


## Ultrasonic level measuring device, non-contact



- For level measurement up to 5 m
- 4... 20 mA/Hart - 2 wires
- Suitable for solids
- ATEX approvals 

Type 8176 can be combined with...



**Type 8611**

Universal process controller eCONTROL on a valve



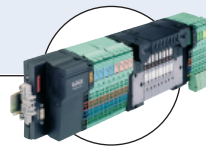
**Type 8793**

Process controller



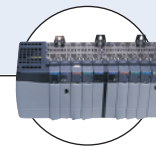
**Type 8802-GB**

Classic control valve system



**Type 8644**

Valve islands



**PLC**

The Type 8176 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.

### General data

#### Materials

Housing	PBT, Stainless steel 316L (1.4435)
Cover	PC
Seal ring	NBR
Ground terminal	Stainless steel 316Ti/316L (1.4571/1.4435)
Wetted parts	
Process connection, transducer	PVDF
Process seal	EPDM

#### Display

LCD in full dot matrix

#### Process connection

Thread G1 1/2" or NPT1 1/2"

#### Max. torque mounting boss

25 Nm

#### Electrical connection

Cable glands M20 x 1.5

#### Measuring value

Distance between lower edge of the transducer and product surface

#### Dead zone

0.25 m

#### Measuring range

0.25 to 5 m (for liquids)  
0.25 to 2 m (for solids)

#### Process temperature

-40 to +80°C (-40 to 176°F)

#### Vessel pressure

-0.2 to 2 bar (-2.9 to 29.02 PSI) (-20 to 200 kPa)

#### Vibration resistance

Mechanical vibrations with 4 g and 5... 100 Hz

#### Temperature coefficient

0.06%/10K (Average temperature coefficient of the zero signal - temperature error)

#### Resolution

max. 1 mm

#### Frequency

70 kHz

#### Interval

> 2 s (dependent on the parameter adjustment)

#### Beam angle at 3 dB

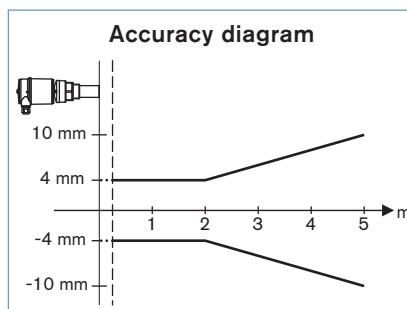
11°

#### Adjustment time<sup>1)</sup>

> 3 s (dependent on the parameter adjustment)

#### Accuracy

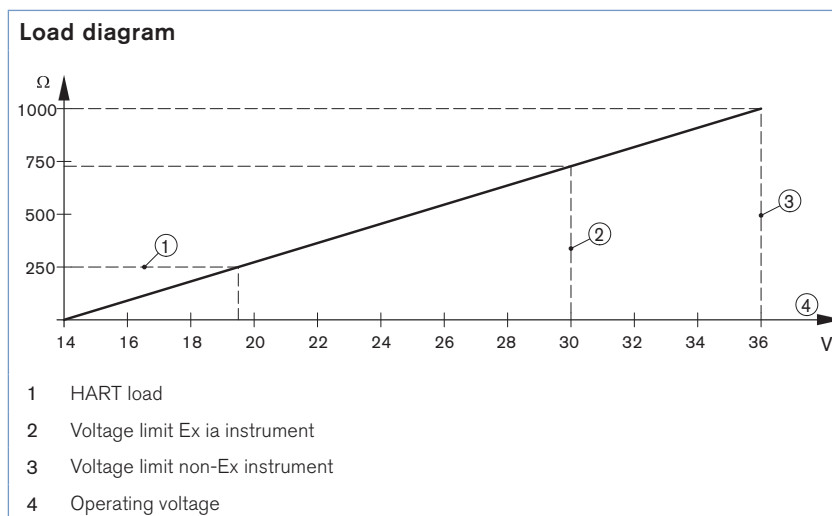
< 0.2% or ± 4 mm (see diagram)



<sup>1)</sup> Time to output the correct level (with max. 10% deviation) after a sudden level change.

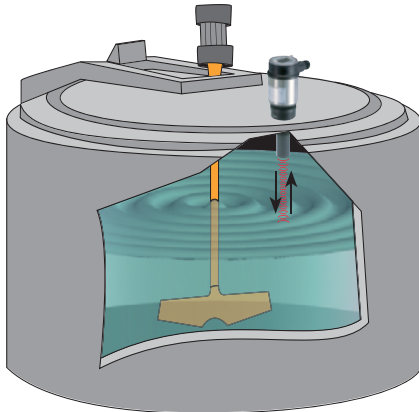
Electrical data	
<b>Operating voltage</b>	14 - 36 V DC or 14 - 30 V DC (Ex ia instrument)
<b>Permissible residual ripple</b>	< 100 Hz: $U_{ss} < 1\text{ V}$ 100 Hz... 10 kHz: $U_{ss} < 10\text{ mV}$
<b>Output signal</b>	4... 20 mA/HART
<b>Resolution</b>	1.6 $\mu\text{A}$
<b>Fault signal</b>	current output unchanged; 20.5 mA; 22 mA < 3.6 mA (adjustable)
<b>Current limitation</b>	22 mA
<b>Load</b>	see load diagram
<b>Damping</b> (63% of the input variable)	0... 999 s, adjustable
Environment	
<b>Ambient temperature</b> with display, adjustment elements	-20 to +70°C (-4 to 158°F) (operation and storage)
<b>Relative humidity</b>	Max. 75% (operation), max. 85% (storage); without condensation
Standards and approvals	
<b>Protection</b>	IP66/IP67 with M20 x 1.5 gland mounted and tightened
<b>Overvoltage category</b>	III
<b>Protection class</b>	II
<b>Standard</b>	
EMC	EN61326
Security	EN61010-1
NAMUR	NE 21; NE 43
<b>Approvals</b>	ATEX <sup>2)</sup> : EN50014; EN50020; EN50284
Specifications Ex	
<b>⊕ - Protection</b>	Categories 1/2G or 2G
<b>⊕ - Certification</b>	Ex ia IIC T6
<b>Conformity specifications<sup>2)</sup></b>	
Operating voltage $U_i$	30 V
Short circuit rating $I_i$	131 mA
Power limitation $P_i$	983 mW
Ambient temperature	-20 to +41°C (-4 to 105.8°F) (dependent on categories)
Internal capacity $C_i$	negligible
Internal inductivity $L_i$	negligible

2) homologation certificate PTB 07 ATEX 2003X



## Target applications

### ■ Continuous level measuring for fluids and solids

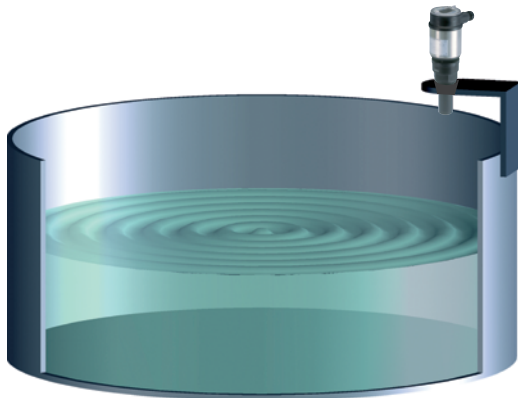


### ■ Distance measuring



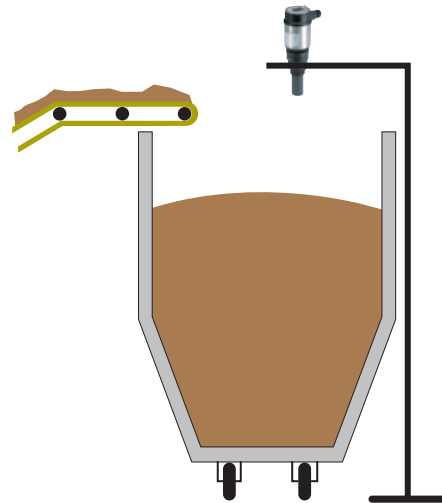
### ■ Open basins

A typical application for the 8176 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 8176 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 8176 measures the surface.



### ■ Sludge container

In sewage treatment plants, the accumulated sludge is dewatered and transported via conveyor belts to containers. The 8176 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 70 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.

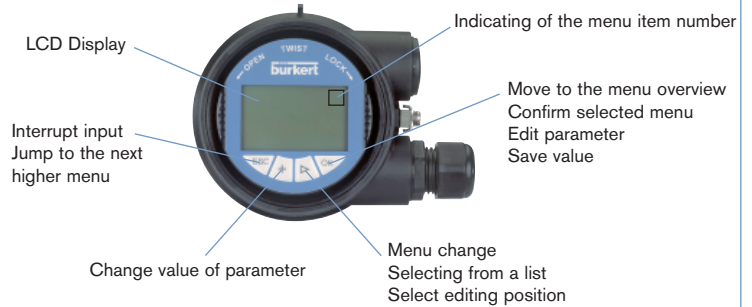
The measuring device is adjusted with the display/configuration module.

The entered parameters are generally saved in the measuring device Type 8176. Optionally, parameters may also be uploaded and downloaded with the display/configuration module.

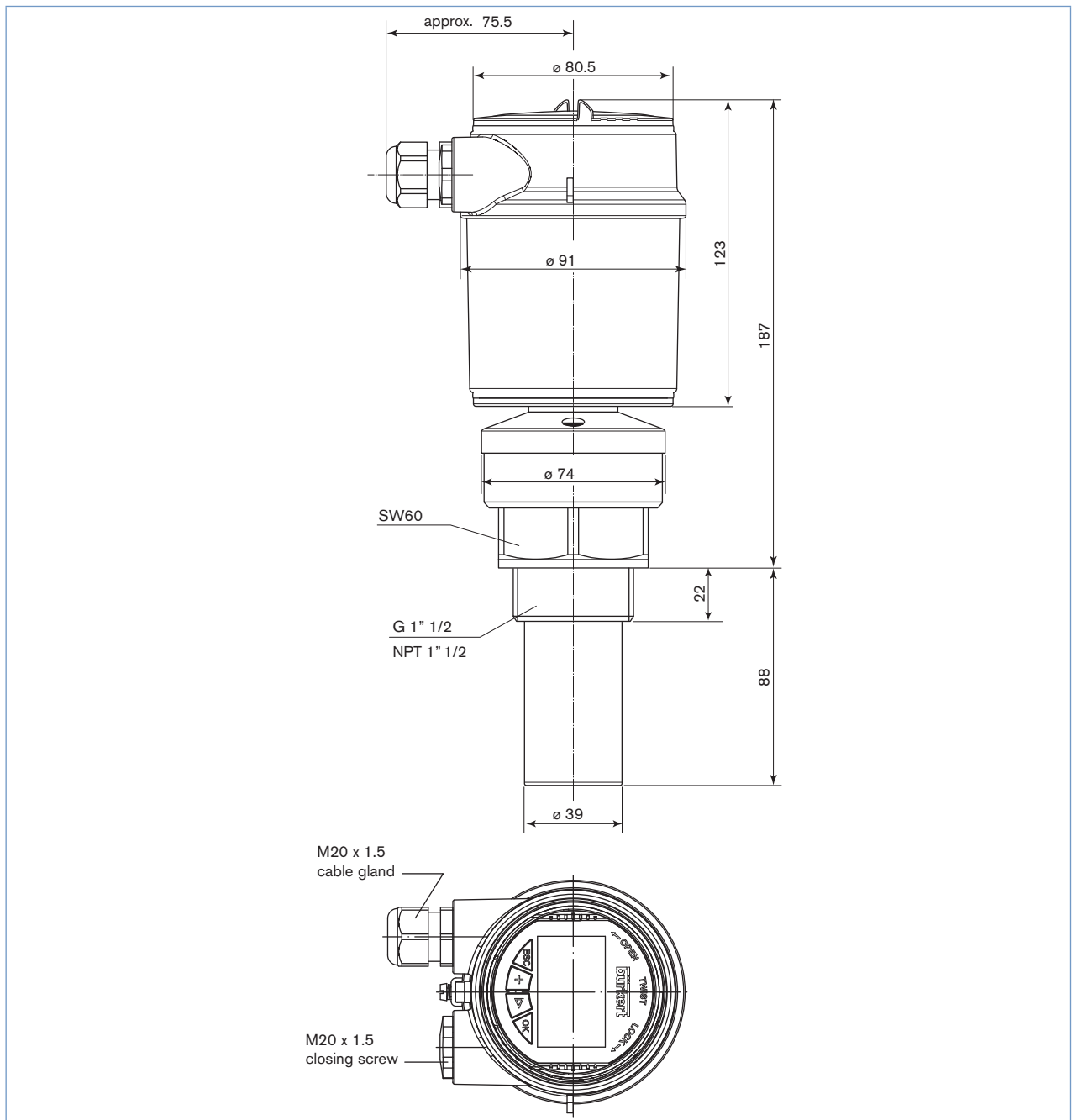
► Set up with display/configuration module

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



### Dimensions [mm]



## Ordering chart for compact measuring device Type 8176

Specifications	Operating voltage	Output	Electrical connection	Item no.	
				with display/ configuration module	without display/ configuration module
G1½" mounting thread	14 - 36 V DC	4... 20 mA/HART (2 wires)	Cable gland M20 x 1.5	558 220	559 240
NPT1½" mounting thread	14 - 36 V DC	4... 20 mA/HART (2 wires)	Cable gland M20 x 1.5	558 221	559 241
Ex version - ATEX approval G1½" mounting thread	14 - 30 V DC	4... 20 mA/HART (2 wires)	Cable gland M20 x 1.5	558 222	559 242

 **Further versions on request**


**Process connection**  
Clamp 2"; 3"; 3½"; 4"

Please also use the "request for quotation" form on page 6 for ordering a customized measuring device. [go to page](#)

## Ordering chart - accessories for measuring device Type 8176 (has to be ordered separately)

Specifications	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
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

## Customized measuring device Type 8176 - request for quotation

Please fill in and send to your local Bürkert Sales Centre\* with your inquiry or order.

### Note

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

Company:	Contact person:
Customer No.:	Department:
Address:	Tel. / Fax.:
Postcode / Town:	E-mail:

### Ultrasonic level measuring device Type 8176

Quantity:

Desired delivery date:

#### ■ Process fitting connection:

External thread  G1 1/2"

NPT1 1/2"

Clamp  2"

3"

3 1/2"

4"

DIN 11851  DN50

DN80

DN100

#### ■ Display/configuration module

Yes

No

#### ■ ATEX approval

Yes

No

## Interconnection possibilities with other Bürkert devices

