



Level measurement device with guided radar - sanitary version

- 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 8189 is a level measurement device with interchangeable rod probe, designed for continuous level measurement.

The unit is suitable for liquids, for industrial use in all areas of process technology. But the main application targets are in Food and Beverage (F&B) and pharmaceutical tanks to the new rod in stainless steel 1.4435 with Ra < 0.76 µm. For applications with corrosive liquids a PFA coated version is available.

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 does not influence the measurement result.

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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 [“3.1. Chemical Resistance Chart – Bürkert resistApp” on page 5.](#)

Non wetted parts

| | |
|--------------------------------|---|
| Housing | Plastic PBT (Polyester) 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

| | |
|--------------------------------------|--|
| Process connection | Stainless steel 316L (1.4404 or 1.4435) and PEEK |
| Process seal | EPDM |
| Rod-Ø 8 mm | Stainless steel 316L (1.4435), polished |
| Dimensions | Detailed information can be found in chapter “4. Dimensions” on page 6. |
| Weights | <ul style="list-style-type: none"> • Housing: 890 g • Rod-Ø 8 mm: approx. 400 g/m |
| Surface quality | Rod: Ra ≤ 0.76 µm (with low delta ferrite content) |
| Probe length | 0.3...4 m (lateral load: 10 Nm) |
| Measured variable | Level of liquids |
| Measuring range | 0.08...4 m Detailed information can be found in chapter “5.1. Measuring range and blocking distance diagram” on page 8. |
| 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 “7.4. Ordering chart accessories” on page 11. |
|---------|---|

Performance data

| | |
|--|--|
| Blocking distance | <ul style="list-style-type: none"> • In water: <ul style="list-style-type: none"> – from top of probe: 80 mm – from bottom of probe: 0 mm • In oil <ul style="list-style-type: none"> – from top of probe: 150 mm – from bottom of probe: 100 mm |
| Measurement deviation ^{2),3)} | According to DIN EN 60770-1: ±2 mm Detailed information can be found in chapter “5.2. Measurement deviation diagram” on page 8. |
| Measuring range resolution | < 1 mm |
| Measuring cycle time | < 500 ms |
| Temperature drift | <ul style="list-style-type: none"> • Digital output: ±3 mm/10 K, max. 10 mm • Current output: < 0.03 %/10K relating to the 16 mA span or ≤ 0.3 % |
| Max. filling/emptying speed | 1 m/min (products with high dielectric constant (> 10) up to 5 m/min.) |
| Non-repeatability | ≤ ± 1 mm |
| Vibration resistance | 1 g with 5...200 Hz according to EN 60068-2-6 (vibration at resonance) with rod length 50 cm |
| Shock resistance | 25 g, 6 ms according to EN 60068-2-27 (mechanical shock) with rod length 50 cm |

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 $9.6 \text{ V} < U_n < 18 \text{ V}$: $\leq 0.7 V_{eff}$ (16...400 Hz) For $18 \text{ V} < U_n < 35 \text{ V}$: $\leq 1.0 V_{eff}$ (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 | -20...+130 °C (-4...+266 °F) (for sterilisation process: up to +150 °C (+302 °F) for max. 120 min) |
| Process pressure | Vessel pressure: -1...16 bar (-14.51...232.16 PSI/-100...1600 kPa) |
| Dielectric constant (min.) | $\epsilon_r > 1.6$ |

Product connections

| | |
|------------------------|---|
| Process connection | <ul style="list-style-type: none"> Clamp 2" DIN 11851 DN 50 |
| Electrical connections | Cable gland M20 x 1.5 |

Approvals and Certificates**Standards**

| | |
|--|---|
| Degree of protection according to IEC/EN 60529 | IP66/IP67 with cable plug mounted and tightened M20 x 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 |

| | |
|-------------|--|
| Certificate | FDA declaration of conformity. Detailed information can be found in chapter "2.2. Certificates" on page 5. |
|-------------|--|

Certifications

| | |
|------------|--|
| ATEX/IECEx | EN IEC 60079-0, EN 60079-11, EN 60079-26 Detailed information can be found in chapter "2.1. Certifications" on page 5. |
|------------|--|

Environment and installation

| | |
|----------------------|--|
| Ambient temperature | Operation and storage: -40...+80 °C (-40...+176 °F) (with display/configuration module) |
| Temperature derating | Detailed information can be found in chapter "5.3. Temperature derating diagram" on page 9. |

| | |
|------------------------|--|
| Relative air humidity | <ul style="list-style-type: none"> • Operation: max. 75 %, without condensation • Storage: 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. Approvals

2.1. Certifications

Note:

Devices with Ex certification have different technical data, see **Supplement ATEX/IECEX Type 8189** ▶ 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 8189 ▶ 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> |

2.2. Certificates

| Certificate | Description |
|-------------|---|
| FDA | <p>FDA</p> <p>The devices comply in their composition with the Code of Federal Regulations published by the FDA (Food and Drug Administration, USA).</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.

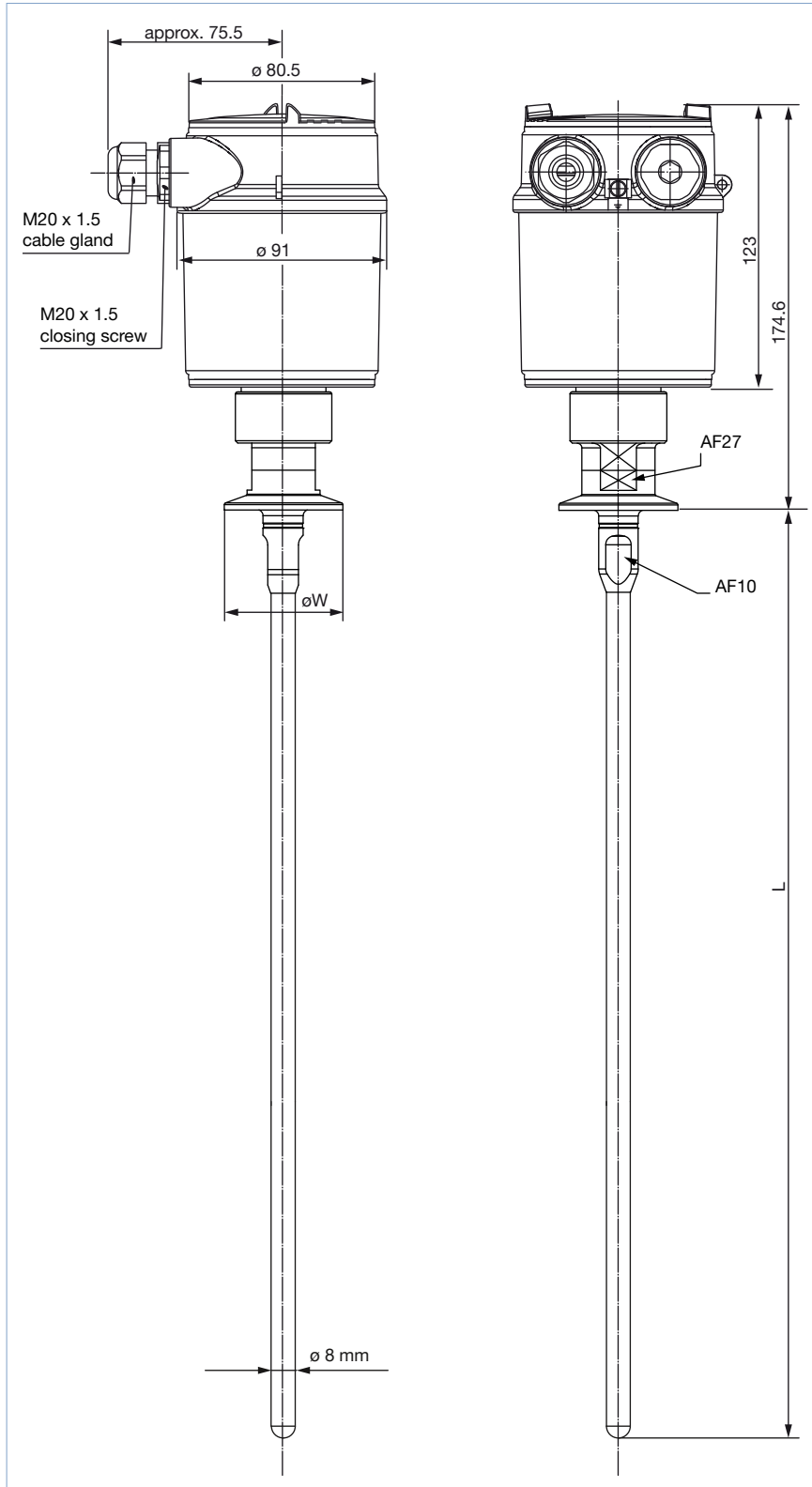
Start Chemical Resistance Check

4. Dimensions

4.1. With clamp process connection

Note:

Dimensions in mm (unless specified differently)

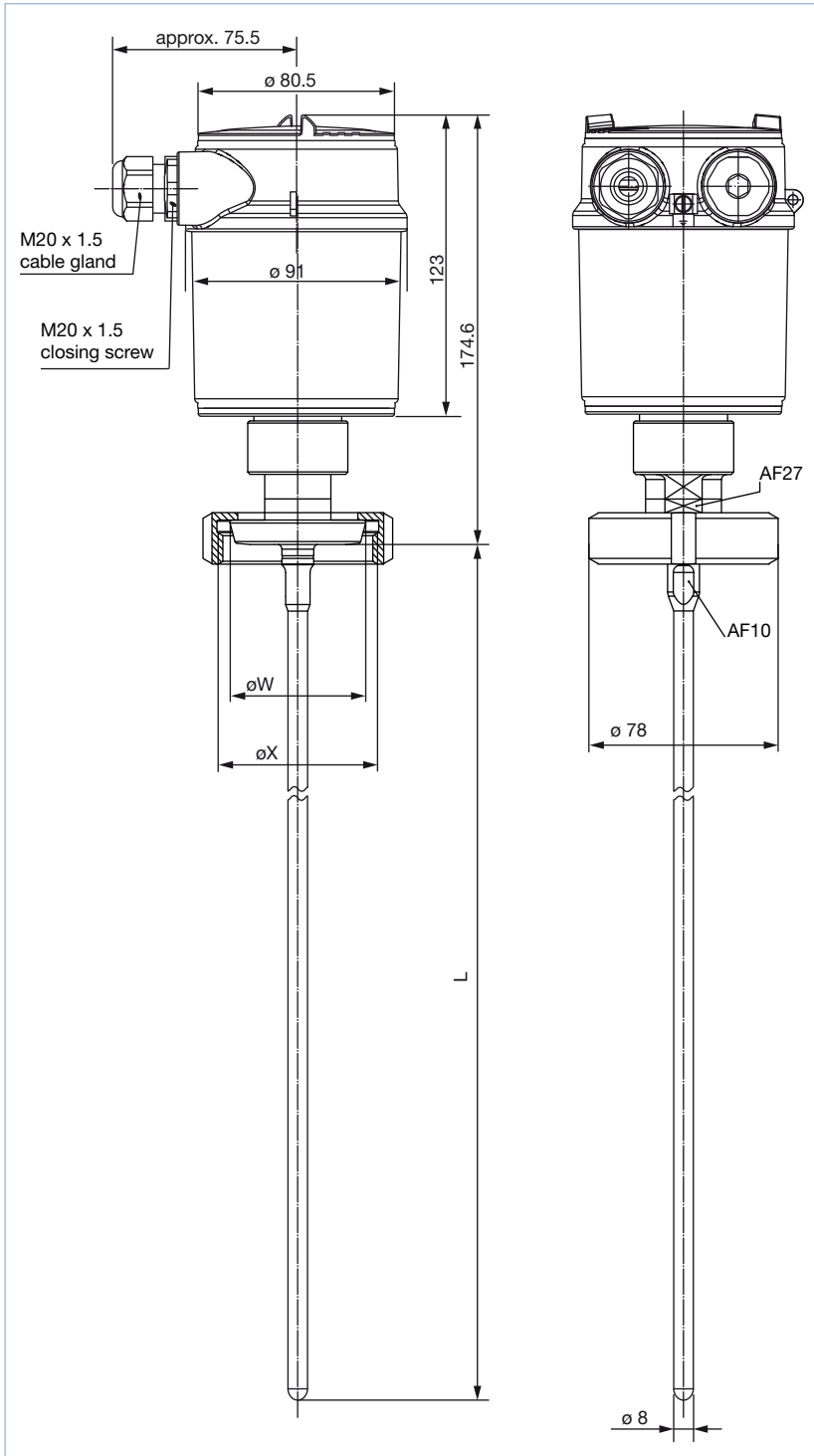


| Clamp connection | Ø W | L |
|------------------|------|-----------|
| 1", 1½" | 50.5 | 0.3...4 m |
| 2" | 64.0 | |
| 2½" | 77.5 | |
| 3" | 91.0 | |

4.2. With process connection according to DIN 11851

Note:

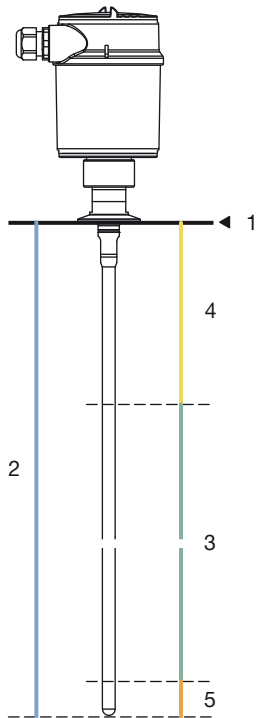
Dimensions in mm (unless specified differently)



| DIN 11851 connection | Ø W | Ø X | L |
|----------------------|------|-------------|-----------|
| DN 32 | 50.0 | Rd 58 × 1/6 | 0.3...4 m |
| DN 40 | 56.0 | Rd 65 × 1/6 | |
| DN 50 | 68.5 | Rd 78 × 1/6 | |
| DN 65 | 86.0 | Rd 58 × 1/6 | |

5. Performance specifications

5.1. Measuring range and blocking distance diagram



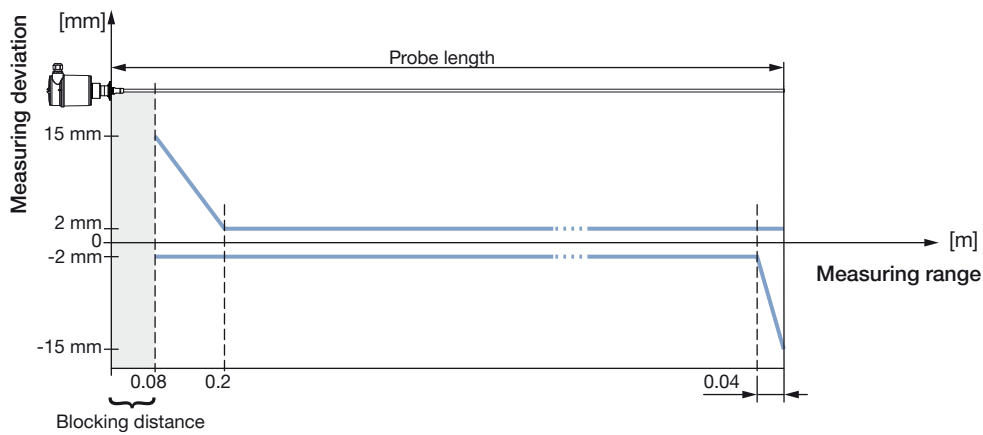
| No. | Description | |
|-----|------------------------|---|
| 1 | Reference plane | - |
| 2 | Measuring probe length | 0.3...4 m |
| 3 | Measurement range | In water: 0.08...4 m In oil: 0.15...3.95 m |
| 4 | Upper block distance | In water: 0.08 m In oil: 0.15 m |
| 5 | Lower block distance | In water: 0 m In oil: 0.1 m |

5.2. Measurement deviation diagram

Rod probe version in water

Note:

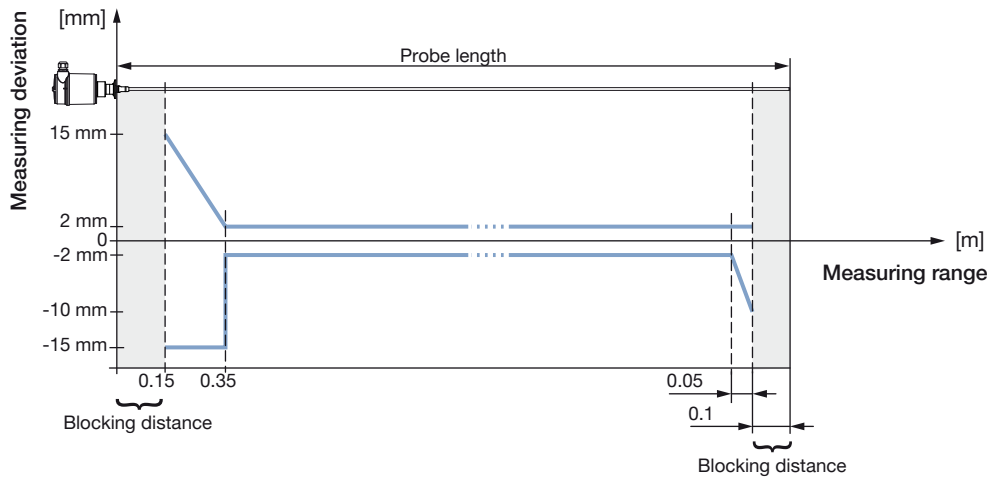
The blocking distance is indicated by the grey area in the diagram. No measurement is possible in this area.



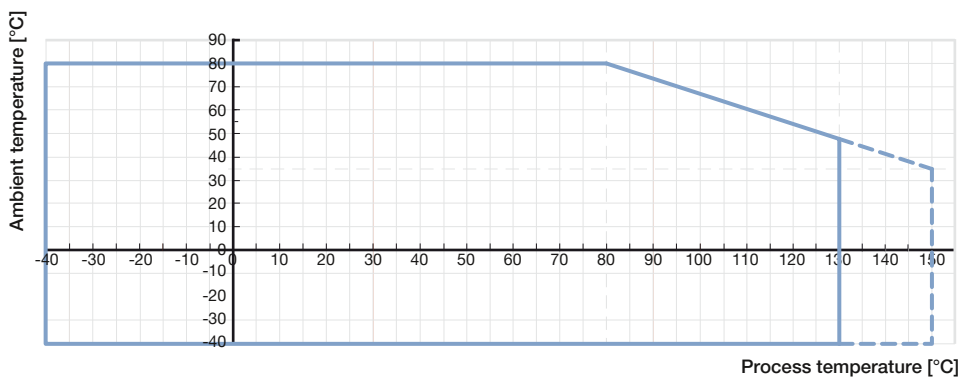
Rod probe version in oil

Note:

The blocking distance is indicated by the grey area in the diagram. No measurement is possible in this area.



5.3. Temperature derating diagram



6. Product operation

6.1. Measuring principle

High frequency microwave pulses are guided along a rod. 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 rod version 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 8189. Optionally, parameters may also be uploaded and downloaded with the display/configuration module or saved in a file by using PACTware™/8189-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 8189, 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>No.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Measuring device Type 8189</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 8189 • PC with PACTware™ and suitable Bürkert DTM • HART-USB Modem • Resistance approx. 250 Ω • Power supply unit | No. | Description | 1 | Measuring device Type 8189 | 2 | HART-USB Modem | 3 | Resistance 250 Ω |
| No. | Description | | | | | | | | |
| 1 | Measuring device Type 8189 | | | | | | | | |
| 2 | HART-USB Modem | | | | | | | | |
| 3 | Resistance 250 Ω | | | | | | | | |

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.

Order online now

DTS 1000244852 EN Version: F Status: RL (released | freigegeben | validé) printed: 18.10.2023

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.

[Try out our product filter](#)

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 version | | | | | | |
| Clamp 2" | 9.6...35 V DC | 4...20 mA/HART (2 wires) | Rod | 1 m | Cable gland M20 × 1.5 | 565850 |
| DIN 11851, DN 50 | | | | 2 m | | 565852 |
| | | | | 1 m | | 565851 |
| | | | | 2 m | | 565853 |
| Ex version - ATEX certification | | | | | | |
| Clamp 2" | 9.6...30 V DC | 4...20 mA/HART (2 wires) | Rod | 1 m | Cable gland M20 × 1.5 | 565854 |
| DIN 11851, DN 50 | | | | 2 m | | 565856 |
| | | | | 1 m | | 565855 |
| | | | | 2 m | | 565857 |
| Ex version - IECEx certification | | | | | | |
| Clamp 2" | 9.6...30 V DC | 4...20 mA/HART (2 wires) | Rod | 1 m | Cable gland M20 × 1.5 | 565858 |
| DIN 11851, DN 50 | | | | 2 m | | 565860 |
| | | | | 1 m | | 565859 |
| | | | | 2 m | | 565861 |

| Further versions on request | |
|---|---|
| Material FFKM | Temperature -20...+150 °C |
| Process connection <ul style="list-style-type: none"> Clamp 1½", 2½", 3" DIN 11851 DN 32, DN 40, DN 65 | Additional Without display/configuration module |

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 |

Bürkert – Close to You

For up-to-date addresses
please visit us at
www.burkert.com

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