürkert product filter and find suitable articles for your application quickly and easily.

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7.3. Ordering chart

Note:

All following versions are supplied with display/configuration module.

Description	Operating voltage	Output	Probe	Length	Electrical connection	Article no.
Standard variant						
G 3/4" mounting thread, PN6, temp. max. 80 °C	16...35 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 × 1.5	565800
				2 m		565804
			Cable	5 m		565812
				10 m		565816
			Coaxial	1 m		565823
				2 m		565824
G 1" mounting thread, PN40, temp. max. 150 °C	16...35 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland +M20 × 1.5	565802
				2 m		565806
			Cable	5 m		565814
				10 m		565818
			Coaxial	1 m		565825
				2 m		565826
NPT 3/4" mounting thread, PN6, temp. max. 80 °C	16...35 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 × 1.5	565801
				2 m		565805
			Cable	5 m		565813
				10 m		565817
			Coaxial	1 m		565827
				2 m		565828
NPT 1" mounting thread, PN40, temp. max. 150 °C	16...35 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 × 1.5	565803
				2 m		565807
			Cable	5 m		565815
				10 m		565819
			Coaxial	1 m		565829
				2 m		565830

Description	Operating voltage	Output	Probe	Length	Electrical connection	Article no.	
Ex variant - ATEX certification							
G ¾" mounting thread, PN6, temp. max. 80 °C	16...30 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 × 1.5	565808	
				2 m		565810	
			Cable	5 m		565820	
				Coaxial		1 m	565831
						2 m	565832
G 1" mounting thread, PN40, temp. max. 150 °C	16...30 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 × 1.5	565809	
				2 m		565811	
			Cable	5 m		565821	
				Coaxial		1 m	565833
						2 m	565834
Ex variant - IECEx certification							
NPT ¾" mounting thread, PN6, temp. max. 80 °C	16...30 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 × 1.5	565839	
				2 m		565840	
			Cable	5 m		565841	
				Coaxial		1 m	565835
						2 m	565836
NPT 1" mounting thread, PN40, temp. max. 150 °C	16...30 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 × 1.5	565842	
				2 m		565843	
			Cable	5 m		565844	
				Coaxial		1 m	565837
						2 m	565838

Further versions on request

Material <ul style="list-style-type: none"> FFKM Alloy C22 (2.4602) 	Temperature -40...+200 °C
Process connection <ul style="list-style-type: none"> Thread G or NPT ½" (PN40, 150 °C), 1½" Flange DN25, DN40, DN50, DN80, DN100, DN150 Flange 1", 1 ½", 2", 3", 4", 6" 	Additional With display

7.4. Ordering chart accessories

Description	Article no.
Set with 2 reductions M20 × 1.5/NPT ½" + 2 neoprene flat seals for cable gland + 2 screw-plugs M20 × 1.5	551782
Hart-USB Modem	560177
Set with a display/configuration module, a transparent cover and a seal ring	559279
Set with a transparent cover and a seal ring	561006

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