This manual contains safety information that if ignored can endanger life or result in serious injury. They are indicated by this icon.

Keep the instrument protected from sun and water.
Avoid water splashes.

OPERATING INSTRUCTIONS FOR "LDTORBH" INSTRUMENT SERIES

Read Carefully !

CE

ENGLISH Version

R2-01-11

NORME CE/EC RULES(STANDARD EC)/NORMAS DE LA CE

Direttiva Basso Voltaggio/Low Voltage Directive

Directiva de baja tensión (2006/95/CE)

Direttiva EMC Compatibilità Elettromagnetica

EMC electromagnetic compatibility directive

EMC directiva de compatibilidad electromagnética (2004/108/CE)

GENERAL SAFETY GUIDELINES

Danger!

In emergencies the instrument should be switched off immediately! Disconnect the power cable from the power supply!

When installing always observe local regulations!

Manufacturer is not liable for any unauthorized use or misuse of this product that may cause injury, damage to persons and / or materials.

Caution!

Instrument must be accessible at all times for both operating and servicing. Access must not be obstructed in any way!

Feeder should be interlocked with a no-flow protection device to automatically shut-off the pumps when there is no flow!

Pumps and accessories must be serviced and repaired by qualified and authorized personnel only!

Always discharge the liquid end before servicing the instrument!

Empty and rinse the liquid end before work on a pump which has been used with hazardous or unknown chemicals!

Always read chemical safety datasheet!

Always wear protective clothing when handling hazardous or unknown chemicals!

Instrument must be operated / serviced by trained technicians only!

All connection operations must be performed while the instrument is not connected to main supply!

1. Introduction

LDTORBH is a microprocessor based digital regulator for NTU and temperature reading. On/Off is main working mode. All information are provided through a large LCD display. Using a revolutionary wheel control the instrument can be easily programmed. LDTORBH is housed in a IP65 plastic box.

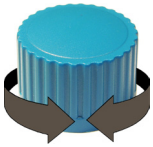
INPUTS:
- Flow
- Temperature probe
- ETORBH probe

OUTPUTS:
- 2 relay outputs (NTU and Probe Cleaning)
- 2 mA outputs (NTU and Temp)
- Main alarm

2. The wheel

Located in the upper right side of LDTORBH there is a wheel that must be used to control the instrument. Wheel can be rotated in both directions to scroll over the menus and / or pressed to confirm highlighted selection / value.

NOTE: Once changes are made press "OK" to save and exit from submenu. Press "ESC" to exit without saving.

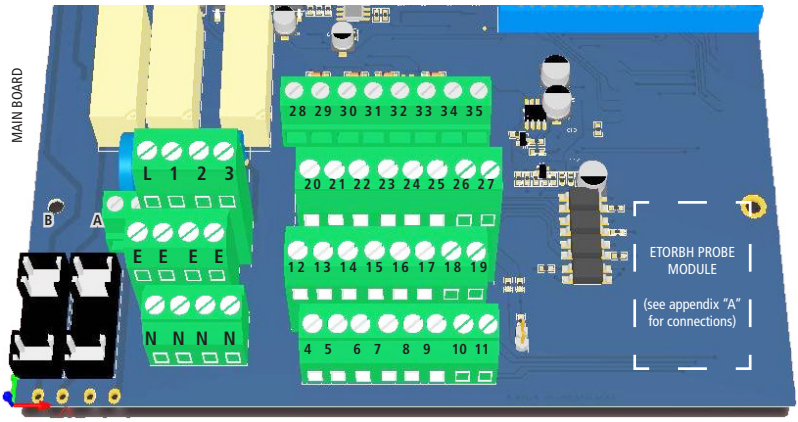


SCROLL

SELECT

3. Mainboard Connections

Unplug instrument from main power supply then perform connections by following the above picture.



A: Main Fuse (6A T)
B: Outputs Fuse (3.15A T)
L(Live) - E (Earth) - N (Neutral): 85÷264VAC - 50/60 Hz

1(Live) - E(Earth) - N(Neutral): 85÷264VAC - 5A 50/60 Hz Relay 1 Output "RELAY NTU". To use with ON/OFF
2(Live) - E(Earth) - N(Neutral): 85÷264VAC - 5A 50/60 Hz Relay 2 Output "PROBE CLEANING".

3(Live.) - E(Earth) - N(Neutral) : 85÷264VAC Alarm output

19(GND) - 26(+RS485) - 27(-RS485): RS485
12(+ Brown) - 13(Black) - 14(- Blue) - 15(GND): Proximity sensor mod. "SEPR"

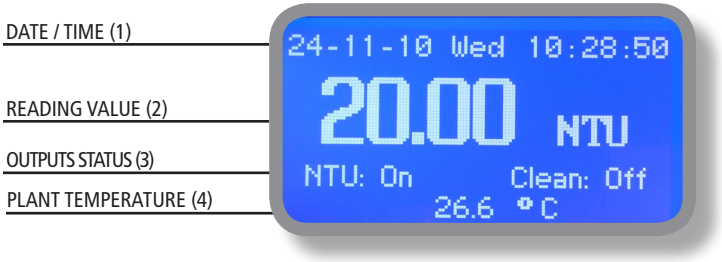
4(Green) - 5(Brown) - 6(White) - 7(Yellow): PT100 temperature probe

29(-) - 28(+): Current output mA1 for NTU
32(-) - 33(+): Current output mA4 for temperature
} Max resistive load: 500 Ohm

Warning: Connections must be perfomed by qualified and trained personnel only.

4. Main Screen

When into normal operating mode, LDTORBH shows the following main screen:



Main screen zones:

(1) DATE / TIME Local date and Time (see "International" menu to configure it) or rotate wheel for atlernative view ("Status").

(2) READING VALUE These numbers are values read by ETORBH probe.

(3) OUTPUTS STATUS These fields are related to current outputs status and instrument activity on main board. For more information rotate the wheel when into main screen. (see next page)

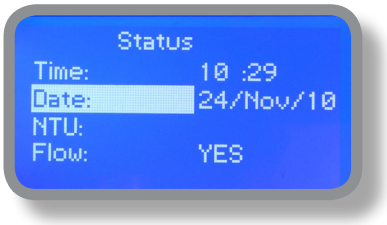
(4) PLANT TEMPERATURE Plant's temperature read by temperature probe if installed.

During critical situations a warning / alarm message may appear. To in-depth explanation **completely rotate clockwise** the wheel to review main instrument parameters and current outputs status.

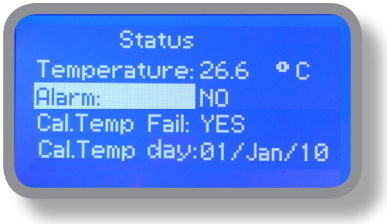
Note: the word "PUMP" as shown into this manual refers to a "dosing device" connected to the instrument!

5. Quick status check

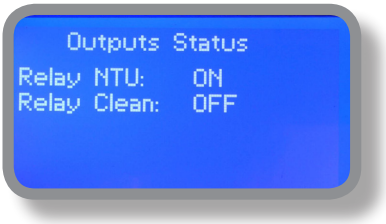
From main screen **completely rotate clockwise** the wheel to review main instrument parameters and current outputs status.



Local Time
Local Date
NTU probe reading
Flow contact status (SEPR)



Temperature probe reading
Dosing alarm condition
Temp. probe calibration status
Temp. probe last calibration date



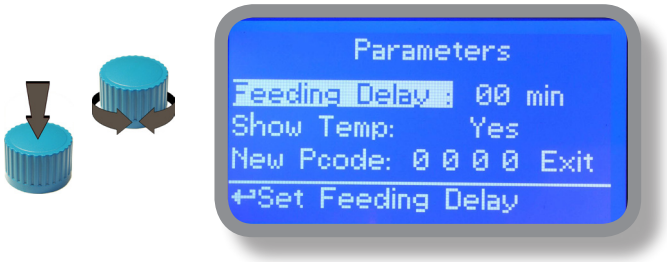
Outputs Status

See mainboard (page 4) for connections.

6. Password

To grant access into "Main Menu" press the wheel from main screen and enter the passcode.
If this is the first time here then the passcode is 0000 (factory preset). Press wheel 5 times to enter into "Main Menu". Otherwise press the wheel 1 time and enter the passcode. Numbers can be selected rotating the wheel.

To set a new passcode choose "PARAMETERS" from "Main Menu" , move on "New Pcode", click on wheel and enter a four numbers code. Click on "EXIT" and choose "YES" to save request. The new passcode is now ready.



Lost passcode ?

Please dont' forget the passcode (if changed). In the unfortunate event, please call your local distributor for unlocking procedure. There is no way for you to recover lost passcode.

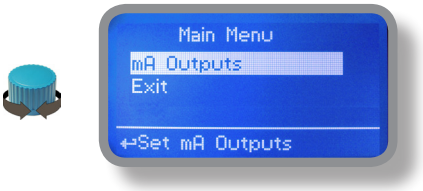
7. "Main Menu" list

To grant access into "Main Menu" enter the passcode (as described in previous chapter). Once into "Main Menu" rotate the wheel to scroll through all the options available.

Setpoint (see page 9)
Self Clean (see page 10)
Calibration (see page 11-12)

Parameters (see page 13)
Output manager (see page 14)
Instrument reset (see page 15)

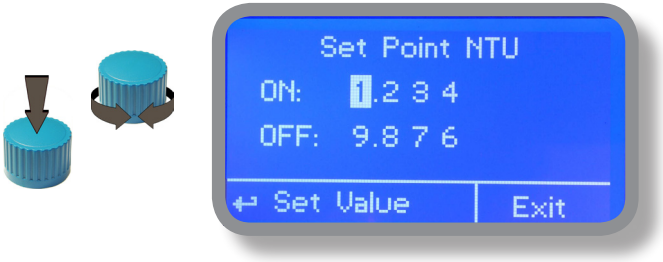
International (see page 16)
Flow (see page 17)
Out of Range Alarm (see page 18)



mA Outputs (see page 19)

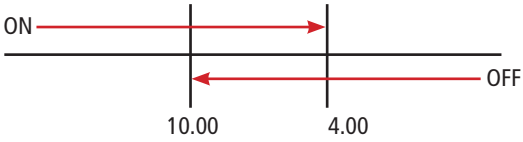
8. "Set-Point", NTU (on/off)

On/Off setpoint mode set the instrument to operate using two set values that enable or disable the "Relay 1 Output". Press wheel for editing.



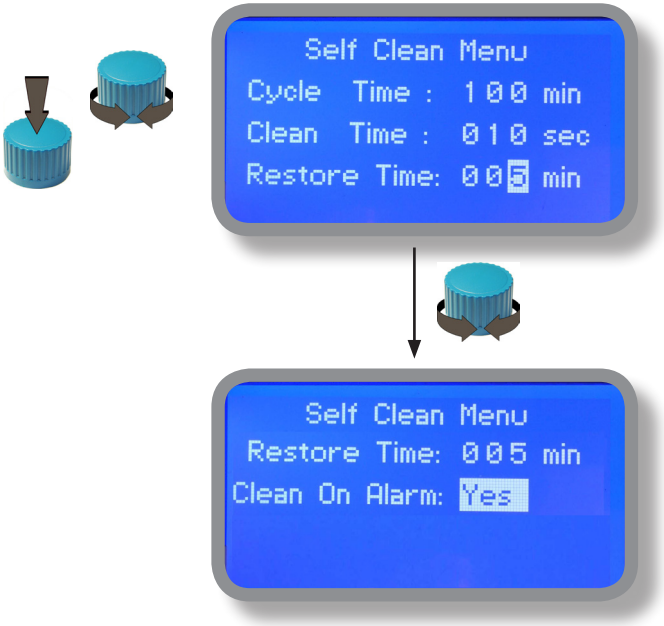
ON/OFF mode

Set NTU value at 4.00 OFF and 10.00 ON.
Instrument will leave **"Relay 1 Output"** active until reading value will decrease up to 4.00NTU.
At 4.00NTU the **"Relay 1 Output"** will be disabled until reading value will increase up to 10.00NTU.



9. "Self clean", probe self-cleaning setup (Relay 2 Output)

An internal motor automatically wipes the optical face of probe. To define how much this motor must be on or off use the "Self Clean" menu.



"Cycle": the time between each cleaning. Can be set between 0 (disabled) and 999 minutes. Setting "0" as value the whole "Self-Clean" function will be disabled.

"Clean Time": probe cleaning time. Can be set between 0 (disabled) and 999 seconds. Setting "0" as value the whole "Self-Clean" function will be disabled.

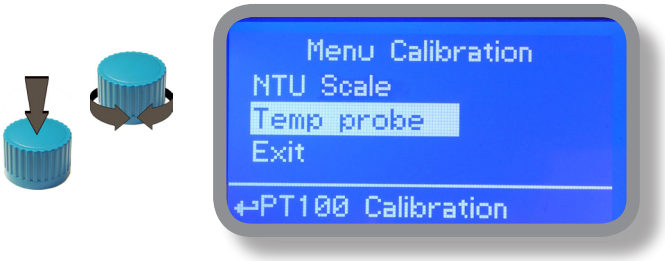
"Restore Time": is the probe recovery time needed to come back in full operations after the cleaning.
Can be set between 0 (disabled) and 999 minutes. Setting "0" as value the whole "Self-Clean" function will be disabled.

"Clean on alarm": automatic probe cleaning when the reading alarm is active. The probe will not read until the end of the cleaning.

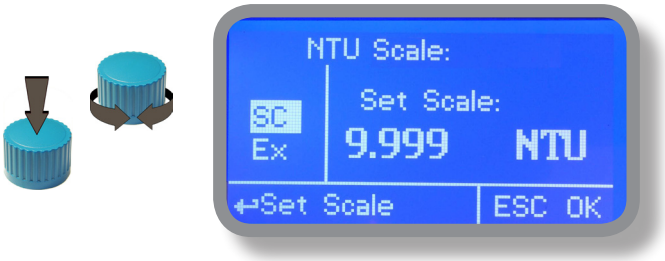
Note: During "Clean Time", "Restore Time" and "Clean on alarm" all NTU outputs are DISABLED.

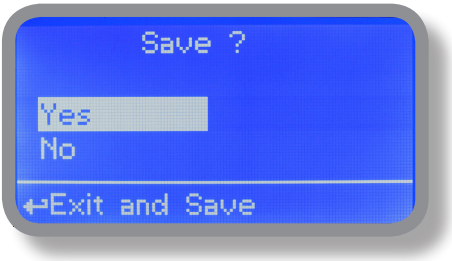
10. "NTU scale set"

To properly set probe's reading range select "Calibration" from main menu and press wheel on "NTU Scale". Choose NTU scale between 9,999NTU or 99,99NTU or 999,9NTU or 9999NTU.



Turbidity sensor is shipped fully calibrated (plug&play) and it doesn't need any calibration.

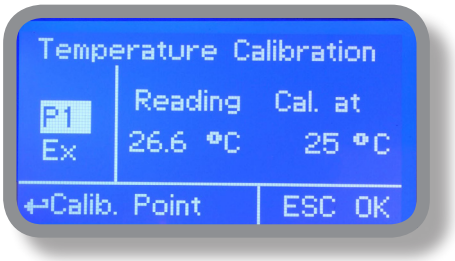




To end procedure move cursor on "EX" and press wheel to confirm. Then proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes. If an error occurred during calibration procedure then the instrument will show an error message and will ask to proceed to a new calibration, cancel current operation or restore default settings.

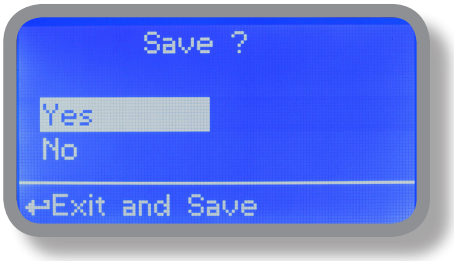
10.1 "Temp probe", °C - Temperature calibration

A professioanl thermometer is required to obtain a reliable calibration. From "Menu Calibration" choose "Temp probe".



Note: This procedure assumes that instrument is correctly installed and configured, connected to a working PT100.. Calibrate using plant's temperature otherwise unattended results may occur.

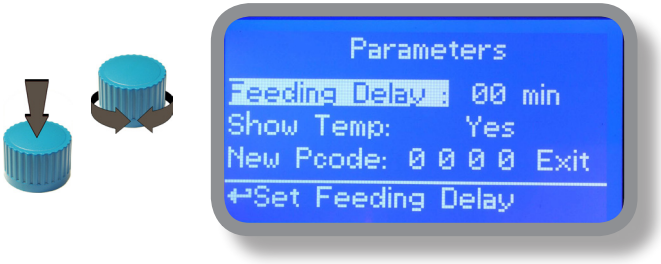
Using an external thermometer read actual temperature and edit related field "Cal. at". Confirm by pressing wheel.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes. If an error occurred during calibration procedure then the instrument will show an error message and will ask to proceed to a new calibration, cancel current operation or restore default settings.

11. "Parameters"

From "Menu Calibration" choose "Parameters". This menu allows to set a delay (max 60 minutes) before pumps begin to feed. Furthermore use this menu to set pH pump startup priority and to change default passcode.



Feeding Delay.

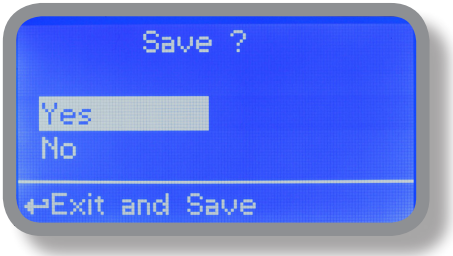
Move on "Feeding Delay" then press wheel. Choose a value between 0 (disabled) and 60 minutes (maximum delay time). This feature can be used to accord a startup delay for the pumps. Delay occurs when instrument is powered or after a "NO FLOW" contact recovery.

Show Temp.

Move on "Show Temp" then press wheel. This option enable or disable display of temperature value on main screen.

New Pcode.

See page 10.

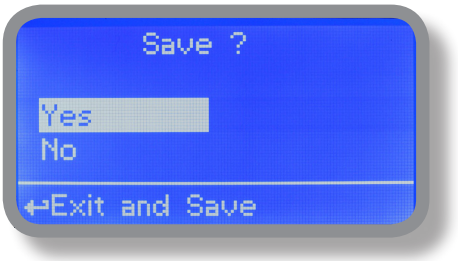


To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

12. "Output Manager"

From "Menu Calibration" choose "Output Manager". This menu allows to manually operate all outputs for a settable time. Set to "AUTO" for normal operating mode. Set to "OFF" to permanently disable outputs.

Press wheel to move cursor on "TIME" field. Once here, choose a working time between 0 (disabled) or 199 minutes. Move on "EXIT", then press wheel.



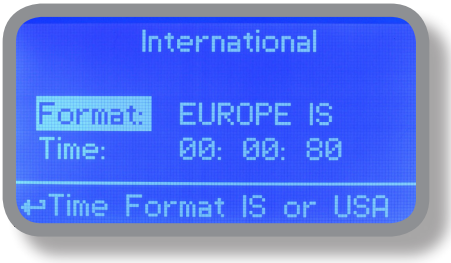
Choose "YES" to save changes. Exit from main menu. Main display will show a countdown for selected output. To stop this countdown go back to "Output Manager" menu and choose "AUTO" as working mode or wait until countdown ends. **This function can be used for priming purposes.**

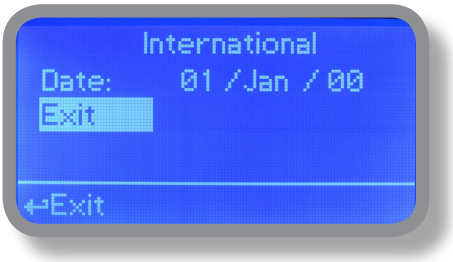
13. "Instrument Reset"

To restore instrument to its default values (including password) once into "Instrument Reset" menu, press wheel then change value to "ON", press wheel again, move on "OK" then finally press wheel. The instrument display will show "CHECKSUM ERROR". Press whell to return into "Main Menu". Move on "EXIT", then press wheel.
The instrument is now restored to factory default. Please repeat all calibration procedures and programming parameters.

14. "International"

Use this menu to set international parameters as UNIT FORMAT (Europe IS or USA), Local Time and Date.





Format.

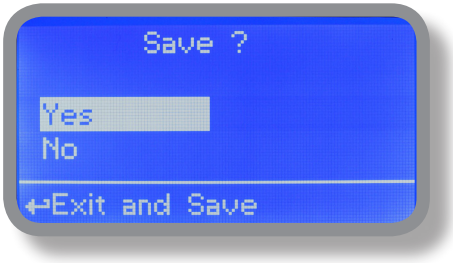
Use this option to use European or USA units format. See table for differencies.

EUROPE IS (Internationl Standard)	USA
Date (DD/MMM/YY)	Date (MMM/DD/YY)
Time 24h	Time AM / PM
°C	°F

Time.
Use this option to set local time.

Date.
Use this option to set date.

Move on exit to end changes.

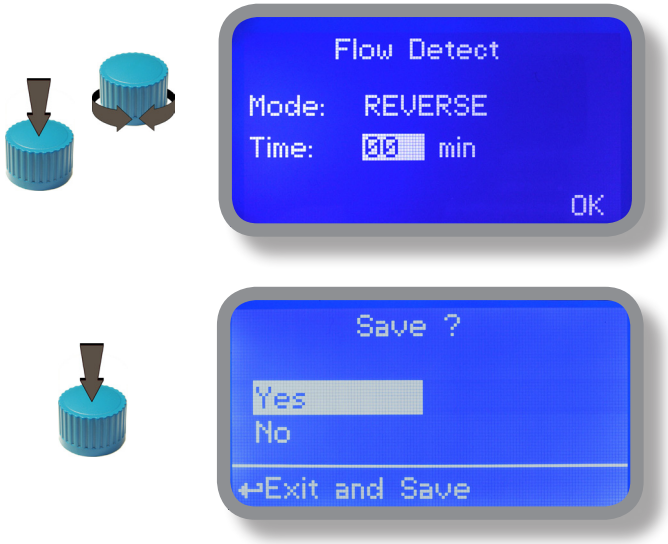


To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

15. "Flow Contact"

Flow contact (see "SEPR" blocks on page 4) can be enabled to stop a dosing procedure using a N.O. contact mode (normally open) or N.C. contact mode (normally closed) when status on blocks changes. Rotate wheel to choose between: **"DISABLE"**, **"REVERSE"** (N.O. contact) or **"DIRECT"** (N.C. contact).

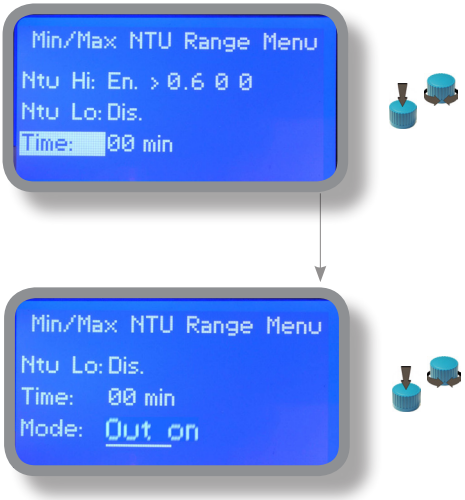
Furthermore "Flow contact" can starts after a specified time when contact status changes. To set it move wheel on "Time:00 min", click it and rotate to choose time (from 0 to 99 minutes). Confirm selection by clicking wheel.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

16. "Out of range alarm"

"Out of range alarm" menu defines the minimum and maximum NTU value read by the probe before to stop connected device activity and to show an alarm message.



Move wheel on "NTU Hi: Dis." and change status from "Dis." (option disabled) to "En." (option enabled) by clicking on wheel and rotating it. Press wheel again and move on next field. Press wheel and enter a value for HIGH alarm.

Repeat procedure for "NTU Lo: Dis." and enter a value for LOW alarm.

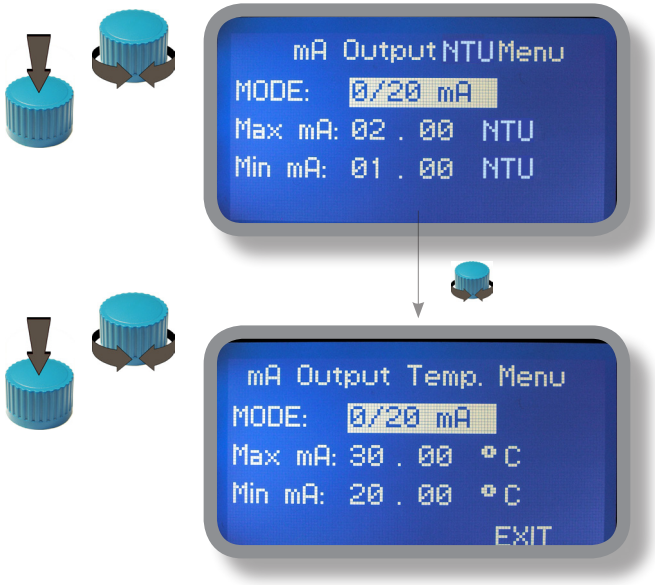
As last option enter "Time" (max 99 minutes) after which if lower or higher read value condition stays then the alarm occurs (to set into mode field).

To change alarm mode move wheel on "Mode", press it and choose between "OUT ON" (connected device will not stop activity when read value is out of range) or "OUT OFF" (connected device will stop activity when read value is out of range and an alarm message is displayed).

17. "mA Outputs"

This menu allows to configure mA current otputs for NTU and Temperature channels. Options to set are:

MODE (selectable between 0-20 or 4-20 mA current output)
Max mA: maximum probe's reading value at 20 mA current
Min mA: minimum probe's reading value at 0 or 4 mA current



Rotate wheel to move within all 3 channels. Click wheel to selecte parameter and rotate wheel to change it. Click wheel again and rotate wheel to move cursor on next parameter.To end procedure move cursor on "EXIT" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

This menu is available only for "LDPHxx" instrument series with current outputs option enabled (blocks on board).

18. Technical information.

Power supply: 85÷264 VAC
NTU Range: 9,999NTU or 99,99NTU or 999,9NTU or 9999NTU
Environment Temperature: -10 ÷ 45°C (14 ÷ 113°F)
Chemical Temperature: 0 ÷ 50°C (32 ÷ 122°F)
Installation Class: II
Pollution Level: 2
Packaging and Transporting Temperature: -10 ÷ 50°C (14 ÷ 122°F)
Protection degree: IP 65

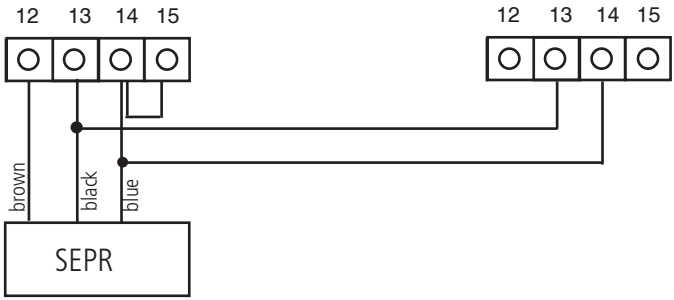
Product	Formula	Ceram.	PVDF	PP	PVC	SS 316	PMMA	Hastel.	PTFE	FPM	EPDM	NBR	PE
Acetic Acid, Max 75%	CH3COOH	2	1	1	1	1	3	1	1	3	1	3	1
Hydrochloric Acid, Concentrate	HCl	1	1	1	1	3	1	1	1	1	3	3	1
Hydrofluoric Acid 40%	H2F2	3	1	3	2	3	3	2	1	1	3	3	1
Phosphoric Acid, 50%	H3PO4	1	1	1	1	2	1	1	1	1	1	3	1
Nitric Acid, 65%	HNO3	1	1	2	3	2	3	1	1	1	3	3	2
Sulphuric Acid, 85%	H2SO4	1	1	1	1	2	3	1	1	1	3	3	1
Sulphuric Acid, 98.5%	H2SO4	1	1	3	3	3	3	1	1	1	3	3	3
Amines	R-NH2	1	2	1	3	1	-	1	1	3	2	3	1
Sodium Bisulphite	NaHSO3	1	1	1	1	2	1	1	1	1	1	1	1
Sodium Carbonate (Soda)	Na2CO3	2	1	1	1	1	1	1	1	2	1	1	1
Ferric Chloride	FeCl3	1	1	1	1	3	1	1	1	1	1	1	1
Calcium Hydroxide (Slaked Lime)	Ca(OH)2	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Hydroxide (Caustic Soda)	NaOH	2	1	1	1	1	1	1	1	2	1	2	1
Calcium Hypochlor.(Chlor.ted Lime)	Ca(OCl)2	1	1	1	1	3	1	1	1	1	1	3	1
Sodium Hypochlorite, 12.5%	NaOCl + NaCl	1	1	2	1	3	1	1	1	1	1	2	2
Potassium Permanganate, 10%	KMnO4	1	1	1	1	1	1	1	1	1	1	3	1
Hydrogen Peroxide, 30% (Perydrol)	H2O2	1	1	1	1	1	3	1	1	1	2	3	1
Aluminium Sulphate	Al2(SO4)3	1	1	1	1	1	1	1	1	1	1	1	1
Copper-II-Sulphate (Roman Vitriol)	CuSO4	1	1	1	1	1	1	1	1	1	1	1	1

Resistance rating: (1: Resistant) ; (2: Fairly resistant) ; (3: Not resistant)

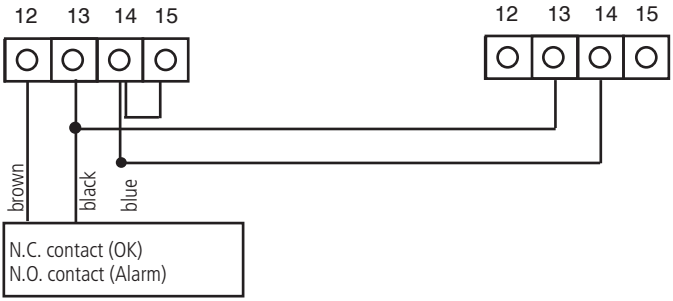
Polyvinyldene fluoride (PVDF) Pump Heads, valves, fitting, tubing
Polypropylene (PP) Pump Heads, valves, fitting, level floater
PVC Pump Heads
Stainless steel (SS 316) Pump Heads, valves
Polymethyl Metacrilate (Acrylic) PMMA Pump Heads
Hastelloy C-276 Injection valve spring
Polytetrafluoroethylene (PTFE) Diaphragm
Fluorocarbon (Viton® B) Sealings
Ethylene propylene (EPDM) Sealings
Nitrile (NBR) Sealings
Polyethylene (PE) Tubing

19. SEPR configuration

SEPR "Flow Sensor" configuration for two instruments

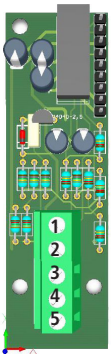


Configuration of a Flow Switch with a voltage free contact and two instruments



Appendix A - ETORBH probe module

Located under mainboard cover there are a connector that are used to install the probe module.
Module come pre-installed upon request. Identify installed module to correctly connect probe.



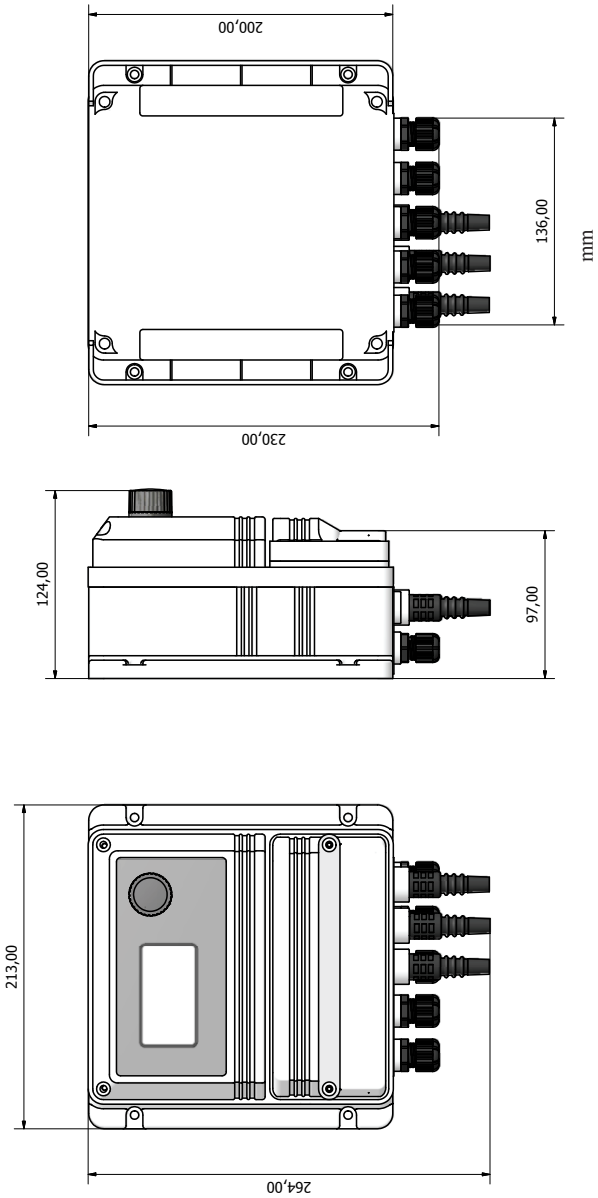
Module suitable for:

ETORBH probe

Connect probe as follows:

1 Green
2 Yellow
3 Black
4 White
5 Brown

Appendix B - Dimensions



19. Index

When dismantling this instrument please separate material types and send them according to local recycling disposal requirements.
We appreciate your efforts in supporting your local Recycle Environmental Program.
Working together we'll form an active union to assure the world's invaluable resources are conserved.