




Ultrasonic level transmitter, non-contact

- Compact 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

PI-controller on a valve



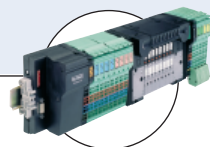
Type 8635

SideControl EEx



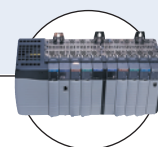
Type 2712 (8630)

Continuous TopControl system



Type 8644

Valve islands with electronic I/O



PLC

The Type 8176 is a non-contact ultrasonic level transmitter, 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 fitting, transducer | PVDF |
| Process seal | EPDM |

Display

LCD in full dot matrix

Process fitting

Thread G1 1/2" A, NPT 1 1/2"

Max. torque mounting boss

25 Nm

Electrical connections

Cable gland M20 x 1.5

Measuring type

Distance between lower edge of the transducer and product surface

Dead zone

0.25 m

Measuring range

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

Process temperature

-40 up to 80°C (-40 to 176°F)

Vessel pressure

-0.2 up to 2.0 bar (-2.9 to 29.02 PSI) (-20...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

Ultrasonic frequency

70 kHz

Interval

> 2 s (dependent on the parameter adjustment)

Beam angle at -3 db

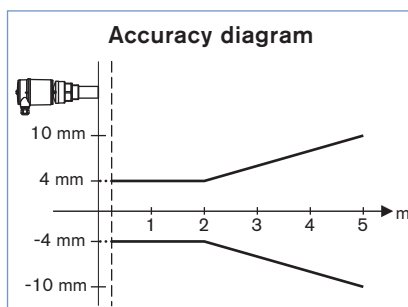
11 degrees

Adjustment time¹⁾

> 3 s (dependent on the parameter adjustment)

Accuracy

< 0.2% or ± 4 mm (see diagram)

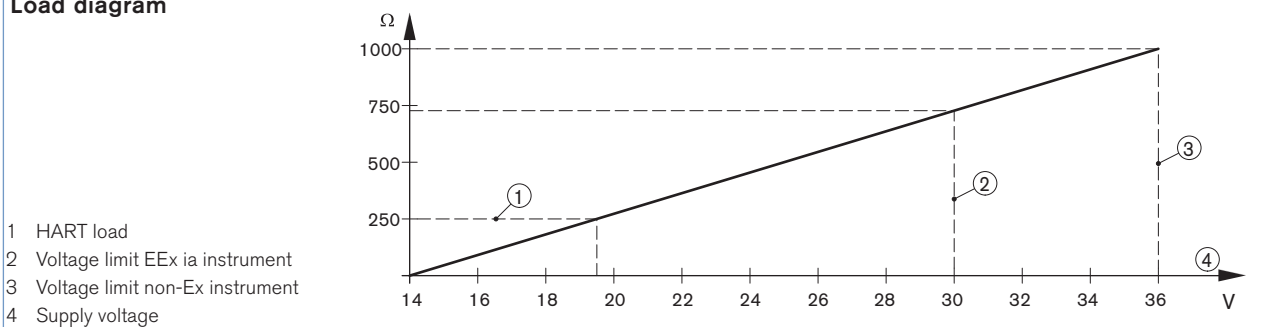


¹⁾ Time to output the correct level (with max. 10% deviation) after a sudden level change.

| Electrical data | |
|---|---|
| Power supply | 14 to 36 V DC or 14 to 30 V DC (EEx ia instrument) |
| Permissible residual ripple | < 100 Hz: $U_{ss} < 1 \text{ V}$ 100 Hz...10 kHz: $U_{ss} < 10 \text{ mV}$ |
| 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 |
| Integration time (63% of the input variable) | 0...999 s, adjustable |
| Fulfilled NAMUR recommendation | NE 43 |
| Environment | |
| Ambient temperature with display, adjustment elements | -20 to +70°C (-4 to 158°F) (operation and storage) |
| Relative humidity | 45-75 %; without condensation |
| Standards and approvals | |
| Protection | IP66/IP67 with M20 x 1.5 gland mounted and tightened |
| Overvoltage category | III |
| Protection class | II |
| Standard | |
| EMC | EN61326 |
| Security | EN61010-1 |
| ATEX | EN50014; EN50020; EN50284 |
| NAMUR | NE 21; NE 43 |
| Specifications EEx | |
| ⚡ - Protection | Categories 1/2 G or 2G |
| ⚡ - Certification | EEx ia IIC T6 |
| Conformity specifications²⁾ | |
| Power supply U_i | 30 V |
| Short circuit rating I_i | 131 mA |
| Power limitation P_i | 983 mW |
| Ambient temperature | -20 up to +41°C (-4 to 105.8°F) (depend on categories) |
| Internal capacity C_i | negligible |
| Internal inductivity L_i | negligible |

²⁾ homologation certificate PTB 07 ATEX 2003 X

Load diagram

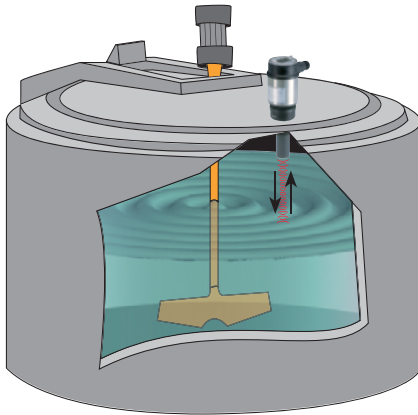


Principle of operation

The transducer of the ultrasonic sensor emits short ultrasonic pulses, at 70 kHz to the measured product. These pulses are reflected by the product 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 an measured value.

Target applications with Type 8176

- Continuous level measuring for fluids and solids.

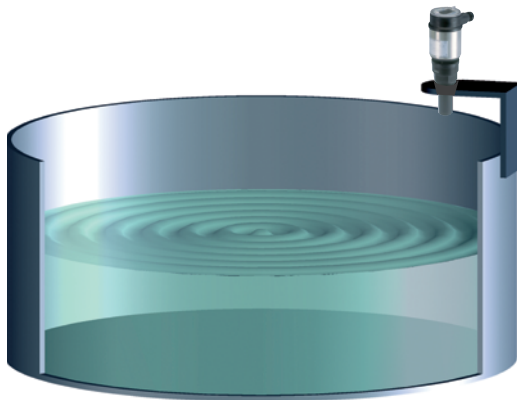


- Distance measuring.



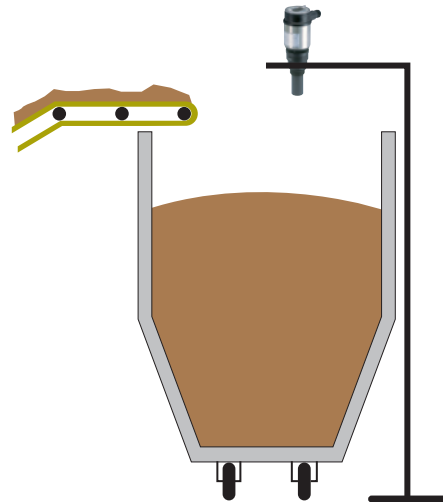
Open basins

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

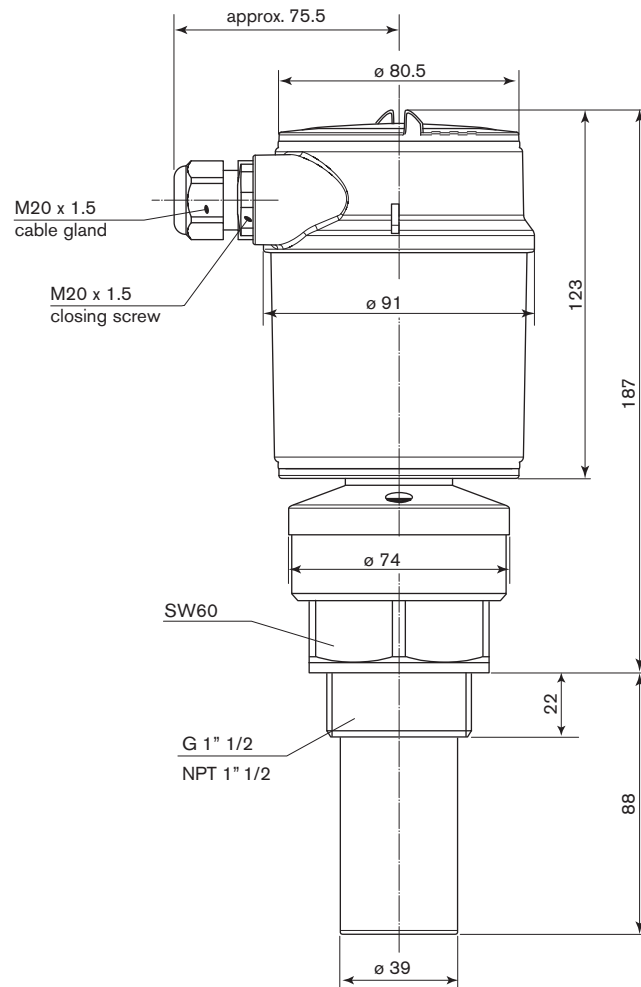


Sludge container

In sewage treatment plants, the accumulated sludge is dewatered and transported via conveyor belts to containers. The 8176 transmitter measures the filling of the container. An empty container can thus be readied in good time before the max. level is reached.



Dimensions [mm]



Ordering chart for compact transmitter Type 8176

| Specifications | Voltage supply | Output | Electrical connection | Item no. | |
|--|----------------|---------------------------|------------------------|---------------------------------|-----------------------------------|
| | | | | with program module and display | without program module no display |
| G 1"1/2 mounting thread | 14-36 V DC | 4-20 mA/HART (2 wires) | Cable gland M 20 x 1.5 | 558 220 | 559 240 |
| NPT 1"1/2 mounting thread | 14-36 V DC | 4-20 mA/HART (2 wires) | Cable gland M 20 x 1.5 | 558 221 | 559 241 |
| EEx version - ATEX approval G 1"1/2 mounting thread | 14-30 V DC | 4-20 mA/HART (2 wires) | Cable gland M 20 x 1.5 | 558 222 | 559 242 |



Further versions on request



Port connection

Clamp 2"; 3"; 3"1/2; 4"

Ordering chart accessories

| Description | Item no. |
|---|----------|
| Set with 2 reductions M20 x 1.5 / NPT1/2" + 2 neoprene flat seals for cable gland + 2 screw-plugs M20 x 1.5 | 551 782 |
| Set with a display and programming module, a transparent cover and a seal ring | 559 279 |
| Set with a transparent cover and a seal ring | 561 006 |

Ultrasonic level transmitter Type 8176 - request for quotation

Note

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

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

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

Ultrasonic level transmitter 8176

Quantity:

Desired delivery date:

■ Process fitting connection:

External thread ☐ G 1"1/2

☐ NPT 1"1/2

Clamp ☐ 2"

☐ 3"

☐ 3"1/2

☐ 4"

DIN 11851 ☐ DN 50

☐ DN 80

☐ DN 100

■ Program module and display

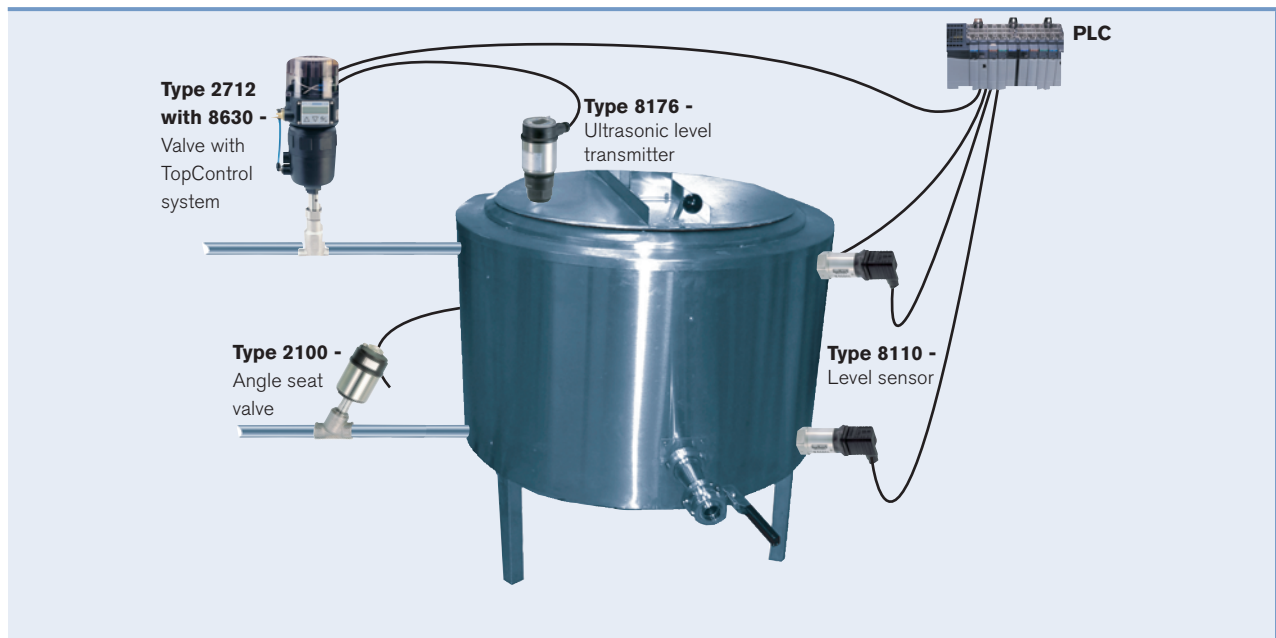
☐ Yes

☐ No

■ ATEX approval

☐ Yes

☐ No



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www.burkert.com

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

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