Non-contact level transmitter

Advantages/Benefits

- **Teach-In function for easy commissioning provides low Total Cost of Ownership**
- **Simulation function for system tests under dry run conditions**

- **Easy Link with 4...20 mA current output for continuous control and 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 pertubating echoes**

Design/Function

The Ultrasonic Level Transmitter type 8175 combines an ultrasonic sensor and a transducer with a large 8-digits multilanguage display in a splash-proof plastic IP65 enclosure.

The transmitter is powered with 18-32 VDC (optionally 115/230 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 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 be easily programmed via fixed default shapes or at complex tank shapes step by step.

The measured value can be showed as a level, a distance (in cm, m, inch or feet) or direct as a volume (liter, m^3, imp. gal, us gal).

The simulation functions allow to control the system to be tested under dry-run conditions.

Burkert offers the Ultrasonic Level Transmitter together with process control valves as a complete, easy to control system.

Easy commissioning, installation and operation provides the Burkert level control system to be number one for cost of ownership.

Applications

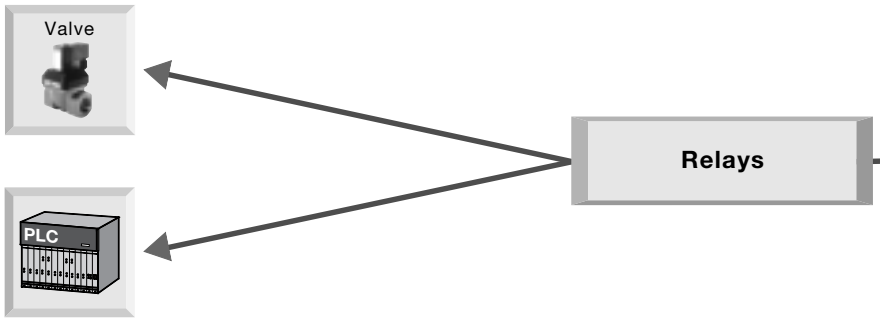
- Non-contact continuous level or volume measurement with all liquids in open or closed vessels
- Flow measurement in open channels
- Distance and movement supervision
- Waste engineering, water treatment and process technology
- Food industry
- Chemical and pharmaceutical industry

bürkert
Easy Fluid Control Systems

The Easy level control system

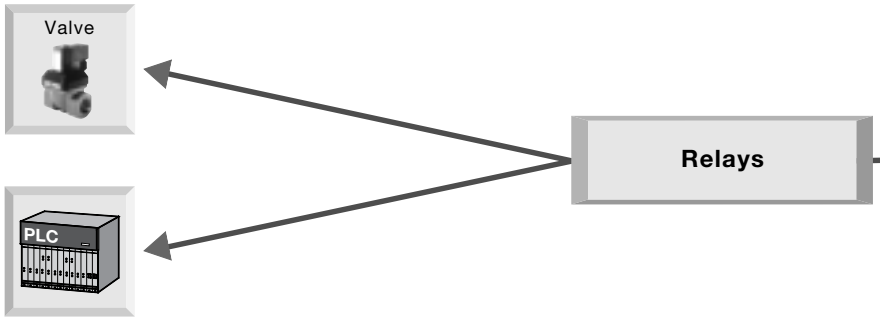
Easy Continuous Pneumatic Control

Applications:
- Continuous chemical dosing
- Automatic continuous vessel filling



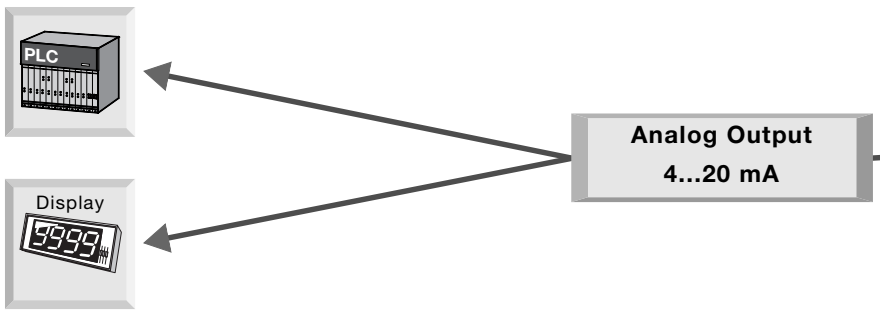
Easy Continuous Solenoid Control

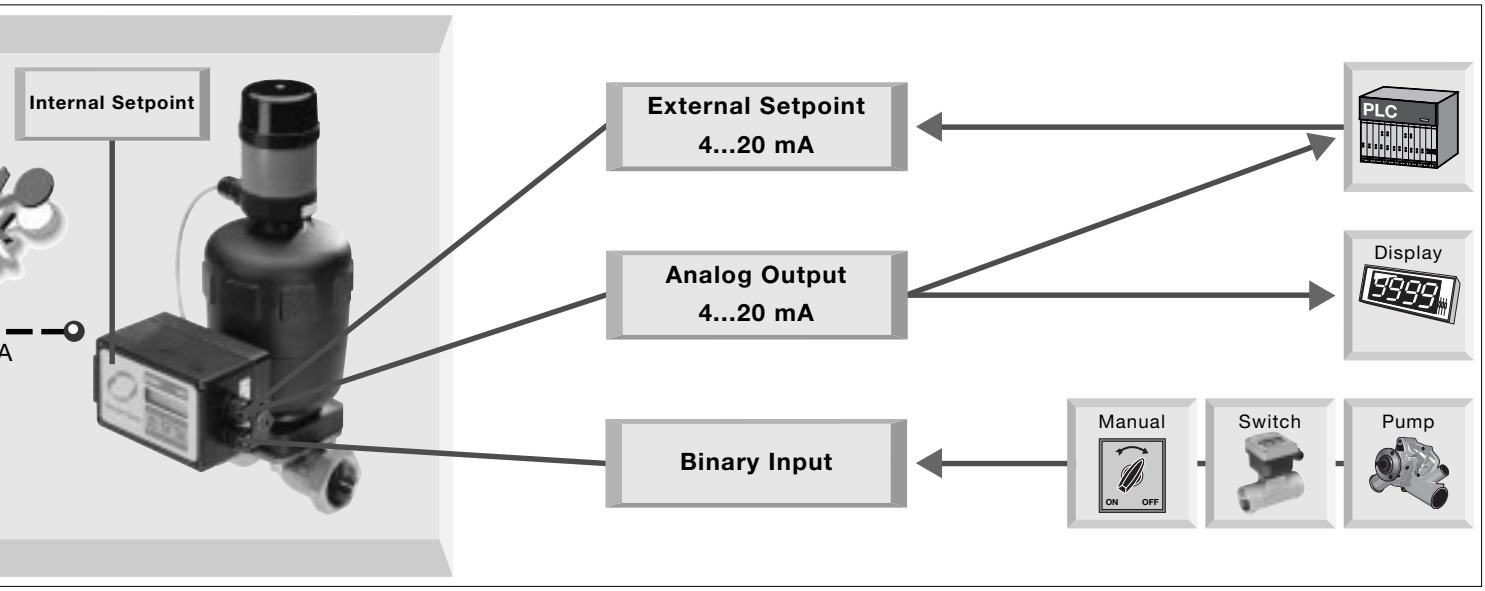
Applications:
- Continuous chemical dosing
- Automatic continuous vessel filling

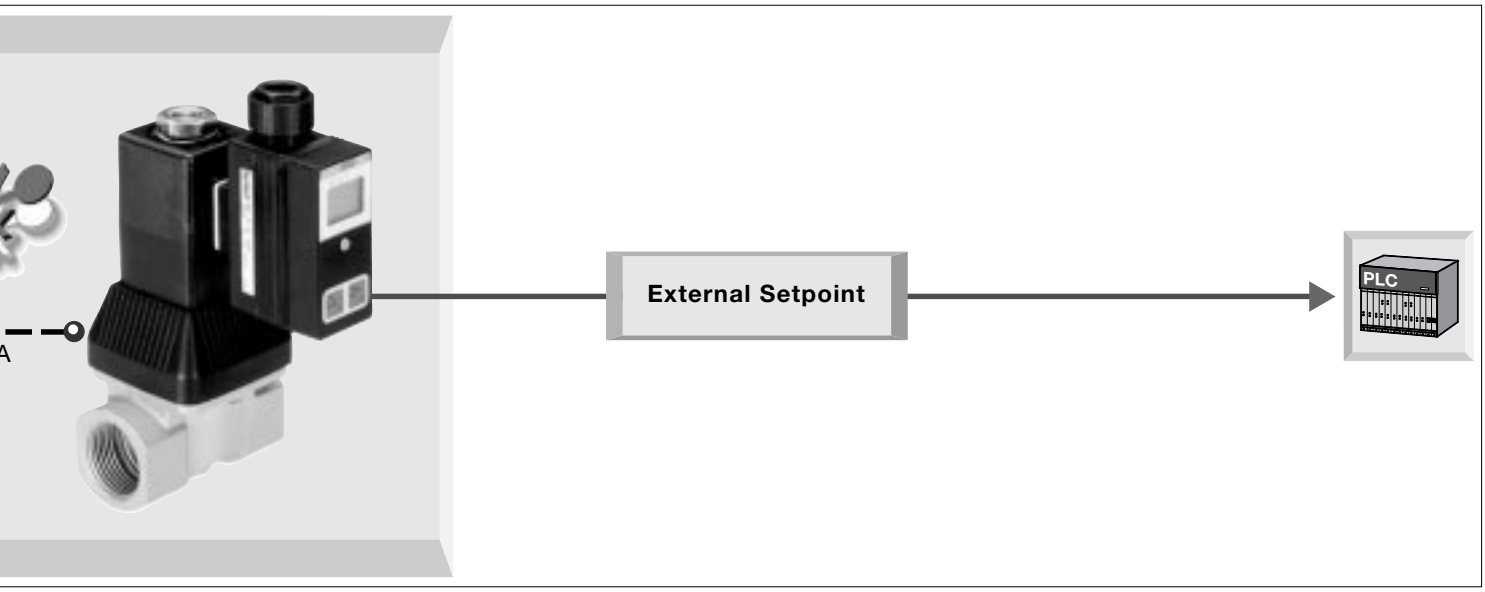


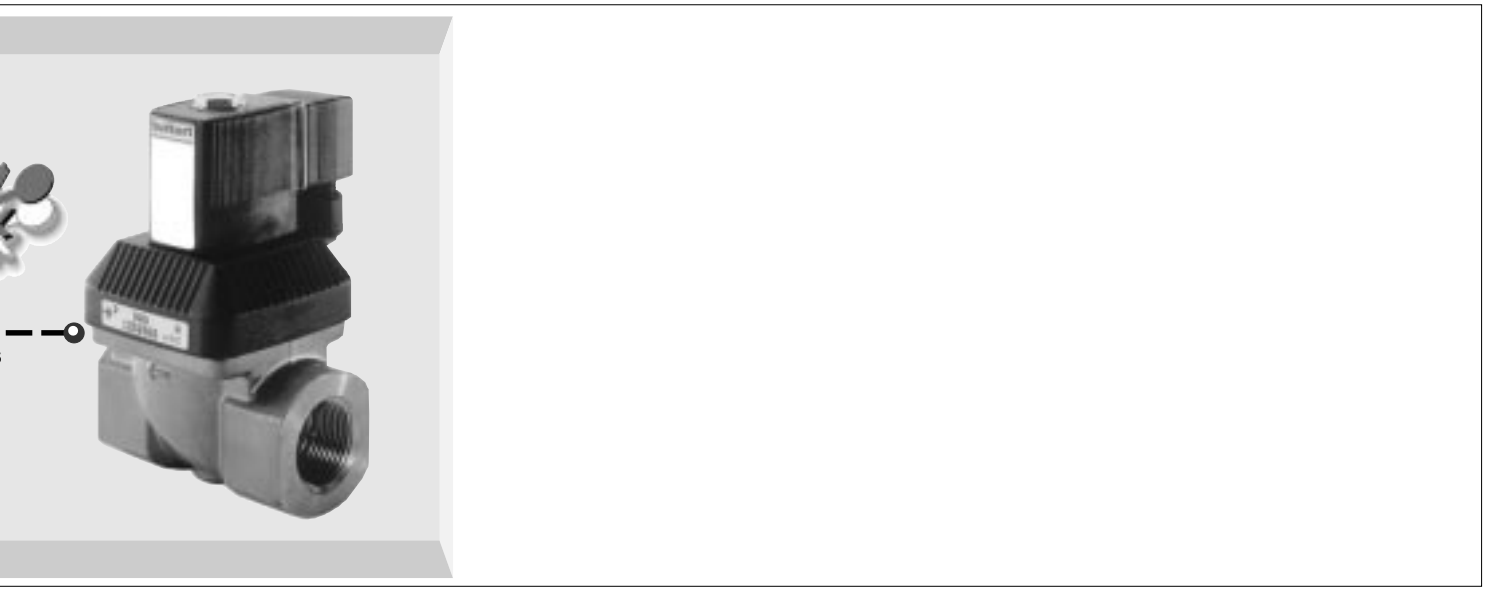
Easy ON/OFF Control

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




Internal Setpoint
External Setpoint
4...20 mA
Analog Output
4...20 mA
Binary Input
PLC
Display
9999
Manual
ON
OFF
Switch
Pump


External Setpoint
PLC



Ultrasonic Level Transmitter

Type 8175
Easy LEVEL

Program

Supply	18-32 VDC (3 wire) 115-230 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 30 cm up to 10 m in liquid (12-394 inch)

Protection cover in reinforced PC

IP65 enclosure in reinforced PC

- Plug (DIN 43650) or
- PG 13.5 or
- G 1/2"

(for details, please see ordering chart)

Gasket made of Viton, EPDM (or no gasket)

Ultrasonic sensor PVDF

30 cm blocking distance

8° conical beam
8 pulses per second

Technical data

Range	0.30 up to 10 meters*
Accuracy	± 0.25% of full scale ± 0.15% of full scale with calibration in Teach-In mode
Resolution	± 3 mm
Frequency	50 kHz
Pulse rate	8 pulses per second
Full beam width	8 degrees conical
Blocking distance	30 cm from transducer base
Display type	15 x 60 mm LCD 8 digits, alphanumeric 15 segments, 9 mm high
Supply voltage	18-32 VDC or 115/230 VAC
Current	200 mA maximum
Current flow	Sinking or sourcing
Signal output	4-20 mA alarm 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 up to +80°C
Ambient temperature	-20 up to +60°C
Temperature adjustment	Programmable according to gas medium
Pressure rating	max. 2 bar at 25°C
Transducer material	PVDF
Enclosure material	PC, reinforced with 20% glass fiber
Enclosure rating	IP65
Mounting threads	G 2" or NPT 2"
Gasket material	Viton 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 (25°C, 1 bar in air, on liquid without foam)

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 acc. to calibration menu).
- 4-20 mA output signal, proportional to the level acc. to 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 (velocity of sound and temperature influence dv/dT°C (or °F)
- 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

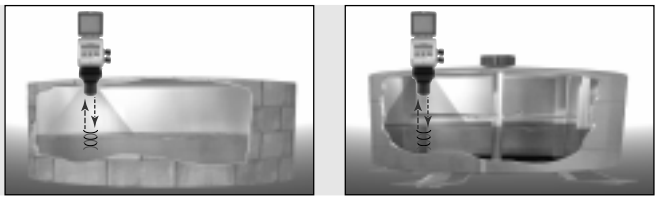
Principle of operation

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.

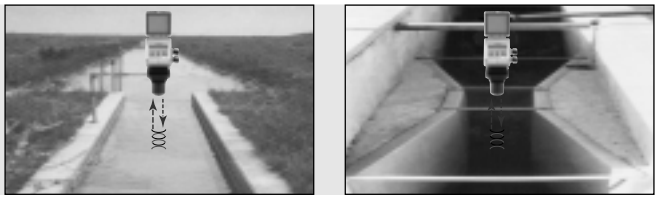
The microprocessor based electronics measure the time of flight between the sound generation and receipt, and translate this figure into the distance between transmitter and process medium below.

Target applications with type 8175

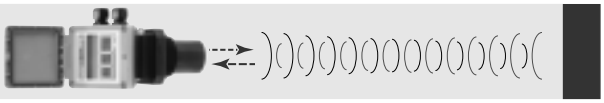
- Continuous level measuring for fluids and solids
- ON/OFF level measuring for fluids and solids



- Flow measurement in open channels



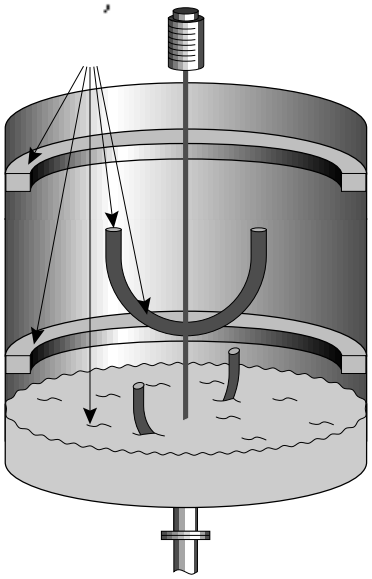
- Distance measuring



Echo filtering

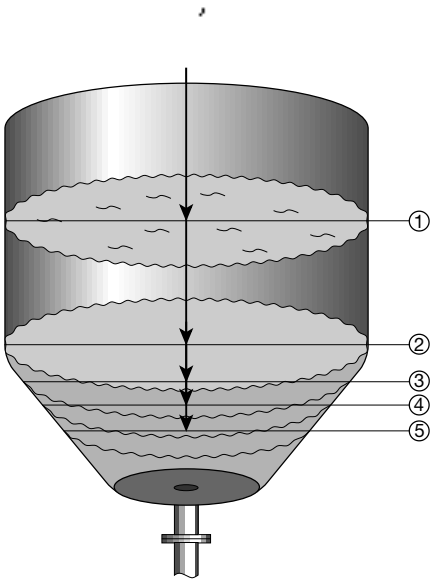
In case of specific applications with many obstacles, the Ultrasonic Level Transmitter type 8175 can adapt itself after entering just one calibration value.

After this operation, all echoes of fixed and intermittent obstacles are stored and rejected. This allows the installation of the Ultrasonic Level Transmitter type 8175 even in applications with obstacles like mounting elements, blades, agitators, etc. in the beam cone.



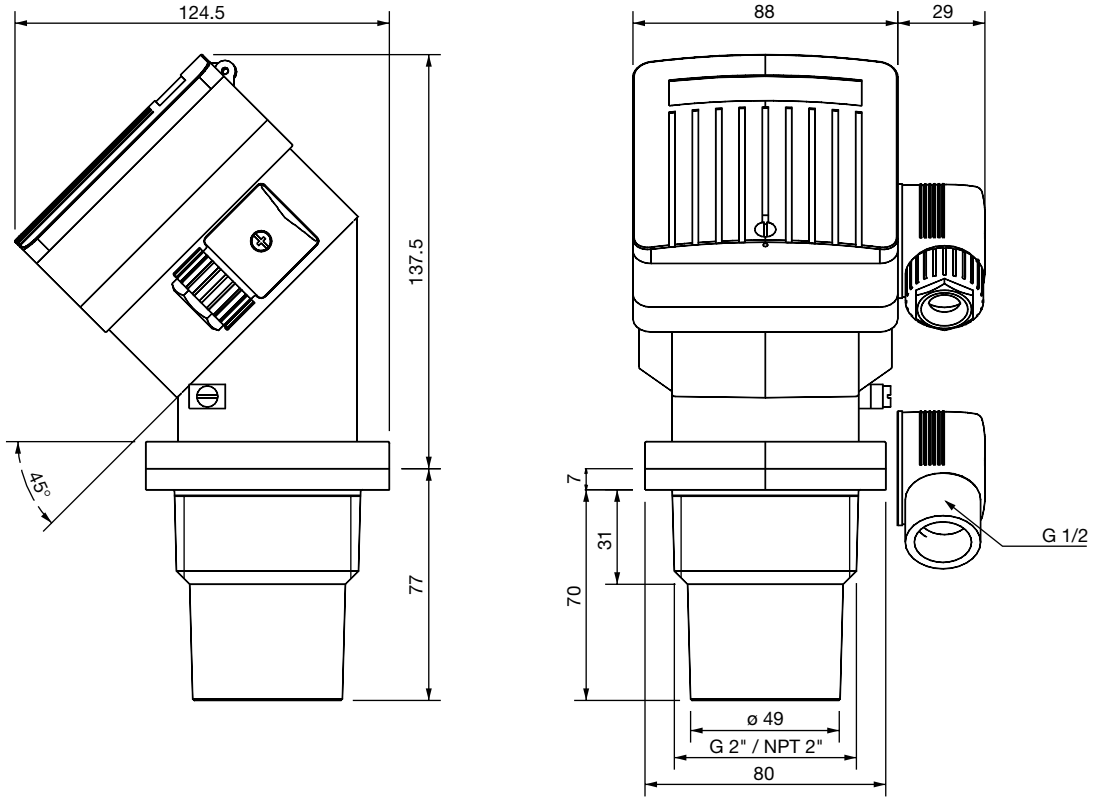
Teach-In

The Ultrasonic Level Transmitter type 8175 allows the measurement of distance, level or volume, in different respective units.
In case of common tanks, entering the measures, for example the diameter of a cylindrical tank and a reference volume is enough to proceed to the volume measurements. In case of particular shapes, the Ultrasonic Level Transmitter type 8175 is able to be teached-in the shape, step-by-step, in an easy way.

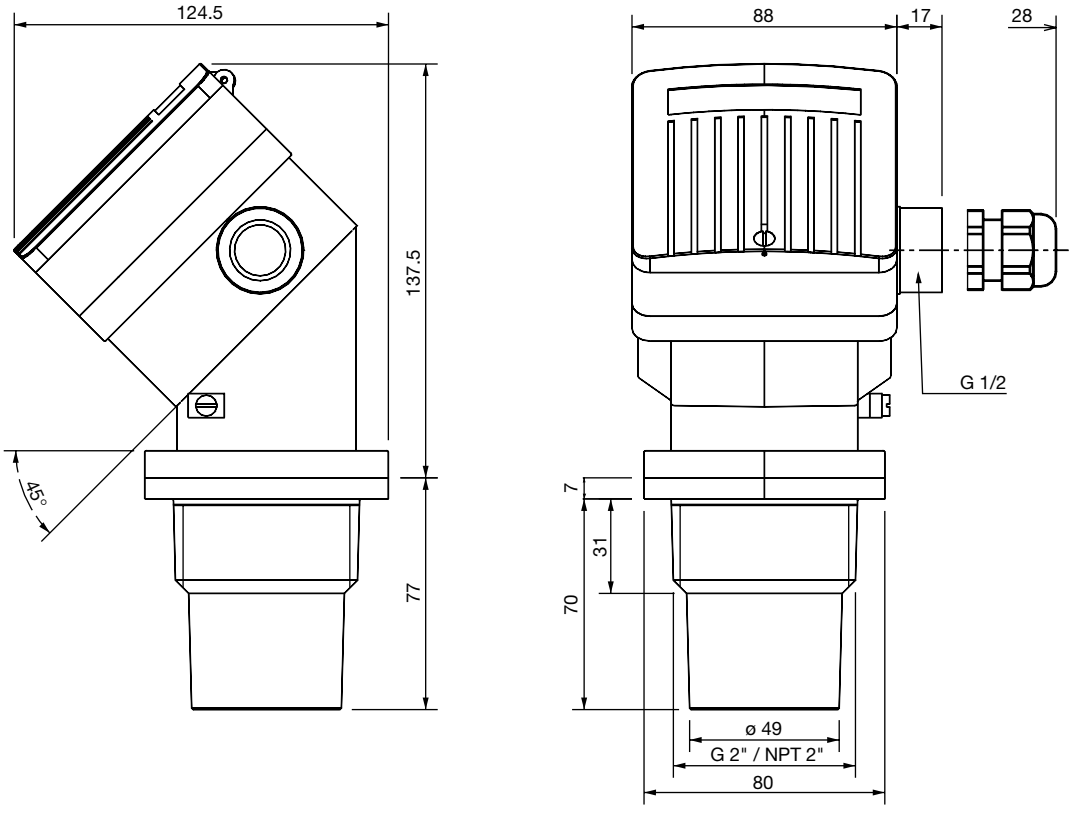


Dimensions [mm]

Compact version with cable plug



Compact version with cable gland



Specifications - ordering chart (other versions on request)

Compact Ultrasonic Level Transmitter with 4-20 mA output

G 2" mounting:

Power supply [V]	Mounting threads [inch]	Relays	Connector	Item-No.
18-32 DC	G 2"	No	DIN 43650, PG 9	430 822 M
18-32 DC	G 2"	No	PG 13.5	430 823 N
18-32 DC	G 2"	2	2 x PG 13.5	430 824 P
115-230 AC	G 2"	No	2 x PG 13.5	430 825 Q*
115-230 AC	G 2"	2	2 x PG 13.5	430 826 R*

NPT 2" mounting:

Power supply [V]	Mounting threads [inch]	Relays	Connector	Item-No.
18-32 DC	2" NPT	No	DIN 43650, G 1/2"	430 827 J
18-32 DC	2" NPT	No	G 1/2"	430 828 T
18-32 DC	2" NPT	2	2 x G 1/2"	430 829 U
115-230 AC	2" NPT	No	2 x G 1/2"	430 830 Z*
115-230 AC	2" NPT	2	2 x G 1/2"	430 831 N*

* available from beginning of 1999

Ordering chart accessories

Description	Item-No.
2" FPM seal	430 749 K
2" EPDM seal	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
Cable plug G 1/2"	418 340 M
Instruction manual for transmitter type 8175 - D/GB/F	427 998 P