



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

Product properties

Materials

Please make sure the device materials are compatible with the fluid you are using. Detailed information can be found in chapter [“4.1. Chemical Resistance Chart – Bürkert resistApp” on page 7.](#)

Non wetted parts

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

Wetted parts

Depending on the device version.

Detailed information can be found in chapter [“2. Product versions” on page 5.](#)

Process seal	NBR with aramid fibres
Dimensions	Detailed information can be found in chapter “5. Dimensions” on page 8.
Weights	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Probe length	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Measured variable	Level of liquids. For solids applications, please contact your local Bürkert Sales Center.
Measuring range	Detailed information can be found in chapter “6.1. Measuring range and blocking distance diagram” on page 11.
Damping (63% of the input variable)	0...999 s, adjustable
Step response time ^{1.)}	≤ 3 s

Product accessories

Display	LCD in full dot matrix. Detailed information can be found in chapter “8.4. Ordering chart accessories” on page 17
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Performance data

Blocking distance	Detailed information can be found in chapter “6.1. Measuring range and blocking distance diagram” on page 11.
Measurement deviation ^{2,3.)}	According to DIN EN 60770-1: ±2 mm Detailed information can be found in chapter “6.2. Measurement deviation diagram” on page 12.
Measuring range resolution	< 1 mm
Measuring cycle time	< 500 ms
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 %
Max. filling/emptying speed	1 m/min
Non-repeatability	≤ ± 1 mm (max.)
Vibration resistance	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Shock resistance	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.

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
Starting current	≤ 3.6 mA, ≤ 10 mA for 5 ms after the switching on

DC reverse polarity protection	Yes
Output signal	4...20 mA/HART
Signal resolution	0.3 μ A
Range of the output signal	3.8...20.5 mA/HART (default setting)
Load resistor	$(U_n - U_{min.})/0.022$ A
Fault signal	Current output: last valid measured value, ≥ 21 mA or < 3.6 mA (adjustable)
Max. output current	21.5 mA
Residual ripple (for DC)	<ul style="list-style-type: none"> For 9.6 V $< U_n < 18$ V: ≤ 0.7 V_{eff} (16...400 Hz) For 18 V $< U_n < 35$ V: ≤ 1.0 V_{eff} (16...400 Hz)
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)

Medium data

Process temperature	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Process pressure	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.
Dielectric constant (min.)	Depending on the device version. Detailed information can be found in chapter “2. Product versions” on page 5.

Product connections

Process connection	Thread G or NPT - $\frac{3}{4}$ ", 1"
Electrical connections	Cable gland M20x 1.5

Approvals and Certificates

Standards

Degree of protection according to IEC/EN 60529	IP66/IP67 with cable plug mounted and tightened M20x 1.5
Overvoltage category according to IEC 61010-1	Category III
Protection class according to IEC 61010-1	Class III

Directives

CE directives	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 recommendations	<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

Certifications

ATEX/IECEx	EN IEC 60079-0, EN 60079-11, EN 60079-26 Detailed information can be found in chapter “3.1. Certifications” on page 7.
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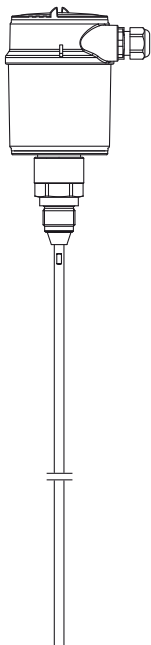
Environment and installation

Ambient temperature	Operation and storage: -40...+80 °C (-40...+176 °F) (with display/configuration module)
Temperature derating	Depending on the device version. Detailed information can be found in chapter “6.3. Temperature derating diagram” on page 14.
Relative air humidity	20...85 %, without condensation
Height above sea level	Max. 2000 m (by default; max. 5000 m with connected overvoltage protection)
Pollution degree	Degree 4 (when used with fulfilled housing protection)

- 1.) 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).
- 2.) 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.
- 3.) The blocking distances can be optimized by a false signal suppression.

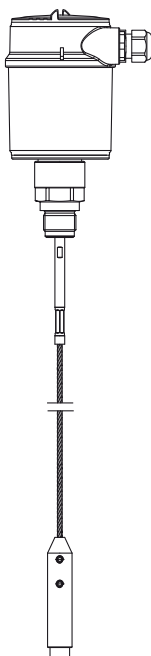
2. Product versions

2.1. Rod version



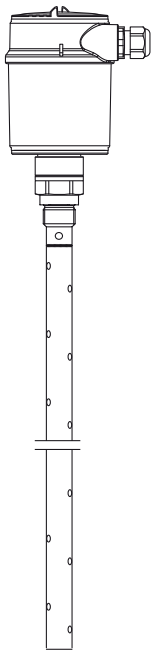
Product details	
Materials	Wetted parts: <ul style="list-style-type: none"> • Process connection in: <ul style="list-style-type: none"> – Stainless steel 316L (1.4404 or 1.4435) and PPS (version up to 6 bar) – Stainless steel 316L (1.4404 or 1.4435) and PEEK (version up to 40 bar) • Process seal on the instrument side (rod lead-through) in EPDM • Rod-Ø 8 mm in stainless steel 316L (1.4404 or 1.4435)
Weights	<ul style="list-style-type: none"> • Housing: 890 g • Rod-Ø 8 mm: approx. 400 g/m
Probe length	0.3...6 m (lateral load: 10 Nm)
Vibration resistance	<ul style="list-style-type: none"> • Housing: 4 g with 5...200 Hz according to EN 60068-2-6 (vibration at resonance) • Measuring probe: 1 g with 5...200 Hz according to EN 60068-2-6 (vibration at resonance) with tube length 50 cm
Shock resistance	<ul style="list-style-type: none"> • Housing: 100 g, 6 ms according to EN 60068-2-27 (mechanical shock) • Measuring probe: 25 g, 6 ms according to EN 60068-2-27 (mechanical shock) with tube length 50 cm
Process temperature	<ul style="list-style-type: none"> • -40...+80 °C (-40...+176 °F) (for version up to 6 bar) • -40...+150 °C (-40...+302 °F) (for version 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.)	$\epsilon_r > 1.6$

2.2. Cable version with gravity weight



Product details	
Materials	Wetted parts: <ul style="list-style-type: none"> • Process connection in: <ul style="list-style-type: none"> – Stainless steel 316L (1.4404 or 1.4435) and PPS (version up to 6 bar) – Stainless steel 316L (1.4404 or 1.4435) and PEEK (version up to 40 bar) • Inner conductor (up to separation cable) in stainless steel 316L (1.4404 or 1.4435) • Process seal on the instrument side (cable lead-through) in EPDM • Cable-Ø 4 mm with gravity weight in stainless steel 316L (1.4404 or 1.4435)
Weights	<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)
Process temperature	<ul style="list-style-type: none"> • -40...+80 °C (-40...+176 °F) (for version up to 6 bar) • -40...+150 °C (-40...+302 °F) (for version 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.)	$\epsilon_r > 1.6$

2.3. Coaxial version




Product details	
Materials	Wetted parts: <ul style="list-style-type: none"> • Process connection in stainless steel 316L (1.4404 or 1.4435) and PEEK • Inner conductor (up to separation cable) in stainless steel 316L (1.4404 or 1.4435) • Process seal on the instrument side (rod lead-through) in EPDM • Coaxial-Ø 21.3 mm (tube) in stainless steel 316L (1.4404 or 1.4435)
Weights	<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)
Dynamic viscosity	0.1...500 mPa s (requirement: with density 1)
Vibration resistance	<ul style="list-style-type: none"> • Housing: 4 g with 5...200 Hz according to EN 60068-2-6 (vibration at resonance) • Measuring probe: 1 g with 5...200 Hz according to EN 60068-2-6 (vibration at resonance) with tube length 50 cm
Shock resistance	<ul style="list-style-type: none"> • Housing: 100 g, 6 ms according to EN 60068-2-27 (mechanical shock) • Measuring probe: 25 g, 6 ms according to EN 60068-2-27 (mechanical shock) with tube length 50 cm
Process temperature	-40...+150 °C (-40...+302 °F)
Process pressure	-1...+40 bar (-100...+4000 kPa/-14.5...+580 psig)
Dielectric constant (min.)	$\epsilon_r > 1.4$

3. Approvals

3.1. Certifications

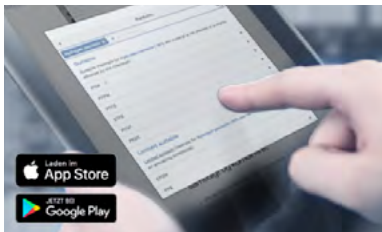
Note:

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

Certificate	Description
	<p>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>

4. Materials

4.1. 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.

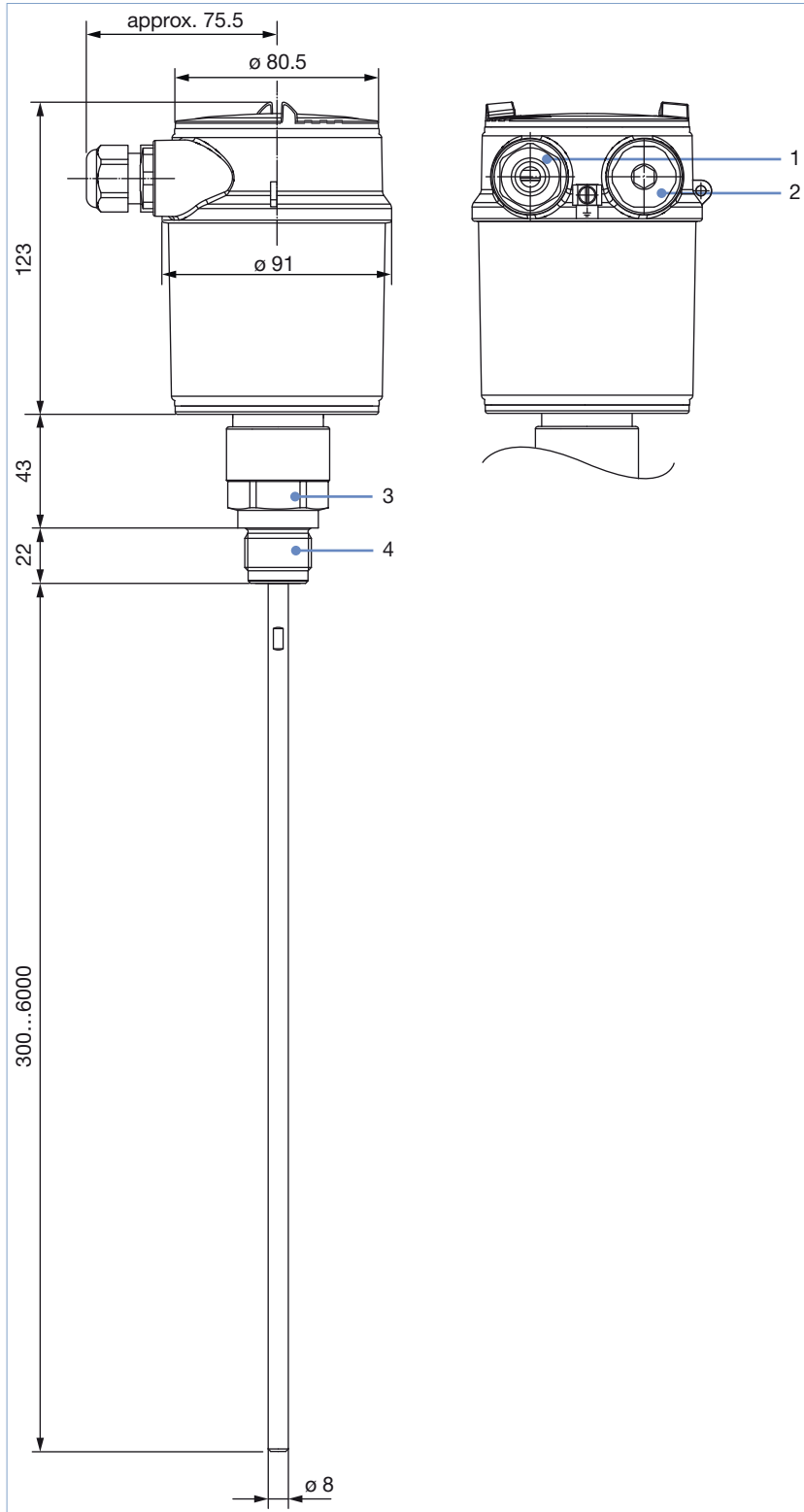
[Start Chemical Resistance Check](#)

5. Dimensions

5.1. Rod version

Note:

Dimensions in mm (unless specified differently)

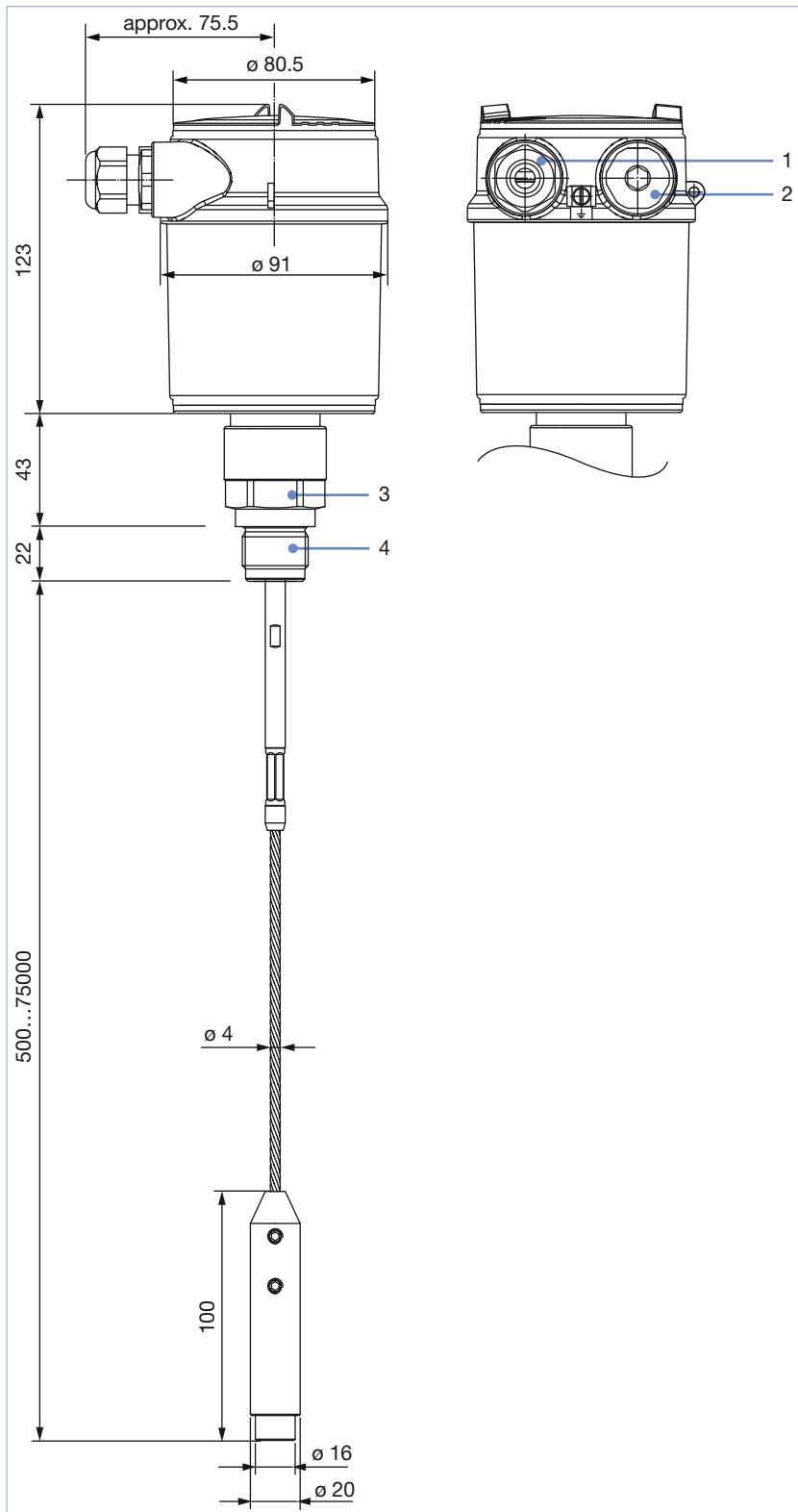


No.	Element
1	Cable gland M20 × 1.5
2	Blind plug M20 × 1.5
3	AF36 for G or NPT 3/4" AF41 for G or NPT 1"
4	G or NPT 3/4" G or NPT 3/4"

5.2. Cable version with gravity weight

Note:

Dimensions in mm (unless specified differently)

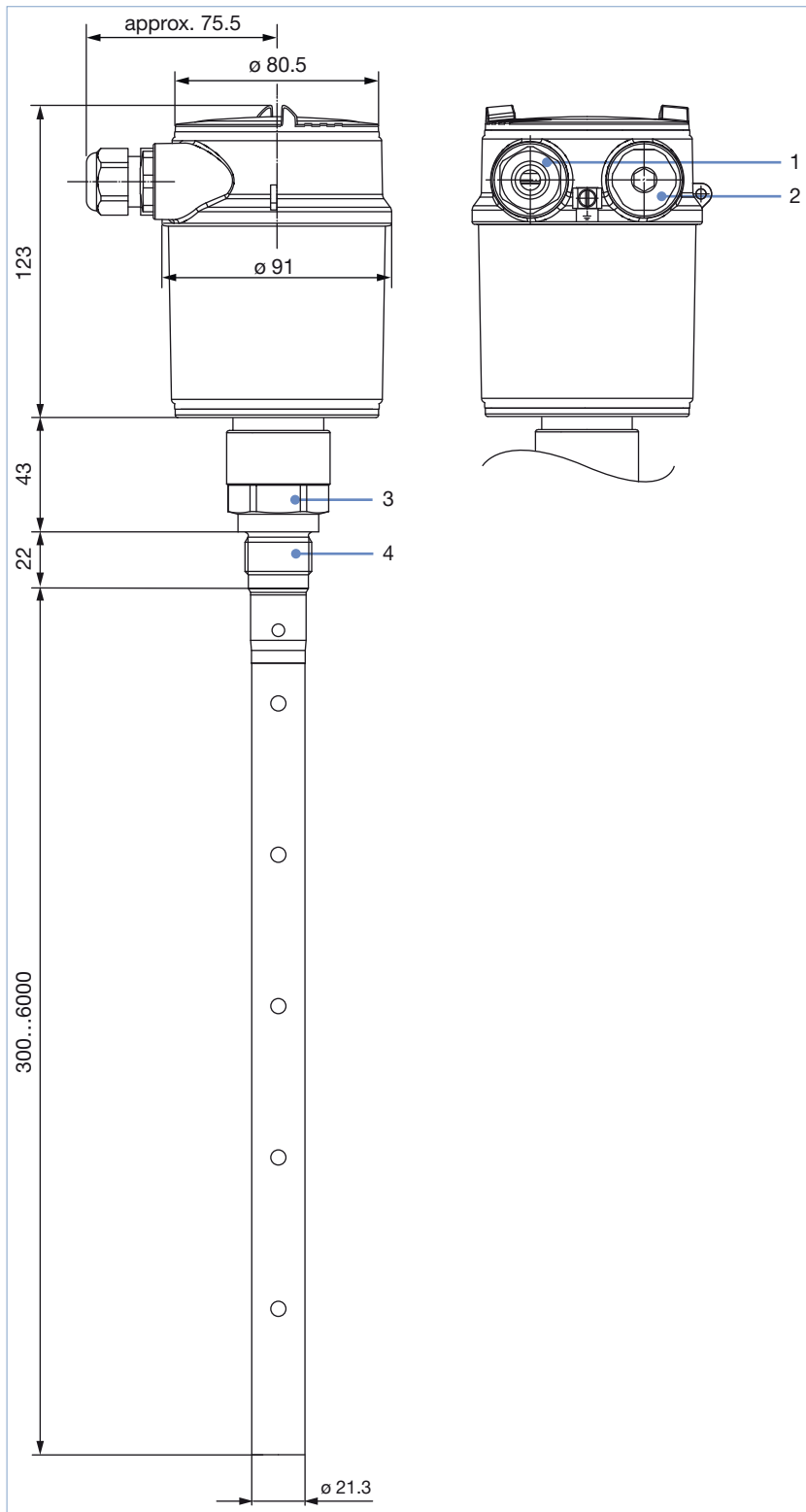


No.	Element
1	Cable gland M20 x 1.5
2	Blind plug M20 x 1.5
3	AF36 for G or NPT 3/4" AF41 for G or NPT 1"
4	G or NPT 3/4" G or NPT 3/4"

5.3. Coaxial version

Note:

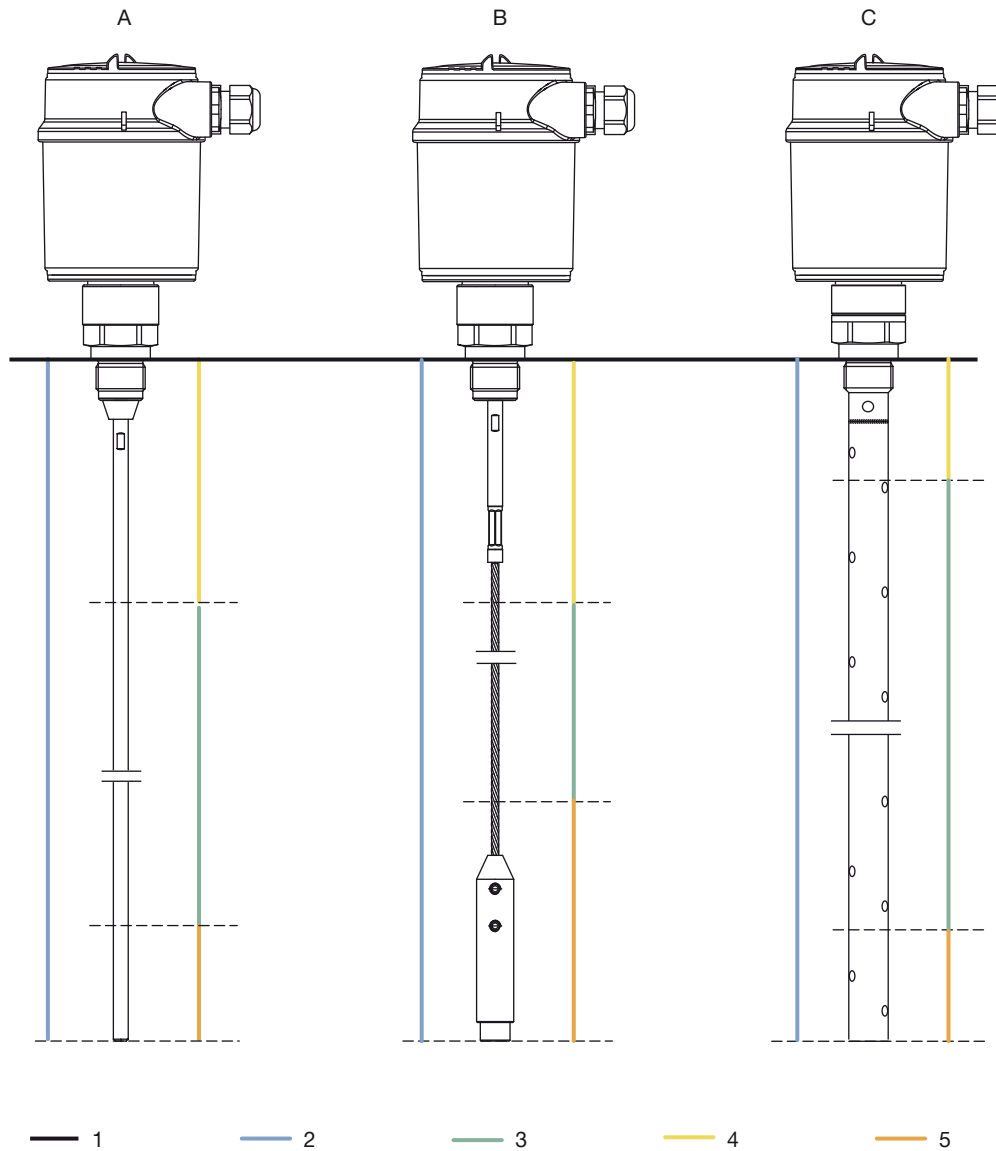
Dimensions in mm (unless specified differently)



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 1"

6. Performance specifications

6.1. Measuring range and blocking distance diagram



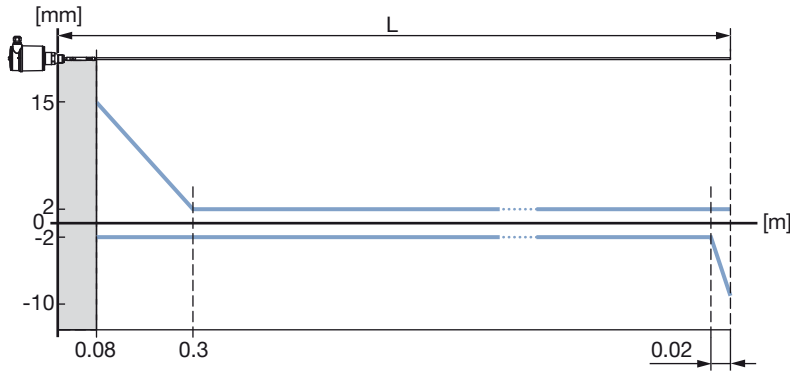
Range length				
No.	Description	A: rod version	B: cable version	C: coaxial version
1	Reference plane	–	–	–
2	Measuring probe length	0.3...6 m	0.5...75 m	0.3...6 m
3	Measurement range	In water: 0.08...6 m In oil: 0.15...5.95 m	In water: 0.08...75 m In oil: 0.15...74.85 m	In water: 0.03...6 m In oil: 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

6.2. Measurement deviation diagram

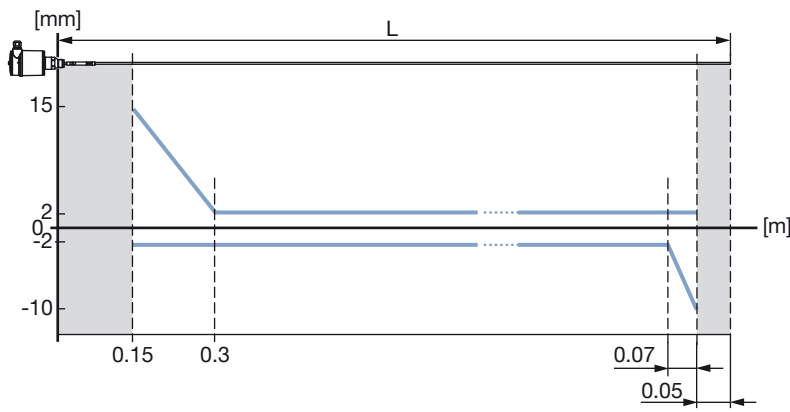
Note:

- 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.

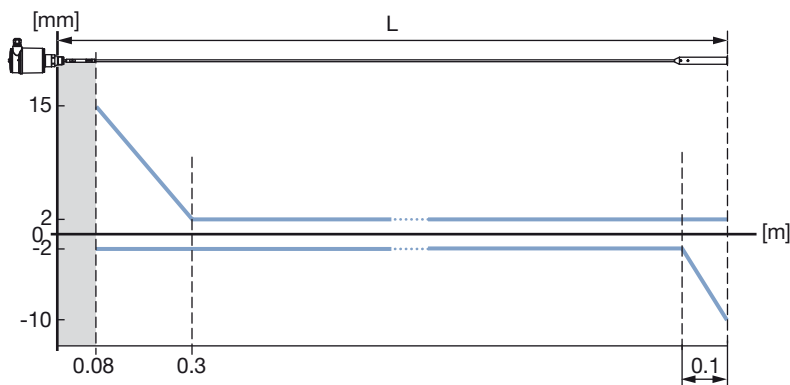
Rod probe version in water



Rod probe version in oil

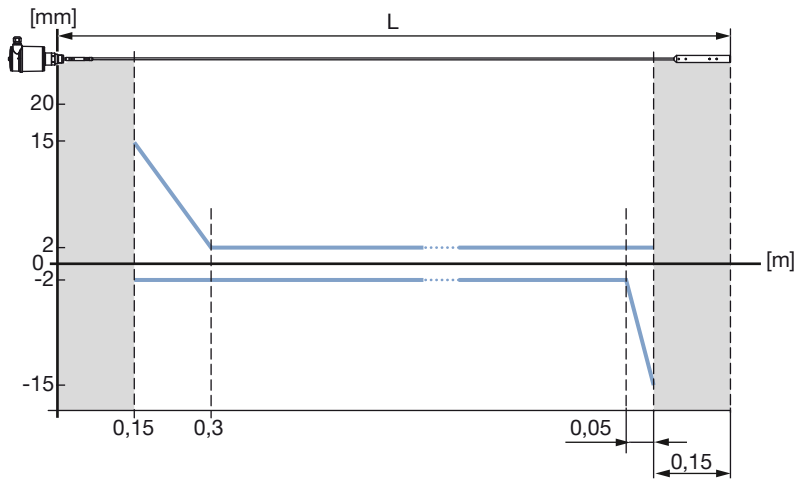


Cable probe version in water

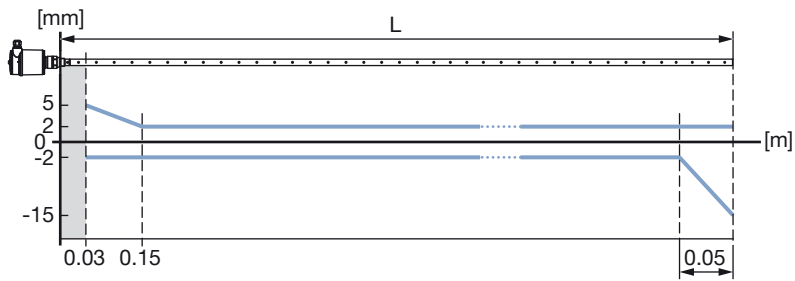


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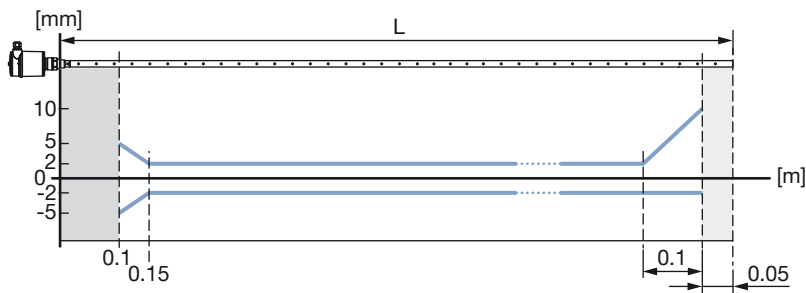
Cable probe version in oil



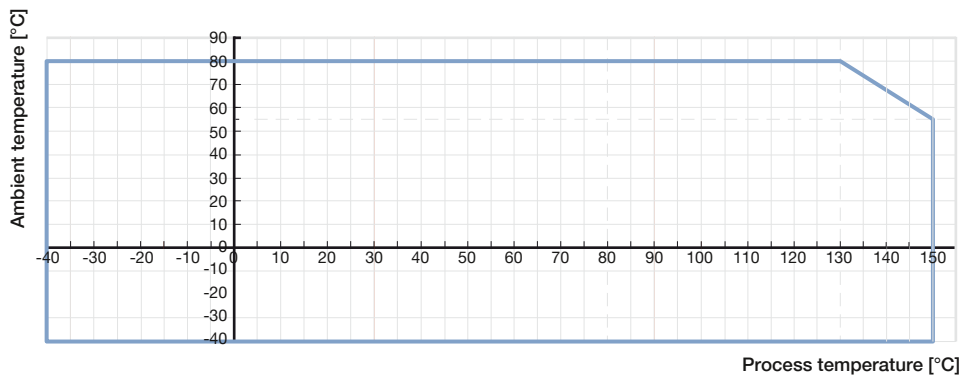
Coaxial probe version in water



Coaxial probe version in oil



6.3. Temperature derating diagram



7. Product operation

7.1. 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 versions can be adapted individually to the local requirements.

7.2. 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
	<p>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.</p>

Set up with PACTware™/DTM and HART communication

Assembly	Description								
	<p>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 ▶.</p> <p>Connecting the PC via HART</p> <table border="1"> <thead> <tr> <th style="background-color: #d9e1f2;">No.</th> <th style="background-color: #d9e1f2;">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> <p>Necessary components:</p> <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 	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								

8. Ordering information

8.1. 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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8.2. Bürkert product filter



Bürkert product filter – Get quickly to the right product




















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8.3. Ordering chart





Note:

All following versions are supplied with display/configuration module.

Description	Operating voltage	Output	Probe	Length	Electrical connection	Article no.
Standard version						
G 3/4" mounting thread, PN6, temp. max. 80 °C	9.6...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	9.6...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	9.6...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	9.6...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 
Ex version - ATEX certification						
G 3/4" mounting thread, PN6, temp. max. 80 °C	9.6...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
			2 m			565832 
			G 1" mounting thread, PN40, temp. max. 150 °C	9.6...30 V DC		4...20 mA/HART (2 wires)
2 m	565811 					
Cable	5 m	565821 				
	Coaxial	1 m			565833 	
2 m		565834 				
Ex version - IECEx certification						
NPT 3/4" mounting thread, PN6, temp. max. 80 °C	9.6...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
			2 m			565836 
			NPT 1" mounting thread, PN40, temp. max. 150 °C	9.6...30 V DC		4...20 mA/HART (2 wires)
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

8.4. 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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