



Ultrasonic Level Transmitter, Non Contact

- Easily Set Up
- 4-20mA / Hart – 2 wires
- For levels up to 8 meters
- ATEX Approvals
- Suitable for Solids

Description:

The Ultrasonic level transmitter combines an ultrasonic sensor and a transducer with a large 8 digit multi-language display all housed in an IP 65 splash-proof enclosure. The transmitter is powered with a 24 VDC supply and features a 4-20mA output for direct controlling a continuous control valve, a PLC or just for monitoring. Easy and fast to commission with teach-in and simulation functions. Different tank shapes can be programmed via fixed default shapes or a step by step set up for more complex shaped tanks.

Applications

Continuous Level Measuring
Sludge Containers
Tank Level Monitoring



ATEX Version



Description

A non contact ultrasonic level transmitter with the measured value shown as level or volume. For use on open or closed vessels with teach-in function for easy commissioning. Range 0.4 up to 8 meters
Temperature Max. 80°C



Beschreibung

Ein berührungsloser Ultraschall-Füllstandmessumformer mit dem Messwert als Füllstand oder Volumen. Für den Einsatz auf offenen oder geschlossenen Gefäßen mit Teach-In-Funktion zur einfachen Inbetriebnahme. Reichweite 0,4 bis 8 Meter Temperatur max. 80°C



Descripción

Un transmisor de nivel ultrasónico sin contacto con el valor medido mostrado como nivel o volumen. Para usar en recipientes abiertos o cerrados con función teach-in para una puesta en servicio sencilla. Rango 0.4 hasta 8 metros Temperatura Máx. 80°C



La description

Un transmetteur de niveau à ultrasons sans contact avec la valeur mesurée comme niveau ou volume. Pour utilisation sur des récipients ouverts ou fermés avec fonction d'apprentissage pour une mise en service facile. Plage de 0,4 à 8 mètres Température Max. 80°C

Ultrasonic level measuring device



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

Type 8177 can be combined with...



Type 8611

Universal process controller eCONTROL



Type 8793

Process controller



Type 8802-GD

ELEMENT control valve system



Type 8644

Valve islands

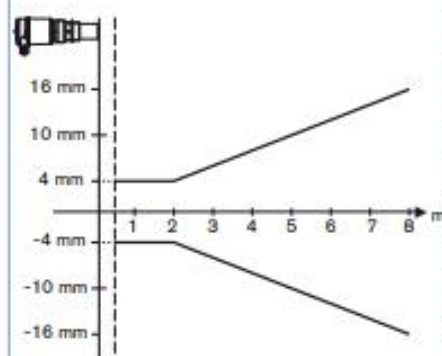


PLC

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.

Measurement deviation diagram



General data	
Materials	
Housing	PBT, Stainless steel 316L (1.4404)
Cover	PC
Seal ring	EPDM
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 G 2" or NPT 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	0.4 m
Measuring range	0.4...8 m (for liquids) 0.4...3.5 m (for solids)
Process temperature	-40...+80 °C (-40...176 °F)
Vessel pressure	-0.2...2 bar (-2.9...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
Frequency	55 kHz
Interval	> 2 s (dependent on the parameter adjustment)
Beam angle at 3 dB	11°
Adjustment time¹⁾	> 3 s (dependent on the parameter adjustment)
Measurement deviation²⁾	< 0.2 % or ± 4 mm (see diagram)

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

²⁾ = "measurement bias" as defined in the standard JCGM 200:2012

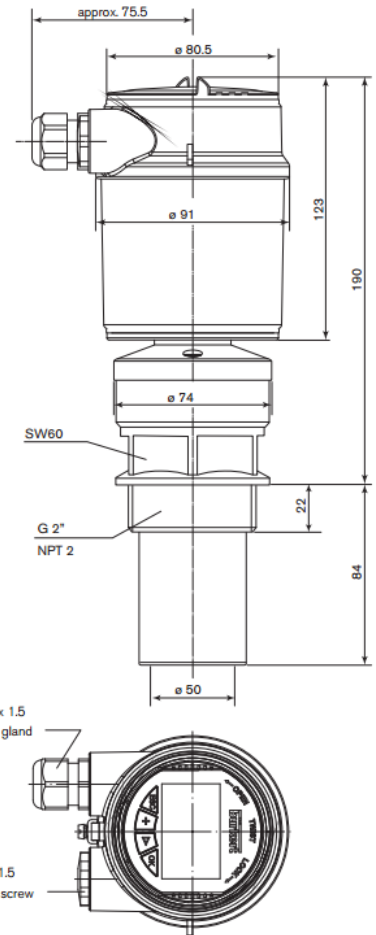
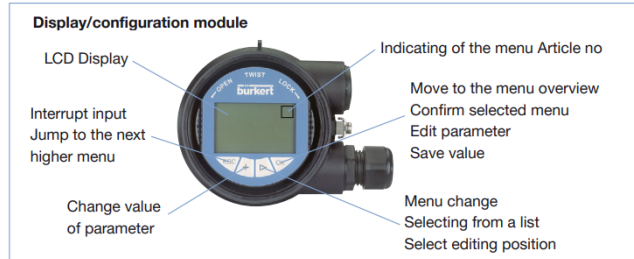
Principle of operation

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.



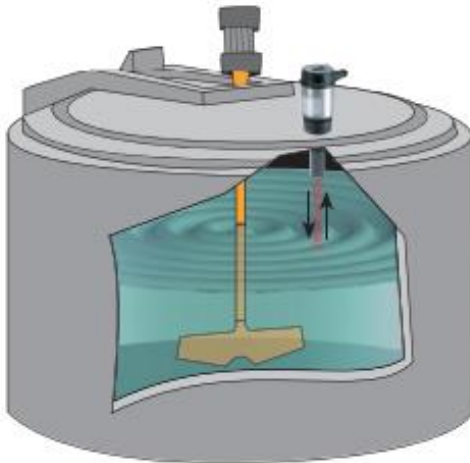
Electrical data	
Operating voltage	14 - 36 V DC or 14 - 30 V DC (Ex ia instrument)
Permissible residual ripple	< 100 Hz: $U_{ss} < 1\text{ V}$ 100 Hz... 10 kHz: $U_{ss} < 10\text{ mV}$
Output signal	4... 20 mA/HART
Resolution	1.6 μA
Fault signal	current output unchanged; 20.5 mA; 22 mA < 3.6 mA (adjustable)
Current limitation	22 mA
Load	see load diagram
Damping (63% of the input variable)	0... 999 s, adjustable
Environment	
Ambient temperature with display, adjustment elements	-20 to +70°C (-4 to 158°F) (operation and storage)
Relative humidity	Max. 75% (operation), max. 85% (storage); 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
NAMUR	NE 21; NE 43
Approvals	ATEX ²⁾ : EN50014; EN50020; EN50284
Specifications Ex	
Protection	Categories 1/2G or 2G
Certification	Ex ia IIC T6
Conformity specifications²⁾	
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

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Target applications

■ Continuous level measuring for fluids and solids

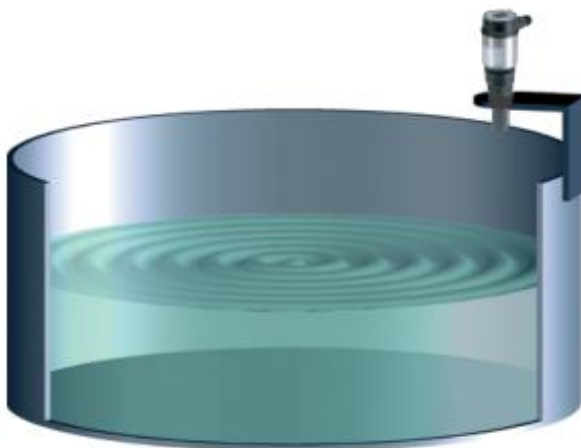


■ Distance measuring



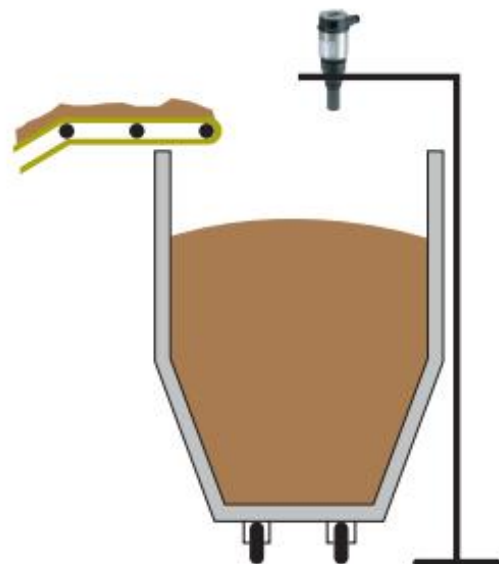
■ Open basins

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.



■ 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.



Ordering chart for compact 8177 measuring device

Specification	Operating voltage	Output	Electrical connection	Article no. (with display / configuration module)	Article no. (without display / configuration module)
G 2" mounting thread	14...36 V DC	4...20 mA/HART (2 wires)	Cable gland M20 x 1.5	558224	559243
NPT 2" mounting thread	14...36 V DC	4...20 mA/HART (2 wires)	Cable gland M20 x 1.5	558225	559244
Ex version – ATEX certification G 2" mounting thread	14...30 V DC	4...20 mA/HART (2 wires)	Cable gland M20 x 1.5	558226	559245

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

Specification	Article no.
Set with 2 reductions M20 x 1.5/NPT½" + 2 neoprene flat seals for cable gland + 2 screw-plugs M20 x 1.5	551782
Set with a display/configuration module, a transparent cover and a seal ring	559279
Set with a transparent cover and a seal ring	561006

Interconnection possibilities with other Bürkert devices

