FINE CONTROLS (UK) LTD

Fine Controls have been supplying process controls & instrumentation equipment since 1994, & now serves an ever expanding customer base, both in the UK & globally.

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Pressure: Pressure Gauges &Transmitters, Precision & High Pressure Regulators & I-P Converters, Volume boosters.

Precision Pneumatics: Pressure Regulators, I-P Converters, Volume Boosters, Vacuum Regulators

Valves: Solenoid & Pneumatic Valves, Control Valves & Positioners, Actuated Ball, Globe or Diaphragm Valves & Isolation Valves

Services: Repair, Calibration, Panel Build, System Design & Commissioning

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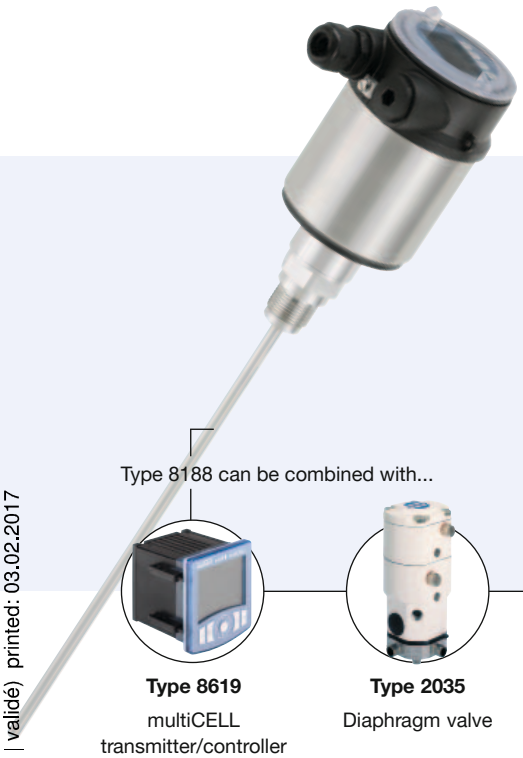
FLUID CONTROL SYSTEMS



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...

Type 8619
multiCELL transmitter/controller

Type 2035
Diaphragm valve

Type 8802-GD
ELEMENT control valve system

Type 8644
Valve islands

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	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
Coax.-ø 21.3 mm	Stainless steel 316L* and PEEK
Process seal	FKM
Inner conductor (up to the separation cable/rod)	Stainless steel 316L*
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 liquids[1)]
Min. dielectric figure	
Rod and cable	εr > 1.6
Coax.-ø 21.3 mm	εr > 1.4

* (1.4404 or 1.4435)
[1)] **For applications regarding solids, please consult your local Bürkert Sales Centre.**

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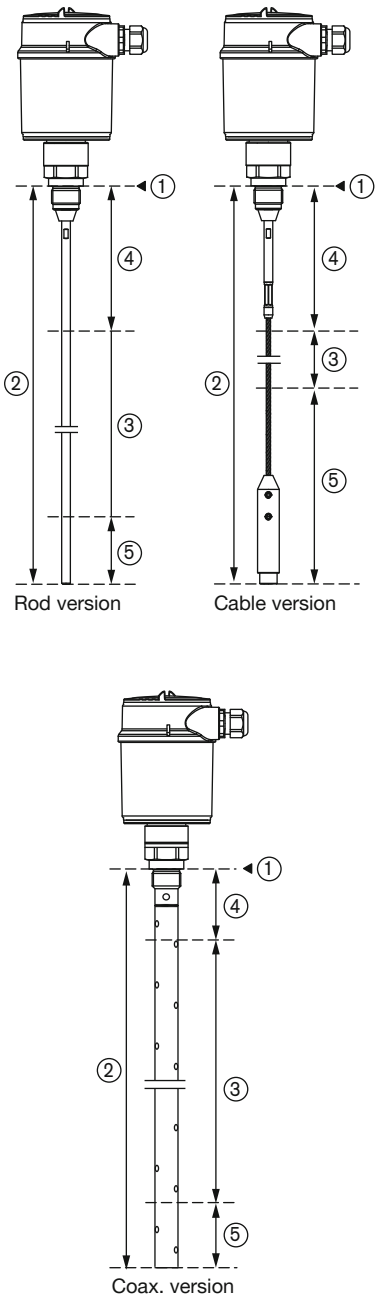
General data (continued)	
Dead band	
in water	
Rod-ø 8 mm	From top of probe: 80 mm - from bottom of probe: 0 mm
Cable-ø 4 mm	From top of probe: 80 mm - from bottom of probe: 0 mm
Coax.-ø 21.3 mm	From top of probe: 30 mm - from bottom of probe: 0 mm
in oil	
Rod-ø 8 mm	From top of probe: 150 mm - from 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 deviation[2]	±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[4]: EN60079-0; EN60079-11; EN60079-26
Specifications Ex	
Ex **- Protection**	Categories 1G, 1/2G or 2G
Ex **- Certification**	EEx ia IIC T6
Conformity specifications[3]	
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

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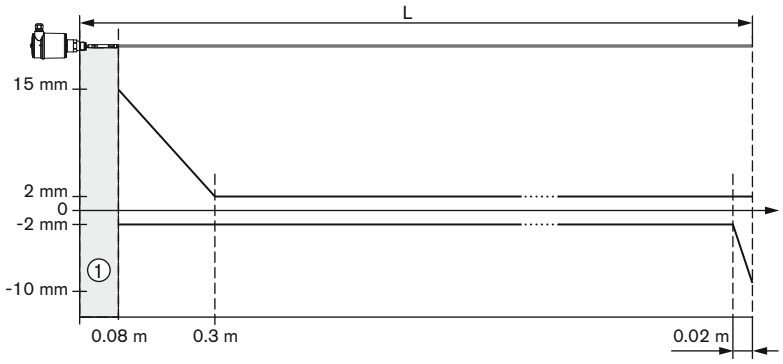
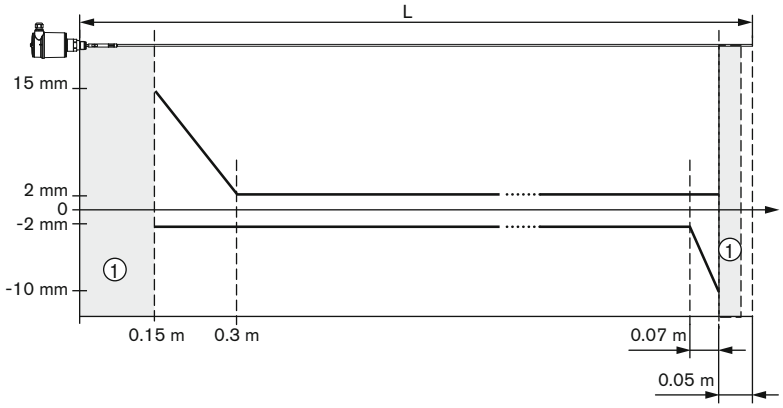
Measurement deviation diagram

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

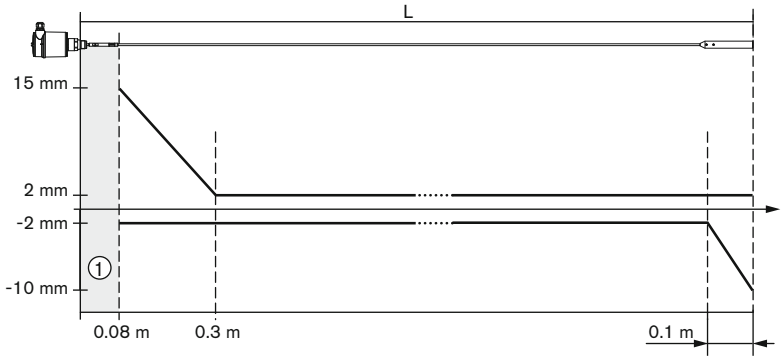
Rod probe version in water



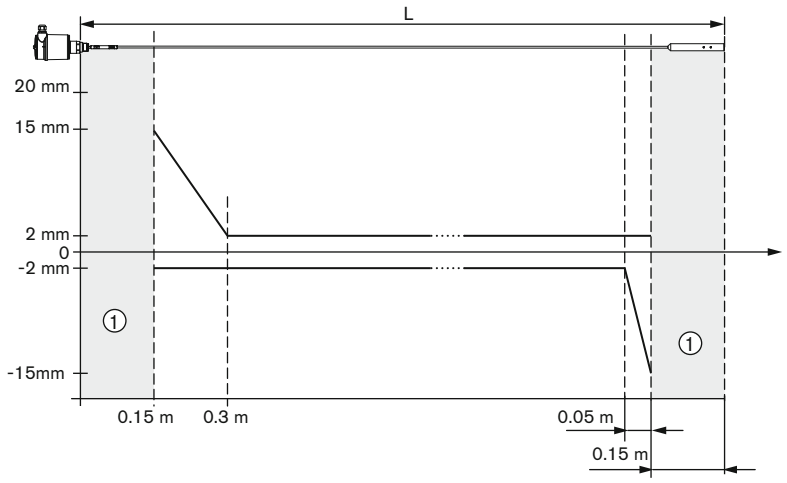
Rod probe version in oil



Cable probe version in water



Cable probe version in oil



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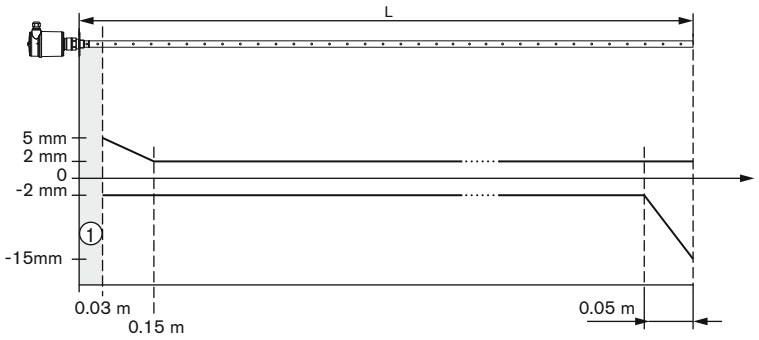
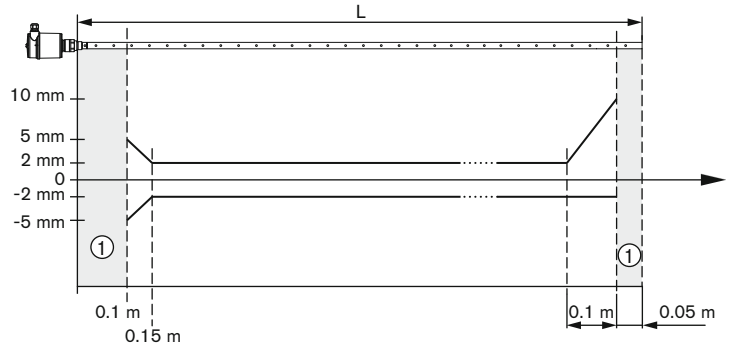
Measurement deviation diagram (continued)

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

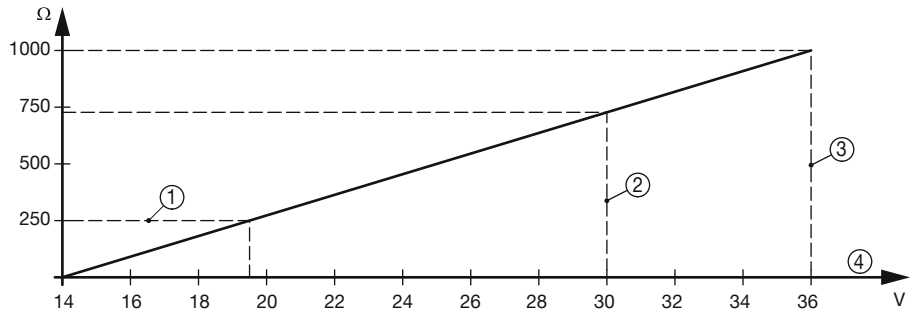
Coax. probe version in water



Coax. probe version in oil



Load diagram



1: HART load
2: Voltage limit Ex ia instrument
3: Voltage limit non-Ex instrument
4: Operating voltage

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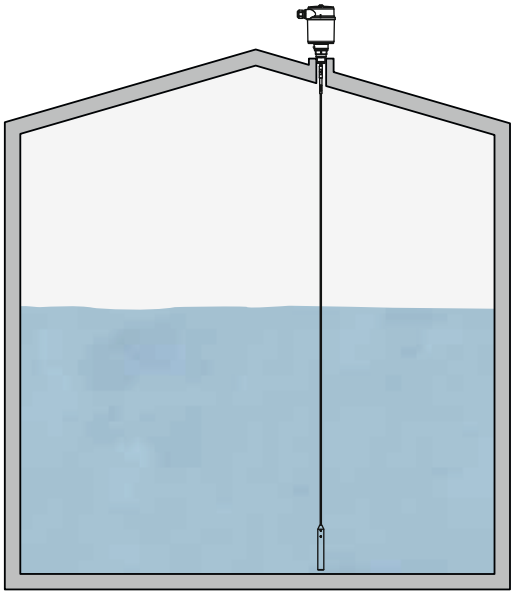
Application examples with Type 8188

Level measurement in

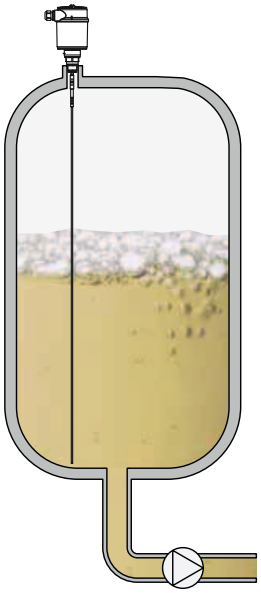
bio-ethanol storage tanks

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



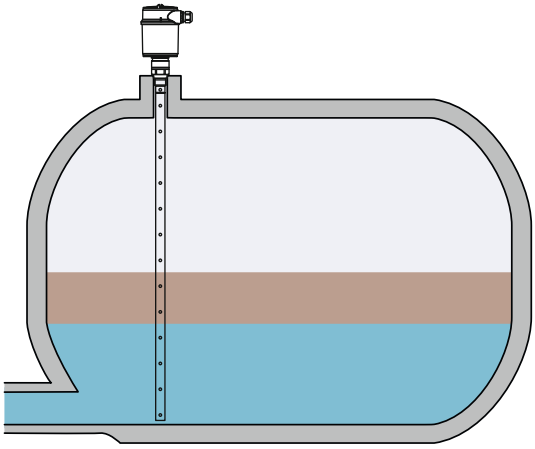
volatile and low-viscosity solvents vessels

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



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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:

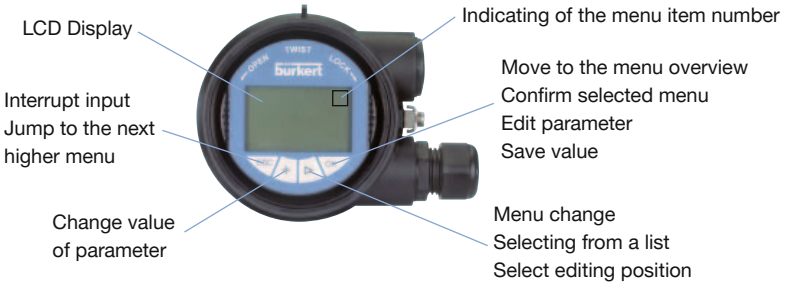
- the display/configuration module
- the suitable Bürkert DTM in conjunction with adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC.
- a HART handheld

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



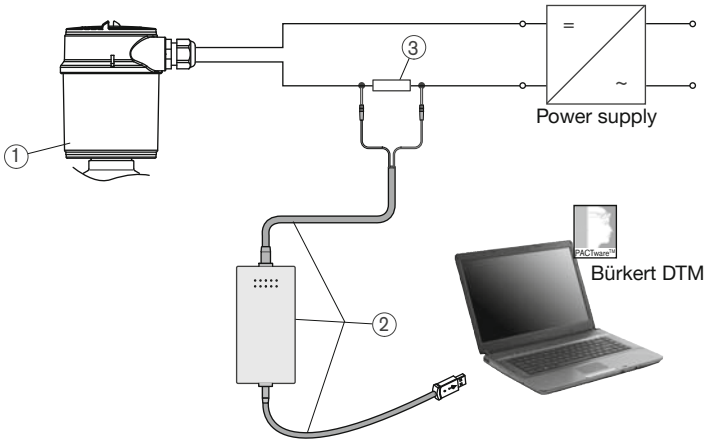
▶ Set up with PACTware™/DTM and HART communication

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.

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



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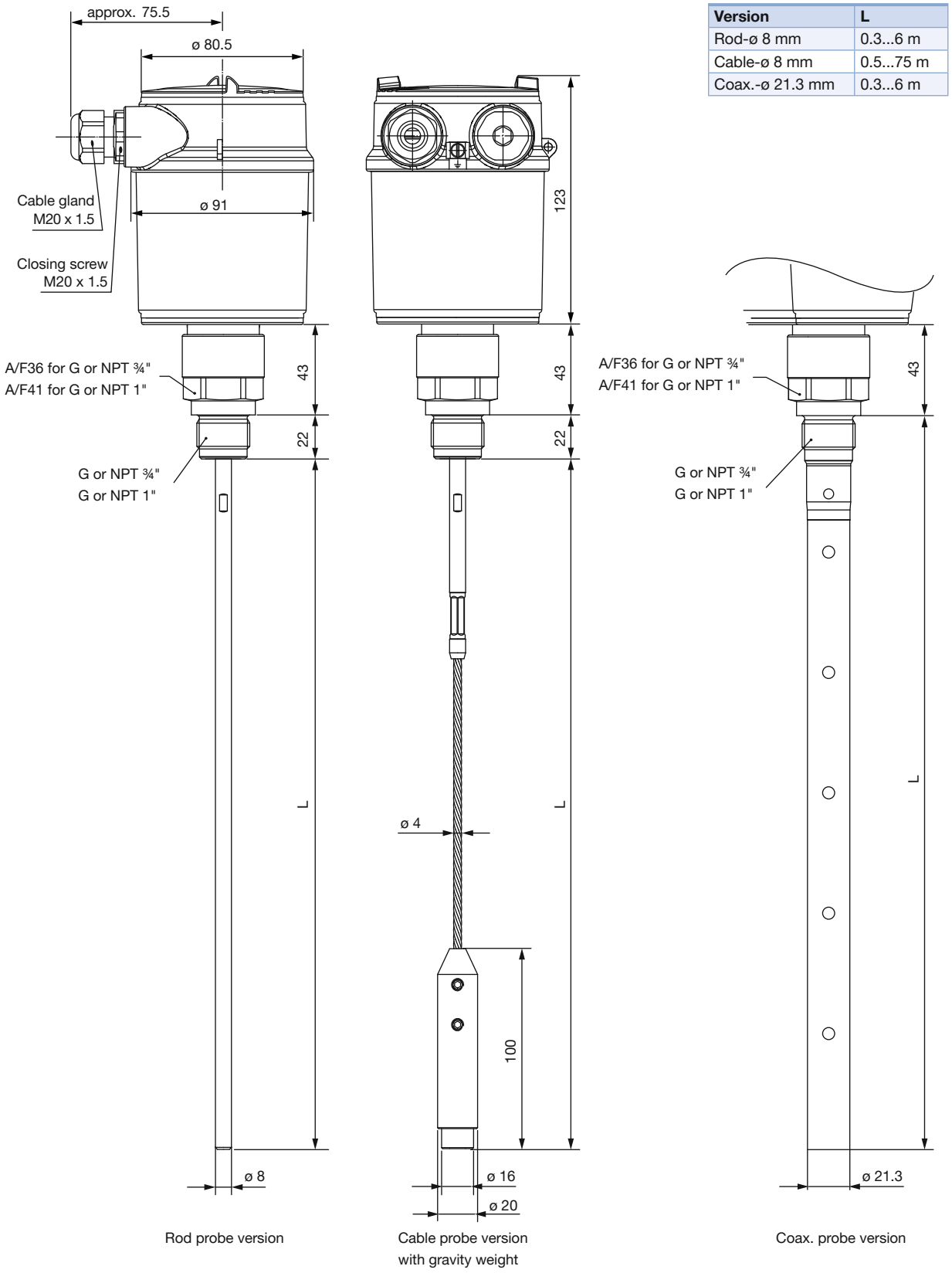
Dimensions [mm]

Version	L
Rod-ø 8 mm	0.3...6 m
Cable-ø 8 mm	0.5...75 m
Coax.-ø 21.3 mm	0.3...6 m



Rod probe version

Cable probe version with gravity weight

Coax. probe version

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Ordering chart for compact measuring device Type 8188

Specification	Operating voltage	Output	Probe	Length	Electrical connection	Item no. (with display / configuration module)
G ¾" 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 ¾" 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

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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 ¾" 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	1 m	Cable gland M20 x 1.5	565 809
				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 ¾" 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	565 839
				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	1 m	Cable gland M20 x 1.5	565 842
				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/NPT½" + 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

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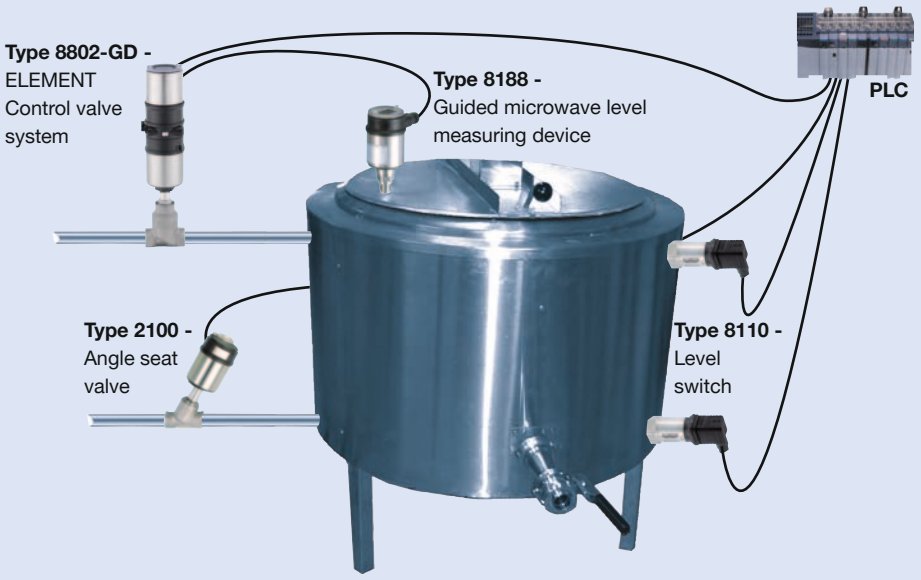
Interconnection possibilities with other Bürkert devices



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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

To find your nearest Bürkert facility, click on the orange box → www.burkert.com

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

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