

8175 / 8170

ULTRASONIC LEVEL TRANSMITTER COMPACT AND SEPARATE VERSIONS



Instruction Manual

INTRODUCTION

1	INTRODUCTION	
1.1	Symbol Used	3
1.2	General Safety Instructions	3
2	QUICKSTART	
2.1	Installation	4
2.2	Programming	
2.2.1	Distance	6
2.2.2	Level	7
2.2.3	Volume	8
2.3	Testing	9
3	INSTALLATION	
3.1	General Installation guidelines	10
3.2	Installation	12
3.2.1	Panel version installation	12
3.2.2	Wall mounted version installation	12
3.3	18-32 VDC electronic card identification	13
3.4	General Electrical Connection	13
3.4.1	8175 Compact version with an EN 175301-803 connector	14
3.4.2	8175 Compact version	15
3.4.3	8175 Panel version	17
3.4.4	8175 Wall mounted version, 18-32 VDC	18
3.4.5	8175 Wall mounted version, 115/230 VAC	20
3.5	Connection examples	21
4	PROGRAMMING AND OPERATION	
4.1	Operating and Control Guide	25
4.2	Menu Guide	26
4.3	Main Menu	27
4.4	Calibration Menu	28
4.4.1	Language	29
4.4.2	Engineering Units	29
4.4.3	Filter Function	31
4.4.4	Gas Characteristics	34
4.4.5	Echo filtering	35
4.4.6	Teach-In procedures	
4.4.6.1	Teach-In for Level and distance	37
A	- 1 or 2 point Level or Distance Teach-In procedure	38
B	- Resetting of the Distance Reference point	39
4.4.6.2	Teach-In for volume	40
C	- Input of tank dimensions	40
D	- Manual input of distances and associated volumes	42
E	- Volume teach-In procedure	44
4.4.7	Output Current	46
4.4.8	Relay (option)	47
4.4.8.1	Relay 1	48
4.4.8.2	Relay 2	49
4.5	Test Menu	50
4.5.1	Offset Compensation	51
4.5.2	Span Compensation	51
4.5.3	Temperature adjustment	52
4.5.4	Strength of return signal	52
4.5.5	Simulation of the level or temperature	53
4.5.6	Resetting of the transmitter	54
4.6	8175 Settings	55
4.6.1	Factory Settings	55
4.6.2	User Settings	55
5	MAINTENANCE	
5.1	Storing and cleaning of the sensor	56
5.2	Trouble shooting guide	56
6	ANNEX	
6.1	Specifications	58
6.2	Horizontal cylindrical tank value conversions	60
6.3	Dimensions	61
6.4	Design and Measuring Principle	64
6.5	Standard delivery	64
6.6	Type specification	65
6.7	Label type 8175	66
6.8	Spare parts list	66

INTRODUCTION

1.1 SYMBOL USED



Indicates information which must be followed. Failure to follow the information could endanger the user and affect the function of the device.

1.2 GENERAL SAFETY INSTRUCTIONS



Before installing or using this product, please read this manual and any other relevant documentation to ensure you fully benefit from all the advantages the product can offer.

- Please verify that the product is complete and free from any damage.
- It is the customer's responsibility to select an appropriate transmitter for the application, ensure the unit is installed correctly, and maintain all components.
- This product should only be installed or repaired by specialist staff using the correct tools.
- Please observe the relevant safety regulations throughout the operation, maintenance and repair of the product.
- Always ensure that the power supply is switched off and the pipes / tank do not contain any pressure before working on the device / system.
- If these instructions are ignored or the transmitter is not used according to the specifications, no liability will be accepted and the guarantee on the device and accessories will become invalid.

QUICKSTART

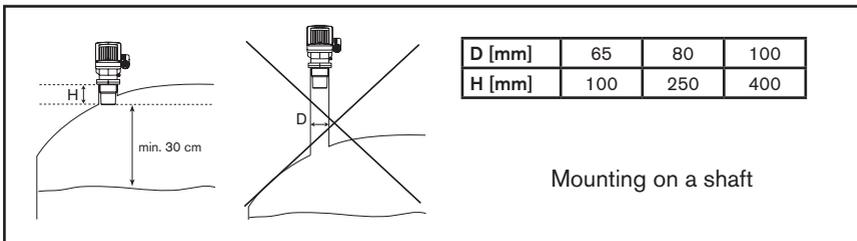
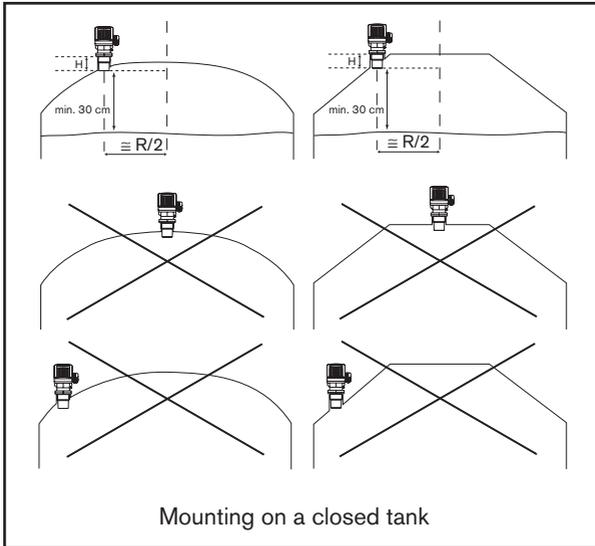
This section provides a comprehensive installation and operation guide which will assist with the commissioning of the 8175 Level Transmitter.

2.1 INSTALLATION

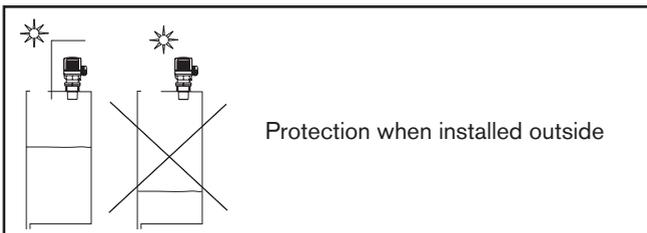


Pay attention to the installation of the transmitter to ensure the proper operating of the device.

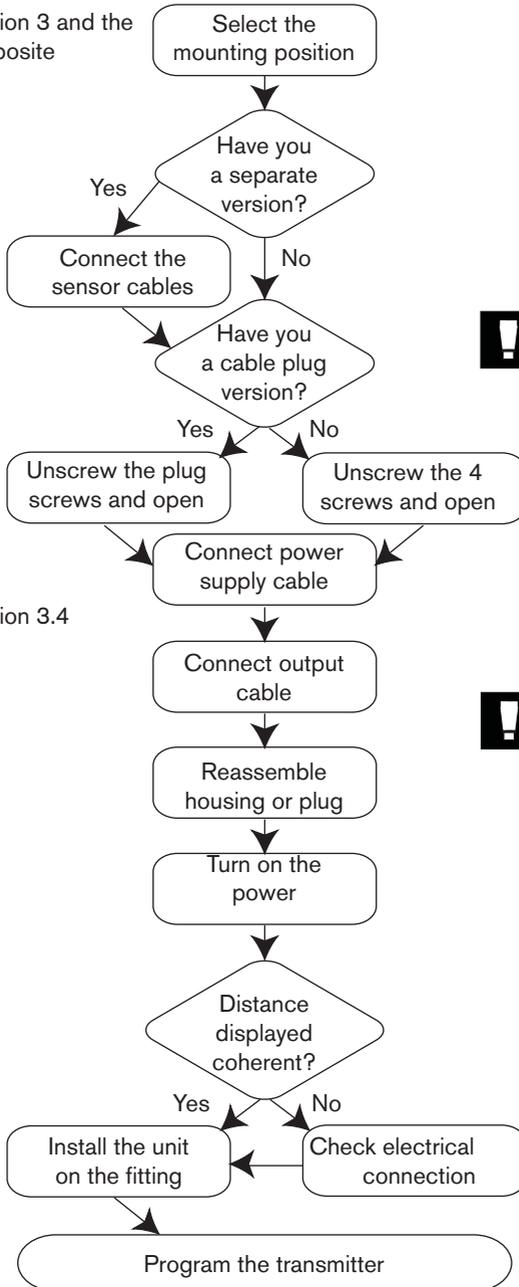
Select the mounting position by respecting the following instructions:



Protect the device against bad weather and temperature changes:



See section 3 and the page opposite



See section 3.4



Ensure the power supply is disconnected before starting work.

For panel versions move to the next step.

Ensure that security provisions are considered with the power cable and relay circuit.



Pay attention to the max. permitted load of the output current loop.

If the unit does not work, See section 5.2

Ensure the power supply is switched on. See Maintenance.

See the next page.

QUICKSTART

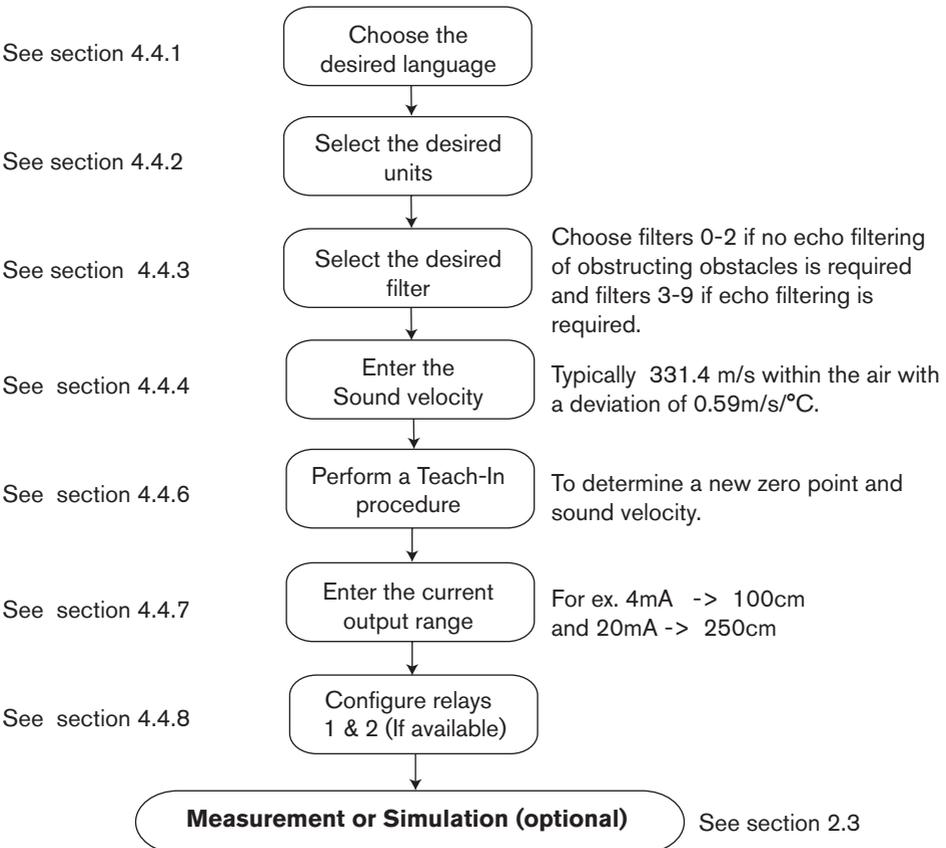
2.2 PROGRAMMING

The electronics within the 8175 ultrasonic level transmitter allows the unit to be configured as either distance, level or volume depending on the application.

To access the **CALIBRATION MENU** simultaneously press   for 5 seconds.

- The 'Enter' key can be locked to avoid accidental or unauthorised access - section 3.3.
- Reference can additionally be made to the menu guide - section 4.2.

2.2.1 Programming - distance

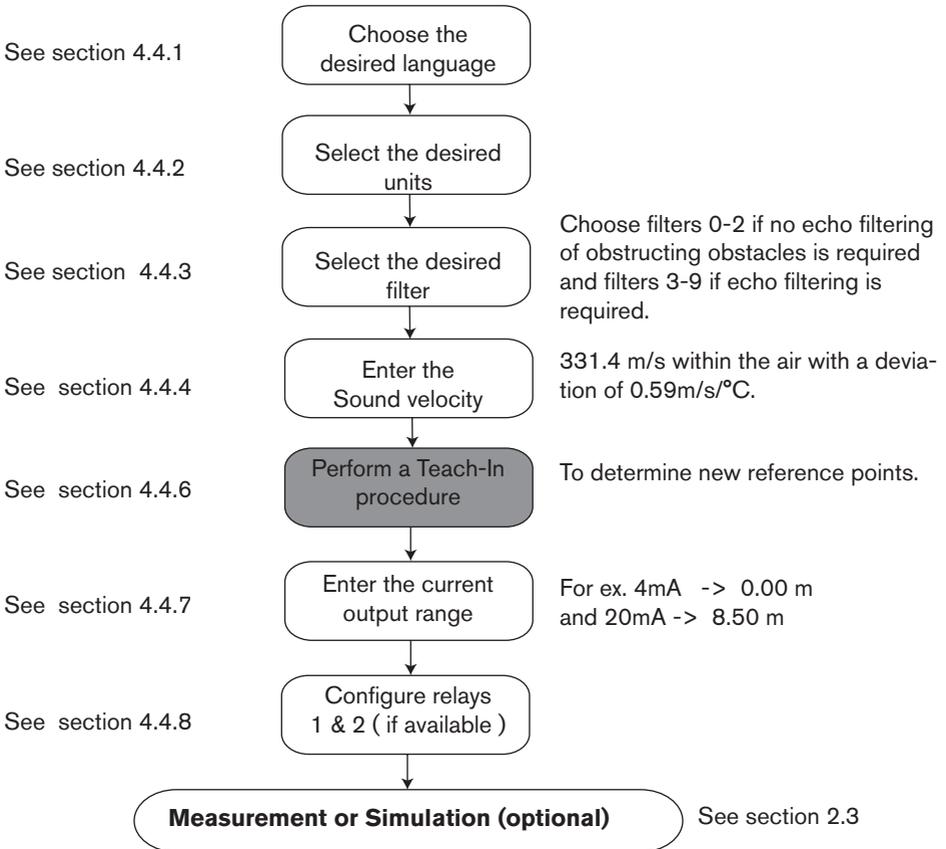


QUICKSTART

To access the **CALIBRATION MENU** simultaneously press   for 5 seconds.

- The 'Enter' key can be locked to avoid accidental or unauthorised access - section 3.3.
- Reference can additionally be made to the menu guide - section 4.2.

2.2.2 Programming - Level



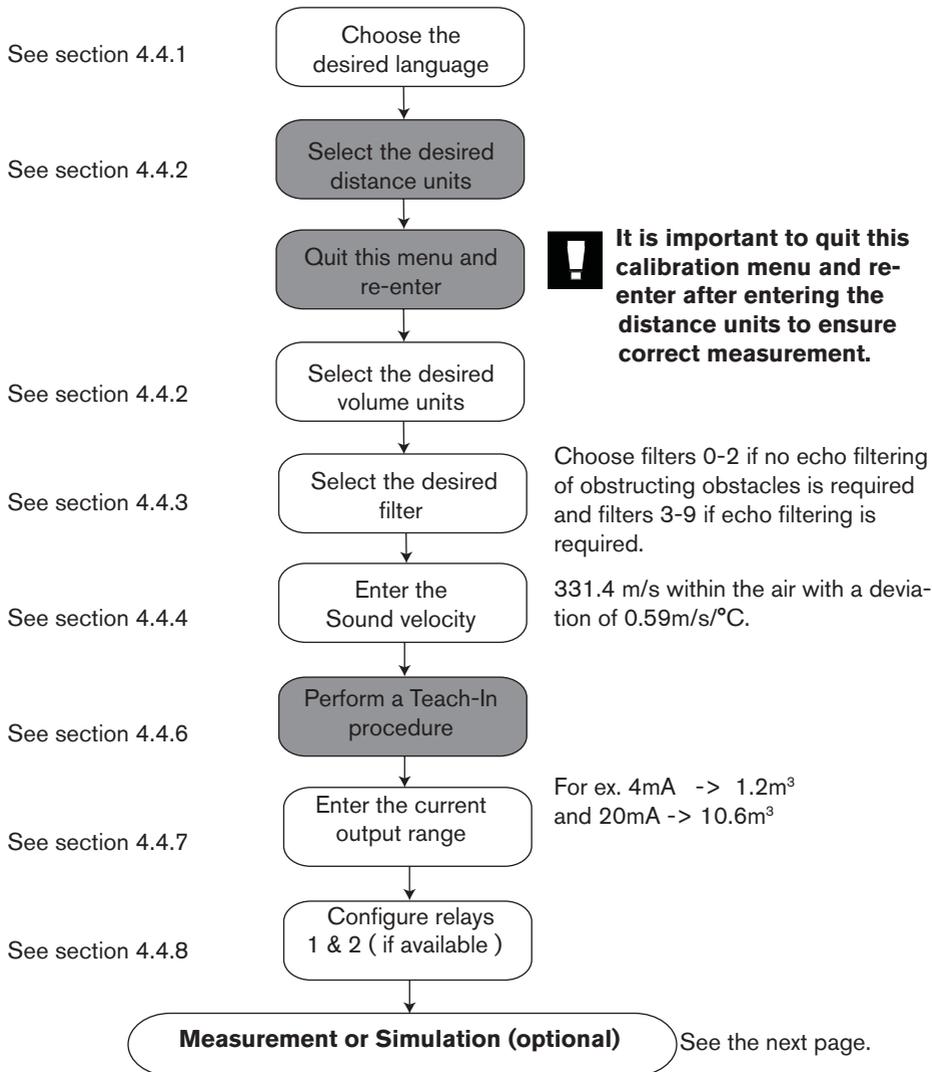
The actions which are highlighted in grey  must be fully completed for accurate measurement.

QUICKSTART

To access the **CALIBRATION MENU** simultaneously press   for 5 seconds.

- The 'Enter' key can be locked to avoid accidental or unauthorised access - section 3.3.
- Reference can additionally be made to the menu guide - section 4.2.
- It is important to exit the menu calibration after entering the desired distance units and re-enter the menu to configure the volume units.

2.2.3 Programming - Volume



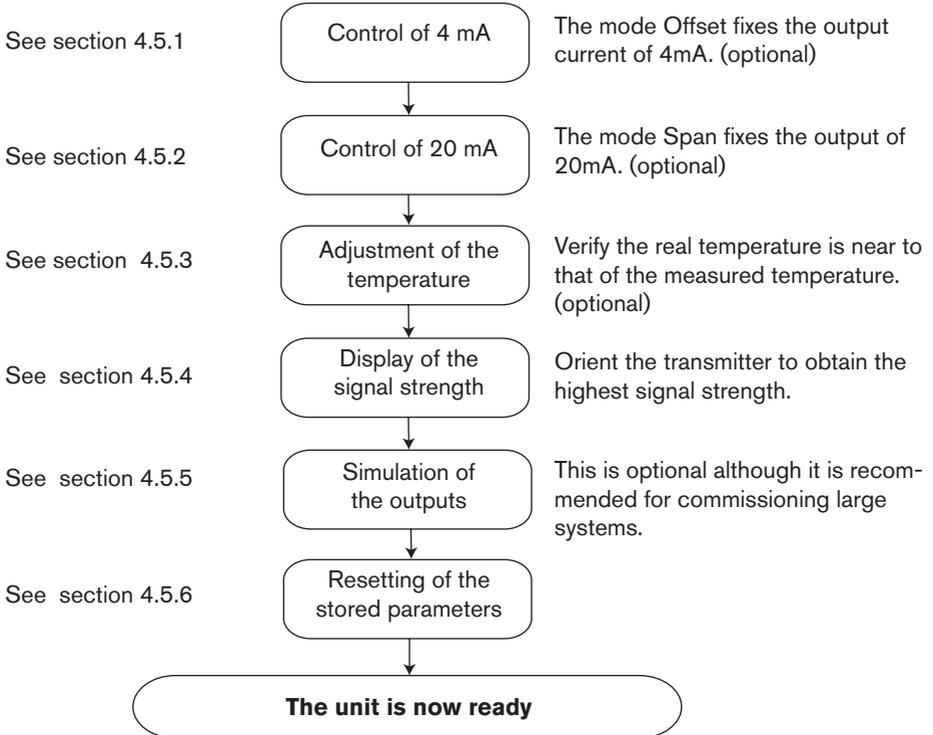
The actions which are highlighted in grey  must be fully completed for accurate measurement.

QUICKSTART

To access the **TEST MENU** simultaneously press    for 5 seconds.

2.3

TESTING



INSTALLATION

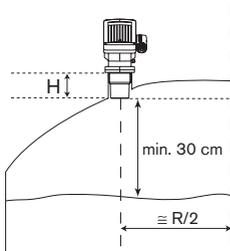
3.1 GENERAL INSTALLATION GUIDELINES

Prior to the installation of the 8175 ultrasonic level transmitter, a clear mounting location for the product must be determined.



- **The level transmitter or sensor 8175 / 8170 are designed for liquid level measurement. It is the user's responsibility to test the functionality of the device for any other material such as powders, granulas etc.**
- **The 8175 ultrasonic level transmitter or sensor must be installed perpendicular to the process medium.**
- **Always protect the transmitter from the rain, ultraviolet radiations and electromagnetic perturbations.**

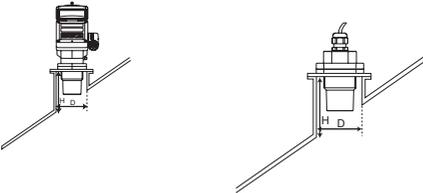
Tanks with bulged or cone-shaped roofs



Do not install the transmitter at the center of a bulged or cone-shaped roof but at half-radius from the center.

H: see table hereafter.

Mounting on a shaft



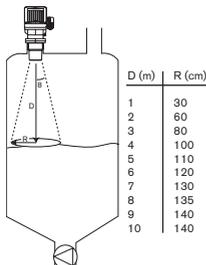
For the mounting on a shaft:

- respect the max. shaft length:

D [mm]	65	80	100
H [mm]	100	250	400

- burr the inside of the shaft.

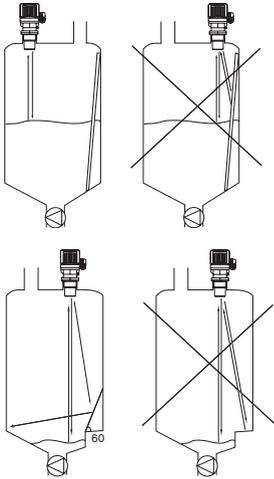
Beam cone



The ultrasonic pulses are emitted from the base of the transmitter with an 8° beam angle. Suppress all the obstacles inside the beam cone to avoid false echos.

INSTALLATION

Obstacles inside the tank

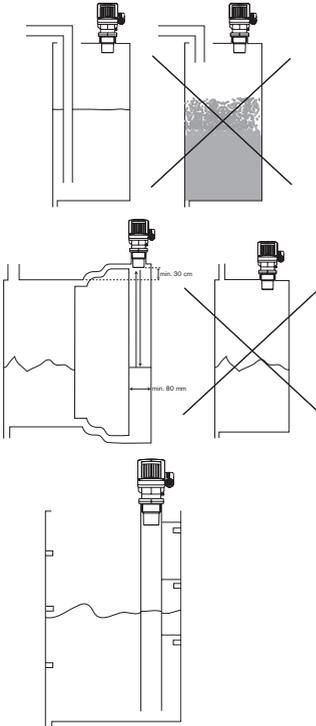


The fixed obstacles inside the tank may generate false echos.

Ensure there is no obstacle within the beam cone.

If this is impossible, mask the obstacles by means of deflectors or use a meter tube as for the rough-surface liquids (see hereafter).

Rough-surface liquids or liquids which can foam



When the tank filling-up generates waves or foam, extend the meter tube as far as under the surface of the liquid.

A meter tube makes it also possible to have stable measurements. It makes it possible to ignore the obstacles inside the tank.



The meter tube cannot be used with clogging products.

INSTALLATION

3.2 INSTALLATION

The ultrasonic transmitter or sensor may be installed through the tank top via a standard G 2" (NPT) fitting or equivalent tapped flange according to the type of level transmitter.

Steps for successful installation:

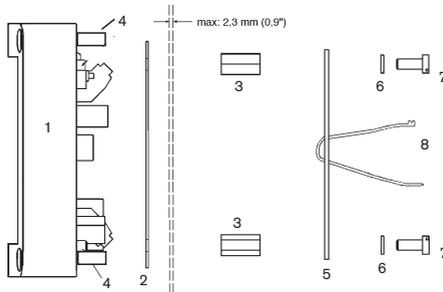


- When securing the transmitter or sensor to the fitting, only tighten by hand!
- Be careful not to overtighten the transmitter in the fitting.

3.2.1 Panel version installation

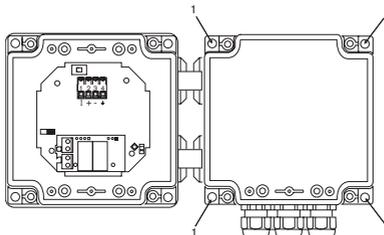
For installation and insertion of the panel version follow the instructions on the enclosed delivery film, the self-adhesive pattern to cut the panel and as follows:

1. Put gasket "2" on the cover 1 and place the complete unit in the cut-away panel.
2. Screw the spacer bolts "3" onto the panel fixing screws "4".
3. Insert the cable clips "8", to secure the various cables (power supply, outputs, sensor) of the transmitter, onto the plate "5".
4. Fasten the plate "5" with the screws "7" onto the bolts "3", tightening the locking washers "6".



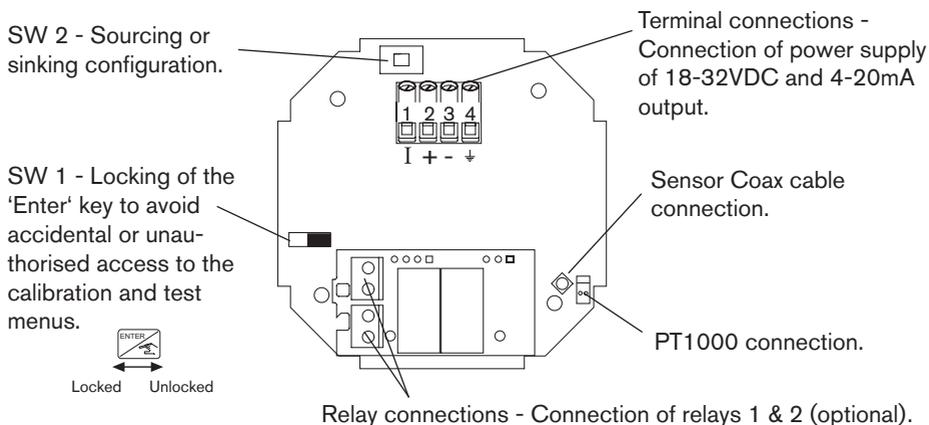
3.2.2 Wall-mounted version installation

The level transmitter in a wall-mounted version has 4 fixing holes at the corners of the enclosure. Remove the white blanking strips and the cover to access to fixing holes "1".



INSTALLATION

3.3 18-32 VDC ELECTRONIC CARD IDENTIFICATION



- The Coax cable and PT1000 connections must be connected in all cases to ensure the device functions correctly.
- The  key can be locked to avoid accidental or unauthorised access by placing SW1 in the left position in the diagram above.

3.4 GENERAL ELECTRICAL CONNECTION

- Use cables with a temperature limit of 80°C minimum.
- For normal operating conditions the measuring signal can be transmitted by a simple cable of 0.75 mm² cross section.
- The line must not be installed in combination with carrying lines with a higher voltage or frequency. If a combined installation cannot be avoided, a minimum space of 30 cm (1 ft) or shielded cables should be adopted.
- When using shielded cables observe faultless grounding of the shield.
- For EMC purposes, the earth must be connected via the earth lug on the side of the enclosure (see fig. 3.2). This point must be connected locally to a good earth.
- The cable diameters for the cable gland versions must respect the following:
Compact: between 6-12mm and 6 mm with a multiway seal
Wall mounted: between 4-8mm (not used cable glands must be blanked off).
- In case of doubt, always use shielded cables.
- The 18-32 VDC power supply must be filtered and regulated - section 6.1.

INSTALLATION



- Do not open and wire the transmitter with the power supply connected.
- It is obligatory to put security devices close to the transmitter, on:
Power supply : 18-32VDC - 250mA fuse and interrupter
115/230VAC - 5A fuse and a bipolar interrupter
Relay : 3A fuse max. and a bipolar interrupter (depending on the application).
- Do not apply both a dangerous voltage and a very low safety voltage to the relays.

3.4.1 8175 Compact version with an EN 175301-803 connector

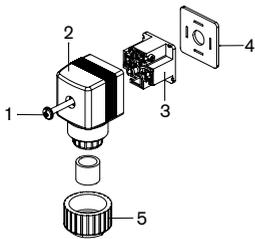
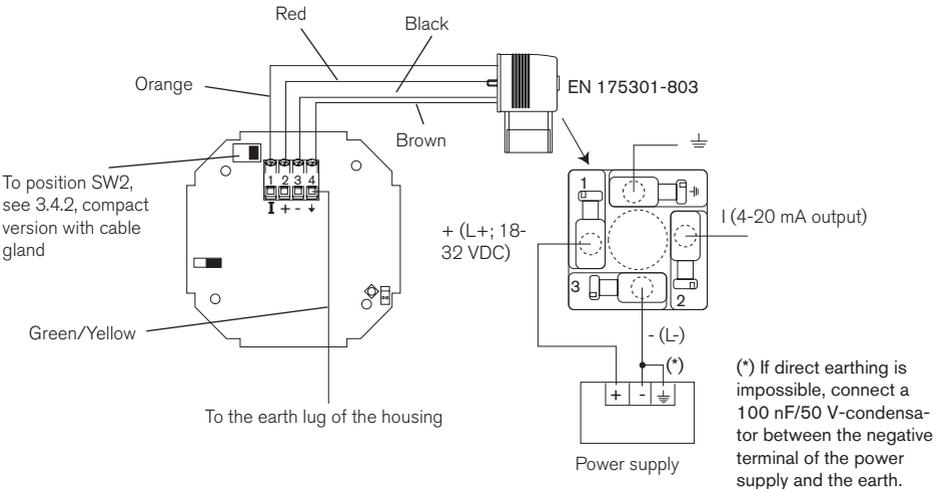


Fig. 3.3 Plug assembly

1. To open the connector remove screw 1 (Fig. 3.3).
2. Remove the internal part 3 from the external casing 2.
3. Connect the transmitter according to the pin assignment in Fig. 3.3
4. When re-assembling, the internal part 3 can be rotated in 90° steps to a desired position before inserting back into the casing 2.
5. Tighten the cable gland 5. Then place gasket 4 between the EN 175301-803 connector and the fixed connector of the transmitter and plug the EN 175301-803 connector onto the transmitter.
6. Tighten screw 1.

Wiring



INSTALLATION

3.4.2 8175 compact version

Wiring of the 18-32 VDC version, with cable gland

Remove the cover via the screws on the front display and pull the cable through the cable gland and wire according to one of the pin assignment diagrams below. The electronics within the 8175 allows a sourcing or sinking PLC to be connected. Position A (Fig 3.5) provides a sourcing configuration and Position B (Fig 3.6) a sinking one.

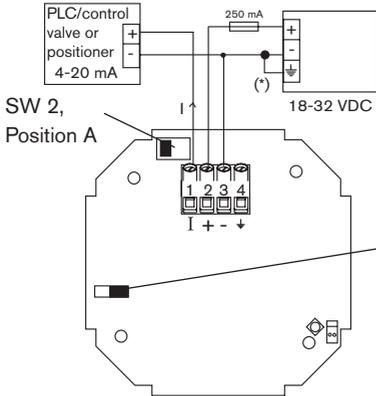


Fig. 3.5 Pin assignment, Position A

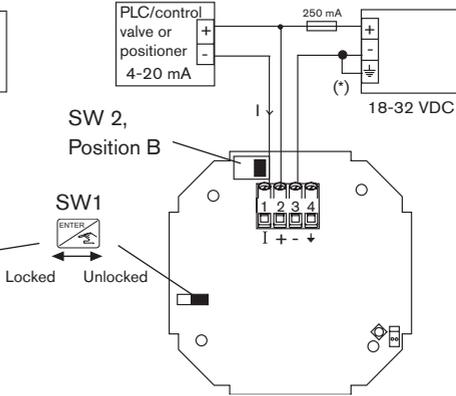


Fig. 3.6 Pin assignment, Position B

Relay connection of the 18-32 VDC version, with cable gland

The electrical wiring of this model is possible via the use of 2 cable glands. Remove the cover via the screws on the front display and pull the cables through the cable glands and wire according to pin assignment diagram below (Fig. 3.7).

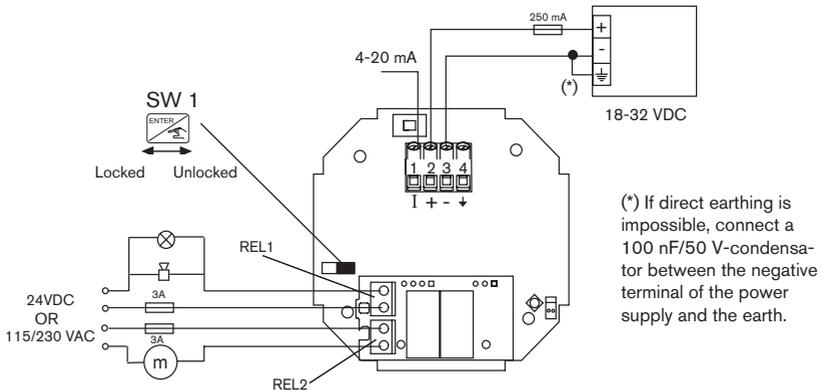


Fig. 3.7 Pin assignment for relays

- The device can be easily connected to a PLC independently of the respective version.
- The 'Enter' key can be locked by placing the SW 1 switch into the left position to avoid accidental or unauthorized access.

INSTALLATION

Wiring of the 115/230 VAC version

Remove the cover via the screws on the front display and pull the cable through the cable gland and wire according to one of the pin assignment diagrams below.

The electronics within the 8175 allows a sourcing or sinking PLC to be connected. Position A (Fig 3.5) provides a sourcing configuration and Position B (Fig 3.6) a sinking configuration.



- Do not open and wire the transmitter with the power supply connected.
- Ensure that the power supply switch is selected for the appropriate voltage 115VAC or 230 VAC.

The connection for relays 1 and 2 are identical to that of the 18-32VDC on the previous page.

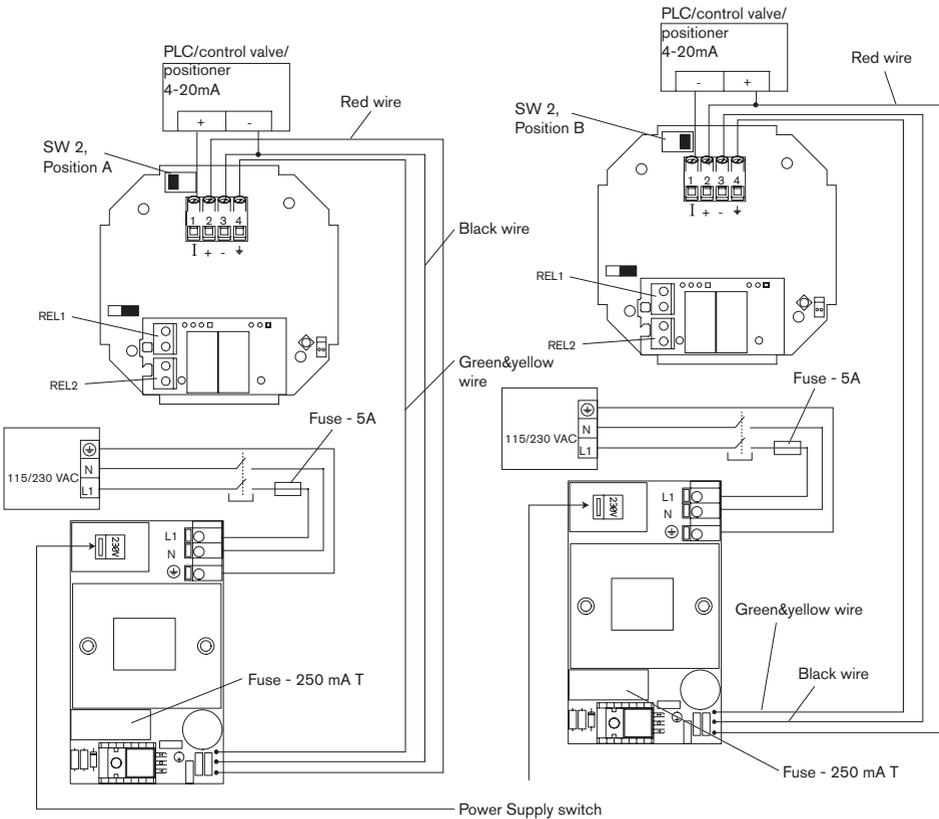


Fig. 3.8 Pin assignment, Position A

Fig. 3.9 Pin assignment, Position B

INSTALLATION

3.4.3 8175 panel version 18-32VDC

Connection of the 8170 sensor

- Pass the cable through the wall / panel and use the cable gland to secure the cable.
- Connect the coax and PT1000 temperature cables as shown in the diagram below.
- Secure all the cables onto the protection plate as indicated via the 2 plastic ties

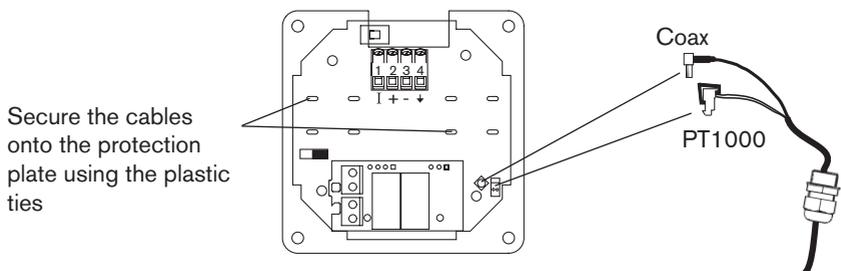


Fig. 3.10 Panel cable connections

8175 panel version 18-32VDC, wiring

Open the cabinet/cupboard and wire according to the pin assignment diagrams below. The electronics within the 8175 allows a sourcing or sinking PLC to be connected. Position A (Fig 3.11) provides a sourcing configuration and Position B (Fig 3.12) a sinking configuration.

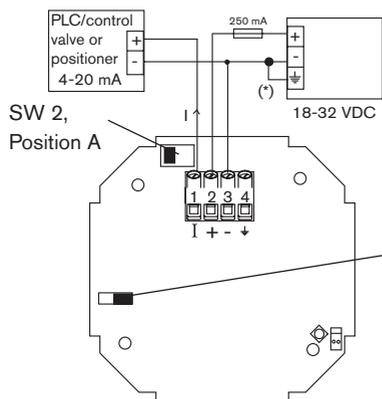


Fig. 3.11 Pin assignment, Position A

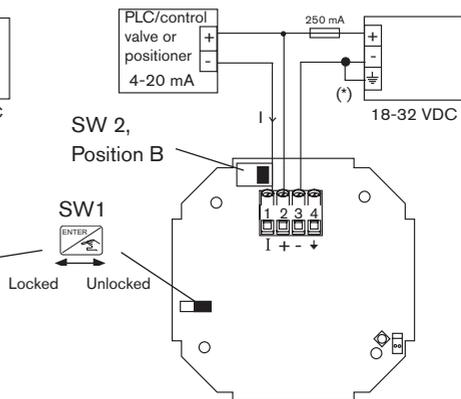


Fig. 3.12 Pin assignment, Position B

(*) If direct earthing is impossible, connect a 100 nF/50 V-condensator between the negative terminal of the power supply and the earth.

INSTALLATION

8175 panel version, relay connection

The relay version is connected as follows :

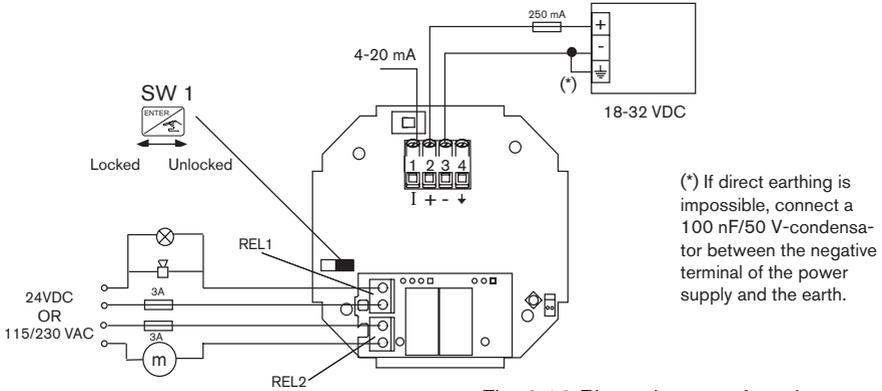


Fig. 3.13 Pin assignment for relays

- The device can be easily connected to a PLC independently of the respective version.
- The 'Enter' key can be locked by placing the SW 1 switch into the left position to avoid accidental or unauthorized access.

3.4.4 8175 Wall Mounted Version 18-32VDC

Connection of the 8170 sensor

- Open the cover after having unfasten the 4 screws on the front display.
- Replace one of the housing cable glands through the cable gland inserted on the sensor cable.
- Connect the coax and PT1000 cables as shown in the diagram below.

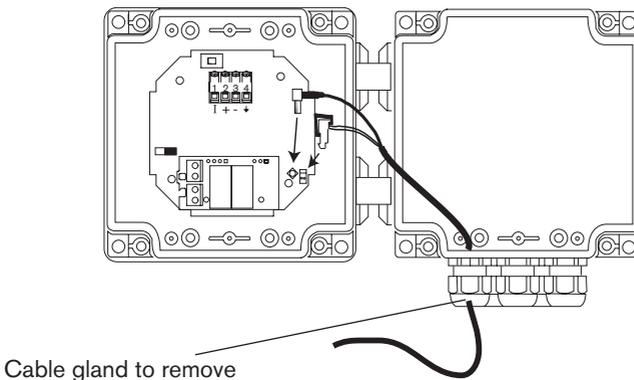


Fig. 3.14 Wall cable connections

INSTALLATION

8175 wall mounted version, 18-32 VDC; WIRING

Remove the cover via the screws on the front display and pull the cable through the cable gland and wire according to one of the pin assignment diagrams below. The electronics within the 8175 allows a sourcing or sinking PLC to be connected. Position A (Fig 3.15) provides a sourcing configuration and Position B (Fig 3.16) a sinking configuration.

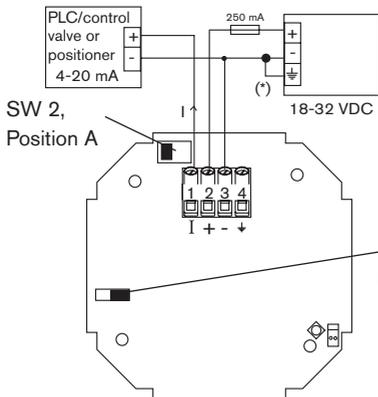


Fig. 3.15 Pin assignment, Position A

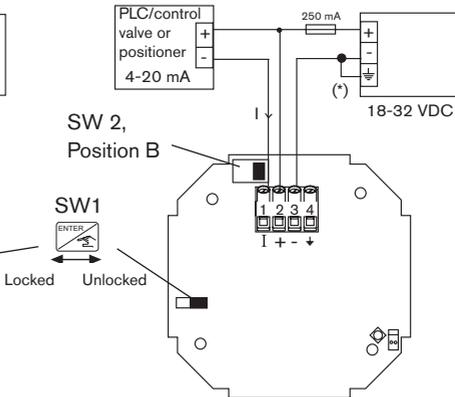
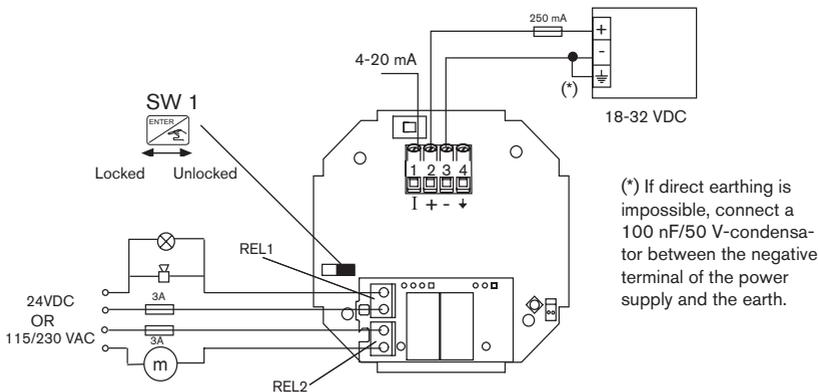


Fig. 3.16 Pin assignment, Position B

8175 wall mounted version, relay connection

The electrical wiring of this model is possible via the use of 2 of the cable glands. Remove the cover via the screws on the front display and pull the cables through the cable gland and wire according to pin assignment diagram below (Fig. 3.17).



(*) If direct earthing is impossible, connect a 100 nF/50 V-condensator between the negative terminal of the power supply and the earth.

Fig. 3.17 Pin assignment for relays

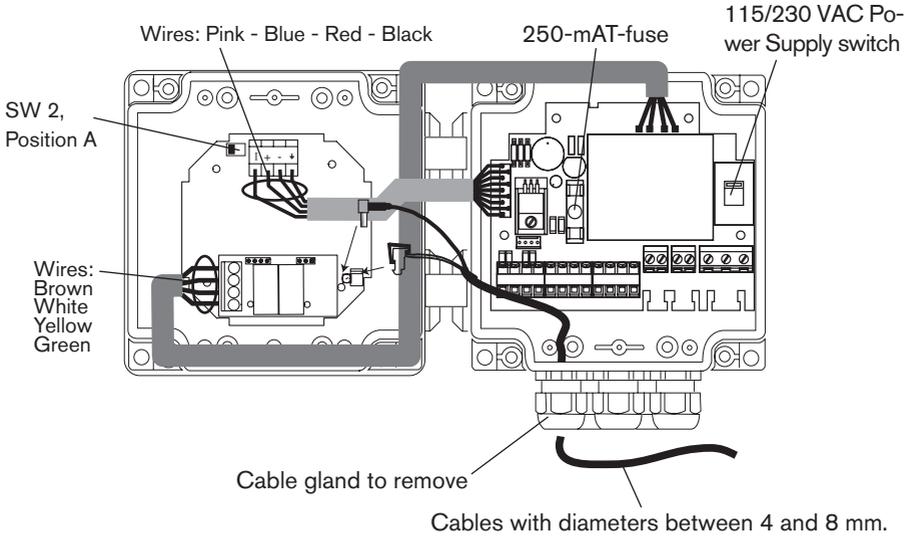
- The device can be easily connected to a PLC independently of the respective version.
- The 'Enter' key can be locked by placing the SW 1 switch into the left position to avoid accidental or unauthorised access.

INSTALLATION

3.4.5 8175 Wall Mounted Version 115/230 VAC

Connection of the 8170 sensor

- Open the cover after having unfasten the 4 screws on the front display.
- Replace one of the housing cable glands through the cable gland inserted on the sensor cable.
- Connect the coax and PT1000 cables as shown in the diagram below.

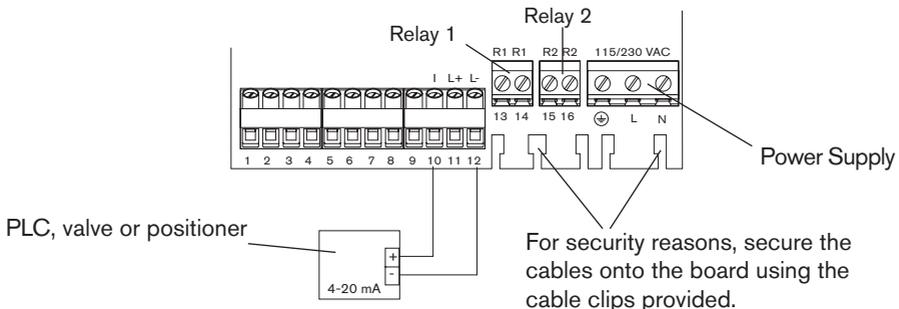


8175 wall mounted version 115/230 VAC with or without relays; Wiring

Remove the cover via the screws on the front display and pull the cable through the cable gland then wire according to the pin assignment diagram below.

To connect the transmitter to a PLC, use terminals 10 and 12 and set SW2 to position A (see figure above).

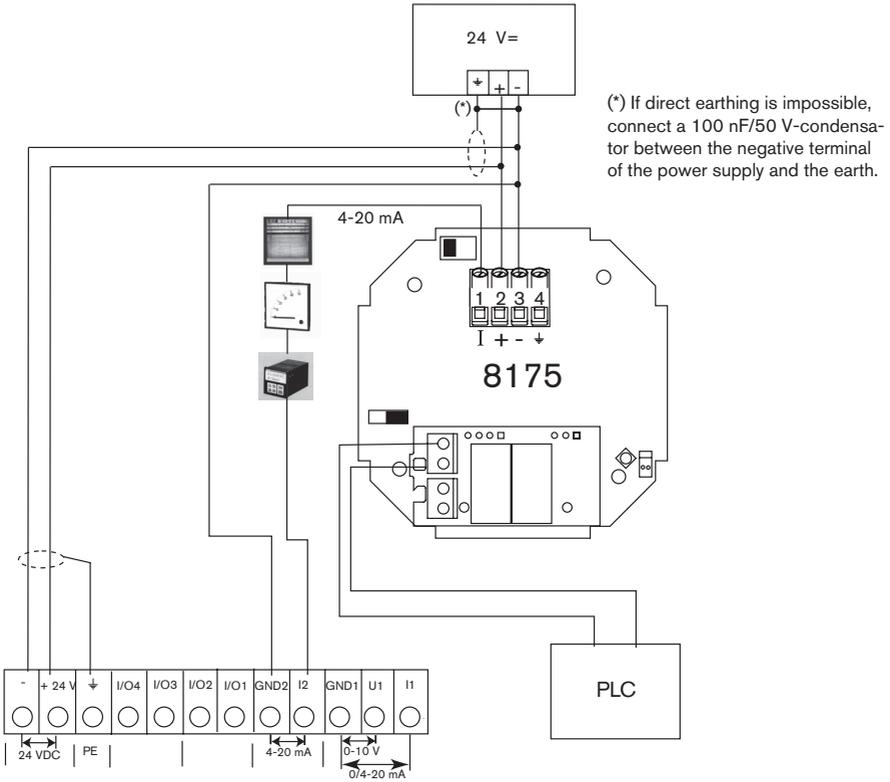
Terminals 13 to 16 must only be connected if the transmitter is a version with relays.



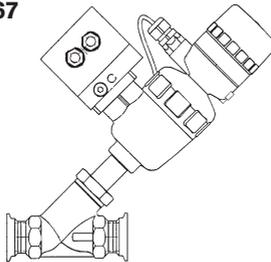
INSTALLATION

Continuous pneumatic level control

ENGLISH



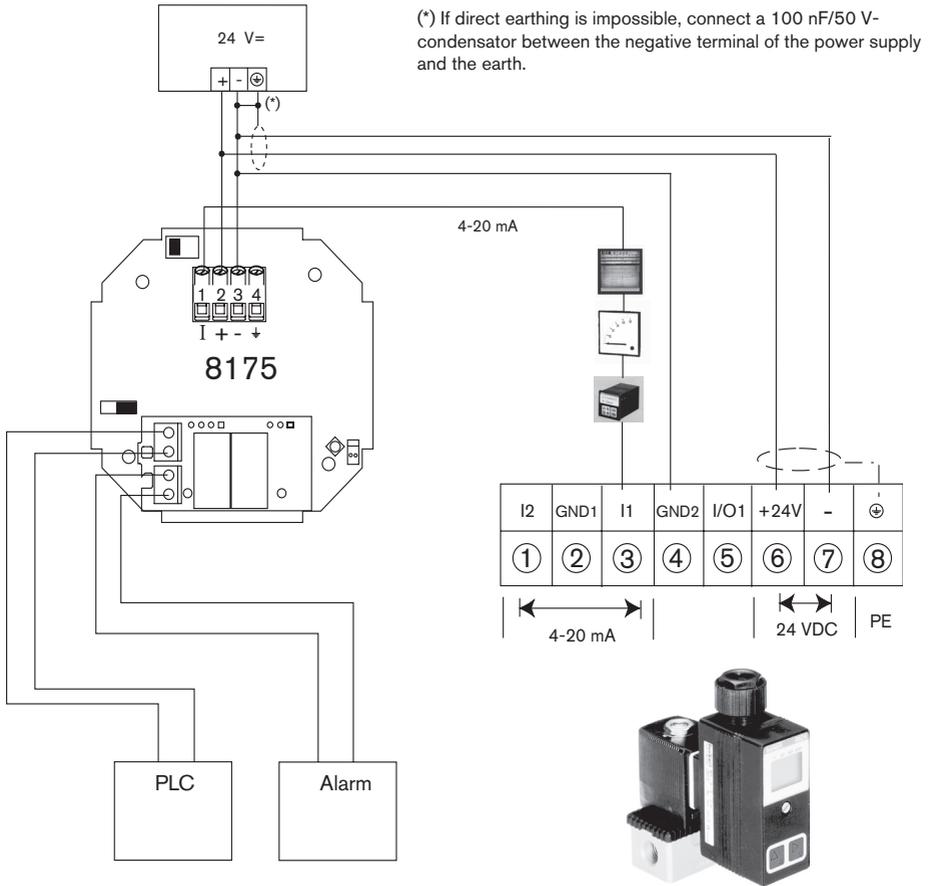
POSITIONER 1067



Connection example between the 8175 level transmitter 18-32VDC and the 1067 positioner mounted on an angle seat valve 2632.

INSTALLATION

Continuous solenoid level control

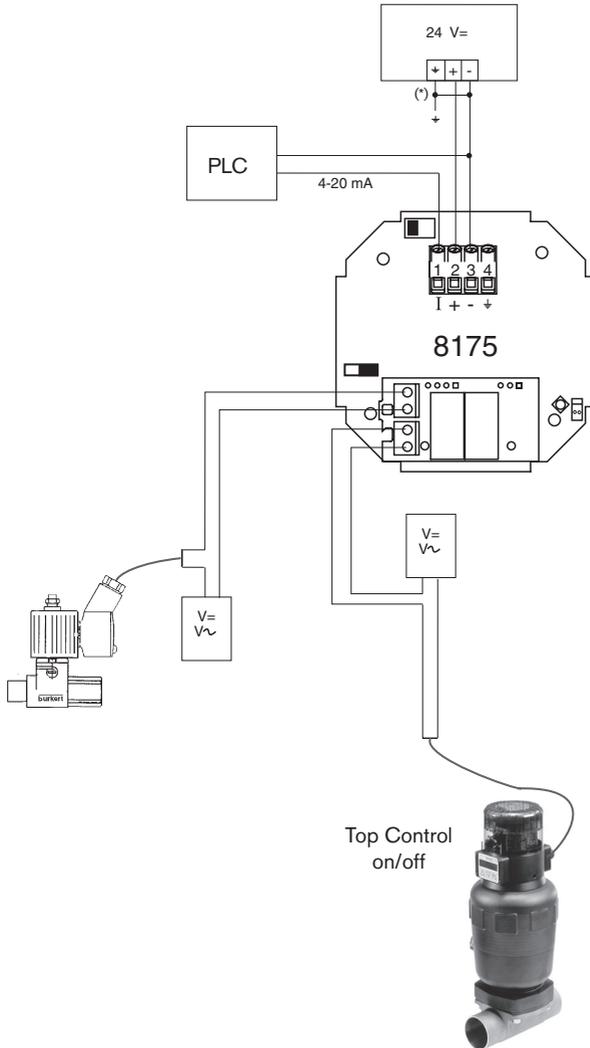


Connection example between the 8175 level transmitter 18-32VDC and the 8624 solenoid valve with PI controller.

INSTALLATION

ENGLISH

On/off level control

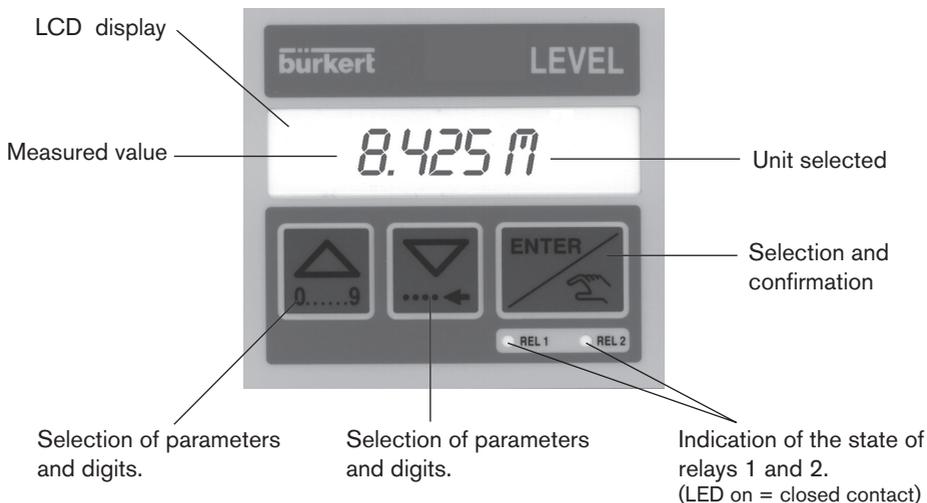


(*) If direct earthing is impossible, connect a 100 nF/50 V-condensator between the negative terminal of the power supply and the earth.

Connection example between the 8175 level transmitter 18-32VDC and the 8631 Top Control on/off mounted on a diaphragm valve 2031 and pilot valve 6012.

OPERATION

4.1 OPERATING AND CONTROL GUIDE



Keys	Menu Mode	Finding a value
	Previous menu	Increase from the blinking digit
	Next menu	Advance to the next digit
	Activate the menu display (if "END" is displayed, save the modified parameters and return to the main menu)	Validate the displayed value
+ pendant 5 s	Access to the CALIBRATION* menu	
+ + pendant 5 s	Access to the TEST* menu	

* Only available within the main menu.

The Key can be locked to avoid accidental or unauthorised access.

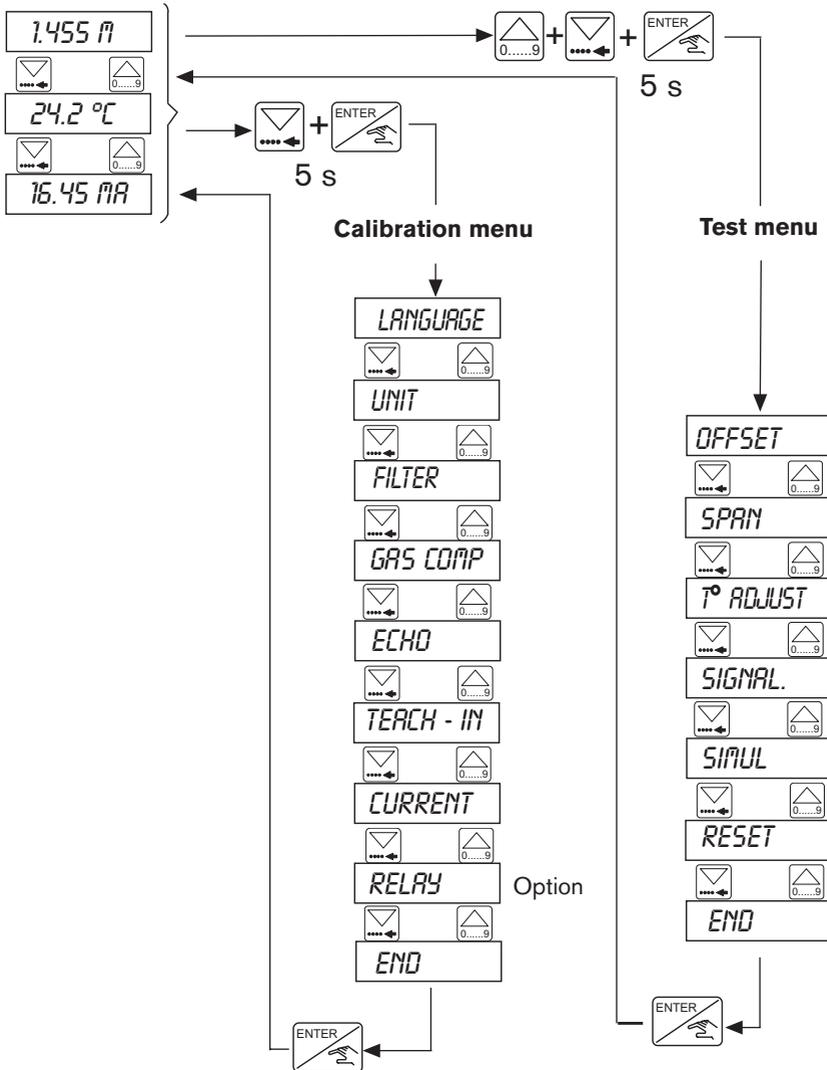
For further information see section 3.3.

OPERATION

4.2 MENU GUIDE

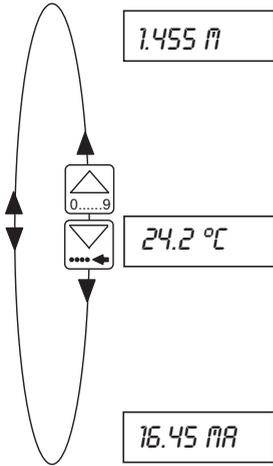
The menu guide below will assist in quickly and easily finding a desired parameter and programming the 8175 ultrasonic level transmitter.

Main menu



4.3 MAIN MENU

The following information is displayed within the Main Menu:



Measured Value: This is displayed as Level, distance or volume in the required engineering unit chosen within the calibration menu - see next section.

Gas Temperature: This is a display of the temperature of the gas in the engineering unit selected within the calibration menu.
If ' --- °C' is displayed within this option the measured temperature is out of range.
(Range -40 to +95°C)

Output Signal: The standard output signal range is proportional to the selected measuring range.
(Range 4.00mA to 20.00mA with a 22mA error signal).

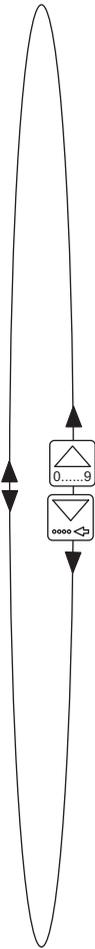
- The units will blink while the transmitter is performing an internal calculation.
- The whole display will blink when the signal has been lost or in cases of an electronic failure.

CALIBRATION MENU

4.4 CALIBRATION MENU

PRESS   SIMULTANEOUSLY FOR 5 SECONDS

The following parameters can be set within this menu:



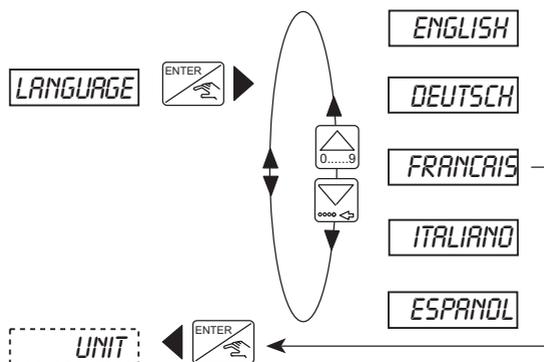
Function	Paragraph
<i>LANGUAGE</i>	Selection between English, German, French, Italian or Spanish. 4.4.1
<i>UNIT</i>	Selection of engineering units for level, distance or volume. 4.4.2
<i>FILTER</i>	Damping selection and delay time setting for signal failure alarm. There are ten different steps available. (Range 0 to 9). 4.4.3
<i>GAS COMP</i>	Gas characteristics (velocity of sound and temperature influence). 4.4.4
<i>ECHO</i>	Selection of the target level and if there are any fixed echos to be filtered and eliminated by the transmitter. 4.4.5
<i>TEACH-IN</i>	Manual or automatic determination of the specific application parameters. 4.4.6
<i>CURRENT</i>	Setting of the 4-20mA output signal range. 4.4.7
<i>RELAY</i>	Parameter definition of relays 1 & 2. 4.4.8
<i>END</i>	Back to the operation mode; store the new parameters set.

The following sections explain how to change the parameter values within the calibration menu above.

CALIBRATION MENU

4.4.1 Language

The selection of an alternative language is confirmed by the Enter-key and becomes immediately active.



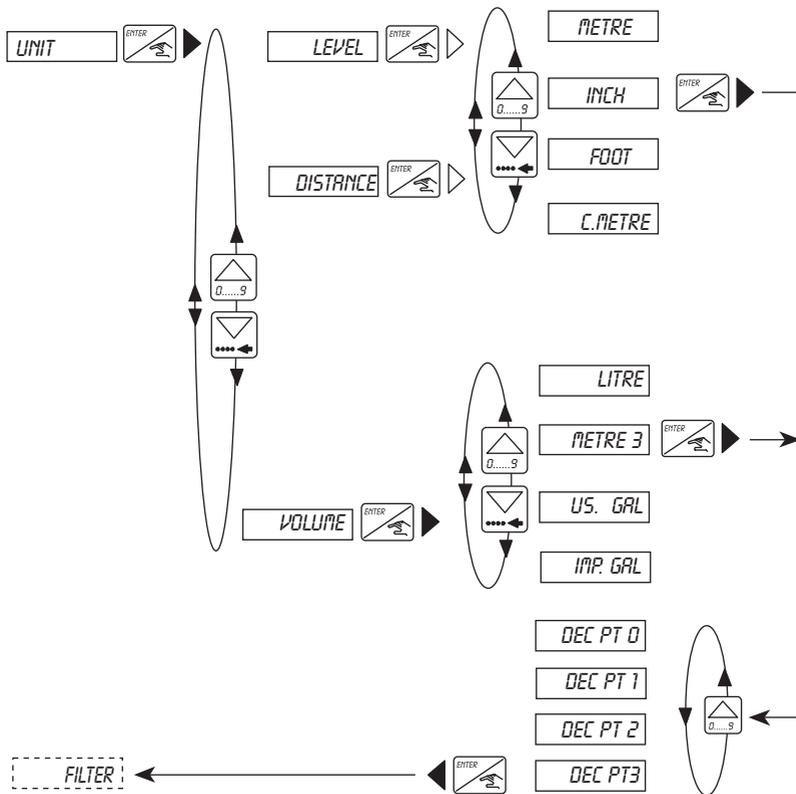
4.4.2 Engineering Units

The selection of the units will depend on the application and the configuration of the transmitter via level, distance or volume for fluid measurement.

- If the transmitter is to be configured to measure Level or Distance, select the measuring units and decimal points as required.
- If volume is to be selected and configured it is important to note that the transmitter display within the 'VOLUME TEACH-IN' may not be the measuring units selected. The conversion of units by the transmitter only applies within the Volume Teach-In and the table below displays the measuring units selected and the displayed units which will be used within the Volume Teach-In.

Selected measuring units		Units used for Teach-In	
Distance	Volume	Distance	Volume
cm	L	m	L
m	L	m	L
cm	m ³	m	m ³
m	m ³	m	m ³
cm	US/Imp Gal	Not to be used	
m	US/Imp Gal	Not to be used	
inch	L	Not to be used	
foot	L	Not to be used	
inch	m ³	ft	m ³
foot	m ³	ft	m ³
inch	US/Imp Gal	ft	US/Imp Gal
foot	US/Imp Gal	ft	US/Imp Gal

CALIBRATION MENU

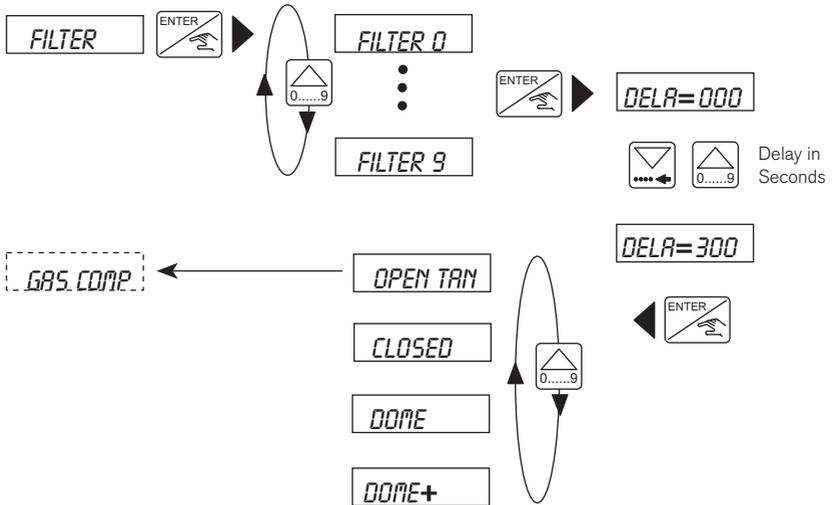


- The number of displayed decimals depends on the chosen unit but 4 digits will always be displayed.
- The temperature unit (°F or °C) is set automatically depending on the chosen unit for the distance, i.e. °C is set when metre or cm has been chosen and °F is set when inch or foot has been chosen.

4.4.3 Filter Function

The function makes it possible to:

- activate the echo filtering and choose a damping level as well as a max. speed change (FILTER 0 to 9)
- define the delay after which a failure is indicated by the outputs (DELA)
- select the type of tank (OPEN TAN, CLOSED or DOME(+)).



4.4.3.1 Filter 0 to 9

Echo Filtering:

Filters 0, 1 and 2: No echo filtering activated; The transmitter takes the nearest echo as the level.

Filters 3 to 9: Echo filtering activated; The transmitter compares the echoes received with those calculated within the ECHO menu so it can display the right level.

- If no echo filtering is chosen, it is advised to select filter 0 during the Teach-In calibration and after select the desired filter for the application.
- If echo filtering is necessary, set the transmitter to filter 3 during calibration in order to access this menu and after select the desired filter for the application.

CALIBRATION MENU

ENGLISH

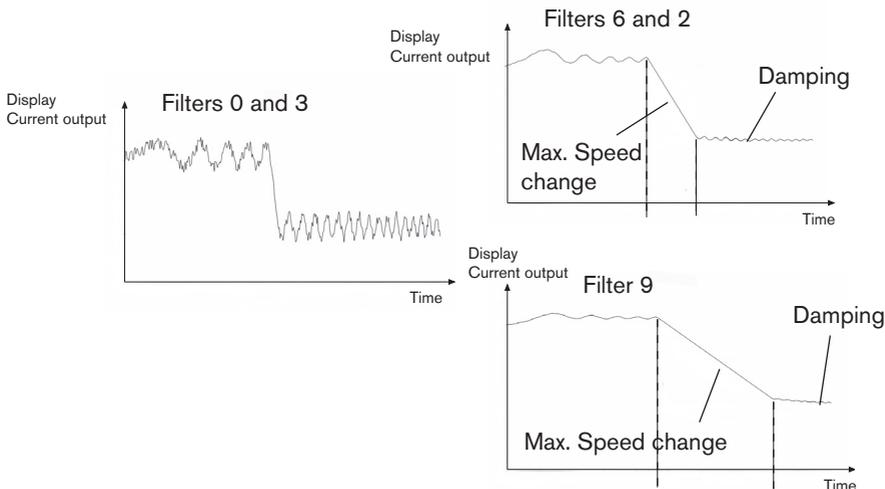
Damping effect and max. speed change

The damping makes it possible to limit the fluctuations of the values displayed and of the output signals.

Depending on the filter chosen there will be a maximum speed change for the recalculation of the level. This can be seen in the diagram below and the maximum speed change times are displayed in the following table.

Choose the filter with a maximum speed change superior to that of your process.

The diagrams below display the relationship between the actual signal and the level of filtering.



Filter level	Echo filtering		Max. speed change	Damping
	Yes *	No		
0		X	immediate	no
1		X	max. 10 m/min	low
2		X	max. 1 m/min	high
3	X		immediate	no
4	X		max. 5 m/min	low
5	X		max. 2 m/min	medium
6	X		max. 1 m/min	high
7	X		max. 0,5 m/min	very high
8	X		max. 0,2 m/min	important
9	X		max. 0,1 m/min	very important

* The menu ECHO is then available (see 4.4.5)

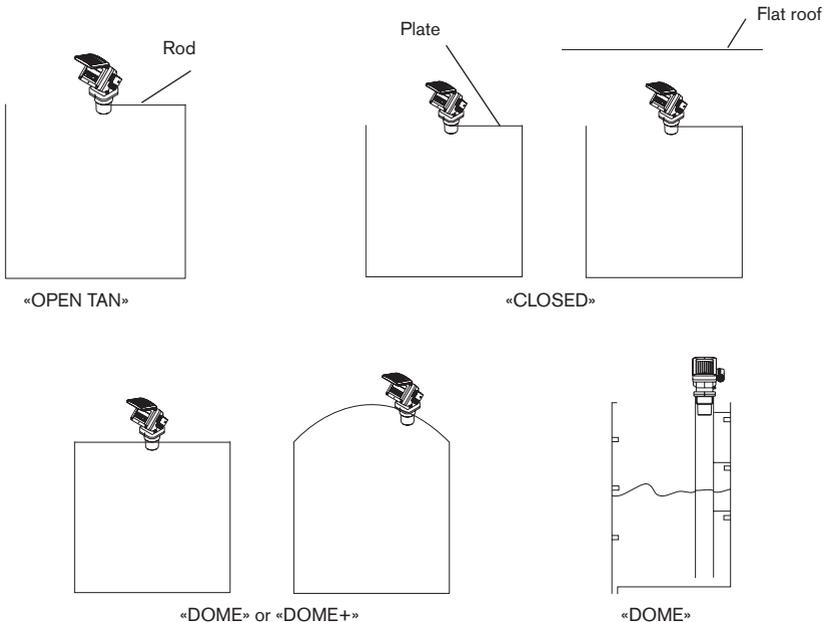
4.4.3.2 DELA time delay



- The DELA function of the menu makes it possible to program the time-out after a failure is indicated by the transmitter by sending a 22 mA output current and switching the relay 2 if it has been connected to an alarm.
- The delay time will be activated at any time if the transmitter cannot find or measure the level. The delay time should be selected in respect to the process conditions eg: a short alarm time for a fast process control.

4.4.3.3 Choosing the type of tank

For a good operation, the transmitter must know in which type of tank it is used. The following drawings indicate which type of tank has to be selected within the FILTER menu to obtain the most precise measurements:



By default, configure the mode indicated by the drawings. Nevertheless, if the transmitter indicates a level which is twice the actual level or that the tank is empty, the type of tank set within the FILTER menu does not suit to the application and thus the next type in the list must be chosen.

If for instance the type „CLOSED“ had been chosen and the transmitter has this defect, set the type „DOME“.

CALIBRATION MENU

4.4.4 Gas Characteristics

In order for the 8175 level transmitter to find a precise measure of the level, the characteristics of gas between the liquid and transmitter have to be defined.

- If this value is not known either a default value can be applied or the characteristics can be calculated by performing a 2 point Teach-In.
- Within this option the values must be entered in m/s or ft/s depending on the type of units selected (metric or imperial).

The default values for the gas characteristics are as follows:

Velocity of sound within the gas:

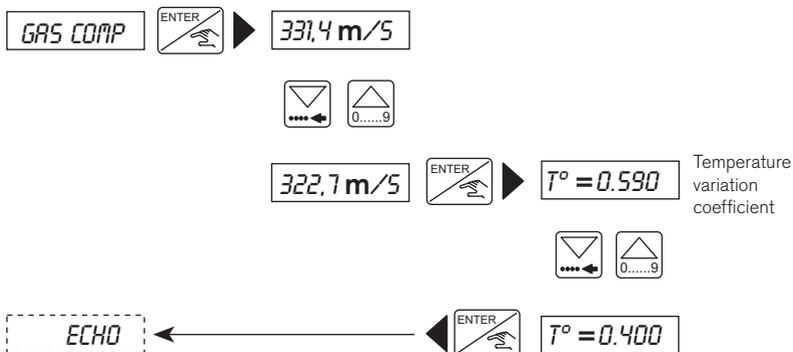


It is important that the velocity entered within this option is for the gas at a temperature of 0°C.

Default value (air): 331.4 m/s within air at 0°C (32°F), if unit=cm or m
087.3 ft/s within air at 32°F (0°C), if unit=ft or inch

Temperature variation of the velocity:

Default value: 0.59 m/s / °C
0.075 ft/s / °F



If no temperature dependency of the sound velocity is requested, calculate the sound velocity at ambient temperature with the following equation:

$$V = 331.4 \text{ m/s} + 0.59 \text{ m/s} \times T^{\circ}\text{C}$$

Enter this calculated value and enter 0.00 as the temperature variation coefficient.

4.4.5 Echo filtering

This function eliminates any fixed obstacles such as mounting elements, blades and inlet pipes which may interfere with the transmitter measurement giving an incorrect value and reading.

This function will only be available if a filter value between 3 and 9 has been selected within the filter function - section 4.4.3



This function should only be used if the echo returned and the displayed value is not that expected but corresponds to that of an obstacle within the tank.

Steps for successful echo filtering

- All obstacles to be identified must be between the transmitter and selected target.
- Enter the distance "1" between the base of the sensor and the fluid surface and press 'Enter' (fig.4.1) and the transmitter will process the information for approx. 10 seconds.
- The transmitter will search for an echo within +/- 0.5m of the distance entered.
- After processing the transmitter will display upto 10 echos identified in decreasing power order (the actual distance is generally the first value displayed) or the message 'ERRDR' will be displayed.
- Select the echo for the actual distance and validate the procedure or exit.
- If the message 'ERRDR' is displayed there has been no obstacles identified at the distance entered.

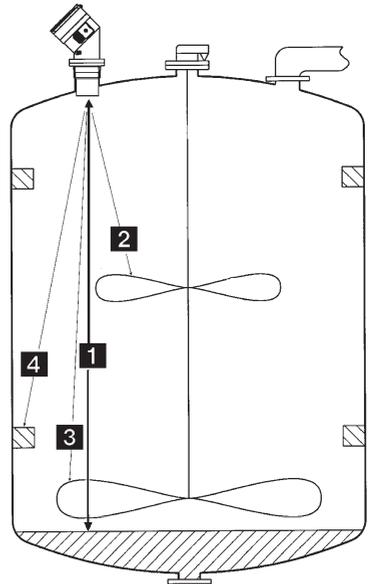


Fig. 4.1 Echo Filtering

NOTE:

After distance "1" has been validated, the transmitter searches for the possible other obstacles ("2", "3" and "4") and memorizes them within the interference table (see the TEST menu). During normal operation the transmitter searches for the level knowing that "2", "3" and "4" correspond to obstacles.

- To assist with the completion of this function a schematical diagram is displayed in the next page.
- The echoes "2", "3" and "4" identified and stored by this procedure can be erased by the reset function within the test menu (interference table) - section 4.5.6.

CALIBRATION MENU

ENGLISH

ECHO



00.00 m



Enter the distance between the base of the sensor and the fluid surface

05.00 m



PROCESS

Process for approx. 10 seconds

Validate and save parameters defined



VALID Y



1 = 5.10 m



2 = 4.80 m



...

N = 4.50 m

Select the echo of the actual distance

TEACH-IN



PROCESS

TEACH-IN



VALID N

TEACH-IN



ERROR



VALID Y

VALID N



4.4.6 Teach-In procedures

The Teach-In function identifies and fixes the relationship between the transmitter display and the real distance, level or volume to ensure accurate measurement.

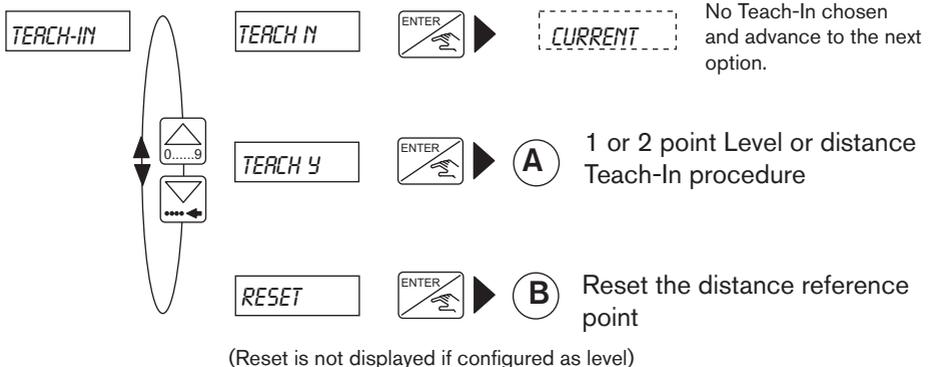
! **The transmitter automatically selects the appropriate Teach-In procedure (distance, level or volume) depending on the configuration and units selected within the engineering units function - section 4.4.2**

- For the Teach-In procedures it is advisable to select either filter 0 or 3 (depending on echo filtering) during the Teach-In procedure for quick calculation of the measure and after select the desired filter.
- If volume has been selected for measurement and gas characteristics have to be defined, follow the procedures below:
- Select distance or level with appropriate units within the engineering units.
- Complete a 2 point Teach-In for identification of the gas characteristics and 'END' the menu to save the parameters.
- Return to the engineering units and select volume and the appropriate units.
- Complete a volume Teach-In to fix the transmitter display and the real distance, level or volume measurement.

4.4.6.1 Teach-In for level and distance

This function allows the relationship between the transmitter and fluid to be defined by distance or level.

- For distance measurement it is not necessary to complete a Teach-In procedure although for accurate measurement it is advised to complete at least a 1 point Teach-In.
- If the transmitter has been configured as level, it is necessary to complete at least a 1 point Teach-In.



A- 1 OR 2 POINT LEVEL OR DISTANCE TEACH-IN PROCEDURE

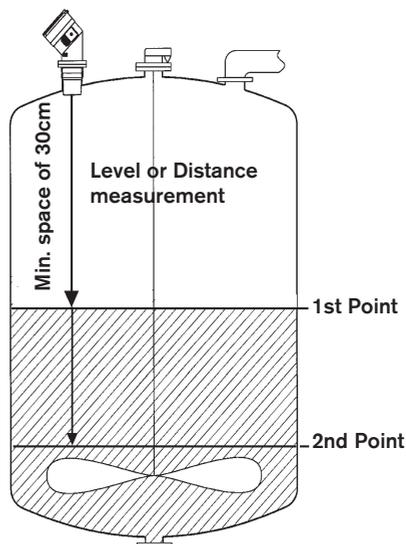
This function identifies the relationship between the transmitter display and real measurements via entering 1 or 2 (point) distance measurements between the fluid and the base of the sensor.

- To obtain the best accuracy it is advised that a 2 point Teach-In is undertaken and the reference points are at the extremity of the application (level at minimum and maximum).
- The 2 point Teach-In will also define the sound velocity within the application if they have not been determined or defined.

Steps for successful measurement:

1 POINT LEVEL OR DISTANCE TEACH-IN:

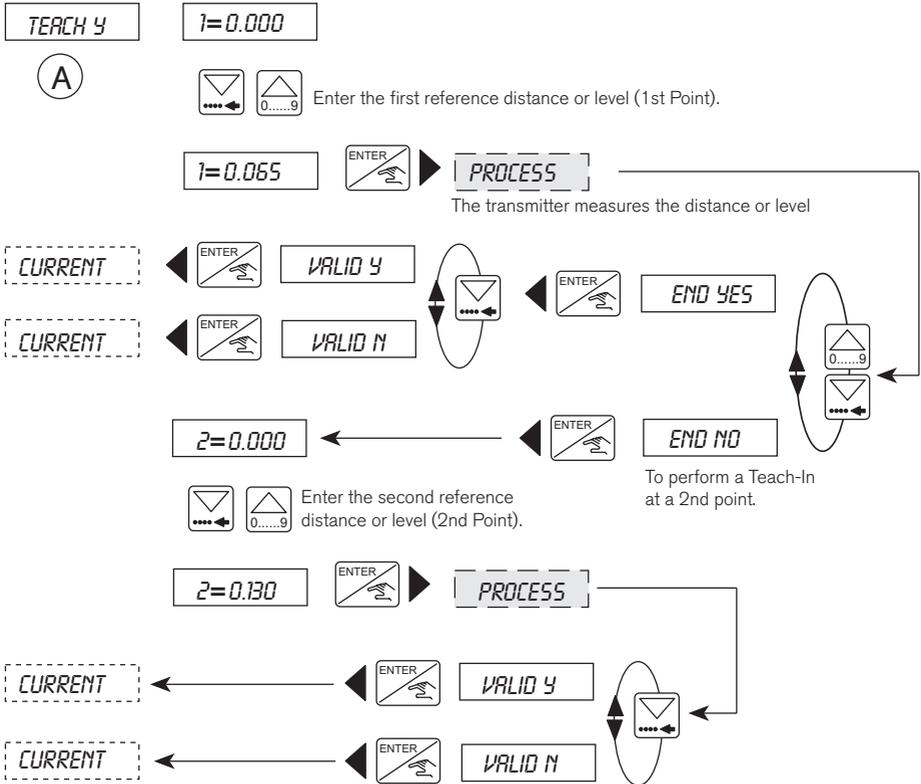
- Bring the fluid to a known distance or level.
- Enter the TEACH-IN function, then select 'TEACH Y'.
- Enter the distance or level of the 1st Point: the transmitter automatically calculates the difference between the entered and measured values (this takes about 3 seconds).
- Now you can choose 'END NO' to perform a 2-point-Teach-in (see next paragraph) for precise measurement.
- Select 'END YES' to exit the 1-point-Teach-in; Here you can validate the 1st measurement by choosing 'VALID Y' or ignore it by selecting 'VALID N'.



2 POINT LEVEL OR DISTANCE TEACH-IN:

- Complete the steps for the 1 point Teach-In although ensure that the reference points are at the extremity of the application (Min. and Max.).
- Select 'END NO'.
- Fill or empty the tank/vessel to the new reference level and measure the distance.
- Enter the distance in the appropriate units and the transmitter will automatically calculate the difference between the distance entered and actual distance measured for a second time. (approx. 3 seconds).
- Select 'VALID Y' to validate the option or ignore and advance to the next parameter.

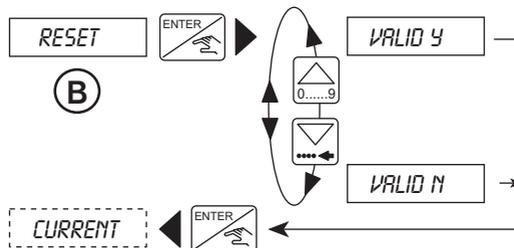
CALIBRATION MENU



B - RESETTING OF THE DISTANCE REFERENCE POINT

This function is only available if the transmitter has been configured for distance measurement. Within this option it is possible to erase any user defined reference point and return to the 'default' reference point - the base of the sensor.

On receiving the transmitter the reference point will be configured as the base of the sensor.



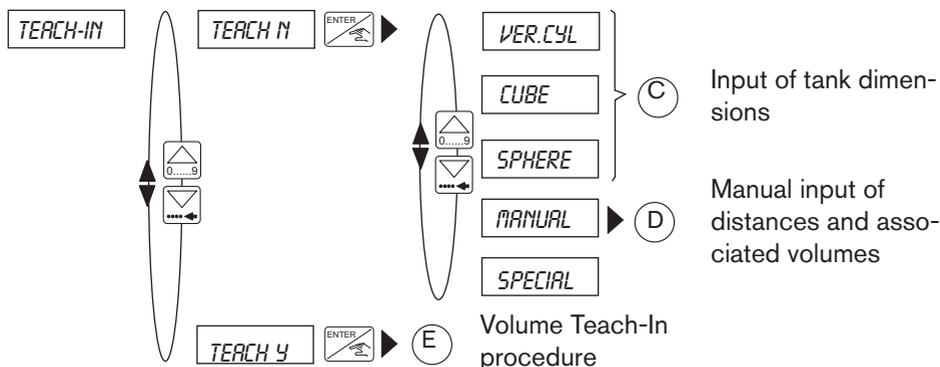
CALIBRATION MENU

4.4.6.2 Teach-In for volume

This function allows the relationship between the transmitter display and real measurement to be defined by volume. This can be completed by entering:

- The dimensions of the tank or vessel (for regular shaped tanks and vessels only) - (C) or
- The input of up to 12 distances and associated volumes (for irregular tanks or vessels) - (D) or
- The input of up to 12 known volumes with distance measurement by the transmitter - (E)

Please pay attention to the units selected and the measured values entered within this option as the transmitter only uses meters and feet to calculate the volume.



(C) - INPUT OF TANK DIMENSIONS

This function identifies the relationship by entering the dimensions of the tank/vessel and the present volume.

- Within this function it is possible to select 1 of 5 options depending on the application and shape of the tank/vessel.
- Select one of the pre-determined shapes - 'VER CYL', 'CUBE' or 'SPHERE' and enter the dimensions required.
- If 'MANUAL' is selected the transmitter automatically advances to the next option D to allow the user to manually input the distance measurements with associated volumes.
- The option 'SPECIAL' allows the user to select the last type E volume Teach-In procedure completed.

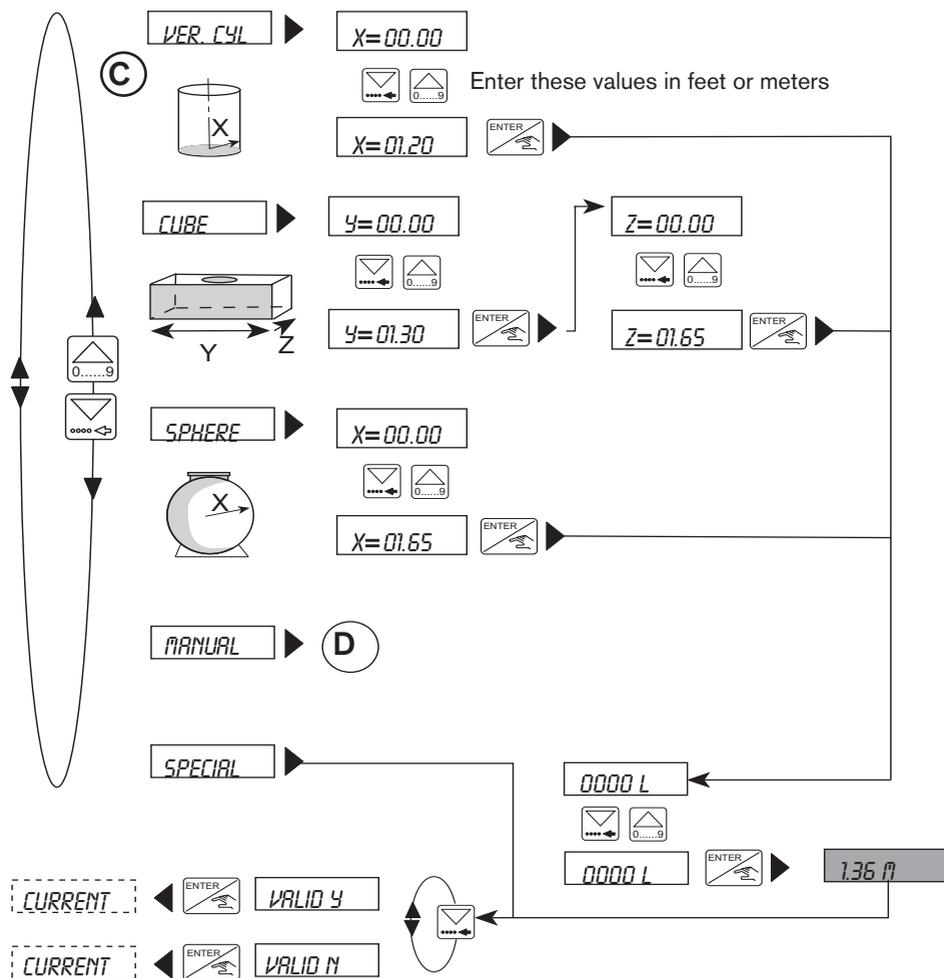
This procedure allows the transmitter to compute the volume of the liquid contained in the tank/vessel according to the measured level of the fluid.

CALIBRATION MENU

- The diagram below displays the available options and the information required in the following format;

X = Radius
 Y = Length
 Z = Width.

- Enter the dimensions of the tank, then enter the actual present volume within the tank or vessel and the transmitter will automatically measure the distance and display the value.
- If an horizontal cylinder is to be used pre-calculate the values by using the table within section 6.2. After select and complete a manual input of distances and associated volumes procedure D by entering the values identified.



CALIBRATION MENU

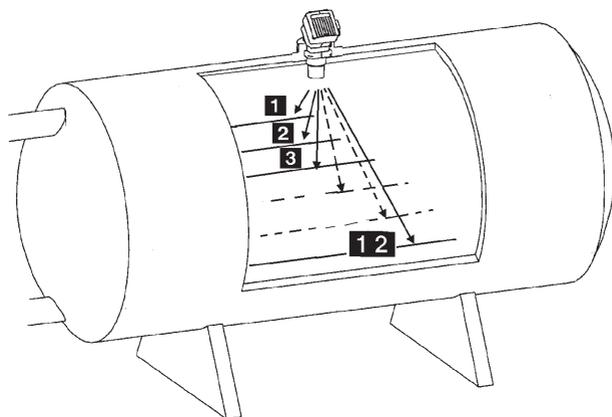
D - MANUAL INPUT OF DISTANCES AND ASSOCIATED VOLUMES

This function uses distances between the base of the sensor, fluid surface and associated volumes to fix the relationship between the transmitter display and real measurement.

- This function allows upto 12 individual distance and associated volume measurements to be entered.
- This option is generally used for irregular shaped tanks and vessels as it allows the input of individual distances and volumes.
- This function can be completed before the transmitter is installed onto the fitting.
- The accuracy of this function is highly dependent on the selected reference points according to the shape of the tank or vessel.

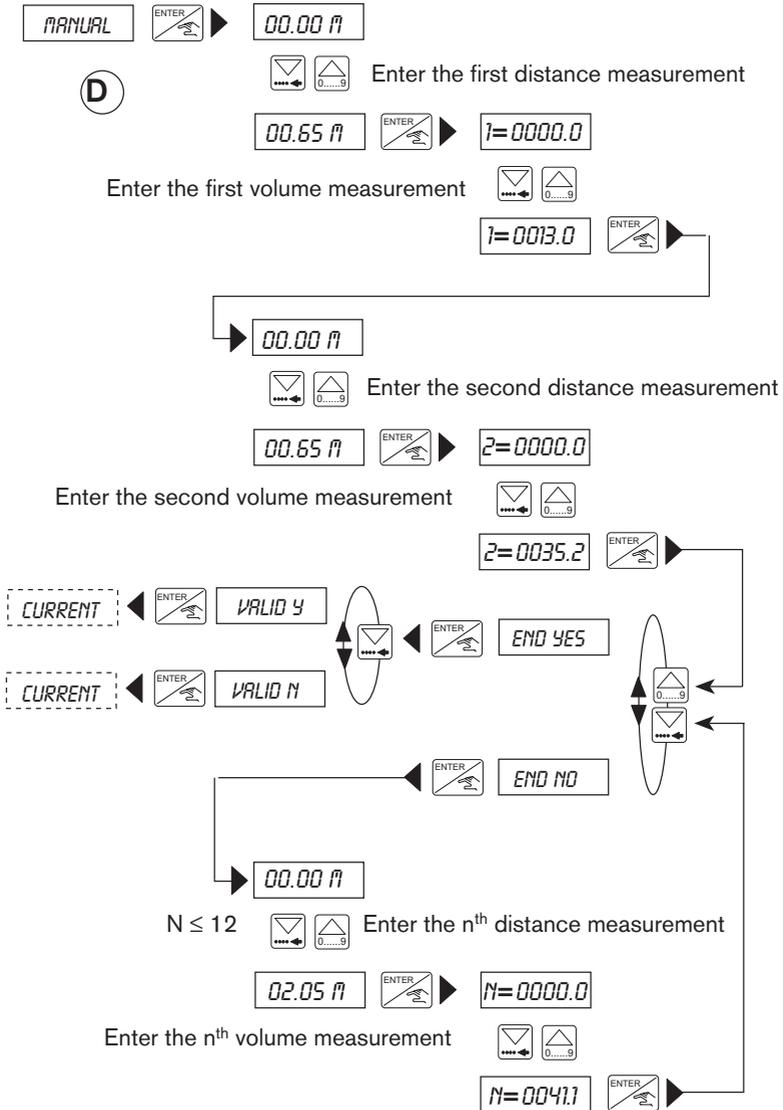
Steps for successful measurement:

- Identify at least 2 reference points according to the shape of the tank or vessel for measuring the distances and entering the associated volumes.
- The values can be entered in either an increasing or decreasing order although the maximum volume which can be entered is 599.99m^3 or 5999.9 litre/Gal.
- Select 'MANUAL' within the 'Input of Tank Dimensions' menu  and press enter.
- Enter the first distance measurement and press enter.
- Enter the associated volume which corresponds to the distance entered previously and press enter.
- Repeat the last 2 steps of entering the distance and associated volume.
- After entering the 2nd associated volume it is possible to quit the function by selecting 'END YES' and select to validate the option or ignore and advance to the next function. Alternatively it is possible to continue and enter a distance measurement and associated volume by selecting 'END NO' when the option appears. This can be repeated to enter a total of 12 measurements.



CALIBRATION MENU

If an incorrect value is entered, select 'END YES' and validate the measurements entered. Within the main menu (calibration) select 'END', then re-enter the menu and function and repeat the input of the measurements starting at the incorrect value.



- This option enables to display volume in a percentage for example or in alternative units. The units selected must then not be taken into account.
- In the same way, the 8175 can be used to display the flow rate within open channels.

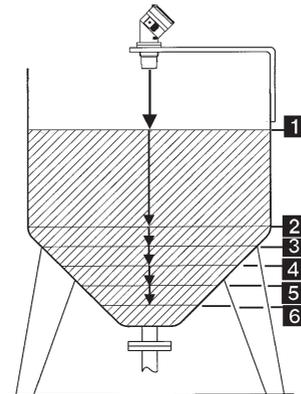
E - VOLUME TEACH-IN PROCEDURE

This function identifies the distance between the base of the sensor and fluid surface and associated volumes are entered to fix the relationship between the transmitter display and real measurement.

- This function allows upto 12 individual associated volume measurements to be entered in relation to the distance measured by the transmitter.
- To perform this function the associated volumes must be known in relation to the measured distance.
- The accuracy of this function is highly dependent on the selected reference points according to the shape of the tank or vessel. (see diagram below)

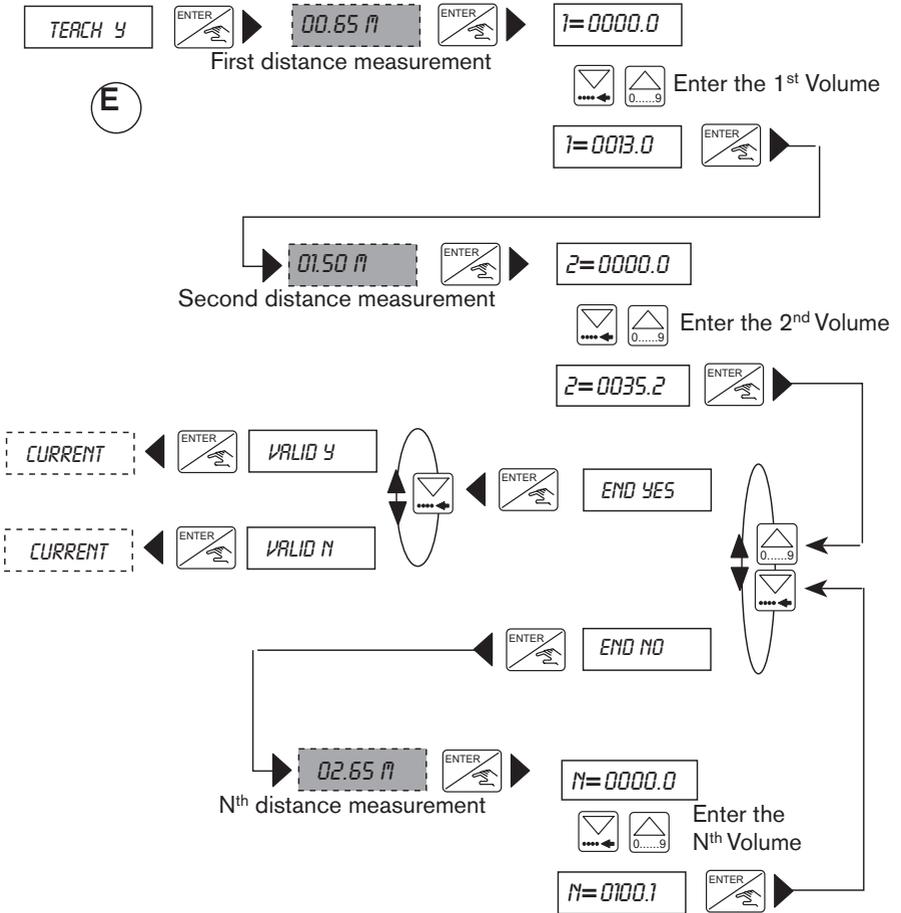
Steps for successful measurement:

- Identify at least 2 reference points according to the shape of the tank or vessel for entering the associated volume to the measured distance given by the transmitter.
- The tank or vessel can be filled or emptied for each reference point although the maximum volume which can be entered is 599.9m³ or 5999.9 litre/Gal.
- Select '*TEACH Y*' on entering the Teach-In function and press enter.
- The transmitter will automatically calculate the first distance measurement.
- If the distance measurement is correct, press 'enter' and insert the volume associated to the measured distance and press enter.
- The previous 2 steps will be repeated automatically as the transmitter requires at least 2 reference points.
- After entering the 2nd associated volume it is possible to quit the function by selecting '*END YES*' and select '*VALID Y*' to validate the option or ignore and advance to the next function. Alternatively it is possible to continue and enter associated volumes by selecting '*END NO*'. This can be repeated to enter a total of 12 measurements.



CALIBRATION MENU

If an incorrect value is entered the whole procedure will have to be repeated, starting at the first measuring point. The previous values entered will not be available for consultation, so it is recommended that the values are written down during this procedure.



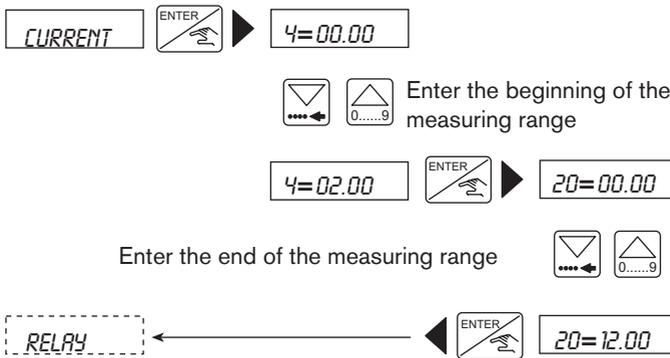
CALIBRATION MENU

ENGLISH

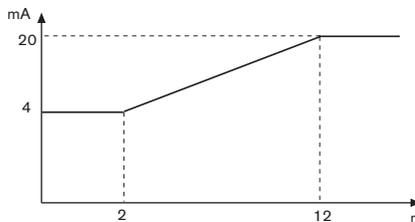
4.4.7 Output Current

Within this option the measuring range can be defined corresponding to the output current of 4-20 mA.

- The beginning of the measuring range might be larger than the end creating an inverted signal, e.g. 0.5 to 6m corresponds to 20-4 mA.
- The engineering units and decimal point selected will be valid within this option.
- The basic setting of the span and offset can be checked within the test menu.



- In case of signal loss the device will emit an error signal of 22mA.
- The diagram below shows the type of relationship between the 4-20mA output and the associated measuring range.



4.4.8 Relay (option)

The parameter definition of the limit contacts is completed within this function. Two limit values are entered for each relay : 1 -, 1 + and 2 -, 2 +. The transmitter also has the option to invert the relays and to set a delay time between 0 and 180 seconds. This delay shall prevent the relays from being activated too quickly. If the measured value exceeds a limit value, the transmitter will wait for the designated delay time before activating the relay. If the value does not exceed the limit value after the delay time, the relay will not be activated.

The unit and decimal point for level, distance, volume or temperature are activated within this option as selected within the «LIMIT» menu (see section 4.4.2).



The following conditions must be observed: $1- \leq 1+$, $2- \leq 2+$.

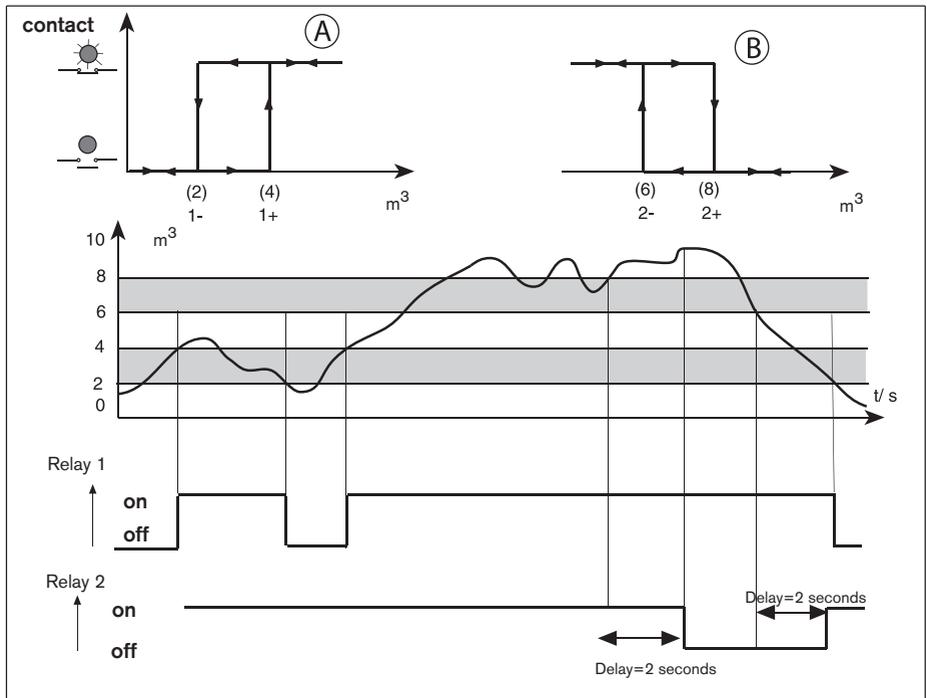
Example

A Relay 1 : Non inverted with thresholds of 2 and 4 m³ and no delay.

B Relay 2 : Inverted with thresholds of 6 and 8 m³ and delay of 2 Sec.

1- and 2- = the low settings for both relays

1+ and 2+ = the high settings for both relays

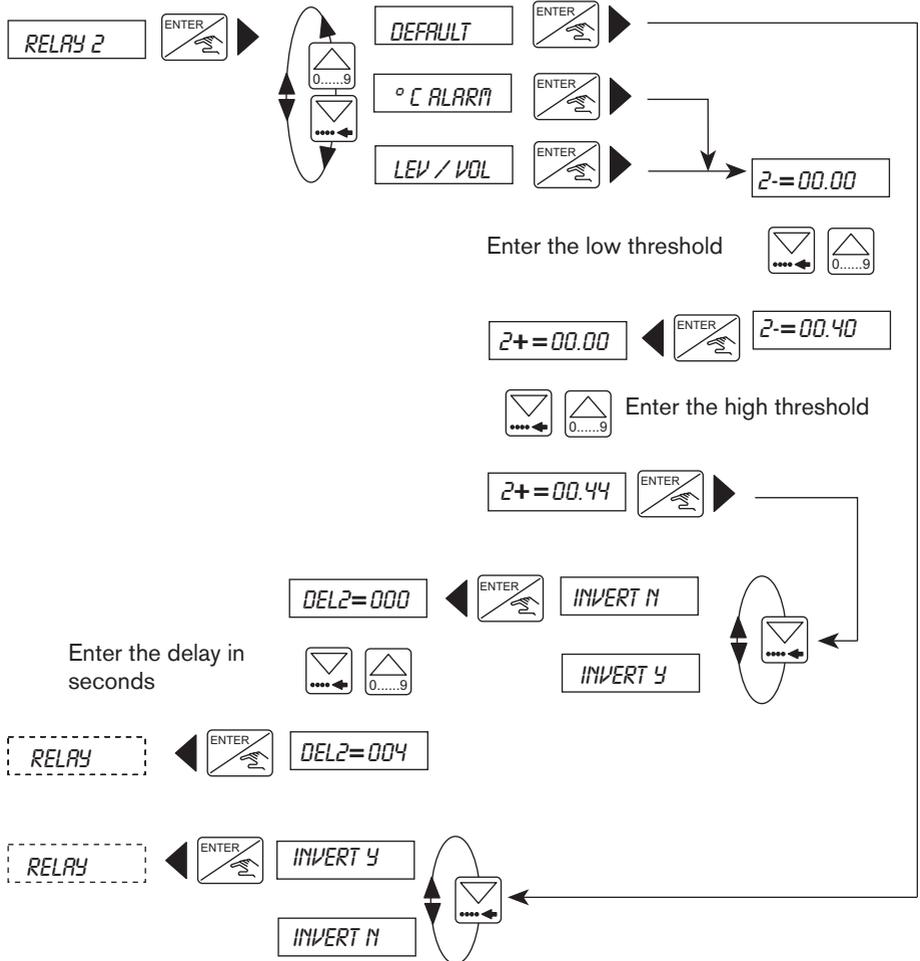


CALIBRATION MENU

4.4.8.2 Relay 2

Relay 2 may be configured as a distance, level, volume switch/alarm or temperature general alarm signalling a signal loss or power supply failure.

- If relay 2 is configured as a signal loss alarm (default), ensure that the final state of the relay is in the safe state. For example: In case of a power failure alarm invert the relay and set a delay time greater than 10 seconds in order to avoid false alarms.
- The delay of the alarm if in 'default' is set within the filter function - section 4.4.3.



TEST MENU

4.5 TEST MENU

PRESS    SIMULTANEOUSLY FOR 5 SECONDS

The following parameters are selected and set within this menu:

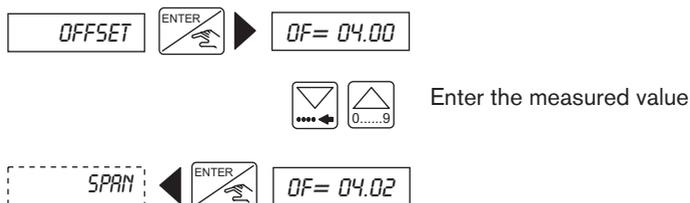
Function	Section	
<i>OFFSET</i>	Zero point compensation (4 mA).	4.5.1
<i>SPAN</i>	Span compensation (20 mA).	4.5.2
<i>T° ADJUST</i>	Temperature correction +/- 15°C .	4.5.3
 <i>SIGNAL</i>	Display of the returned signal strength.	4.5.4
<i>SIMUL</i>	Input of the level, volume or temperature to be simulated. The current and relay outputs will react according to this value.	4.5.5
<i>RESET</i>	Reset of the device to the factory settings and resetting of the echo filtering table (see 4.4.5).	4.5.6
<i>END</i>	Return to the main menu and store the new parameters. If one of the two values for <i>OFFSET</i> and <i>SPAN</i> is inappropriate, the device will automatically return to the « <i>OFFSET</i> » parameter and new values must be entered.	

The following sections explain how to change and investigate the parameter values within the test menu above.

4.5.1 Offset Compensation

Within this option the user has the possibility of correcting the basic setting of 4 mA generated by the transmitter. The transmitter generates a value of 4mA by pressing  when «OFFSET» is displayed within the main test menu.

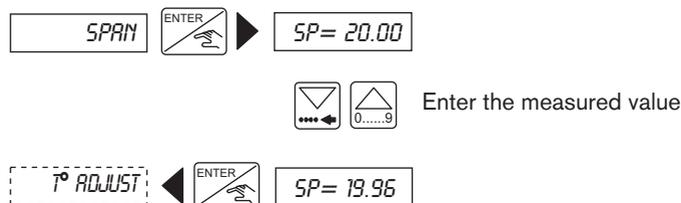
Measure the generated current with an ammeter. If the displayed value is incorrect it can be corrected by entering the measured value on the ammeter.



4.5.2 Span Compensation

Span compensation provides the option of changing the basic setting of 20 mA. The procedure is identical to that of the offset compensation above. The transmitter generates 20mA if the  key is pressed when «SPAN» is displayed within the main test menu.

Measure the generated current with an ammeter. If the displayed value is incorrect it can be corrected by entering the measured value on the ammeter.

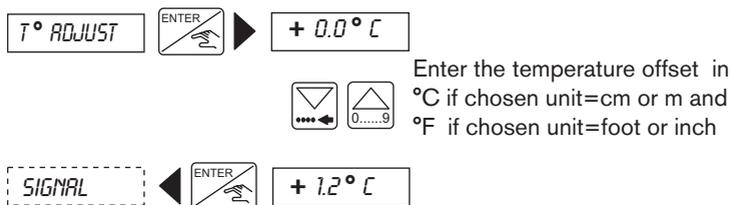


TEST MENU

4.5.3 Temperature adjustment

The 8175 level transmitter possesses a temperature probe within the sensor. The value from this sensor can be influenced by an offset entered within this option. To enter a desired offset press  when «T ° ADJUST» is displayed within the test menu and enter the value.

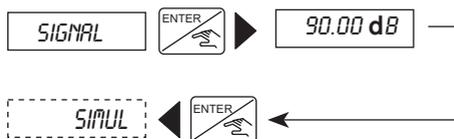
- The offset range is + or - 15°C.
- The temperature adjustment remains active until another temperature value is entered.



4.5.4 STRENGTH OF RETURN SIGNAL

This function allows the power of the ultrasonic echo received by the sensor to be viewed. When the optimum signal strength is 90 dB the transmitter has a measuring range of 7m for the remote version and 10m for compact version. The strength of this signal is maximum if the temperature of the gas and liquid are equal or the surface of the fluid is calm.

This measure is useful to determine the best orientation of the transmitter during installation. The best orientation is reached when the signal strength is at the highest value possible.

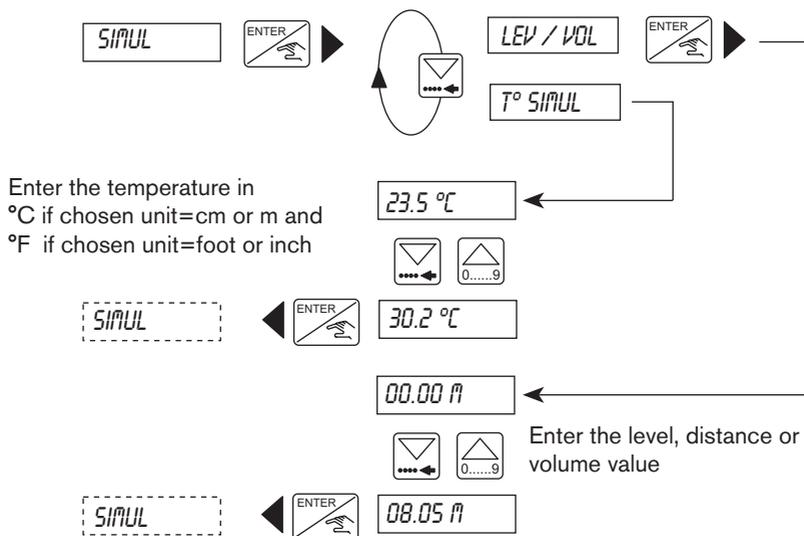


TEST MENU

4.5.5 Simulation of the level or temperature

A level or temperature can be simulated within this function which allows the control system to be tested whatever the conditions of the tank or vessel. The simulated value influences the current output including the relays.

The units and decimal points selected within the engineering units are valid within this function.



Press  or  to quit the Simulation sub-menu and let the output be automatically determined by the transmitter according to the application.

TEST MENU

ENGLISH

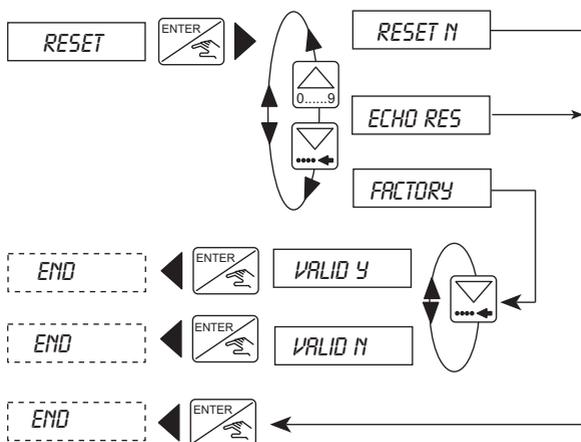
4.5.6 Resetting of the transmitter

Within this function it is possible to erase the interference signals identified within the echo filtering function or return to the factory settings displayed on the next page.

If a filter value of 0 to 2 is selected within the option 'ECHO RES' will not be displayed.



If the resetting of the transmitter to the factory settings is selected it is important to note that the procedure is irreversible.



4.6 8175 SETTINGS

The 8175 ultrasonic level transmitter is calibrated within the factory before delivery to the settings shown in the table below.

4.6.1 Factory settings of the Ultrasonic level transmitter 8175 at delivery

Language:	English	Relay:	1-:	00.00
Measure / Unit	Distance M		1+:	00.00
	Temperature °C		Del1:	0 s
Decimal points:	2		Invert:	NO
			2-:	00.00
Current: 4 mA:	00.00		2+:	00.00
20 mA:	00.00		Del2:	0 s
Gas Comp.: V=	331,4 m/s		Invert:	NO
(air at 0°C) T°=	0,59 m/s/°C			
Filter:	0			
Dela:	10 s			

4.6.2 User settings of the Ultrasonic level transmitter 8175

ORDER CODE:

SERIAL NO:

Language:	.....	Relay:	1-:	.....
Measure / Unit	.....		1+:	.....
	.....		Del1:	.....s
Decimal points:	.....		Invert:	.....
Current: 4 mA:	.....		2-:	.....
20 mA:	.....		2+:	.....
Gas Comp.: V=	.....		Del2:	.....s
(air at 0°C) T°=	.....		Invert:	.....
Filter:	.....		
Dela:	.....		

MAINTENANCE

5.1 STORING AND CLEANING OF THE SENSOR

Ultrasonic level sensors do not require any special maintenance, however, the bottom of the sensor must not be covered by sediments. If necessary the sensor can be easily cleaned using a soft bristled brush and detergent compatible with PVDF. Do not use harsh abrasive brushes or solutions which may damage the PVDF sensor enclosure.



Ensure that the tank / pipe does not contain any fluid or pressure before dismounting.

5.2 TROUBLE SHOOTING GUIDE

This section is designed to assist with problems which may occur during installation or operation. If in doubt, please do not hesitate to contact your local Bürkert subsidiary.

Faults	Status	Actions	See
The transmitter does not work			
- Transmitter connected?	No	Connect the device	3.3
- Fuses OK ?	No	Change the fuses	--
- Switch ON?	No	Set the switch to ON	--
- Power supply on terminals IN+ and IN- OK?	No	Check the connection	3.3
Transmitter programming unavailable Switch SW1 set to the left (ENTER key locked)?	Yes	Set SW1 switch to the right	3.3
Display «ERROR»			
- Display at the start-up (EEPROM failure)?	Yes	Restart the device	--
- Error at each start-up?	Yes	Send the device back to Bürkert	--
- Display after validation of the menu (EEPROM failure)?	Yes	Configure the device again	4.4
- Failure at each validation of the menu?	Yes	Send the device back to Bürkert	--
- Display within the Teach-In mode?	Yes	Perform a new Teach-in	4.4.6
Display «--- °C» or «--- °F»			
- Fluid temperature between -40 and +80 °C?	No	Device out of range	--
- Connector for Pt1000 connected? (open the transmitter)	No	Connect the Pt1000	--
Blinking display of the transmitter			
- Blinking unit? (m, cm, pouce, pied, m ³ , l, US Gal, IMP Gal)	Yes	Perform an echo reset	4.5.6
- Blinking of the whole display?	Yes	Check the connection of connectors	3.3
Current output of 22 mA			
- Fluid temperature between -40 and +80 °C?	No	Device out of range	--
- Display blinking?	Yes	See above	4.5.6
- Display message "ERROR"?	Yes	Re-calibrate the device	4.4
Current output value zero or different from the display			
- SW2 correctly set (sinking or sourcing)?	No	Modify SW2	3.3
- Connection of the current output OK?	No	Connect current output	3.3
- Failure < 1 mA?	Yes	Set the offset and span	4.5

MAINTENANCE

Faults	Status	Actions	See
Fixed current output value (4 or 20 mA) Parameters for current output OK?	No	Program the current output	4.4.7
The devices connected to the relays do not work - Relay parameters OK? (threshold, inversion and delay) - Relays correctly connected? - Connection of relays 1 et 2 inverted? - Protection fuses for the relays OK?	No No Yes No	Program the relay output again Connect relays Connect relays accordingly Change fuses	4.4.8 4.4.8 4.4.8 --



If any problems persist, please contact your local Bürkert subsidiary or return the product with a full explanation of the problem.

SPECIFICATIONS

6.1 SPECIFICATIONS

Specifications in relation to the process

Measurement

Measurement type	Level, distance or volume measurement
Measurement range	0.30 to 10 meters compact version and 0.30 to 7 meters wall and panel versions
Measurement range in the following conditions:	Measure of the fluid without foam, Tambient = 20°C ; Tfluid = 20°C Ambient pressure value : atmospheric pressure
Accuracy	+/- 0.25% of the full scale +/- 0.15% after calibration with Teach-In
Resolution	+/- 3mm
Full beam width	8 degrees conical
Pulse rate	8 pulses per second
Blocking distance	30 cm from the base of the sensor

Installation

Pressure rating	2 bar at 25°C maximum
Mounting threads	G 2" or NPT 2"
Fluid temperature	-40 to +80°C / -40 to +176°F
Gasket material	FPM or EPDM (option)

Specifications in relation to the outputs

Electrical connection

Power supply	18-32VDC 115/230 VAC 50-60Hz (+/- 10% VAC only)
Consumption	200mA maximum

Proportional output

Output type	Current output of 4-20mA (22mA error signal)
Accuracy	+ / - 2%
Wiring	Sinking or sourcing
Maximum load	1300 Ohms at 32V 1000 Ohms at 24V 550 Ohms at 18V
Output calibration	4-20mA or inverted to 20-4mA adjustable

Relay output

Output type	2 relays (3A), normally open
Load	DC : 250V, 3A AC : 250V, 3A
Life expectancy	100 000 cycles (minimum)
Switching	Thresholds, hysteresis and delay programmable

SPECIFICATIONS

Specifications in relation to the user

User's interface

Display	8 digits alphanumeric LCD 9mm high
Display :	
Current output	Generated current indication : xx.xx mA
Relay state	Red LED's on when contact is closed
Programming	Menus with 3 programming keys
Protection	Lockable switch for the 'Enter' key

Specifications in relation to the environment

Ambient conditions

Storing and operating temperature	-20 to +60°C / -4 to +140°F -40 to +80°C / -40 to +176°F (for the remote sensor)
Humidity	Maximum of 80%, non condensated
Enclosure protection rating	IP65 (Compact, Wall & Panel front) IP20 (Interior of panel version)
Sensor 8170 protection rating	IP67

Construction

Dimensions maximum	See section 6.3
Weight	1kg maximum

Materials

Electronic housing	PC (glass reinforced fiber) (compact and panel-mounted versions) ABS (Wall version)
Front foil	Polyester
Sensor 8170	PVDF /POM

Conformity to standards

Emission	According to generic norm EN 50081.1
Immunity	According to generic norm EN 50082.2
Safety	According to safety regulations for measuring instruments for regulation and laboratory NF EN 61010-1

6.2 HORIZONTAL CYLINDRICAL TANK VALUE CONVERSIONS

For the calculation and input of the measured values for a horizontal cylindrical tank, both the level % and Volume % relationships have to be calculated and then entered within the manual input of distances and associated volumes procedure.

To calculate the values a table below has been provided to assist with the calculations.

Level in %	Level (chosen unit)	Volume in %	Volume (chosen unit)
0		0,00	
10		5,20	
20		14,24	
30		25,23	
40		37,35	
50		50,00	
60		61,64	
70		74,77	
80		85,76	
90		94,79	
100		100,00	

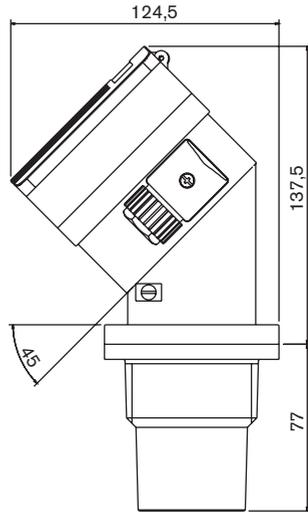
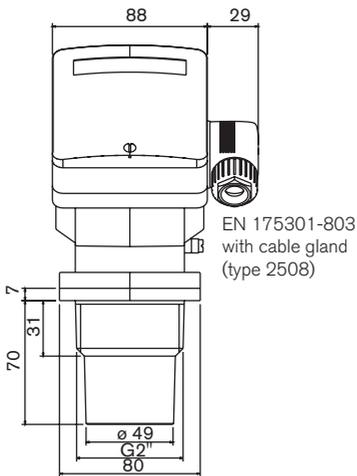
Steps for value calculation

- Identify the maximum and minimum level and volume for the application.
- Enter the maximum (100%) and minimum (0%) volume and level within the table.
- Calculate the level values at the respective level percentages for the application (90% - 0%).
- Calculate the volume values for the respective volume percentages by multiplying the maximum volume of the application by the volume % within the table and dividing by 100.

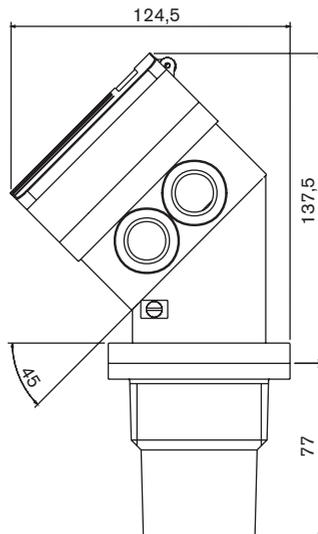
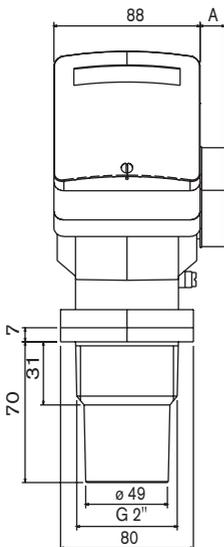
After calculating the values perform a volume Teach-In - D.

6.3 DIMENSIONS

Cable plug version (in mm):



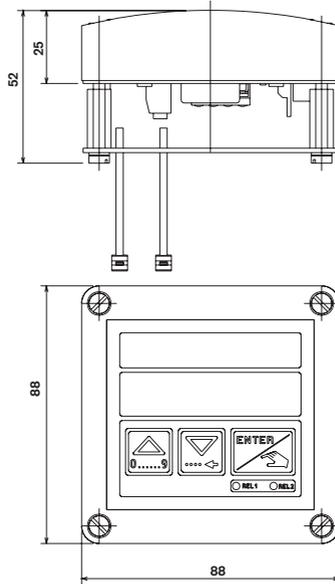
Cable gland & NPT 1/2" versions (in mm):



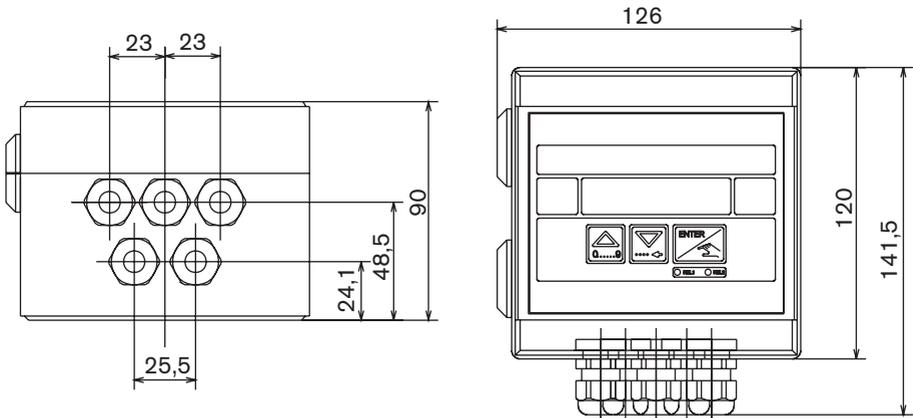
The dimension 'A' will vary depending on the type of connection selected -
Cable gland = 28mm and NPT 1/2" = 15mm.

INFORMATION

Panel mounted
version (in mm):

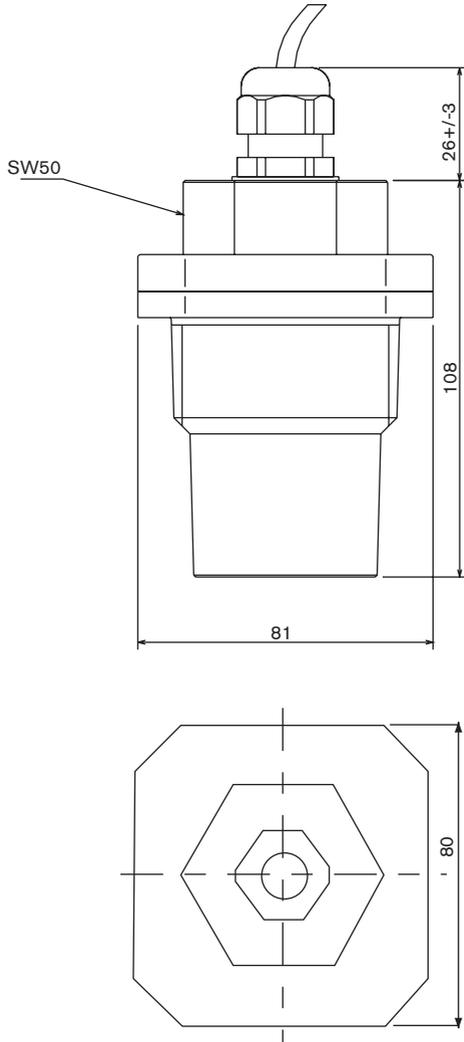


Wall mounted
version (in mm):



INFORMATION

8170 Sensor (in mm):



6.4 DESIGN AND MEASURING PRINCIPLE

6.4.1 Design

The ultrasonic level transmitter 8175 compact combines an ultrasonic sensor and a transducer with display.

Alternatively the 8175 wall and panel versions integrate the ultrasonic sensor 8170 to provide a remote version.

The output signals are provided via a connector or two cable glands.

Option: 2 additional relays, which limit values are freely adjustable. The relay 2 may be used for signal loss control.

6.4.2 Ultrasonic Technology

Ultrasonic sound waves are generated 8 times per second. Sound waves can move with low attenuation in the air, but are reflected by any liquid or solid state surface. Between two consecutive emissions, advanced signal processing techniques, including air temperature adjustment and noise rejection ensures the return of the echo signals. Time of flight between emitted and received signal is measured with high accuracy and converted in distance (or volume) by the internal microprocessor.



The level transmitter or sensor 8175 / 8170 are designed for liquid level measurement. It is the user responsibility to test the functionality of the device for any other material such as powders, granulas etc.

6.4.3 Signal Output

The 8175 ultrasonic transmitter is powered with 18-32VDC or 115/230VAC and features a 3-wire, 4-20 mA output. In addition the 3 A relay output can be configured as an alarm or for automatic fill or empty operations.

6.5 STANDARD DELIVERY

From a standard delivery you should have received the following:

COMPACT VERSION:

- 1 8175 level transmitter
- 1 Instruction Manual (3 languages)

SEPARATE VERSION:

- 1 8175 level transmitter (wall or panel version)
- 1 8170 sensor
- 1 Instruction Manual (3 languages)

6.6 TYPE SPECIFICATION

Transmitter 8175, compact, with 4-20 mA output, Worldwide versions

Power supply	Relays	Mounting thread	Electrical connection	Order code
18-32 VDC	No	G 2"	EN 175301-803	430822
18-32 VDC	No	G 2"	2 x M20x1,5 ¹⁾	430823
18-32 VDC	2	G 2"	2 x M20x1,5 ¹⁾	430824
115/230 VAC	No	G 2"	2 x M20x1,5 ¹⁾	430825
115/230 VAC	2	G 2"	2 x M20x1,5 ¹⁾	430826

¹⁾ M20x1,5 = cable gland for cables with \varnothing 6-12 mm

Transmitter 8175, compact, with 4-20 mA output, North-american versions

Power supply	Relays	Mounting thread	Electrical connection	Order code
18-32 VDC	No	NPT 2"	EN 175301-803	430827
18-32 VDC	No	NPT 2"	2 x NPT 1/2"	430828
18-32 VDC	2	NPT 2"	2 x NPT 1/2"	430829
115/230 VAC	No	NPT 2"	2 x NPT 1/2"	430830
115/230 VAC	2	NPT 2"	2 x NPT 1/2"	430831

Transmitter 8175, panel-mounted, with 4-20 mA output, Worldwide and North-American Versions

Power supply	Relays	Electrical connection	Order code
18-32 VDC	No	Terminal strip	436567
18-32 VDC	2	Terminal strip	436568

Transmitter 8175, wall-mounted, with 4-20 mA output, Worldwide and North-American Versions

Power supply	Relays	Electrical connection	Order code
18-32 VDC	No	5 x M16x1,5 ²⁾	436569
18-32 VDC	2	5 x M16x1,5 ²⁾	436570
115/230 VAC	No	5 x M16x1,5 ²⁾	437339
115/230 VAC	2	5 x M16x1,5 ²⁾	437340

²⁾ M16x1,5 = cable gland for cables with \varnothing 4-8 mm

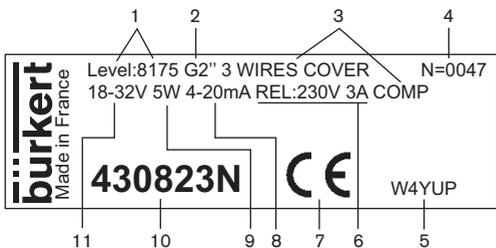
Sensor 8170, Worldwide and North-American Versions

Mounting thread	Cable length	Electrical connection	Order code
G 2"	10 m	1 x M16x1,5 + 1 x M20x1,5 ³⁾	436563
G 2"	20 m	1 x M16x1,5 + 1 x M20x1,5 ³⁾	436564
NPT 2"	10 m	1 x M16x1,5 + 1 x M20x1,5 ³⁾	436565
NPT 2"	20 m	1 x M16x1,5 + 1 x M20x1,5 ³⁾	436566

³⁾ M20x1,5 = cable gland for cables with \varnothing 6-12 mm
M16x1,5 = cable gland for cables with \varnothing 4-8 mm

INFORMATION

6.7 LABEL TYPE 8175



- 1 Measured quantity and product type
- 2 Process connection
- 3 Type specification
- 4 Serial number
- 5 (Factory internal N°)
- 6 Relay characteristics
- 7 CE mark
- 8 Output current
- 9 Current consumption
- 10 Order code
- 11 Power supply

6.8 SPARE PARTS LIST

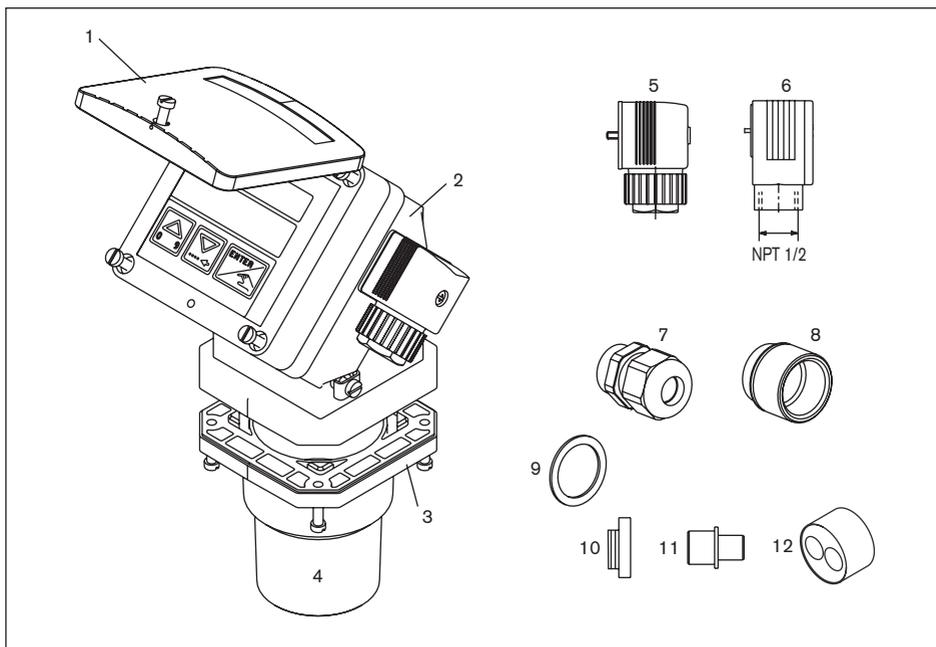


Fig. 6.1 Spare parts diagram of the 8175 ultrasonic level transmitter

INFORMATION

Position	Description	Order code
1	PC cover with screws and window	553189
	Cover with screws, front foil and electronic board for panel version without relay	448821
	Cover with screws, front foil and electronic board for panel version with relays	448822
2	Housing for version with plug EN 175301-803	448392
	Housing for version with 2 M20x1,5 cable glands	430833
	Housing for wall-mounted version without relay nor electronic board	448823
	Housing for wall-mounted version with relays, without electronic board	448824
3	FPM gasket	448818
	EPDM gasket	448819
4	Sensor for fitting G2"	448394
	Sensor for fitting NPT 2"	448817
5	Cable plug EN 175301-803, with cable gland (type 2508)	438811
6	Cable plug EN 175301-803 with NPT 1/2" reduction (type 2509)	162673
7+9+10+12	Set incl. 2 x M20x1,5 cable glands + 2 neoprene flat gaskets for cable glands or screwed plugs + 2 x M20x1,5 screwed plugs + 2 multiway seals, 2x6 mm	449755
8+9+10	Set incl. 2 x M20x1,5 / NPT1/2" reductions (mounted gasket) + 2 neoprene flat gaskets for screwed plugs + 2 x M20x1,5 screwed plugs	551782
10+11+12	Set incl. 1 x M20x1,5 cable gland obturator + 1 multiway seal, 2x6 mm, for cable glands + 1 black EPDM gasket (unused) + 1 mounting instruction sheet	551775
	Power supply board, 115/230 VAC, for compact transmitter	448393
	Power supply board, 115/230 VAC, for wall-mounted transmitter	448827
	Electronic board for a compact transmitter without relay	553175
	Electronic board for a compact transmitter with relays	553176
	Electronic board for a wall-mounted transmitter without relay	448825
	Electronic board for a wall-mounted transmitter with relays	448826
	PC nut	619204
	Mounting set for the panel-mounted version	448820

