Ultrasonic level measuring device

- For level measurement up to 8 m
- 4…20 mA/HART - 2 wires
- Suitable for solids
- ATEX certification

The type 8177 is a non-contact ultrasonic level measuring device, designed for continuous level measurement in open or closed vessels. The unit is suitable for liquids, but also for solids, in virtually all industries, particularly in water and waste water management.

- For level measurement up to 8 m
- 4…20 mA/HART - 2 wires
- Suitable for solids
- ATEX certification

The type 8177 can be combined with...

- Type 8611 Universal process controller eCONTROL
- Type 8644 Valve islands
- Type 8793 Process controller
- Type 8802 ELEMENT control valve system
### Electrical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>14…36 V DC or 14…30 V DC (Ex ia instrument)</td>
</tr>
</tbody>
</table>
| Permissible residual ripple     | < 100 Hz: Uss < 1 V  
100 Hz…10 kHz: Uss < 10 mV |
| Output signal                   | 4…20 mA/HART                   |
| Resolution                      | 1.6 µA                         |
| Fault signal                    | Current output unchanged; 20.5 mA; 22 mA < 3.6 mA (adjustable) |
| Current limitation              | 22 mA                          |
| Load                            | See load diagram               |
| Damping (83% of the input variable) | 0…999 s, adjustable            |

### Environment

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature (with display, adjustment elements)</td>
<td>-20…+70 °C (-4…+158 °F) (operation and storage)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>Max. 75% (operation), max. 85% (storage); without condensation</td>
</tr>
</tbody>
</table>

### Standards, directives and certifications

- Protection: IP66/IP67 with M20 x 1.5 gland mounted and tightened
- Overvoltage category: III
- Protection class: II

### Standards and directives

- 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

### Certification

- ATEX: EN 50014; EN 50020; EN 50284
- EEx ia IIC T6

### Specifications Ex

- Protection: Categories 1/2G or 2G
- Certification: EEx ia IIC T6

### Conformity specifications

- Operating voltage $U_i$: 30 V
- Short circuit rating $I_{sc}$: 131 mA
- Power limitation $P_i$: 983 mW
- Ambient temperature: -20…+41 °C (-4…+105.8 °F) (dependent on categories)
- Internal capacity $C_i$: negligible
- Internal inductivity $L_i$: negligible

### Measurement deviation diagram

![Measurement deviation diagram](image)

### Load diagram

![Load diagram](image)

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

- **Continuous level measuring for fluids and solids**

![Image of fluid and solids level measurement](image)

- **Open basins**

A typical application for the 8177 ultrasonic measuring device is level measurement in open basins. Products such as rain water or sewage water, i.e. with impurities. Here is where the advantages of non-contact measurement with the 8177 come into their own: simple and maintenance-free. The degree of pollution of water or an accumulation of mud in the basin is not important, because the 8177 measures the surface.

- **Distance measuring**

- **Sludge container**

In sewage treatment plants, the accumulated sludge is dewatered and transported via conveyor belts to containers. The 8177 measuring device measures the filling of the container. An empty container can thus be readied in good time before the max. level is reached.

Principle of operation

The transducer of the ultrasonic measuring device emits short ultrasonic pulses, at 55 kHz to the measured product. These pulses are reflected by the medium surface and received by the transducer as echoes. The running time of the ultrasonic pulses from emission to reception is proportional to the distance and hence to the level. An integrated temperature sensor detects the temperature in the vessel and compensates the influence of temperature on the signal running time. The determined level is converted into an output signal and transmitted as a measured value.

The measuring device is adjusted with the display/configuration module. The entered parameters are generally saved in the measuring device, Type 8177. Optionally, parameters may also be uploaded and downloaded with the display/configuration module.

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**

- LCD Display
- Interrupt input
- Jump to the next higher menu
- Change value of parameter
- Indicating of the menu article no.
- Move to the menu overview
- Confirm selected menu
- Edit parameter
- Save value
- Menu change
- Selecting from a list
- Select editing position
Ordering chart for compact 8177 measuring device

<table>
<thead>
<tr>
<th>Specification</th>
<th>Operating voltage</th>
<th>Output</th>
<th>Electrical connection</th>
<th>Article no. (with display / configuration module)</th>
<th>Article no. (without display / configuration module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 2&quot; mounting thread</td>
<td>14…36 V DC</td>
<td>4…20 mA/HART</td>
<td>Cable gland M20 × 1.5</td>
<td>558224</td>
<td>559243</td>
</tr>
<tr>
<td>NPT 2&quot; mounting thread</td>
<td>14…36 V DC</td>
<td>4…20 mA/HART</td>
<td>Cable gland M20 × 1.5</td>
<td>558225</td>
<td>559244</td>
</tr>
<tr>
<td>Ex version – ATEX certification</td>
<td>14…30 V DC</td>
<td>4…20 mA/HART</td>
<td>Cable gland M20 × 1.5</td>
<td>558226</td>
<td>559245</td>
</tr>
</tbody>
</table>

Ordering chart - accessories for 8177 measuring device (has to be ordered separately)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set with 2 reductions M20 × 1.5/NPT1½&quot; +2 neoprene flat seals for cable gland +2 screw-plugs M20 × 1.5</td>
<td>551782</td>
</tr>
<tr>
<td>Set with a display/configuration module, a transparent cover and a seal ring</td>
<td>559279</td>
</tr>
<tr>
<td>Set with a transparent cover and a seal ring</td>
<td>561006</td>
</tr>
</tbody>
</table>

Interconnection possibilities with other Bürkert devices

To find your nearest Bürkert facility, click on the orange box → [www.burkert.com](http://www.burkert.com)

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

Subject to alteration.

© Christian Bürkert GmbH & Co. KG

1806/11_EU-en_00895005