

## 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 alpha-numeric display**
- ▶ **Intelligent echo filter for automatic rejection of perturbing echoes**
- ▶ **CE Approval**

## Design/Function

The Ultrasonic Level Transmitter Type 8175 combines an ultrasonic sensor and a transducer with a large 8-digit multi-language display in a splash-proof plastic NEMA 4 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 configured 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 shown as a level, a distance (in cm, m, inch or feet), or direct as a volume (liter, m<sup>3</sup>, imp. gal, U.S. gal).

The simulation functions allow 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 makes the Burkert level control system number one in 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

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**burkert**  
*Easy* Fluid Control Solutions

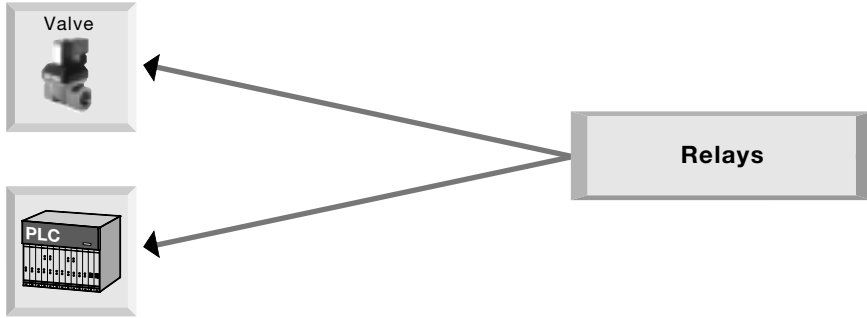
# Ultrasonic Level Transmitter

## The Easy Level Control System

### Easy Continuous Pneumatic Control

Applications:

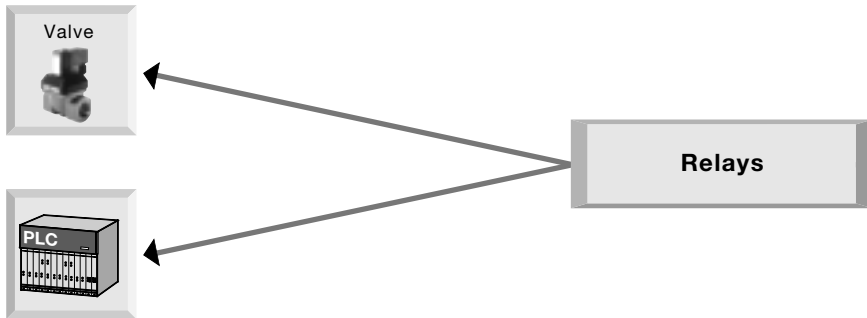
- Continuous chemical dosing
- Automatic continuous vessel filling



### Easy Continuous Solenoid Control

Applications:

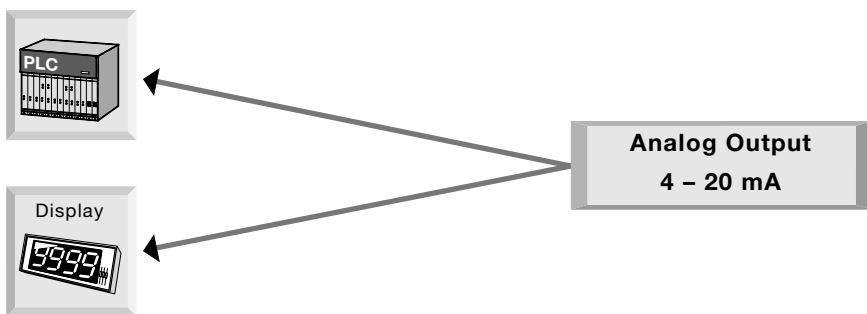
- Continuous chemical dosing
- Automatic continuous vessel filling

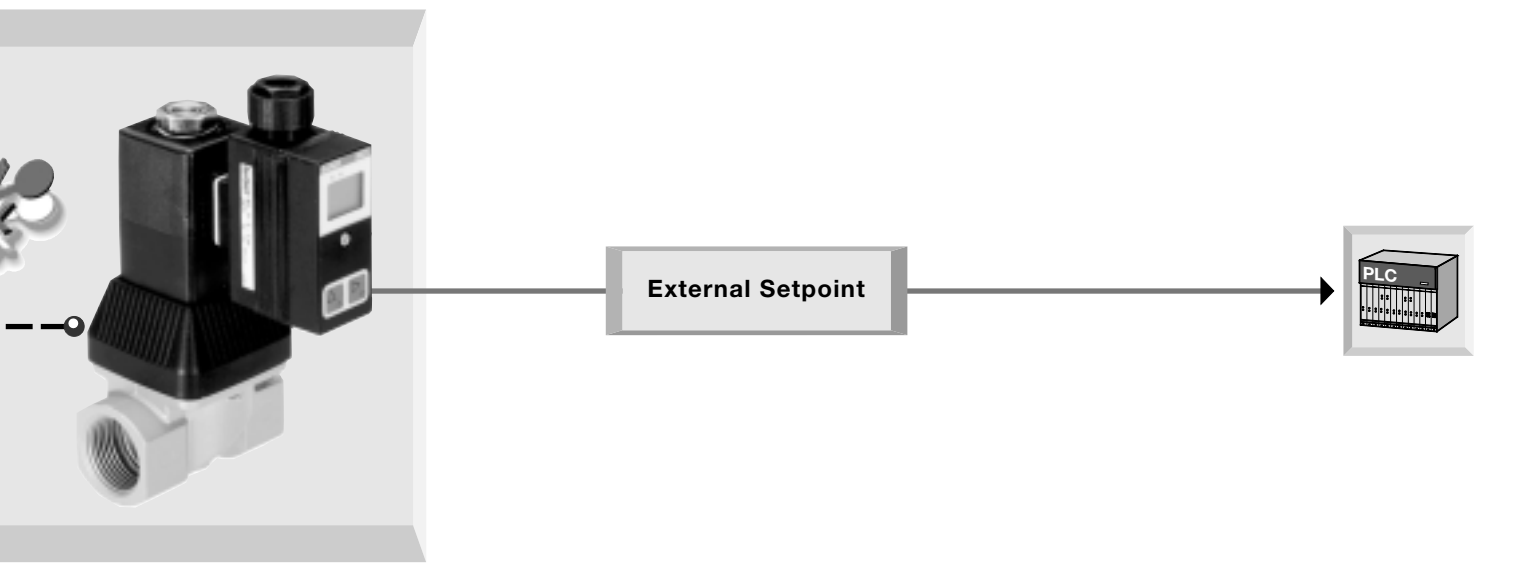
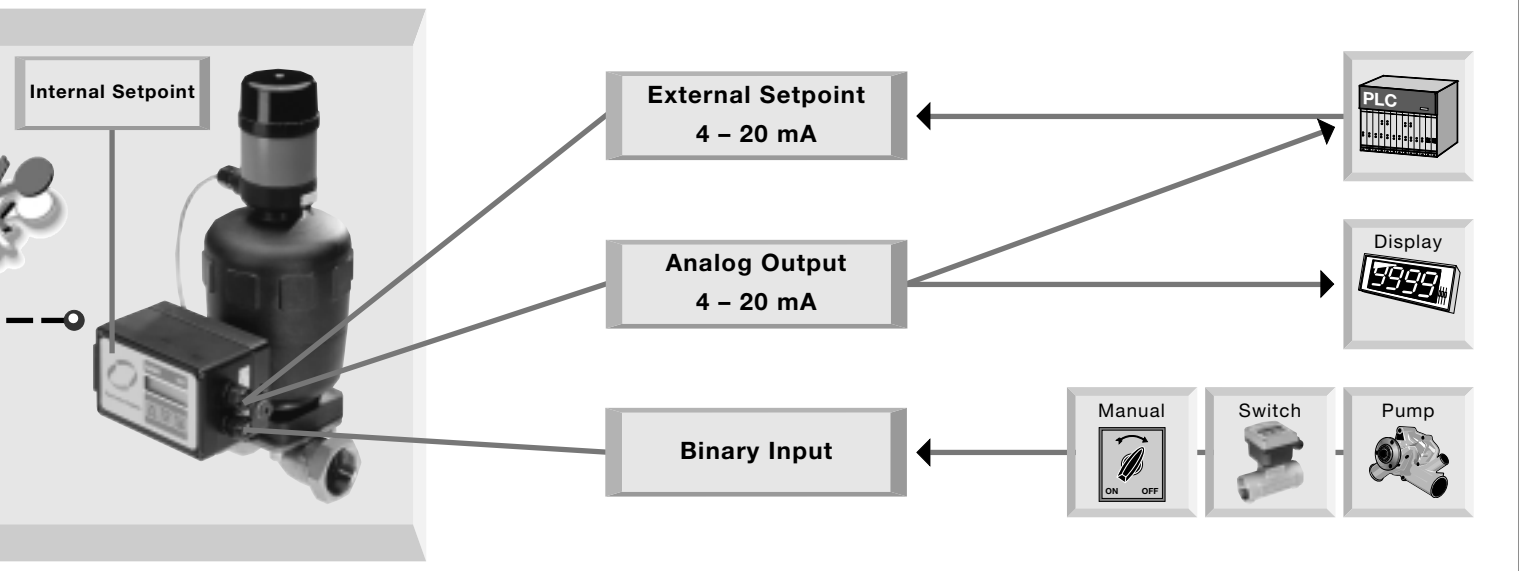


### Easy ON/OFF Control

Applications:

- Fill / Empty control
- Overfill protection
- Monitoring





## 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 to 10 m in liquid  
(12-394 inch)

12 inch blocking distance

8° conical beam  
8 pulses per second



Protection cover in reinforced PC

NEMA (IP65) enclosure  
in reinforced PC

• Plug (DIN 43650) or  
• PG 13.5 or  
• NPT 1/2"  
(for details, please see ordering chart)

Gasket made of FPM (Viton), EPDM  
(or no gasket)

Ultrasonic sensor PVDF

## Technical Data

Range	1.0 to 32 ft.*
Accuracy	±0.25% of full scale
Resolution	±1/8 inch
Frequency	50 kHz
Pulse rate	8 pulses per second
Full beam width	8 degrees conical
Blocking distance	12" 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	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°F to 176°F
Ambient temperature	-4°F to 140°F
Temperature adjustment	Programmable according to gas medium
Pressure rating	max. 30 psi at 77°F
Transducer material	PVDF
Enclosure material	PC, reinforced with 20% glass fiber
Enclosure rating	NEMA 4
Mounting threads	G 2" or NPT 2"
Gasket material	FPM (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 (77°F, 15 PSI 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  $dv/dT^{\circ}\text{C}$  (or  $^{\circ}\text{F}$ ))
- 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,  $T^{\circ}$ , 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)
- Scroll downwards in menu or sideways for digit selection
- Scroll upwards in menu or choose 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.

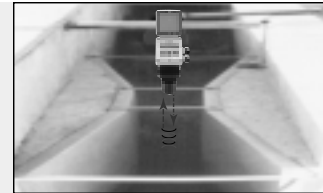
The microprocessor based electronics measure the time of flight between the sound generation and receipt, and translate this figure into the distance between transmitter and process medium below.

## Target Applications with Type 8175

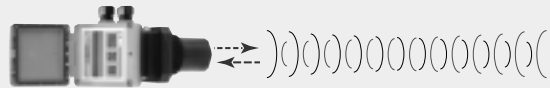
- Continuous level measuring for fluids and solids
- ON/OFF level measuring for fluids and solids



- Flow measurement in open channels



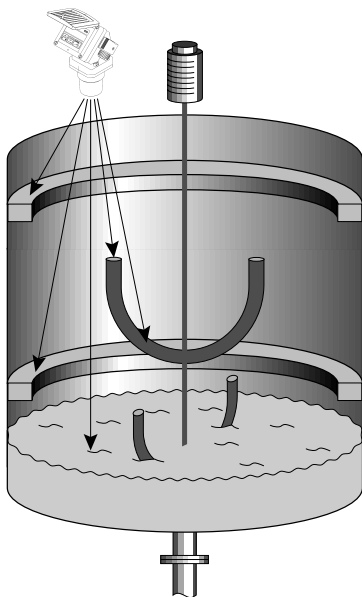
- Distance measuring



## 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.

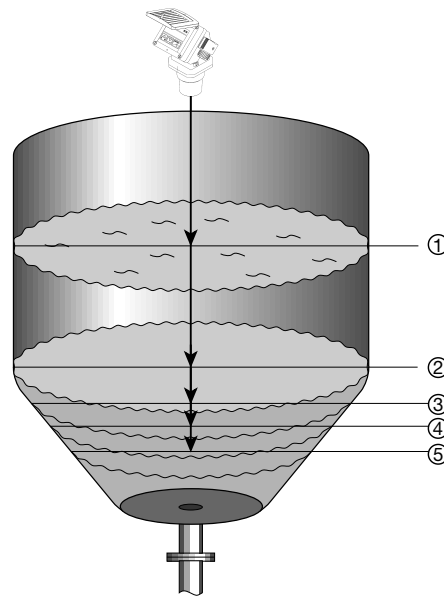
After this operation, all echoes of fixed and intermittent obstacles are stored and rejected. This allows the installation of the Ultrasonic Level Transmitter Type 8175 even in applications with obstacles like mounting elements, blades, agitators, etc. in the beam cone.



## Teach-In

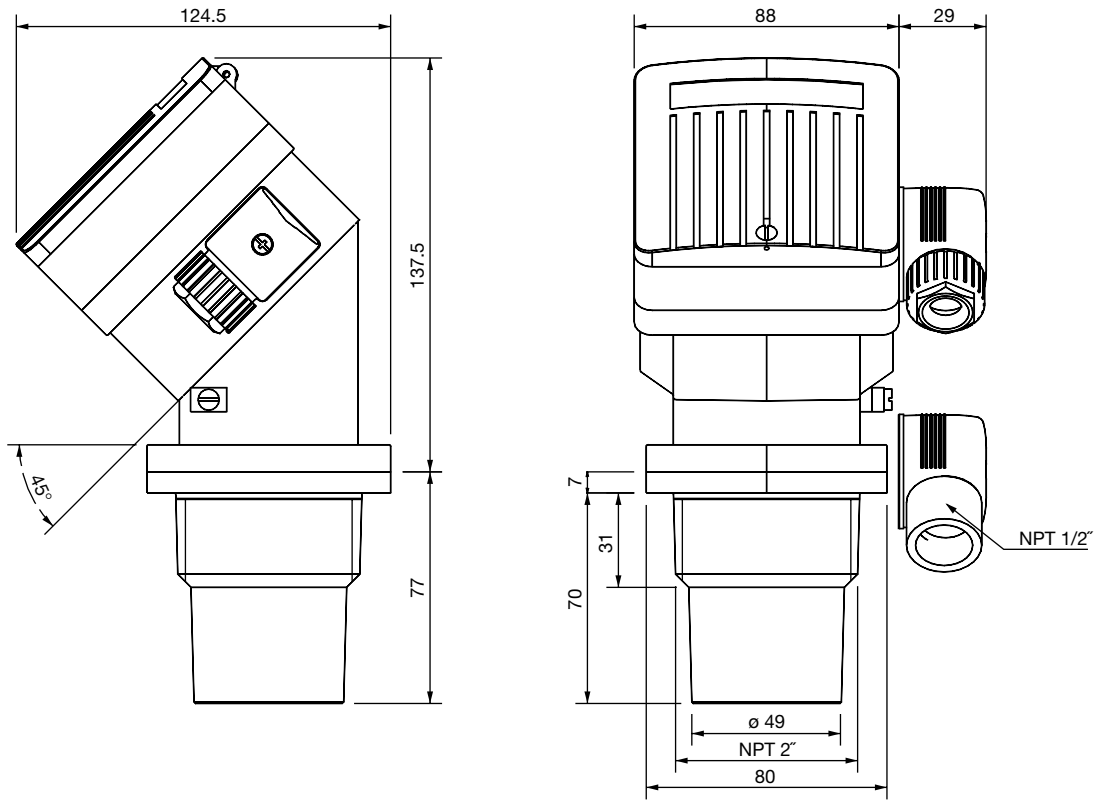
The Ultrasonic Level Transmitter Type 8175 allows the measurement of distance, level or volume, in different respective units.

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 taught-in the shape, step-by-step, in an easy way.

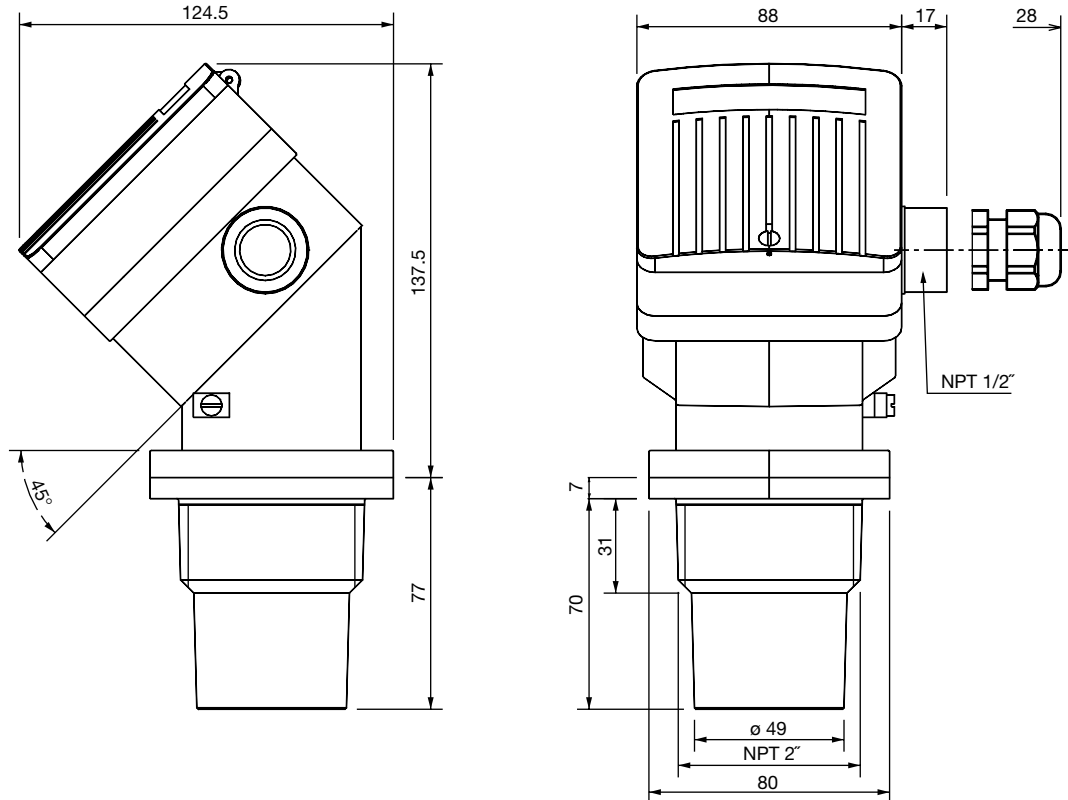


Dimensions [mm]

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	1/2" Conduit plug, (1ea.)	430 827 J
18-32 DC	2" NPT	No	1/2" Conduit entry, (1ea.)	430 828 T
18-32 DC	2" NPT	2	1/2" Conduit entry, (2ea.)	430 829 U
115-230 AC	2" NPT	No	1/2" Conduit entry, (2ea.)	430 830 Z
115-230 AC	2" NPT	2	1/2" Conduit entry, (2ea.)	430 831 N

### Ordering chart accessories / spare parts

Description	Item-No.
Cover with electronics for transmitter without relay	430 834 R
Cover with electronics for transmitter with relays	430 835 J
Transmitter housing for DIN 43650 cable plug	427 050 X
Transmitter housing for cable gland PG 13.5 or G 1/2"	430 832 P
Transmitter housing for two cable glands PG 13.5 or G 1/2"	430 833 Q
2" FPM (Viton) seal	430 749 K
2" EPDM seal	430 750 Q
Transmitter transducer for fitting G 2"	427 053 N
Transmitter transducer for fitting NPT 2"	427 054 P
Cable plug DIN 43650 PG 9	424 205 Z
Cable plug DIN 43650 G 1/2"	424 206 S
Cable gland PG 13.5	418 339 G
Cable gland G 1/2"	418 340 M
Power supply card 115/230 VAC	427 435 A
Instruction manual for transmitter Type 8175 - D/GB/F	427 998 P



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