

AGRÓNIC 54

INSTRUCTION MANUAL

24 Vac

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PRESENTATION

We wish to take this opportunity to thank you for the confidence in us which you have demonstrated in expressing interest or acquiring Agrónic 54.

This confidence, for our part, stimulates our efforts to meet and surpass the expectations of our clients to justify the traditional quality of our products.

This Manual will allow you to see the capacity of the unit as well as its installation and use.

However, if after reading this you still have any doubts, contact us and we will happily answer them.

1. INTRODUCTION

Agrónic 54 is a unit which regulates both the electrical conductivity (EC) of irrigation water, injecting 2 possible fertilizers, and its pH, injecting acid or base.

There are 3 formulas or programs, which are started by external orders received by the corresponding inputs, so this unit itself does not control the irrigation sectors.

There are 2 versions, according to the way in which the dosage is done: one with “pulsed injection”, which works on the solenoids, another one with “analog injection”, which works on frequency variators.

In the “by pulsed injection” version, to maintain the EC, the unit applies every certain seconds, a dose of every fertilizer, which is related to the desired proportion between fertilizers and the programmed reference. To maintain the pH the unit works in a similar way.

In the “analog injection” version, to maintain the EC and/or the pH, the unit changes the injection speed of the engines until it gets the programmed references.

In the version with pulsed injection, there are outputs for 2 fertilizers and 1 acid or base.

In the version with analog injection (0-10 Vdc), there is an output for fertilizer and another one for acid or base.

In both versions, there is also a general output and another one for alarm and/or mixer.

Feeding of the unit at 24 Vac. Optionally, 12 Vdc.

Outputs at 24 Vac in the version with pulsed injection and at 0-10 Vdc in the version with analog injection.

There are 3 inputs for the start of the fertilization programs and 1 input to detect malfunctions.

There is also 1 input for the conductivity sensor and 1 for the pH sensor, with a transmitter, which is integrated in the unit circuitry.

The calibration of sensors is done with the keyboard.

It is possible to program three different crops. The EC reference, pH reference and the proportion of two fertilizers to be applied (this is in the version with pulsed injection) are given to every one of the three programs.

There are independent EC and pH alarms, being possible to configure the high value, the low one and the delay in the detection of an irregularity.

Start and stop times are programmable for the pre-mixing, mixing and alarm.

Configurable lag for the detection of the start up and malfunction inputs.

It is easy to use and program by means of three keys and a LC screen with 13 millimeter-high digits.

The unit is located in a poly-carbonate closed box.

Agrónic 54 follows the CE guidelines.

2. SCREEN DATA

Information is displayed on the screen in the following way: the first two digits indicate the code in which we are in. The following block of digits always gives information about the electrical conductivity or fertilizer 1, while the last block of digits makes reference to the pH or fertilizer 2.

Use the "C" key to go from one code to the next one. If you keep pressing this key, the code will change rapidly.

Use the "+" and "-" key to modify the values which are displayed on the screen. These keys will increase or decrease the active value, which is displayed in that moment. If you keep pressing the key, it increases or decreases rapidly.

3. TECHNICAL CHARACTERISTICS

Power supply		
	Power source	24 Vac \pm 10%
	Energy consumption	Average consume: 8.5VA
	Input fuse	2.5 A, F type, 250 V (fast)

Outputs		
	Number	5
	Type	Relay, Triac optolinked

Inputs		
	Number	4
	Type	Optolinked

Environment	
Temperature	0 °C a 45 °C
Humidity	< 85 %
Height	2000 m.
Pollution	Grade II

Weight (approximate)
1 Kg.

Memory backup	
Parameters, programs	It cannot be erased

DECLARATION OF CONFORMITY

It follows the 89/336/CEE Guidelines for the Electromagnetic compatibility and the 73/23/CEE Guidelines of Low Tension for the Fulfillment of the Product Security. The fulfillment of the following specifications was demonstrated as indicated in the Official Diary of the European Communities.

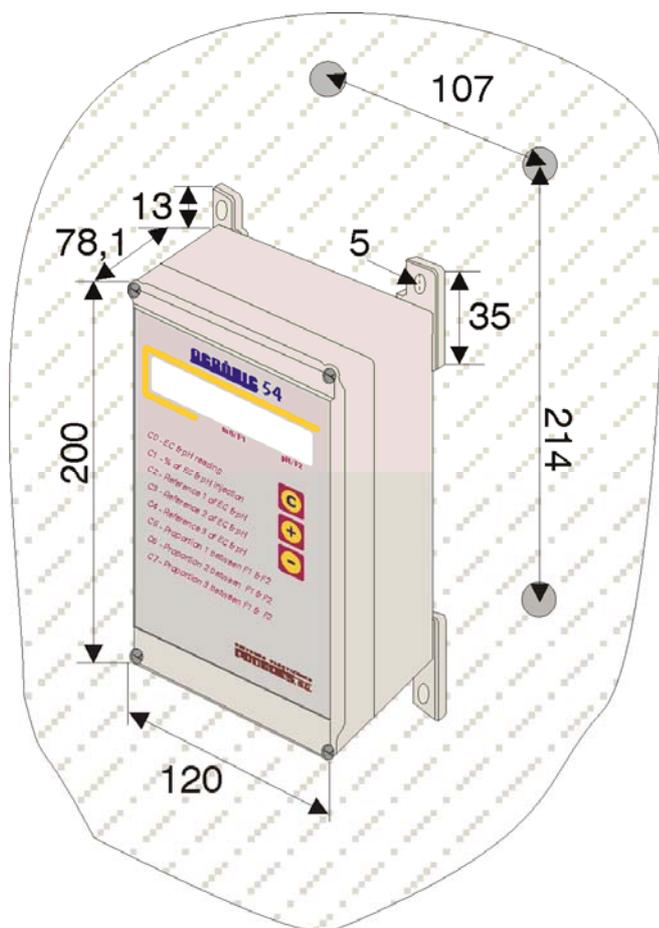


Symbols which can be displayed on the product	Double insulation	
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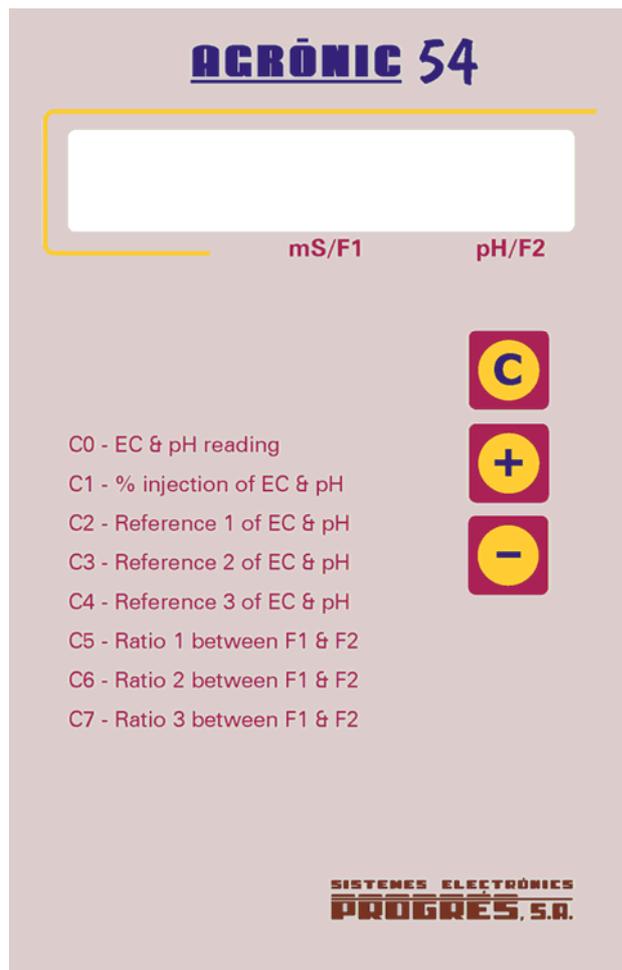
	This symbol indicates that the electrical and electronic equipment should not be disposed of as general household waste at its end-of-life. Instead, the product should be handed over to the applicable collection point for the recycling of electrical and electronic equipment for proper treatment, recovery and recycling in accordance with your national legislation.
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4. DIMENSIONS

All measures in mm.



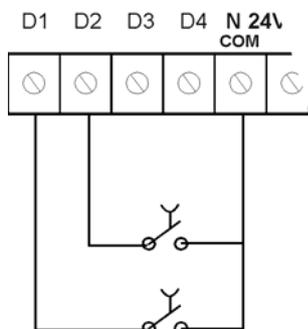
5. TITLE PAGE



6. INPUTS AND OUTPUTS

6.1. INPUTS

The unit has four digital inputs (D1, D2, D3, D4). Three of them work as switches (D1, D2 and D3), starting or stopping the corresponding program, while the fourth one is a malfunction input (D4).



The activation of inputs is done through their connection to the common.

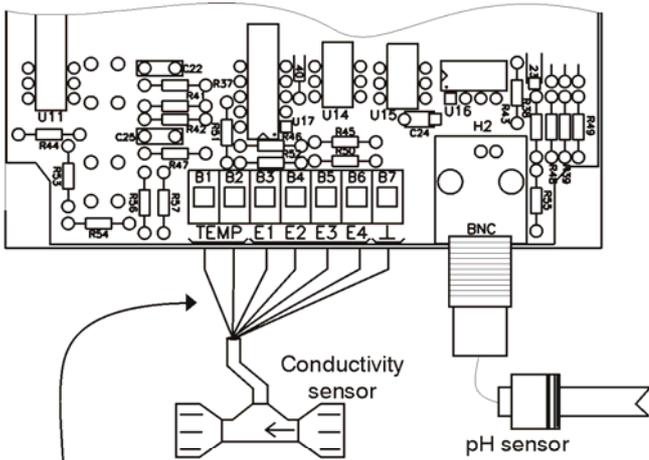
A time for the detection delay can be configured for every input, but the deactivation is immediate.

The pH and conductivity reference, as well as the proportion between fertilizers can be configured for every input or program 1, 2 and 3. If more than one input is activated at the same time, the program which has priority is the one with the lowest cardinal number.

Input 4, malfunction, is only taken into account if a program is working.

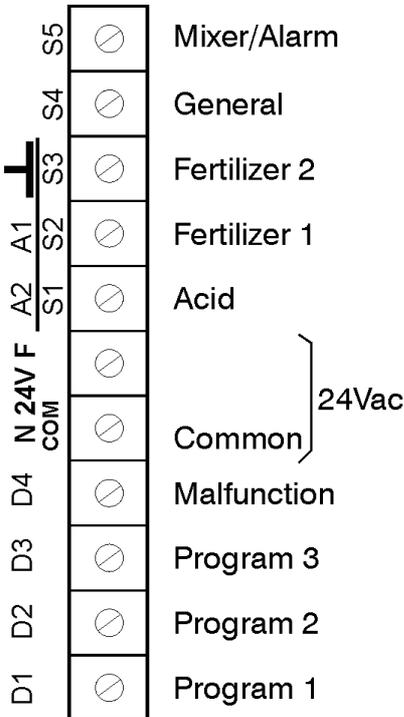
The unit also has an input for pH sensor (terminal type BNC) and another one for conductivity sensor.

SECTION OF THE UNIT SUPERIOR BOARD



	HI7635 IN-LINE SENSOR		HI-3001 DIRECT SENSOR TO PIPE	
	GRID	GRID	GRID	GRID
E4	Green	Green	Blue	Blue
E3	White	Yellow	Red	Red
E2	Blue	Blue	Yellow	Pink
E1	Brown	Brown	Green	Green
Temp	Red	Red	Brown	Brown
Without connection	--	Pink and White	Pink	Yellow

VERY IMPORTANT: The grid must be connected to the box terminal  of the unit.



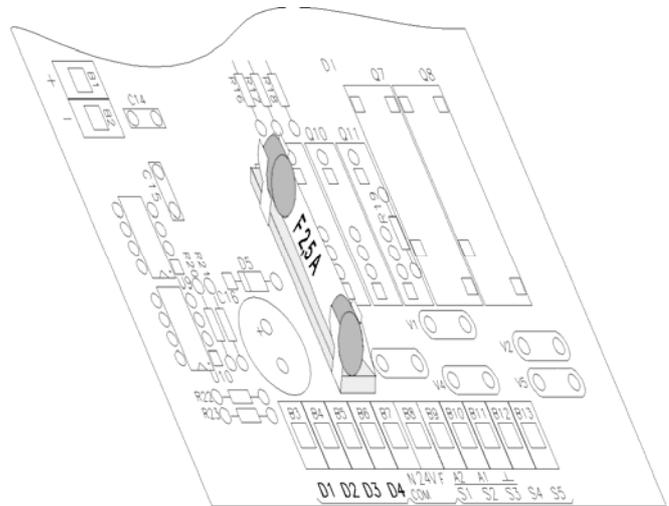
6.2. OUTPUTS

The unit has 4 or 5 outputs, 2 of them are digital and the other can be 3 digital, in “pulsed injection” units, or 2 analog outputs in units with “analog injection”.

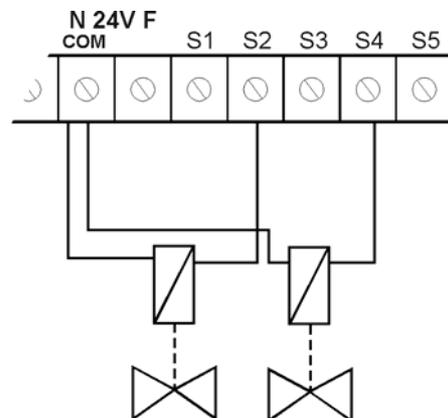
	Output 1	Output 2	Output 3	Output 4	Output 5
A-54 pulsed injection	Digital	Digital	Digital	Digital	Digital
A-54 Analog injection	Analog 0-10V	Analog 0-10V	Analog outputs common	Digital	Digital

Outputs are protected by a 2.5 A fuse type F (fast). Replace it with a similar one if it fuses.

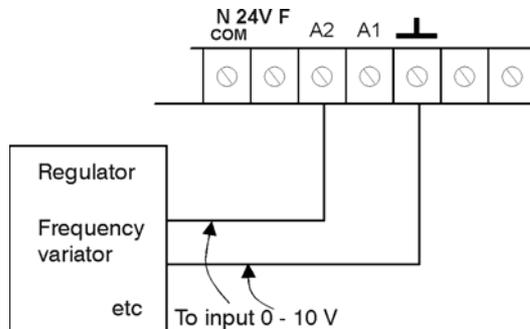
SECTION OF THE UNIT INFERIOR BOARD



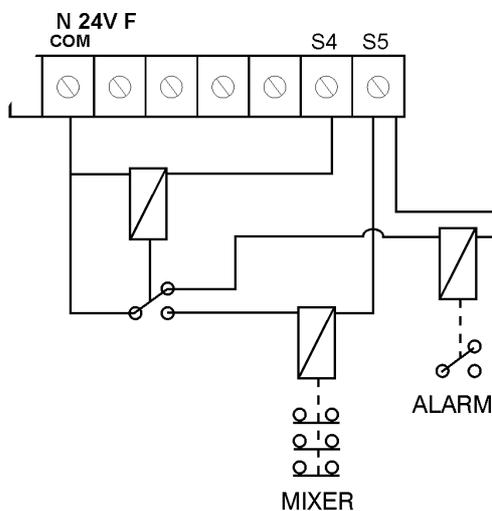
- **S1, S2 and S3 (A-54 pulsed injection):** Digital outputs for the injection of acid or base and fertilizer by pulses. The acid or base electrovalve is connected to S1, the fertilizer number 1 electrovalve to S2 and the fertilizer number 2 electrovalve to S3. Electrically, the electrovalves will be connected directly to the outputs without any relay in between and hydraulically they will be connected to the Venturis or to the magnetic pumps.



- **A1, A2, (A-54 analog injection):** Analog outputs from 0 to 10 volts to connect to frequency variators or regulators. It is important neither to short-circuit these signs nor to put the cables near power lines. Output A1 corresponds to fertilizer and A2 to acid or base. The symbol  is the common output or 0 volts.



- **S4 (in two versions):** Digital output, which is activated during the whole irrigation, except when there is a malfunction.
- **S5 (in two versions):** Digital output used both for the start and stop of mixers and for malfunction detection. For a shared use of both functions, it is necessary to use a relay activated by the general output. If it is activated, the mixers will work, but if it is deactivated, the alarm device will work.



7. CONFIGURATION OF THE INSTALLER

This configuration must be done by the unit installer. Press the “+” and “-” keys at the same time to access it. Press the “C” key to go to the following code. Press the “+” and “-” keys to change the values. Press the “C” key until the C0 code is displayed to go back to CONSULTATION.

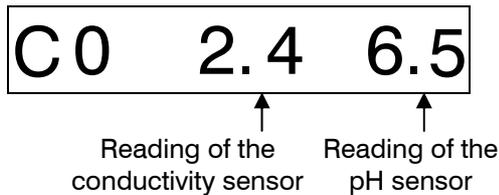
- **Code 00: Delay until the first regulation.** Indicate the time in seconds that the programmer must wait to calculate the regulation when a program is started. During this time, the % of applied injection will be the one memorized in the last irrigation. This allows the injection stabilization. The value must be between 0 and 250.
- **Code 01: Reaction delay.** Indicate the time in seconds that the programmer must use to carry out the adjustment to be done. The maximum time is 5 seconds. Time 0 indicates that the adjustment must be done as soon as it is detected.
- **Code 02: Self adjustment delay.** Indicate the time in seconds that must go by between a self-adjustment attempt and the next one. The self-adjustment is a small increase or decrease of the % of injection which is introduced when the sensor value is outside the programmed reference value but within the allowed error. The minimum time is 4 seconds and the maximum is 15.
- **Codes 03, 04 and 05: Proportional bands.** The limits, within which the % of injection will be calculated, must be indicated in these three codes, one for every program. The lower the limit, the more abrupt the changes will be when trying to obtain the desired reference. The value can be between 0 and 9.9, although the normal is 2.0.
- **Code 06: Modulation cycle (*).** Indicate, in seconds, the frequency in which the injection impulses will be repeated. A suitable value would be between 2.0 seconds and 4.0 seconds, although it can go from 2.0 to 9.9 seconds.
- **Codes 07, 08, 09 and 10: Delay.** Indicate, in seconds, the time that has to go by from the moment the activation of an input is detected until the programmer takes it into account. The value must be between 0 and 250.
- **Code 11: Acid o base.** In this code it can be selected how it will work the pH regulation in the irrigation water, by means of acid or base. If it leaved the value to 0 it will work like an acid, and if it is modified with the “+” key and leaved to 1 it will work like a base. Then, it will be determinate if there is an acid or base tank.

(*) In the “by impulse” version, to maintain the EC, the unit applies every certain seconds, a dose of every fertilizer, which is related to the desired proportion between fertilizers and the programmed reference. To maintain the pH the unit works in a similar way. In the “analog” version, to maintain the EC and/or the pH, the unit changes the injection speed of the engines until it gets the programmed references.

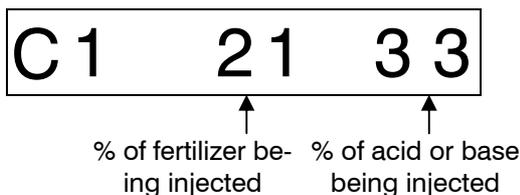
8. CONSULTATION

The first two codes of the programmer correspond to consultations of the unit state (C0 and C1).

- **Code C0:** It shows the conductivity and pH reading that reach the unit through the sensors. If a malfunction takes place, the programmer shows this code and the alarm origin (program number) intermittently, and the reason for it (high or low conductivity, high or low pH, malfunction input). For further information read the section MALFUNCTIONS.



- **Code C1:** It shows the percentage of fertilizer injection, which has the highest proportion, as well as the percentage of acid or base, which is being injected.



9. PROGRAMMING

The codes that go from C2 to C7 are used to define every program, having to specify the desired level of conductivity and pH, as well as the relationship between the injection of the two fertilizers.

Every code is divided into two sections. The first one corresponds to values of conductivity or values from the first fertilizer, while the second one corresponds to values of pH or of the second fertilizer. Press the "C" key to change section or code and the "+" and "-" keys to increase or decrease the value of the section which is active, that is to say the one which has a blinking point on its left.

A point showed just after the code means that the program is activated.

- **Codes C2, C3 and C4:** Indicate the desired reference value for conductivity (value from 0 to 9.9) and pH (value from 0 to 9.9) which is to be reached when program 1, 2 and 3 are activated. The value 00 means that this part is not to be regulated.



↑ ↑ ↑
 Activated Conductivity reference pH reference
 program (program 1) (program 1)

- **Codes C5, C6 and C7:** Indicate the desired proportion between the fertilizers of every one of the three programs.



↑ ↑ ↑
 Non activated Proportion of fertilizer Proportion of fertilizer
 program 1. (program 2) 2. (program 2)

10. CONFIGURATION OF THE USER

In this section we can find the parameters which allow you to adjust the working of the unit, as well as the sensor calibration. To access this section, press the "C" and "+" keys at the same time when the programmer is at code C0 of consultation. If no input is activated, the programmer goes to sensor calibration; otherwise, it goes directly to the first configuration code (code 04).

Press the "C" key to go from one code to another. Use the "+" and "-" keys to change values. Press the "C" key until the code C0 appears to go back to consultation.

Codes from 00 to 03, corresponding to calibration are explained in the CALIBRATION section.

- **Code 04: EC high alarm.** Indicate the value at which the indicated reference has to be surpassed (between 0 and 9.9) in order to activate the alarm because the conductivity level is too high.
- **Code 05: EC low alarm.** Indicate which value (between 0 and 9.9) can be reached below the desired reference in order to activate the alarm because the conductivity level is too low.
- **Code 06: pH high alarm.** Indicate the quantity of points (between 0 and 9.9) the indicated reference can be surpassed in order to activate the alarm because the pH level is too high.
- **Code 07: pH low alarm.** Indicate the quantity of points (between 0 and 9.9) below the indicated reference must be reached in order to activate the alarm because the pH level is too low.

- **Code 08: Delay in the EC alarm detection.** Indicate the number of seconds during which conductivity must be at an alarm level before its activation. The value must be between 0 and 999.
- **Code 09: Delay in the pH alarm detection.** Indicate the number of seconds during which pH must be at an alarm level before its activation. The value must be between 0 and 999.
- **Code 10: Pre-mixing.** Indicate the number of seconds during which the mixer must be working before injection is started. The value must be between 0 and 250.
- **Code 11: Mixer working.** Indicate the number of seconds the mixer must be working in the mixing cycles, which take place during the fertilization. The value must be between 0 and 250.
- **Code 12: Mixer at stop.** Indicate the number of seconds the mixer must be at stop in the mixing cycles, which take place during the fertilization. The value must be between 0 and 250.
- **Code 13: Alarm working.** Indicate the number of seconds the alarm must be working in the cycle of alarm signal. The value must be between 0 and 250.
- **Code 14: Alarm at stop.** Indicate the number of seconds the alarm must be at stop in the cycle of alarm signal. The value must be between 0 and 250.

11. CALIBRATION

In the configuration of the user, codes from 00 to 03 are used to calibrate sensors. On entering in everyone of the codes, the code and value which is expected from the sensor appears for a few seconds. After these seconds, the screen blinks and displays the reading, which is being obtained from the sensor. If the reading is stable enough and similar to the desired one, the screen stops blinking after approximately 10 seconds, indicating that the sensor has been calibrated. If you press the “+” and “-“ keys simultaneously the unit is forced to accept the value which is displayed at this moment.

If the calibration of sensor is not to be done, press the “C” key during the initial seconds or press the “C” key until the code changes, when the screen is blinking.

In order to have a good calibration, the sensor and the liquid have to be as close as possible to 25°C degrees. Then, the liquid value and the automatic compensation that the sensor have will be correct. If the irrigation water is cooler than 25°C the sensor it

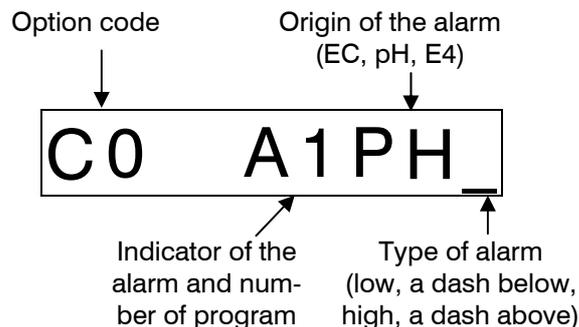
should be taken out for several minutes because the sensor has an inertia to the temperature changes.

The calibration codes go in pairs. So, codes 00 and 01 are used to calibrate the conductivity sensor, while codes 02 and 03 correspond to the calibration of the pH sensor. If a suitable calibration is not done in the first code, the second one does not appear. So, to do a valid calibration of the sensor, it is necessary to do the two codes, which correspond to the sensor correctly.

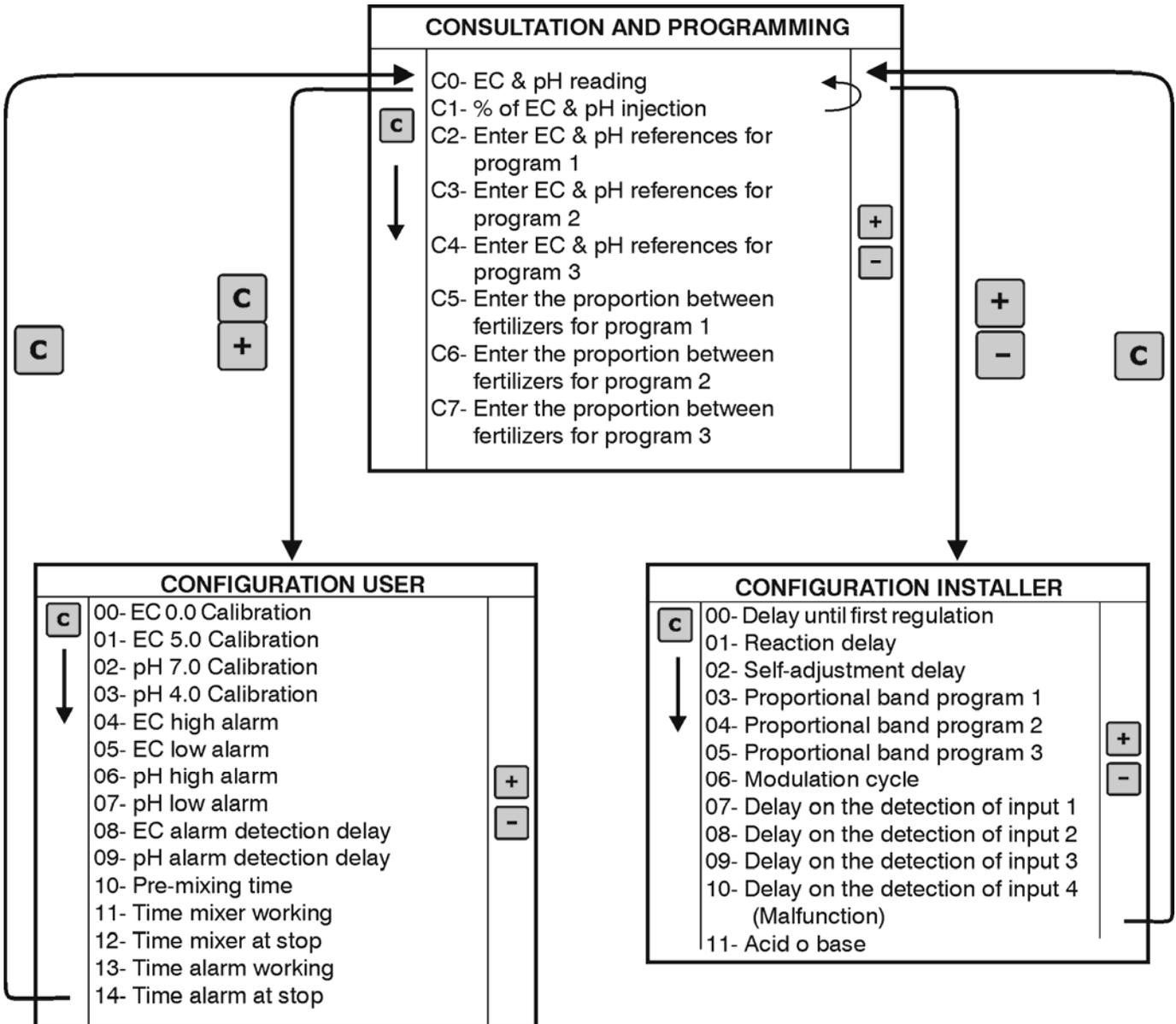
Finished the calibration process, the result can be verified on consultation screen, introducing the pH or EC sensors in the calibration liquids.

12. MALFUNCTIONS

When the unit detects a malfunction, because a non desired level of conductivity or pH has been reached or because input 4 has been activated, the program stops automatically and injection also stops. The screen displays the consultation code C0 and the information about the reason of the malfunction in a blinking way. The program will not be started again until the malfunction is not deactivated by pressing the “C” key.



13. FUNCTION CHART



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