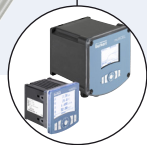


## Guided microwave level measurement device

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

Type 8188 can be combined with...



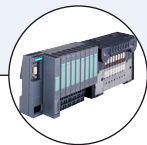
**Type 8619**  
multiCELL  
Transmitter/Controller



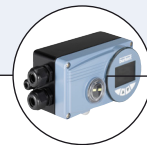
**Type 8611**  
eCONTROL  
Universal controller



**Type 8802**  
ELEMENT  
Control valve system



**Type 8644**  
Remote process  
actuation control  
system AirLINE



**Type 8793**  
Process controller  
SideControl



**PLC**

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  
Seal ring / Ground terminal  
Wetted parts  
Process fitting  
Rod and cable

PBT, Stainless steel 316L (1.4404) / PC  
NBR / Stainless steel 316L

Coax.-Ø 21.3 mm  
Process seal  
Inner conductor  
(up to the separation cable/rod)  
Spacers  
Rod-Ø 8 mm  
Cable-Ø 4 mm with gravity weight  
Coax.-Ø 21.3 mm (tube)

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  
EPDM

Stainless steel 316L\*  
PFA (only for coax. probe version)

Stainless steel 316L\*  
Stainless steel 316L\*  
Stainless steel 316L\*

#### Display

LCD in full dot matrix

#### Process connection

Thread G or NPT - 3/4", 1"

#### Weight

Housing  
Rod-Ø 8 mm  
Cable-Ø 4 mm  
Coax.-Ø 21.3 mm  
Gravity weight (only with cable version)

890 g  
approx. 400 g/m  
approx. 60 g/m  
approx. 1110 g/m  
approx. 200 g

#### Length

Rod-Ø 8 mm  
Cable-Ø 4 mm  
Coax.-Ø 21.3 mm

0.3...6 m - Lateral load: 10 Nm  
0.5...75 m - Max. tensile load: 2.5 KN  
0.3...6 m - Lateral load: 60 Nm

#### Electrical connection

Cable gland M20 x 1.5

#### Measurement type

Level of liquids<sup>1)</sup>

#### Min. dielectric figure

Rod and cable  
Coax.-Ø 21.3 mm

$\epsilon_r > 1.6$   
 $\epsilon_r > 1.4$

\* (1.4404 or 1.4435)

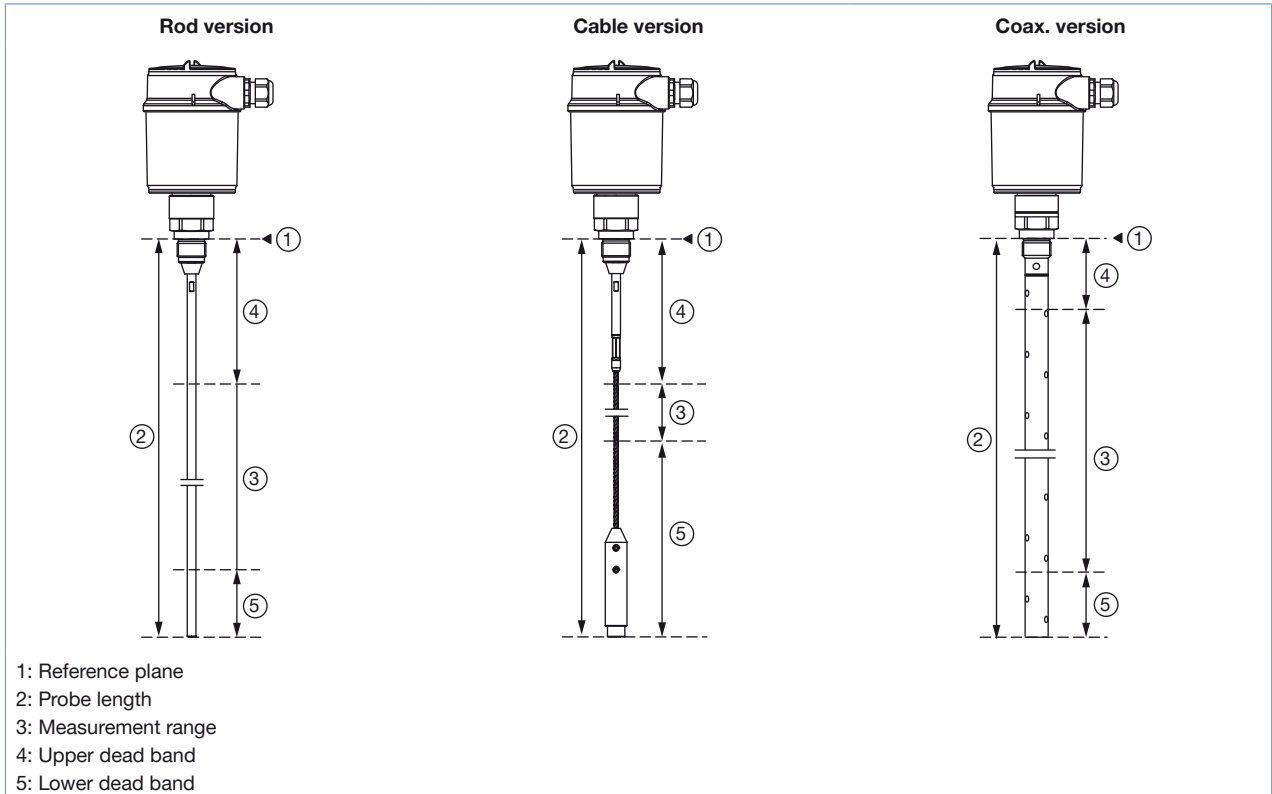
<sup>1)</sup> For applications regarding solids, please consult your local Bürkert Sales Centre.

General data (continued)	
<b>Dead band</b> in water Rod-Ø 8 mm Cable-Ø 4 mm Coax.-Ø 21.3 mm in oil Rod-Ø 8 mm Cable-Ø 4 mm Coax.-Ø 21.3 mm	From top of probe: 80 mm - from bottom of probe: 0 mm From top of probe: 80 mm - from bottom of probe: 0 mm From top of probe: 30 mm - from bottom of probe: 0 mm From top of probe: 150 mm - from bottom of probe: 50 mm From top of probe: 150 mm - from bottom of probe: 150 mm From top of probe: 100 mm - from bottom of probe: 50 mm
<b>Measuring range</b>	0.03...6 m or 0.08...75 m (see diagram on next pages)
<b>Process temperature</b>	-40...+150 °C (-40...+302 °F) (restricted up to 80 °C (176 °F) for rod and cable probe version up to 6 bar)
<b>Process pressure</b> (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)
<b>Temperature drift</b>	0.03 %/10K (Relating to the max. measurement range)
<b>Repeatability</b>	±1 mm (max.)
<b>Measurement deviation<sup>1)</sup></b>	±2 mm (see deviation diagram, on next pages)
Electrical data	
<b>Operating voltage (Un)</b>	9.6...35 V DC or 9.6...30 V DC (Ex ia instrument), filtered and regulated; connection to main supply: permanent (through external SELV and LPS power supply)
<b>Output signal</b>	4...20 mA/HART [Range of the output signal 3.8...20.5 mA/HART (default setting)]
<b>Resolution</b>	0.3 µA
<b>Fault signal (adjustable)</b>	Last valid measured value or ≥21 mA; <3.6 mA
<b>Current limitation</b>	21.5 mA (max. output current)
<b>Load</b>	(Un - U <sub>min</sub> )/0.0215 A
<b>Damping (63 % of the input variable)</b>	0...999 s, adjustable
Environment	
<b>Ambient temperature</b> with display, adjustment elements	-40...+80 °C (-40...+176 °F) (operation and storage)
<b>Relative air humidity</b>	Max. 75 % (operation), max. 85 % (storage); without condensation
<b>Height above sea level</b>	Max. 5000 m
<b>Pollution degree</b>	Degree 4 (when the sensor housing is properly closed)
Standards, directives and certifications	
<b>Protection rating according to IEC/EN 60529</b>	IP66/IP67 with M20 x 1.5 gland mounted and tightened
<b>Overvoltage category according to IEC 61010-1</b>	Category III
<b>Protection class according to IEC 61010-1</b>	Class III
<b>Standards and directives CE</b>  NAMUR	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) NE 21; NE 43; NE 53; NE 107
<b>Certification</b>	ATEX <sup>2)</sup> : EN60079-0; EN60079-11; EN60079-26
Specifications Ex	
<b>Ex - Protection</b>	Categories 1G, 1/2G or 2G
<b>Ex - Certification</b>	EEx ia IIC T6
<b>Conformity specifications<sup>2)</sup></b> Operating voltage Ui Short circuit rating Ii Power limitation Pi Ambient temperature Internal capacity Ci Internal inductivity Li	30 V 131 mA 983 mW -50...+46 °C (-58...+114.8 °F) (dependent on categories) negligible ≤5 µH

<sup>1)</sup> = "measurement bias" as defined in the standard JCGM 200:2012

<sup>2)</sup> Certificate IECEx TUR 14.0014 X / TÜV 14 ATEX 7490 X

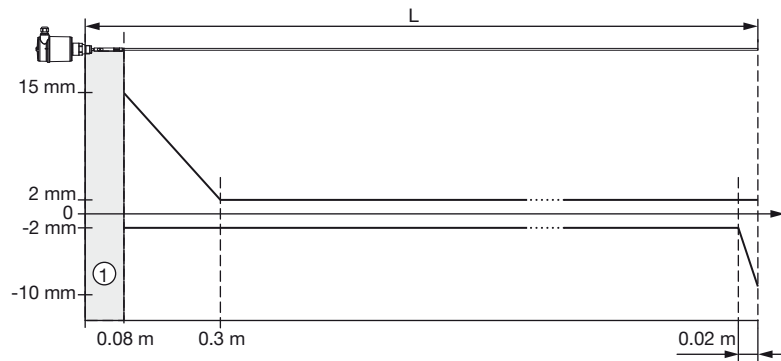
Measurement range diagram



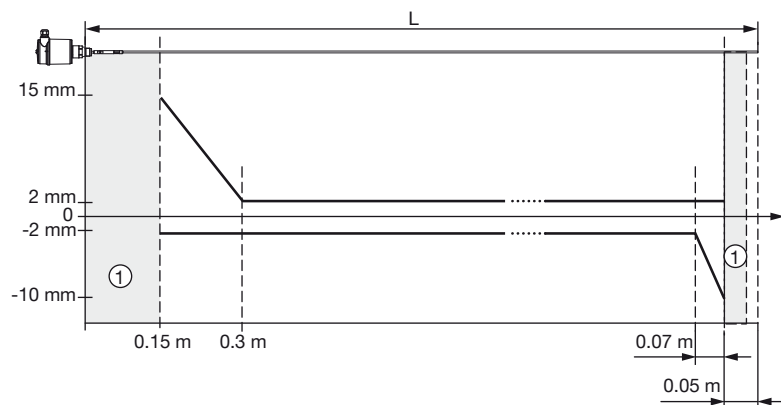
Measurement deviation diagram

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

Rod probe version in water



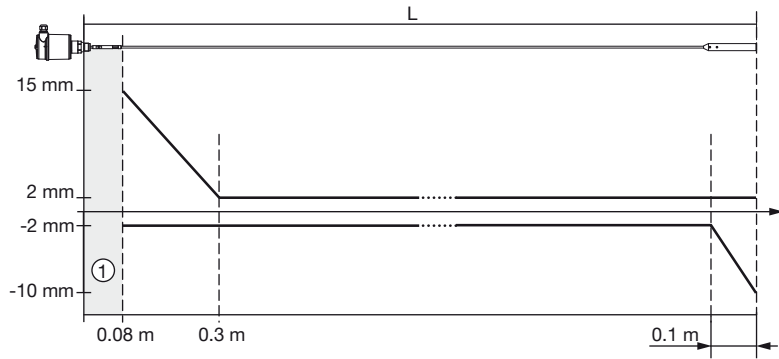
Rod probe version in oil



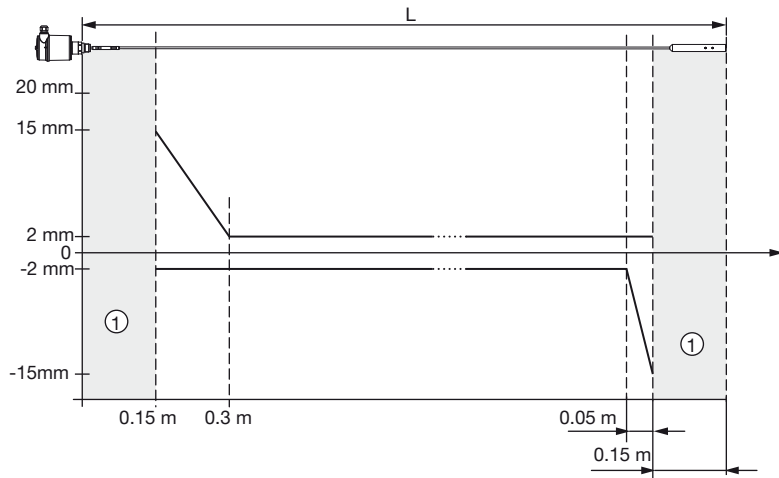
Measurement deviation diagram (continued)

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

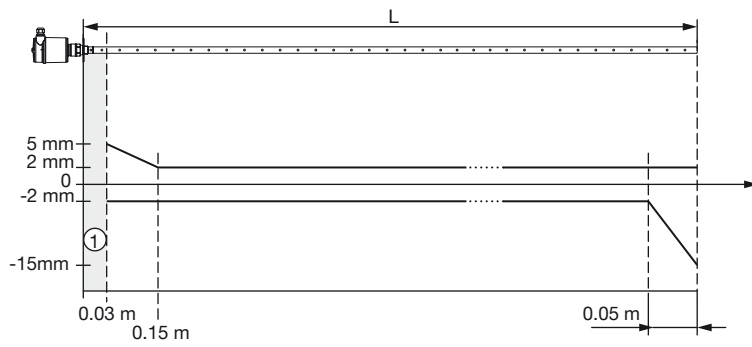
Cable probe version in water



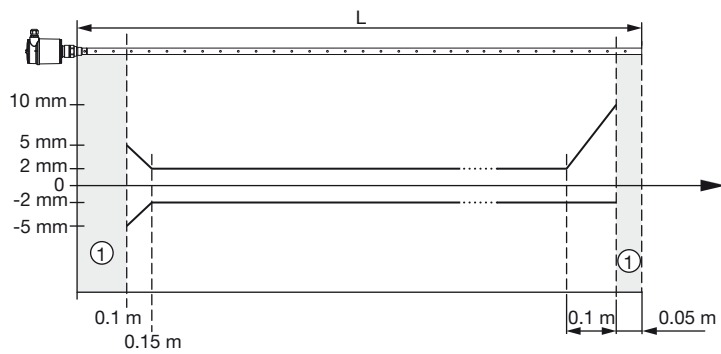
Cable probe version in oil



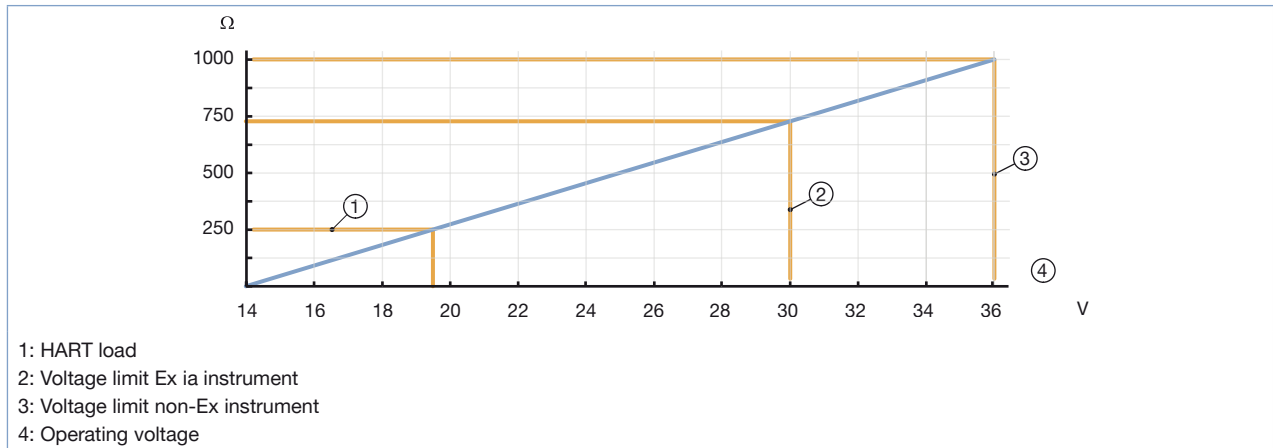
Coax. probe version in water



Coax. probe version in oil



## Load diagram

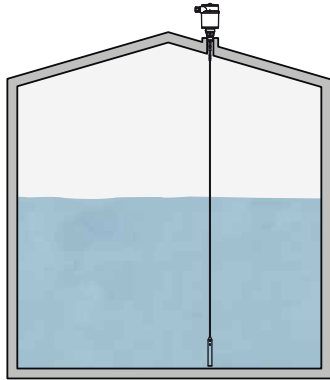


## Application examples with Type 8188

### 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



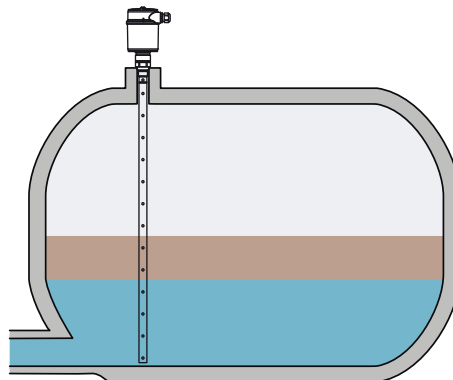
#### ■ volatile and low-viscosity solvents vessels

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:

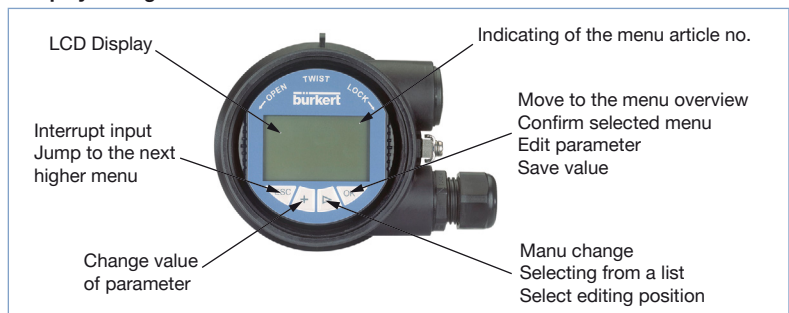
- the display/configuration module
- the suitable Bürkert DTM in conjunction with adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC.
- a HART handheld

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.

### Display/configuration module



▶ Set up with PACTware™/DTM and HART communication

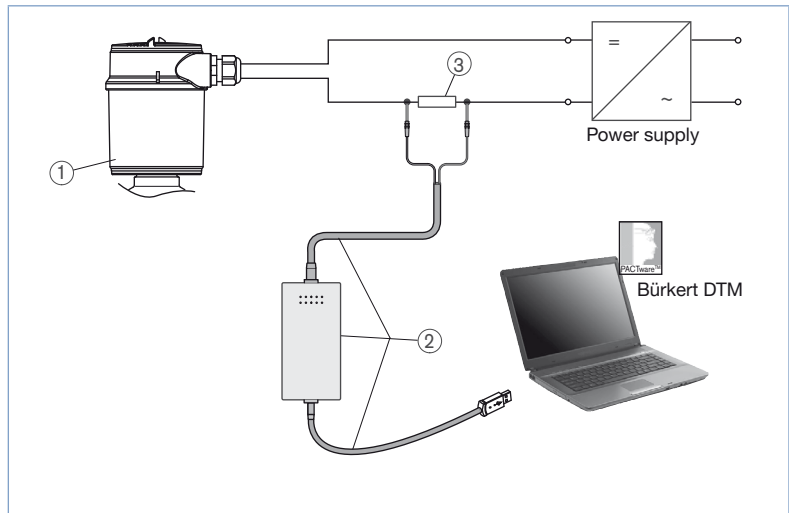
The measuring device can be operated thanks to PACTware™, via the HART signal. An interface adapter is necessary for the adjustment with PACTware™. For the setup of the Type 8188, DTM-Collection in the actual version must be used. The basic version of this DTM Collection incl. PACTware™ is available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

Connecting the PC via HART

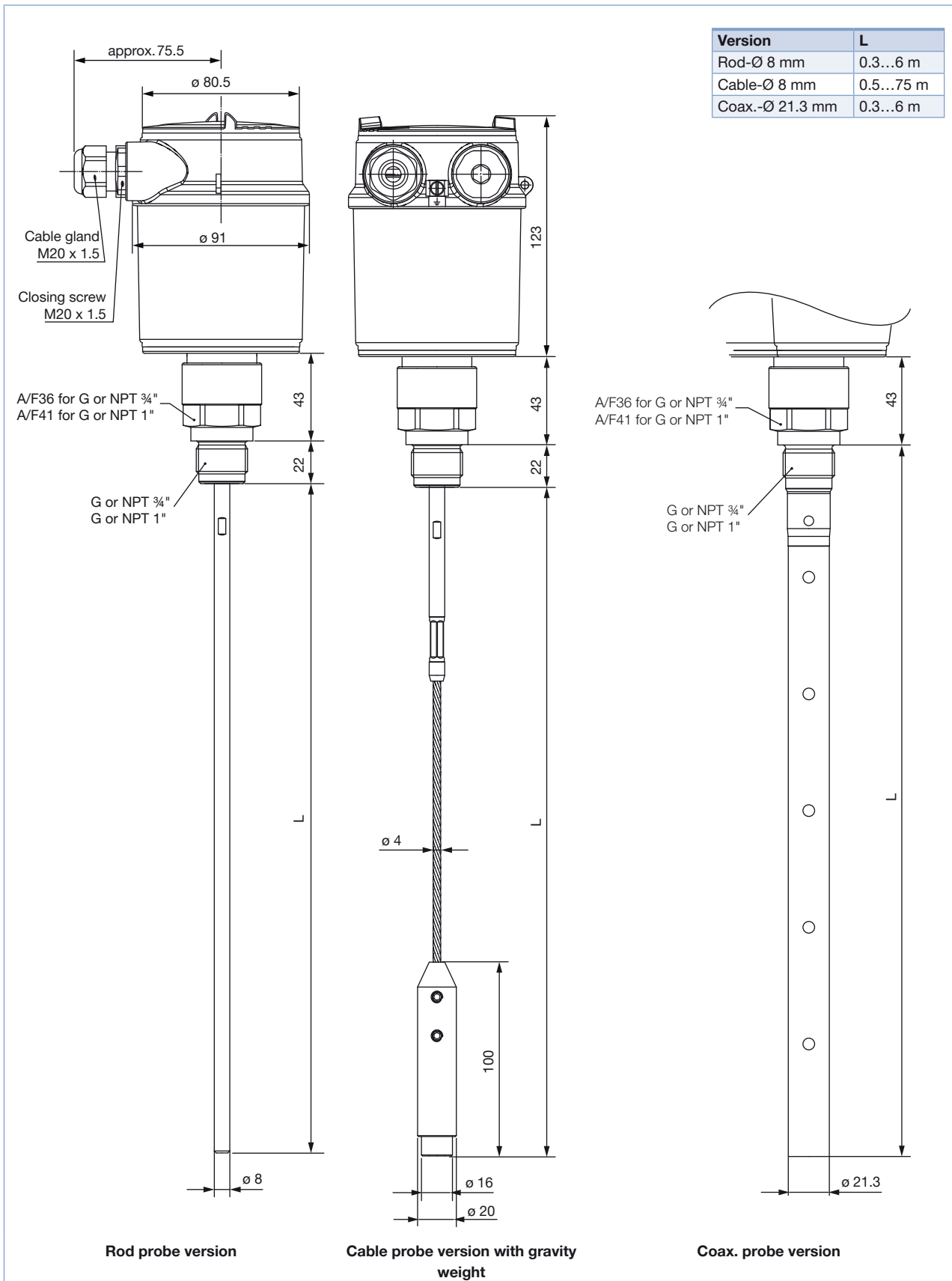
1. Measuring device 8188
2. HART-USB Modem
3. Resistance 250 Ohms

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	Article 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 × 1.5	565800 
				2 m	Cable gland M20 × 1.5	565804 
			Cable	5 m	Cable gland M20 × 1.5	565812 
				10 m	Cable gland M20 × 1.5	565816 
			Coax	1 m	Cable gland M20 × 1.5	565823 
				2 m	Cable gland M20 × 1.5	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	Cable gland M20 × 1.5	565806 
			Cable	5 m	Cable gland M20 × 1.5	565814 
				10 m	Cable gland M20 × 1.5	565818 
			Coax	1 m	Cable gland M20 × 1.5	565825 
				2 m	Cable gland M20 × 1.5	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	Cable gland M20 × 1.5	565805 
			Cable	5 m	Cable gland M20 × 1.5	565813 
				10 m	Cable gland M20 × 1.5	565817 
			Coax	1 m	Cable gland M20 × 1.5	565827 
				2 m	Cable gland M20 × 1.5	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	Cable gland M20 × 1.5	565807 
			Cable	5 m	Cable gland M20 × 1.5	565815 
				10 m	Cable gland M20 × 1.5	565819 
			Coax	1 m	Cable gland M20 × 1.5	565829 
				2 m	Cable gland M20 × 1.5	565830 



## Ordering chart for compact measuring device Type 8188 (continued)

Specification	Operating voltage	Output	Probe	Length	Electrical connection	Article 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 × 1.5	565808	
				2 m	Cable gland M20 × 1.5	565810	
			Cable	5 m	Cable gland M20 × 1.5	565820	
				Coax	1 m	Cable gland M20 × 1.5	565831
					2 m	Cable gland M20 × 1.5	565832
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	1 m	Cable gland M20 × 1.5	565809	
				2 m	Cable gland M20 × 1.5	565811	
			Cable	5 m	Cable gland M20 × 1.5	565821	
				Coax	1 m	Cable gland M20 × 1.5	565833
					2 m	Cable gland M20 × 1.5	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	Cable gland M20 × 1.5	565840	
			Cable	5 m	Cable gland M20 × 1.5	565841	
				Coax	1 m	Cable gland M20 × 1.5	565835
					2 m	Cable gland M20 × 1.5	565836
Ex version - IECEx certification - NPT 1" mounting thread, PN40, temp. max. 150 °C	9.6...30 V DC	4...20 mA/HART (2 wires)	Rod	1 m	Cable gland M20 × 1.5	565842	
				2 m	Cable gland M20 × 1.5	565843	
			Cable	5 m	Cable gland M20 × 1.5	565844	
				Coax	1 m	Cable gland M20 × 1.5	565837
					2 m	Cable gland M20 × 1.5	565838

 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"



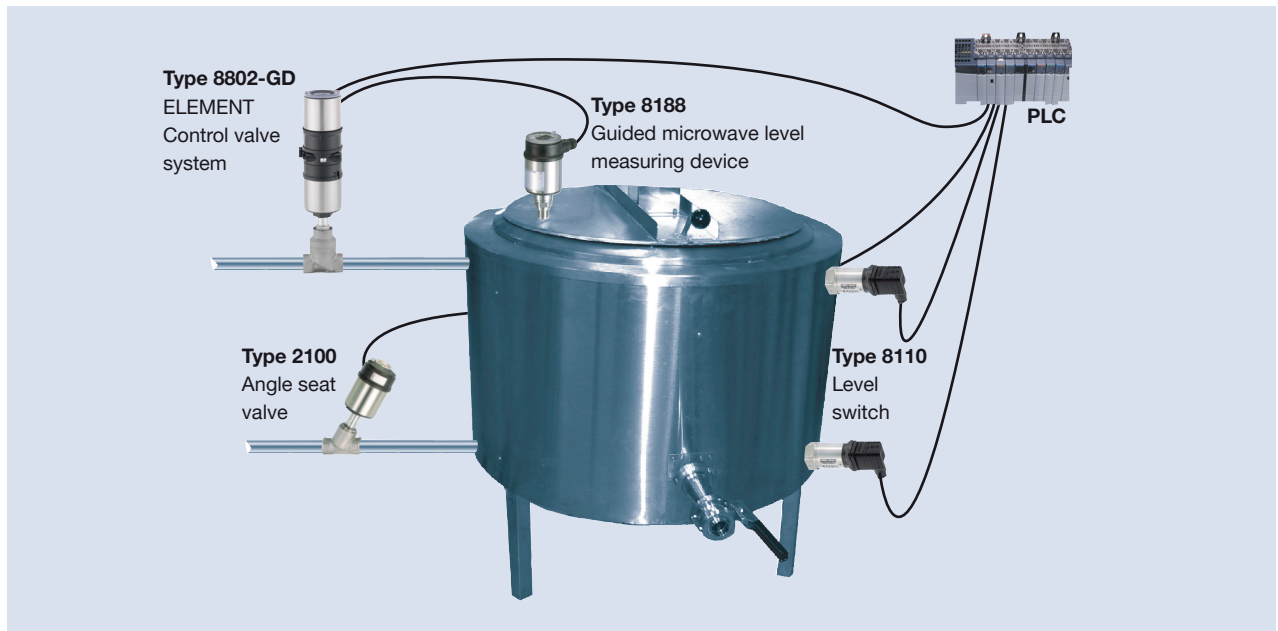
## Additional

Without display

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

Specification	Article no.
Set with 2 reductions M20 x 1.5/NPT1/2" + 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

## 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
 G ¾", PN6, 80 °C G 1" G 1"½ G ¾", PN40, 150 °C NPT ¾", PN6, 80 °C NPT 1" NPT 1"½ NPT ¾", PN40, 150 °C
 Flange
 DN25 DN40 DN50 DN80 DN100 DN150 ANSI 1" ANSI 1"½ ANSI 2" ANSI 3", ANSI 4" ANSI 6"

#### Sensor version

##### Probe

 Rod Cable Coax.

##### Length

 1 m 2 m 5 m 10 m Special length
 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

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[www.burkert.com](http://www.burkert.com)

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

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