bürkert
FLUID CONTROL SYSTEMS

Ultrasonic level measuring device, non-contact

- For level measurement up to 15 m
- 4... 20 mA/Hart - 2 wires
- Suitable for solids

Type 8178 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

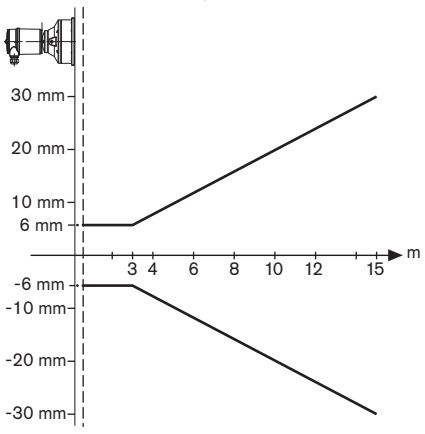
PLC

The Type 8178 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)
Mounting strap	UP
Wetted parts	
Process connection / Process seal	Stainless steel 1.4301 / EPDM
Transducer diaphragm	Stainless steel 1.4571
Display	LCD in full dot matrix
Process connection	Mounting strap
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	0.6 m
Measuring range	0.6 to 15 m (for liquids) 0.6 to 7 m (for solids)
Process temperature	-40 to +80°C *(-40 to 176°F)*
Vessel pressure	0 bar *(0 PSI)* (0 kPa) - because no sealing possibility
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	35 kHZ
Interval	> 2 s (dependent on the parameter adjustment)
Beam angle at 3 dB	6°
Adjustment time[1)]	> 3 s (dependent on the parameter adjustment)
Accuracy	< 0.2% or ± 6 mm (see diagram)

Accuracy diagram



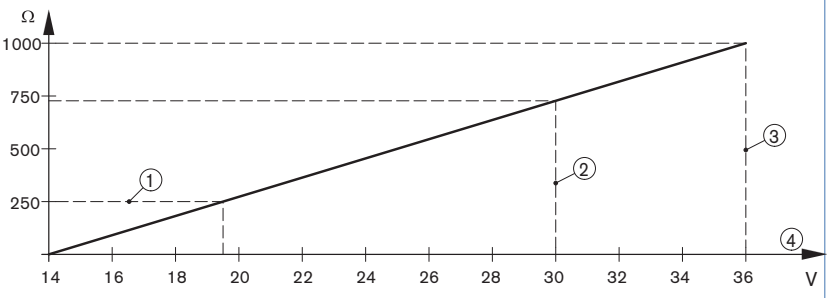
[1] Time to output the correct level (with max. 10% deviation) after a sudden level change.

Electrical data	
Operating voltage	14 - 36 V DC
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 (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 Security NAMUR	 EN61326 EN61010-1 NE 21; NE 43

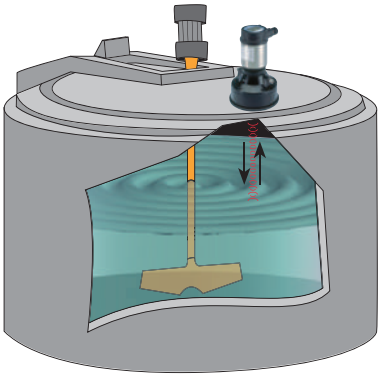
Load diagram



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

Target applications

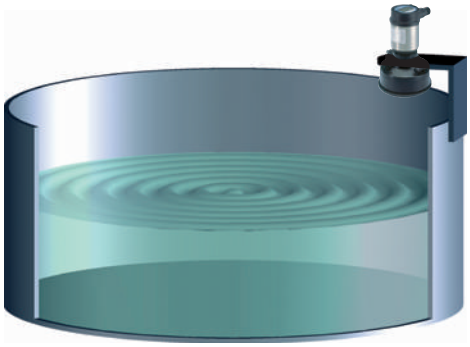
Continuous level measuring for fluids and solids



Distance measuring

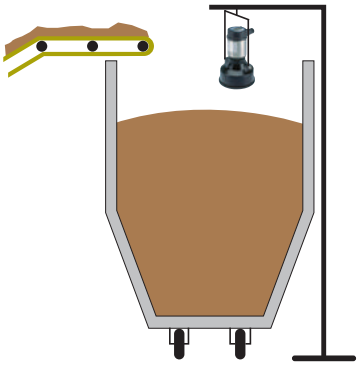
Open basins

A typical application for the 8178 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 8178 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 8178 measures the surface.



Sludge container

In sewage treatment plants, the accumulated sludge is dewatered and transported via conveyor belts to containers. The 8178 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 35 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.

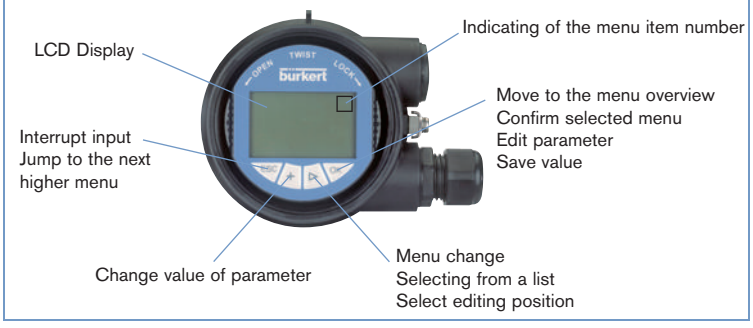
The measuring device is adjusted with the display/configuration module.

The entered parameters are generally saved in the measuring device Type 8178. Optionally, parameters may also be uploaded and downloaded with the display/configuration module.

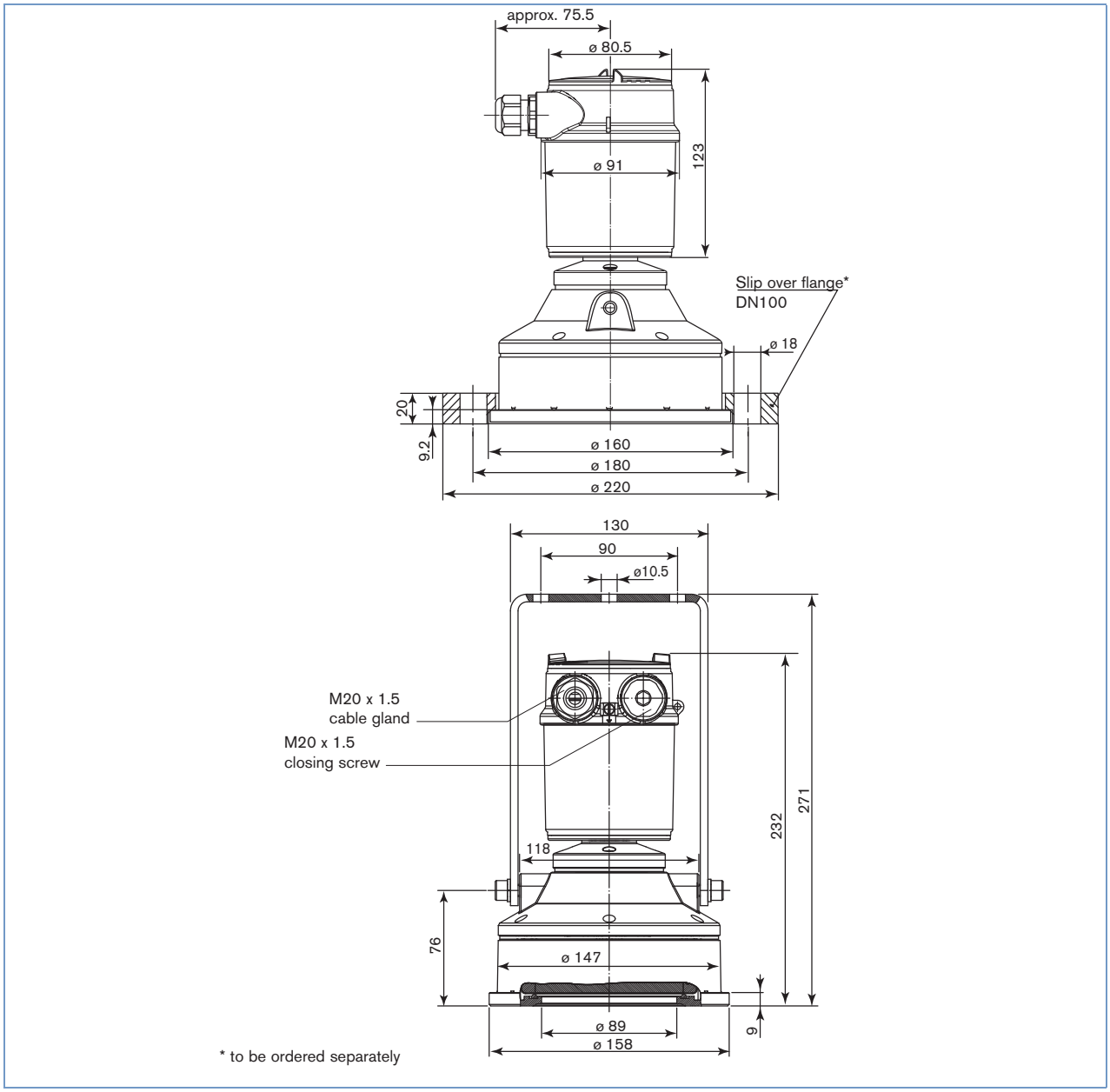
▶ Set up with display/configuration module

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 8178

Specifications	Operating voltage	Output	Electrical connection	Item no.	
				with display/ configura- tion module	without display/con- figuration module
Mounting loop	14 - 36 V DC	4... 20 mA/HART (2 wires)	Cable gland M20 x 1.5	558 228	559 246

Further versions on request

Process connection
Compression flange

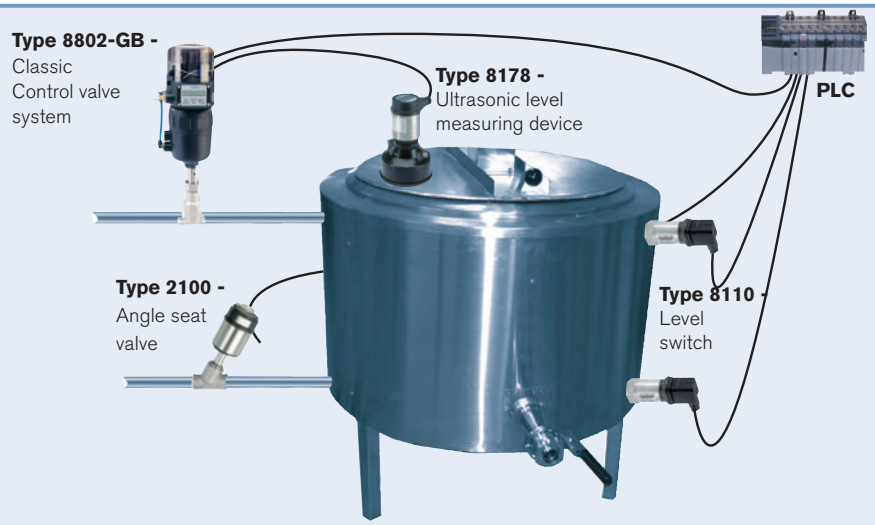
Materials
PPH

Please also use the "request for quotation" form on page 5 for ordering a customized measuring device. go to page

Ordering chart - accessories for measuring device Type 8178 (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
Slip over flange, DN100, PN16, 316L	560 536

Interconnection possibilities with other Bürkert devices



Customized measuring device Type 8178 - 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 8178

Quantity: _____ **Desired delivery date:** _____

- **Process fitting connection:**
  - **Mounting loop** ☐
  - **Compression flange** ☐ DN100 ☐ ANSI 4"
  - **Materials** ☐ Stainless steel ☐ PPH
- **Display/configuration module** ☐ Yes ☐ No

reset form