


Guided microwave level measurement device

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

Type 8188 can be combined with...



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.

General data

Materials

Housing / Cover	PBT, Stainless steel 316L (1.4404) / PC
Seal ring / Ground terminal	NBR / Stainless steel 316L
Wetted parts	
Process fitting	
Rod and cable	Stainless steel 316L* and PPS for version up to 6 bar Stainless steel 316L* and PEEK for version up to 40 bar Stainless steel 316L* and PEEK
Coax.-ø 21.3 mm	FKM
Process seal	
Inner conductor	Stainless steel 316L*
(up to the separation cable/rod)	
Spacers	PFA (only for coax. probe version)
Rod-ø 8 mm	Stainless steel 316L*
Cable-ø 4 mm with gravity weight	Stainless steel 316L*
Coax.-ø 21.3 mm (tube)	Stainless steel 316L*

Display

LCD in full dot matrix

Process connection

Thread G or NPT - ¾", 1"

Weight

Housing	890 g
Rod-ø 8 mm	approx. 400 g/m
Cable-ø 4 mm	approx. 60 g/m
Coax.-ø 21.3 mm	approx. 1110 g/m
Gravity weight (only with cable version)	approx. 200 g

Length

Rod-ø 8 mm	0.3...6 m - Lateral load: 10 Nm
Cable-ø 4 mm	0.5...75 m - Max. tensile load: 2.5 KN
Coax.-ø 21.3 mm	0.3...6 m - Lateral load: 60 Nm

Electrical connection

Cable gland M20 x 1.5

Measurement type

Level of liquids¹⁾

Min. dielectric figure

Rod and cable	$\epsilon_r > 1.6$
Coax.-ø 21.3 mm	$\epsilon_r > 1.4$

* (1.4404 or 1.4435)

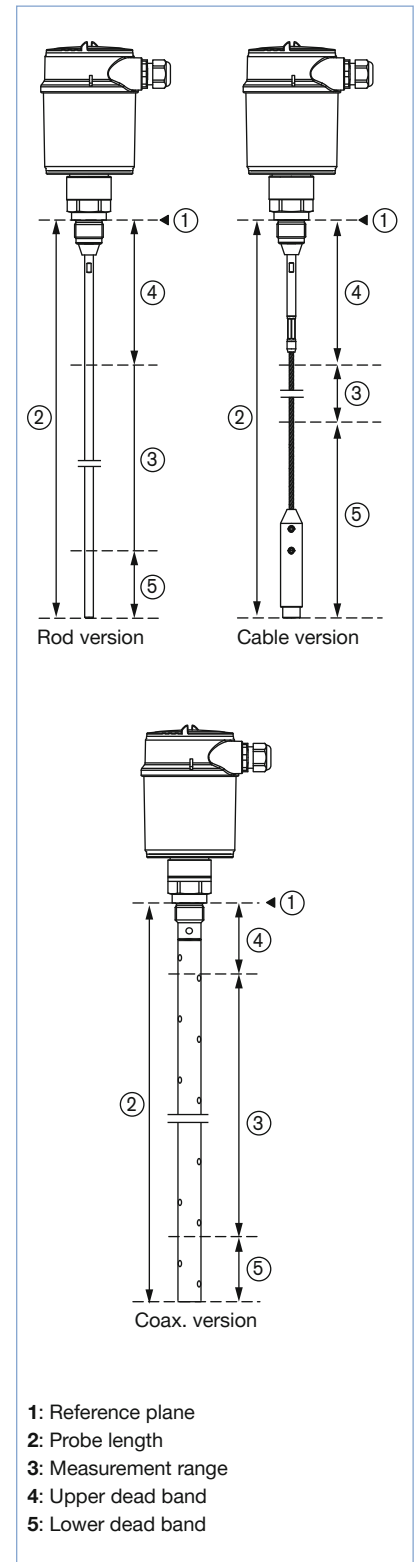
¹⁾ For applications regarding solids, please consult your local Bürkert Sales Centre.

General data (continued)	
Dead band	
in water	
Rod-ø 8 mm	From top of probe: 80 mm - from bottom of probe: 0 mm
Cable-ø 4 mm	From top of probe: 80 mm - from bottom of probe: 0 mm
Coax.-ø 21.3 mm	From top of probe: 30 mm - from bottom of probe: 0 mm
in oil	
Rod-ø 8 mm	From top of probe: 150 mm - from bottom of probe: 50 mm
Cable-ø 4 mm	From top of probe: 150 mm - from bottom of probe: 150 mm
Coax.-ø 21.3 mm	From top of probe: 100 mm - from bottom of probe: 50 mm
Measuring range	0.03...6 m or 0.08...75 m (see diagram on next pages)
Process temperature	-40...+150°C (-40...+302°F) (restricted up to 80°C (176°F) for rod and cable probe version up to 6 bar)
Process pressure (depends on the fitting)	For process fitting in: stainless steel 316L/PPS: -1...+6 bar (-14.5...+87 PSi) (-100...+600 kPa) stainless steel 316L/PEEK: -1...+40 bar (-14.5...+580.1 PSi) (-100...+4000 kPa)
Temperature drift	0.03%/10K (Relating to the max. measurement range)
Repeatability	±1 mm (max.)
Measurement deviation²⁾	±2 mm (see deviation diagram, on next pages)
Electrical data	
Operating voltage (Un)	9.6...35 V DC or 9.6...30 V DC (Ex ia instrument)
Output signal	4...20 mA/HART [Range of the output signal 3.8...20.5 mA/HART (default setting)]
Resolution	0.3 µA
Fault signal (adjustable)	Last valid measured value or ≥ 21 mA; < 3.6 mA
Current limitation	21.5 mA (max. output current)
Load	(Un - Umin.)/0.0215 A
Damping (63% of the input variable)	0...999 s, adjustable
Environment	
Ambient temperature with display, adjustment elements	-40...+80°C (-40...+176°F) (operation and storage)
Relative humidity	Max. 75% (operation), max. 85% (storage); without condensation
Standards, directives and certifications	
Protection	IP66/IP67 with M20 x 1.5 gland mounted and tightened
Overvoltage category	III (IEC 61010-1)
Protection class	III (IEC 61010-1)
Standards and directives CE	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	NE 21; NE 43
Certification	ATEX ³⁾ : EN60079-0; EN60079-11; EN60079-26
Specifications Ex	
- Protection	Categories 1G, 1/2G or 2G
- Certification	EEx ia IIC T6
Conformity specifications³⁾	
Operating voltage Ui	30 V
Short circuit rating Ii	131 mA
Power limitation Pi	983 mW
Ambient temperature	-50...+46°C (-58...+114.8°F) (dependent on categories)
Internal capacity Ci	negligible
Internal inductivity Li	≤ 5 µH

²⁾ = "measurement bias" as defined in the standard JCGM 200:2012

³⁾ Certificate IECEx TUR 14.0014 X / TÜV 14 ATEX 7490 X

Measurement range diagram

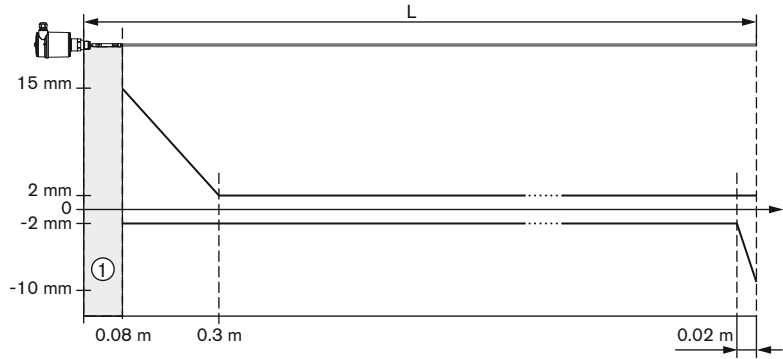


- 1: Reference plane
- 2: Probe length
- 3: Measurement range
- 4: Upper dead band
- 5: Lower dead band

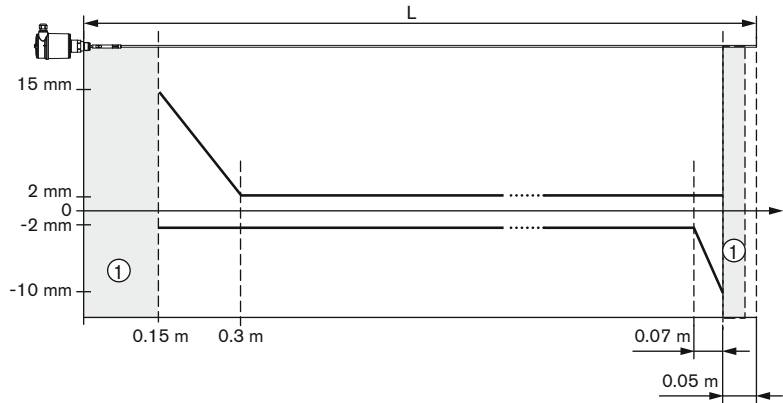
Measurement deviation diagram

NOTE: ① = Dead band - no measurement possible in this area
L = Probe length

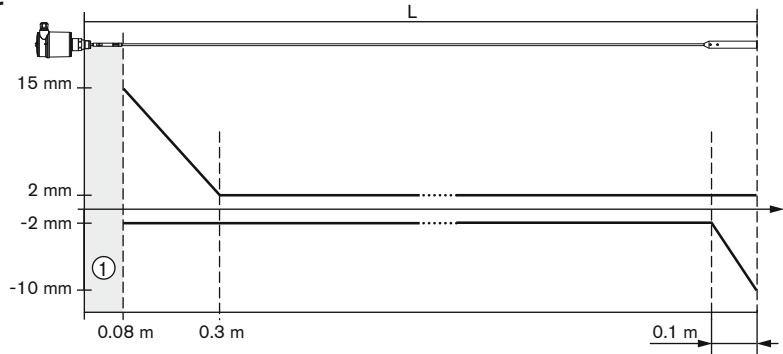
Rod probe version in water



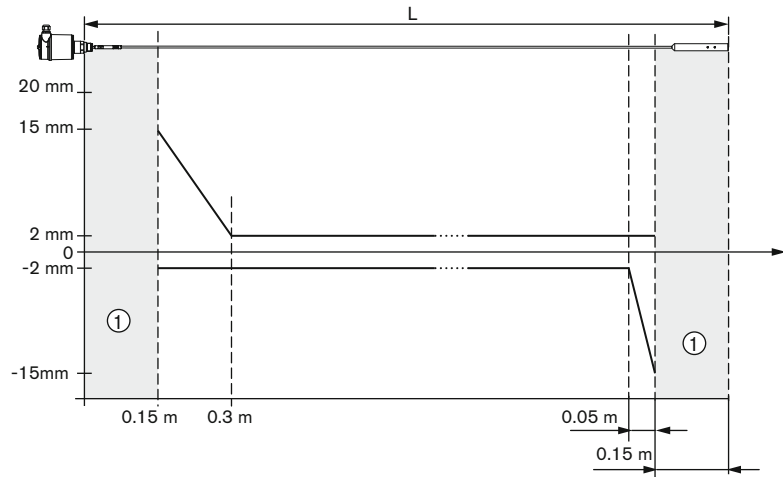
Rod probe version in oil



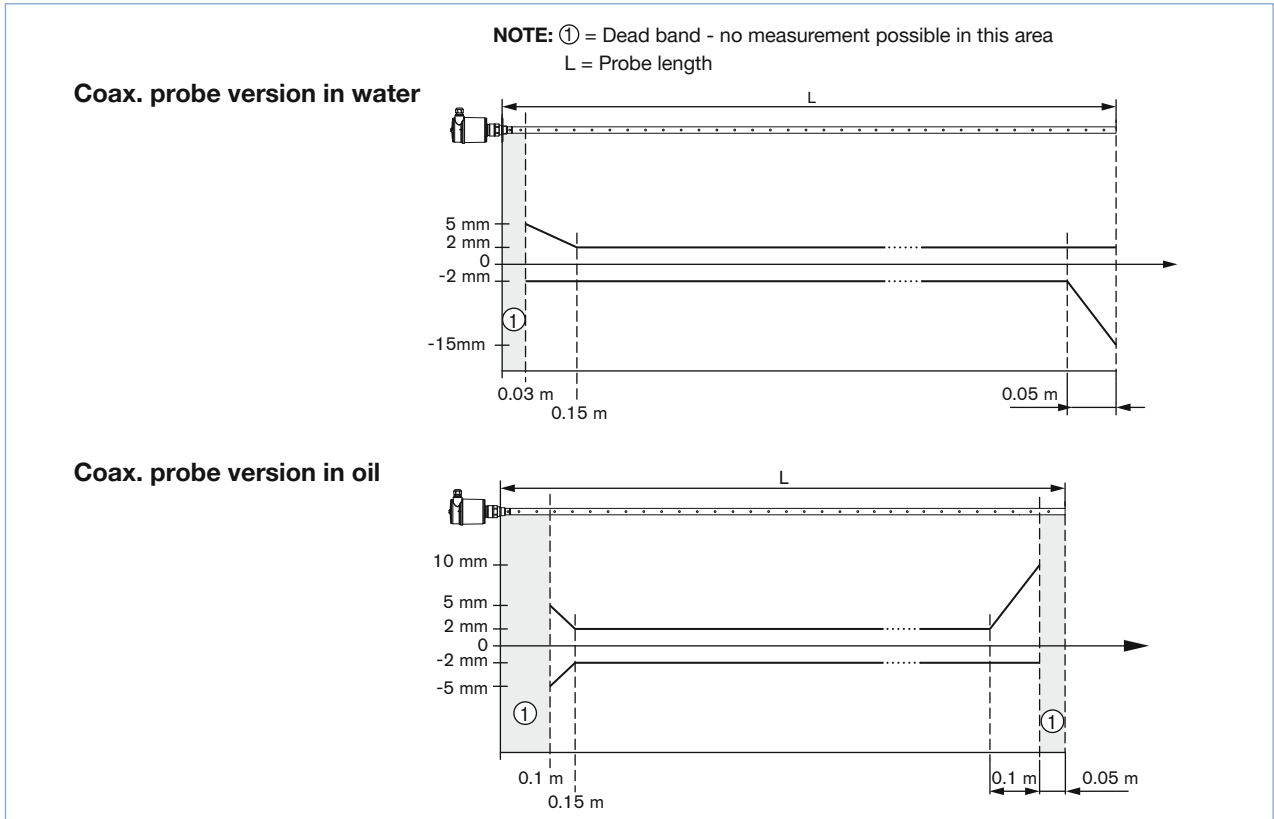
Cable probe version in water



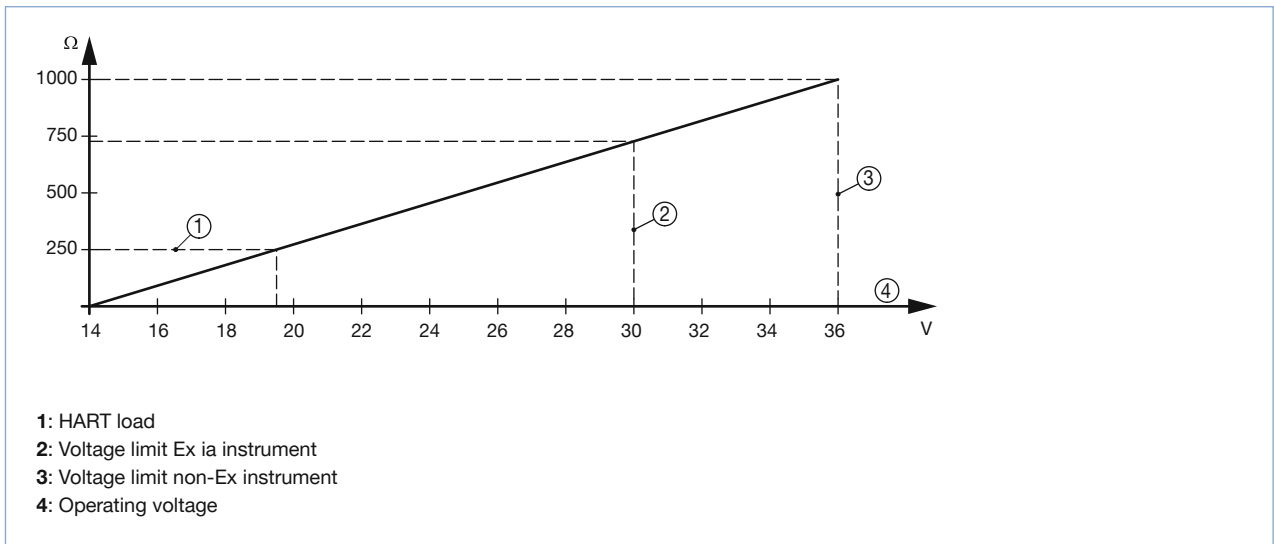
Cable probe version in oil



Measurement deviation diagram (continued)



Load diagram

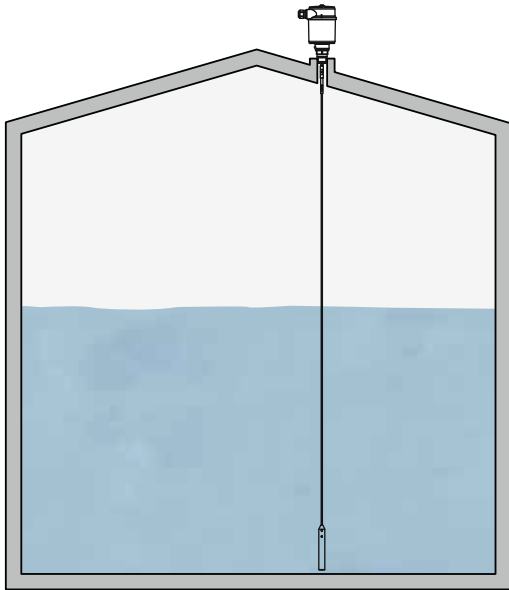


Application examples with Type 8188

Level measurement in

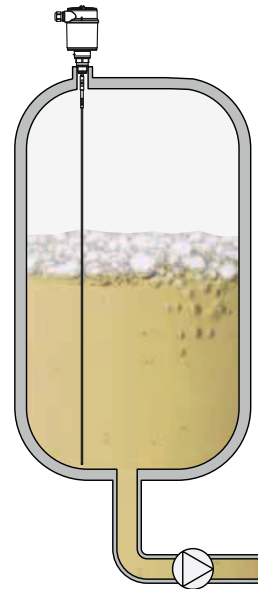
■ bio-ethanol storage tanks

After running through all process steps, the ethanol is ready for delivery to the consumer and is stored in a tank storage depot. Accurate measurement of the tank contents is a prerequisite for reliable logistics planning and ensures the supply to customers. Since the tanks often cannot be emptied after an initial filling, maintenance-free operation is an important criteria when selecting a suitable measurement technology



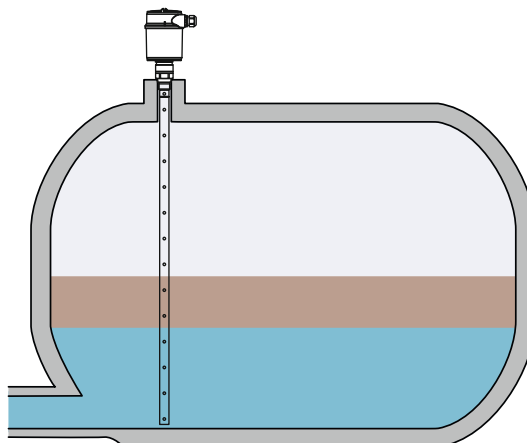
■ volatile and low-viscosity solvents vessels

The very low viscosity solvents diffuse through many plastics. This increases the demands placed on the measurement technology. To protect against overfilling, a separate level detection setup is also recommended. It increases system safety and guarantees protection of human health and the environment.



■ separating tank, to determine the exact proportion of each substance

Distillation products are often mixed with other substances of varying density and consistency. In the separating tank, for example, water is separated from the hydrocarbons and collected at the bottom of the tank. To determine the exact proportion of each substance, a so-called interface measurement is necessary



Principle of operation

High frequency microwave pulses are guided along a steel cable, a rod or a coax. When they reach the product surface, the microwave pulses are reflected and received by the processing electronics. The running time is valuated by the instrument and outputted as distance. Time consuming adjustment with medium is not necessary. The instruments are preset to the ordered probe length. The shortenable cable, rod and coax. versions can be adapted individually to the local requirements.

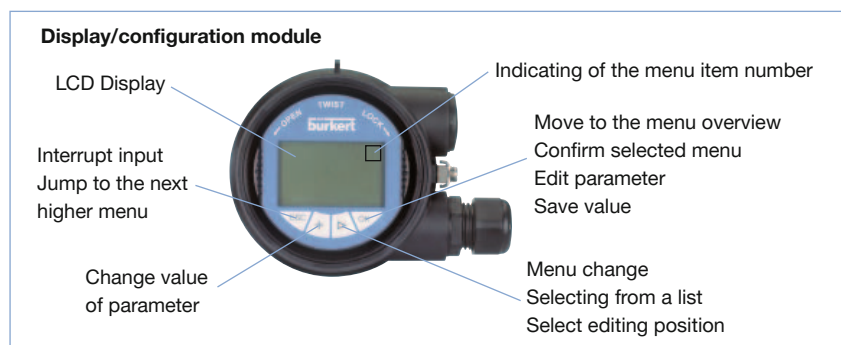
The measuring device can be adjusted with:

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

▶ Set up with display/configuration module:

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

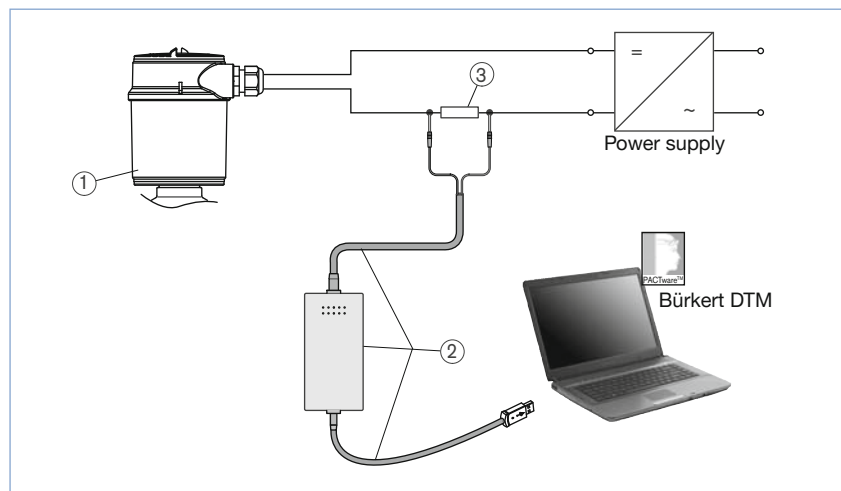
The measuring device can be operated thanks to PACTware™, via the HART signal. An interface adapter is necessary for the adjustment with PACTware™. For the setup of the Type 8188, DTM-Collection in the actual version must be used. The basic version of this DTM Collection incl. PACTware™ is available as a free-of-charge download from the Internet at www.burkert.com.

Connecting the PC via HART

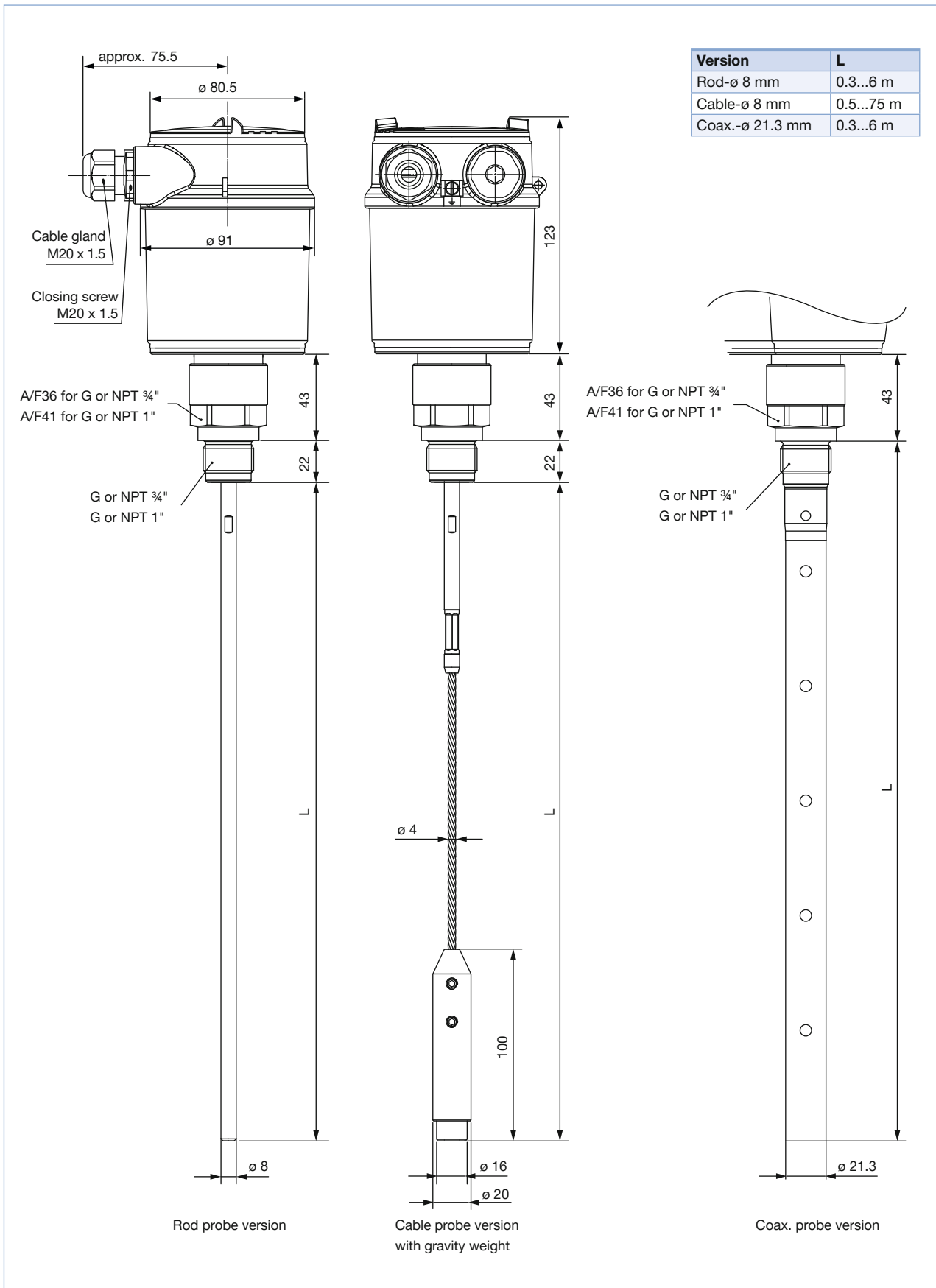
1. Measuring device 8188
2. HART-USB Modem
3. Resistance 250 Ohms

Necessary components:

- Measuring device 8188
- PC with PACTware™ and suitable Bürkert DTM
- HART-USB Modem
- Resistance approx. 250 Ohms
- Power supply unit



Dimensions [mm]



Ordering chart for compact measuring device Type 8188

Specification	Operating voltage	Output	Probe	Length	Electrical connection	Item no. (with display / configuration module)
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 x 1.5	565 800
				2 m	Cable gland M20 x 1.5	565 804
			Cable	5 m	Cable gland M20 x 1.5	565 812
				10 m	Cable gland M20 x 1.5	565 816
			Coax	1 m	Cable gland M20 x 1.5	565 823
				2 m	Cable gland M20 x 1.5	565 824
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 x 1.5	565 802
				2 m	Cable gland M20 x 1.5	565 806
			Cable	5 m	Cable gland M20 x 1.5	565 814
				10 m	Cable gland M20 x 1.5	565 818
			Coax	1 m	Cable gland M20 x 1.5	565 825
				2 m	Cable gland M20 x 1.5	565 826
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 x 1.5	565 801
				2 m	Cable gland M20 x 1.5	565 805
			Cable	5 m	Cable gland M20 x 1.5	565 813
				10 m	Cable gland M20 x 1.5	565 817
			Coax	1 m	Cable gland M20 x 1.5	565 827
				2 m	Cable gland M20 x 1.5	565 828
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 x 1.5	565 803
				2 m	Cable gland M20 x 1.5	565 807
			Cable	5 m	Cable gland M20 x 1.5	565 815
				10 m	Cable gland M20 x 1.5	565 819
			Coax	1 m	Cable gland M20 x 1.5	565 829
				2 m	Cable gland M20 x 1.5	565 830

Ordering chart for compact measuring device Type 8188 (continued)

Specification	Operating voltage	Output	Probe	Length	Electrical connection	Item no. (with display / configuration module)	
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 x 1.5	565 808	
				2 m	Cable gland M20 x 1.5	565 810	
			Cable	5 m	Cable gland M20 x 1.5	565 820	
				Coax	1 m	Cable gland M20 x 1.5	565 831
					2 m	Cable gland M20 x 1.5	565 832
				Ex version -ATEX certification - G 1" mounting thread, PN40, temp. max. 150°C	9.6...30 V DC	4...20 mA/HART (2 wires)	Rod
2 m	Cable gland M20 x 1.5	565 811					
Cable	5 m	Cable gland M20 x 1.5	565 821				
	Coax	1 m	Cable gland M20 x 1.5				565 833
		2 m	Cable gland M20 x 1.5				565 834
	Ex version -ATEX certification - NPT 3/4" mounting thread, PN6, temp. max. 80°C	9.6...30 V DC	4...20 mA/HART (2 wires)				Rod
2 m				Cable gland M20 x 1.5	565 840		
Cable				5 m	Cable gland M20 x 1.5	565 841	
				Coax	1 m	Cable gland M20 x 1.5	565 835
					2 m	Cable gland M20 x 1.5	565 836
				Ex version -ATEX certification - NPT 1" mounting thread, PN40, temp. max. 150°C	9.6...30 V DC	4...20 mA/HART (2 wires)	Rod
2 m	Cable gland M20 x 1.5	565 843					
Cable	5 m	Cable gland M20 x 1.5	565 844				
	Coax	1 m	Cable gland M20 x 1.5				565 837
		2 m	Cable gland M20 x 1.5				565 838

 **Further versions on request**
**Port connection**

Thread G or NPT 1/2" (PN40, 150°C), 1" 1/2"

Flange DN25, DN40, DN50, DN80, DN100, DN150

Flange 1", 1" 1/2, 2", 3", 4", 6"

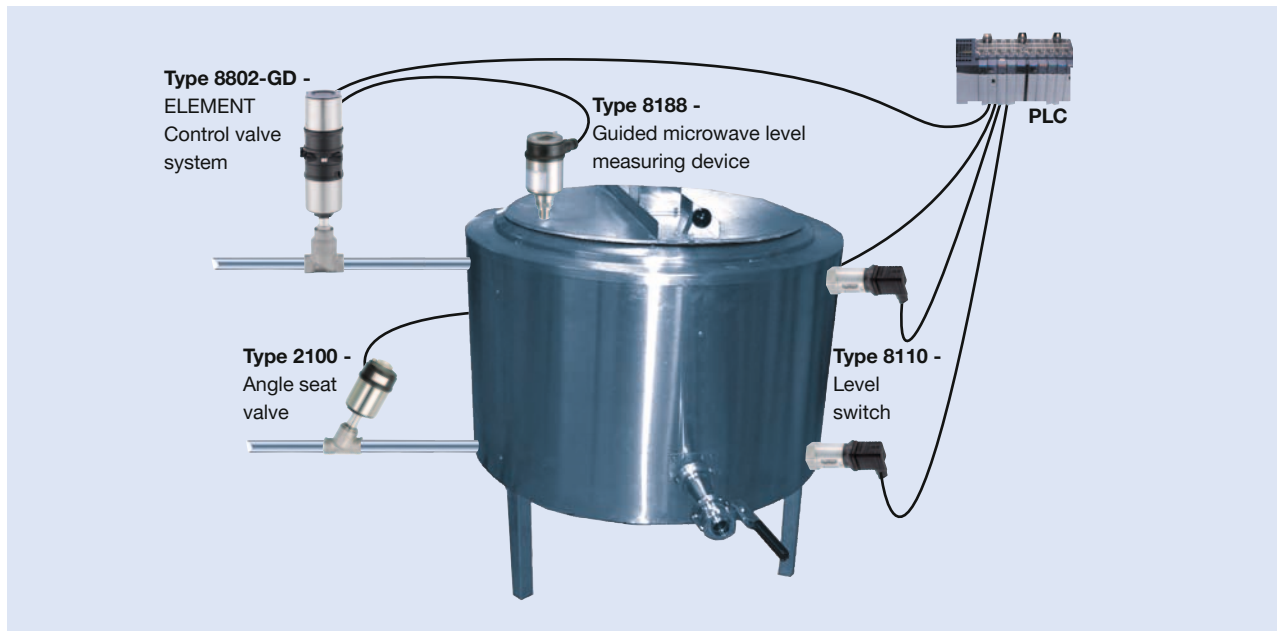
**Additional**

Without display

Ordering chart -accessories for measuring device Type 8188 (has to be ordered separately)

Specification	Item no.
Set with 2 reductions M20 x 1.5/NPT1/2" + 2 neoprene flat seals for cable gland + 2 screw-plugs M20 x 1.5	551 782
Hart-USB Modem	560 177
Set with a display/configuration module, a transparent cover and a seal ring	559 279
Set with a transparent cover and a seal ring	561 006

Interconnection possibilities with other Bürkert devices



Note

You can fill out the fields directly in the PDF file before printing out the form.

Guided microwave level measuring device Type 8188 - request for quotation

Please fill out this form and send to your local Bürkert Sales Centre* with your inquiry or order

Company	Contact person
Customer no.	Dept.
Address	Tel./Fax
Town / Postcode	E-Mail

■ Guided microwave level measuring device Type 8188

Quantity:

Desired delivery date:

Process connection

- **External thread**
- | | | | |
|--|---------------------------------|-----------------------------------|--|
| <input type="checkbox"/> G ¾", PN6, 80°C | <input type="checkbox"/> G 1" | <input type="checkbox"/> G 1 ½" | <input type="checkbox"/> G ¾", PN40, 150°C |
| <input type="checkbox"/> NPT ¾", PN6, 80°C | <input type="checkbox"/> NPT 1" | <input type="checkbox"/> NPT 1 ½" | <input type="checkbox"/> NPT ¾", PN40, 150°C |
- **Flange**
- | | | |
|----------------------------------|------------------------------------|----------------------------------|
| <input type="checkbox"/> DN25 | <input type="checkbox"/> DN40 | <input type="checkbox"/> DN50 |
| <input type="checkbox"/> DN80 | <input type="checkbox"/> DN100 | <input type="checkbox"/> DN150 |
| <input type="checkbox"/> ANSI 1" | <input type="checkbox"/> ANSI 1 ½" | <input type="checkbox"/> ANSI 2" |
| <input type="checkbox"/> ANSI 3" | <input type="checkbox"/> ANSI 4" | <input type="checkbox"/> ANSI 6" |

Sensor version

- **Probe**
- | | | |
|------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> Rod | <input type="checkbox"/> Cable | <input type="checkbox"/> Coax. |
|------------------------------|--------------------------------|--------------------------------|
- **Length**
- | | | | |
|---|------------------------------|---|-------------------------------|
| <input type="checkbox"/> 1 m | <input type="checkbox"/> 2 m | <input type="checkbox"/> 5 m | <input type="checkbox"/> 10 m |
| <input type="checkbox"/> Special length | <input type="text"/> | mm (multiple of 100 mm between 300 and 6000 mm for Rod version or coax version - multiple of 100 mm between 500 and 75000 mm for cable version) | |

Additional specifications

- **Display/configuration module** Yes No
- **ATEX certification** Yes No
- **IECEX certification** Yes No

To find your nearest Bürkert facility, click on the orange box →

www.burkert.com

In case of special application conditions, please consult for advice.

Subject to alteration.
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