Manuale Operativo
Operating Manual

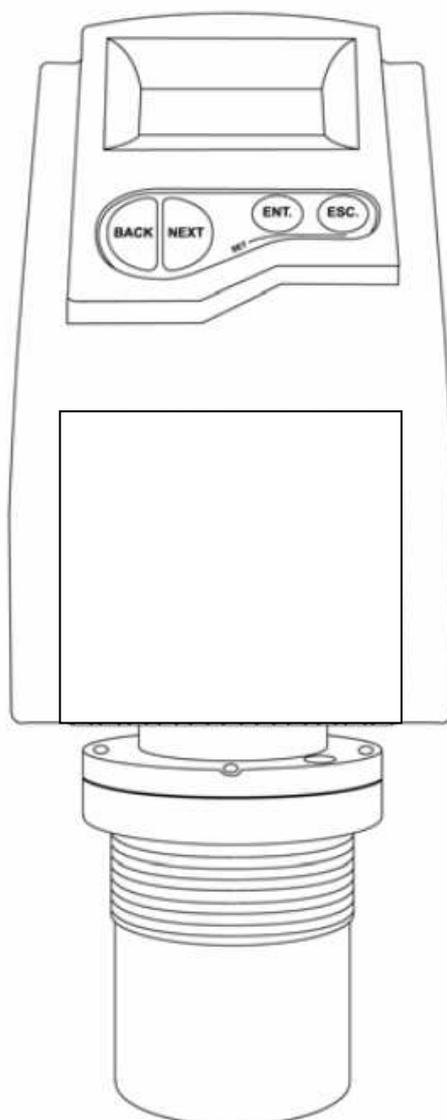## Serie ULG
Trasmettitori di livello ad ultrasuoni
ULG series
Ultrasonic level gauge

CE

valcom®
Sensors & automation systems
for ships & industry

Introduzione

Questo manuale non contiene tutte le informazioni relative ad ogni tipo di apparecchiatura, né prende in considerazione tutti i possibili casi di montaggio, di funzionamento o di manutenzione.
Per maggiori informazioni o per problemi particolari non considerati nel manuale Vi preghiamo di rivolgerVi al nostro ufficio tecnico.
La garanzia é quella prevista nelle ns. condizioni generali di assistenza. Tale garanzia non viene né ampliata né limitata da quanto contenuto in questo manuale.

Attenzione!

Questo strumento deve essere installato ed utilizzato solo da personale qualificato che abbia precedentemente verificato la correttezza della alimentazione in modo che sia in funzionamento normale, sia in caso di guasto dell'impianto o di sue parti nessuna tensione pericolosa possa arrivare all'apparecchiatura. Poiché lo strumento può essere utilizzato sia con alte pressioni sia con sostanze aggressive va tenuto presente che un uso non corretto può portare danni gravi a persone e cose. Un funzionamento corretto e sicuro presuppone un adeguato trasporto, immagazzinamento e montaggio nonché una manutenzione appropriata. E' pertanto necessario affidare l'apparecchiatura a persone che abbiano esperienza con il montaggio, la messa in servizio ed il funzionamento e che siano in possesso dei titoli per svolgere la loro attività con riferimento agli "Standard di Sicurezza".

> La Società si riserva il diritto di modificare il contenuto di questo manuale senza preavviso.

Introduction

This manual does not contain information concerning all type of transmitters or all different installation and/or working and mounting solutions.
For more information or for particular problems not considered in this manual, please address to our technical office.
The warranty period is the one contemplated in our general servicing conditions. This warranty is neither increased nor restricted by the contents of this manual.

Attention!

This instrument has to be installed and used only by qualified persons who have first checked the correctness of supply voltage so that both in standard working conditions and in presence of damages of the plant or of any part of it, no dangerous voltage can reach the instrument.
As the instrument can be utilized both with high pressure values and with aggressive media it must be considered that an incorrect use of it could bring even serious damages to people and things. A correct and safe working needs an adequate transport, stock and mounting other than an appropriate maintenance service. So it is necessary for the people handling these apparatus to have knowledge and experience in mounting, servicing and working and to have title to do their job with reference to "Safety Standards".

> *The Company could modify this manual in any moment without previous advice.*

Rev	Data/Date	Descrizione/Description	Red	Chk	App
0	26/01/09	Emissione	MC	RS	EV

Chapter 1

Introducing ULG

ULG is an ultrasonic, continuous-level measurement gauge of mono-block construction (combining the sensor and electronic components in a single unit). ULG measures the height of both liquids and solids accurately.

It can be used for the following measurement tasks:

✦ Liquid tanks with calm surfaces

✦ Solids tanks that are dust-free

✦ Open channel flow measurement

ULG has a range of up to 15 m (49.21 ft) with an accuracy of 0.25% within that range.

The following diagrams show the front and side views of ULG, and its dimensions:
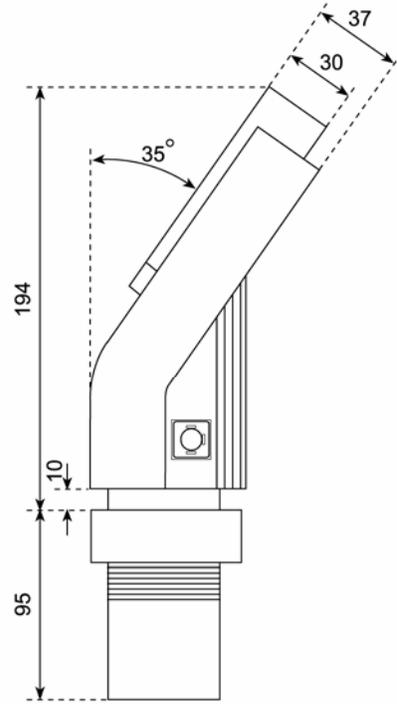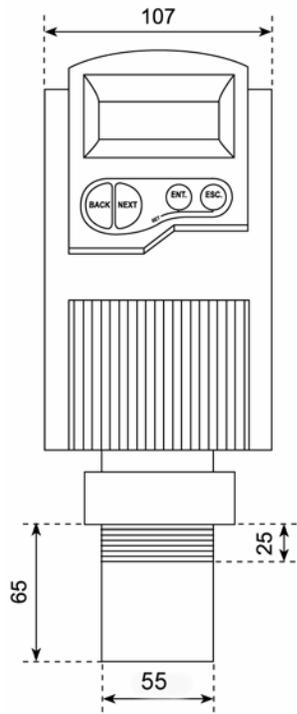

Figure 1: Front View

Figure 2: Side View

Specifications

Accuracy	0.25% of measuring range
Resolution	1 mm (0.04")
Beam angle	5° @ 3db point
Ambient temperature compensation	Automatic

Measuring Ranges

Liquids	Short Range	0.25 m — 5 m 0.82 ft — 16.4 ft
	Standard	0.6 m — 15 m 1.96 ft — 49.2 ft
Solids	Short Range	0.25 m — 5 m 0.82 ft — 16.4 ft
	Standard	0.6 m — 8.5 m 1.96 ft — 27.8 ft
Open channels	Short Range	0.25 m — 5 m 0.82 ft — 16.4 ft
	Standard	0.6 m — 15 m 1.96 ft — 49.2 ft

Mechanical Specifications

Enclosure	IP 65, Mono-block construction. Plastic enclosure: ABS+UV
Pollution degree	2 (as per IEC61010)
Insulation category	II (as per IEC61010)
Wetted parts	Sensor body: PolyProp. PVDF, Coated aluminum (ECTFE) for Solid/Liquid model.
Operating temperature	-40° C to + 70° C (-40° F to +158° F)
Mounting	2" BSP or 2" NPT
Operating pressure	0.9 bar
Dimensions	289 x 107 x 85 mm (11.38 x 4.21 x 3.35")
Weight	Up to 1.4 kg (3.08 lb)

Electrical Specifications

Display	Integral LCD, four digits.
Loop current	4 — 20 mA, 750 Ω @ 28 VDC
Supply	12 — 28 VDC (CE certified)

Sensor Recommendations

Material	Description
Coated Aluminum (Halar®ECTFE)	Designed for complex environments with problematic echoes, such as non-conductive vapors, solids or liquids.
	Good performance in problematic applications.
	Usable in highly acidic or alcoholic environments. High sensitivity to echoes.

Chapter 2

Installing ULG

Precautions

✦ Ensure that ULG is mounted in an area that meets the stated temperature, pressure and technical specifications.

✦ Ensure that high-voltage sources or cables are at least 1 m away from the sensor and its cable.

✦ Use round cables with minimum diameter of 6 - 7 mm to ensure that the unit remains sealed, IP 65.

✦ Ensure that cables are routed correctly and tightened along walls or pipes.

✦ Installation and operation of this product should be performed, according to the Product User Manual and Product Certification. Otherwise the use of this product is prohibited.
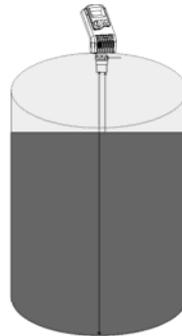
Installing

When installing, ensure that it is:

✦ Mounted above the dead-zone area.

✦ Positioned at least 0.5 m (1.64 ft) away from the tank walls.
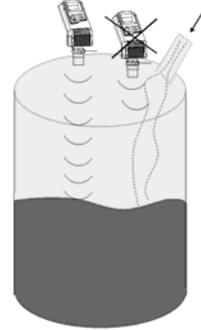
✦ Perpendicular to the surface of the target.

✦ Placed as far as possible from noisy areas, such as a filling inlet.

NOTE:

When installed in a humid environment it is recommended to position the sensor on a tripod on top of the vessel.

Installing on Threaded Flange/Thread-Free Flange

ULG is available in two thread types, 2" BSP or 2" NPT.

ULG can be installed with threaded-flange mounting or with thread-free flange mounting, as shown below:
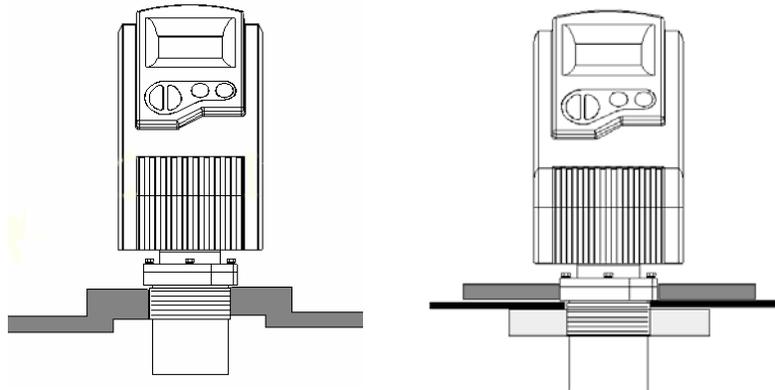

Figure 3: Threaded Flange/Thread-Free Flange Mounting

➢ **To install:**

**1** Insert the threaded end of ULG into the aperture at the top of the tank or pipe.

2 Bolt ULG into place in one of the following ways:

✦ **Threaded-flange mounting**: Screw the unit into a flange with a threaded 2" hole.

✦ **Thread-free mounting**: Place ULG in the flange, and bolt it from within the tank with a 2" locking nut.

Installing ULG via Extension Pipes

If the level of the measured surface falls within the dead-zone area, you should use an extension pipe to mount ULG.

When using an extension pipe, ensure that:

✦ The sensor is positioned in the center of the pipe.

✦ The pipe extension is parallel to the side/tank walls.

✦ The internal pipe diameter is at least 3" wide.
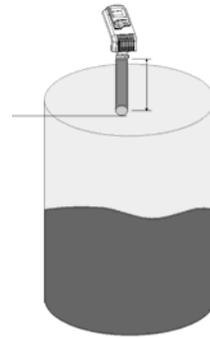
When installing the ULG with extension pipes, follow these specifications:

Pipe Length	Internal Pipe Diameter
0.50 m (1.64 ft)	3"

NOTE:

It is always recommended to use interference signal feature (Pr.03) to locate interfering signals when using an extension pipe.

Connecting the ULG to a Power Cable

Using a connector

1 Remove the retaining screw from the electrical connector.

2 Remove the male part.

3 Separate the plastic electrical connector shell from the wiring block.

4 Connect the +24V wire to Terminal 1, connect the -24V wire to Terminal 2 on the Wiring Block.

5 Snap the electrical connector wiring block back into the electrical connector shell.

6 Pull the electrical connector to the socket plug and fasten with the retaining screw provided.
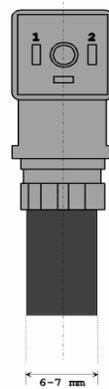

Figure 4: Connector Front View

NOTE:
The cable for the mating connector must be at least 6 mm in diameter.

Using a conduit

1 Remove the four retaining screws from the conduit adapter cover.

2 Pull the electrical wires through the 1/2" NPT/ M20 conduit connection.

3 Connect the -24V wire to Terminal 1, connect the +24V wire to Terminal 2 on the Wiring Block.

4 Return the adapter's cover to its place properly. Make sure that the O-ring is placed correctly. Fasten the four retaining screws.
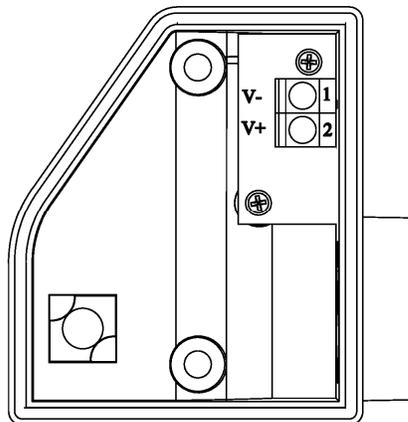
Figure 5: Conduit Adapter

NOTE:

The conduit adapter should not exceed a torque of 50 lb/In.

To maintain the transmitter properly sealed, make sure that conduit is firmly screwed to the conduit's adaptor.

Non-Intrinsically Safe Connections

Positive Ground

load resistor
4-20mA

24V DC
supply

-

+

Figure 6: Non-Intrinsically Safe Positive Ground Connection

Negative Ground

+

24V DC
supply

load resistor
4-20mA

-
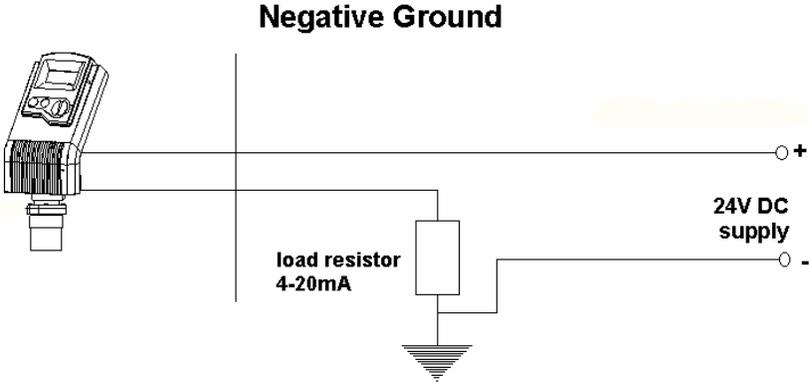
Figure 7: Non-Intrinsically Safe Negative Ground Connection

Power Supply and Load Resistance Recommendations
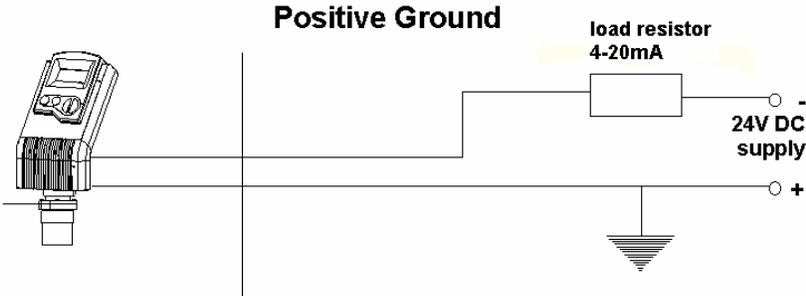
The following table specifies the recommended resistance range for each power supply voltage (Non-Intrinsically Safe).

Power Supply Voltage	Minimum Current on Resistor	Maximum Current on Resistor
12 V	0 Ω	50 Ω
15 V	0 Ω	220 Ω
24 V	41 Ω	610 Ω
28 V	68 Ω	820 Ω

Ripple/Noise Parameters Recommended for the Power Supply

The following ripple/noise parameters are recommended for the power supply:

✦ For less than 15 V: 75 mV p-p max

✦ For more than 15 V: 100 mV p-p max

Chapter 3

Setting Up and Calibrating ULG

This chapter explains how to set up and calibrate ULG for accurate measurement monitoring.

ULG is supplied with preprogrammed default settings, making it ready for immediate operation. There is no need to change the default settings, unless you wish to calibrate ULG for your specific requirements; however, it is recommended that you replace the default tank height value with the actual tank height.
When using, the tank height is calculated as the distance from the surface of the sensor to the bottom of the tank. You should enter this value whenever tank height is required. (For flow measurement, enter the precise flume height.)

ULG contains eleven programs, referred to as functions, which enable you to change the default settings and calibrate ULG as required. These functions are accessed from a functions menu. The functions **Pr01**, **Pr02**, **Pr04** and **Pr05** are the most important to ensure correct usage of your ULG device (with the addition of **Pr00** if using a ULG O model). Function **Pr03** may be used if there are interfering signals.

The remaining functions (**Pr06**, **Pr07, Pr08, Pr09 and Pr10**) enable you to customize ULG for your monitoring requirements or to restore factory default settings.

The diagram below shows the functions available in the functions menus:

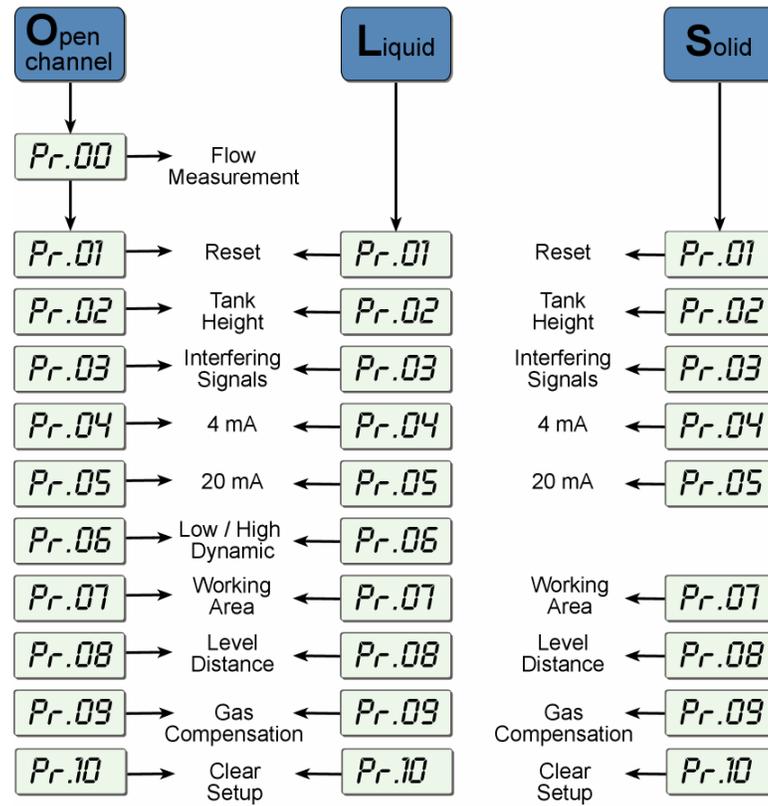| Open channel		Liquid		Solid
Pr.00 → Flow Measurement				
Pr.01 → Reset	← Pr.01	Reset	← Pr.01	
Pr.02 → Tank Height	← Pr.02	Tank Height	← Pr.02	
Pr.03 → Interfering Signals	← Pr.03	Interfering Signals	← Pr.03	
Pr.04 → 4 mA	← Pr.04	4 mA	← Pr.04	
Pr.05 → 20 mA	← Pr.05	20 mA	← Pr.05	
Pr.06 → Low / High Dynamic	← Pr.06			
Pr.07 → Working Area	← Pr.07	Working Area	← Pr.07	
Pr.08 → Level Distance	← Pr.08	Level Distance	← Pr.08	
Pr.09 → Gas Compensation	← Pr.09	Gas Compensation	← Pr.09	
Pr.10 → Clear Setup	← Pr.10	Clear Setup	← Pr.10	

Figure 10: Functions Menus

Using Functions

The LCD display screen, functioning in "normal" mode, provides continuously updated measurement readings. The display screen is also used to view menu options, function settings and data values, accessed by using the function buttons.
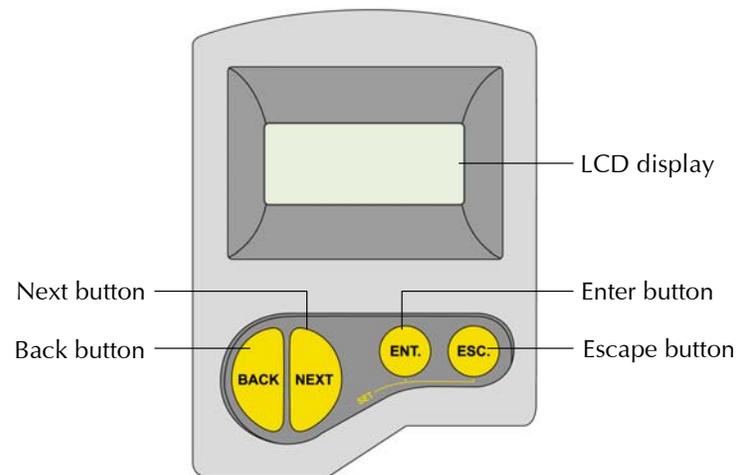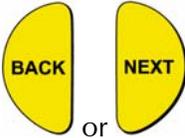
The picture below shows the upper part of ULG:

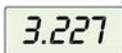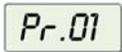Figure 11: Display and Function Buttons

The function buttons are used to perform various operations, summarized in the following table.

Button	Uses Include:
ENT.	✦ Accessing the functions menu (when pressed simultaneously with ESC.) ✦ Selecting functions ✦ Progressing to the next step of a function ✦ Moving from left to right between displayed digits (see note on the following page) ✦ Saving changes to data
ESC.	✦ Accessing the functions menu (when pressed simultaneously with ENT.) ✦ Exiting the functions menu to restore the distance reading ✦ Moving from right to left between displayed digits (see note on following page) ✦ Exiting a function without saving changes ✦ Clearing error messages
BACK NEXT or	✦ Scrolling through the functions menu ✦ Scrolling through available data values in functions ✦ **NEXT** button only: Recording interfering signals)

NOTE:

Within some functions, the digits in the displayed value can be individually modified. This is indicated by a flashing digit (flashing digits are shown in gray in the display illustrations, for example, `15.00`). In this case, the **ENT** and **ESC** buttons enable you to move between the digits. Each flashing digit can be modified using the **BACK** and **NEXT** buttons.

➢ To start up and access the functions:

Press/Action	Display	Explanation
⇨ Connect ULG to power supply	`8.8.8.8`	Temporary display while ULG takes a reading.
⇨ After a brief pause	For example: `3.227`	Distance reading.
⇨ **ENT.** and **ESC.** (simultaneously)	For example: `Pr.01`	Enters the functions menu.
⇨ **BACK** or **NEXT**		Used to search for the required menu selection.
⇨ **ENT.**		Accesses the selected function.

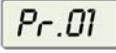## $Pr.01$ Resetting ULG

The **PR01** function enables you to do a reset, refreshing the ULG measurement reading. (Other saved function settings are not changed.) After resetting, the actual reading is displayed on the LCD, and ULG begins to scan (same as in turning the unit on/off).

The reset function may sometimes be required after changing one of the ULG settings or after receiving an error message.

Press/Action	Display	Explanation
⇨ (ESC.) and (ENT.) (simultaneously)	`Pr.01`	Required menu selection.
⇨ (ENT.)	`8.8.8.8`	Temporary display while ULG takes reading.
⇨ After a brief pause	For example, `3.227`	Distance reading.
⇨ (ESC.) and (ENT.) (simultaneously)		Returns to the functions menu.
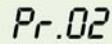
`Pr.02` Entering the Tank Height Value

The **Pr02** function enables you to enter the tank height. The default value is the highest value in the relevant measurement range for your model. If you enter a value that exceeds this highest value, the **Err** error message is displayed and the value is not saved.

NOTES:

Whenever the tank height is required, you should enter the distance from the surface of the sensors to the bottom of the tank. For flow measurement, enter the precise distance from the sensor to the bottom of the flume (the deepest point between the flume and sensor).

The first digit can be modified to read between 0 and 1 for metric units or between 0 and 5 for feet units.
For Shift Blocking Distance refer to Chapter 3, page 46 .

➢ To enter the tank height value:

Press/Action	Display	Explanation
⇨	`Pr.02`	Required menu selection.
⇨ (ENT.)	`H nn`	Indicates the measurement unit, either meters or feet.
⇨ (ENT.)	For example `15.00`	Displays last saved tank height or default value (maximum value in range).
⇨ (ESC.) or (ENT.) or (BACK) (NEXT)		Used to enter a new value
⇨ (ENT.)	`YES`	To save the new value, press (ENT.) when standing on the far-right digit. After **YES** is displayed, the display returns to the functions menu.
OR		
⇨ (ESC.)		To return to the main menu without saving, press (ESC.) when standing on the far-left digit.

`Pr.03` Defining Interfering Signals

The **Pr03** function enables you to locate and store up to six interfering signals (false echoes) in the memory, to avoid having obstructions such as a tank agitator or sidewall interfere with the measurement of the contents. Defining interfering signals is done while the tank is empty.
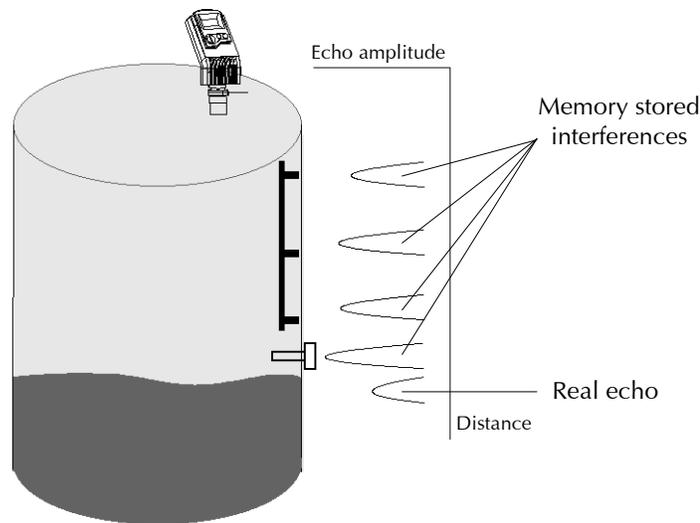
Figure 12: Scan Distance Process

Each reading (scan distance) taken using the **Pr03** function is stored as an interfering signal, until a reading is achieved that indicates the real echo. If six interfering signals are already stored, the following values will not be saved.

NOTES:

The reading of the actual target height may not be exact, for example, a target height of 6 m may give a reading in the range 5.98 - 6.02.

The displayed values are in distance units.

➢ **To define interfering signals:**

Press/Action	Display	Explanation
⇨	`Pr.03`	Required menu selection.
⇨ BACK or NEXT	`SrCH` `CLr`	Select *Search* to locate acoustic interferences, or *Clear* to delete stored interferences.
⇨ ENT.	`YES`	Displayed after the selection for 3 seconds and then the menu returns to Pr.03.
⇨ ENT.	`0.0.5.E`	Temporary display while ULG searches for interfering signals.
⇨ After a brief pause	For example, `3.227`	Depth to interfering signal.
⇨ NEXT		Saves the interfering signal, then searches again and displays the next reading. Continue to press this button to save up to six
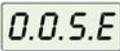
Press/Action	Display	Explanation
		interference readings.
⇨	For example, 6.000	Actual target height reading indicates that there are no more interfering signals.
⇨ ENT.	YES	Saves the entered values.

NOTES:

If the value represents an interference or false echo or false target - press NEXT. If the value represents the real target, real distance – press ENT.

`Pr.04` Configuring 4mA Current Output

Pr04 function enables you to enter values to be used as the 4mA mark for remote monitoring. You can define the 4mA values for Level, Distance or Flow measurements. The measurement values types should be defined in Pr.04 (described on page 31). These definitions will be applicable as well for the 20mA values defined in Pr.05. Distance and level measurements can be defined for both Solid and Liquid models. For Flow models, distance, level and flow measurements can be defined.

To set 4mA and 20mA for *level* measurements you should configure **Pr04** and **Pr05** for level values.
For example, if we measure a tank with tank height configured for 5 meters, the 4mA values will represent zero tank level and 20mA values will represent full tank level. Therefore, the value entered in **Pr04** will be 0.000m and the value entered in **Pr05** will be 5.000m.

When setting 4mA and 20mA for *distance* measurements, 4mA values will represent the minimal distance between the surface of the target and the sensor and 20mA values will represent the maximal distance between the sensor and the surface of the target. Therefore, 4mA represents the full part of the tank and 20mA represents the empty part of the tank.

➢ **To enter 4mA values:**

Press/Action	Display	Explanation
⇨	Pr.04	Required menu selection.
⇨ BACK or NEXT	For example, L000	Select 4mA (and 20mA) values format: Level (L000), Distance (d000) and Flow (F000).
⇨ ENT.	C004	
⇨ ENT.	For example 00.00	Last saved 4mA level or zero default value.
⇨ ESC. or ENT. or BACK or NEXT		Used to enter a new value

Press/Action	Display	Explanation
⇨ ENT.	YES	To save the new value, press ENT. when standing on the far-right digit. After **YES** is displayed, the display returns to the functions menu.
⇨ ESC.		To return to the main menu without saving, press ESC. when standing on the far-left digit.

`Pr.05` Configuring 20mA Current Output

The **Pr05** function enables you to enter values to be used as the 20mA mark for remote monitoring.

➢ **To enter 20mA values:**

Press/Action	Display	Explanation
⇨	`Pr.05`	Required menu selection.
⇨ (ENT.)	`C020`	
⇨ (ENT.)	For example `05.00`	Last saved 20mA level or default value (maximum value in range).
⇨ (ESC.) or (ENT.) (BACK) or (NEXT)		Used to enter a new value, as described on page 26.
⇨ (ENT.)	`YES`	To save the new value, press (ENT.) when standing on the far-right digit. After **YES** is displayed, the display returns to the functions menu.
OR		

Press/Action	Display	Explanation
⇨ **ESC.**		To return to the main menu without saving, press **ESC.** when standing on the far-left digit.

NOTES:

Type of measurement (level, distance, flow) selected in Pr.04 is also applicable for Pr.05.

The values for 4mA and 20mA must be different; otherwise an **Err** error message is displayed.

The values for 4mA and 20mA should not be higher than the value used for the tank height (**Pr02**).

The first digit of the 20mA value can be modified to read between 0 and 1 for metric units or between 0 and 5 for U.S. Standard units.

After accessing the **Pr05** function, the unit generates a fixed current of 22mA on the 4-20mA line. When the ULC reverts to regular scanning mode, the 4-20mA line returns to regular functioning.

Please refer to chapter 5 *Troubleshooting* for 20mA error indications.

`Pr.06` Selecting Low/High Dynamic Speed (Open Channels and Liquid Only)

The **Pr06** function enables you to choose the required speed level. There are two settings available:

✦ **SE 0**: Low dynamic mode (default setting). This mode provides slower readings with a greater degree of accuracy (Rate of up to 80 cm/31in per min').

✦ **Fail Safe**: 10 minutes.

✦ **SE 1**: High dynamic mode. This mode provides faster readings but with less precision
(Rate of up to 100 cm/39 in per min').

✦ **Fail Safe**: 3 minutes.

NOTE:

Fail – Safe timer determines the waiting period from an echo loss till a transmission of an error signal.

➢ To select the speed mode:

Press/Action	Display	Explanation
⇨	`Pr.06`	Required menu selection.
⇨ ENT.	`SE 0` or `SE 1`	Displays the current operation mode setting.
⇨ BACK or NEXT		Used to toggle between the operation modes.
⇨ ENT.	`YES`	Saves the selected operation mode.

`Pr.07` Defining Working Area

The **Pr07** function allows you to add distance range that exceeds the tank's height, thus enabling accurate readings of complicated tank shapes with conic ending. This may be required when the vessel has a conical bottom shape which is causing false echoes and consequently faulty measurements. The minimal value can be the entered tank height and the maximal value can be double the value of the entered tank height (limited to 15m/49ft). The default setting is the entered tank height.
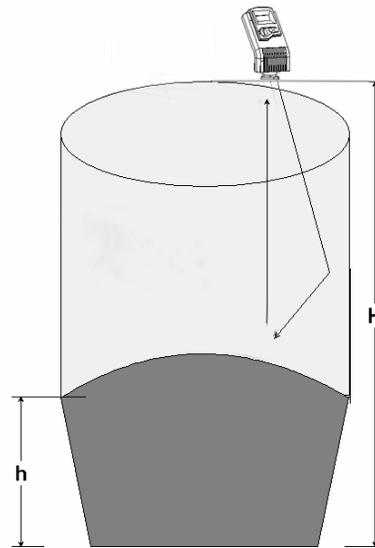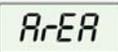

Figure 13: Defining Working Area

NOTE:

It is recommended to use the **Pr.07** function only in *Distance* mode.

➢ To define a Working Area:

Press/Action	Display	Explanation
⇨	Pr.07	Required menu selection.
⇨ ENT.	ArEA	Displayed when entering the function.
⇨ ENT.	for example: 05.00	Displays the value last saved in the tank height (default). The entered value should not be more than double the tank height and should not exceed the ULG maximum measuring range (15m/49ft).
⇨ ESC. or ENT. BACK or NEXT		Used to enter a new value, as described on page 26.
⇨ ENT.	YES	Saves the entered value.
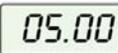
Press/Action	Display	Explanation
⇨ BACK or NEXT		Used to move on to the next function.

`Pr.08` Selecting Distance or Level Display

The **Pr08** function enables you to choose whether ULG displays either distance or level measurements. There are two settings available:

✦ **d000**: Distance mode (default setting): In this mode, ULG displays the distance from the sensor to the surface of the contents.

✦ **L000**: Level mode: In this mode, ULG displays the level of the contents from the bottom of the tank.

NOTE:
The measurement mode selected for the display will not influence the measurement mode selected for the 4-20mA values (**Pr.04**).

➢ To select distance or level display:

Press/Action	Display	Explanation
⇨	`Pr.08`	Required menu selection.

⇨ (ENT.)	`d000`
	 or
	 `L000`
		Displays the current distance/level mode setting.

⇨ (BACK) or (NEXT)		Used to toggle between the modes.
⇨ (ENT.)	`YES`	Saves the selected mode.

`Pr.09` Entering factor for Gas Compensation

Function Pr.09 enables you to compensate for sound velocity changes in different types of gasses. You can enter the appropriate factor for each type of gas listed on the 'Gas Factor Table' (Appendix A). For example the sound velocity in air (in room temperature) is 343 m/sec and for Methane (C_{h4}) 445.82 m/sec, therefore a factor of 445.82/343 = 1.29 should be entered to compensate for this type of gas. This factor will compensate in cases when the gas compound consists on 100% Methane. In case the gas is not pure, the sound velocity cannot be estimated and therefore a minor deviation could appear. It is recommended to use a reference measurement indicator (using a tape or other measuring device) and compare the measurement results between the ULG and the reference measurement indicator.   If the result is correct, press ENT. If the accuracy deviation is higher than expected, continue and calibrate the factor to meet the gas maintained in the vessel. For example, if the gas composition consists of water and gas you can add +/- 0.01 to the factor figure already entered, to meet your application requirements.

➢ **To enter a gas compensation factor:**

Press/Action	Display	Explanation
⇨	`Pr.09`	Required menu selection.
⇨ ENT.	`CnnP`	Default screen.
⇨ ENT.	`01.00`	Default value.
⇨ BACK NEXT or ESC. or ENT.	`00.71`	Choose a factor from the 'Gas Factor Table' (Appendix A, Page 75).
	For example:	This is the factor for Ethanol.
⇨ ENT.	`YES`	Saves the chosen gas factor.

NOTES:

Repeat this procedure if the measurement results differ from the actual material level measured with a reference tape (or other reference measurement method). Add or reduce 0.01 to calibrate the factor figure already entered.

Updated on-screen results may take a few seconds to appear.

`Pr.10` Restoring the Default Settings

The **Pr10** function allows clearing all user-defined settings and reverting to the default factory settings.

Default factory settings are:
Pr.00: GPM 1U01 or M /Hr 1E01
Pr.02: Sbd 00.00, E000, Tank Height =default
Pr.03: Resets all interfering signals
Pr.04: Solid/Liquid device L000, 00.00 or
　　　　　Flow device F000, 00.00
Pr.05: Solid/Liquid device Tank Height = Pr.02
　　　　　Flow device 55500 M^3/Hr or 244400 GPM
Pr.06: SE 0 (Liquid & Flow)
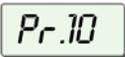**Pr.07**: Tank Height = Pr.02
Pr.08: d000
Pr.09: 01.00

NOTE:
If you decide not to revert to the default settings, press **ESC** when **CLCL** is displayed. A redo option is not available when **ENT** has been pressed.
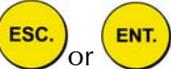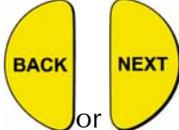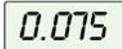
➢ **To restore the default settings:**

Press/Action	Display	Explanation
⇨	`Pr.10`	Required menu selection.
⇨ ENT.	`CLCL`	
⇨ ENT.	`YES`	Reverts all settings to default factory settings.

Shifting the Blocking Distance

This function enables you to define an area in which measurement results would be ignored. This option is applicable for installations requiring extension pipes or nuzzles positioned above the material level. This area should fit the pipe/nuzzle length to eliminate false echoes and to provide accurate and stable measurement readings.

➢ **To shift the blocking distance:**
Follow the directions given for *Entering the Tank Height Value*, page 26. Instead of entering the tank height value, enter **00.01**, and continue as follows:

Press/Action	Display	Explanation
⇨	00.01	Insert this code to enter the Blocking Distance area.
⇨ ENT.	Sbd	This message will flash for a few seconds, indicating an entry to the Blocking Distance area.
⇨ ESC. or ENT. BACK NEXT or	For example, 0.075	Shifts the blocking distance to 0.75m (2.46 ft).
⇨ ENT.	YES	Saves this entry and returns to Pr.02.

Verifying the Version Number

In addition to the functions described, you can verify the ULG version number.

➢ **To verify the version number:**

Follow the directions given for *Entering the Tank Height Value*, page 26. Instead of entering the tank height value, enter **00.17**, and continue as follows:

	Press/Action	Display	Explanation
⇨	ENT.	`YES`	
⇨	After a brief pause	`Addr`	
⇨	ENT.		Displays the version number.

Defining 22mA Signal Error Messages

ULG allows you to define if the following signal error indications: Near Zone and Lost Echo, will be active when the current output reaches 22mA. The ULG default setting enables 22mA analog current and error messages to appear on its LCD display.

Near Zone - whenever the distance is below the defined Dead Zone (depending on the ULG model you are using) $\boxed{F.F.F.F}$ message will be displayed on the LCD.

Lost Echo - whenever the echo is lost, or in cases when the measurement results exceed the tank height or when a returned echo is not received $\boxed{E.E.E.E}$ message will be displayed on the ULG's LCD.

You can choose to enable or disable these error messages and 22mA analog signal as follows:

✦ **d000**: Disable

✦ **E000**: Enable (default setting)

➤ **To disable/enable 22mA signal error:**

Follow the directions given for *Entering the Tank Height Value*, page 26. Instead of entering the tank height value, enter **00.16**, and continue as follows:
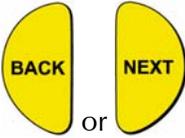
Press/Action	Display	Explanation
⇨ (ENT.)	`d000`	Choose disable
⇨ (BACK) (NEXT) or		Used to toggle between the modes.
(ENT.)	`YES`	Disables the 22mA error messages

Chapter 4

Troubleshooting ULG

This chapter describes how to resolve problems that may occur when calibrating ULG, as follows:

Error	Description	Solution
EC11	Noise in area.	Check that the power supply is appropriate.
E555	Faulty power supply.	Make sure that the power supply corresponds with the specifications described in *Chapter 2, Installing UIG*. If the problem persists, replace the power supply.
5544	Sensor disconnected.	Contact the distributor for further instructions.
8818	Any combination of three 8s and one 1: Indicates an electrical shortage caused by depressing the buttons for too long.	Contact the manufacturer for further instructions.

Error	Description	Solution
`8.8.8.8`	Appears for several seconds after restarting the unit. If it is displayed for more than several seconds, it may be due to one of the following: ✦ Power supply voltage is too low ✦ Load resistor resistance is too high or unnecessary ✦ A random pulse that causes the unit to automatically restart	Make sure that the power supply corresponds with the specifications described in *Chapter 2, Installing UIG*. If the problem persists, replace the power supply.
`HHHH`	Measurement value is greater than 9999.	Double check the unit configuration (Tank h, type of flume, 4-20mA settings.)
`00.00`	In Flow mode, appears when the entered tank height is incorrect.	Decrease the Tank Height value.

22mA Signal Error Messages

The following list of messages will appear on the display and coincides with a 22mA analog current error output signal (when the error signals messages are enables):

Error	Description	Solution
5544	Sensor disconnected.	Contact the distributor for further instructions.
F.F.F.F	Near dead zone. (depends on the measurement definitions)	Move the sensor farther from the dead zone area.
E.E.E.E	Tank empty. (depends on the measurement definitions)	Check the level of material in the tank.
EC11	Noise in area. (indicated by 22mA if the Error Signals are Enabled).	Check that the power supply is appropriate.
E555	Faulty power supply. (indicated by 22mA if the Error Signals are Enabled).	Make sure that the power supply corresponds with the specifications described in *Chapter 2, Installing UIG*. If the problem persists, replace the power supply.

Appendix A

Gas Factor

The following table contains 33 different types of gasses and their factor for compensating the sound velocity:

Gas	Symbol	Factor
Acetic Acid	$C_2H_4O_2$	0.62
Acetone	C_3H_6O	0.63
Acetaldehyde	C_2H_4O	0.74
Acetyl Chloride	$C_2H_3C_1O$	0.54
Acetylene	C_2H_2	0.99
Ammonia	H_3n	1.26
Argon	Ar	0.92
Benzene	C_6H_6	0.53
Bromine	Br_2	0.41
Bromochlorodifluoromrthane	$Cbrclf_2$	0.37
Butanone	$CH_3COCH_2CH_3$	0.56

Gas	Symbol	Factor
Carbon Dioxide	CO_2	0.77
Carbon Monoxide	CO	1.01
Carbon Tetrachloride	CCl_4	0.38
Chlorine	Cl_2	0.68
Dimethyl Ether	C_2h_6o	0.71
Ethane	C_2h_6	0.90
Ethanol	C_2h_6o	0.71
Ethylene	C_2h_4	0.95
Helium	He	2.93
Hydrogen	H_2	3.79
Hydrogen Sulfide	H_2S	0.89
Isopropyl Alcohol	C_3h_8o	0.62
Methane	CH_4	1.29
Methyl Hydrazine	Ch_6n_2	0.71
Neon	Ne	1.30
Nitrogen	N_2	1.01

Gas	Symbol	Factor
Nitromethane	CH_3NO_2	0.63
Oxygen	O_2	1.02
Propane	C_3H_8	0.72
Propanol	C_3H_8O	0.61
Tetrahydrofuran	C_4H_8O	0.57

Condizioni generali di garanzia
1. GARANZIA
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3. ESCLUSIONI
Sono esclusi dai servizi di assistenza in garanzia:
3.1. strumenti soggetti ad usura;
3.2. difetti risultanti da normale usura;
3.3. difetti risultanti da operazioni che non rientrano nei parametri d'uso descritti nei manuali d'uso;
3.4. difetti risultanti dal mancato rispetto delle avvertenze generiche;
3.5. difetti risultanti da applicazione/prelievo di segnali fuori dai massimi limiti ammessi;
3.6. malfunzionamento causato da danni (anche se accidentali).

4. RESPONSABILITA'
L'utente non ha altre rivendicazioni di garanzia o di risarcimento verso **VALCOM® S.r.l.** che quelle poste in questo documento. **VALCOM® S.r.l.** non è responsabile per danni incidentali o consequenziali di qualsiasi natura e forma, né di alcun tipo di costo aggiuntivo da parte di chiunque per i prodotti ceduti al committente. **VALCOM® S.r.l.** non sarà responsabile per alcun danno provocato anche per negligenza durante le riparazioni. **VALCOM® S.r.l.** e i suoi tecnici di assistenza non saranno responsabili né per danni né per la perdita di eventuali programmazioni introdotte negli strumenti inviati per assistenza.

5. COSTI
La riparazione degli strumenti viene effettuata franco stabilimento **VALCOM® Srl** di Terranova P. (LO). Gli strumenti riparati verranno ritornati in porto assegnato (i rischi di trasferimento e gli oneri sono a carico dell'acquirente). Gli strumenti spediti per assistenza in garanzia che dovessero risultare correttamente funzionanti verranno aggravati di un costo di Euro 50,00 per spese di controllo e gestione. Gli strumenti non coperti da garanzia verranno verificati tecnicamente; la valutazione dei costi verrà formalizzata e trasmessa al Cliente attraverso la conferma di Riparazione (Mod.CDR).
In caso di mancata accettazione del preventivo gli strumenti subiranno un aggravio da un minimo di Euro 50,00 ad un massimo di Euro 250,00 a seconda del tipo di apparecchio, per spese di controllo, verifica tecnica e gestione.

General servicing conditions
1. WARRANTY
*Instruments supplied by **VALCOM® S.r.l.** are covered by warranty, against production faults, for a period of 12 months from start up to a maximum of 18 months from the original shipping date; warranty does not cover products being damaged, repaired by not authorized servicing or handled not in accordance with suggested on standard warnings. Even if not expressly agreed, goods always travel at buyer's total risk and charge.*

2. SERVICING
*During period of servicing covered by warranty, **VALCOM® S.r.l.** will repair, at his own discretion, products or will replace defective instruments with new units. If, after several efforts, **VALCOM® S.r.l.** will not be able to bring the instruments to a good functioning level, the company itself could, at his own discretion, pay back purchase price or replace the product with a new one, having same characteristics.*

3. EXCLUSIONS
***VALCOM® S.r.l.** warranty servicing does not cover:*
3.1. instruments suffering deterioration;
3.2. defects caused by normal deterioration;
3.3. defects caused by operations not in accordance to working parameters described in operative manual;
3.4. defects caused by not respect of generic warnings;
3.5. defects caused by application/taking of signal out of max limits admitted;
3.6. malfunctioning caused by damages (even if accidental).

4. RESPONSABILITY
*User can claim against **VALCOM® S.r.l.** only warranty or compensation conditions stated in this document.*
***VALCOM® S.r.l.** is not responsible of any kind of incidental or consequential damage and is not responsible of any additional cost claimed by anybody for products delivered to the customer. **VALCOM® S.r.l.** is not responsible of any damage caused also by negligence during repairs.*
***VALCOM® S.r.l.** and his servicing technicians are not responsible of damages neither for lost of eventual programs introduced in instruments sent for servicing.*

5. COSTS
*Instruments for repair have to be shipped carriage free - **VALCOM® Srl** factory of Terranova P. (LO). Instruments repaired will be returned Fob **VALCOM®** factory (goods travel at buyer's total risk and charge). Instruments sent for servicing under warranty, which should appear correctly functioning, will be charged with a cost of Euro 50,00 for checking and management cost. Instruments not covered by warranty will be technically verified; evaluation costs will be formalized and sent to the Client by Repair Acknowledgement (Form "Mod.CDR"). In case of non acceptance of quotation, instruments will be charged with a cost of min Euro 50,00 up to a max of Euro 250,00 depending on type of apparatus, for checking, technical test and management.*

6. MODALITA' OPERATIVE DI ASSISTENZA
6.1. Modulo NAR

Procedere all'imballo e alla spedizione del materiale in porto franco. Il materiale deve essere accompagnato dal documento di trasporto. Al ricevimento della merce, **VALCOM® Srl** assegnerà un numero di identificazione al reso (numero NAR) e lo comunicherà al cliente.

Nel caso gli strumenti siano venuti in contatto con sostanze tossiche e/o nocive, ciò deve essere comunicato tempestivamente alla VALCOM® Srl, al fine di tutelare il personale tecnico addetto alla riparazione.

6.2. Solleciti

Eventuali solleciti dovranno essere riferiti al numero NAR.

7. CONTROVERSIE

Qualsiasi controversia dovesse insorgere tra Fornitore e Cliente, sarà devoluta in via esclusiva alla competenza del Foro di Milano, con rinuncia espressa a qualsiasi altra sede di competenza, anche in caso di chiamate in garanzia, di connessione o continenza di causa.

6. SERVICING OPERATING MODALITIES
6.1. Form "Modulo NAR"

Proceed with packing and shipping of material to **VALCOM® S.r.l.** factory, prepaying shipment costs. Goods must be accompanied by delivery note. At receipt of the goods, **VALCOM® Srl** will assign an identification number to the return (NAR number) and will communicate it to the customer. If necessary, return NAR form to **VALCOM Srl** with additional information.

If instruments have been exposed to toxic and/or dangerous substances, VALCOM® Srl has to be informed promptly, in order to protect personnel responsible for the repair.

6.2. Reminders

Eventual reminders should be referred to NAR number.

7. CONTROVERSY

Any controversy arising between Supplier and Customer must be held exclusively in the Forum of Milan, with expressed renunciation to any other Forum of competence, even if in case of warranty claim, connection or contingency of cause.

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