Ultrasonic Level Probe and Transmitter Remote Mounted

Non–contact Level Transmitter

- Teach–In function for easy commissioning provides low Total Cost of Ownership
- Simulation function for system tests under dry run conditions
- 4–20 mA current output for continuous control
- Two relay outputs for ON/OFF control and fail–safe logic
- Easy commissioning due to multi language, menu–guided operation with 8-digit alphanumeric display
- Intelligent echo filter for automatic rejection of perturbating echoes
- CE

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The Ultrasonic Level Transmitter Type 8170/8175 combines an ultrasonic sensor probe and a remote transducer with a large 8–digits multi-language display in a splash–proof plastic NEMA 4 enclosure for remote mounting.

The transmitter is powered with 18–32 VDC (optionally 120/240 VAC) and features a three–wire 4–20 mA output for direct controlling a continuous control valve, a PLC or for monitoring. Two optional 3A relays can be configurated as alarms or latched for automatic fill or empty operations.

The transmitter Type 8170/8175 includes a range of fail-safe features. Signal loss, power supply failure, level or temperature alarm can be activated with an adjustable time delay. A range of filter functions control the return echoes and automatically eliminate all interferences due to elements of the vessel.

Easy and fast commissioning is guaranteed with the “Teach–In” and “Simulation” functions. Different tank shapes (cylindric, cubic, spheric) can easily be programmed via fixed default shapes. Complex tank shapes can be programmed using a step–by–step procedure.

The measured value can be read as a level, a distance (cm, m, inch or feet) or directly as a volume (liter, m3, imp. gal, us gal).

The simulation function permits testing the control system under dry–run conditions.

Burkert offers the Ultrasonic Level Transmitter together with process control valves as a complete, easy control system. Easy commissioning, installation and operation makes the Burkert level control system number one for low cost of ownership.

Applications

- Non–contact continuous level or volume measurement with all liquids in open or closed vessels
- Flow measurement in open channels
- Distance and movement supervision
- Waste engineering, water treatment and process technology
- Food industry
- Chemical and pharmaceutical industry
- Electroplating

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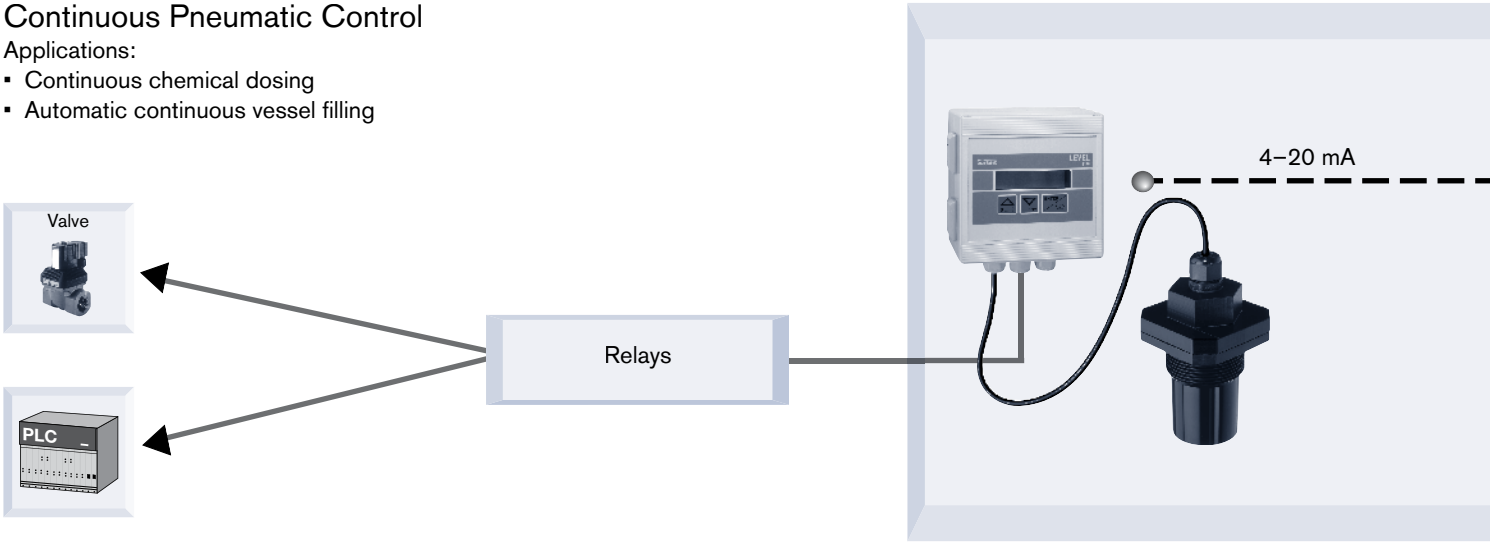
bürkert
Fluid Control Systems

Level control system

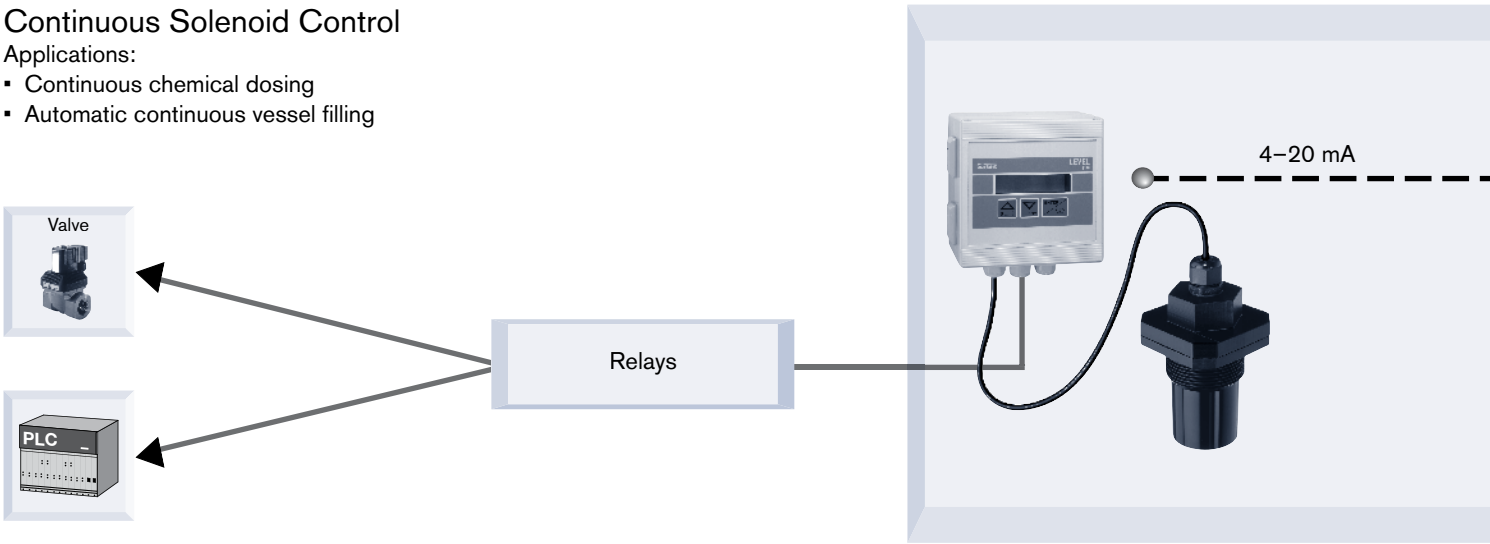
Continuous Pneumatic Control

Applications:
- Continuous chemical dosing
- Automatic continuous vessel filling



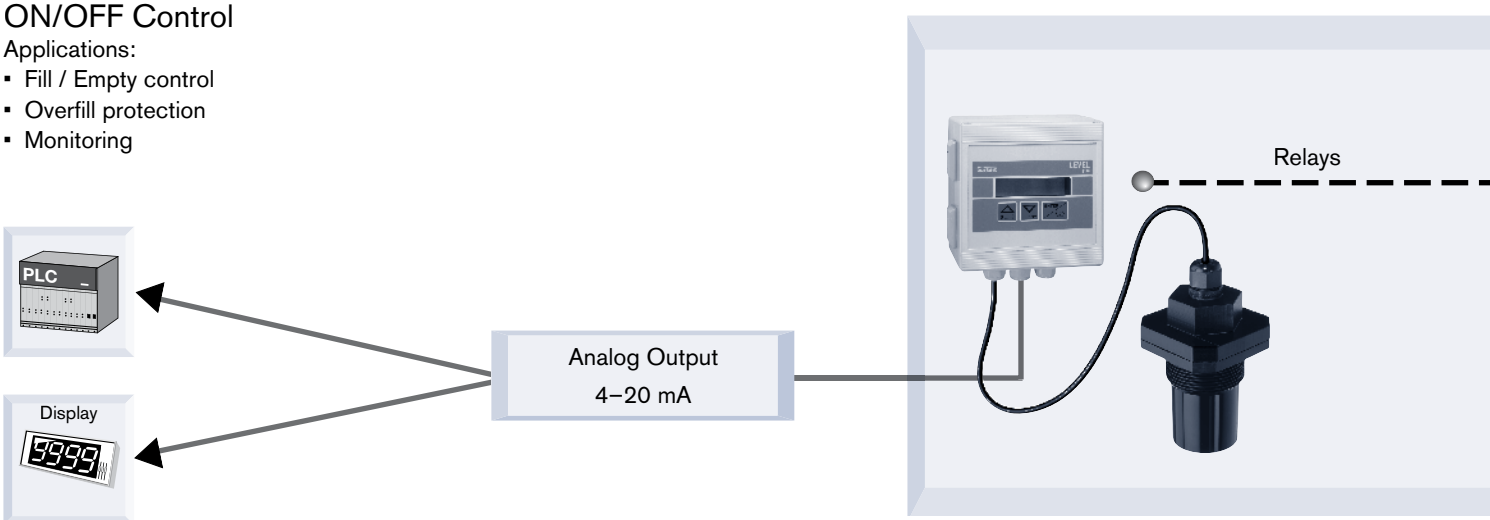
Continuous Solenoid Control

Applications:
- Continuous chemical dosing
- Automatic continuous vessel filling



ON/OFF Control

Applications:
- Fill / Empty control
- Overfill protection
- Monitoring



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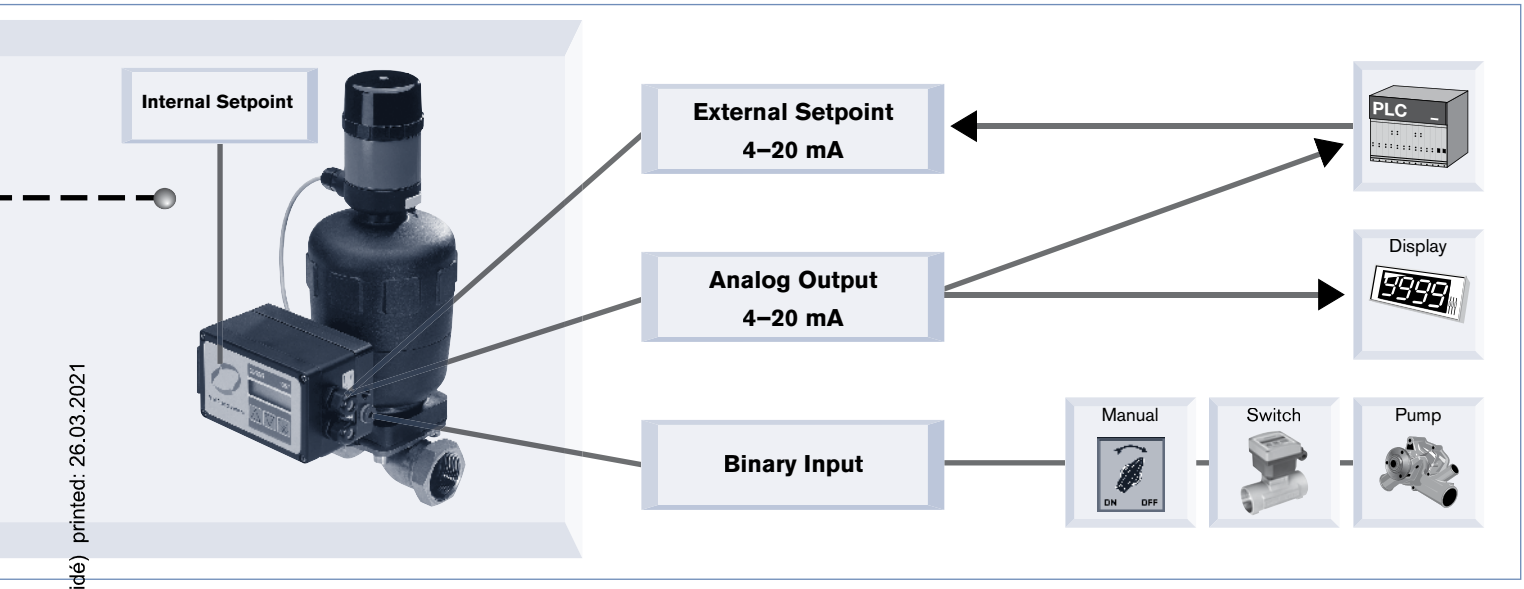

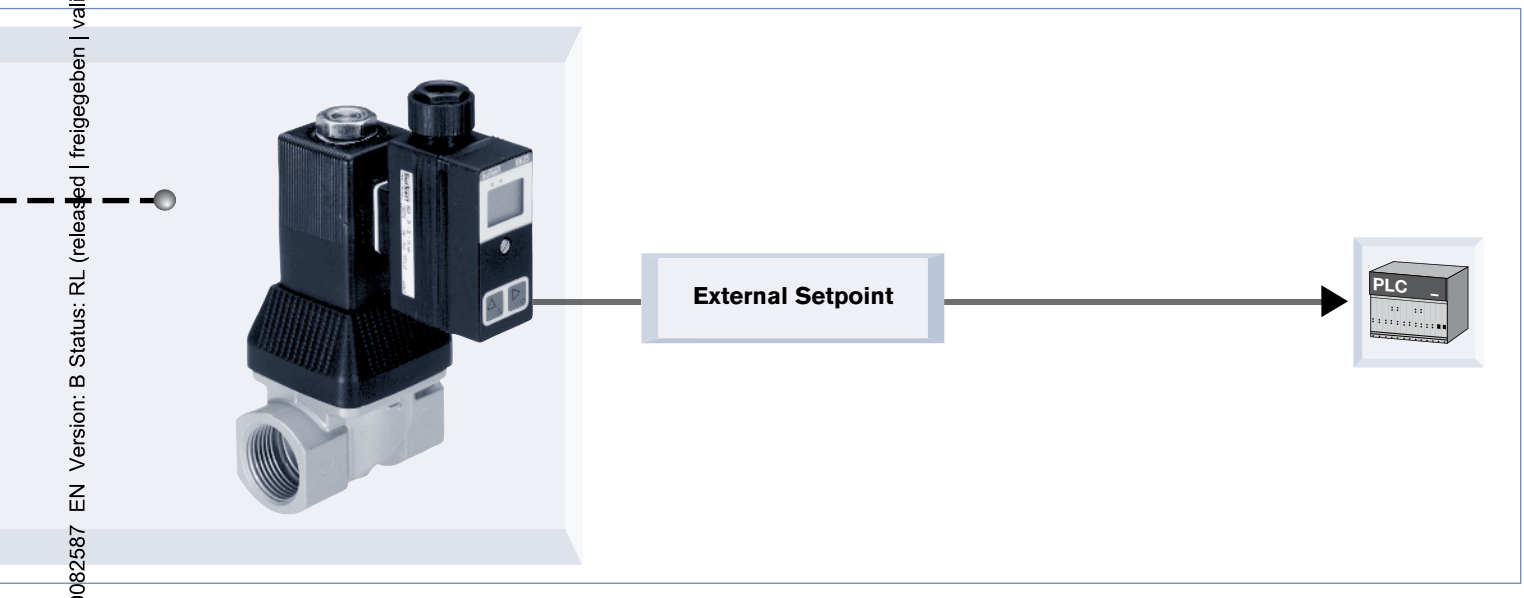

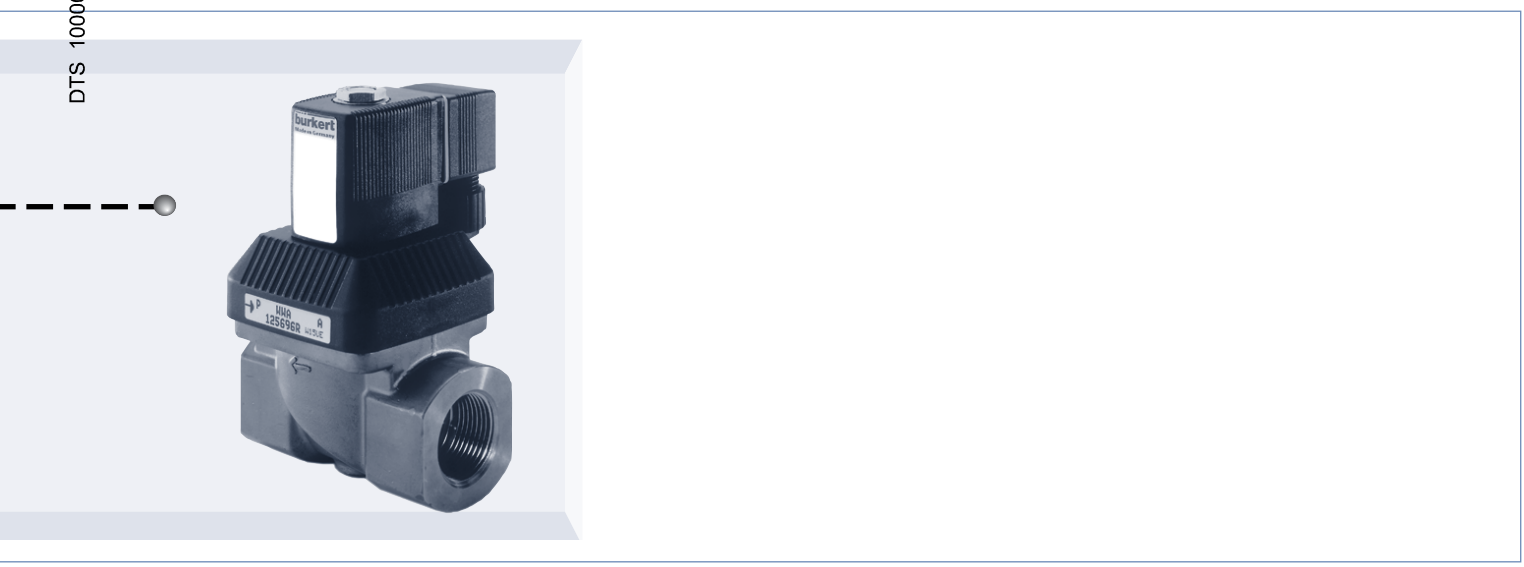

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Program

Supply 18 to 32 VDC (3 wire)
115 or 230 VAC

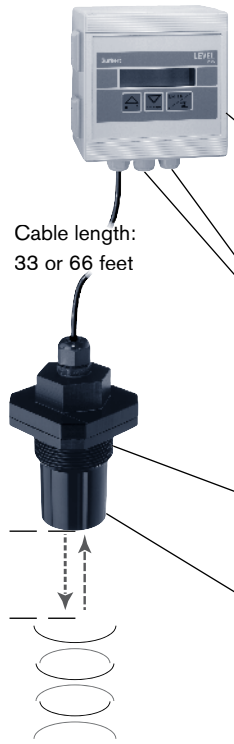
Current output 4-20 mA
(invertible, sourcing
or sinking)
for continuous control
or monitoring

Outputs 2 relay / 3 Amp
(optional)
for limit values, alarm, etc.

Ultrasonic specifications Measuring range from
1 ft. to 23 ft.
(30 cm to 7 m in liquid)

1 ft. blocking distance

8° conical beam
8 pulses per second



NEMA 4 (IP65) panel and wall-mount version
(panel version IP20 for cabinet installation)
PC for panel, ABS for wall-mount version

▪ PG 9
(for details, please see ordering chart)

Gasket made of FKM, EPDM
(or no gasket)

Ultrasonic sensor probe PVDF

Technical data	
Range	1 ft. to 23 ft. (0.30 to 7 meters)*
Accuracy	±0.25% of full scale ±0.15% of full scale with calibration in Teach–In mode
Resolution	± 0.125 inch
Frequency	50 kHz
Pulse rate	8 pulses per second
Full beam width	8 degrees conical
Blocking distance	1 foot from transducer base
Display type	0.6 x 2.36 in. LCD 8 digits, alphanumeric 15 segments, 0.35 in. high
Supply voltage	18–32 VDC or 115/230 VAC
Current consumption	200 mA maximum
Current flow	Sinking or sourcing
Signal output	4–20 mA alarm at 22 mA 18-32 VDC
Load	
at 32 V	Max. 1300 Ω
at 24 V	Max. 1000 Ω
at 18 V	Max. 550 Ω

Medium temperature	-40°F to 176°F (-40°C to 80°C)
Ambient temperature	-4°F to 140°F (-20°C to 60°C)
Temperature adjustment	Programmable according to gas medium
Pressure rating	Max. 29 PSI at 77°F (2 bar at 25°C)
Transducer material	PVDF / POM (cover)
Enclosure material	PC for panel version ABS for wall-mount version
Enclosure rating	NEMA 4 (IP65)
Mounting threads	G 2″ or NPT 2″
Gasket material	FKM or EPDM (or no gasket)
Signal invert	4–20 mA or 20–4 mA
Relay output	2 relays; 3 A; freely adjustable
Fail safe	
Power loss	Relay automatically inverts to the NO safe position in the event of signal or power supply loss
Signal loss	The relay takes the previously programmed safe position

*) In reference conditions (77°F, 14.5 PSI in air, on liquid without foam)

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Operation and display

The unit is operated in the following 3 different modes:

Operation mode

- Display of Level, distance or volume, in the required engineering unit (refer to the calibration menu).
- Gas temperature (unit per calibration menu).
- 4–20 mA output signal, proportional to the level per the selected measuring range.

Calibration mode

- Language selection between English, German, French, Italian and Spanish
- Selection of engineering units to display, level, distance & volume
- Damping selection and delay time setting for signal failure alarm. There are 10 steps available
- Gas characteristics (speed of sound and temperature influence dv/dT°F (or °C)
- Selection of target level, if there are any fixed echoes to be filtered and eliminated by the transmitter
- Manual / Automatic determination (Teach–In) of reference measuring points (level, distance or volume)
- Determination of 4–20 mA measuring range
- Parameter definition of relays (level, distance, volume, T°, and / or failure alarm available)
- Return to operation mode and storage of new parameters

Test mode

- Offset adjustment (4 mA)
- Span adjustment (20 mA)
- Temperature adjustment
- Signal strength display
- Entering level, volume or temperature to be simulated. The outputs will react in accordance to this input
- Reset of interference table or return to factory settings

Display Type 8175

- 8 digits alphanumeric

Description of buttons

- Acceptance of chosen parameter or adjusted value
- LED relay 2 (contact closed)
- LED relay 1 (contact closed)
- Direction downwards in menu or sidewards for digit selection
- Direction upwards in menu or choice of digit value Steps from 0 to 9

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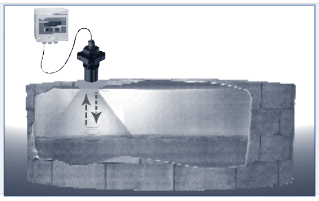
Principle of operation

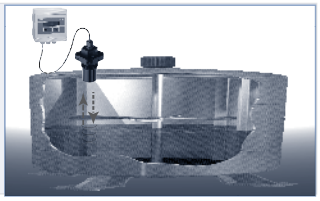
A high frequency ultrasonic sound wave is pulsed eight times per second from the base of the transducer. This sound wave reflects against the process medium below and returns to the transducer.

The microprocessor-based electronics measure the time of flight between the sound wave generation and receipt of the return signal, and translates this figure into the distance between transmitter and process medium below.

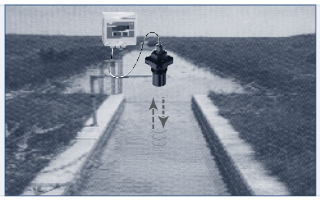
Target applications with Type 8170/8175

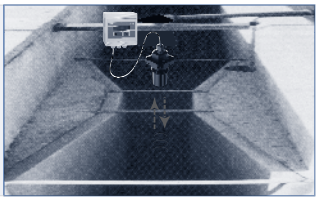
- Continuous level measuring for fluids and solids
- ON/OFF level measuring for fluids and solids





- Flow measurement in open channels





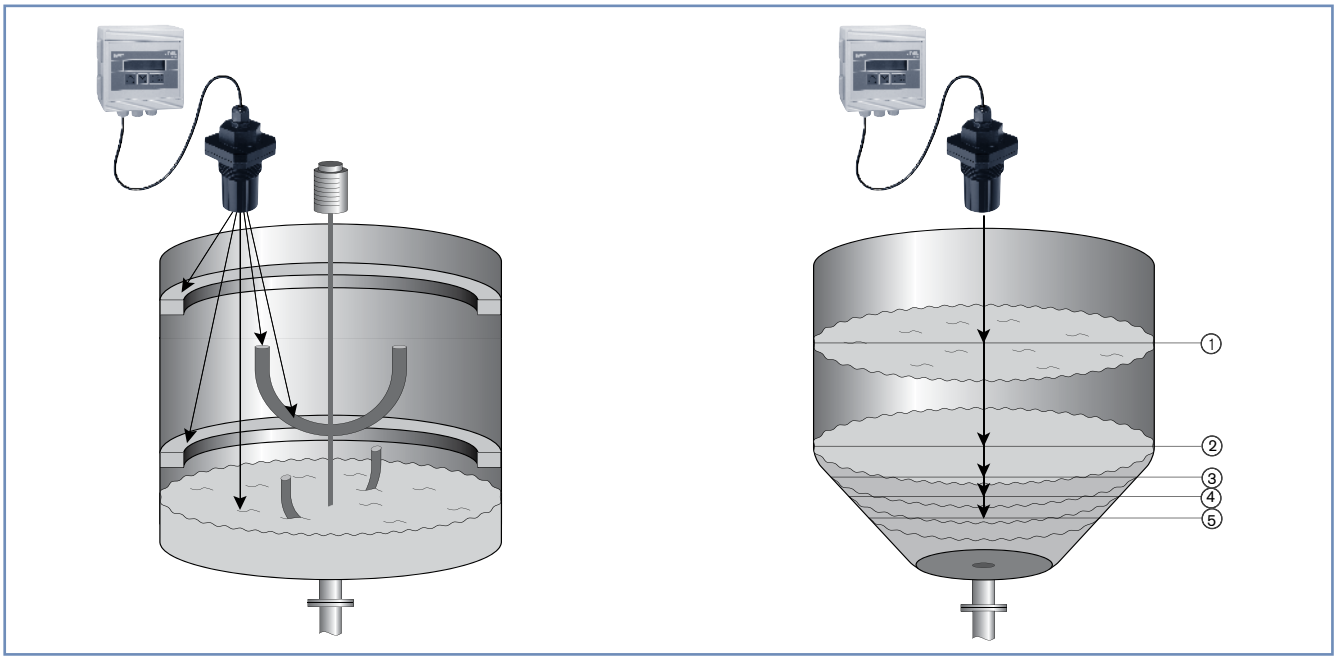
- Distance measuring

Echo filtering

In case of specific applications with many obstacles, the Ultrasonic Level Transmitter Type 8170/8175 can adapt itself after entering just one calibration value. After this operation, all echoes of fixed and intermittent obstacles are stored and rejected. This allows the installation of the Ultrasonic Level Transmitter Type 8170/8175 even in applications with obstacles in the beam cone like mounting elements, blades, agitators, etc.

Teach–In

The Ultrasonic Level Transmitter Type 8170/8175 allows the measurement of distance, level or volume. In case of common tanks, entering the dimensions, for example the diameter of a cylindrical tank and a reference volume, is enough to proceed to the volume measurements. In case of unusual shapes, the Teach–In can be used to store the shape using an easy step–by–step technique.



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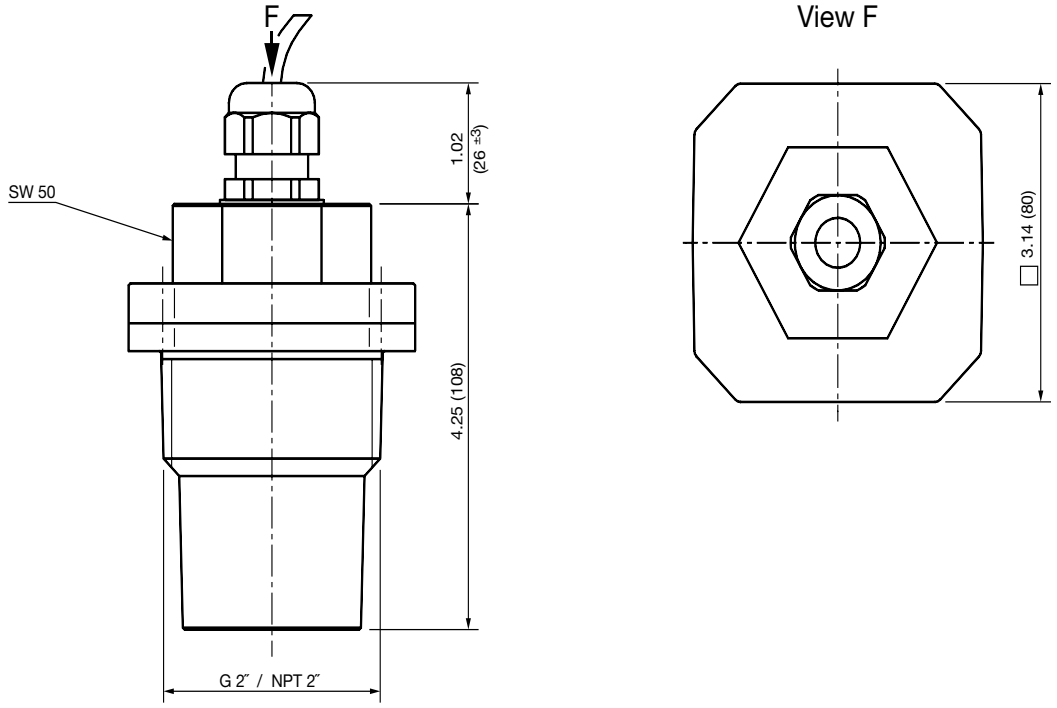
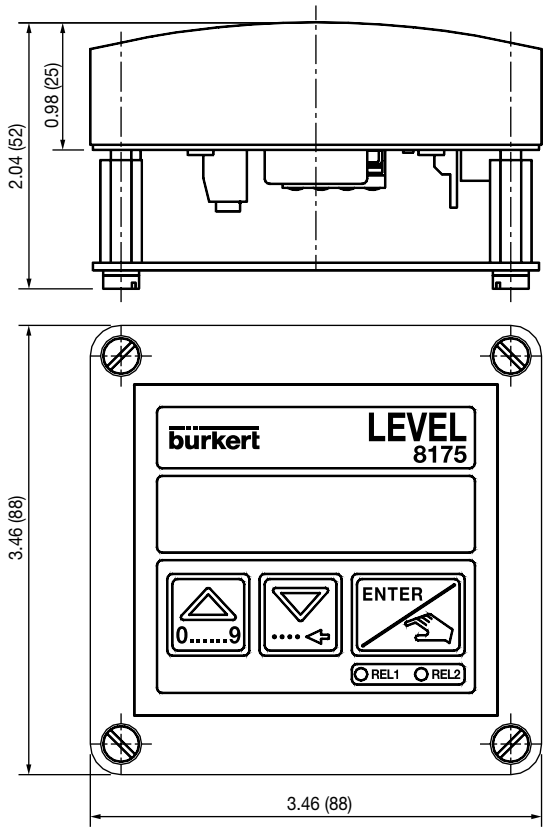
Dimensions [mm]

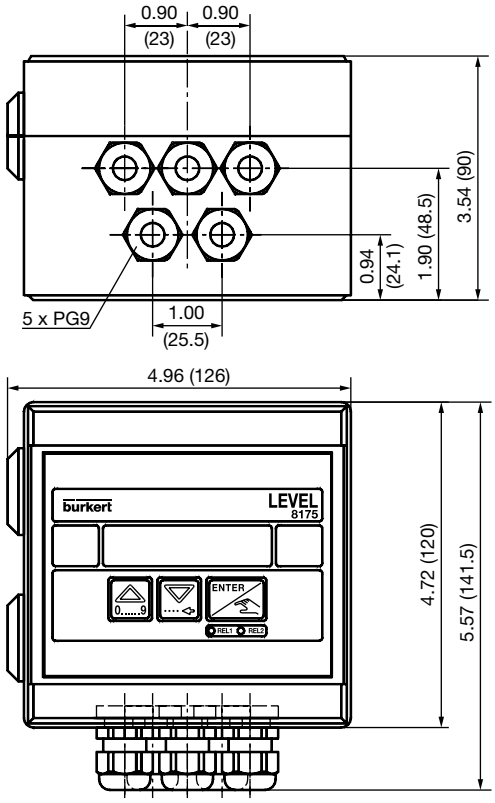
Remote control ultrasonic probe



Remote control panel



Remote control wall–mount version



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Specifications – Ordering chart (other versions on request)

Probe, Panel Mount and Wall Mount Version

Probe Type 8170, NPT 2″ mounting:

Power Supply [V]	Mounting Threads [inch]	Relays	Connection	Item No.
–	NPT 2″	No	Cable, 33 ft. (10 m) length	436 565 M
–	NPT 2″	No	Cable, 66 ft. (20 m) length	436 566 N

Probe Type 8170, G 2″ mounting:

Power Supply [V]	Mounting Threads [inch]	Relays	Connection	Item No.
–	G 2″	No	Cable, 33 ft. (10 m) length	436 563 K
–	G 2″	No	Cable, 66 ft. (20 m) length	436 564 L

Panel Mount Version Type 8175 for Probe Type 8170:

Power Supply [V]	Output Options	Relays	Connection	Item No.
18–32 DC	4–20 mA, 3 wire version	No	Terminal	436 567 P
18–32 DC	4–20 mA, 3 wire version	2	Terminal	436 568 Y

Wall Mount Version Type 8175 for Probe Type 8170:

Power Supply [V]	Output Options	Relays	Connection	Item No.
18–32 DC	4–20 mA, 3 wire version	No	5 x PG 9 Cable Grommet Entry	436 569 Z
18–32 DC	4–20 mA, 3 wire version	2	5 x PG 9 Cable Grommet Entry	436 570 W
115/230 AC	4–20 mA, 3 wire version	No	5 x PG 9 Cable Grommet Entry	437 339 T
115/230 AC	4–20 mA, 3 wire version	2	5 x PG 9 Cable Grommet Entry	437 340 G

Ordering chart accessories

Description	Item No.
2″ FKM seal (for “G” thread mounting only)	430 749 K
2″ EPDM seal (for “G” thread mounting only)	430 750 Q
Cable plug DIN 43650 PG 9	424 205 Z
Cable plug DIN 43650 G 1/2″	424 206 S
Cable plug PG 13.5	418 339 G
Instruction manual for transmitter Type 8170 – 8175	427 998 P

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