µACP 4061/P

WALL MOUNTED NEPHELOMETRIC TURBIDITY ANALYSER

TECHNICAL MANUAL

P/N: .....

Rev. 0 -Ver. 1.1

EDITION May 2006

GENERAL CLAUSES

Despite the fact that the utmost attention has been given taken in the preparation of this document, CHEMITEC s.r.l. cannot guarantee the accuracy of all information contained and cannot be held responsible for any consequent mistakes or damages that may arise from its use or application.
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AUTHORISED TECHNICAL SUPPORT CENTRES

CHEMITEC s.r.l.
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INDEX

1 GENERAL

1.1 INFORMATION ON THE MANUAL

This document contains reserved information. It may be subject to modifications and updates without any prior notice.

Printing chronology:

First edition: **µACP 4061/P – Rev. 0 - Ver. 1.1**

This manual is an integral part of the instrument. Upon initial installation of the equipment, the operator must carry out a careful control of the contents of the manual in order to check its integrity and completeness.

If for any reason it is ruined, incomplete or inadequate please contact CHEMITEC in order to reintegrate or replace the non-compliant manual immediately.

The official versions of the machine, for which CHEMITEC is directly responsible, are the ones in Italian and in English.

For countries of different languages from the ones indicated above, the official manual will remain the one in Italian. CHEMITEC will not be held responsible for any possible translations in different languages made by distributors or users themselves.

Compliance with the operative procedures and the precautions described in this manual is an essential requirement for the correct operation of the instrument and to guarantee total operator safety.

The manual must be ready in all parts, in front of the instrument, before use so that all methods of operation are clear as well as the controls, connections to the peripheral equipment and precautions for a correct and safe use.

The user manual must be stored, integral and legible in all parts, in a safe place and at the same time it must be immediately accessible to the operator during installation, use and/or installation revision operations.

1.1.1 CONVENTIONS

The present user manual uses the following conventions:

NOTE

The notes contain important information to be highlighted compared with the rest of the text. They generally contain information that is useful to the operator to carry out and optimise operative procedures of the equipment in a correct manner.

CAUTION

Caution messages appear in the manual before procedures or operations that must be observed in order to avoid any possible losses of data or damages to the equipment.

CAUTION

Caution messages appear in the manual in correspondence to the description of procedures or operations that, if carried out incorrectly, may cause damages to the operator or users.

1.2 DECLARATION OF RESPONSIBILITY BY THE MANUFACTURER

CHEMITEC will be held responsible for the safety, reliability and performance of the equipment only if used in compliance with the following conditions:

- Calibration, modifications or repairs must be carried out by qualified personnel, specifically authorised by CHEMITEC.
- Opening of the equipment and access to its internal parts may only be carried out by personnel qualified for maintenance and specifically authorised by CHEMITEC.
- The environment in which the equipment is used must comply with safety regulations.
- The electrical connections of the environment must be carried out according to regulations and must be perfectly efficient.
- Replacements that can be carried out on parts of the equipment and accessories must be done so with others of the same kind and of the same characteristics.
- The use and maintenance of the equipment and of relative accessories must be carried out in compliance with the instructions indicated in this manual.
- This manual must always be kept integral and legible in all parts.

1.3 LIMITS OF USE AND PRECAUTIONS FOR SAFETY

In order to guarantee safety of the operator together with the correct functioning of the equipment, it is important to work within the limits permitted and to adopt all of the precautions listed below:

CAUTION

Check before use to make sure that all safety requirements are fully satisfied. The equipment must not be powered or connected to other equipment until safety conditions are satisfied.

1.3.1 ELECTRICAL SAFETY

CAUTION

All of the connections on the are isolated from the environment ground (mass is not isolated).
DO NOT connect any of these connections to earth.

In order to guarantee conditions of utmost safety for the operator, we recommend that all of the indications listed in this manual are respected.

- **Power the equipment exclusively using network tension according to specifications (85÷260Vac 50/60Hz)**
- **Replace damaged parts immediately.** Cables, connectors, accessories or other parts of the equipment that may be damaged or not working correctly must be replaced immediately. In this case contact your nearest authorised technical assistance centre.
- **Only use accessories and peripheries specified by CHEMITEC.** In order to guarantee all of the safety requirements, it is important to make exclusive use of the accessories specified in this manual which have been tested in combination with the equipment. The use of accessories and consumption materials of other manufacturers or not specifically recommended by CHEMITEC will not guarantee the safety and correct operation of the equipment. Only use peripherals that comply with the regulations of their specific categories.

1.3.2 SAFETY OF THE OPERATIVE ENVIRONMENT

- **The panel of the 4061/P device is protected against the introduction of liquids.** Avoid subject the equipment to the risk of dripping water, sprays of water or immersion in water and the use in environments in which such risks may be present. Equipment in which liquids may have accidentally penetrated must be immediately switched off, cleaned and controlled by authorised and qualified personnel.
- Once programming has been carried out, we recommend that the transparent panel is closed.
- **Protection of the electronic section**
  - with a closed transparent panel IP65
  - with an open transparent panel IP20
  - EMI /RFI CEI EN55011 - 05/99

- **Use the equipment within the environmental limits of temperature, humidity and pressure specified.** The instrument has been developed to operate in the following environmental conditions:
  - Temperature of the working environment 0°C ÷ +50°C
  - Temperature of storage and transportation -25°C ÷ +65°C
  - Relative humidity 10% ÷ 95%RH – not condensing

CAUTION

The water treatment plant in which the instrument is introduced must be developed in accordance with the functional requirements imposed by current legislation.

The apparatus must be inserted perfectly into the plant.

The plant must be kept operative in full compliance with the safety regulations provided.

The parameters indicated on the analyser must comply with current regulations.

Any signals of faults to the device must be positioned in an environment that is constantly controlled by operative personnel or plant assistants.

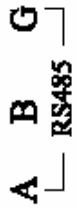
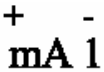
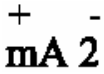
Non compliance with even just one of these conditions may lead the "logics" of the device to operate in a potentially dangerous manner for users of the service.

Therefore, we recommend that service personnel and/or maintenance personnel operate with the utmost care, pointing out any changes to the safety parameters immediately, in order to avoid the creation of any potentially dangerous situations.

As the considerations indicated above cannot be controlled by the product in question, the manufacturer will not be held responsible for any damages that these malfunctions may cause to people or things.

1.4 GRAPHIC SYMBOLS

The following table illustrates the drawings, the relative description and the position of all graphic symbols present on the equipment panels and on any other equipment or external devices to which they may be connected.

SYMBOL	DESCRIPTION	POSITION
	**Danger symbol**	A symbol located close to the clamps for connection to power.
	**Phase**	Symbols located close to the connections of the equipment to the electricity network
	Neutral	
	Earth protection	
	**Caution! Refer to the documentation attached**	A symbol located close to the points in which the user manual should be consulted for important information. (see paragraph CAUTION).
	**Positive**	Positive pole of the connector RS485
	Negative	Negative pole of the connector RS485
	Clamp	A symbol located close to the shield of the cable for RS485
	**CELL**	Turbidimetric cell connection (Photosensor group)
	**CELL**	Reference cell connection (Lamp group)
	**Analogical output n.1**	0/4 ÷20mA separated galvanically
	**Analogical output n. 2**	0/4 ÷20mA separated galvanically

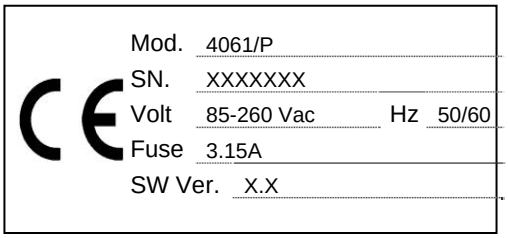
1.5 CAUTION SYMBOL

The symbol illustrated below represents the **CAUTION** symbol and reminds the operator that he should read the user manual for important information, advice and suggestions for the correct and safe use of the equipment.

In particular, when it is positioned close to connection points to cables and peripheries, the symbol in question refers to careful reading of the user manual for instructions related to the nature of such cables and peripheries and the methods for correct and safe connections.

For the position of the CAUTION symbols on the equipment, refer to Chapter 2 "*Commands and Indicators, Connections*" and Chapter 3 "*Installation"* of this user manual. The reproductions of equipment panels, with relative commands, connections, symbols and labels are provided in this chapter. Each caution symbol is accompanied by a detailed explanation of its meaning.

1.6 PLATE DETAILS



1.7 INFORMATION ON RECYCLING AND USE OF MATERIALS

CHEMITEC, in accordance with specific European regulations, aims at constant improvement of development and of production procedures of its equipment with the objective of drastically reducing the negative impact on the environment caused by parts, components, consumption materials, packaging and the equipment itself at the end of its life cycle.

Packaging is conceived and produced to allow for its re-use or recovery, including recycling of the majority of the materials and to reduce the amount of waste or residues to be disposed of, to a very minimum. In order to assure a correct environmental impact the equipment has been designed with the smallest circuit possible, with the lowest differentiation possible of materials and components, with a selection of substances that guarantee utmost recycling and maximum reuse of the parts and waste disposal free from ecological risks.

The equipment is made in such a way as to guarantee the easy separation or dismantling of the materials containing contaminants compared with others, in particular during maintenance operations and the replacement of parts.

CAUTION

The disposal/recycling of packaging, of consumption materials and of the equipment itself at the end of its life cycle must be carried out in accordance with the norms and regulations that are currently valid in the country in which the equipment is used.

1.7.1 SPECIAL ATTENTION TO CRITICAL COMPONENTS

The instrument is fitted with an LCD liquid crystal display, which contains small amounts of toxic materials.

1.8 COMPLIANCY DECLARATION

The Compliance Statement of the µACP 4061/P Nephelometric Turbidity Measurer is indicated below.

DICHIARAZIONE DI CONFORMITÀ CE
EC STATEMENT OF COMPLIANCE
DECLARATION DE CONFORMITE CE
EG-KONFORMITÄTSERKLÄRUNG

Fabbricante: **CHEMITEC S.r.l.**
(Producer/Producteur/Hersteller)
Indirizzo: Via Isaac Newton, 30 – 50018 Scandicci (FI) ITALY
(Address/Adresse/Anschrift)

Dichiara che l'apparecchiatura:
Hereby states that the device known as:
Déclare que l'appareil :
Erklärt, daß das nachfolgend aufgeführte Gerät :

MODELLO : **µACP 4061 Misuratore di Torbidità Nefelometrico**
(MODEL/MODELL/MODELL) µACP4061 Nephelometric Turbidity Meter - Controller
µACP4061 Transmetteur per la measure de turbidité selon le principe de disusion à 90°
µACP4061 Trübungsmessung (90° Streulichtmessung)

È conforme alle seguenti direttive CE:
73/23CE, 89/336CE, 92/31CE, 93/68CE,
come modificate e recepite dalla legislazione italiana
The machinery meets the requirements set by the following EEC Directives:
Directives 73/23EC, 89/336EC, 92/31CE, 93/68CE, as amended and implemented under Italian law
L'appareil est conforme aux Directives CE suivantes:
Directive 73/23EC, 89/336EC, 92/31CE, 93/68CE, telle que modifiée et accueillie formellement par la législation italienne.
Im entspricht das Gerät den folgenden EG-Richtlinien:
EG Richtlinie 73/23EC, 89/336EC, 92/31CE, 93/68CE, wie von der italienischen Rechtsprechung modifiziert und aufgefaßt

Sono state applicate le seguenti Norme Nazionali, che traspongono le Norme Armonizzate CE:
The following national standards and technical specifications, conforming to EEC Harmonized Regulations, were followed:
Les normes nationales transposant les normes harmonisées CE qui ont été appliquées sont les suivantes:
Folgende nationale Normen wurden angewandt, die den vereinheitlichten EG-Normen entsprechen:
EN 61000-6-4 (2002/10), EN 61000-6-2 (2002/02), EN 55011 (1999/05)
CEI EN 61000-3-2 (2002/04), CEI EN 61000-3-3 (1977/06), EN 61010-1 (2001/11)

Firenze, 15 Marzo 2006

CE

Sig. CATELANI Filippo

2 GENERAL DESCRIPTION

The analyser discussed in this manual and illustrated in figure 1 consists of a hydraulic section and an electronic section.

The two parts are joined between them and their internal optical and electrical connections have already been completed.

On the external part of the hydraulic section, as can be seen from the drawing, some connections for feeding of the cell have already been completed.

It is powered by the network (85÷260Vac -50/60Hz) by a Switching feeder.

This equipment has been designed to analyse ON-LINE the water turbidity under various applications:

- Primary waters, drinking waters and Depuration
- Industrial process treatment, like as:
    - Food industry
    - Pharmaceutical industry
    - Irrigation
    - Energy
- Environmental controls

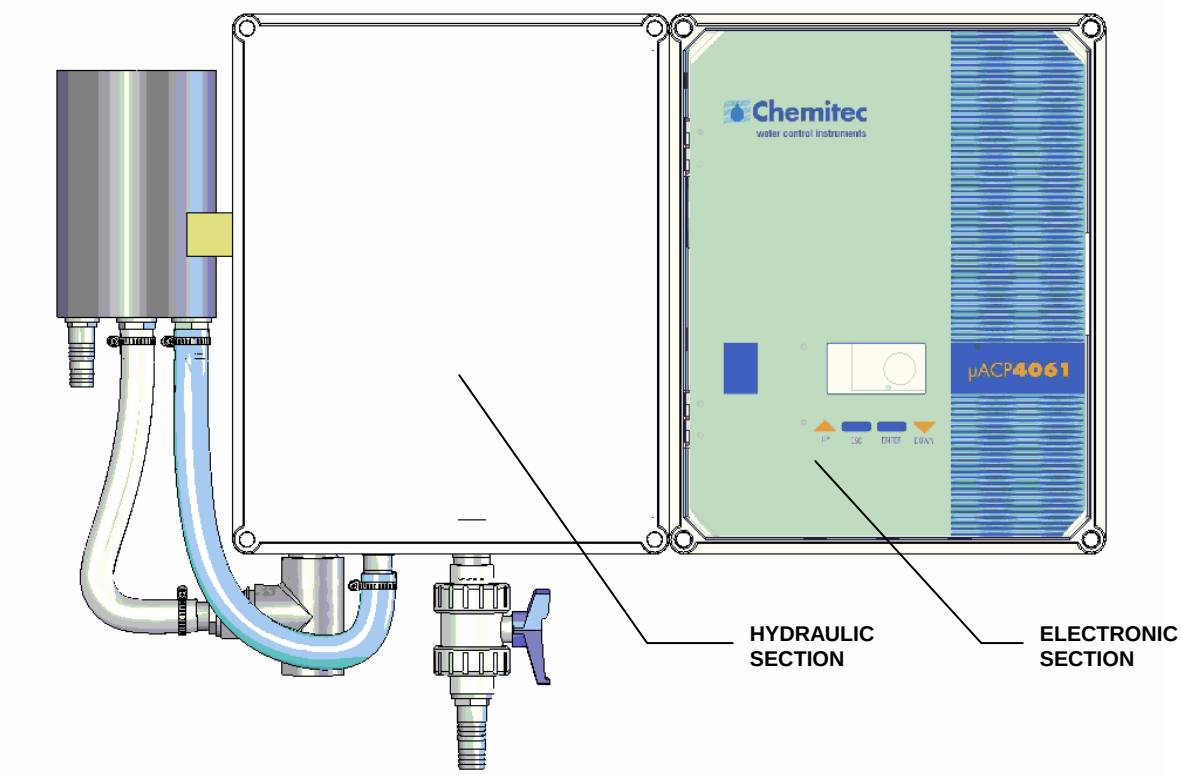


Figure 1 - Wall mounted turbidity meter unit (µACP4061/P)

2.1 MEASURING PRINCIPLE

Turbidity means water less clearness due to the suspended elements made of very thin particles which cannot sediment within a reasonably short time. The suspended particles cause the absorption of the light radiations, which depend on the number and the sizes of the particles. The turbidity value can be determined by comparing the absorption of the sample under test to the values derived by a known calibration curve.

2.2 MAIN CHARACTERISTICS

- Measuring of Nephelometric Turbidity
- Programming keyboard with 4 bubble keys
- A graphical LCD 128x64 display with illumination
- An internal data Logger (flash 4 Mbit) with the possibility of graphic visualisation and tables of measurement trends
- PID adjustment
- Serial outlet RS485 MOD BUS RTU
- 2 programmable analogical outlets
- 1 relay outlet for instrument fault alarm
- 2 relay outlets for intervention limits
- 1 relay outlet for activation of any possible automatic cell washing devices
- 1 digital input for deactivation of doses

Main hardware characteristics of the electronic device

The hardware structure of this periphery is based on the adoption of extremely new CPU CMOS with 8 bits developed specifically for the execution of the so-called “embedded” applications.

The card uses an EEPROM to store the Set-up data and flash memories for storage of the archives of historical data and LOG files of events.

The Card has 1 RS485 gate (opto-isolated) for local networks used for connections with local communication devices (configuration computer, terminals and remote controls etc).

The card integrates a Real Time Clock (clock with date) that allows the software to storage figures in a chronological order.

A nephelometric measuring cell with a 90° diffusion angle ° (ISO 7027). Dual sensor for automatic compensation of derivation of the optical signal. A black PVC structure. A gas stripper lung to eliminate air bubbles.

2.2.1 TECHNICAL CHARACTERISTICS

2.2.1.1 Measuring range

Turbidity	000.0 ÷ 100.0 / 0000 ÷ 1000 FTU/NTU
Resolution	± 0.1 / ± 1 FTU/NTU
Accuracy	± 2.5% F.S.

2.2.1.2 Displaying / Programming

Display	Backlighted graphic LCD 128x64
Measure contemporary displaying:	
	(Absolute value + bargraph) temperature, digital output status, analog output values, storage status, malfunctioning
Programming keyboard	4 bubble keys

2.2.1.3 Measuring recordings

Data Logger	Inside, with Flash memory, 4 Mbit equal to 16000 recordings
Recording range	00:00 ÷ 99:99 min Type: circular / filling
Displaying	on tables / graphic data

2.2.1.4 Analog outputs

- **Primary output**

Size	Turbidity
Type	0.00 / 4.00 ÷ 20.00 mA, galvanically isolated
Programming limits	lower / upper
Max. loading	500 Ohm
Alarm output according to NAMUR	2.4 mA (with range 4/20mA)

- **Secondary output**

Measure Repetition / PID	
Type	0.00 / 4.00 ÷ 20.00 mA, galvanically isolated
Programming limits	lower / upper, Max. loading: 500 Ohm
PID dosing function	(P – PI – PID)
Proportional field	0 ÷ 500%
Integrated time	0:00 ÷ 5:00 min
Derivative time	0:00 ÷ 5:00 min

2.2.1.5 Digital outputs

- **Nr. 2 - Set Point**

Max. resistive load relay	1A to 230Vac
ON – OFF	000.0 ÷ 100.0 / 0000 ÷ 1000 FTU/NTU
Hysteresis programming and	
Working time	000 ÷ 999 secs.

- **Nr.1 - Alarm**

Max. resistive load relay	1A at 230Vac
ON-OFF	cumulative for set point delay, troubles, min / max, standby time (live check)
Delay	00:00 ÷ 59:99 mm:ss at 15 sec. min. steps
Threshold disabling	ON / OFF
Relay	Closed / opened
Standby field	000.0 ÷ 100.0 / 0000 ÷ 1000 FTU/NTU
Standby time	00:00 ÷ 99:99 hh:mm at 15 min, min. steps
Resistive max. load relay	1A at 230Vac

- **Nr.1 - washing**

Resistive max. load relay	1A at 230Vac
Programmable frequency ON-OFF	00:00 ÷ 24:00 hh:mm
Min. range	15 min

2.2.1.6 Digital input

Input voltage	24 Vdc /ac
Absorption	10mA max

2.2.1.7 Serial output

RS485	With programmable speed 1200÷38400 Baud Rate.
Protocol	MOD BUS RTU

2.2.1.8 Working conditions

Working temperature	0 ÷ 50°C
Storage and transport	-25 ÷ 65°C
Humidity	10 ÷ 95% with no condensation

2.2.1.9 Powering and electrical guards

Power supply	90 ÷ 260 Vac 50-60 Hz (optional 24 Vac/dc
Transformer insulation	4KV
Average absorption	< 6W
Electrical guard	EMI / RFI CEI-EN55011 – 05/99

2.3 CONTROLS, INDICATORS AND CONNECTIONS

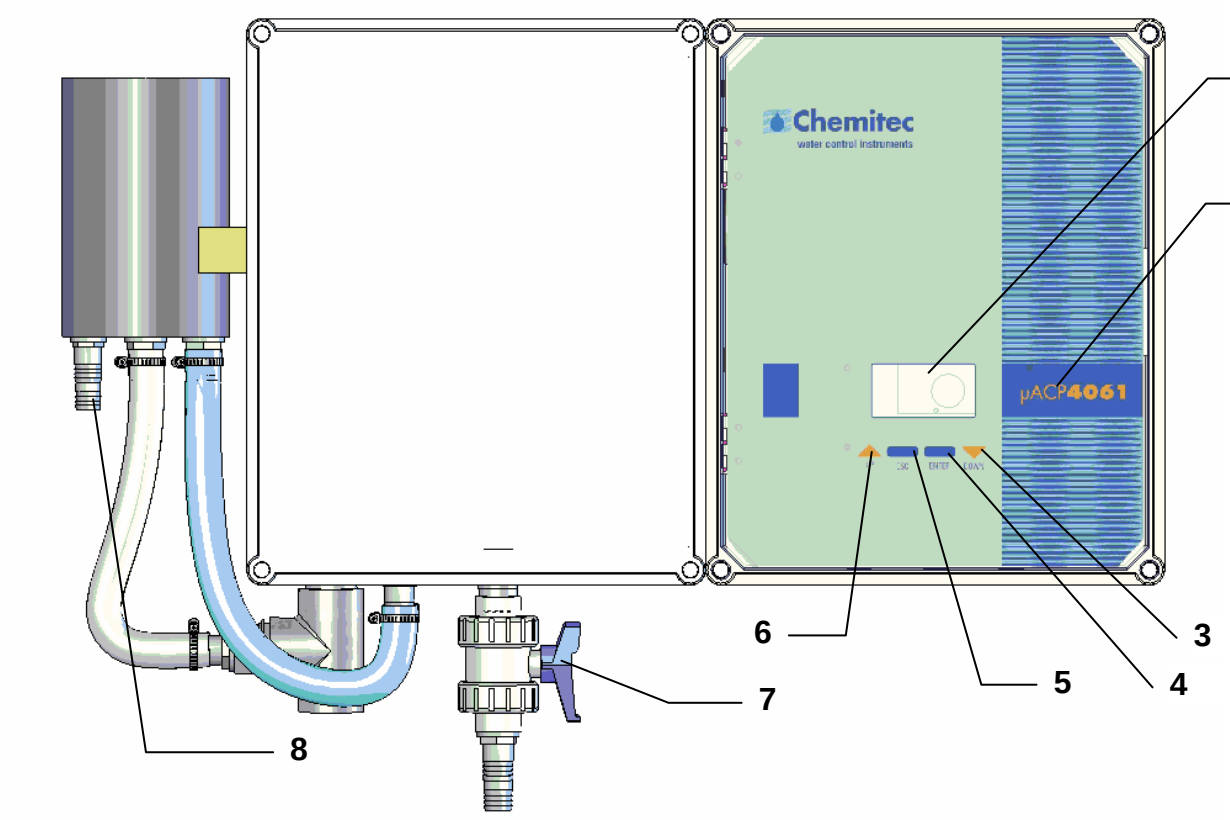


Figure 2 – Wall device. Front panel

1. Visualizer with LCD Display
2. Instrument Identification (µACP4062/P)
3. DOWN key
4. ENTER key
5. ESC key
6. UP key
7. Discharge tap of measuring cell
8. Undersized liquid inlet

Access to the connection terminal boxes is within the electronic section. Access is gained by opening the relative front panel: the cables are located on the bottom wall.

By opening the panel of the hydraulic section, access can be gained to the measuring cell and to the photosensor. The following diagram illustrates the analyser without the front panels.

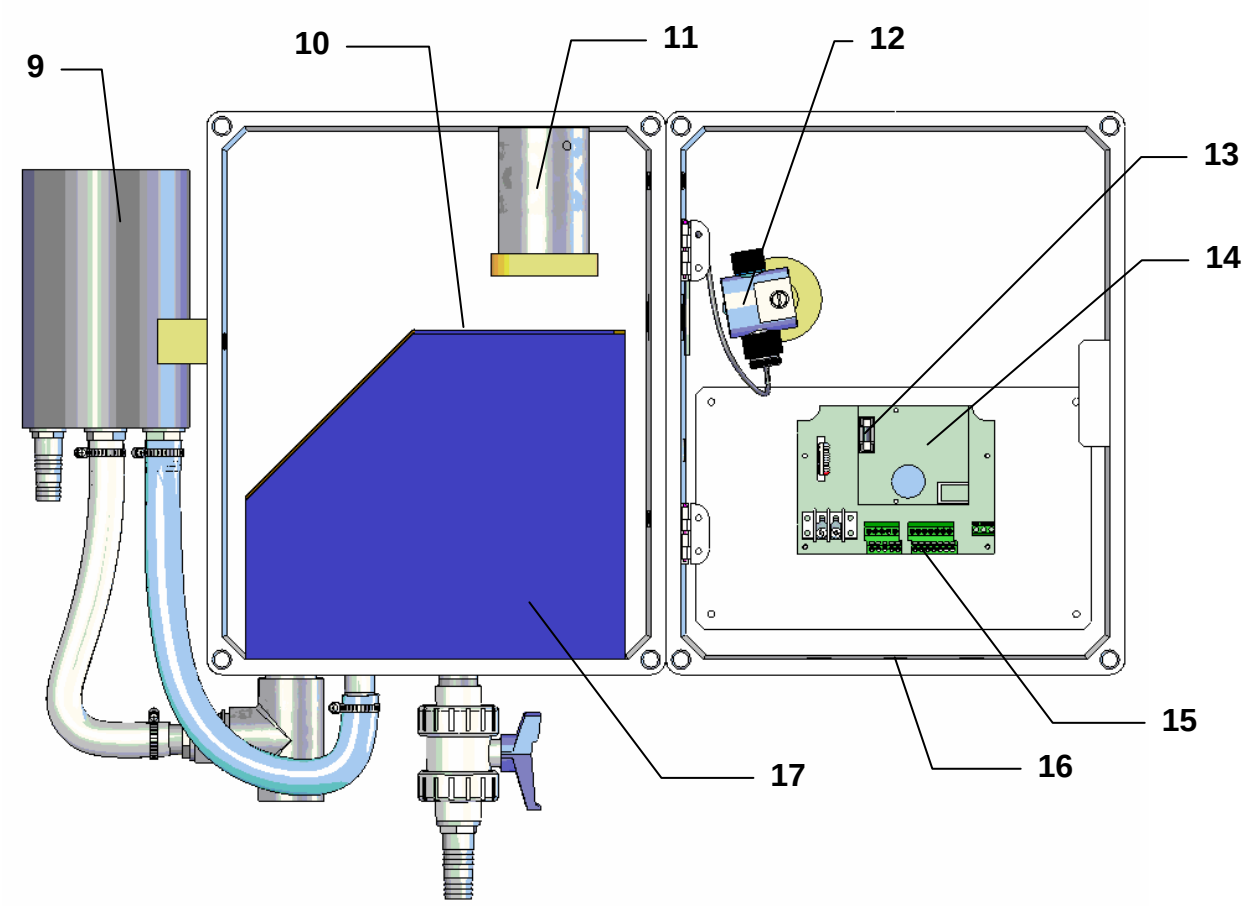


Figure 3 – Wall power unit, internal view

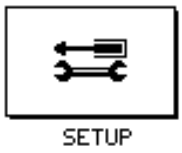
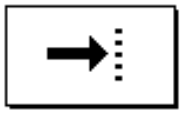
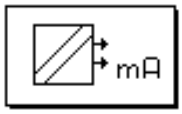
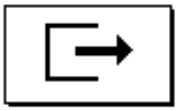
9. Compensation tank
10. Reflection surface
11. Photosensor
12. Light emitter
13. Fuse
14. Electronic card
15. Terminal box
16. Cable management
17. measuring cell

2.4 GRAPHIC DISPLAY

The graphic display allows for visualization of the various programming menus and, in the measuring method (Run), visualization of the measurements and of the state of operation.

2.4.1 LIST OF PRIMARY MENUS

The following table illustrates the symbols visualized on the display, which represent the various programming menus.

VISUALIZATIONS ON THE GRAPHIC DISPLAY	DESCRIPTION
1 	SETTINGS MENU All basic parameters for operation logics are set
2 	CALIBRATIONS MENU Programming stage for the probe calibration
3 	ANALOGUE OUTPUT MENU Setting of analogical outputs in current
4 	ARCHIVE MENU Filing data setting and file table displaying
5 	GRAPHICAL MEASUREMENT MENU Visualization of archives in a graphical form
6 	MANUAL CONTROL MENU Probe input, analogical and digital outputs Instrument digital input
7 	Return to operation in measuring method (RUN)

2.4.2 DIVISION OF THE GRAPHICAL DISPLAY INTO AREAS IN THE RUN METHOD

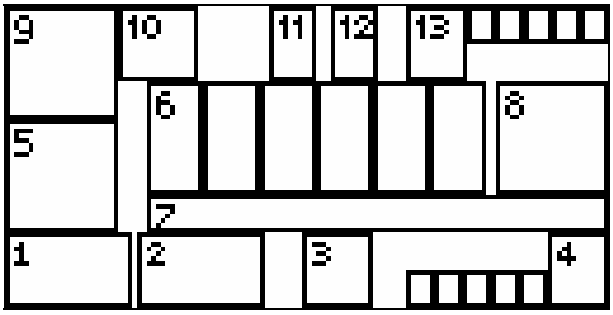
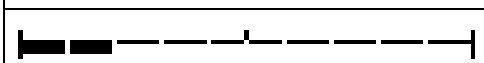
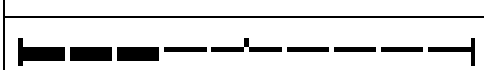
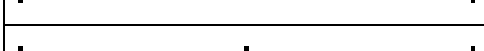


Figure 4 – Graphic display - divided up into areas

In the following table, for every area of the display indicated in figure 4, the symbols that may appear during functioning of the device in a measurement method (RUN) are represented and briefly described.

GRAPHICAL AREA	REPRESENTATION	DESCRIPTION
1		Set1 - Open Relay
		Set1 - Closed Relay
		Set1 – Timed Active Threshold Relay Open
		Set1 – Timed Deactivated Threshold Relay Open
		Set1 - Timed Active Threshold Relay Closet
2		Set2 - Open Relay
		Set2 - Closed Relay
		Set2 - Timed Active Threshold Relay Open
		Set2 - Timed Deactivated Threshold Relay Open
		Set2 – Timed Active Threshold Relay Closed
1-2		Disabling Set Indicates digital entrance ON

GRAPHICAL AREA	REPRESENTATION	DESCRIPTION
		Stay time Probe frozen on a value
		Maximum Logical Set Exceeded
		Minimum Logical Set Exceeded
		Maximum dosage time exceeded
3		Washing stage active
4		Value output n.1 (in mA)
		Value output n.2 of temperature (in mA)
		Value output n.2 auxiliary (in mA)
		Value output n.2 with PID function PID (in mA)
		Manual value of temperature (in Fahrenheit)
		Manual temperature value (in Centigrades)
5		Alarm active – Alarm relay closed
6		Numerical
7		0% of the scale
		10% of the scale
		20% of the scale
		30% of the scale
		40% of the scale

GRAPHICAL AREA	REPRESENTATION	DESCRIPTION
		50% of the scale
		60% of the scale
		70% of the scale
		80% of the scale
		90% of the scale
		100% of the scale
8	**NTU**	*Nephelometric Turbidity Unit* measurement unit
	FTU	*Formazine Turbidity Unit* measurement unit
		Seconds during stabilization
9		Archive full
		Storage of Data
10		Frozen probe
11		Wait – Freezing stage of measurements and outputs
12		Active Password
13		System Clock

3 INSTALLATION

Before installing the **µACP 4061/P** carefully read the instructions provided below.

3.1 COMPOSITION OF THE SUPPLY

The supply consists of just one package which contains the following parts:

- 1 PN electrical power unit and control unit .....?????
- 1 Technical Manual PN .....?????

3.1.1 INSTALLATION OF WALL MOUNTED DEVICE

The wall must be completely **smooth and vertical** in order to allow for perfect adhesion of the device.

For correct operation use a clinometer to position the power unit correctly.

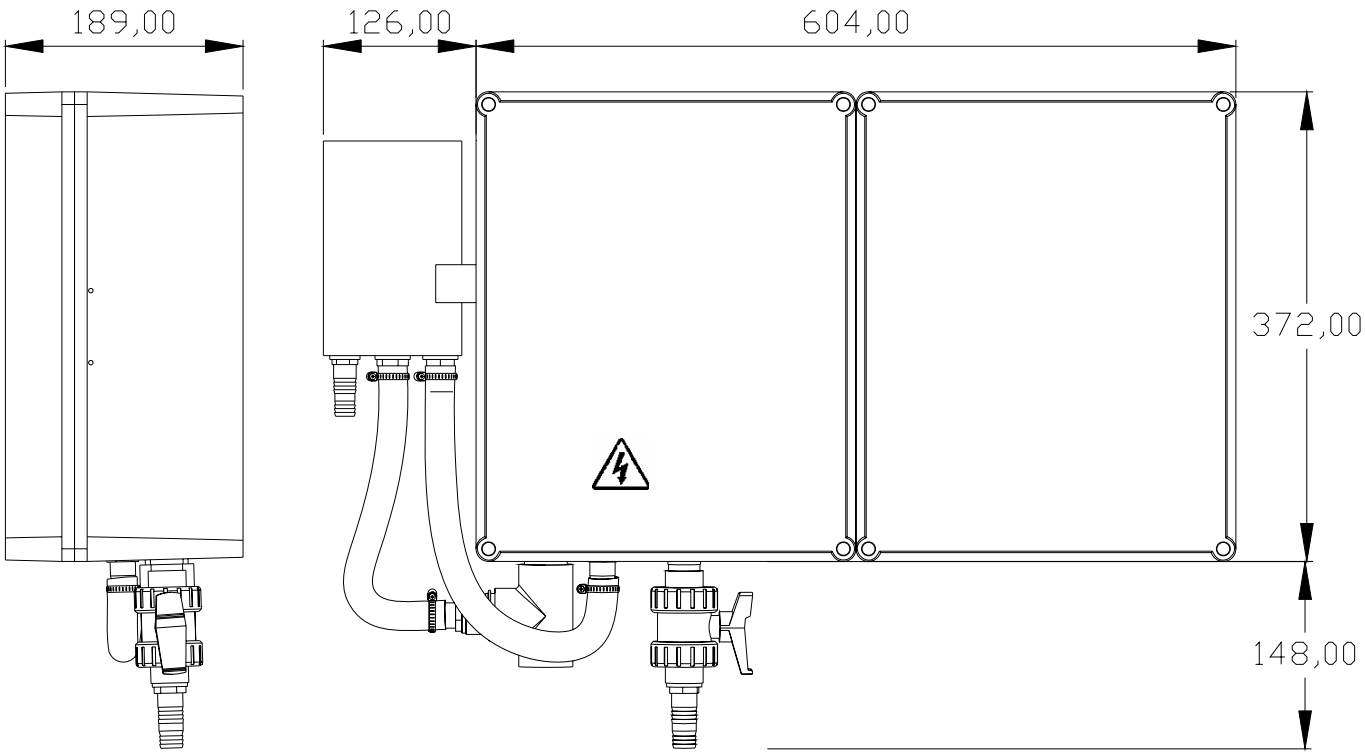


Figure 5 – Dimensions and encumbrance of the wall mounted device

Mechanical Dimensions	**µACP 4061/P**
Dimensions (L x H x P)	604x372x189 mm
Total width (including the side tank)	approx. 730mm
Total height (including taps)	approx. 520mm

The cable holders are located on the bottom of the power unit for connections, therefore it is important to space out the equipment by at least 15cm in order to facilitate connections.

Keep away from water drips and/or sprays of water from adjacent areas in order to safeguard the instrument during programming or calibration stages.

3.1.2 HYDRAULIC CONNECTIONS

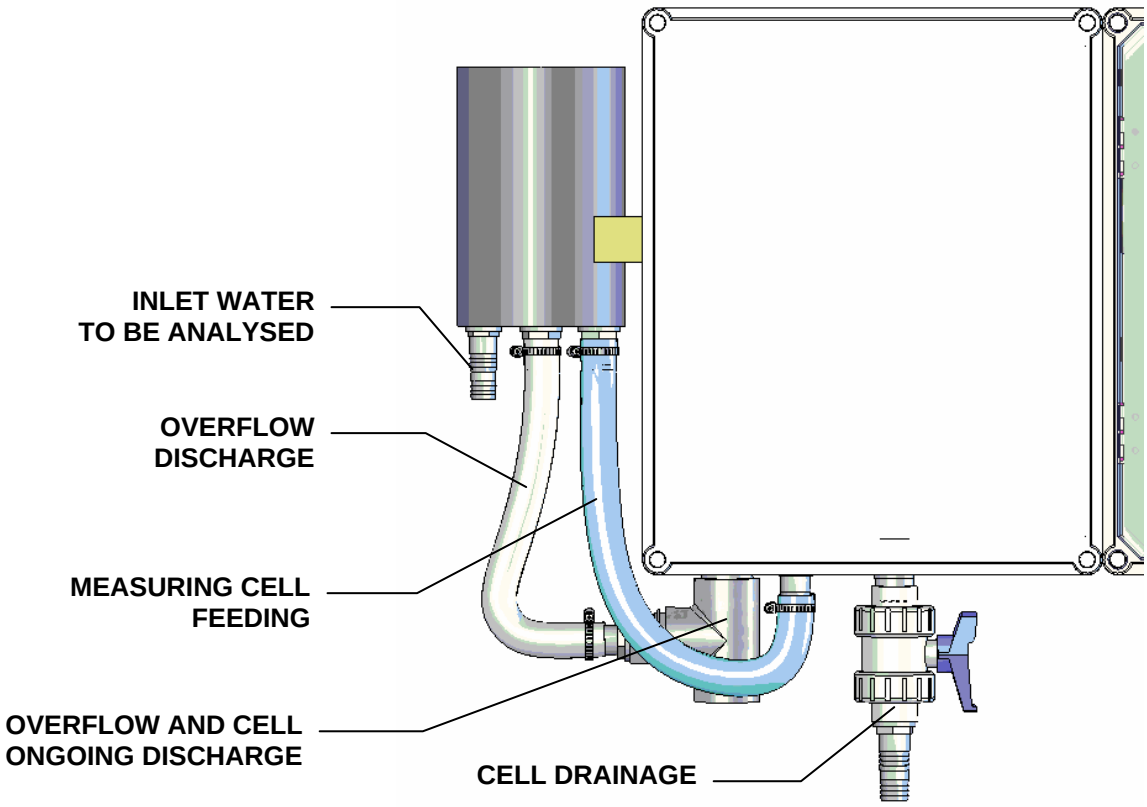


Figura 6 – Hydraulic connections

Connections with the water network upon which measurements are to be made, should be carried out using a rubber or plastic tube with an internal diameter of 13mm.

Its capacity should be between 1 and 2 lt/min.

The maximum pressure should be 1 bar in order to run off the liquid from the tank entering the measuring cell without any turbulence; for this objective the device is supplied complete with a constant level tank that guarantees consistency of capacity to the measuring cell.

If the capacity is insufficient or too high it may compromise the measuring precision. The constant download of too full and of the measuring cell is expected in the conduits without pressure from the 1" GAS tube: it is not possible to connect the discharge into pressurised tubes.

WARNING

The constant discharge of too full and of drainage of the cell should never be connected in pressurised tubes.

When started and during normal operation, there should be a constant discharge that will highlight the perfect filling of the measuring cell.

Emptying of the cell for cleaning purposes should be carried out in free fall containers, opening the relative drainage tap.

3.1.3 CONNECTIONS TO THE POWER SUPPLY

If possible avoid any cables destined for high power use to be positioned close to the device as they may cause faults of an inductive nature to the analogical section of the instrument.

Apply a tension alternating between 85Vac and 260Vac 50/60 Hz or, according to details on the identification plate, the most stabilised tension possible.

Avoid at all costs connections to power supplies that have been rebuilt, for example, with the help of transformers in which this rebuilt power supply will feed other systems beyond the device (perhaps of an inductive kind) because, in this way, high tension spikes will be created and once they are irradiated it becomes very difficult to block and/or eliminate them.

CAUTION

The electric line must be fitted with a suitable life-saving device and magneto-thermal, in compliance with correct installation norms.

In any case it is always best to check the quality of the Ground connection. It is very common to find Ground connections, mainly in industrial environments, that are generators themselves of disturbances: in the case of any doubts on quality a connection to a rod dedicated to the device plant is recommended.

3.1.3.1 Electrical Connections to the dosage systems (Users)

CAUTION

Before starting connections between the Device and the external Users, make sure that the electrical panel is switched off and the cables from the Users are not under tension.

"Users" mean the outputs and relays used in the device

- (SET1) for the Dosage Pump or control command
- (SET2) for the Dosage Pump or control command
- (ALARM) the alarm command transmitted by the instrument to the siren and/or flashing light
- (WASH) electrode washing command

CAUTION

Each relay contact can support, on a resistive load, a maximum current of 1 Ampere with a max. of 230V, therefore a total power of 230VA

In the case of higher levels of power it is best to carry out connections as indicated in the layout of fig. 7-b)

If the load to be handed is of low power or of a resistive nature, the layout indicated in Fig. 7-a) can be used.

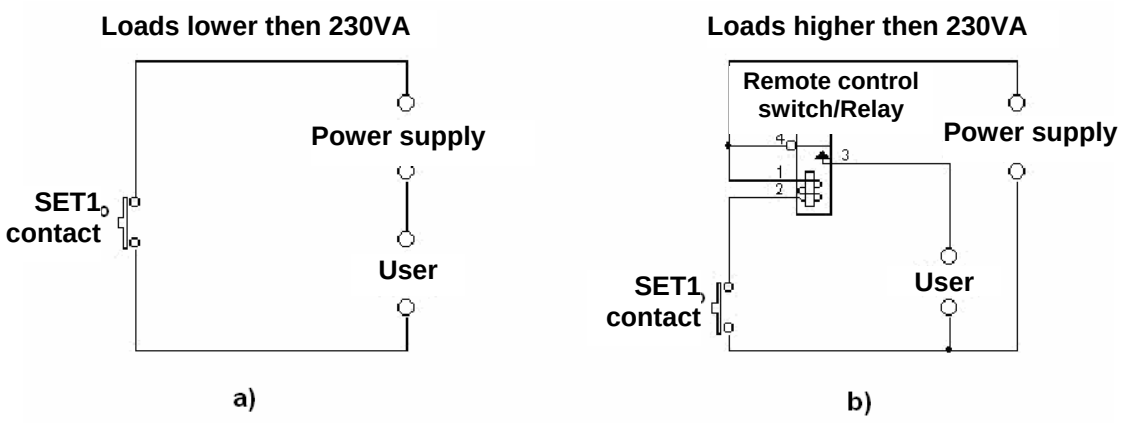


Figure 7 Examples of connection with users

NOTE

The layouts indicated above are typically indicative as details of all of the protection and safety devices necessary are missing.

3.1.3.1.1 Connection terminal box for wall device 4061/P

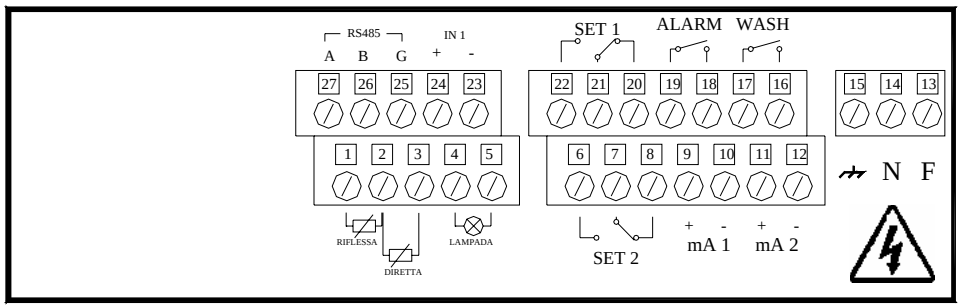
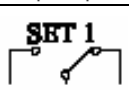
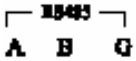


Figure 8 Connections

N° CLAMP	GRAPHIC	DESCRIPTION
1		Turbidimetric cell – Direct light sensor
2		Turbidimetric cell – Direct + deviated light sensor
3		Turbidimetric cell – Deviated light sensor
4	LAMPADA	Turbidimetric cell – Lamp
5		Turbidimetric cell – Lamp
6		Relay for Set Point 2 (contact N.O.)
7	SET 2	Relay for Set Point 2 (contact C.)
8		Relay for Set Point 2 (contact N.C.)
9	+ - mA 1	mA1 positive cable
10		mA1 negative cable
11	+ - mA 2	mA2 positive cable
12		mA2 negative cable
13	N F	Power supply (Phase)
14		Power supply (Neutral)
15		Power supply (Earth)

N° CLAMP	GRAPHIC	DESCRIPTION
16		Relay for washing of probe (contact N.O.)
17		Relay for washing of probe
18		Relay for remote alarm (contact N.O.)
19		Relay for remote alarm
20		Relay for Set Point 1 (contact N.C.)
21		Relay for Set Point 1 (contact C.)
22		Relay for Set Point 1 (contact N.O.)
23		Negative input 24Vdc
24		Positive input 24Vdc
25		Interface RS485 (G)
26		Interface RS485 (B)
27		Interface RS485 (A)

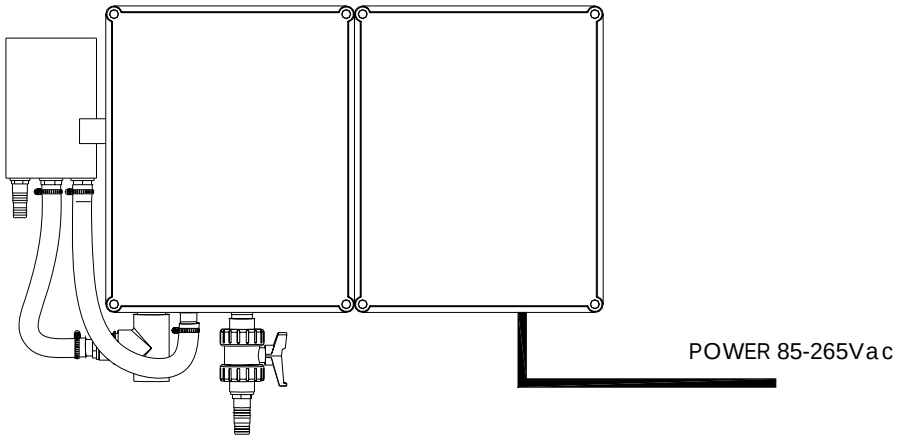
3.1.3.2 Connections to the Power Supply

Once you have made sure that the tension complies with the one indicated in the previous paragraphs, connect the electrical power line to the clamps marked by connecting the clamp with the relative symbol to earth.

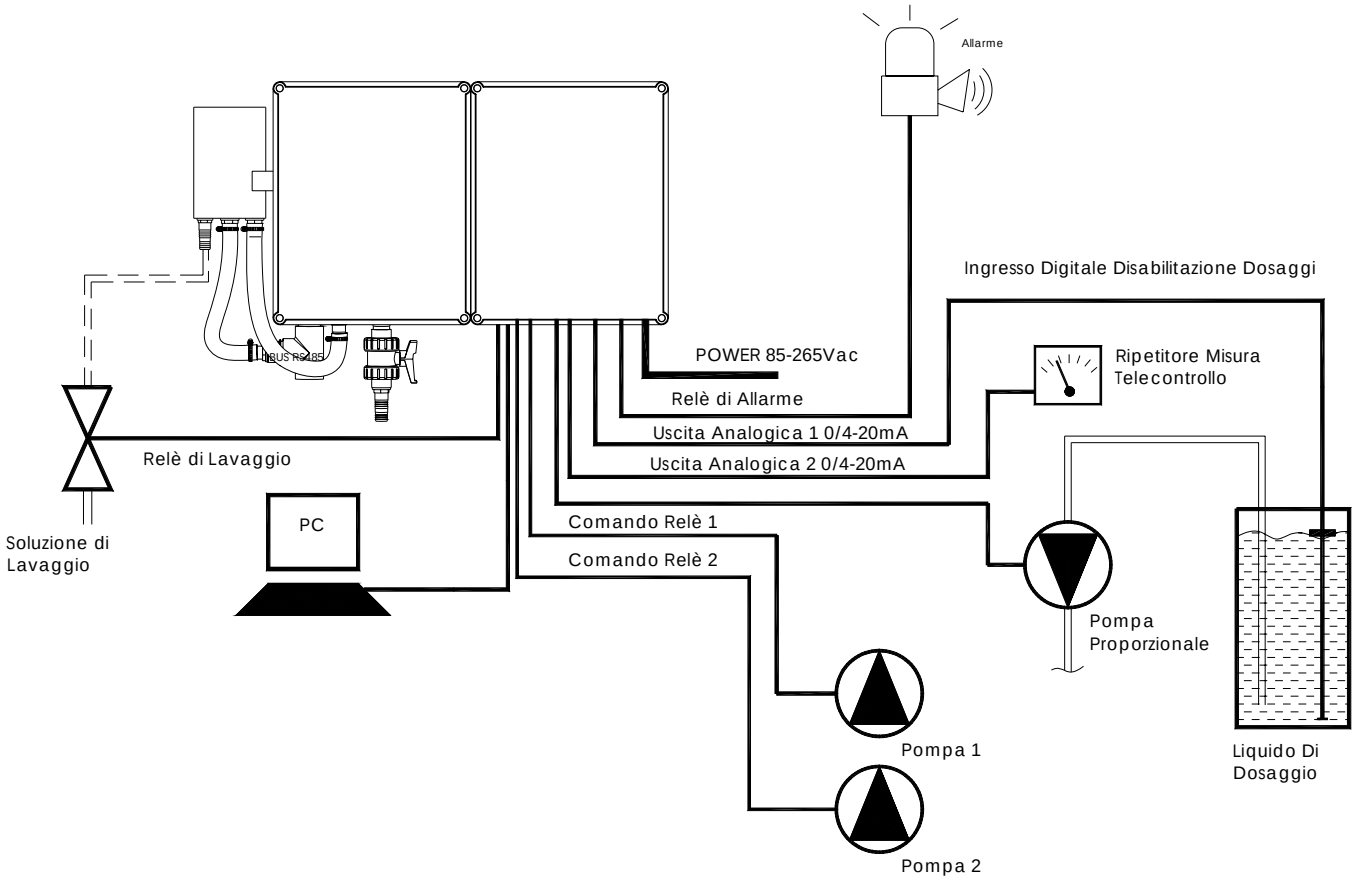
4 METHODS OF USE

4.1 COMPOSITION OF THE MEASURING SYSTEM

4.1.1 MINIMUM CONFIGURATION



4.1.2 MAXIMUM CONFIGURATION



4.2 START UP OF THE SYSTEM

Once the electronic device have been connected, programming of the software must be carried out in order to determine "personalisation" of parameters for correct use of the equipment.

Turn on the equipment by connecting it to the mains; the device does not have a power supply switch.

4.2.1 MENU FUNCTIONS AT START

When the equipment is turned on, it is possible to use some keys to intervene on programming functions not present in the SETUP.

(See paragraphs 4.1.1.1; 4.1.1.2)

4.2.1.1 Setup parameter reset and measuring unit selection

Press the **UP** and **DOWN** keys together before turning the equipment on, then keep them pressed till the displaying of the measuring unit selection window, after the CHEMITEC Logo and the SW version number, with the default parameters, see Fig. 9.

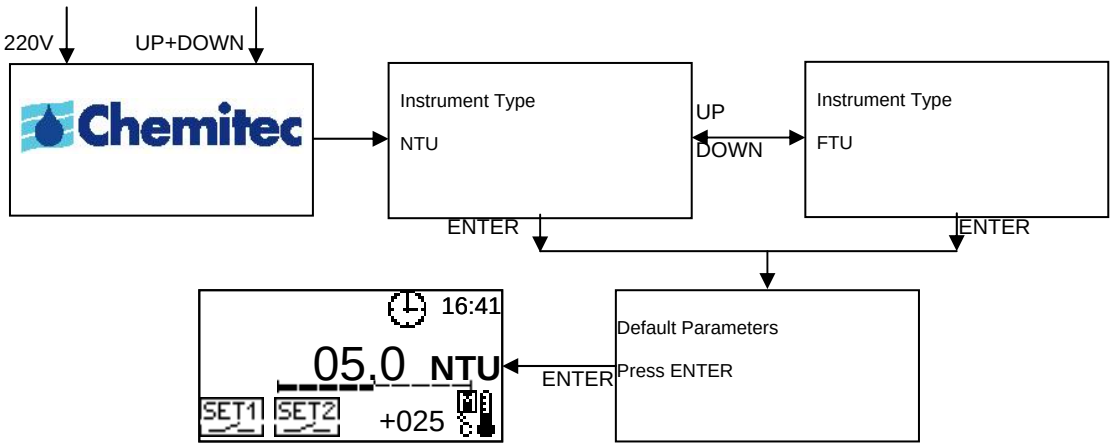


Figure 9 – Flow- Chart – Measuring unit selection and parameter reset

4.2.1.2 Contrast adjustment

Using the same procedure, but keeping the **DOWN** button pressed, the display contrast adjustment window will appear.

NOTE

During this operation release the DOWN button immediately after the first acoustic beep, otherwise the contrast will go quickly to 0% and the display will be completely white. In order to reset the correct level, simply press the UP key to the desired value.

Using the **UP** and **DOWN** keys it is possible to adjust the contrast percentage.

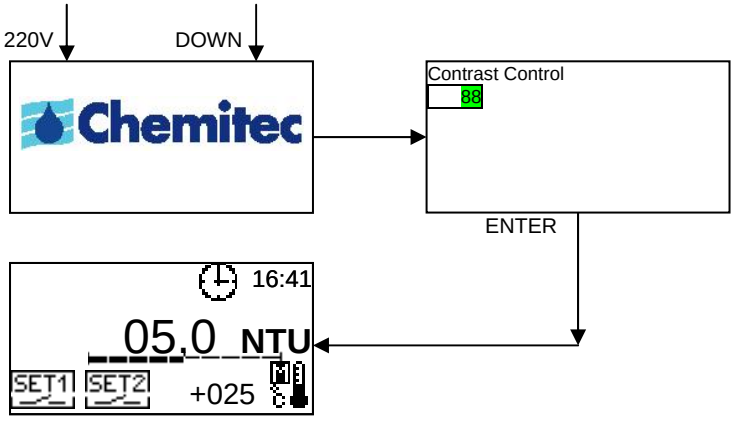


Figure 10 – Flow-Chart Contrast Function

Subsequently pressing ENTER, the RUN visualisation will be activated.

4.3 INTRODUCTION OF OPERATIVE PARAMETERS – THE USE OF KEYS

In order to introduce/modify operative figures and to carry out calibration procedures, use the menus visualised on the display through the 4 function keys located on the front panel of the device.

When turned on the apparatus will automatically position itself in a measuring method – the RUN function. By pressing the ESC key the programming method will be available through the first menu " 1 SETTINGS".

Using the UP and DOWN keys the various menus and submenus can be scrolled and information can be modified (increase/reduction).

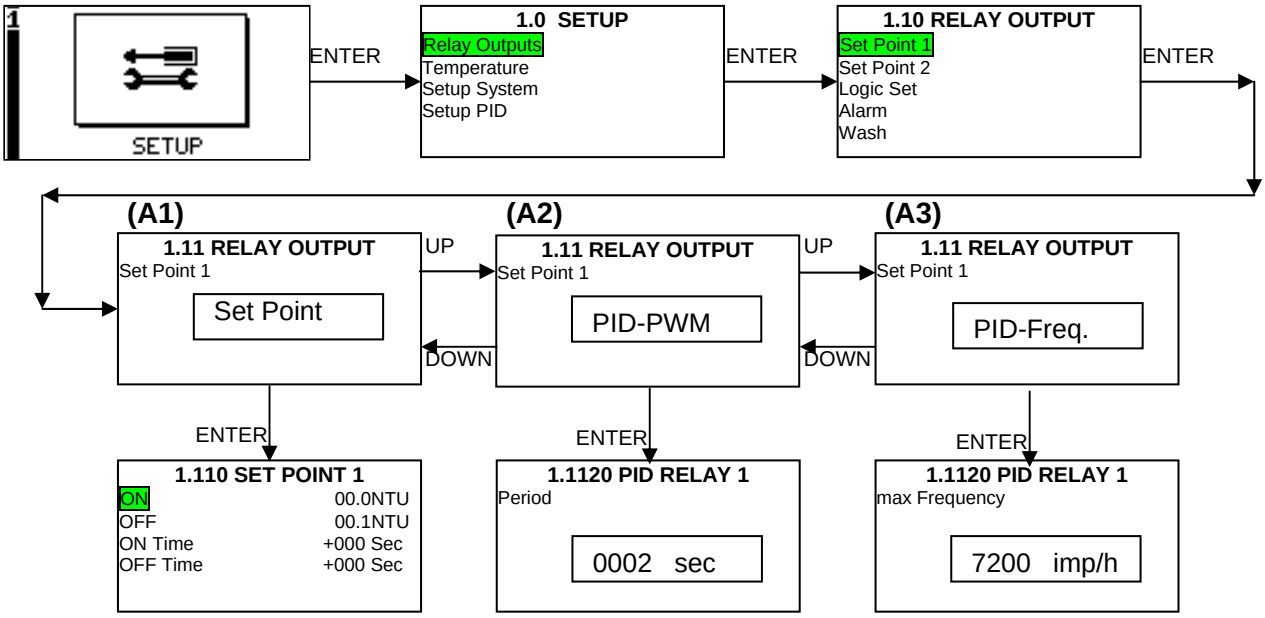
Using the ENTER key access will be provided to the submenus for the input of information and the variations made will be confirmed.

By pressing the ESC key the screen will go back to the menu or to the previous function and any variations made will be cancelled.

NOTE

Before setting the various parameters, check and reset the system set-up measuring range. When the measuring range changes (1.60), all the parameters are reset; the system has to be reset and recalibrated.

4.3.1 SETTINGS MENU (RELAY OUTPUT - SET POINT 1)



The programming parameters of Set Point 1 establish the working logic of Relay 1. It is possible to programme using the logics of Relay 1 in the following ways:

A1) Threshold

By programming the Set Point for this function, we can activate the relay as a Threshold by programming an ***ON*** value (relay activation) and an ***OFF*** value (relay deactivation). The free programming of these two values will allow for the creation of a hysteresis suitable for any kind of application.

By programming the ***ON*** value higher than the ***OFF*** one (fig. 11.a) an *UPWARD* threshold will be achieved: (When the value exceeds the ***ON*** value, the relay is activated and remains active until the value falls below the ***OFF*** value).

By programming the ***OFF*** value higher than the ***ON*** one (fig. 11.b) a *DOWNWARD* threshold will be achieved: (When the value falls below the ***ON*** value, the relay is activated and remains active until the value exceeds the ***OFF*** value). See fig.11.

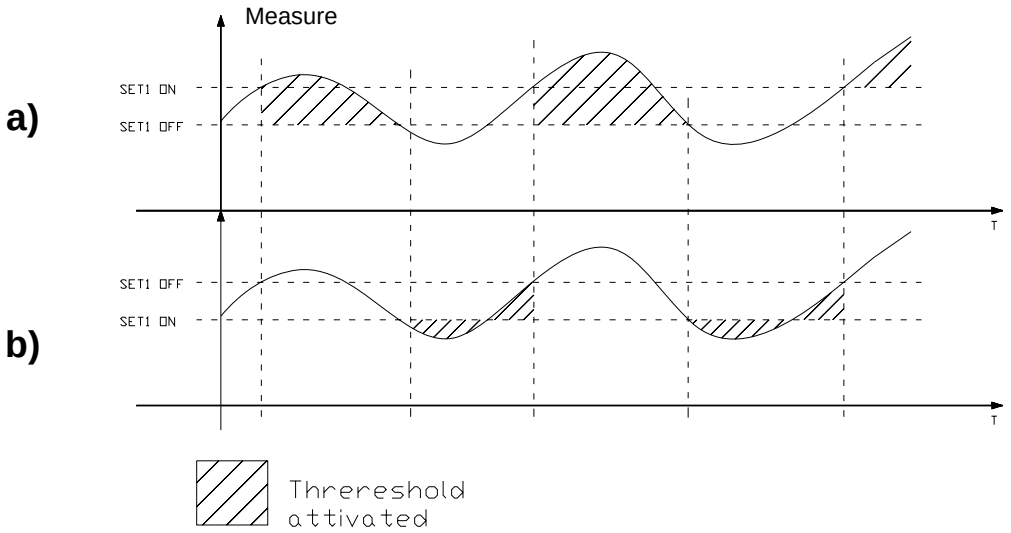


Figure 11 – Threshold operation

Furthermore by acting on the ***Time ON*** and ***Time OFF*** parameters it is possible to define a *DELAY* time or a *TIMED* operation of the Relay during its activation.

Negative of positive ON and OFF Times can be defined. (fig. 12)

By programming *Negative Times* the *DELAY* function is activated:

Eg. Time ON: –5sec , Time OFF -10sec. (fig. 12.a)

When the threshold is activated, the relay will close after 5 seconds (***ON time***) and it will remain closet for the entire period in which the threshold is active. When the threshold is deactivated the relay will remain closed for another 10 seconds (***OFF time***) after which time it will open.

By programming *Positive Times* the *TIME* function will be activated:

Eg. Time ON: 5sec , Time OFF 10sec. (fig. 12.b)

When the threshold is activated the relay will alternate between an open/closed position according to the times programmed. In the case of the example the relay will close for 5 seconds (***ON time***) after which time it will remain open for 10sec (***OFF time***). This cycle will continue until Threshold 1 is not deactivated.

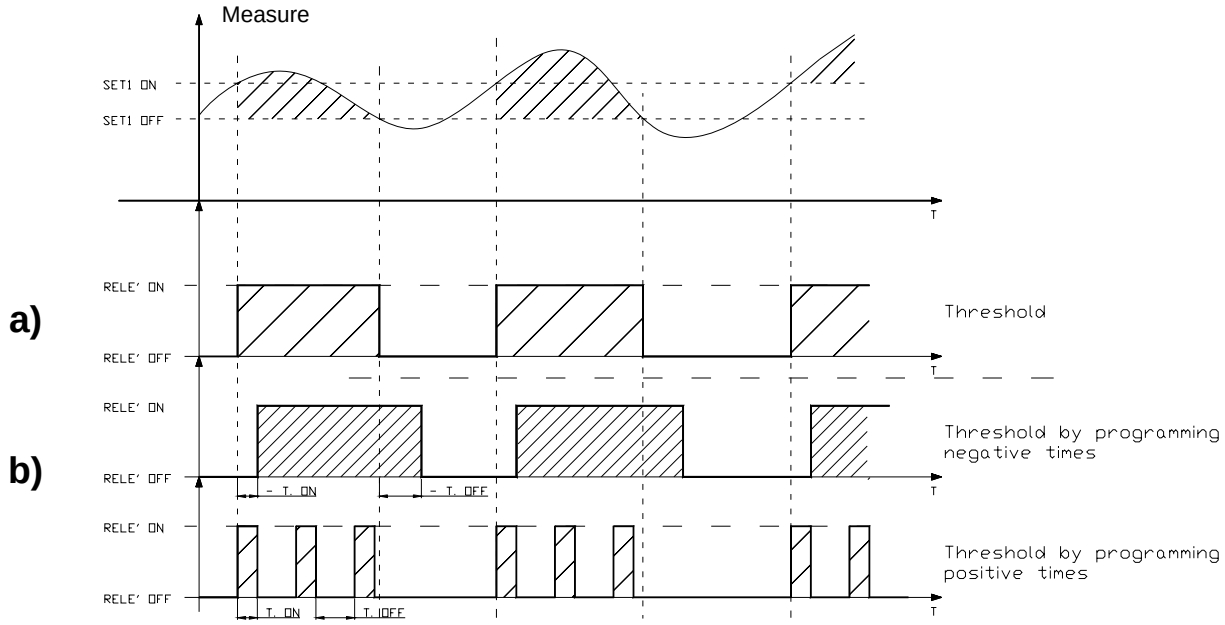


Figure 12 – Operation of Relay 1

A2) PID-PWM

By defining the Set Point as PID-PWM, through Relay 1, it is possible to activate a pump with an ON/OFF command almost as if it had a proportional adjustment. For this function the time period must be programmed (in seconds) within which the calculation of the PWM adjustment will come about. The maximum time that can be programmed is 999 seconds with a 1 second step. We recommend starting with short periods of time and increasing them gradually in order to avoid drastic variations in measuring. For operation of the Relay in a PID-PWM function see fig. 13.b.

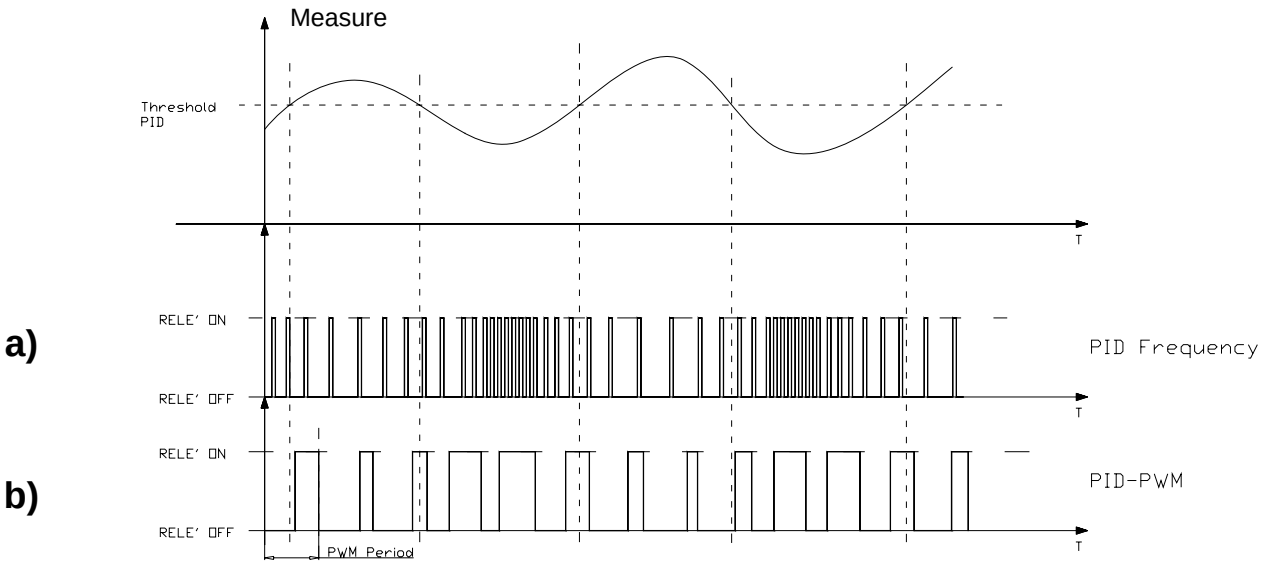


Figure 13 – Operation of Relay 1 as PID

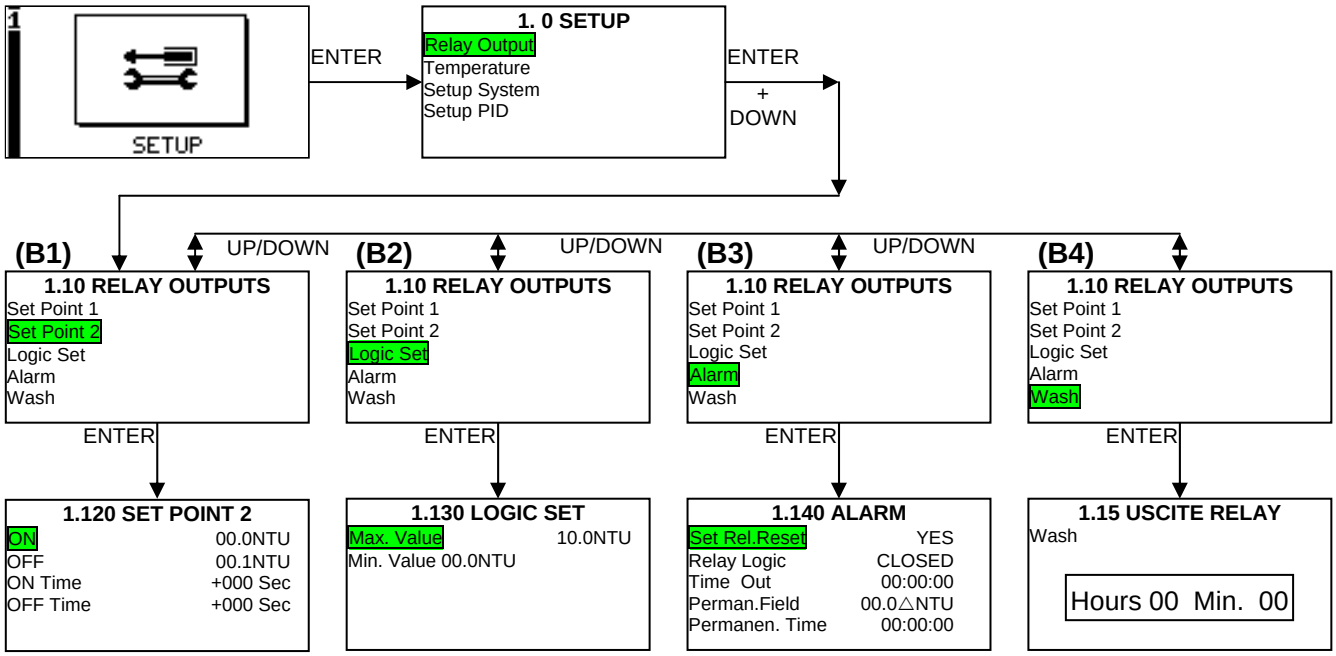
A3) PID-Frequency

By setting the Set Point as PID-Frequency it is possible, through Relay 1, to control a pump directly with impulse inputs. The maximum number is 7200 imp/h with steps of 200. The ON and OFF impulse time is fixed at 250mSec. For operation of the Relay in a PID-Frequency see fig. 13.a.

NOTE

Functions A2) and A3) are related to the programming of the PID parameters to be found in the menu 1.4 (Par.4.3.3). Therefore, before programming this function we recommend that you check the programming of the PID parameters.

4.3.2 SETTINGS MENU (RELAY OUTPUT - SET POINT 2 ETC.)



B1) Set Point2

The programming parameters of Set Point 2 determine the functioning logic of Relay 2.

This Relay may only be programmed as a Threshold. Programming of threshold 2 is identical to the one described for Threshold 1.

B2) Logical Set

The parameters of the Logical Set determine the functioning of the Alarm Relay. This function is deactivated by default.

This function activates an alarm when the measuring values are located outside of a specific "window". It is, in reality, possible to programme a minimum value and a maximum value and once they are exceeded the instrument will generate an alarm. This function will allow an alarm to be activated if the measure values are over a certain "range". In fact, it is possible to program a minimum and a maximum value: when exceeded, the equipment will generate an alarm.

This Logical Set is useful to control any possible faults to the system, eg. Defects in the dosage pumps etc.

B3) Alarm

With this function the basic settings of the Alarm Relay are defined, all of which are handled by the anomaly conditions inside and outside of the instrument.

Considering the importance of this Relay, we recommend that it is connected to a visual and acoustic signal which should always be kept under control by personnel in charge of running the plant, in order to intervene immediately in the case of a signal.

Programming of the Alarm Relay is articulated into 5 functions, therefore allowing for external anomalies (measuring electrode and dosage systems) as well as internal anomalies to be kept under control. Description of the functions:

SET RELEASE

With this function it is possible to deactivate or activate dosages in the case of an alarm.

By programming YES, when any kind of alarm is activated, the Relay 1 and 2 contacts will open up immediately and the analogical outputs 1 and 2 will be cancelled.

By programming NO, even in the case of activation of the alarm, the Relay contacts and the analogical outputs will not change their position.

YES is set as a default.

RELAY LOGICS

The Alarm relay is an ON/OFF alarm and with this function it is possible to programme its opening/closing logic. CLOSED is set as a default.

By setting "CLOSED", the Alarm relay will be opened in normal working conditions and will close in the event of an alarm.

By setting "OPEN" it will work in exactly the opposite way. The Alarm relay will close in normal working conditions and will open in the event of an alarm.

Furthermore, by setting OPEN it is also possible to control the anomaly of the absence of power tension which will lead to the immediate opening of the relay.

TIME OUT

With this function it is possible to set a maximum activation time of Set Point 1 and 2 *after which time the alarm will be activated.* This allows for the state of the dosage pumps to be kept under control.

By default this function is deactivated (time 00:00.00). The maximum time that can be programmed is 60 minutes, at steps of 15 seconds.

PERMANENCE FIELD – PERMANENCE TIME

This function allows for the state of functioning of the measuring probe to be kept under control.

If the measurement is stabilised within a certain interval for a period of time that exceeds the time set, the instrument will generate an alarm.

In order to activate this function, the following must be set:

in the "PERMANENCE FIELD" step the minimum oscillation interval of measuring (delta Turbidity)

in the "PERMANENCE TIME" the maximum time in which excursion must come about.

If, during the period of time programmed, measuring is always within the interval programmed, the instrument will set off an alarm.

By default this function is deactivated as a delta 0 and a time of 00:00:00 has been programmed. The maximum time that can be programmed is 99 hours at steps of 15 minutes.

B4) Washing

The instrument is fitted with a Washing Relay that can control a solenoid valve for washing of the measuring cell.

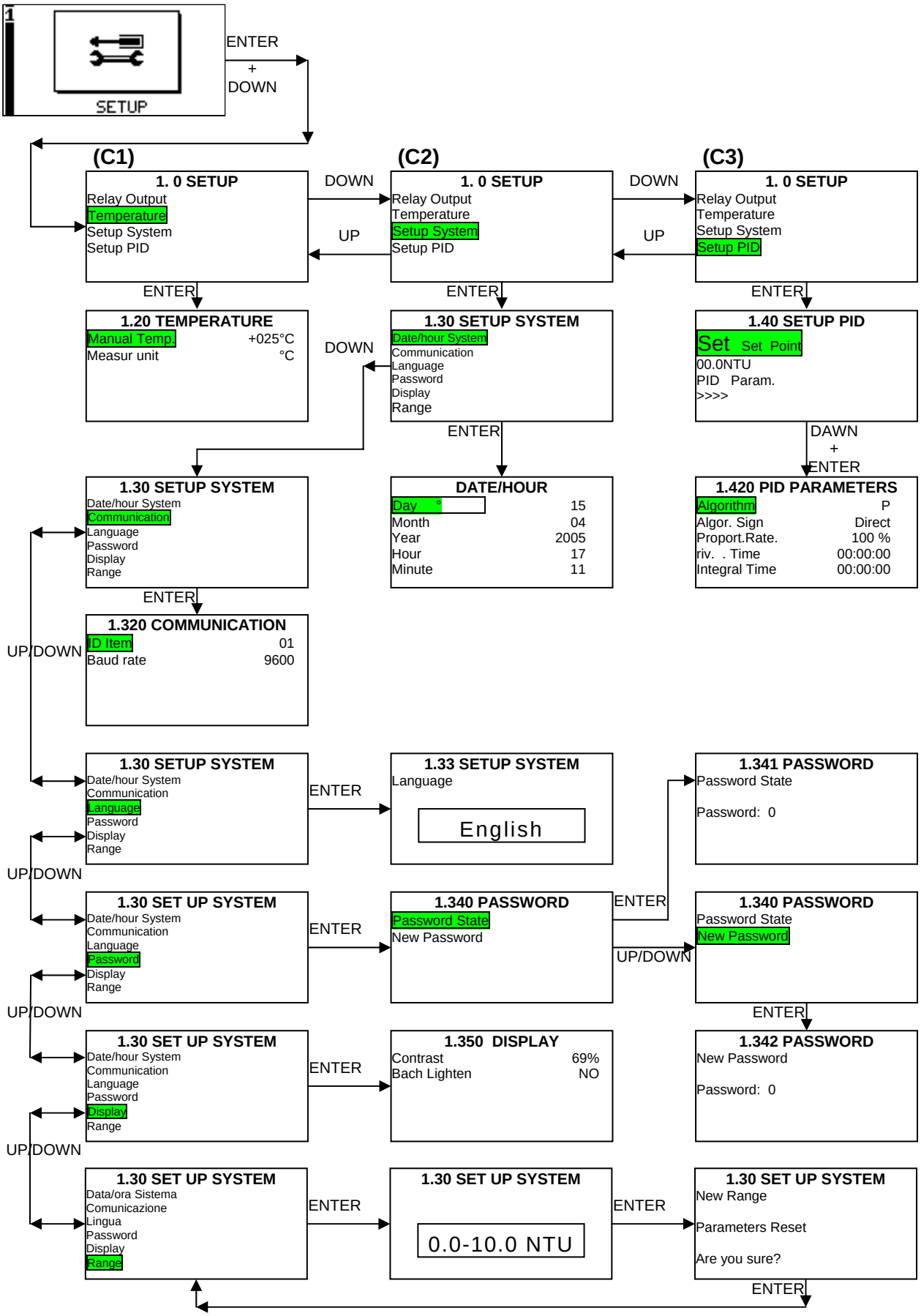
The washing stage lasts 1 minute altogether and it includes 15 seconds for control of the solenoid valve (closing of the washing relay) and 45 seconds for stabilisation.

With this function it is possible to set the interval of time between one washing stage and the next. Immediately before it starts, the instrument memorizes the values of the measurements, the state of Relay 1 and 2 and the values of the analogical outputs and it keeps them "frozen" for the entire duration of the washing cycle.

This situation is highlighted on the display using an hourglass and, furthermore, instead of the measuring value a counter appears indicating how many seconds are left until the washing stage is completed.

By default this function is deactivated as a time of 00 hours and 00 minutes is programmed. The maximum interval that can be programmed is 24 hours at steps of 15 minutes.

4.3.3 SETUP MENU (TEMPERATURE – SYSTEM SETUP - PID SETUP)



C1) Temperature

This function allows to manually set the temperature measuring unit.

The Unit of Measurement function allows for the value of the temperature to be visualised in Centigrade or Fahrenheit. Centigrades are set as a default.

C2) Setup System

In this part of the programme which is divided up into 5 functions, the basic functioning parameters of the instrument are set.

Description of the functions:

DATE/HOUR SYSTEM

Setting of the DATE and TIME of the system that will be memorised every time that figures are viewed in a historical perspective.

COMMUNICATION

The instrument has a serial port in RS485 which is separated galvanically and can be used for dialogue with a HOST system using the standard protocol MOD BUS RTU. Through the serial port it is possible to visualise the real time status, programme all of the Set-Up and downloading all of the archives of the instrument.

The Communication Set-up function is used to programme the serial port and is divided up into two settings:

ID Instrument: A numerical address from 1 to 99 to which the instrument will reply. The default is 01.

Baud Rate: Speed of the RS485 serial which can be programmed at between 1200 and 38400. The default is 9600.

LANGUAGE

It is possible to select the language used by the Software between: Italian, English, French, Spanish and German.

PASSWORD

At this stage it is possible to activate and programme for access to the instrument. Once activated, each time that the programming stage is accessed the access password will be requested.

The password is made up of a 4 figure number. The default is 2002 which will always remain active even if a new password is programmed.

In order to access the step “Password Status” or “New Password”, the existing password must be inserted and then the new input can be carried out.

DISPLAY

Contrast: It allows for the definition of a greater or lower contrast of the display according to the temperature in which the instrument is operating.

Background illumination: At this stage you can decide whether or not to maintain background illumination or to switch it off one minute after having released the key.

By programming YES the background illumination stays on, by programming ON it switches off automatically. NO is programmed as a default.

RANGE

This program stage allows the working measure field to be selected by pressing UP and DOWN keys; enabled values:

000.0 ÷ 100.0 / 0000 ÷ 1000 FTU/NTU

If the measure field changes, all the relay outputs, set-up pid, analogical outputs and calibrations previously set parameters are reset.

C3) Setup PID

In this step of the programme, the programming of parameters for PID functioning is carried out. The output of PID adjustment is analogical as well as digital and they can both be activated at the same time. The PID outputs are: Analogical Output 2 and Relay 1.

The PID function allows for all of the swings due to ON/OFF dosages to be eliminated. Furthermore, it allows for the threshold desired to be maintained and reached with extreme precision. The PID adjustment is a complicated adjustment that must take into account all system variables. This PID has been designed for those general applications with a fast retroactivity of the system. In reality, the maximum integral and derived times are 5 minutes.

The PID function allows for three adjustments to handle the dose.

The PROPORTIONAL (P) Adjustment allows for the outward dimension to be more or less amplified.

The DERIVATIVE (D) function allows for our system to become more or less reactive to variations of the sizes measured.

The INTEGRATIVE (I) function allows for the swings to be regulated due to the derivative part.

Description of functions:

SET POINT

The value of the PID threshold that we want to maintain stable.

PID SETUP

ALGORITHM

The kinds of algorithms handled by the instrument are: P = Proportional ; PI = Proportional – Integral and PID = Proportional – Integral – Derivative

The type of algorithm will be chosen according to the application requested. The P regulation will be set as a default.

THE ALGORITHM SIGN

In this function the PID sign is programmed. If we programme DIRECT it means that as the value measured is increased compared with the threshold defined, the PID value will decrease. However, if we programme OPPOSITE, as the value measured increases compared with the threshold defined, the PID value will increase. DIRECT is set as a default.

PROPORTIONAL

The Proportional Range of the PID regulation compared with the bottom of the scale for the instrument.

Eg. For a Conductivity with a range of 0-20mS, if a 100% Proportional is programmed it means having a range of ±20mS of regulation compared with the threshold set. Therefore the value of the proportional is inversely proportional to the output, that is to say as the percentage of the proportional is increasing the effects on the output decrease. Regulation of the proportional may vary between 1 and 500% in steps of 1%. The default is set at 100%.

DERIVATIVE TIME

The Derivative part is set. The more the programmed time increases, the more the system will be ready for variations to the measurement. The derivative time can be programmed between 0 and 5 minutes at steps of 5 seconds. The default is programmed at 0 minutes.

INTEGRAL TIME

The Integrative part is set. The more the programmed time increases, the more the system will mediate with the measuring swings. The derivative time can be programmed between 0 and 5 minutes at steps of 5 seconds. The default is programmed at 1 minute.

4.3.4 CALIBRATION MENU

This program step allows the instrument/measuring cell chain to be metered.

The calibration procedure is regularly done at the factory when preparing the materials to be supplied. At the first system commissioning, the calibration will not be required.

The calibration must be carried out:

- Whenever the measuring cell or the sensor or spot group is replaced;
- When starting after a long ineffective time;
- Whenever there is a difference to the standard solution values or to the reference comparison instruments.

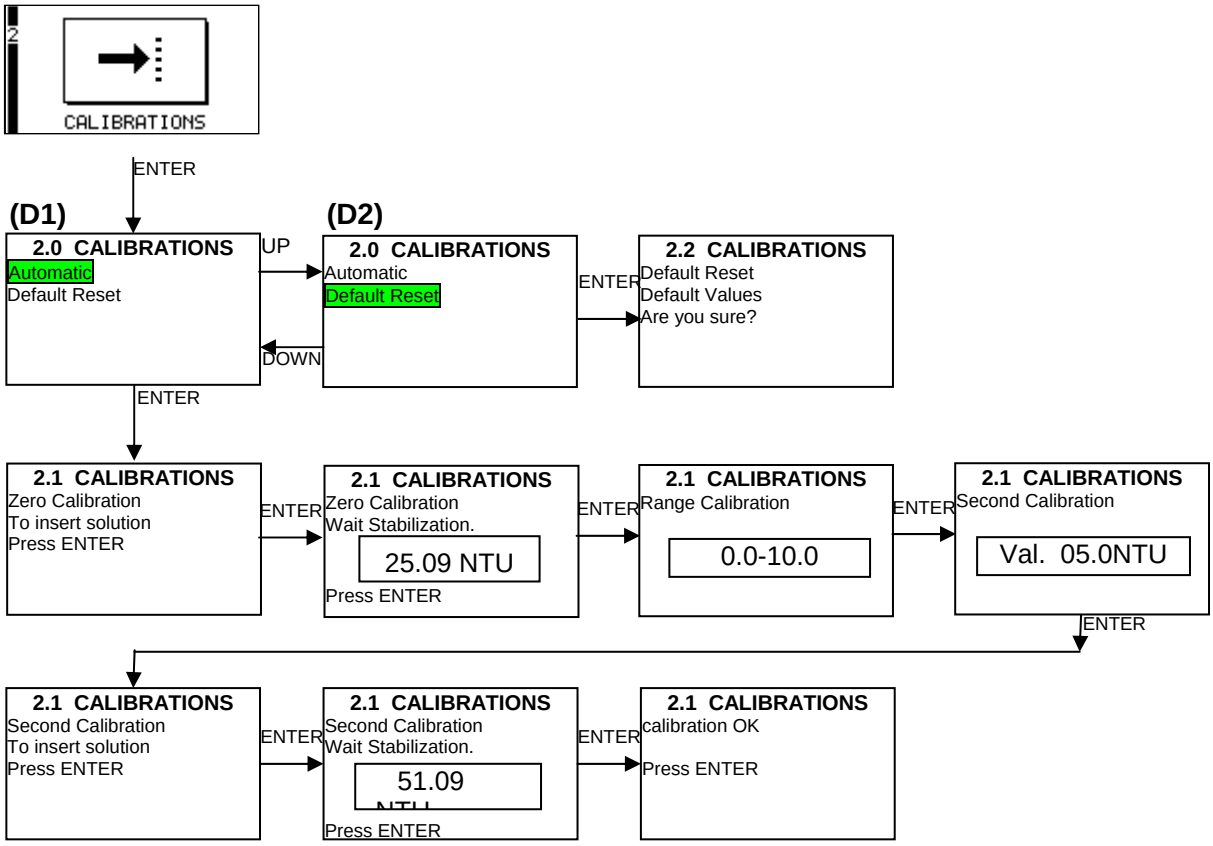
For granting a proper working, further to the above mentioned conditions, it will be required to check the calibration of or to recalibrate the instrument periodically.

This operation frequency will be determined by the user keeping into consideration the application type and the measured liquid type.

NOTE

Before doing the verifications or the calibration, properly wash the probe in water and use sure and fresh alkaline solutions.

Descriptions of the calibration functions:



D1) Automatic system

The turbidity analyser calibration ACP 4061 includes two metering points.

D.1.1) The first calibration must be done at 0 FTU!!. For doing this, it is required to fill the measuring cell by clean water and let the liquid to stay into the cell for 15 minutes min. After that, the zero calibration procedure can be started.

D.1.2) Wait for the displayed value, read by the sensor, to stabilize, then press ENTER.

D.1.3) The instrument will display the 0000FTU value automatically. Press ENTER.

D.1.4) The instrument will display "calibration range". Select now the measuring range including the value of the calibration solution to be used; press ENTER

D.1.5) Calibrate the second point as per the first one. During this phase, fill the measuring cell with the FTU known concentration solution, which value must be input by pressing the UP and DOWN keys.

Alternatively, the calibration PVC plate supplied with instrument, may be used and in this case operate as follows:

Stop the flow of analysis water and empty the measuring cell

Remove the cover of the hydraulic section.

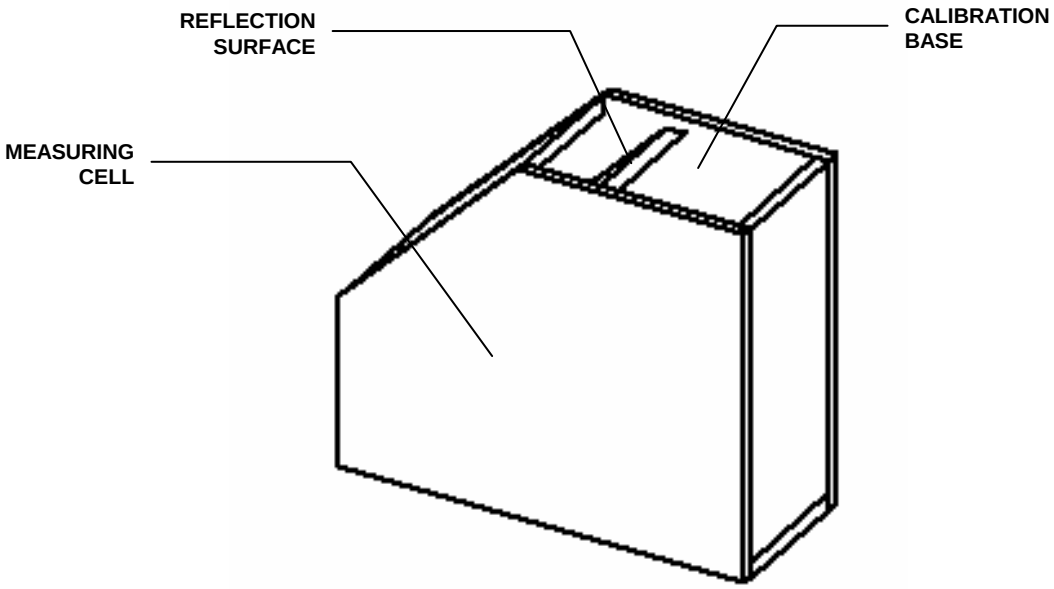


Figure 14 – Measuring Cell

Position the calibration PVC plate on the surface of the measuring cell - the printed surface should be facing upwards.

Close the hydraulic section with the relative opaque cover.

At this point start the calibration procedure of the second point by inserting the value printed on the calibration PVC plate using the UP and DOWN keys.

Once completed the second point calibration, the instrument will check the calibration data consistency. If correct, the instrument will display "Calibration OK", otherwise "Calibration error".

If "Calibration error" is displayed:

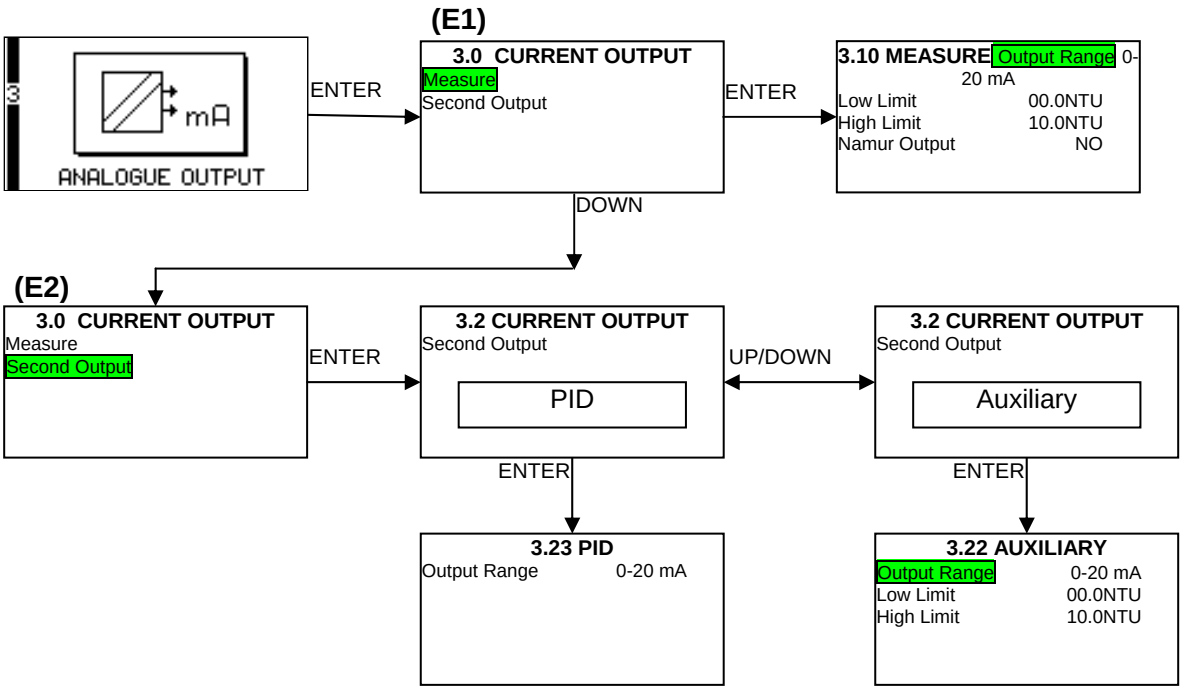
- Check for the physical integrity of the sensor and of the lamp;
- Check for the cable integrity and for its correct connection to the instrument.

D2) Default Reset

This step of the programme allows for the calibration factors to be reset to the original factory ones. To be used when incorrect calibrations are confirmed.

4.3.5 ANALOGUE OUTPUT MENU

The instrument is fitted with two analogical outputs in a current that is separated galvanically and are independent of each other. The first output refers to the primary measuring therefore proportional to the Turbidity measured. The second, however, can be programmed between Temperature, Auxiliary or PID.



E1) Measuring

In this step of the programme 4 functions can be set:

OUTPUT RANGE:

A selection can be made between 0-20mA or 4-20mA. The default is programmed at 0-20mA

LOWER LIMIT:

A Turbidity value at 0 to 4mA of outward current can be set. The default is set at 0FTU or NTU

UPPER LIMIT:

A Turbidity value of 20mA can be set for outward current.

The default is set at 00.0 ÷ 100.0 / 000 ÷ 1000 FTU - NTU according to the used range.

The regulation of Lower and Upper Limit functions allow for the scale of analogical output to be amplified. Furthermore, the output can be inverted to 20-0mA o 20-4mA

NAMUR OUTPUT:

This function is only activated if chosen as an Output Range of 4-20mA. If this function is activated in the case of an alarm, the outward value of the current will be 2.4mA according to the NAMUR standard. The default of this function is deactivated.

E2) Second Output

The second output can be set as Auxiliary or PID.

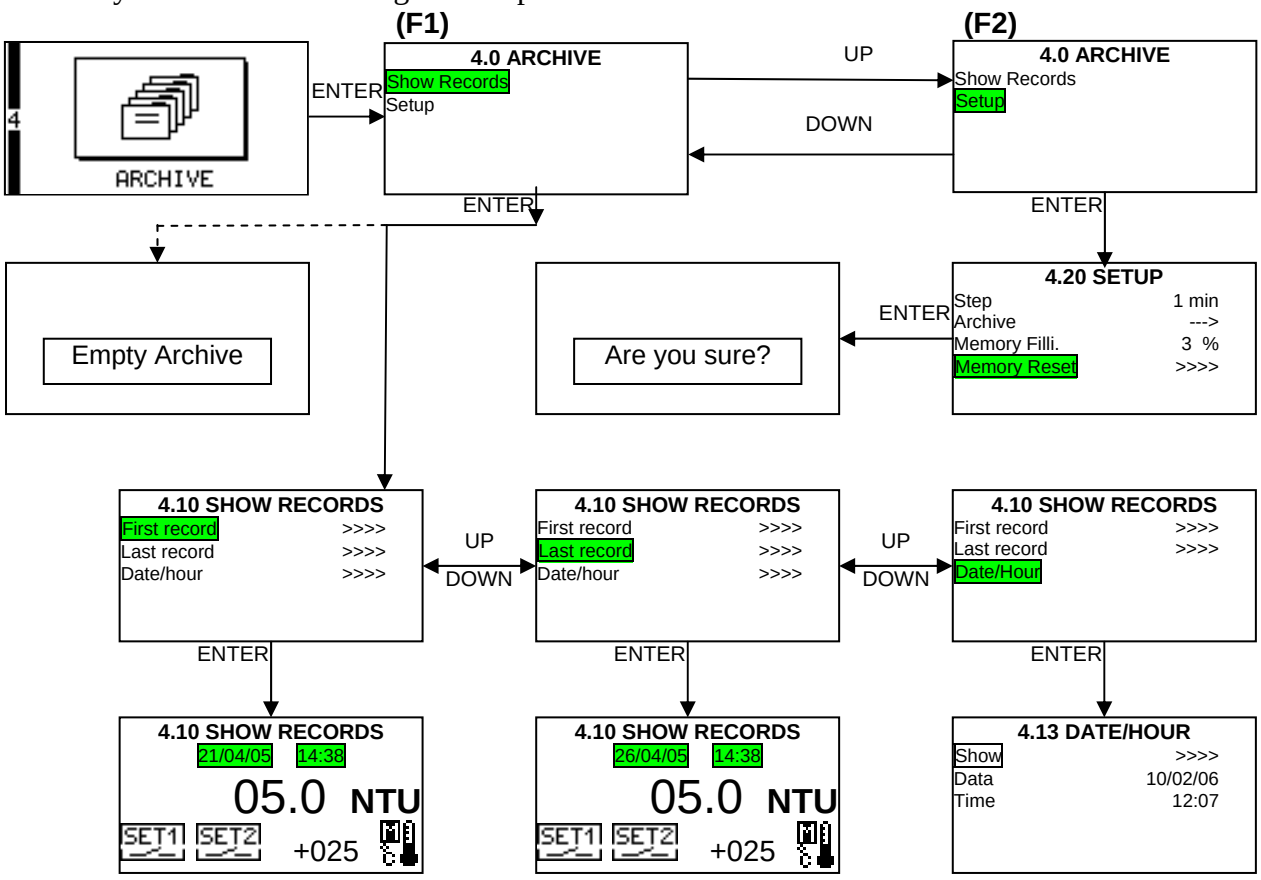
If set as Auxiliary, the measure of FTU/NTU will be repeated. The range and the limits can be set as different from the first one. Default setting: Range 0-20mA, Lower limit (0FTU/NTU) and Upper limit (000.0 ÷ 100.0 / 0000 ÷ 1000 FTU/NTU).

If set as **PID**, the output range will be set between 0-20mA or 4-20mA. For the other PID settings, see chapter 4.3.3, section C3. The second output can be set as Temperature, Auxiliary or PID.

4.3.6 ARCHIVE MENU

The instrument is fitted with a Data Logger that allows for 16,000 records to be stored. Each record contains: the date, the time and the Turbidity value, the temperature value, the value of the Threshold 1 and 2, the state of the Relays 1 and 2 and the state of the Alarm Relay. The archive must be of a Circular kind, therefore once filled the next data will overwrite the oldest one and so on until it is completely FILLED, that is to say once it is filled storage is blocked and the full archive icon will appear.

The archive can be examined directly through the instrument in the form of a table or drawing. The archive may be downloaded using a serial port.



F1) Visualise data

In this part of the programme it is possible to visualise data in the form of a table as long as the archives are not empty. In order to decide on where to start and examine the table, there are three options:

First Data >>> You will start by examining the archive of the first data stored and move forward

Last Data >>> You will start by examining the archive of the last data stored and move backwards

Date/Time>>> You will start by examining the archive from a specific date and time

In order to move backwards and forwards use the UP and DOWN keys and once you reach the first or last data it will stop.

F2) Set-up

In this part of the programme the storage parameters are set using 4 functions:

STEP

It indicates the registration step and it can be programmed at between 0 and 99 minutes. The default is 0 minutes, therefore deactivated, and it can be increased by 1 minute at a time.

ARCHIVE TYPE

Circulation of "⇦" of the Archive once it is full and it will write over the first data

Filling "--⇨" Once it is full it will stop storage

SPACE USED

It indicates the amount of memory used up by the data stored.

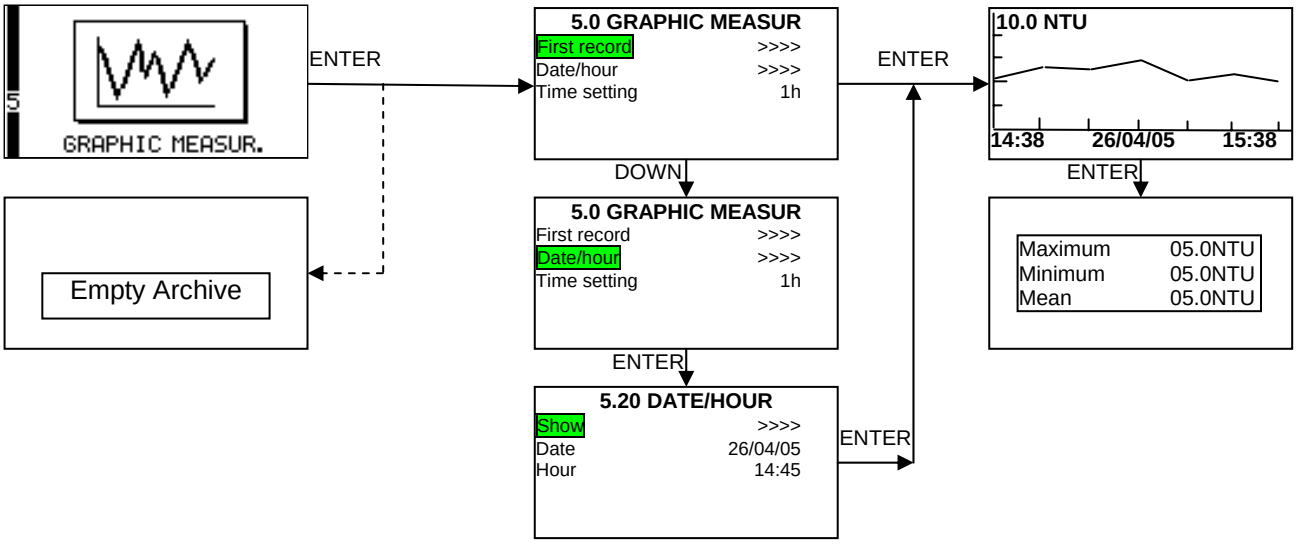
MEMORY RE-SET

It is used to clean the memory.

CAUTION

Once this operation is carried out all measurements stored will be lost.

4.3.7 MENU OF MEASURING GRAPHICS



In this step of the programme you can see data in a graphic form, as long as the archive is not empty. In order to decide from where to start to examine the graphics and tables, there are two options:

First Data >>> You will start by examining the archive of the first data stored and move forward

Date/Time>>> You will start by examining the archive from a specific date and time

In order to move backwards and forwards use the UP and DOWN keys and once you reach the first or last data it will stop.

Time setting

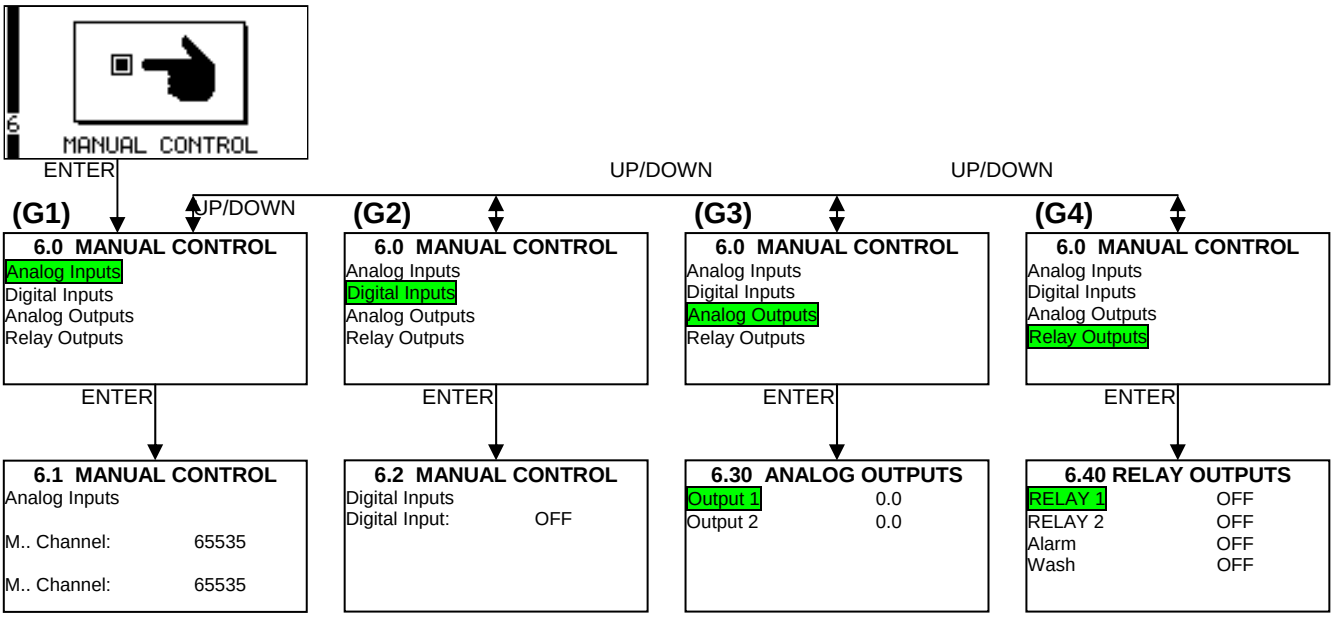
The Times item indicates for how many hours we want to visualise the drawing. The default is 1 hour but we can choose from 1, 6 or 24 hours.

NOTE

Once the drawing is visualised, if the ENTER key is pressed a table will appear indicating the Minimum, Maximum and Average value of the measurements visualised on the screen. Furthermore, if the ENTER key is pressed again, a ZOOM of the data visualised will appear. If the ENTER key is pressed again, it will return to the initial visualisation.

The ZOOM allows for a clearer evaluation of small valuations of Turbidity.

4.3.8 MENU MANUAL CONTROL



This program step is useful for all the functional checking which are required when starting the measuring and dosing system, as it allows the instrument inputs and outputs to be displayed and activated manually.

G1) Analogical Inputs

This function allows for the values read by the digital analogical converter related to the Turbidity and temperature measuring to be seen directly.

This allows you to understand if the level of analogical acquisition of the instrument works correctly.

G2) Digital Inputs

The instrument is fitted with a passive digital input, separated galvanically, which allows for the doses to be deactivated, on the Relay and also on the Analogical Output. This step allows you to check whether or not the digital input works correctly.

If it is Open it must indicate OFF and if, however, tension is applied to the clamps, according to specifications, the instrument should indicate ON.

G3) Analogical Outputs

It allows for manual simulation of both the Analogical Outputs under current. The variations of the output have a step of 0.1mA.

G4) Relay Outputs

It allows for manual activation of the Relay Output.

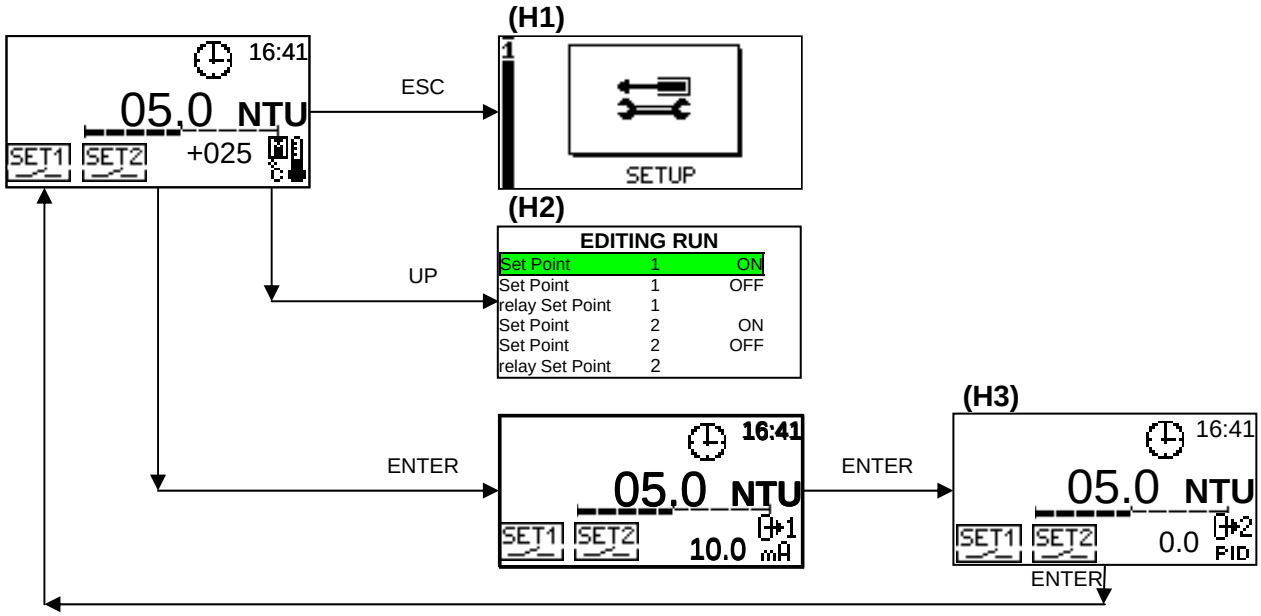
4.3.9 MENU "EXIT MENU"

Leaving the menu allows you to return to the RUN method. Before returning to the operative method and saving all programming carried out in a stable manner, the instrument will ask for confirmation. If the ENTER key is kept pressed down, the instrument will save all programming on EEPROM and will return to its operative status.

CAUTION

If the ESC key is pressed, the instrument will return to its operative states and will not save the modifications made but it will recover the previous ones. Therefore all modifications will be lost.

4.3.10 FUNCTIONS IN RUN



In the RUN screen the following things can be seen:

- Turbidity measuring
- the point in which it is operating
- the system time
- the status and type of programming of Relays 1 and 2

- Status of Digital Input
- Status of the Alarm Relay
- Status of the Washing Relay
- Status of the Password
- Status of measuring and output freezing
- Value of the Temperature or of the Analogical Output 1 or of the Analogical Output 2
- System errors
- Storage of Data in the Archive
- Archive Full

H1) Pressing the ESC key

By pressing this key you will enter the Instrument Programming stage and all measuring and dosage functions will be deactivated. Caution: the instrument will not leave this stage automatically and therefore if it is left in the Instrument Set-up it will never carry out any operation.

In the Instrument Set-up stage, serial communication is also deactivated.

H2) The UP key

It allows for programming of the Set Point 1 and 2 thresholds without stopping the instrument and therefore stopping the pumps. Furthermore, it is also possible to pilot Relays 1 and 2 manually and without blocking the system.

H3) The ENTER key

It visualises the value of Temperature of the value of the Analogical output 1 or the value of the Analogical output 2 at the bottom of the display.

5 USER MAINTENANCE

5.1 SPECIAL CAUTIONS FOR CRITICAL COMPONENTS

An LCD (Liquid Crystal Display) is incorporated into the equipment and it contains small amounts of toxic materials.

In order to avoid damages to people and to limit the negative effects on the environment, comply with the following instructions:

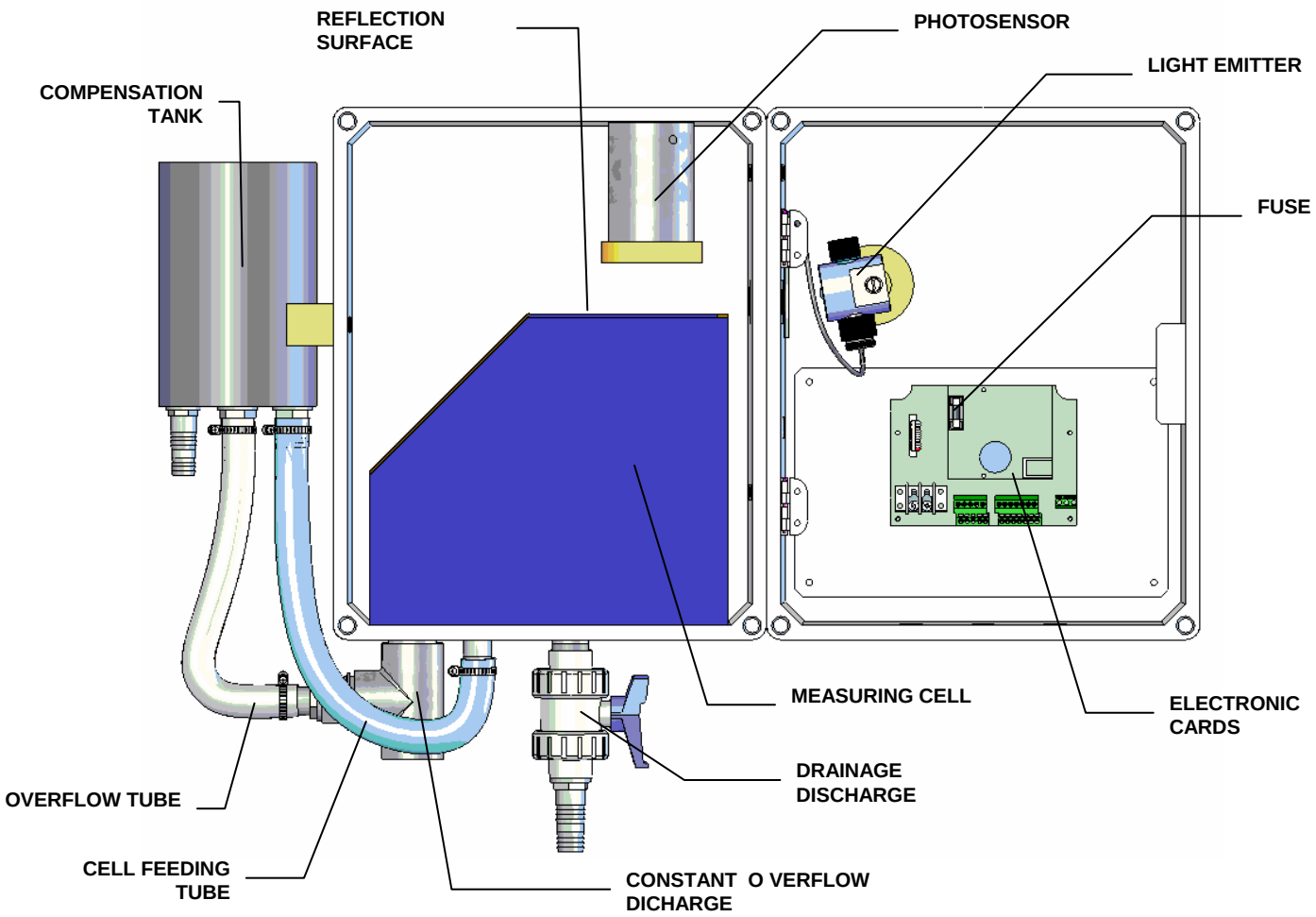
Display LCD:

- The LCD display of the electronic device is fragile (it is made of glass) and therefore should be handled with extreme care. For this reason we recommend that the device is protected in its original packaging during transport or when not in use.
- If the glass of the LCD breaks and liquid spills out, make sure that you do not touch it. Wash every part of the body that may have come into contact with the liquid for at least 15 minutes. If, once this operation has been carried out, you notice any symptoms consult a doctor immediately.

6 CORRECTIVE MAINTENANCE

Switch the machine off before every kind of operation and also close access to the liquid under control.

The figure below illustrates the main components.



6.1 REPLACEMENT OF FUSES

The 500 mA-T fuse located alongside the supply clamps should only be replaced with fuses of the same value, on the contrary you may risk causing irreparable damage to the device.

The fuse supplied has been calculated according to the maximum absorption of the system and it must jump immediately when project characteristics are varied.

When, after replacement, it is necessary to replace the fuse once again, check the cables and/or the correct value of the fuse itself.

7 REQUEST FOR ASSISTANCE

7.1 PROCEDURE OF REQUEST FOR TECHNICAL ASSISTANCE TECNICA

In the case of a fault to the equipment or in the case of partial or incorrect functioning that cannot be resolved through the ordinary maintenance operations described in this manual or in the documentation attached, we kindly ask you to contact a CHEMITEC office or branch or your nearest dealer or authorised assistance centre.

CAUTION

If the equipment has any faults or starts to operate incorrectly and in any case in a way that does not comply with the contents of the user manual with special reference to the aspect of safety, YOU SHOULD IMMEDIATELY SUSPEND USE of the equipment and contact technical assistance. Do not use the equipment until all safety requirements have been checked and restored.

NOTE

In order to accelerate all starting procedures related to assistance intervention and to facilitate identification of the problem by specialised technical staff, we kindly ask you to fill in the form on this page before your telephone contact.
The information related to the equipment can be taken from the details indicated on the equipment plate.

REQUEST FOR TECHNICAL ASSISTANCE

Name of the equipment/system .....

Code/catalogue number .....

Serial number (SN).....

Version of current software (Rel) .....

7.2 MAIN CHEMITEC OFFICES

OPERATIVE OFFICES

CHEMITEC s.r.l.
Operating centre:
Via Isaac Newton, 30
50018 Scandicci
FIRENZE
Tel. 0039/055/7565645 - Fax 0039/055/ 7565697
E-mail info@chemitec.it
Web site: www.chemitec.it