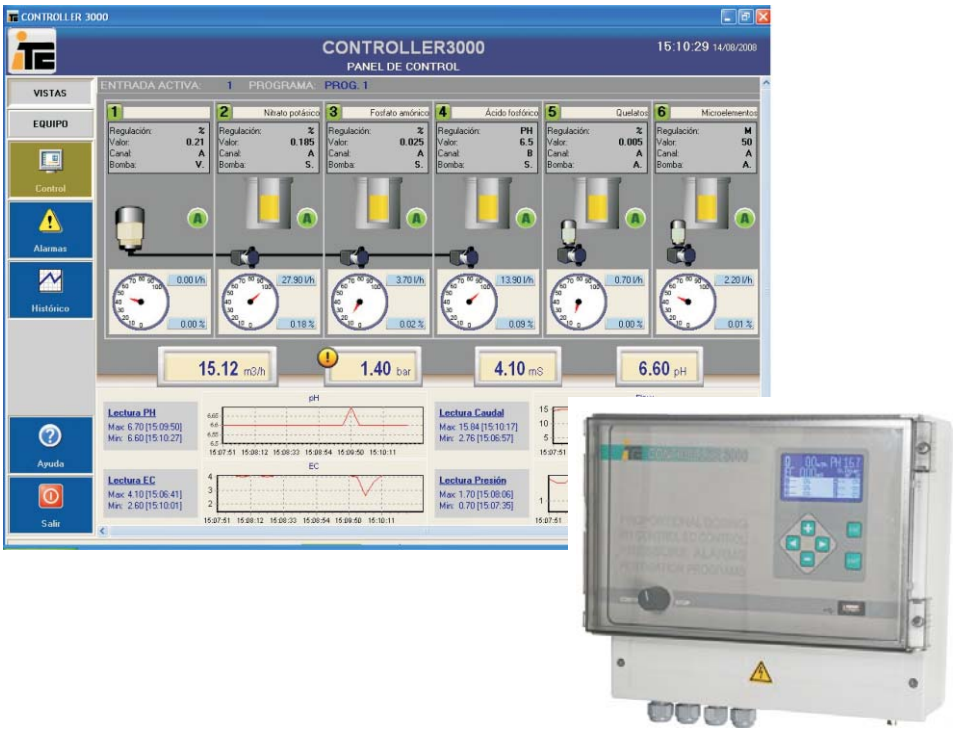


CONTROLLER 3000 SCADA

ENGLISH

INDEX

CONTROLLER 3000 QUICK CONFIGURATION

Quick Configuration Guide is a useful tool to help to set up a basic controller configuration to enable a quick startup of a Controller 3000.

Through the indications in the "Quick Configuration" you can go to next step.

Quick Configuration Guide diagram:

- Description
- System identification:
  - Single pumps
  - Modular pumps
  - Modular and single pumps
- Instalation
- Configuration
- Fertigation Programs:
  - Proportional dosing and pH control
  - Dosification for EC control and pH control
- Flowmeter and pressure sensor calibration
- Send configuration from PC to Controller 3000
- EC and pH calibration

For more in-depth configuration (alarms, communication, etc.) please check the complete Controller 3000 manual.

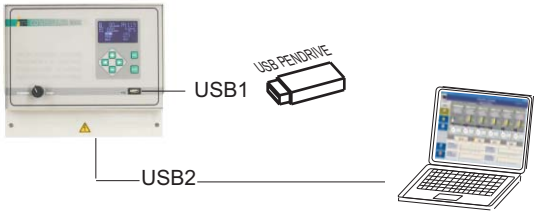
To start the Quick Configuration go to the chapter shown.

Step number

Chapter and page number for next step

When there is a PC, it is recomended to set the configuration in the software SCADA, and send this configuration to the Controller.

Do not use simultaneously the USB1 and USB2 Ports. Before connecting a pen drive to USB1 Port, disconnect USB2 port.

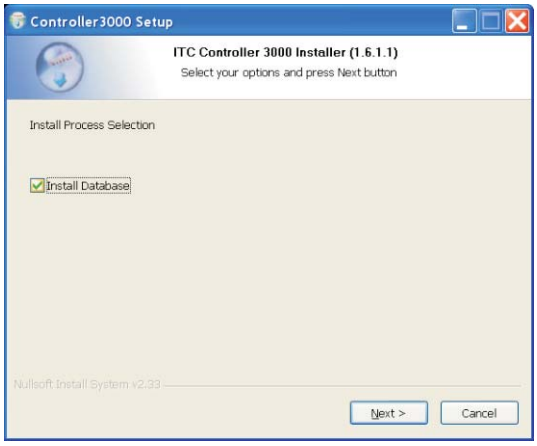


0.1 COMPUTER REQUIREMENTS

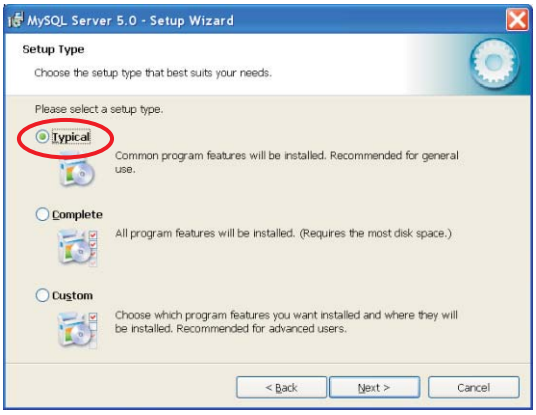
Operating system: Windows XP
Minimum screen configuration : 1024x768
Hard disk free size: 30Mb
1 free USB port

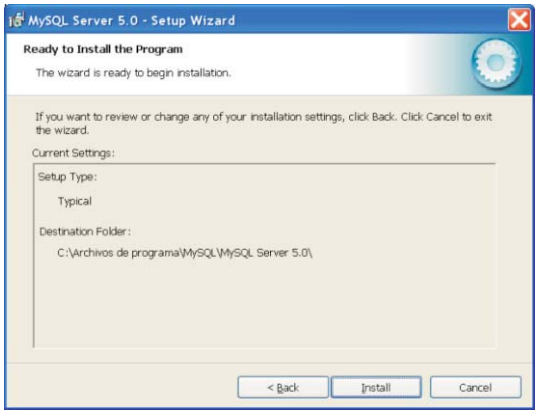
0.2 SOFTWARE INSTALLATION

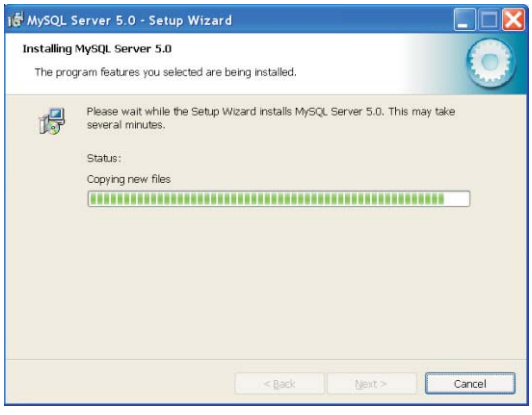
Double click on Installer. exe and follow the instructions



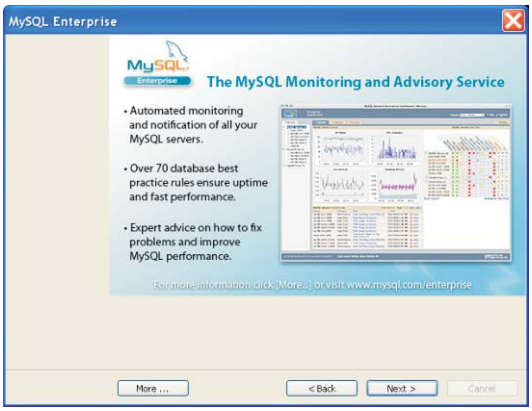
0.2.1 DATA BASE (MySQL) INSTALLATION

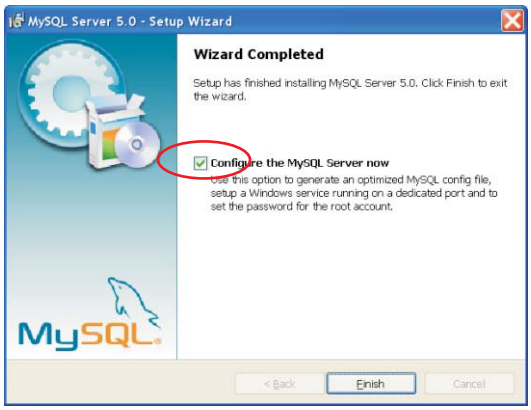


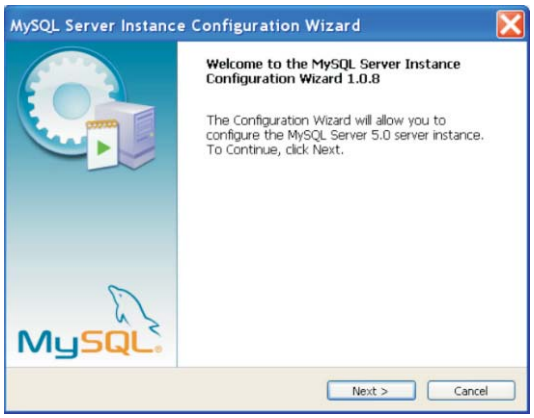


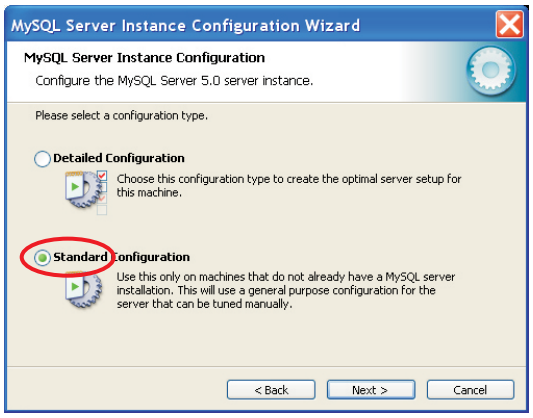



MySQL Enterprise
MySQL
Enterprise
A MySQL Enterprise subscription is the most comprehensive offering of MySQL database software, services and support to ensure your business achieves the highest levels of reliability, security and uptime.
An Enterprise Subscription includes:
1. The MySQL Enterprise Server - The most reliable, secure, and up-to-date version of the worlds most popular open source database.
2. The MySQL Monitoring and Advisory Service - An automated virtual database assistant.
3. MySQL Production Support - Technical and consultative support when you need it, along with service packs, hot-fixes and more.
For more information click [More...] or visit www.mysql.com/enterprise
More ...
< Back
Next >
Cancel


MySQL Enterprise
MySQL
Enterprise
The MySQL Monitoring and Advisory Service
• Automated monitoring and notification of all your MySQL servers.
• Over 70 database best practice rules ensure uptime and fast performance.
• Expert advice on how to fix problems and improve MySQL performance.
For more information click [More...] or visit www.mysql.com/enterprise
More ...
< Back
Next >
Cancel

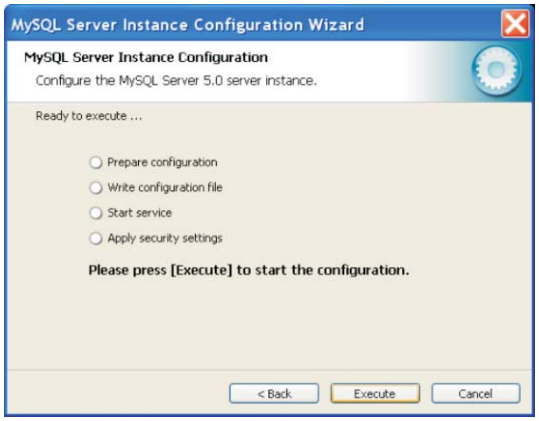

MySQL Server 5.0 - Setup Wizard
Wizard Completed
Setup has finished installing MySQL Server 5.0. Click Finish to exit the wizard.
Configure the MySQL Server now
Use this option to generate an optimized MySQL config file, setup a Windows service running on a dedicated port and to set the password for the root account.
MySQL
< Back
Finish
Cancel

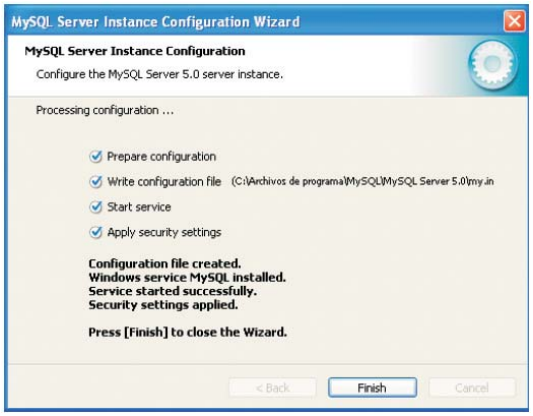

MySQL Server Instance Configuration Wizard
Welcome to the MySQL Server Instance Configuration Wizard 1.0.8
The Configuration Wizard will allow you to configure the MySQL Server 5.0 server instance.
To Continue, click Next.
MySQL
Next >
Cancel

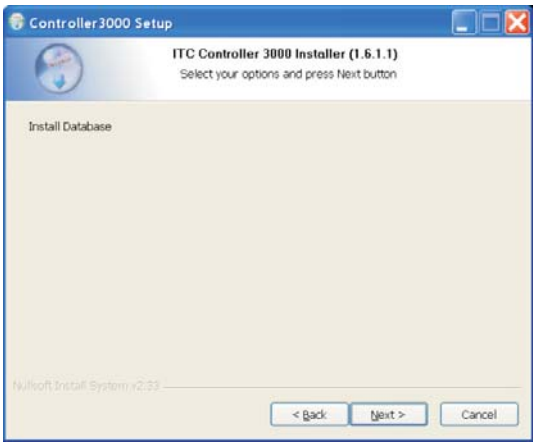

MySQL Server Instance Configuration Wizard
MySQL Server Instance Configuration
Configure the MySQL Server 5.0 server instance.
Please select a configuration type.
Detailed Configuration
Choose this configuration type to create the optimal server setup for this machine.
Standard Configuration
Use this only on machines that do not already have a MySQL server installation. This will use a general purpose configuration for the server that can be tuned manually.
< Back
Next >
Cancel


MySQL Server Instance Configuration Wizard
MySQL Server Instance Configuration
Configure the MySQL Server 5.0 server instance.
Please set the Windows options.
Install As Windows Service
This is the recommended way to run the MySQL server on Windows.
Service Name:
MySQL
Launch the MySQL Server automatically
Include Bin Directory in Windows PATH
Check this option to include the directory containing the server / client executables in the Windows PATH variable so they can be called from the command line.
< Back
Next >
Cancel

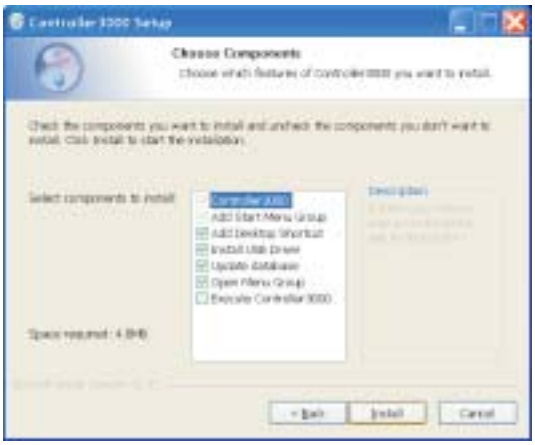

MySQL Server Instance Configuration Wizard
MySQL Server Instance Configuration
Configure the MySQL Server 5.0 server instance.
Please set the security options.
Modify Security Settings
New root password:
admin
Enter the root password.
Confirm:
admin
Retype the password.
Enable root access from remote machines
Create An Anonymous Account
This option will create an anonymous account on this server. Please note that this can lead to an insecure system.
< Back
Next >
Cancel

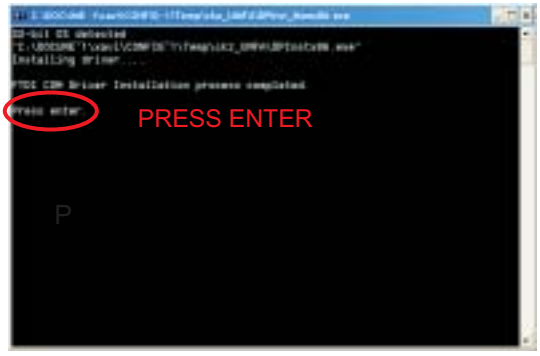

MySQL Server Instance Configuration Wizard
MySQL Server Instance Configuration
Configure the MySQL Server 5.0 server instance.
Ready to execute ...
Prepare configuration
Write configuration file
Start service
Apply security settings
Please press [Execute] to start the configuration.
< Back
Execute
Cancel





0.2.2 SCADA CONTROLLER 3000 INSTALLATION





Instalation complete

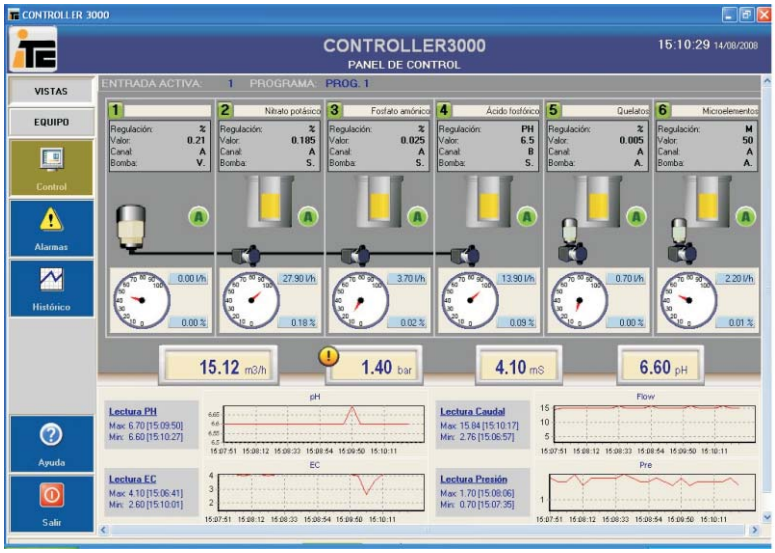
To start the program double click on

CONTROLLER 3000

Fertigation controller for dosification of 6 different products, and the online management of the most important parameters to adjust in an irrigation system: flow, pH, conductivity, pressure and activated irrigation sector.

Using the specific Windows software for the Controller 3000, the user can achieve perfect management and tracking of the agriculture operation. It lets you store the information on all values viewed and display them as graphics, with maximum, minimum and average flow, pH and EC values. Furthermore, you can list incidences with information as to date, time and type of alert.

For each irrigation program, it allows to obtain a Traceability Report, with the consumptions of water, fertilisers, acid and additives, and pH, EC and pressure values, in addition to the alarms activated for the time period required.



2. DESCRIPTION CONTROLLER SCADA.

CONTROLLER 3000

Controller 3000 is a Fertigation Controller for the dosage of 6 different Products and on-line Control of the most important Parameters to adjust for each area in an Irrigation System: Flow, pH, Conductivity and Pressure.

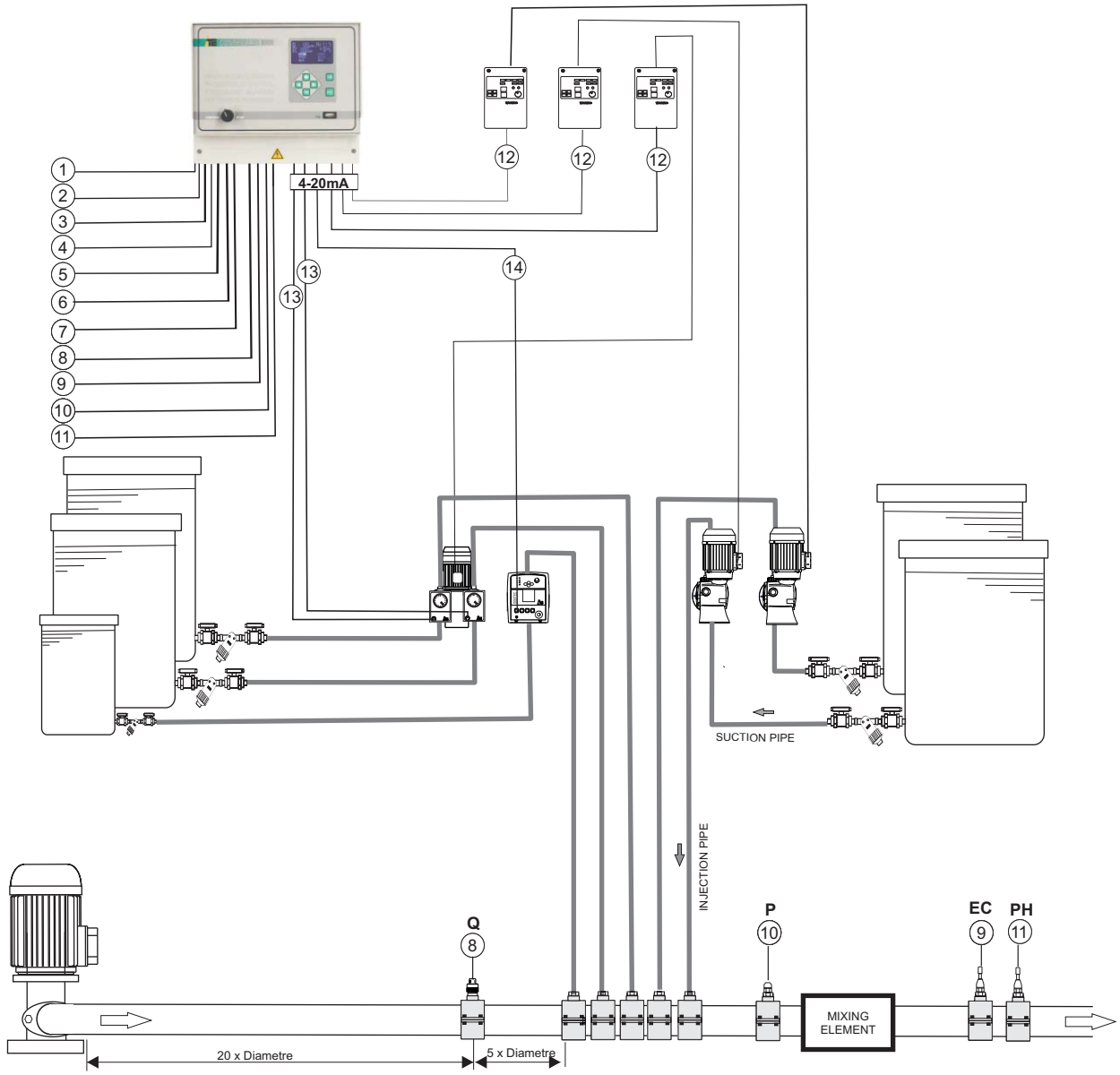
Inputs:
-Flow meter: Reading of the instantaneous Water Flow in the System.
-Electrical Conductivity (EC): Reading of the Water Conductivity in the System.
-pH: Reading of the Water pH in the System.
-Pressure: Reading of the Pressure in the System.
-Inputs of Remote Control Channels A/B.
-Fertigation Programme Inputs (Controller 3000-6/12): Information Inputs about the enabled Irrigation Area: By the signal of a simple Irrigation Programmer, Controller 3000 identifies the enabled Irrigation Area and will carry out the previously programmed Treatment for this Area.

Outputs:
-6 analogue Outputs for Metering Pumps.
-Independent Alarms Outputs for Flow, EC, pH and Pressure.
-USB1 Port for a USB Memory Device (pen drive): it allows storing Records, Configuration and Programming of the Controller 3000, and to load a new Configuration and Programming previously executed by the Fertigation SCADA installed in the PC.
-USB2 Port for the connection to PC. It allows connecting the Controller to a computer with the Organic Irrigation SCADA installed, so you can visualize in real time the development of the Sensors Readings and Dosing Pumps Adjustment.

Fertigation SCADA:

PC Software for Data Supervision, Control and Acquisition:
-Graphic Visualization in real time of all the variables executed by Controller 3000.
-Graphs about the Development of Readings with maximum and minimum Values.
-Table with Records exportable to a Spreadsheet.
-Incidences List: Date, Time and Alarm type.
-Traceability Document for each Irrigation Area: Consumption of Water, Fertilizer, Acids and Additives. Medium, maximum and minimum Values of pH, EC, Flow and Pressure. Alarms during the selected time.

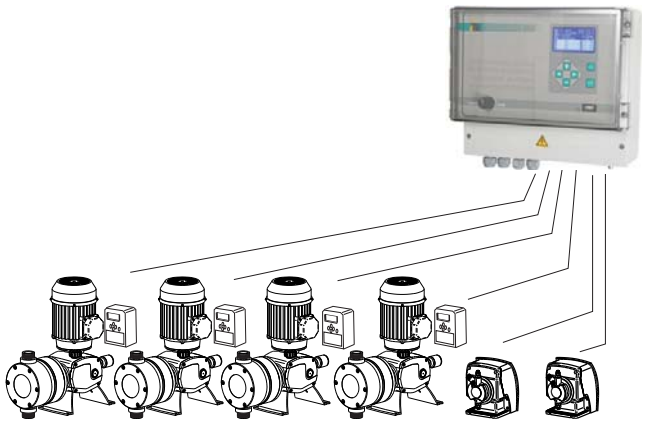
2.1. INSTALLATION SCHEME



1. Power 230 V AC +/- 20%, 50/60Hz
2. Program inputs
3. Alarm outputs
4. Input selection remote activation, channel A/B
5. Output 24V AC
6. Output RS-485, for module expansion of 12 programs
7. Output port USB2, for the connection to PC Input for flowmeter
8. Input for flow
9. Input for sensor of EC
10. Input for Pressure sensor
11. Input for pH sensor
12. Output 4-20 mA for dosing pump with variator of frequency
13. Output 4-20 mA for Servo
14. Output 4-20 mA for dosing pump electromagnetic Dositec

2.1.1. INDEPENDENT DOSING PUMPS

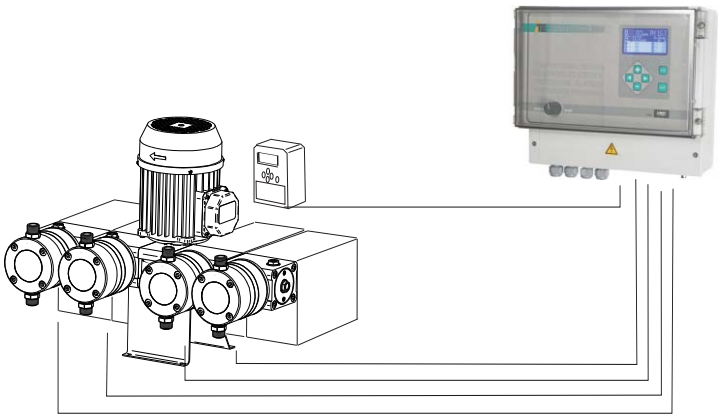
Independent Flow Control for up to 6 different Dosing Pumps, with Frequency Variators or analogue Control Dosing Pumps. Each dosing pump can be programmed for a fixed Flow dependent on each Programme, a Flow proportional to the instantaneous Irrigation Flow, Conductivity or pH Set Point.



2.1.2. MODULAR DOSING PUMPS WITH FREQUENCY VARIATORS AND SERVOMOTOR

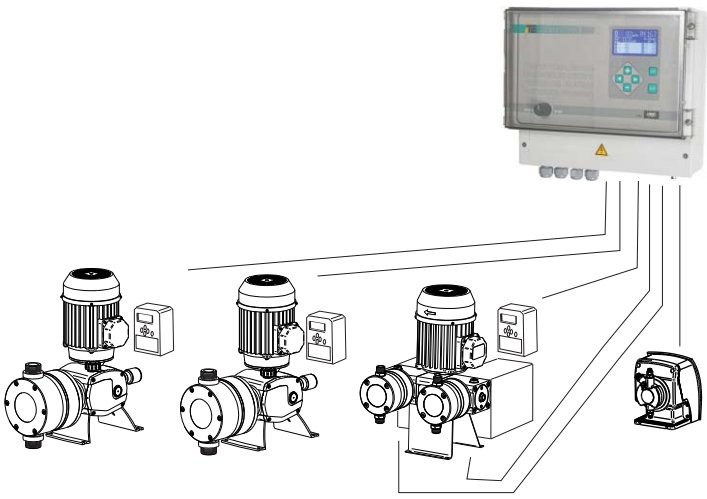
Flow Control for up to 5 different Products by a simultaneous Adjustment of a Frequency Variator and some Servomotors. Controller 3000 calculates the Flow according to the Frequency Variation of the Injections and the Location of each Servomotor.

Controller 3000 optimizes the Performance of MULTIFERTIC Dosing Pumps, obtaining the maximum Performance level by combining both Adjustment Systems, and with the chance of applying from 1% to 120% of the rated Flow of each module, by combining ideally the Frequency and Stroke in each moment.



2.1.3. MIXED EQUIPMENT WITH INDEPENDENT AND MODULAR METERING PUMPS

Flow Control for up to 5 different Products, some of them with independent Dosing Pumps, and some with modularDosing Pumps with Frequency Variator and a Servomotor for each module.

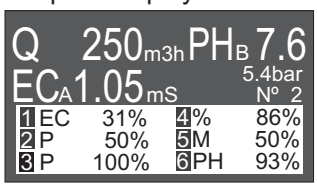


2.2. EQUIPMENT DESCRIPTION

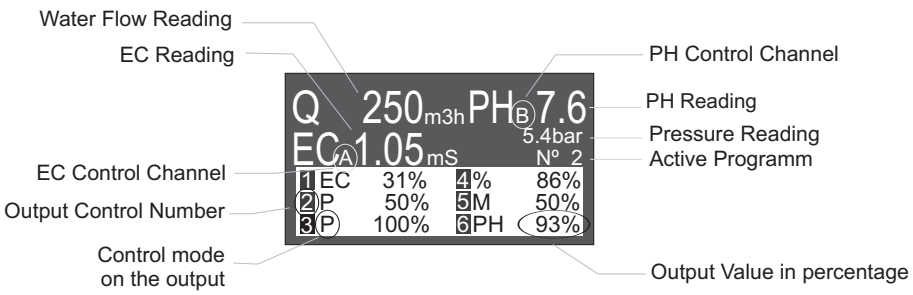
1. CONTROL/STOP Switch:
   STOP: for the Control, allows the Calibration
2. Wiring Plate
3. LCD Screen
4. Keyboard: ENT to validate, ESC to quit without validating, +/- to increase/decrease Value, </> to scroll to left/right.
5. USB1: USB Port to connect a device such a pendrive.

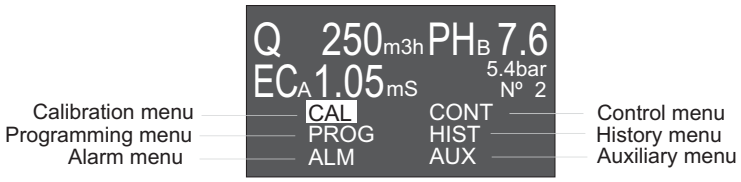
LCD SCREEN DESCRIPTION

Readings Screen with Outputs Display



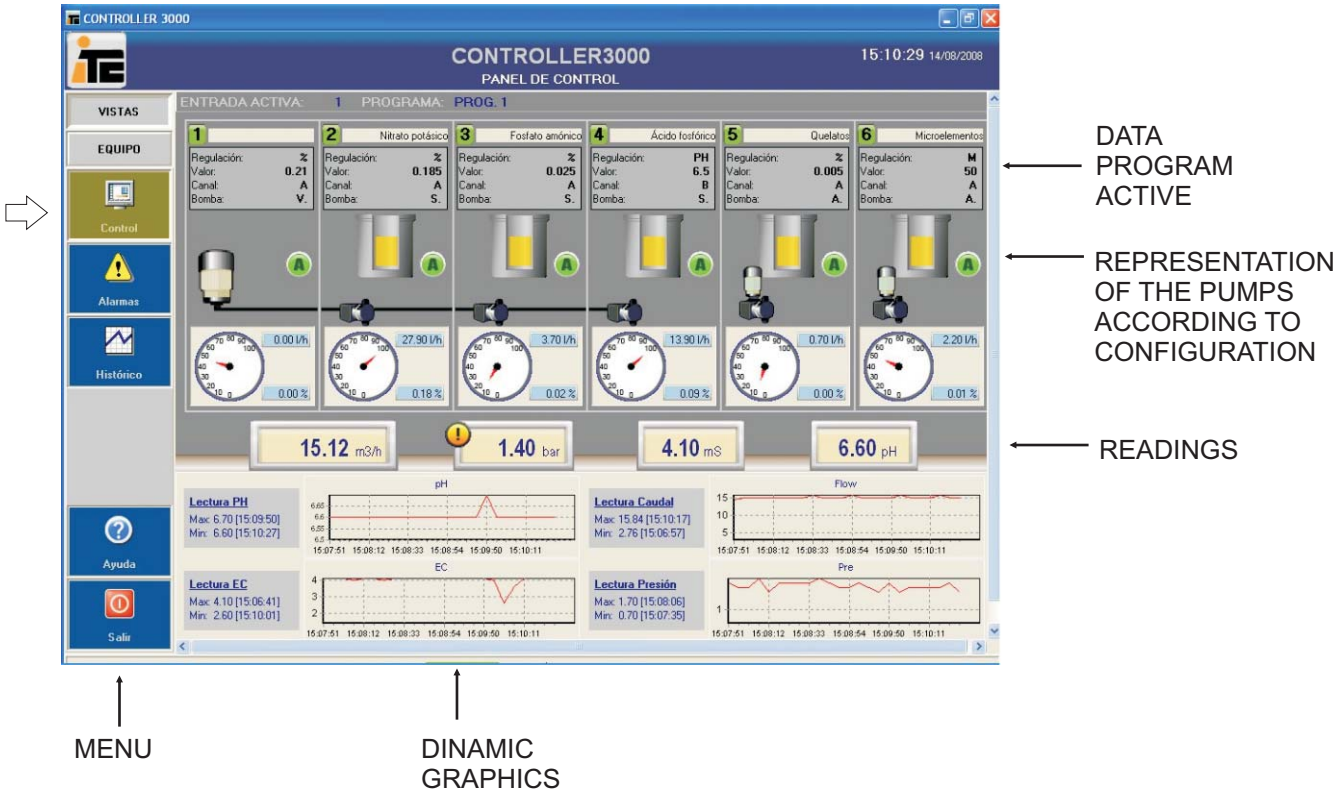
Readings Screen with Menus Display



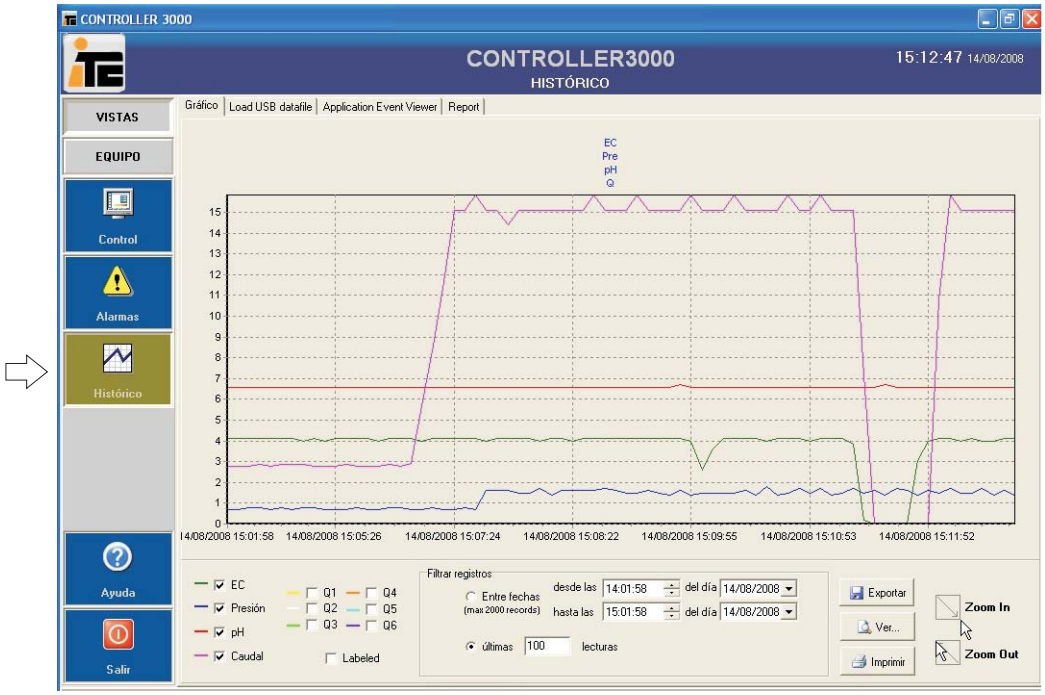


2.3. SCADA INTERFACE DESCRIPTION

CONTROL PANEL

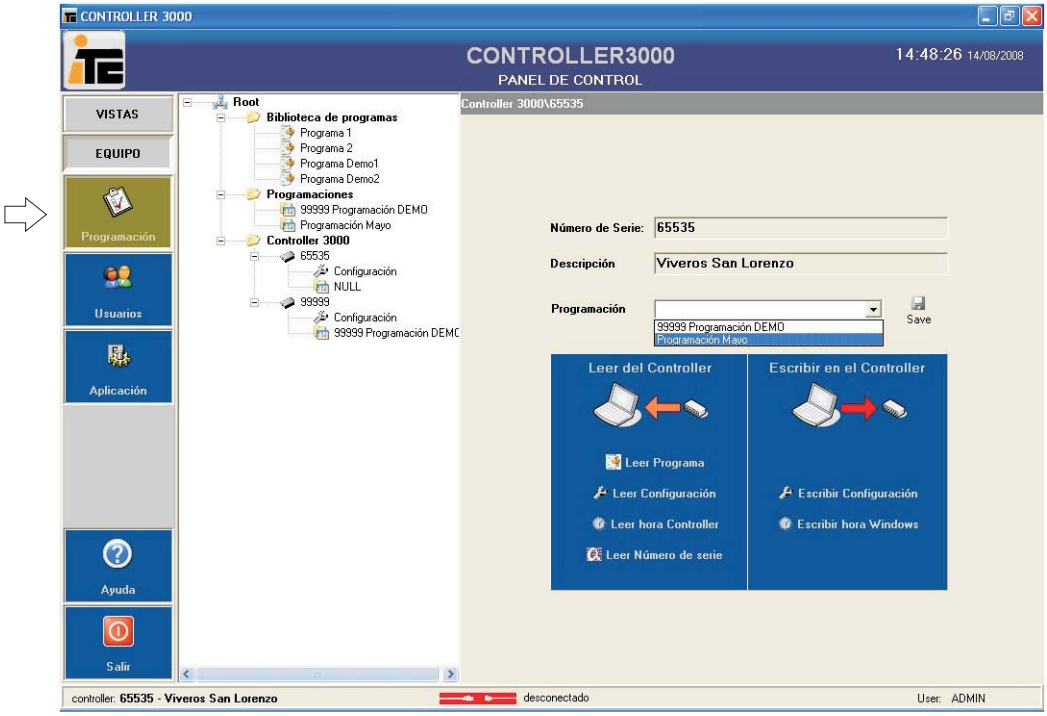


HISTORICS

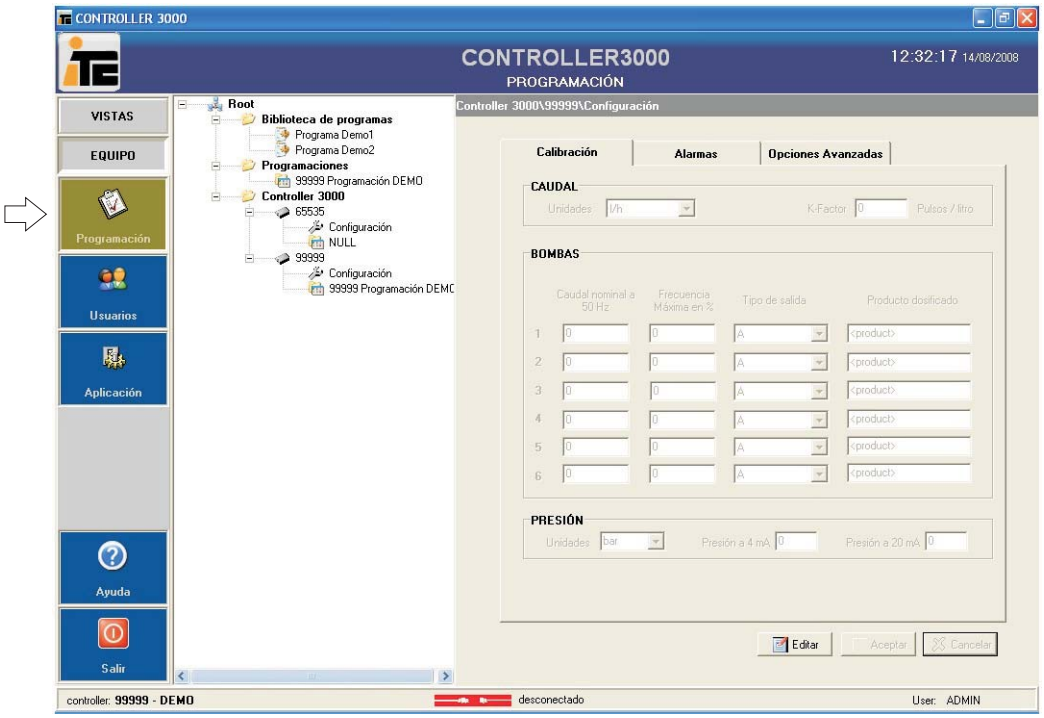


2.3. SCADA INTERFACE DESCRIPTION

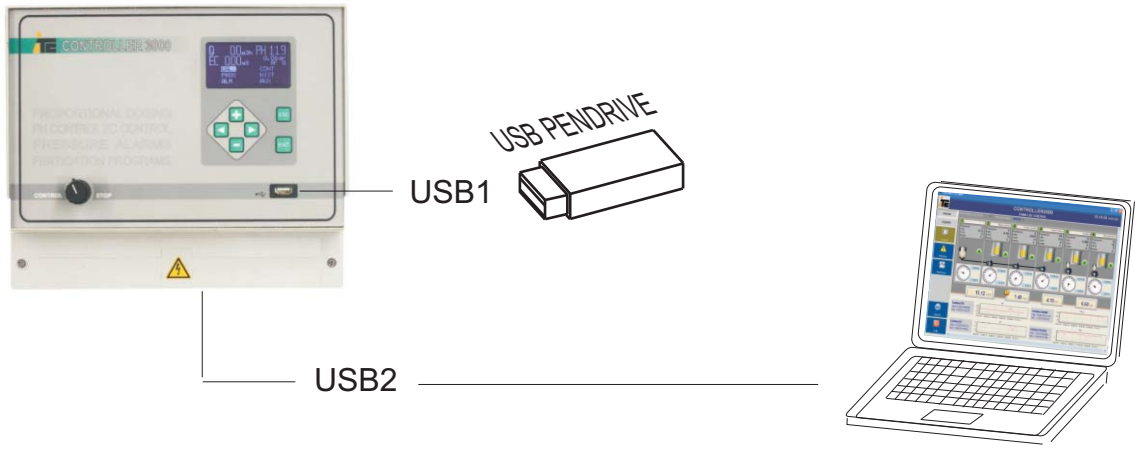
MACHINE PROGRAMATION



CONFIGURATION



2.4. USB COMMUNICATION PORTS



USB1 port
For USB memory (pendrive): It allows to save historical data, configuration and programming of Controller 3000, as well as to load a new configuration and programming made previously with the Fertirrigation SCADA installed in a PC.

USB2 port
For PC connection. It allows to connect the controller to a computer that it has the fertirrigation SCADA installed and thus to view the evolution of the readings of the sensors and the regulation of the dosing pumps in real time.

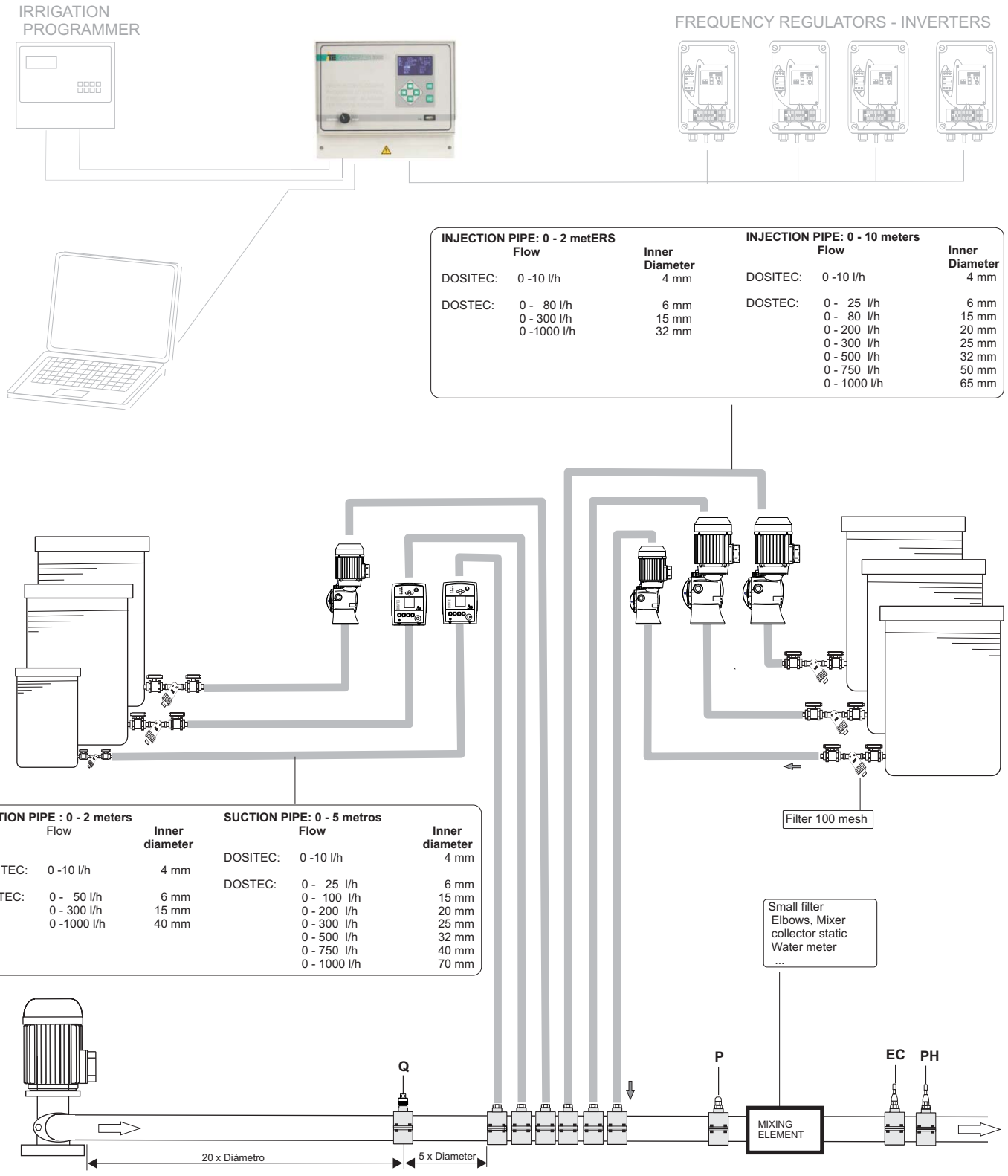
⚠ Do not use simultaneously port USB1 and USB2.

Desconect port USB2 before connecting a pendrive in port USB 1.

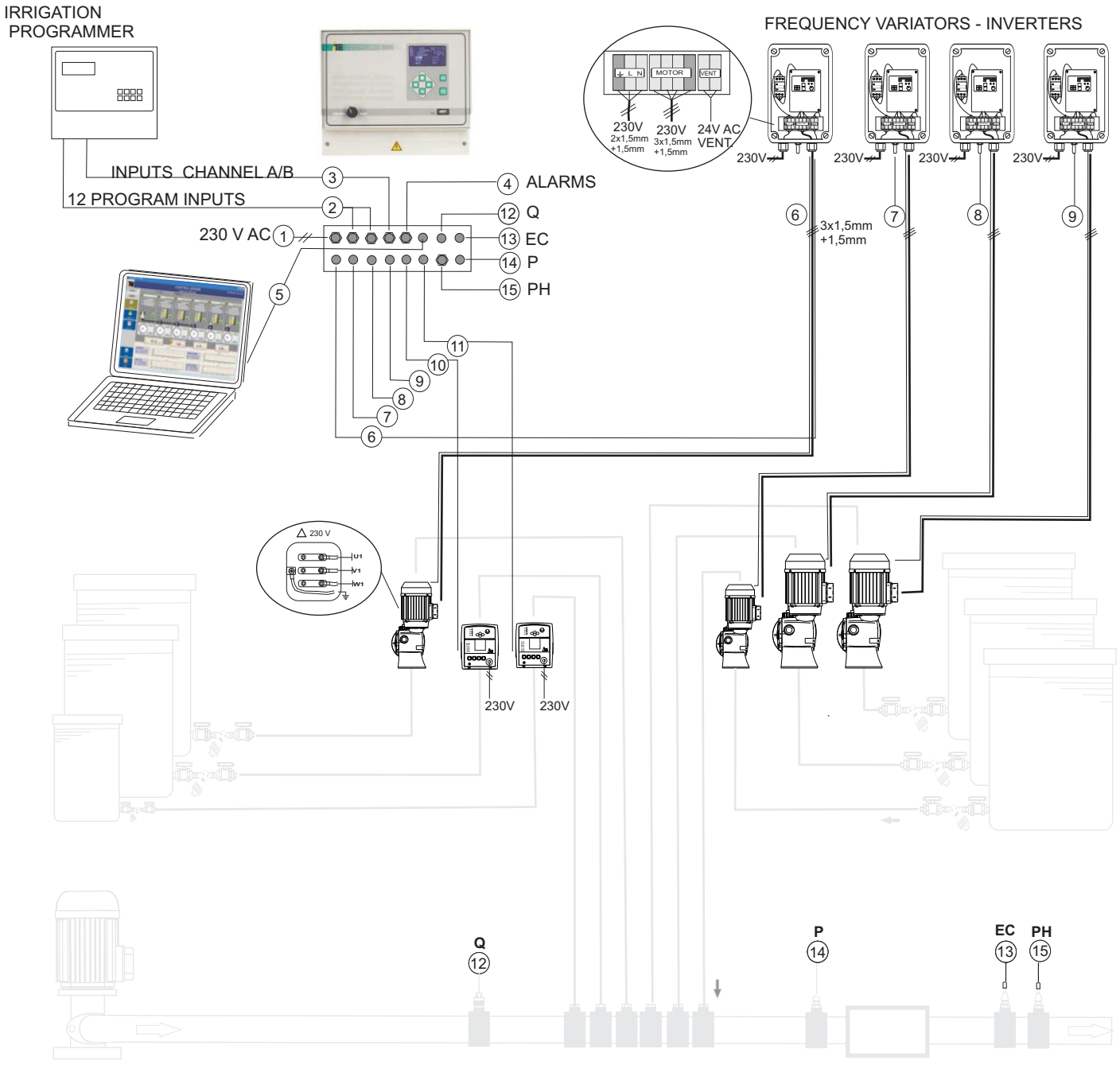
3.1. INDEPENDENT DOSING PUMPS

Independent dosing control of up to 6 different dosing pumps , through frequency variators or analogical controlled dosing pumps.

3.1.1 HYDRAULIC SCHEME



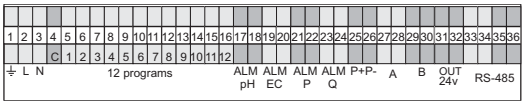
3.1.2 ELECTRICAL SCHEME



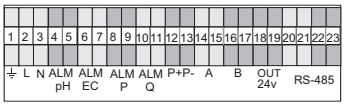
① Power 230 V AC +/- 20%, 50/60Hz
② Program input: digital inputs of 12-24V AC/DC
③ Remote activation input selection, channel A/B. 24V AC.
④ Alarm outputs. Relay outputs NA, 24V AC-1A máx
⑤ Port output USB2, for connection to PC
⑥ Output 4-20 mA, nº1 (5 pins connector)
⑦ Output 4-20 mA, nº2 (5 pins connector)
⑧ Output 4-20 mA, nº3 (5 pins connector)
⑨ Output 4-20 mA, nº4 (5 pins connector)
⑩ Output 4-20 mA, nº5 (5 pins connector)
⑪ Output 4-20 mA, nº6 (5 pins connector)
⑫ Input for flowmeter (3 pins connector)
⑬ Input for sensor of EC (4 pins connector)
⑭ Input for pressure transmitter
⑮ Input for sensor of pH (conector BNC)

TERMINAL CONNECTION

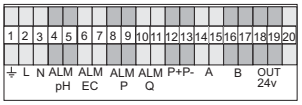
CONTROLLER 3000-6/12



CONTROLLER 3000-6



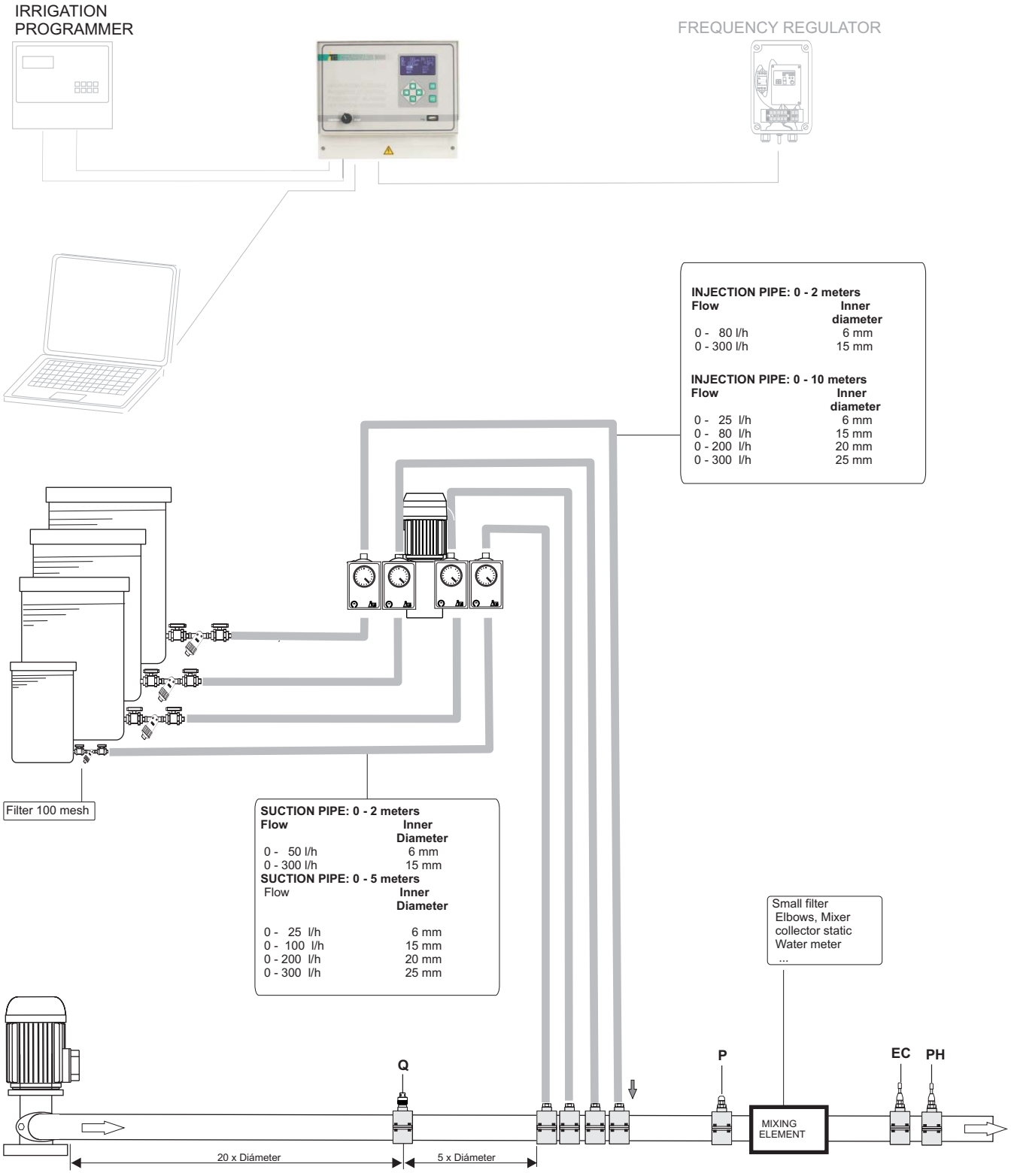
CONTROLLER 3000-2



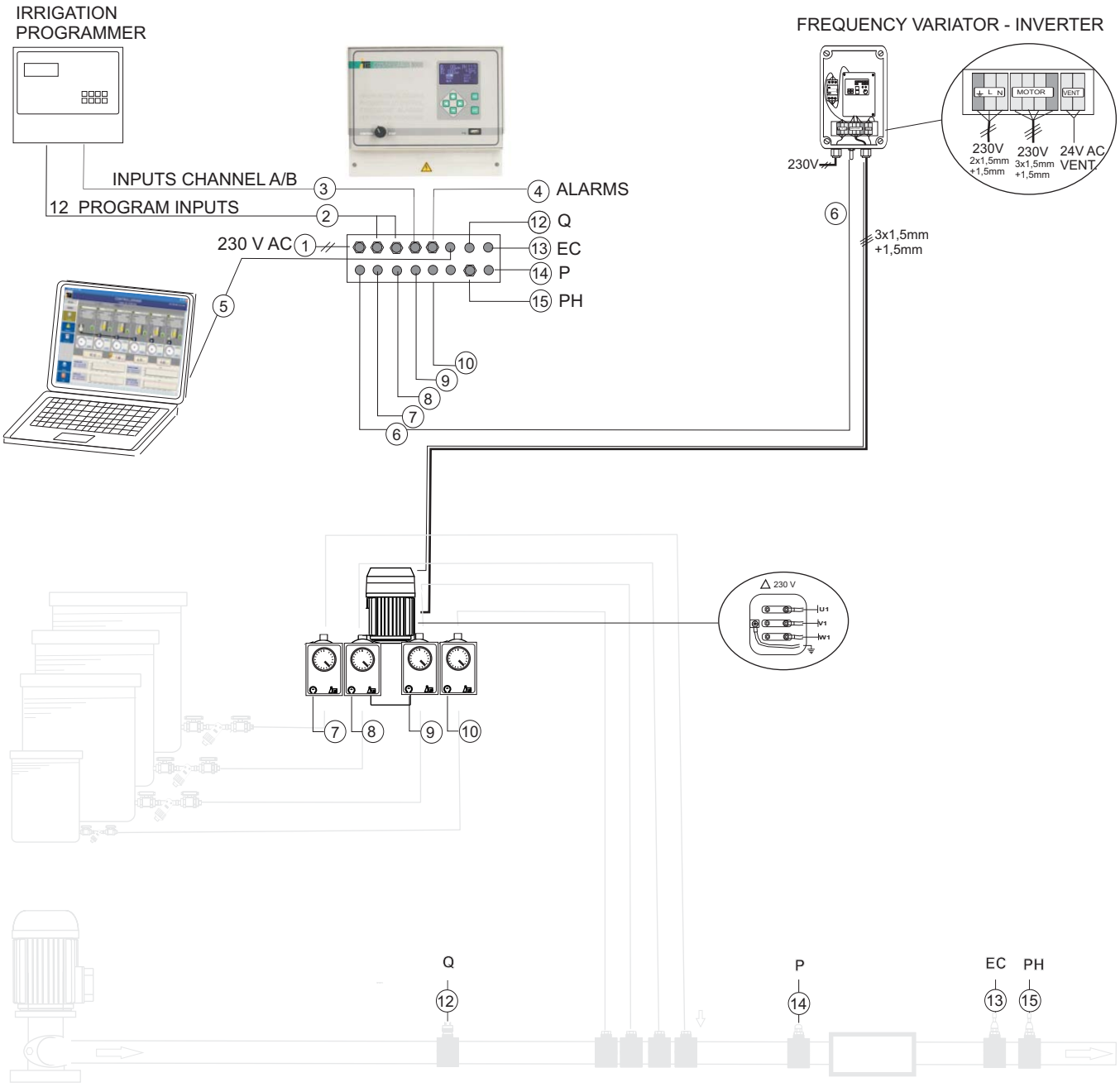
3.2.MODULAR DOSING PUMP (MULTIFERTIC)

Dosing control of up to 5 different products through synchronizing a frequency regulator and several servomotors at the same time.

3.2.1 HYDRAULIC SCHEME



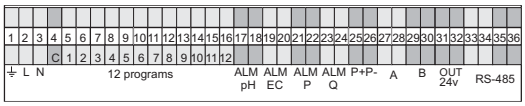
3.2.2 ELECTRICAL SCHEME



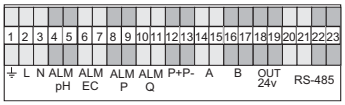
① Power 230 V AC +/- 20%, 50/60Hz
② Program input: digital input of 12-24V AC/DC
③ Remote activation input selection, channel A/B. 24V AC.
④ Alarm outputs.Output relay NA, 24V AC-1A máx
⑤ Port output USB2, for connection to PC
⑥ Output 4-20 mA, nº1 (5 pins connector)
⑦ Output 4-20 mA, nº2 (5 pins connector)
⑧ Output 4-20 mA, nº3 (5 pins connector)
⑨ Output 4-20 mA, nº4 (5 pins connector)
⑩ Output 4-20 mA, nº5 (5 pins connector)
⑪ Output4-20 mA, nº6. Without connection.
⑫ Input for flow (3 pins connector)
⑬ Input for sensor of EC (4 pins connector)
⑭ Input for pressure transmition
⑮ Input for sensor of pH (connector BNC)

TERMINAL CONNECTION

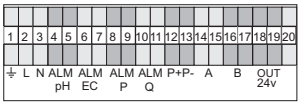
CONTROLLER 3000-6/12



CONTROLLER 3000-6



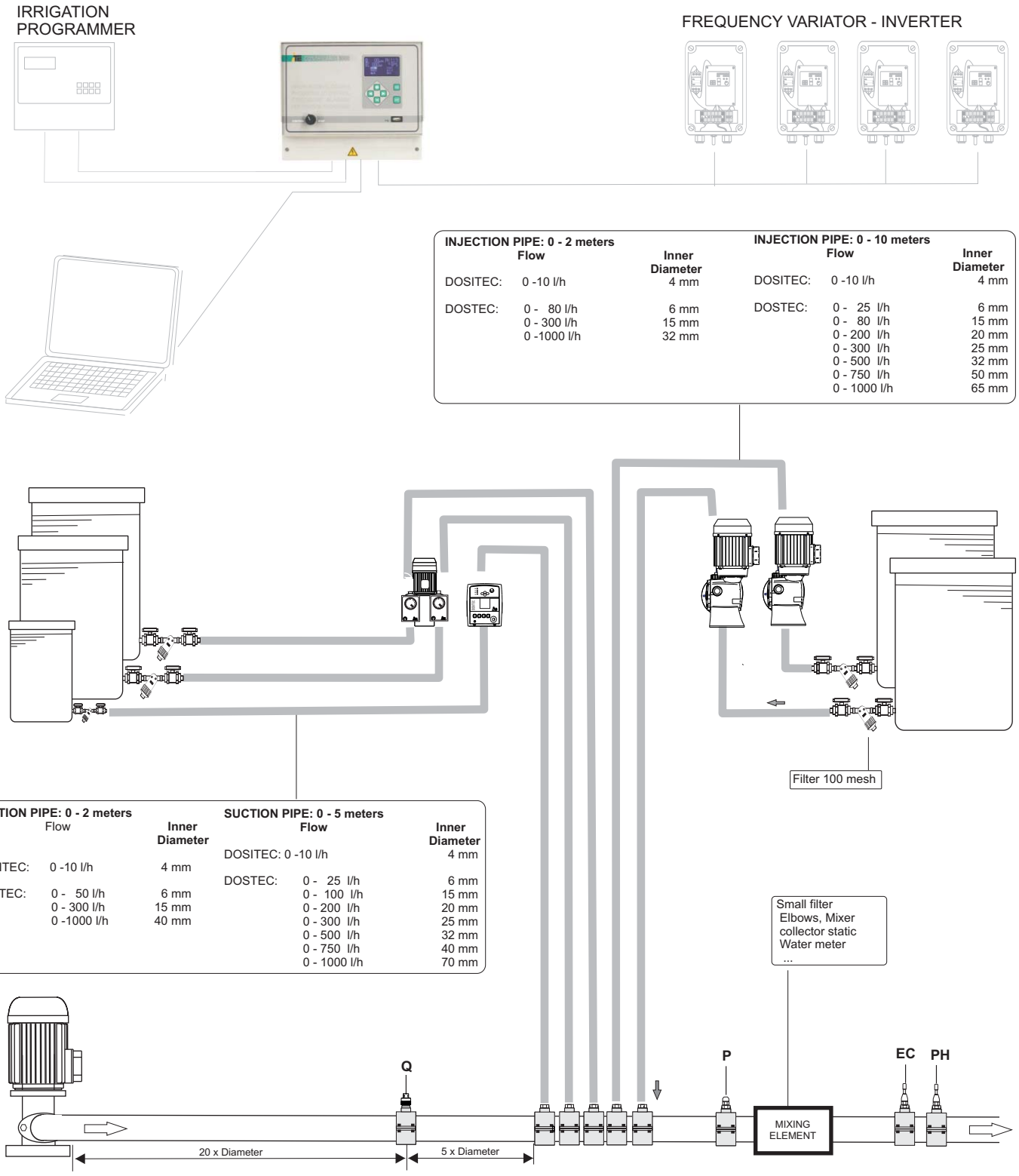
CONTROLLER 3000-2



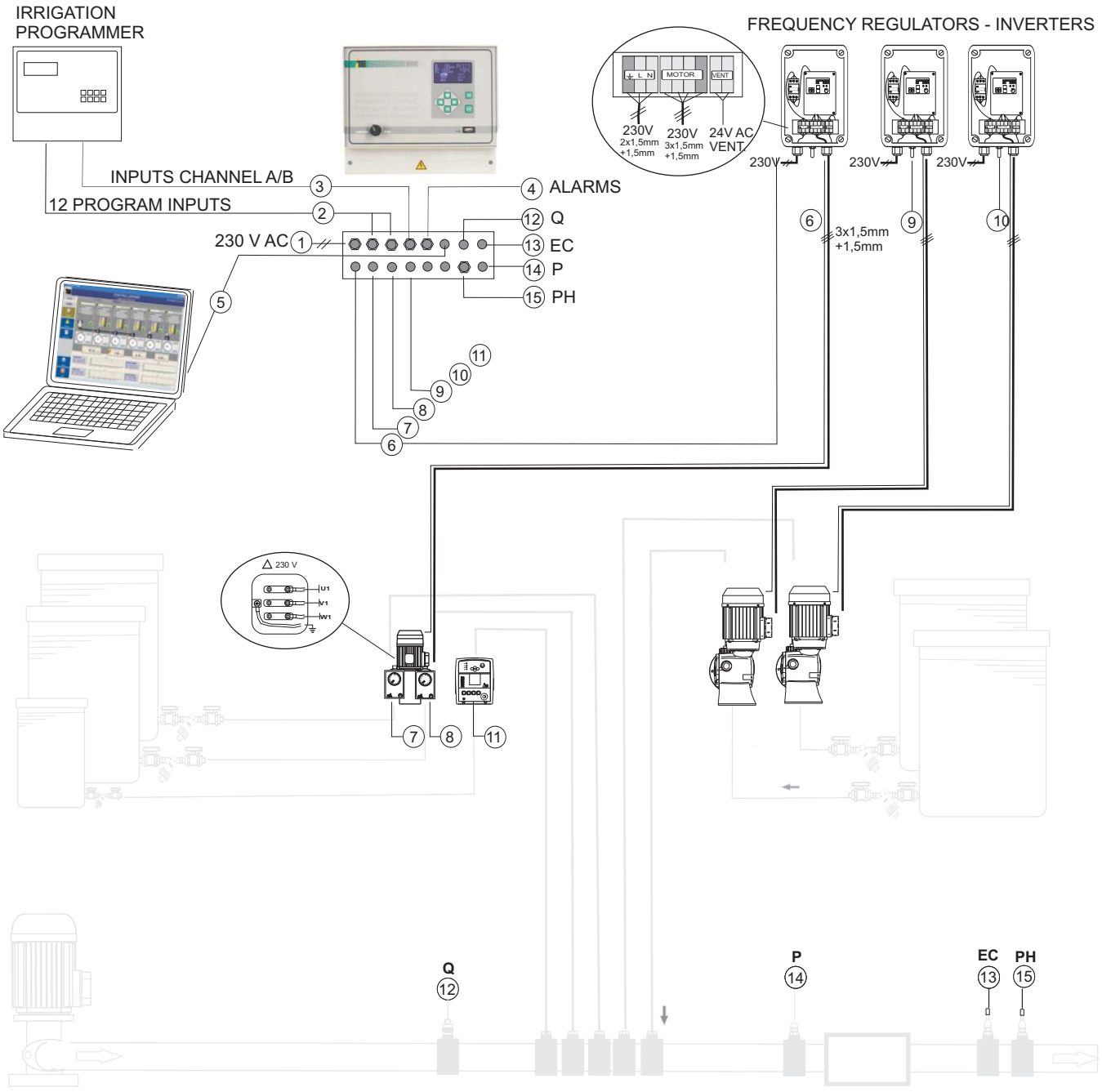
3.3. MIXED SYSTEM OF INDEPENDENT AND MODULAR DOSING PUMPS

Dosing control of up to 5 different products, some of them through independent dosing pumps, and others through a modular dosing pump with frequency regulator and independent servomotors for each module.

3.3.1 HIDRAULICAL SCHEME



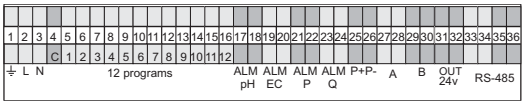
3.3.2 ELECTRIC SCHEME



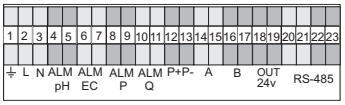
① Power 230 V AC +/- 20%, 50/60Hz
② Program input: digital input of 12-24V AC/DC
③ Remote activation input selection, channel A/B. 24V AC.
④ Alarm outputs. Relay outputs NA, 24V AC-1A máx
⑤ Port output USB2, for connection to PC
⑥ Output 4-20 mA, nº1 (5 pins connector)
⑦ Output 4-20 mA, nº2 (5 pins connector)
⑧ Output 4-20 mA, nº3 (5 pins connector)
⑨ Output 4-20 mA, nº4 (5 pins connector)
⑩ Output 4-20 mA, nº5 (5 pins connector)
⑪ Output 4-20 mA, nº6 (5 pins connector)
⑫ Input for flowmeter (3 pins connector)
⑬ Input for sensor of EC (4 pins connector)
⑭ Input for pressure transmitter
⑮ Input for sensor of pH (connector BNC)

TERMINAL CONNECTION

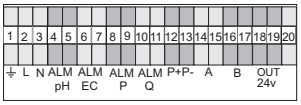
CONTROLLER 3000-6/12



CONTROLLER 3000-6

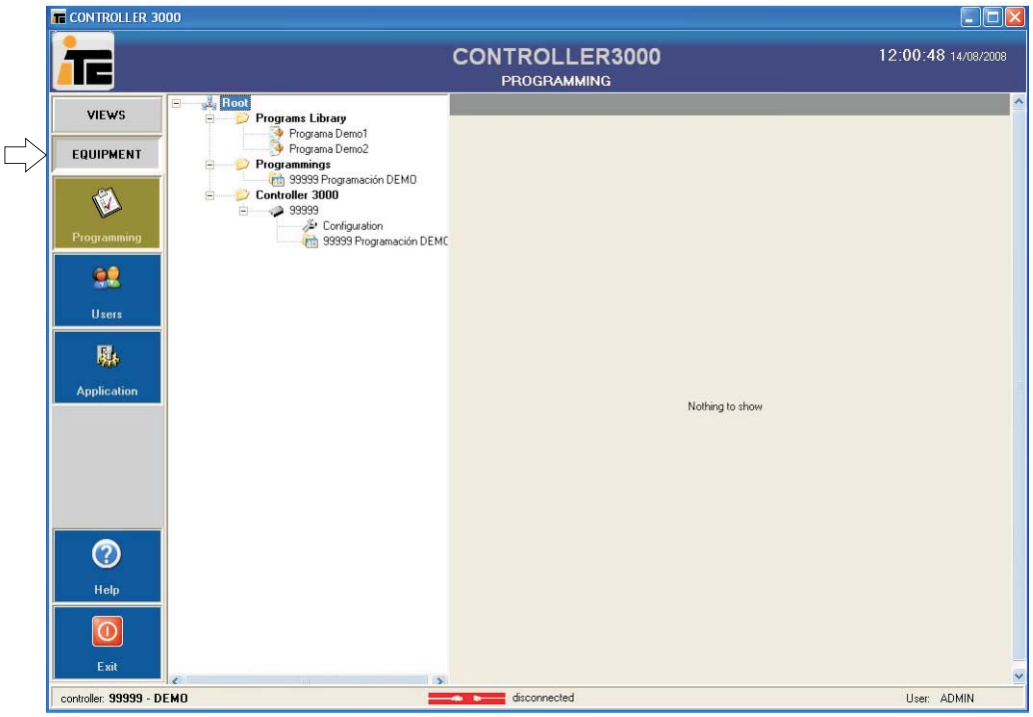


CONTROLLER 3000-2

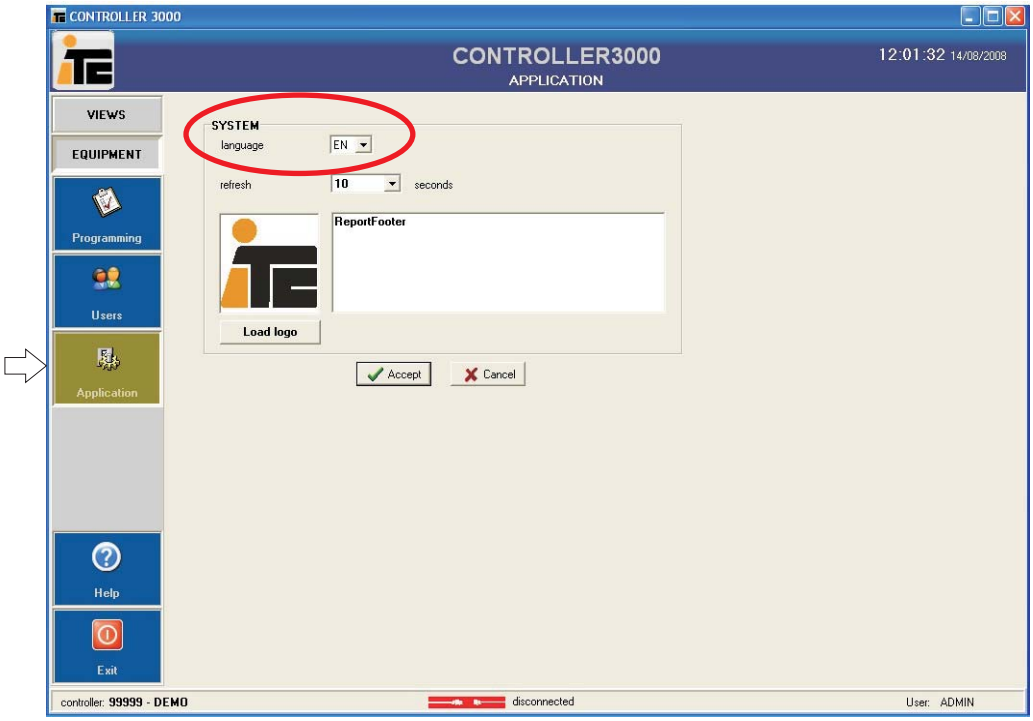


4.1.LANGUAGE SELECTION.

MENU: EQUIPMENT



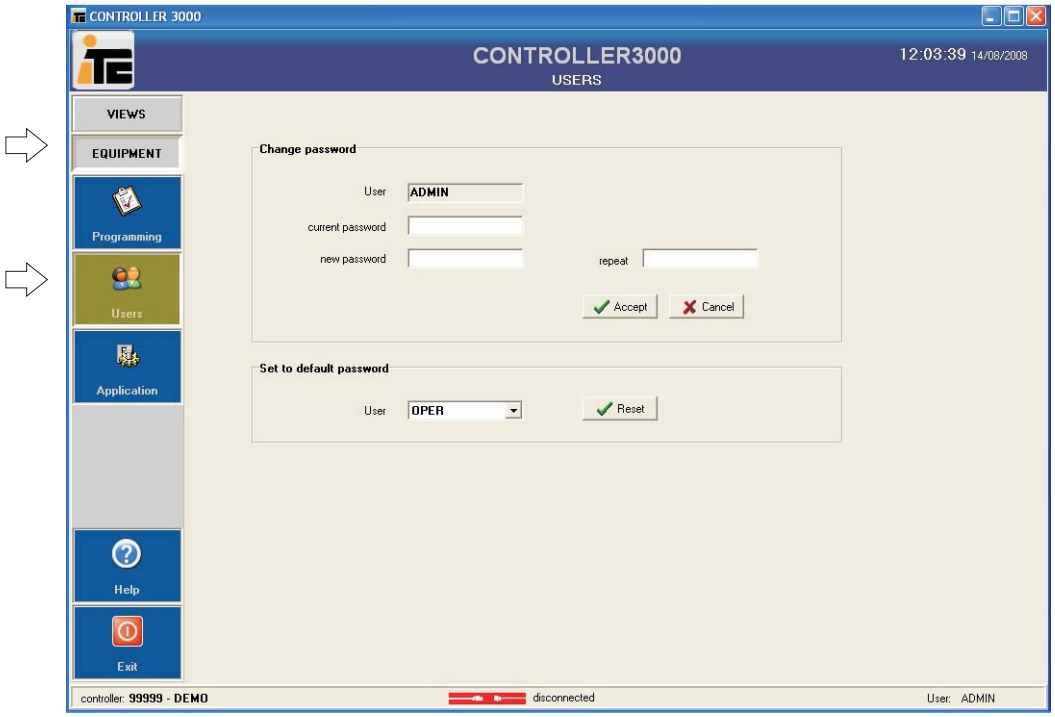
Application. Select at “Language” the language.



4.2. USERS CONFIGURATION.

MENU: EQUIPMENT>Users
By log in the program as ADMIN, all the passwords can be changed. Default password 0000.

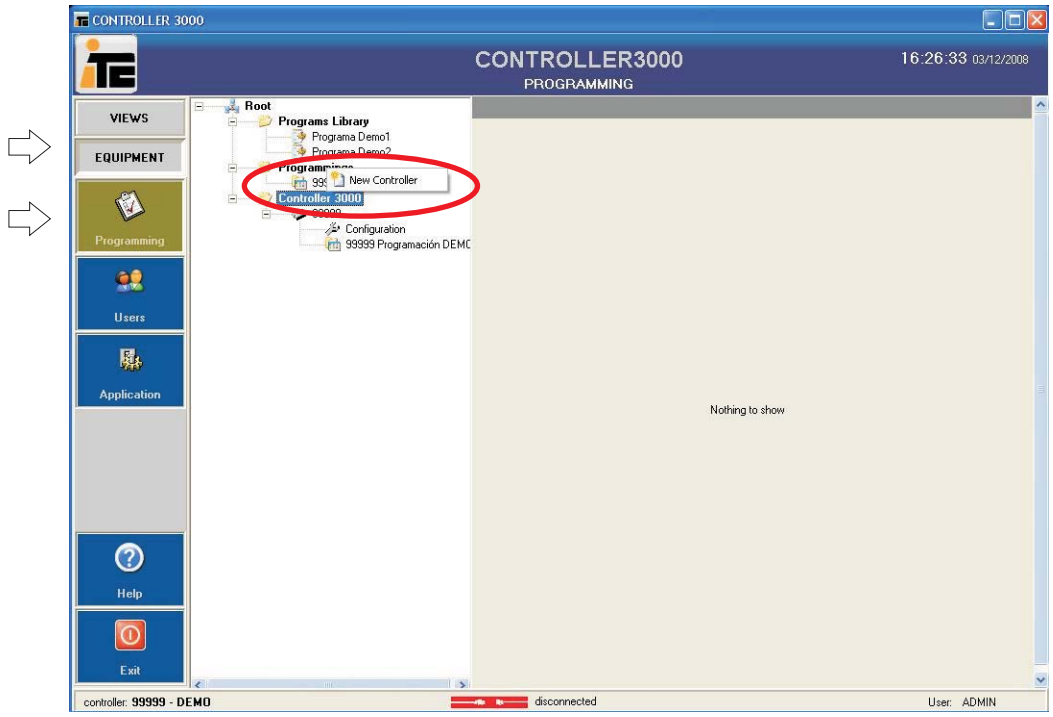
By log in the program as OPER the only password that can be changed is the OPER. user password .



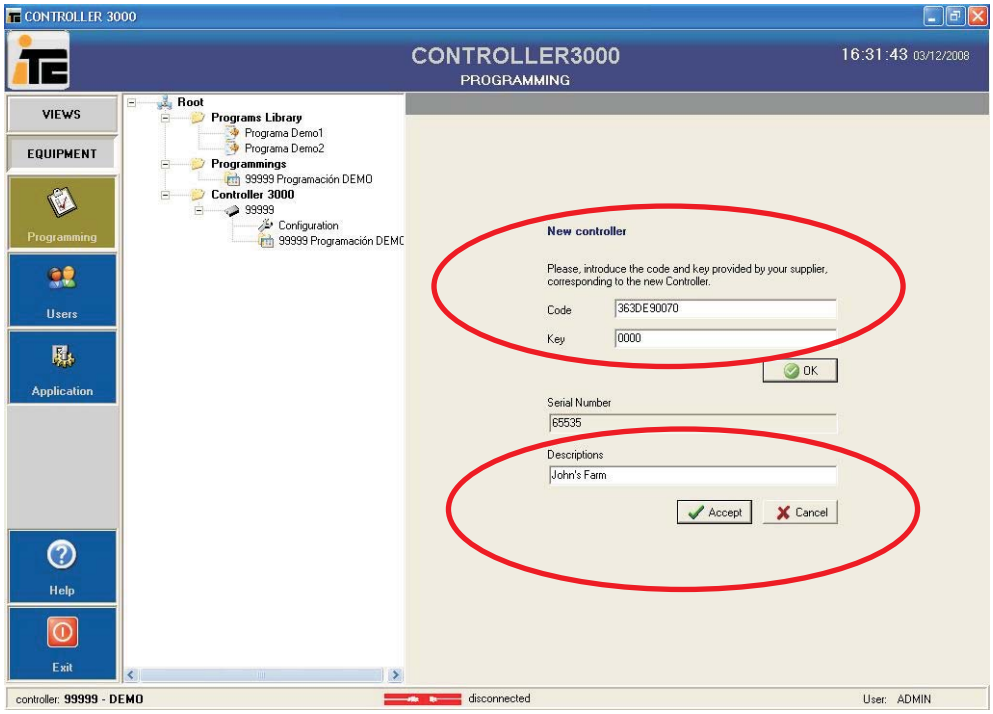
4.3. NEW CONTROLLER.

MENU: EQUIPMENT> Programming.

Select the folder Controller 3000, and pressing the right botton of the mouse, select add a new Controller.

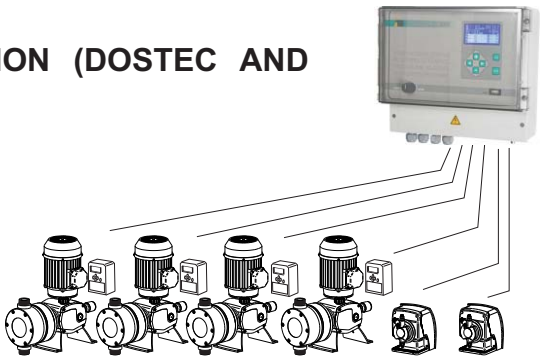


Introduce the code, and the key provided by your supplier and description of the equipment.



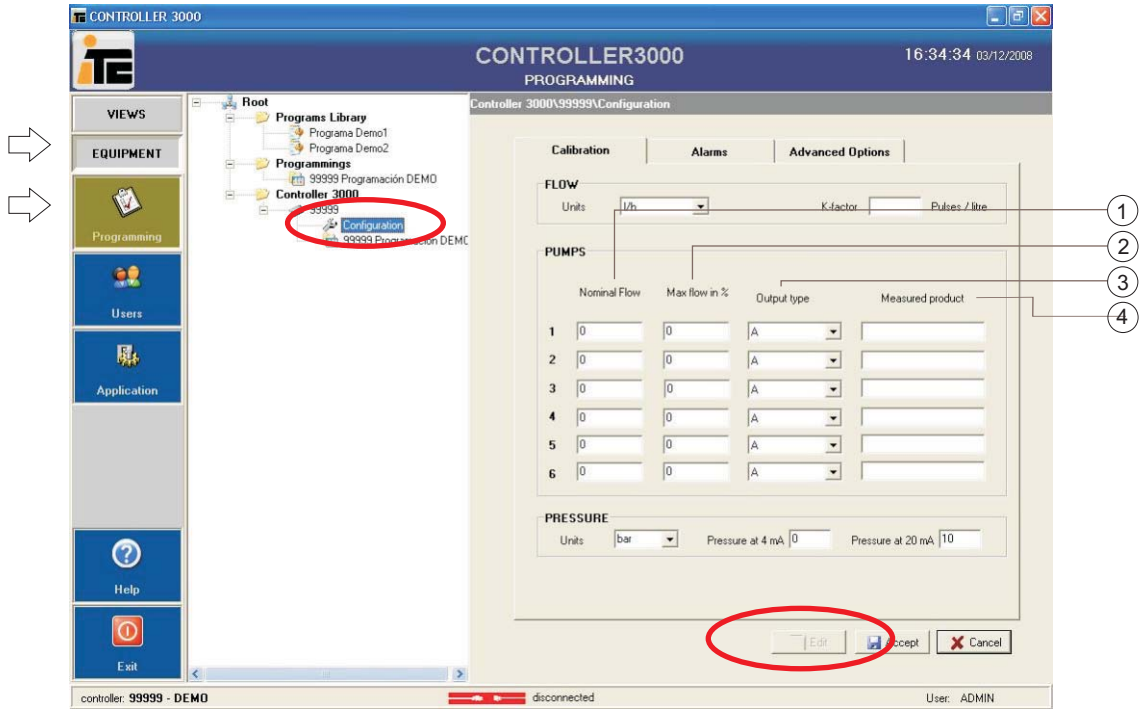
4.4. INDEPENDENT DOSING PUMPS CONFIGURATION.

4.4.1. INDEPENDENT DOSING PUMPS CONFIGURATION (DOSTEC AND DOSITEC).



MENU: EQUIPMENT>Programming

Select configuration of the selected Controller, and press Edit.



① **Rated flow.** Rated flow of the dosing pumps.

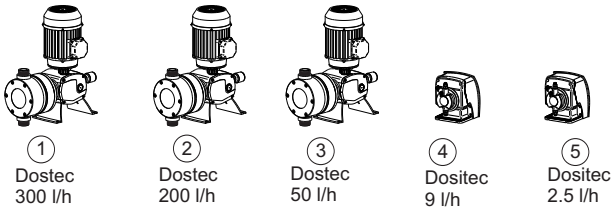
All the indicated values are for pumps regulated to the 100%. Example: Pump of 300 liters/hour with the regulator to 60%, value to put will be 300x60/100=180 liters/hour.
For membrane pumps its Rated flow depends on the working pressure. See graph volume/pressure in their manual.

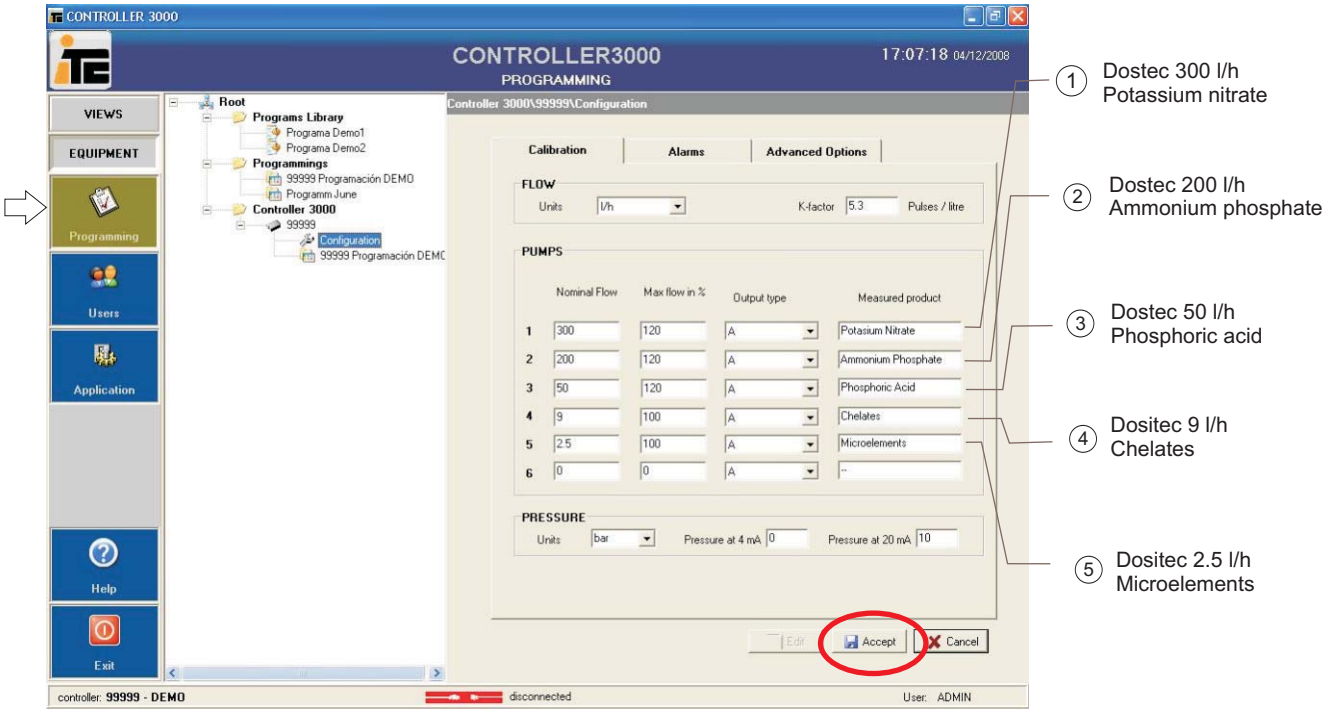
②
Maximum flow in % :
It is the maximum flow to which the pump can work according to the Rated flow, expressed in %.
For pumps with frequency variators with a Rated flow at 50Hz, in case of being able to work to 60 Hz the maximum value is 120 % ((60Hz/50Hz) x100=120 %). For pumps of Rated flow at 60Hz, its maximum flow will be 100 %.
It is possible to limit the flow of a pump to values lower than 100 % (example: 60 %).

③ **Type of output:**
The type of ouput will always be A for independent pumps.

④ **Dosed product:**
Name of the product, it is necessary to be able to generate the reports of dosed products.

Example of configuration:





1 Dostec 300 l/h
Potassium nitrate

2 Dostec 200 l/h
Ammonium phosphate

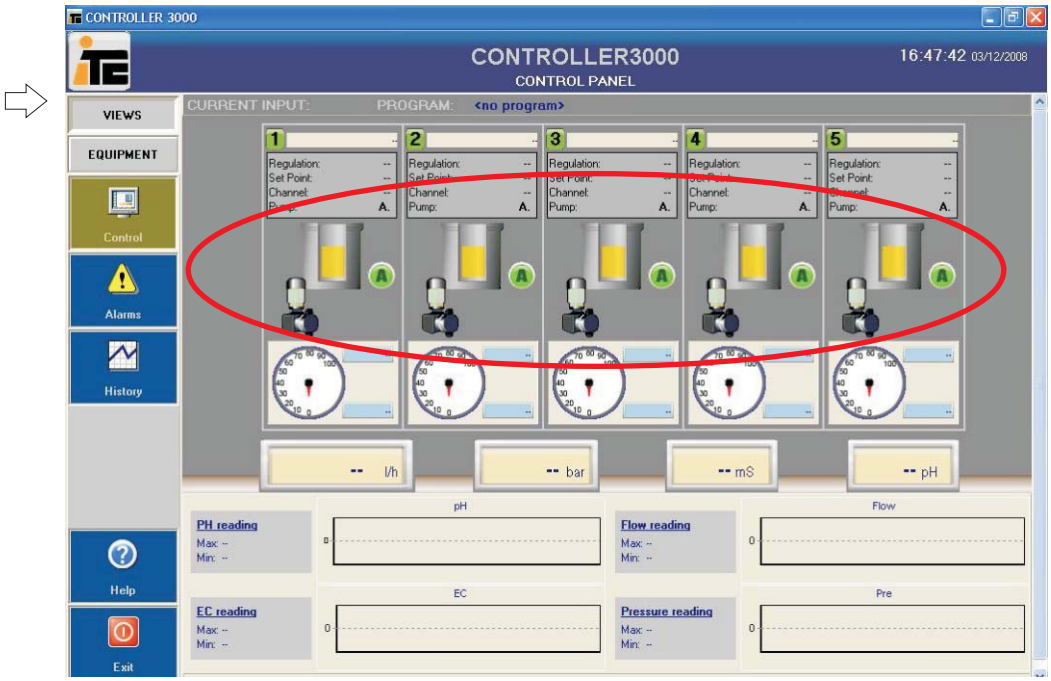
3 Dostec 50 l/h
Phosphoric acid

4 Dositec 9 l/h
Chelates

5 Dositec 2.5 l/h
Microelements

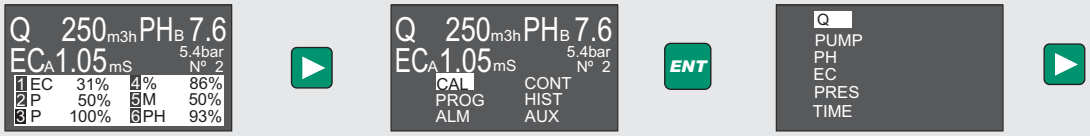
Accept and Save.

MENU: Views.
To view configuration.

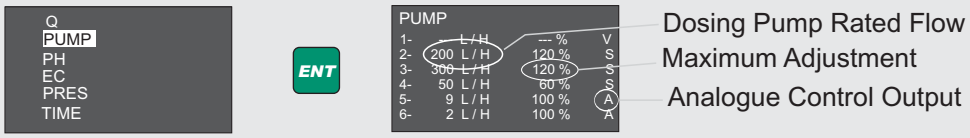


4.4.1.1. CONFIGURATION FROM CONTROLLER 3000.

To Calibrate, set the switch to **STOP**



DOSING PUMPS CONFIGURATION (See Programming Examples)



Change Values by pressing +/-, press <> to scroll on the Menu, and validate the Configuration of the 6 Outputs by pressing ENT.

Rated Flow:
Introduce the Rated Flow of the Metering Pump corresponding to working in 50Hz.
Leave "--" when the Output is V.

Maximum Adjustment:
%<100: Introduce a percentage lower than 100 to limit the 4-20mA Output to a Value lower than 20mA, for example due to an over dimensioned Pump or when an Acid too concentrated is dosified.

%>100: Only for Dosing Pumps with Frequency Variator programmed to work in a Frequency higher than 50Hz. For maximum Frequency of 60 Hz the maximum Adjustment will be 120%.
Leave "--" when the Output is V.

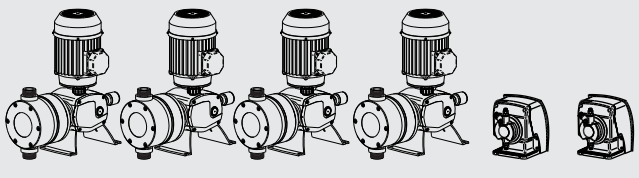
Analogue Control Outputs (See Performance)
A: Analogue independent Output: for Electromagnetic Pumps (Dositec) and Pumps with Electric Motor and Frequency Variator (Dostec).

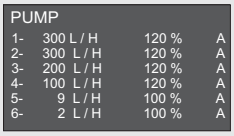
V: Analogue Master Output for a Variator in multihead Pump with Servos: to control the Output that regulates the speed of the Motor of a multihead Pump (MF-Multifertic) provided with Servos for the independent Adjustment of each Head.
Only one V-type Output can be configured, and there should be an Output configured as S.

S: Analogue Output for Servos in multihead Pump, with Adjustment of the Motor by Frequency Variator (V Output)

EXAMPLE OF DOSING PUMPS CONFIGURATION

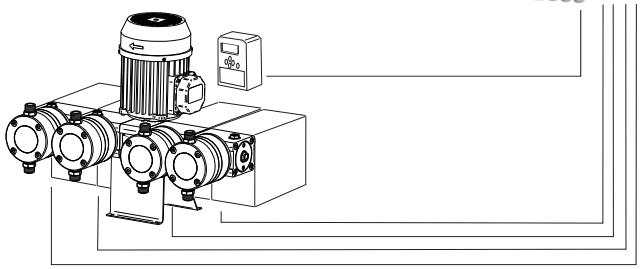
Independent Dosing Pumps. 4 Dostec with Frequency Variator and 2 Dositec.

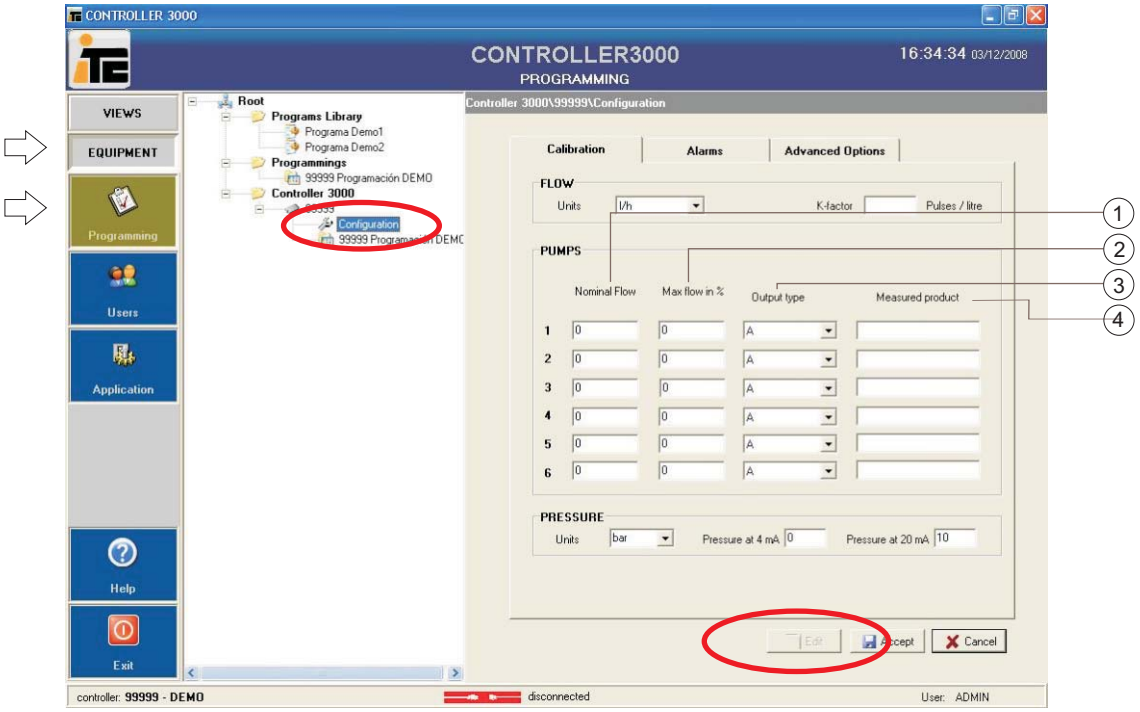




4.4.2. DOSING MODULAR WITH SERVOMOTOR CONFIGURATION (MULTIFERTIC).

MENU:EQUIPMENT> Programming.
Select Configuration inside the selected Controller. Select Edit button. Define every pump of every output of the Controller 3000.





① **Rated flow: Rated flow of the dosing pump.**
Introduce the Rated flow for every output. The frequency regulator does not need any value. Every servo needs the flow of the module in which it is assembled.

② **Maximum flow in %:**
It is the maximum flow to which every module can work with from the Rated flow expressed in %.
For the regulator it is not necessary to introduce any value. For the modules formed with a Rated flow to 50Hz, in case of being able to work to 60 Hz the maximum value is 120 % ((60Hz/50Hz) x100=120 %). For the modules of Rated flow to 60Hz, its maximum flow will be 100 %.
To limit a servomotor, it is enough to limit this value to the required percentage (always lower than 100 %), for example to 80 %. This can happen when a product (for example, acid) is too concentrated, or when a module is oversized.

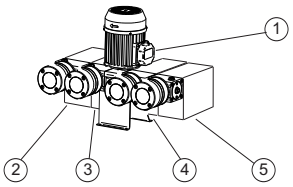
Type of output:
It is V for the frequency regulator of the pump where the servomotors are installed, and S for every servomotor.

③

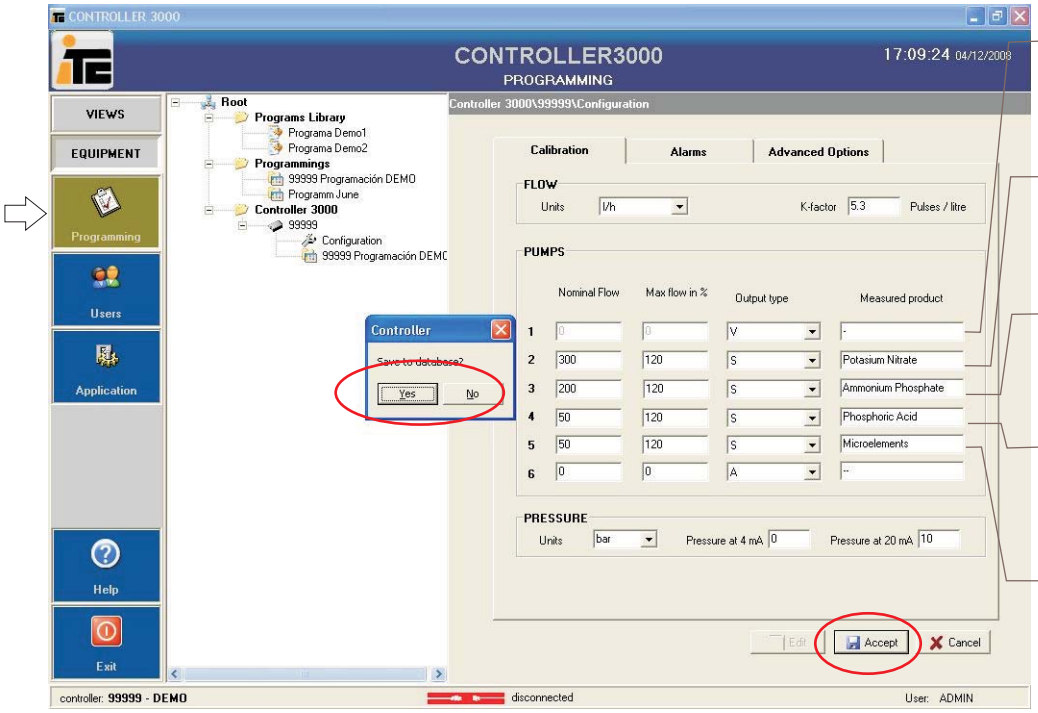
Dosed product:
Name of the product, it is required to be able to generate the reports of dosed products.

④

Example of configuration:



① Inverter
② Servo Module 300l/h
③ Servo Module 200l/h
④ Servo Module 50l/h
⑤ Servo Module 50l/h



① *Inverter, it is allowed only one.*

② *Module of 300 l/h with servomotor. Potassium nitrate.*

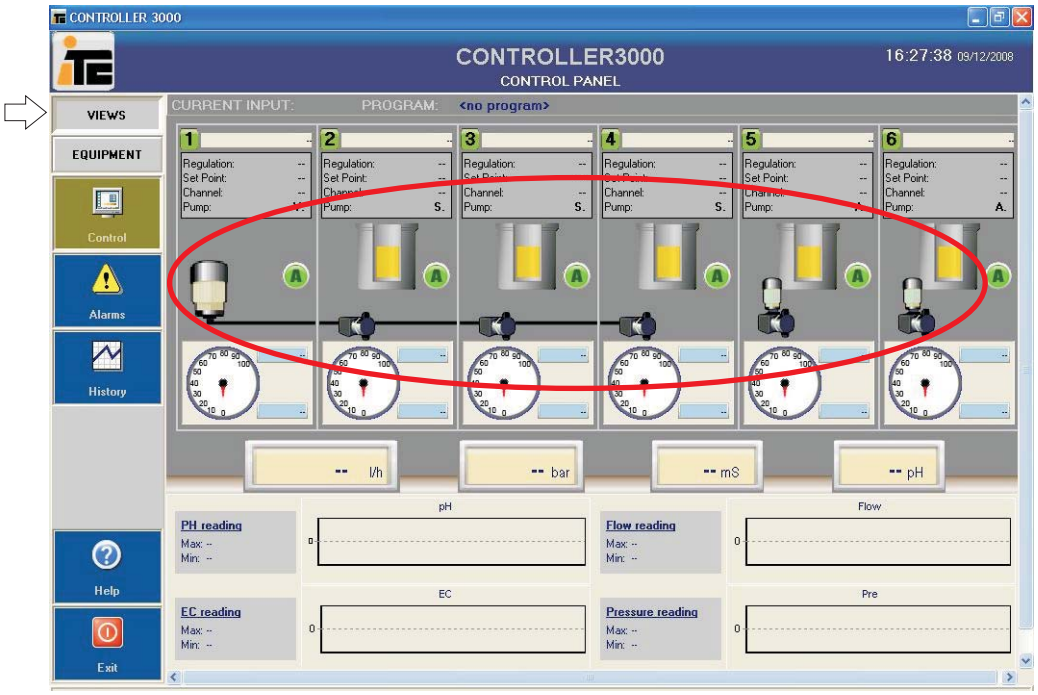
③ *Module of 200 l/h with servomotor Ammonium Phosphate.*

④ *Module of 50 l/h with servomotor Phosphoric acid.*

⑤ *Module of 50 l/h with servomotor Microelements.*

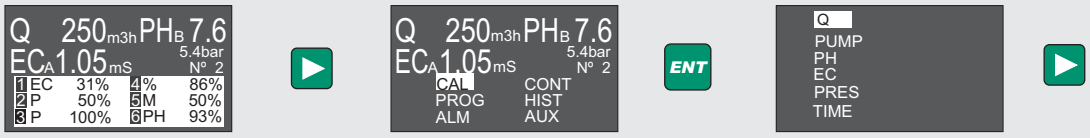
Accept and Save.

MENU: VIEWS.
To see the configuration.

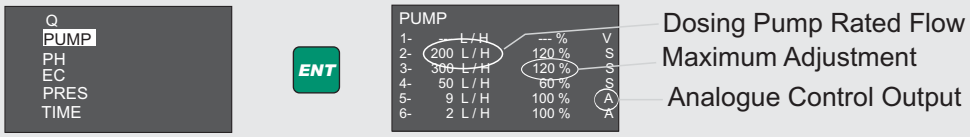


4.4.2.1. CONFIGURATION FROM CONTROLLER 3000.

> To Calibrate, set the switch to **STOP**



DOSING PUMPS CONFIGURATION (See Programming Examples)



Change Values by pressing +/-, press <> to scroll on the Menu, and validate the Configuration of the 6 Outputs by ENT.

Rated Flow:
Introduce the Rated Flow of the Metering Pump to work at 50Hz.
Leave in "--" when the Output is V.

Maximum Adjustment:
%<100: Introduce a percentage lower than 100 to limit the 4-20mA Output to a Value lower than 20mA, for example due to an over dimensioned Pump or when an Acid too concentrated is dosified.

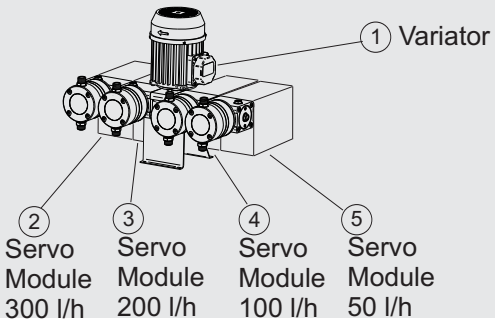
%>100: Only for Dosing Pumps with Frequency Variator programmed to work in a Frequency higher than 50Hz. For maximum Frequency of 60 Hz the maximum Adjustment will be 120%.
Leave in "--" when the Output is V.

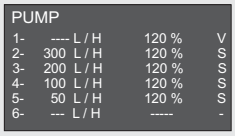
Analogue Control Outputs (See Performance)
A: Analogue independent Output: for Electromagnetic Pumps (Dositec) and Pumps with Electric Motor and Frequency Variator (Dostec).

V: Analogue Master Output for a Variator in multihead Pump with Servos: to control the Output that regulates the speed of the Motor of a multihead Pump (MF-Multifertic) provided with Servos for the independent Adjustment of each Head.
Only one V-type Output can be configured, and there should be two Output configured as S.

EXAMPLE OF DOSING PUMPS CONFIGURATION

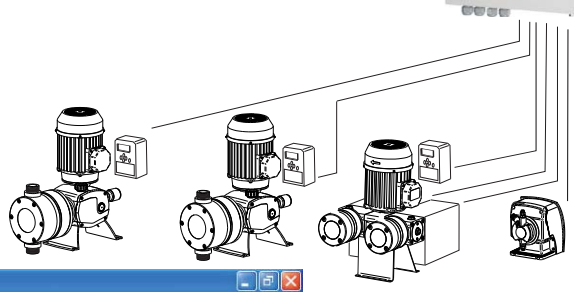
Multifertic Dosing Pump with 4 Modules and one servo in each Module.

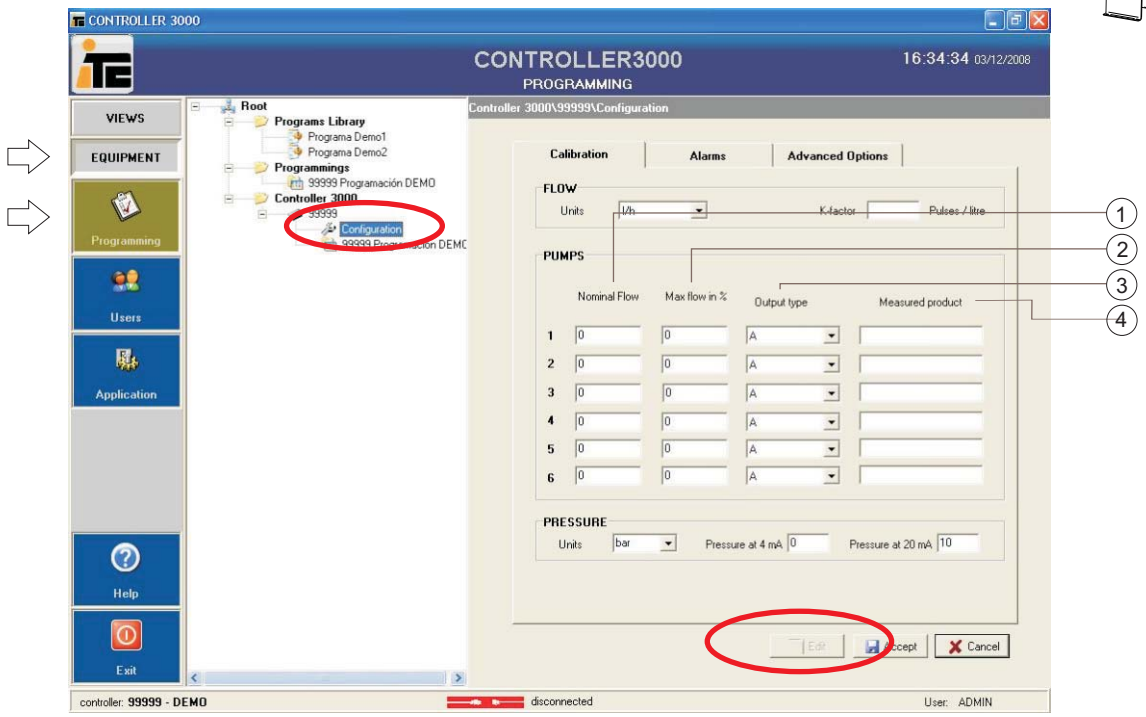




4.4.3. MIXED CONFIGURATION OF INDEPENDENTS AND MODULARS. DOSING PUMPS.

MENU:EQUIPMENT> Programming.
Select Configuration at the selected Controller. Select the button of Editing. Define every pump of every output of the Controller 3000.





① **Rated flow: Rated flow of the dosing pump.**
To introduce the Rated flow for every output.

> All the stated values are for pumps regulated to 100 %. Example:pump of 300 liters / hour with the regulator placed to 60 %, the value to put will be 300x60/100=180 liters / hour.
> For membrane pumps its Rated flow depends on the pressure of work. Check the correct value at the graph flow / pressure at the pump manual.

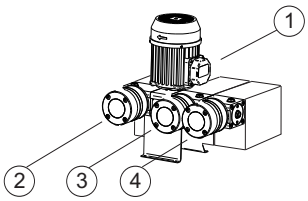
The frequency variator does not need any value. Each servo needs the flow of the module in which it is mounted.

② **Maximum flow in %:**
It is the maximum flow to which every pump/module can work from the Rated flow expressed in %.
The frequency variator of the modular pump does not require any value.
For the pumps with frequency variator and modules with a Rated flow at 50Hz, when working at 60 Hz the value is 120 % ((60Hz/50Hz) x100=120 %). For the pumps and modules of Rated flow at 60Hz, its maximum flow is 100 %.
It is possible to limit the flow of a pump or module to values lower than 100 % (example: 60 %).

③ **Type of output:**
The output will always be A for independent pumps, V for the frequency variator of the pump where the servomotors are installed, and S for each servomotor.

④ **Dosed product:**
Name of the product, it is required to be able to generate the reports of dosed products.

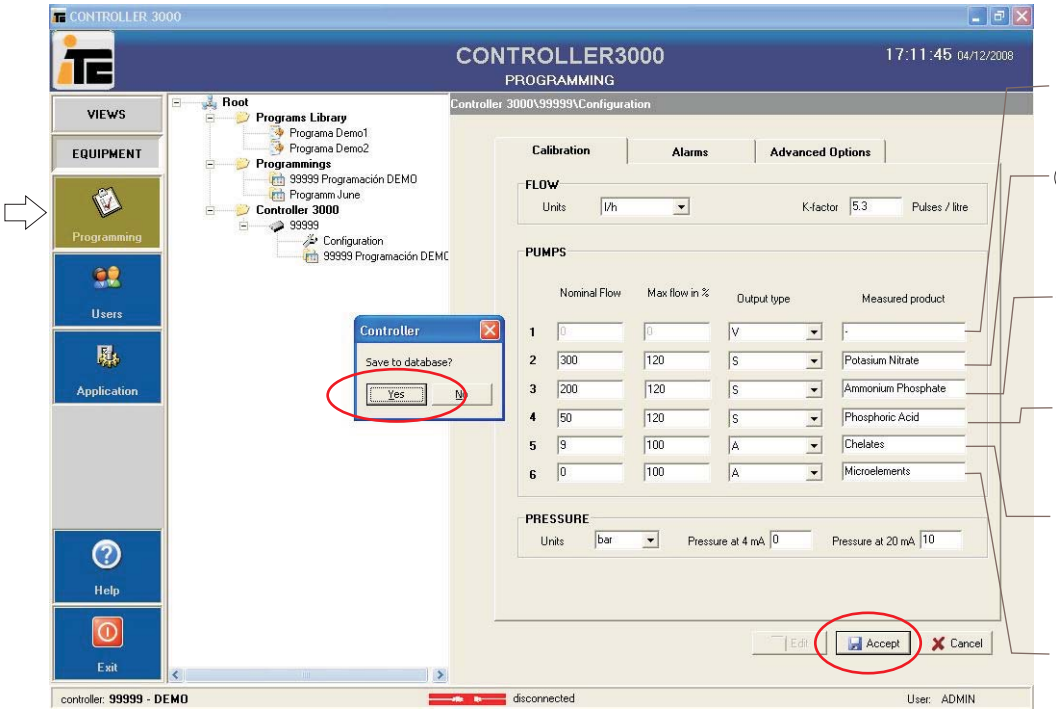
Example of configuration:



5 Dositec 9 l/h

6 Dositec 2.5 l/h

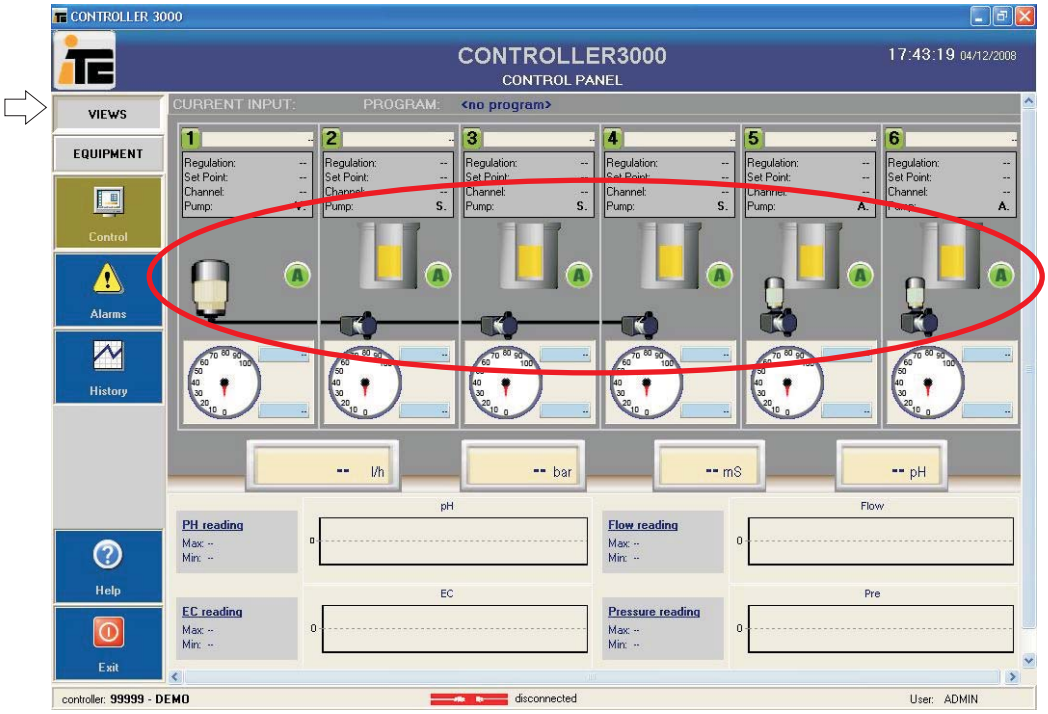
1. Inverter
2. Servo Module 300l/h
3. Servo Module 200l/h
4. Servo Module 50l/h



1. *Inverter, it is only allowed one.*
2. *Module 300 l/h with servomotor Potassium nitrate.*
3. *Module 200 l/h with servomotor Ammonium phosphate.*
4. *Module 50 l/h with servomotor Phosphoric acid.*
5. *Dositec 9l/h Chelates.*
6. *Dositec 2.5l/h Microelements.*

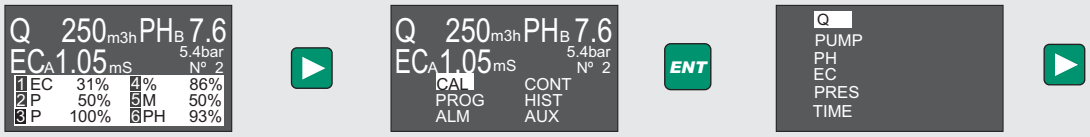
Accept and Save.

MENU: VIEWS.
To see the configuracion.

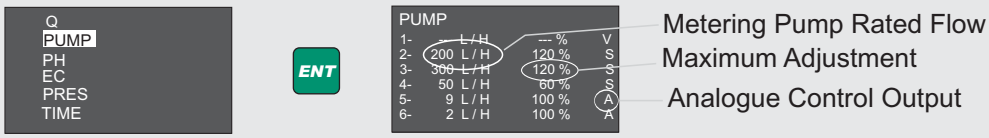


4.4.3.1. CONFIGURATION FROM CONTROLLER 3000.

> To Calibrate, set the switch to **STOP**



DOSING PUMPS CONFIGURATION (See Programming Examples)



Change Values by pressing +/-, press <> to scroll on the Menu, and validate the Configuration of the 6 Outputs by ENT.

Rated Flow:
Introduce the Rated Flow of the Metering Pump corresponding to working in 50Hz.
Leave “--“ when the Output is V.

Maximum Adjustment:
%<100: Introduce a percentage lower than 100 to limit the 4-20mA Output to a Value lower than 20mA, for example due to an oversized Pump or when an Acid too concentrated is dosified.

%>100: Only for Dosing Pumps with Frequency Variator programmed to work in a Frequency higher than 50Hz. For maximum Frequency of 60 Hz the maximum Adjustment will be 120%.
Leave “--“ when the Output is V.

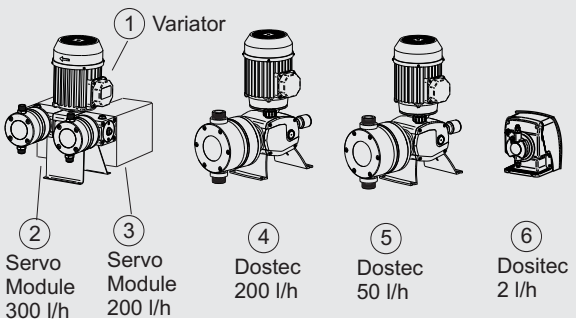
Analogue Control Outputs
A: Analogue independent Output: for Electromagnetic Pumps (Dositec) and Pumps with Electric Motor and Frequency Variator (Dostec).

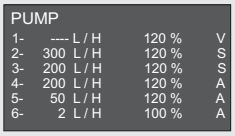
V: Analogue Master Output for a Variator in multihead Pump with Servos: to control the Output that regulates the speed of the Motor of a multihead Pump (MF-Multifertic), with Servos for the independent Adjustment of each module. Only one V-type Output can be configured, and there should be some Outputs configured as S.

S: Analogue Output for Servos in multihead Pump, with Adjustment of the Motor by Frequency Variator (V Output)

EXAMPLE OF DOSING PUMPS CONFIGURATION

Multifertic Dosing Pump with 2 Modules and one Servo in each Module, two Dostec and one Dositec.



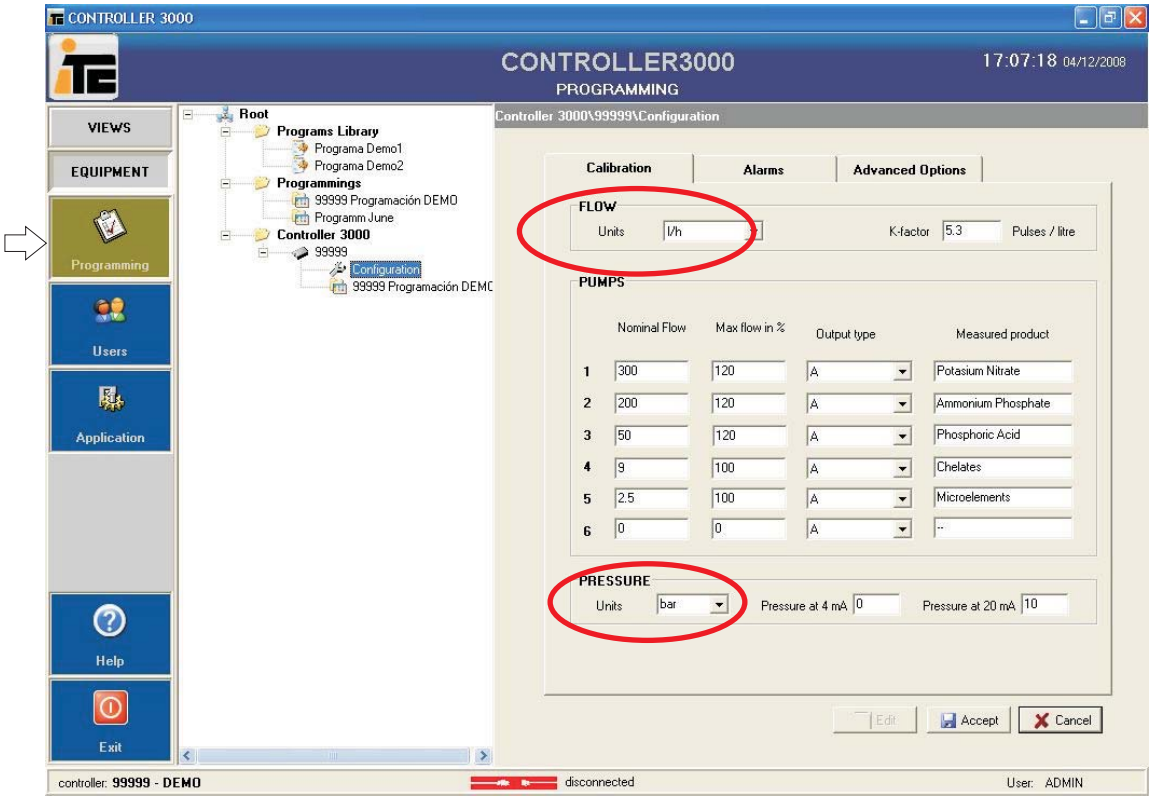


4.5. CALIBRATION AND UNITS SELECTION .

4.5.1. PRESSURE SELECTION AND FLOW MEASURE UNITS.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Edit the values selecting Edit button.

At FLOW, select l/h (liters per hour), or g/h (gallons per hour).
At PRESSURE, select bar, or psi.



Accept and Save.

4.5.1.2. CONFIGURATION FROM CONTROLLER 3000.

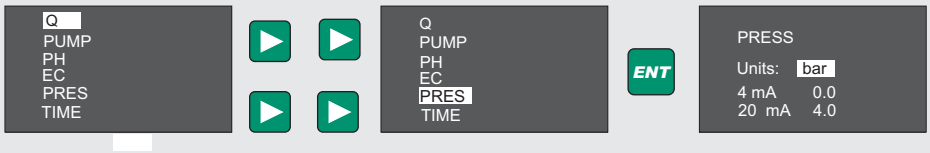
> To Calibrate, set the switch to **STOP**

FLOW METER CALIBRATION

Change Units by pressing +/- and validate by ENT:
m3h: Water Flow in m3/h
Dosage Flow in l/h

gal: Water Flow in GPM
Dosage Flow in GPH

PRESSURE TRANSMITTER CALIBRATION

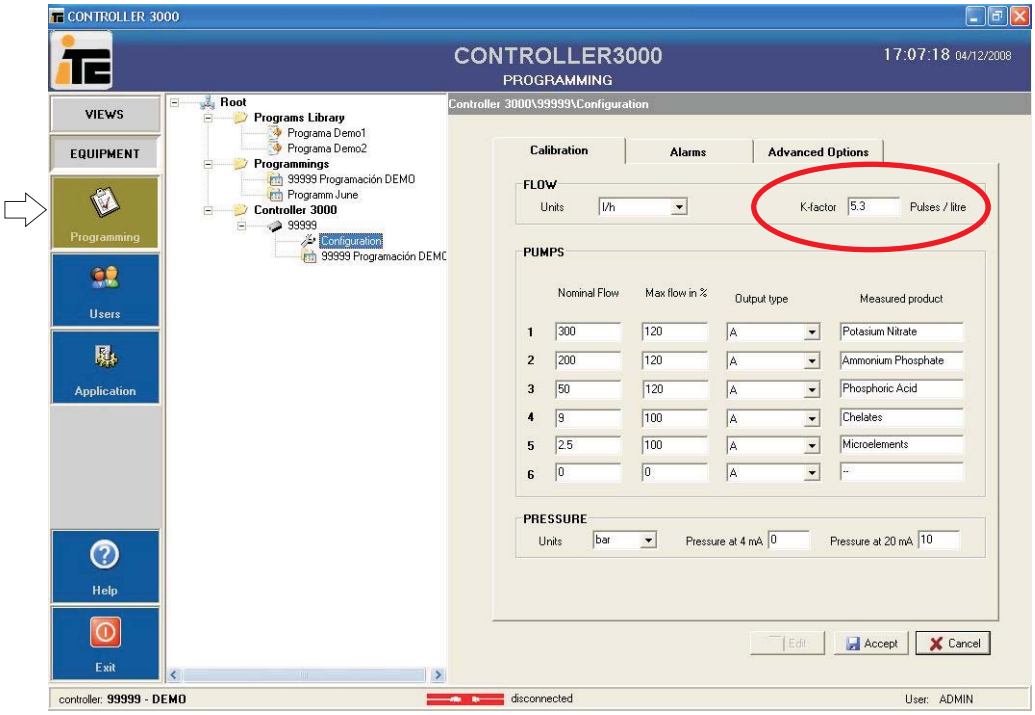


Change Units by pressing +/-. Press > to scroll on the Menu and introduce the Pressure corresponding to 4mA and 20mA. Validate values pressing ENT.

4.5.2. FLOWMETER CALIBRATION.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Edit the values selecting Edit button.

At FLOW, introduce the K-factor. How to find the K-factor:
Use the external diameter of the tubes, the type of unit used (l/h, or gallons/h), and look for the value in the technical sheet of the flowmeter. As an example we have the typical values for two types of flowmeters. For other flowmeter consult with the manufacturer.



Flowmeter Burkert 8020

Diametre(Inches)	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8	10	12	16
Diametre (mm)	32	40	50	63	75	90	110	125	160	200	250	315	400
K-factor (pulse/liter)	57	30	18.6	15.6	12.3	7.6	5.3	4.0	2.0	1.4	0.8	0.4	0.2
K-factor (pulse/gallon)	214	113	71.5	59	47	29	20	15.1	7.7	5.2	3.0	1.6	0.9

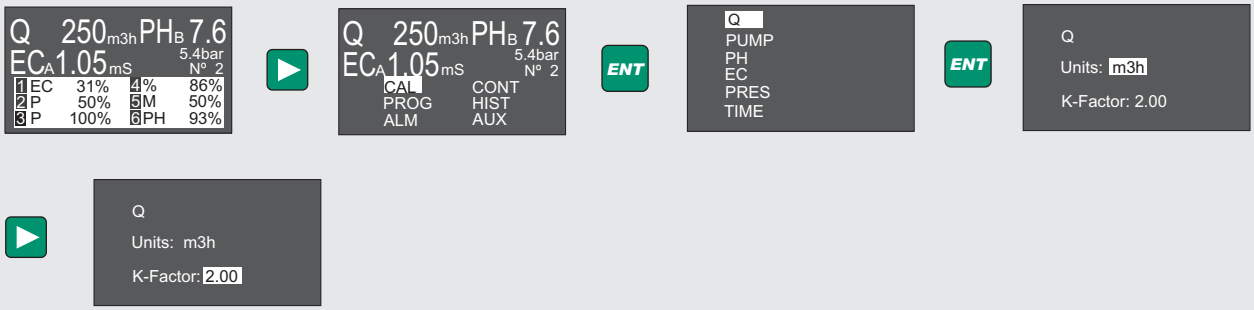
Flowmeter GF 2536

Diametre(Inches)	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8	10	12	16
Diametre (mm)	32	40	50	63	75	90	110	125	160	200	250	315	400
K-factor (pulse/litre)	78.5	45	27.4	15.7	9.2	6.6	4.3	3.6	2.2	1.3	0.74	0.52	0.27
K-factor (pulse/gallon)	297	170	104	59.5	35	25	16.3	13.6	8.2	4.8	2.8	2.0	1

4.5.2.1. CONFIGURATION FROM CONTROLLER 3000.

To Calibrate, set the switch to **STOP**

CALIBRATION OF THE FLOWMETER

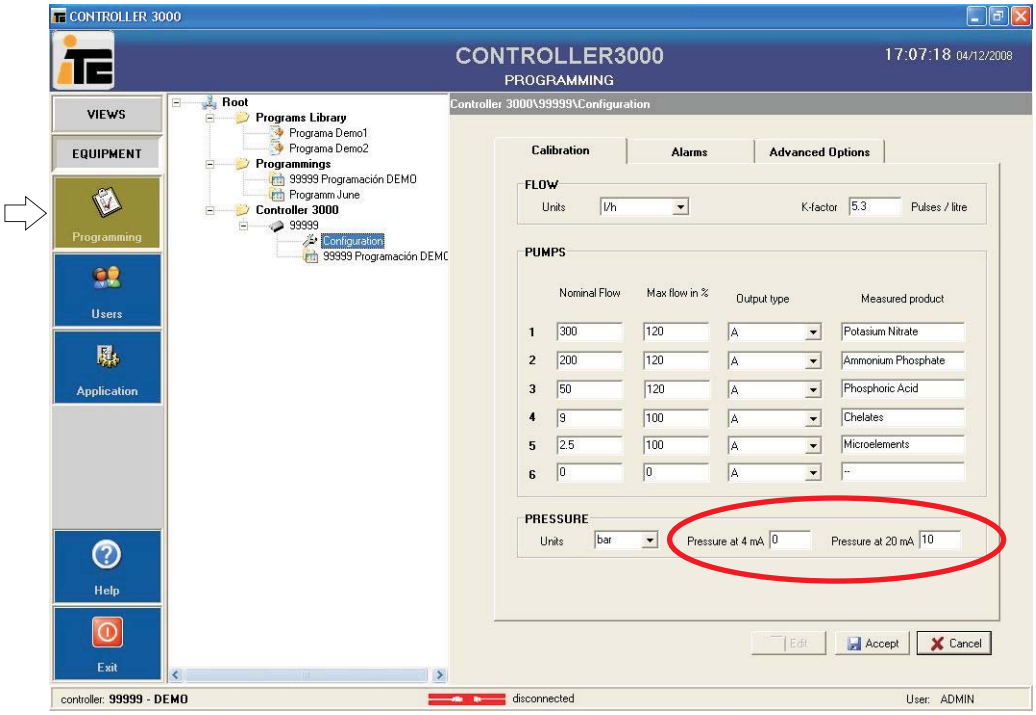


K-Factor (pulses/litre or pulses/gallon):
Please refer to Manual Instructions of Flow Meter in accordance with the type and size of the pipes where it is installed.
Change Value by pressing +/- and validate by ENT

4.5.3. CALIBRATION OF THE PRESSURE TRANSMITTER.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Edit the values selecting Edit button.
In PRESSURE configure the values of 4mA and 20mA in accordance to the installed transmitter of pressure.

Example: A typical value is from 0 to 10 Bar, from what in this case it will be assigned to 4mA the lower value (0 bar), and to 20mA the higher value (10 bar).

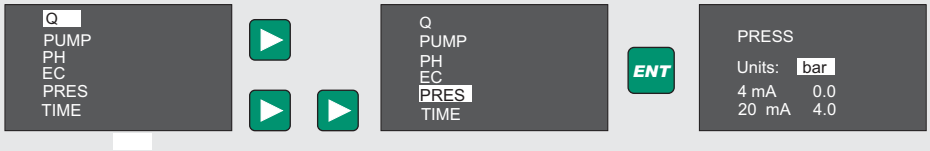


Accept and Save.

4.5.3.1. CONFIGURATION FROM CONTROLLER 3000.

To Calibrate, set the switch to **STOP**

PRESSURE TRANSMITTER CALIBRATION



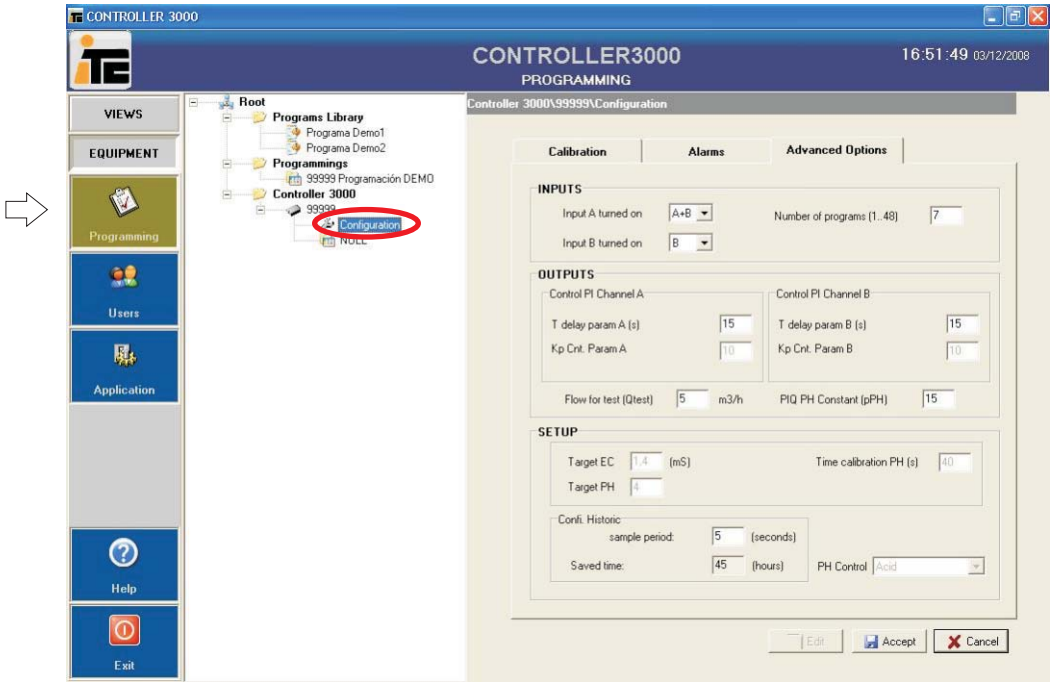
Change Units by pressing +/-. Press > to scroll on the Menu and introduce the Pressure corresponding to 4mA and 20mA.

Validate all the Information by pressing ENT.

4.5.4. pH SENSOR CALIBRATION

MENU:EQUIPMENT> Programming.
Select the wished Configuration of the Controller 3000 .
Edit the values selecting Edit button.

Select Advanced Options, to view current values. To change some value, this change must be done directly at the equipment. Once done, it is possible to read the configuration as paragraphs 6.4.2 (USB2), or 6.4.7., and 6.4.8. (USB1, pendrive).



4.5.4.1. BUFFER SOLUTION SELECTION.

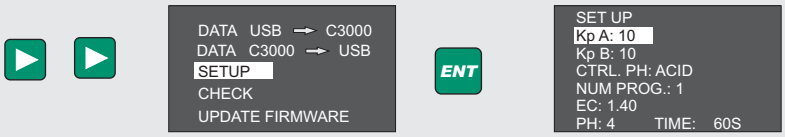
In SETUP there is the value of the buffer by default its pH 4. The estimated time that the equipment needs to stabilize the reading of the value of the buffer is 60 seconds. It is recommended not to turn down this value, since the calibration of the pH sensor is basic for the control of the water pH.

4.5.4.2. SELECTION OF THE TYPE OF DOSAGE, ACID OR BASE.

In SETUP there is the type of dosage at Control pH. If the product to dose is an acid the program must show acid, on the other hand if a base is used, the program must show base.

4.5.4.3. CONFIGURATION FROM CONTROLLER 3000.

INITIAL CONFIGURATION



Change Units by pressing +/- and validate by pressing ENT.

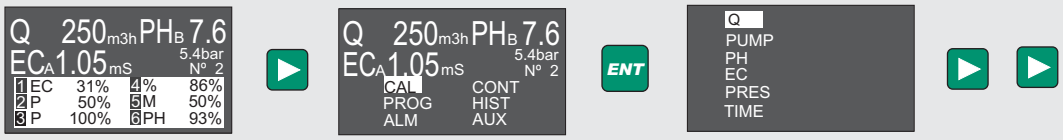
CTRL. PH: ACID/ALKALINE: defines if the pH Control is executed by adding Acid (ACID) or Base (ALKALINE)

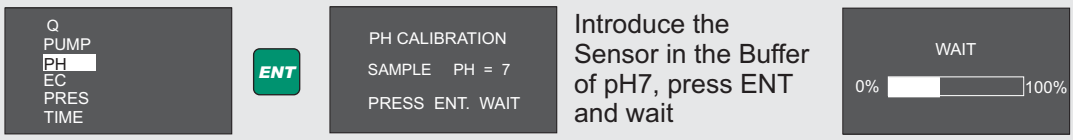
PH: 4 Time 60s: defines the pH Buffer and the Stabilization Time for the Sensor Calibration.

4.5.4.4. PH SENSOR CALIBRATION .

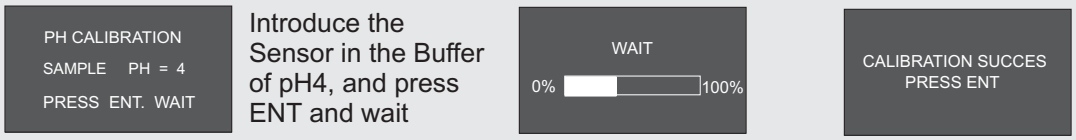
Must be done at the equipment site.

> To Calibrate, set the switch to **STOP**





Introduce the Sensor in the Buffer of pH7, press ENT and wait



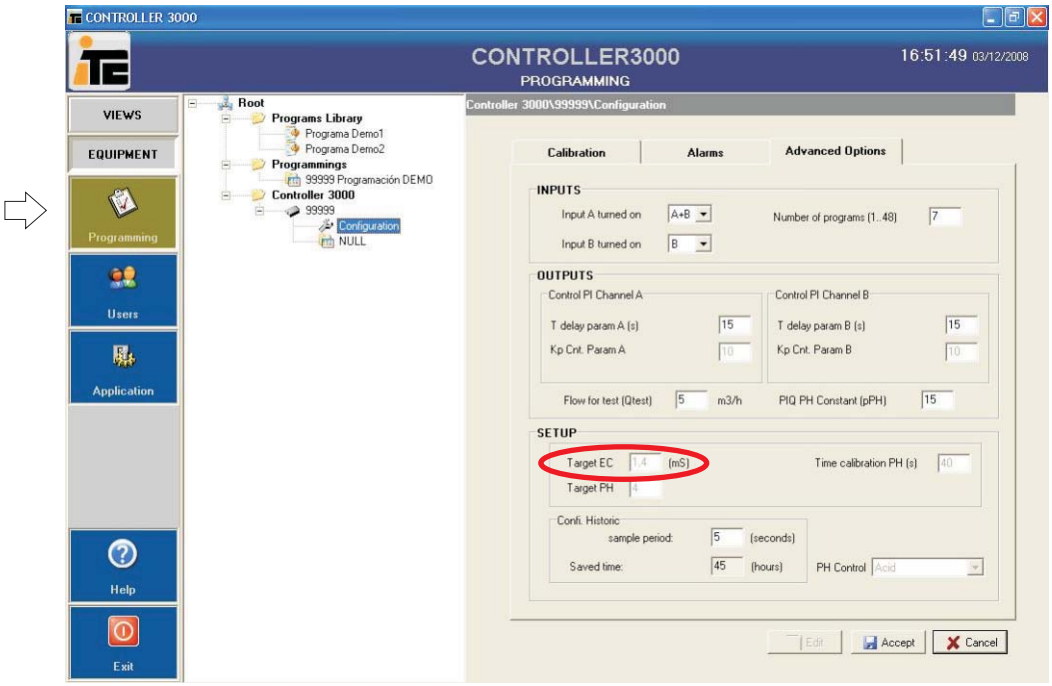
Introduce the Sensor in the Buffer of pH4, and press ENT and wait

Validate the pH Calibration by pressing ENTER.

4.5.5. CONDUCTIVITY SENSOR CALIBRATION.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Edit the values selecting Edit button.

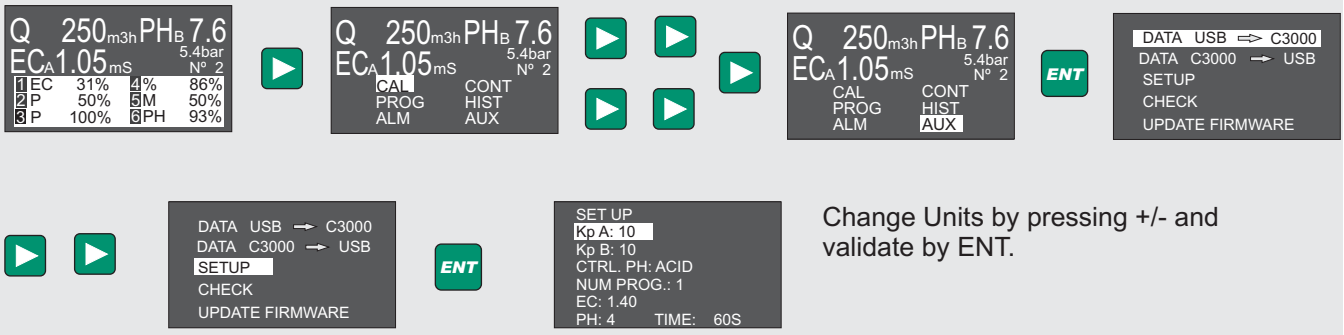
Select Advanced Options, to see current values. To change some value, this change must be done in the equipment directly. Once done, it is possible to read the configuration at sections 6.4.2 (USB2), or 6.4.7., and 6.4.8 (USB1, pendrive).



4.5.5.1. STANDARD SOLUTION SELECTION.

In SETUP there is the value of the buffer solution, default value is 1.4mS.

Selection of the buffer solution from the equipment.



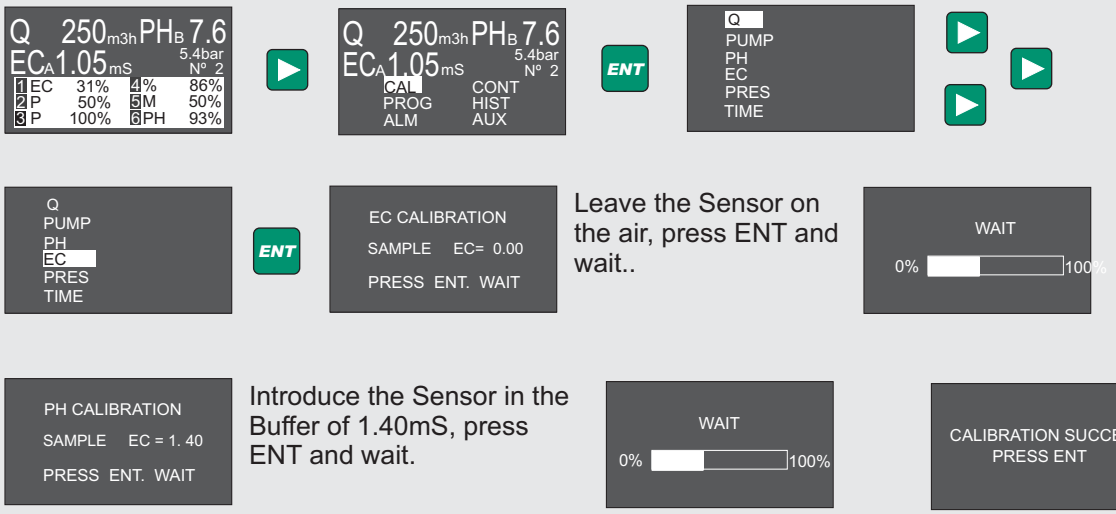
Change Units by pressing +/- and validate by ENT.

EC: 1.40: sets the EC Buffer for the EC Sensor Calibration.

4.5.5.2. EC SENSOR CALIBRATION.

Must be done at the equipment site.

> To Calibrate, set the switch to **STOP**



Leave the Sensor on the air, press ENT and wait..

Introduce the Sensor in the Buffer of 1.40mS, press ENT and wait.

Validate the EC Calibration by pressing ENTER.

4.6. ALARMS

4.6.1. pH ALARM.

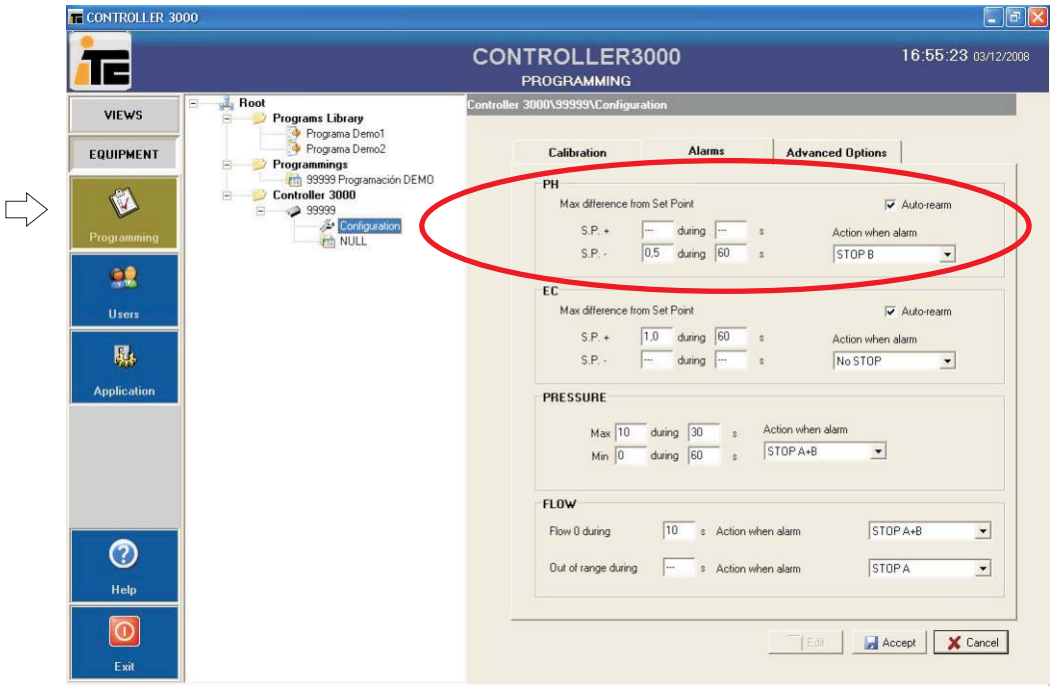
MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Select Alarms.
Edit the values selecting Edit button.

pH options:
Maximum differentials from Set Point**:** SP+ is the maximum value to add to the Set Point, once overcome for the time assigned (in seconds) activates the alarm**.**
SP - is the maximum value to substract to the Set Point, once overcome for the time assigned (in seconds) activates the alarm.

Values for alarm time between 10 and 99 seconds.

Example: pH Set Point = 6.5
SP+ = 1 for 10 seconds.
SP - = 0.5 for 10 seconds.

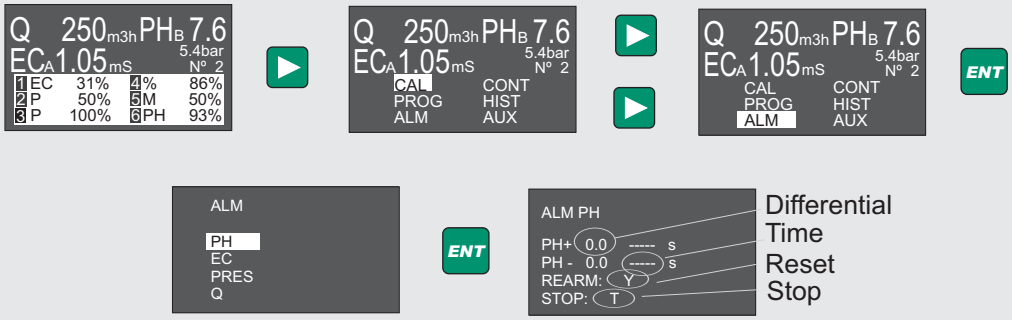
The alarm is activated when for 10 seconds the pH value is higher than 6.5 + 1=7.5, or when it goes lower than 6.5-0.5=6.
Auto-rearm: It allows the equipment to start controlling once the working conditions have recovered.
Action when there is an alarm: STOP A, stops pumps activated by channel A
STOP B, stops pumps activated by channel B.
STOP A+B, stops all pumps.
NO STOP, do not stop pumps.



Accept and Save.

4.6.1.1. CONFIGURATION FROM CONTROLLER 3000.

PH ALARM



Change Units by pressing +/- and validate with ENT:

Differential: Value to add/ subtract from the Set Point, from which the Alarm is activated
Time: Time required for activating the Alarm
Reset: automatic Reset of the Alarm when the Reading returns to correct Values.

- Y: Reset activated
- N: There is no Reset. Press ESC to deactivate the Alarm
- STOP: in case of Alarm it stops the Control of:
  - T: Everything
  - A: Pumps in Channel A
  - B: Pumps in Channel B
  - N: Nothing

4.6.2. CONDUCTIVITY ALARM.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Select Alarms.
Edit the values selecting Edit button.

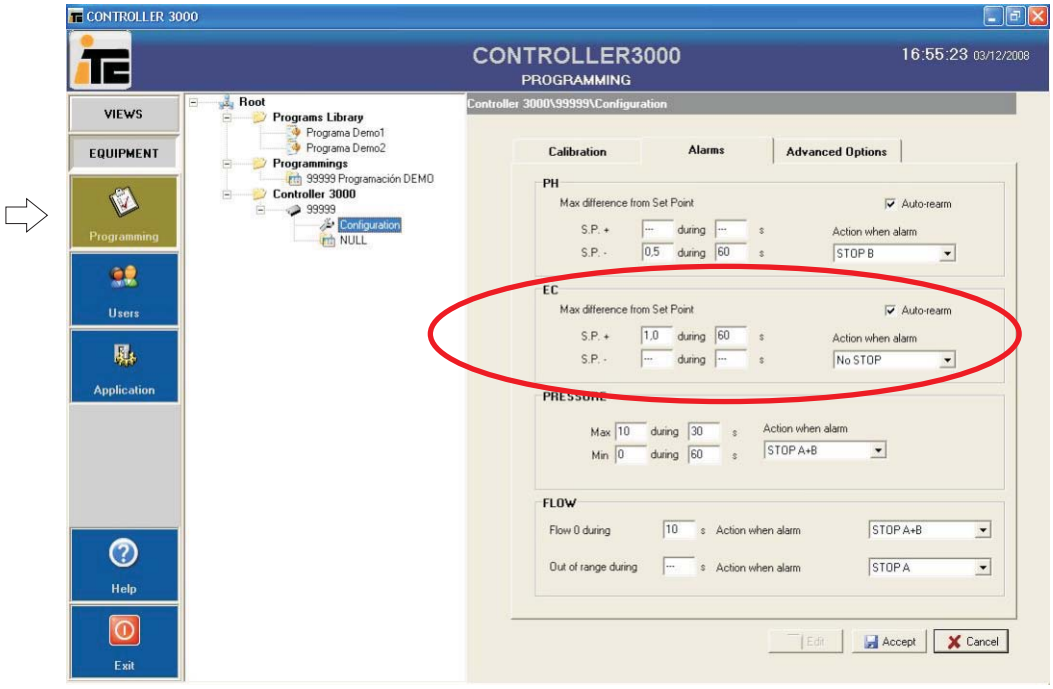
EC options:
Maximum differentials from Set Point**:** SP+ is the maximum value to add to the Set Point, once overcome for the time assigned (in seconds) activates the alarm**.**
SP - is the maximum value to substract to the Set Point, once overcome for the time assigned (in seconds) activates the alarm.

Values for alarm time between 10 and 99 seconds.

Example:
EC Set Point =2
SP+ =0.5 for 10 seconds.
SP-=0.5 for 10 seconds.

The alarm will activate when for 10 seconds the EC is higher than 2+ 0.5=2.5, and when for 10 seconds readings go lower than 2-0.5=1.5.

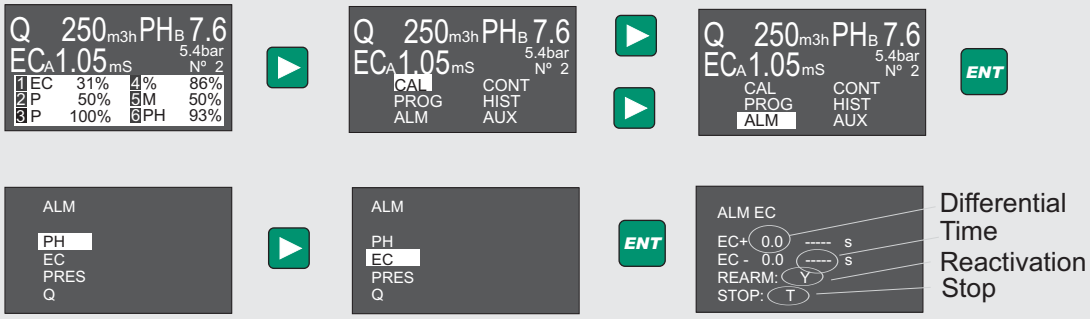
Auto-rearm: It allows the equipment to start controlling once the working conditions have recovered.
Action when there is an alarm: STOP A, stops pumps activated by channel A
STOP B, stops pumps activated by channel B.
STOP A+B, stops all pumps.
NO STOP, do not stop pumps.



Accept and Save.

4.6.2.1. CONFIGURATION FROM CONTROLLER 3000.

EC ALARM



Change Units by pressing +/- and validate by ENT.

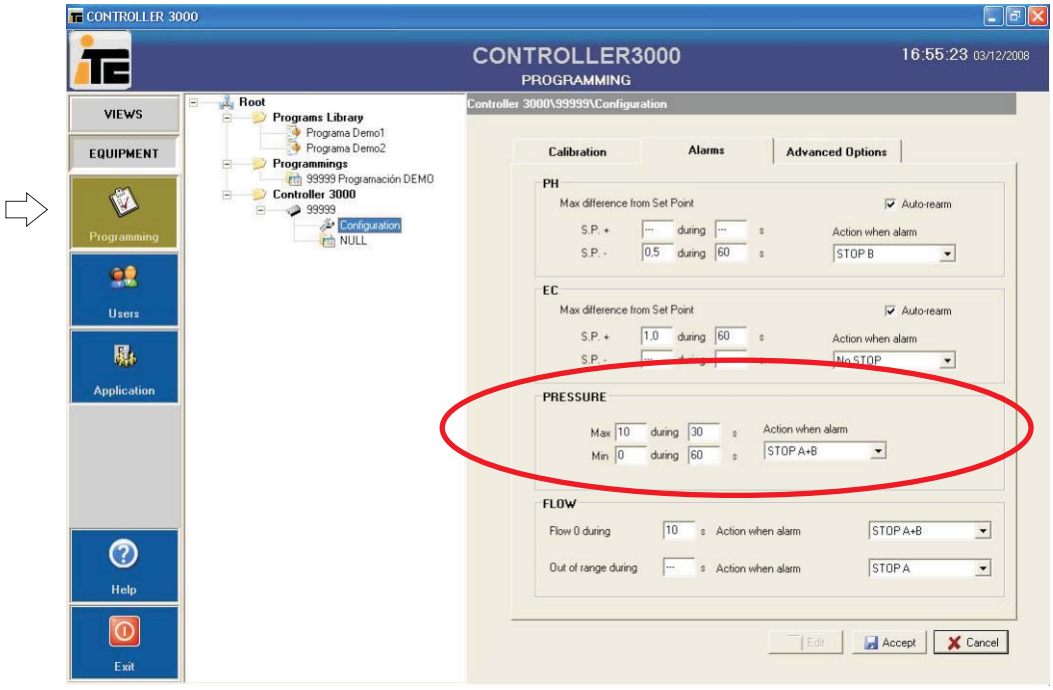
Differential: Value to add/ subtract from the Set Point, from which the Alarm is activated
Time: Time required for activating the Alarm
Reset: automatic Reset of the Alarm when the Reading returns to correct Values.
- Y: Reset activated
- N: There is no Reset. Press ESC to deactivate the Alarm
- STOP: in case of Alarm it stops the Control of:
  - T: Everything
  - A: Pumps in Channel A
  - B: Pumps in Channel B
  - N: Nothing

4.6.3. PRESSURE ALARM.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Select Alarms.
Edit the values selecting Edit button.

Options of PRESSURE:
MAX.: It is the maximum admitted pressure and the time to activate the pressure alarm, if pressure is over this value. Time from 10 to 99 seconds.
MIN.: It is the minimum admitted pressure and the time to activate the pressure alarm, if pressure value is lower this value. To activate the alarm when 0, it allows to stop the equipment in case of the pipe breaks. Time from 10 to 99 seconds.

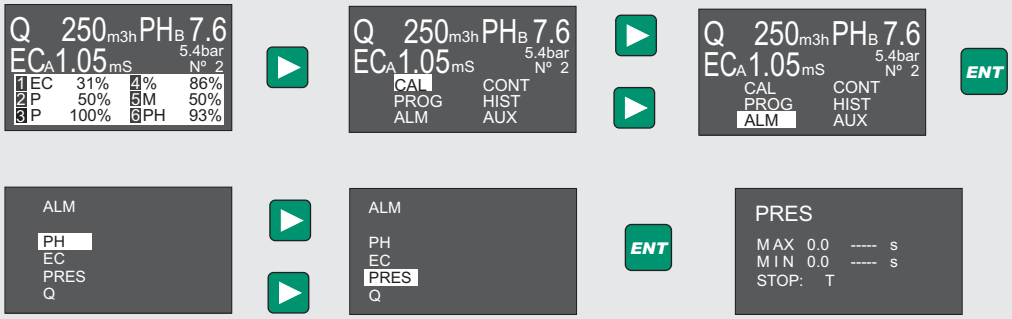
Action when there is an alarm: STOP A, stops pumps activated by channel A
STOP B, stops pumps activated by channel B.
STOP A+B, stops all pumps.
NO STOP, do not stop pumps.



Accept and Save.

4.6.3.1. CONFIGURATION FROM CONTROLLER 3000.

PRESSURE ALARM



Change Units by pressing +/- and validate by ENT:
MAX: Maximum Pressure
MIN: Minimum Pressure
Time: Time required for activating the Alarm
STOP: in case of Alarm stops:
T: Everything
N: Nothing

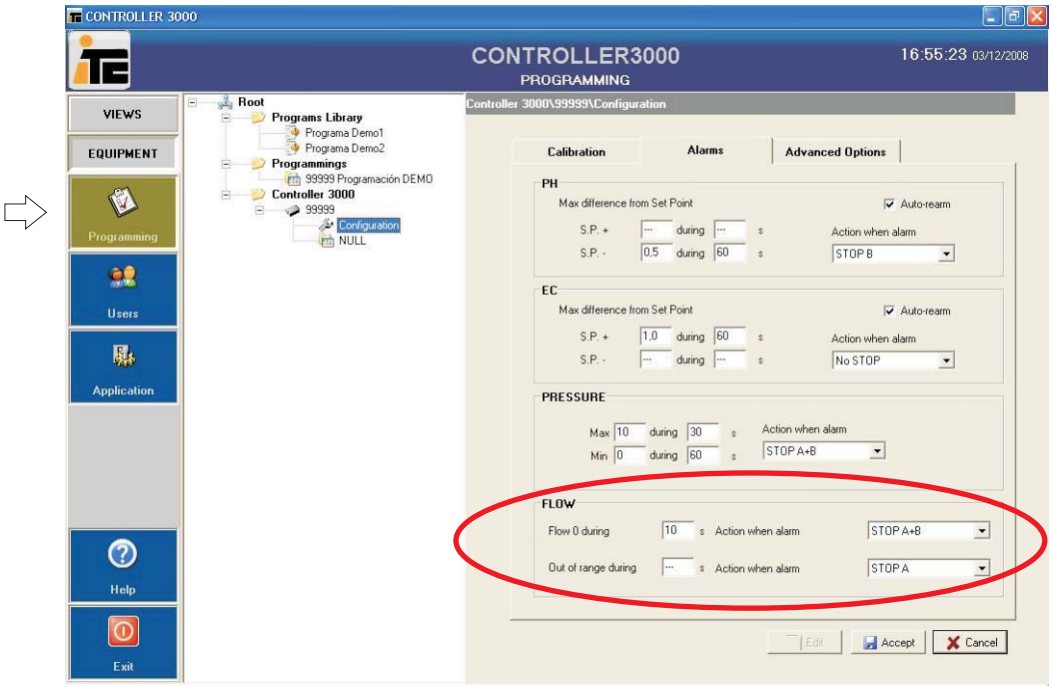
4.6.4. FLOW ALARM.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Select Alarms.
Edit the values selecting Edit button.

FLOW options:
Flow zero for "x" seconds: It is the time that the equipment still work from the moment it detects that there is no flow. Time from 10 to 99 seconds.
When there is an alarm: It allows to decide if it should stop some pumps (pumps activated by channel A, pumps activated by channel B), all (pumps activated by channel A or by channel B), or none (Stop).
Out of status for "x" seconds: This alarm is used when becouse of the dimension of the pumps, it could not inject product in the required proportion, both for excess and for shortcoming. Time from 10 to 99 seconds.

Example 1: Maximum capacity of injection 50l/h, real requirement 75l/h.
Example 2: Minimal capacity 15 l/h, real requirement 10l/h.

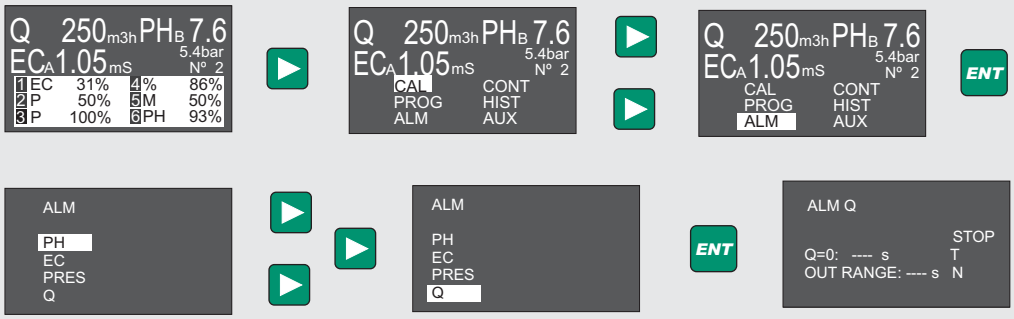
Action when there is an alarm: STOP A, stops pumps activated by channel A
STOP B, stops pumps activated by channel B .
STOP A+B, stops all pumps .
NO STOP, do not stop pumps.



Accept and Save.

4.6.4.1. CONFIGURATION FROM CONTROLLER 3000.

FLOW ALARM



Change Units by pressing +/- and validate by ENT.

Q=0: Alarm when there is no Flow and the Control is activated.
OUT RANGE: Alarm of Dosing Flow out of the capacity of the Pump.
Time: time required for activating the Alarm
STOP: in case of Alarm stops:
T: Everything
A: Pumps in Channel A
B: Pumps in Channel B
N: Nothing

4.7. ADVANCED CONTROL OPTIONS.

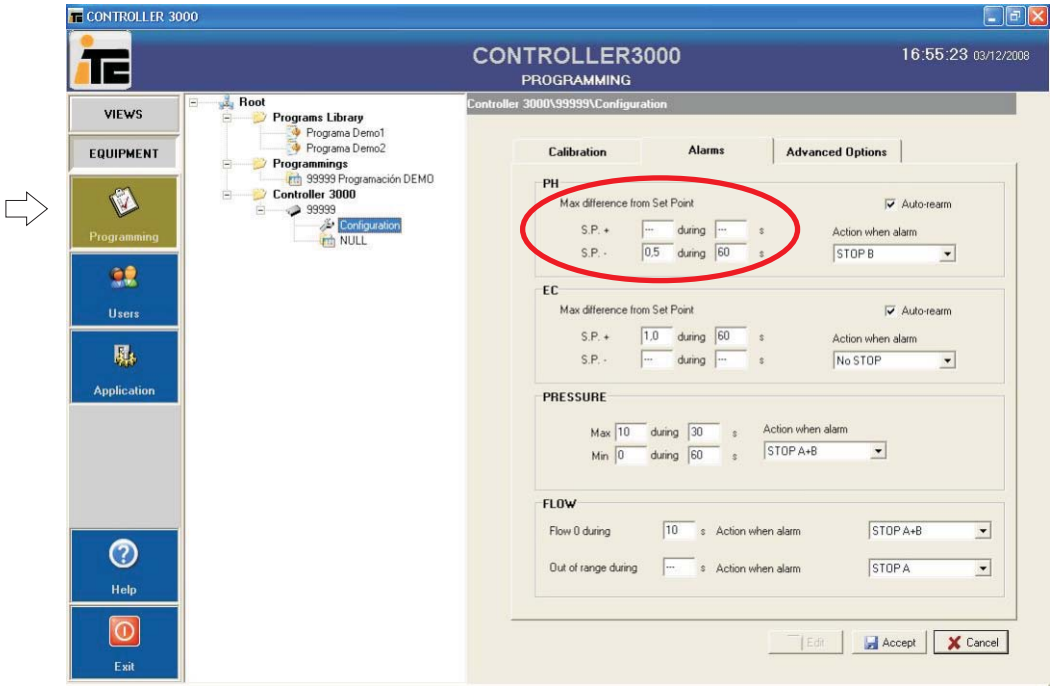
4.7.1. REMOTE CONTROL: CONFIGURATION CHANNELS A/B.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Select Alarms.
Edit the values selecting Edit button.

Select Advanced Options. Options of INPUTS:

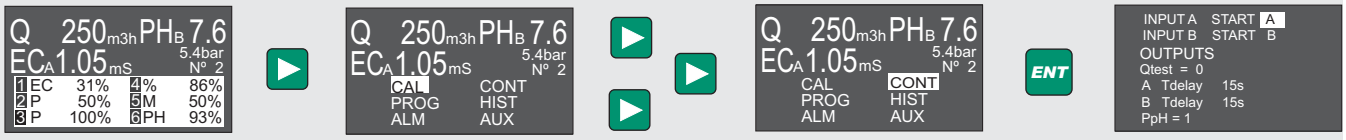
Input A, active: A. Activates pumps programmed A when 24Vac are used at the terminals of channel A.
A+B. Activates pumps programmed A or B when 24Vac are used at the terminals of channel A.

Entrance B, active: B. Activates pumps programmed B when 24Vac are used at the terminals of channel B.
A+B. Activates pumps programmed A or B when 24Vac are used at the terminals of channel B.



4.7.1.1. CONFIGURATION FROM CONTROLLER 3000.

Configuration from channels A and B.



Change Units by pressing +/- and validate by ENT.

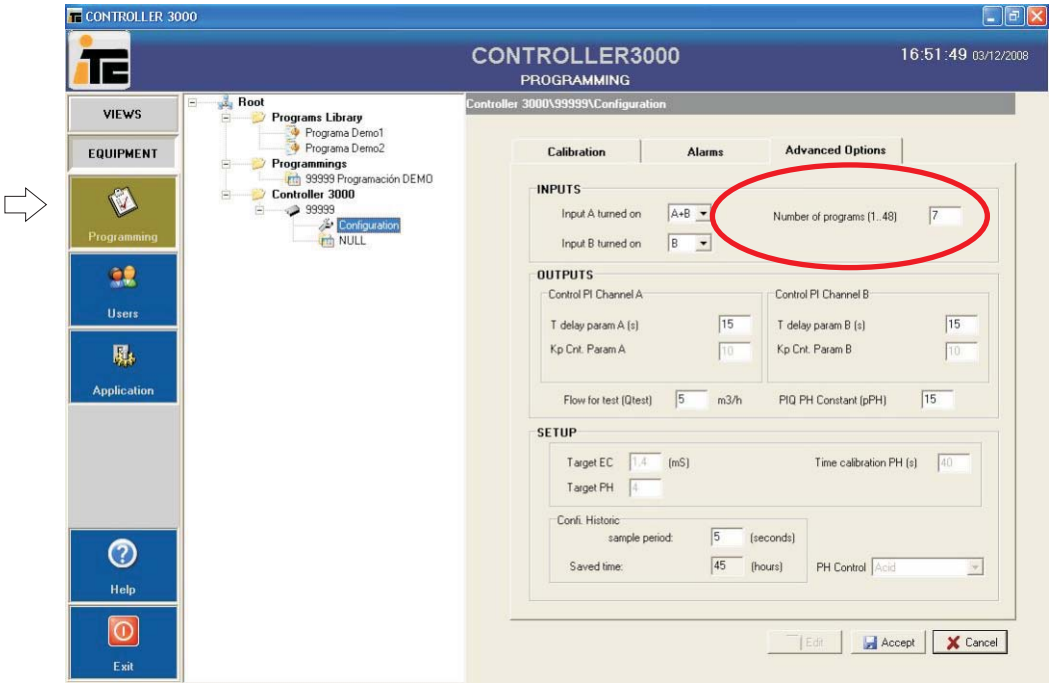
INPUTS: Configuration of the Remote Control Inputs in Channels A and B. It allows configuring each Input with its Channel, and activating both Channels just by one Input.
A START A/A+B: Input A activates Channel A (A) or Channels A and B (A+B)
B START B/A+B: Input B activates Channel B (B) or Channels A and B (A+B)

4.7.2. CONFIGURATION OF THE NUMBER OF PROGRAMS.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Edit the values selecting Edit button.

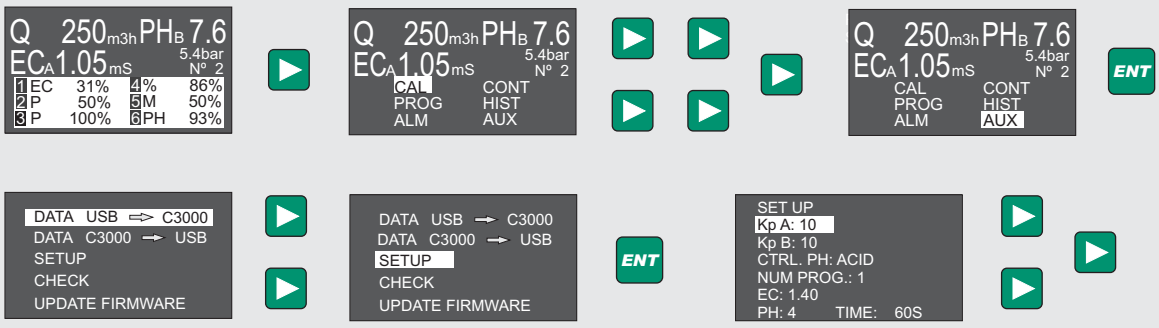
Select Advanced Options. In INPUTS there is the option:
Number of programs: According to the installed equipment it is possible to have 1, 12, 24, 36, or 48 programs. It is necessary to indicate the number of programs to use, which will be lower or equal to the available programs in the equipment.

Exemple: Controller has 12 programs, and just 5 programs are required. Number of programs will be from 5 to 12.



4.7.2.1. CONFIGURATION FROM CONTROLLER 3000.

Configuration of the number of programs.

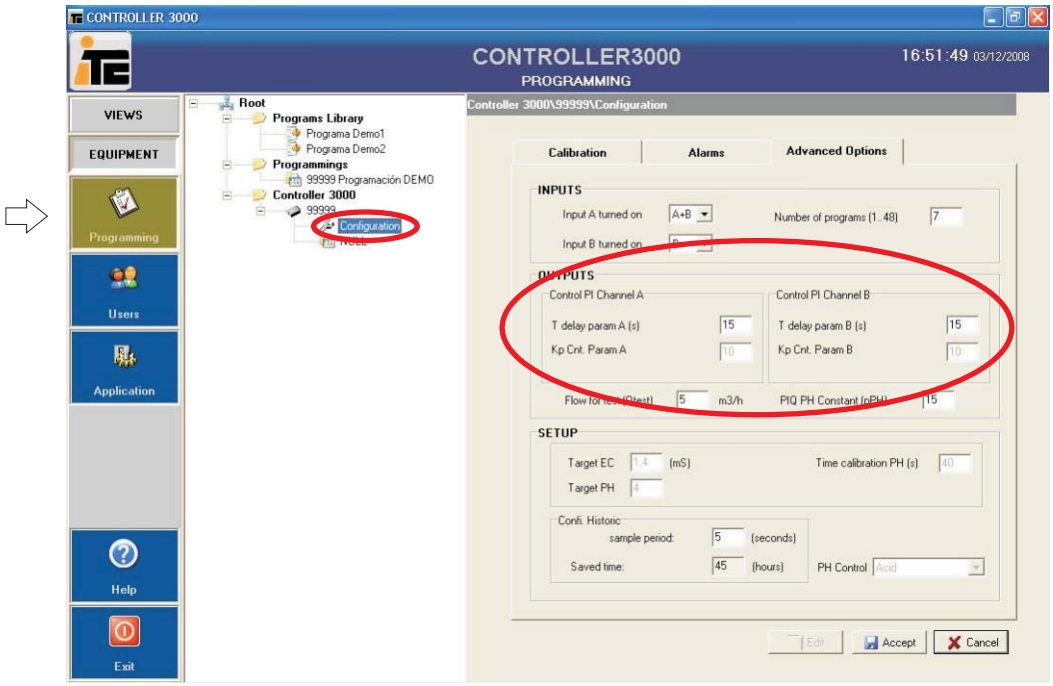


Change Units by pressing +/- and validate by ENT.

NUM PROG: Number of available Fertirrigation Programs

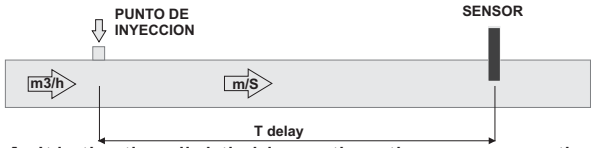
4.7.3. CONFIGURATION OF THE CONTROL PARAMETERS PI.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Edit the values selecting Edit button.
Select Advanced Options, to see current values. To change some value, this change must be done in the equipment directly. Once done, it is possible to read the configuration as explained at sections 6.4.2 (USB2), or 6.4.7., and 6.4.8 (USB1, pendrive).



Controller 3000 allows the dosage of a product to reach and maintain a value of EC or pH. For that, it uses a curve of proportional integral approach (PI).

Tdelay refers the time between two consecutive orders of Controller 3000 regulate the outputs. For a correct regulation this time has to be greater than time used a by the product to arrive to the sensor from the injection point.



Tdelay delay time of channel A: It is the time lightly bigger than the necessary time since a product has been injected into the tubes, until this one comes to the corresponding sensor (EC or pH), with a certain flow (Qtest).
Tdelay time of delay of the channel B: It is the time lightly bigger than the necessary time since a product has been injected into the tubes, until this one comes to the corresponding sensor (EC or pH), with a certain flow (Qtest).

Test flow (Qtest): Flow to establish the values of TdelayA, and Tdelay B.
Qtest=0, fixed Tdelay.
Qtest diferent of zero means Tdelay changes with the flow (inverse proportionally).

Example: For a Qtest=20m³/h, if Tdelay is 20 sec., When flow is 40m³/h, then Tdelay is changed to 10 sec.

Constant Kp of channel A: it is recommended to maintain the value of 10. A higher value, it will get to the Set Point quicker, but it will not be stable quickly, if the value is too high it can unstabilize the dosage.
Constant Kp of channel B: it is recommended to maintain the value of 10. A higher value, it will get to the Set Point quicker, but it will not be stable quickly, if the value is too high it can unstabilize the dosage.

Example:
For 8" Pipe, Flow 100m3/h, water Speed is approximately 1m/s. If the distance between the Injection and Sensor Point is 10m, the Delay Time of the System will be 10 seconds.

The Sensor will have a Reaction Time (approximately 10 seconds for the pH Sensor), which should be added to the Delay Time of the System. Therefore, we should set a Tdelay = 20 seconds.

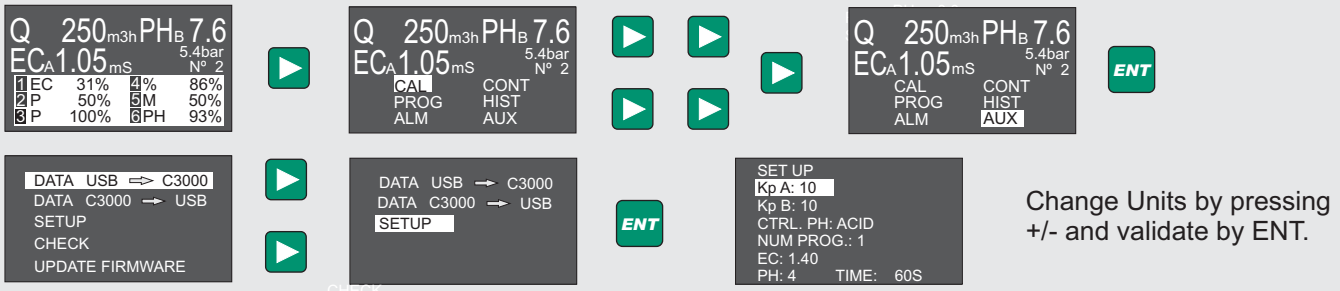
If there is a Filter between the Injection and Sensor Point, the Calculation of 10metersx1m/s = 10 seconds is no more valid.

Therefore, **TDelay** changes when the Flow of the System change. To optimize the Adjustment, the TDelay can be associated with a certain Flow (Q Test), so Controller 3000 changes **TDelay** according to Water Flow. **TDelay** is limited from 5 to 120 seconds.

How to find Tdelay
1.-Start the irrigation make sure that there is no dosage of products.
2.-Wait until the readings of the sensors are stable.
3.-Start manually a dosing pump, for example fertilizer. In the same moment start a chronometer.
4.-After some time the reading of the sensor will start increasing up until its stable. In this moment the chronometer will stop, and Tdelay is found.

4.7.3.1. CONFIGURATION FROM CONTROLLER 3000.

Configuration of Kp A, and Kp B.



Change Units by pressing +/- and validate by ENT.

Kp A: Proportionality Constant for the PI Control in Channel A. It is advisable to leave the default Value Kp A = 10
Kp B: Proportionality Constant for the PI Control in Channel B. It is advisable to leave the default Value Kp B = 10

Configuration of Channels A and B

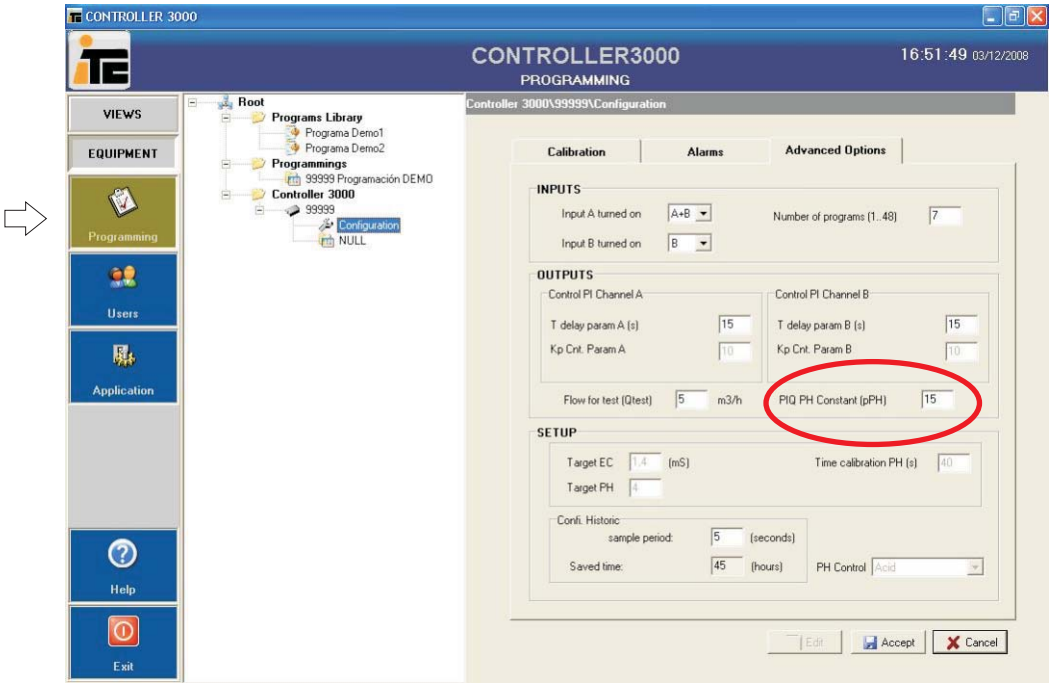
Change Units by pressing +/- and validate by ENT.

INPUTS: Configuration of the Remote Control Inputs in Channels A and B. Configure each Input with its Channel, and the activation of both Channels just by one Input.
A START A/A+B: Input A activates Channel A (A) or Channels A and B (A+B)
B START B/A+B: Input B activates Channel B (B) or Channels A and B (A+B)

OUTPUTS: Delay Time Configuration in the System for Channels A and B, corresponding to the Time passed between two consecutive Orders from the Controller (see System Start-Up).
A fixed Delay Time can be defined (Q Test=0) or proportionally inverse to the Flow.
Q Test=0: it allows establishing a Flow as Reference for defining the Delay Time (Tdelay) changeable by the Flow. If Q Test =0 Delay Time is constant.
A Tdelay: 15s Delay Time in Channel A
B Tdelay: 15s Delay Time in Channel B

4.7.4. CONFIGURATION OF THE PARAMETERS OF PIQ CONTROL.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Edit the values selecting Edit button.
Select Advanced Options, to see current values. To change some value, it must be done in the equipment directly. Once done, it is possible to read the configuration as explained in sections 6.4.2 (USB2), or 6.4.7., and 6.4.8 (USB1, "pendrive").



PIQ control mode for pH adjustement is a PI algorithm conditioned by the water flow. Using PpH parameter an initial dosage proportional to water flow is established, which is modified in time through a PI process.
PpH can only be activated by independent pumps (outputs type A to dosify acid). It gives a better stability of pH even with very variable flow and gives a better answer of the system to reach and keep readings at Set Point value.

PARAMETERS OF CONTROL PIQ:
PpH=0: Deactivated PIQ

PpH = 1-200 The variable PpH corresponds to the initial concentration of applied reagent, expressed in parts for 100.000.

Example: For a flow of 200.000 l/h of water and a PpH = 1, the proportional dosage of acid corresponds to: (1 / 100.000) x 200.000 l/h = 2 l/h

The necessary proportion of reagent to reach a certain pH will depend not only on his nature and concentration, but also on the nature of the water to treat and of the rest of dosed products that they could influence this parameter. Next we detail the status of values PpH advised for a fast answer and stability in the pH.

The following table for different acids is an approach of the value PpH for these acids according to the correction of necessary pH (1 or 2 points of pH).

Table for nitric acid.

A	1point	2 points
60%	4-10	10-20
40%	8-15	15-30
10%	30-60	60-120
5%	60-110	120-200

Table for phosphoric acid.

A	1point	2 points
80%	3-8	8-15
50%	6-15	15-25
10%	30-60	60-120
5%	60-110	120-200

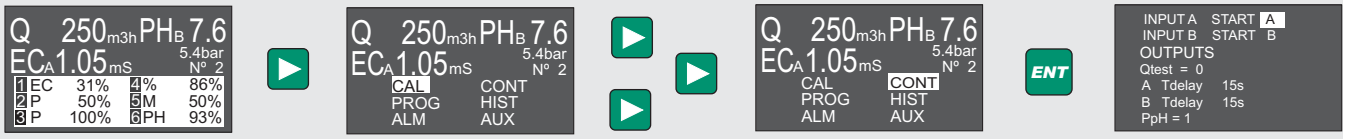
Table for sulphuric acid.

A	1point	2 points
95%	1-3	2-5
50%	2-5	4-10
10%	10-25	20-50
5%	20-50	40-100

Note: The A column corresponds to the concentration of acid.

4.7.4.1. CONFIGURATION FROM CONTROLLER 3000.

Configuration of Pph.



Regulation of pH for control PIQ (PI determined to the flow). It only controls outputs type A.
PpH=0 Control PI. PIQ Control disabled.
PpH = 1 - 200 The dosage of acid will be proportional to the water flow with adjustment to Set Point across a PI algorithm. Proportion is indicated by the parameter PpH and it is indexed to 100.000 units of water flow.

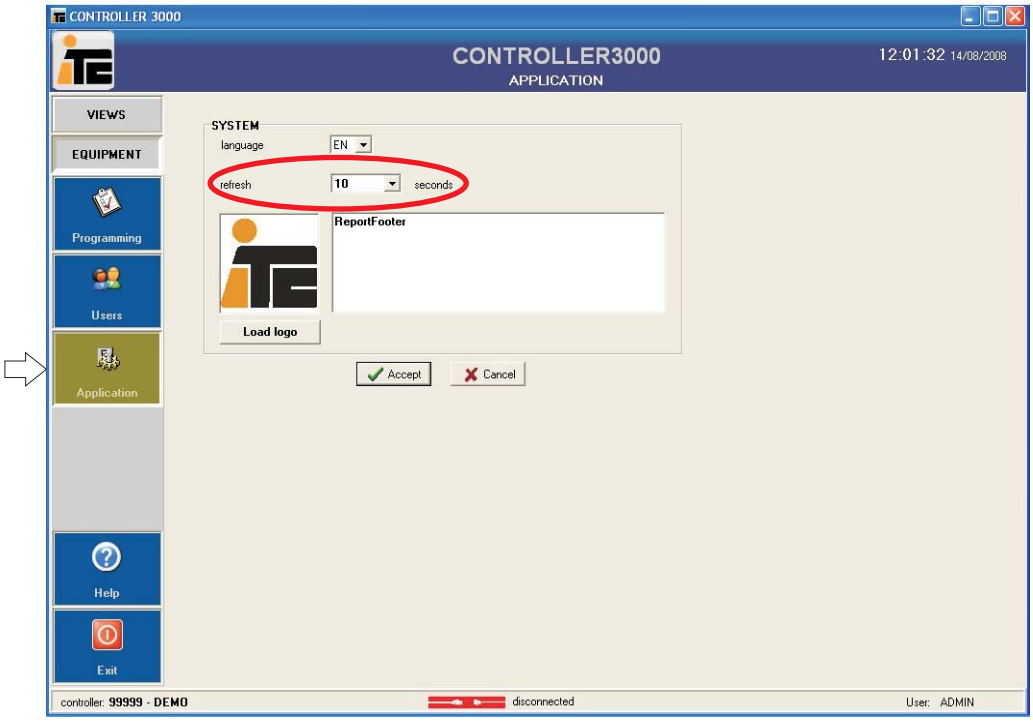
Example: For a water flow of 200.000 l/h and a PpH = 1, the proportional dosage of acid will correspond to: (1 / 100.000) x 200.000 l/h = 2 l/h

4.8. CONFIGURATION OF THE COMMUNICATIONS.

4.8.1. CONFIGURATION OF THE REFRESH TIME.

MENU:EQUIPO> Application.
To select the refresh time.
Refresh time: It is the time in seconds that orders the computer to read variables of the Controller, and update data on the screen of the computer.

Note: This parameter is exclusive of the program, therefore it is not possible to define it from the Controller.



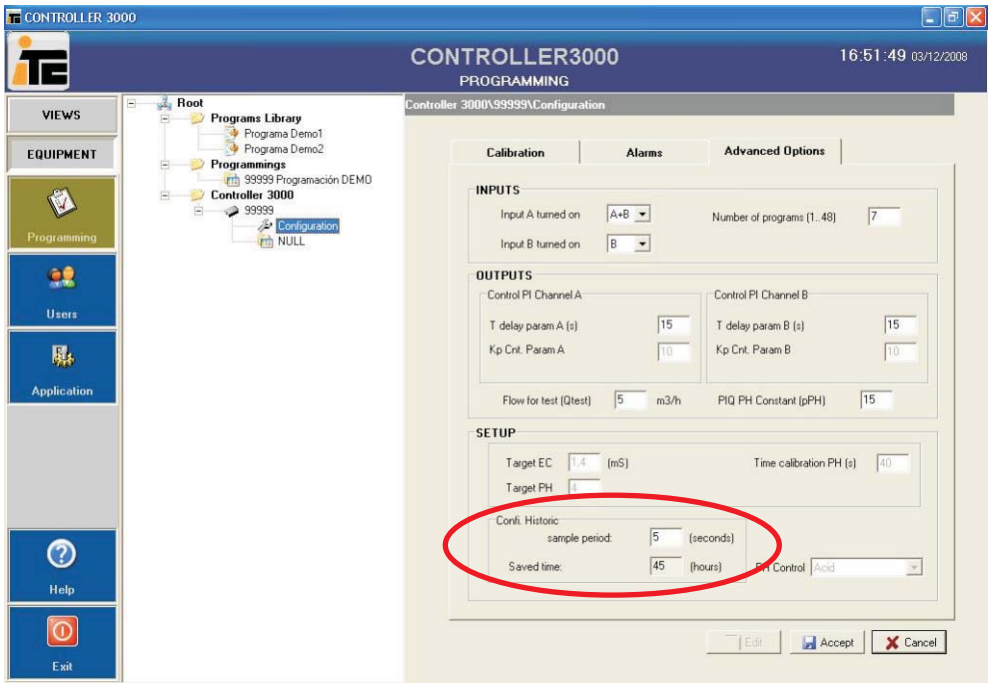
4.8.2.CONFIGURATION OF THE SAMPLING PERIOD.

MENU:EQUIPMENT> Programming.
Select Configuration of the Controller 3000 selected.
Edit the values selecting Edit button.

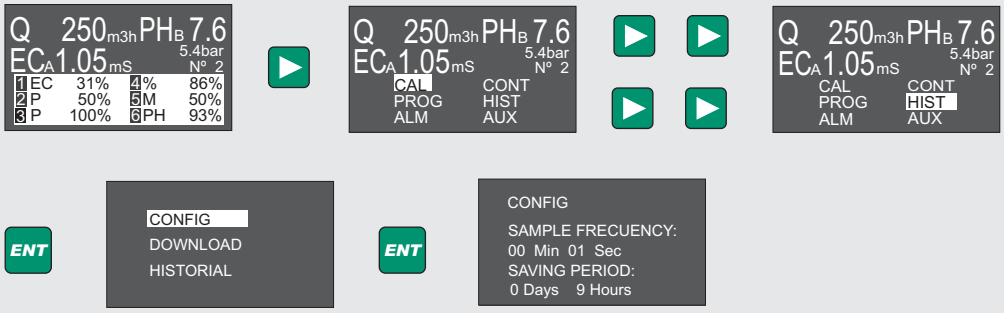
Select Advanced Options, to see current values. To change some value, it must be done in the equipment directly. Once done, it is possible to read the configuration as explained in sections 6.4.2 (USB2), or 6.4.7., and 6.4.8 (USB1, pendrive).

The value of the sampling time is in SETUP, Config. Historical.

Sampling time: Indicates time between data storaged in Controller 3000. Because the memory is limited, depending on the value, C3000 can keep the record of several hours up to several days. This is known reading the value Saved time which appears in the same section.



4.8.2.1. CONFIGURATION FROM THE CONTROLLER 3000.

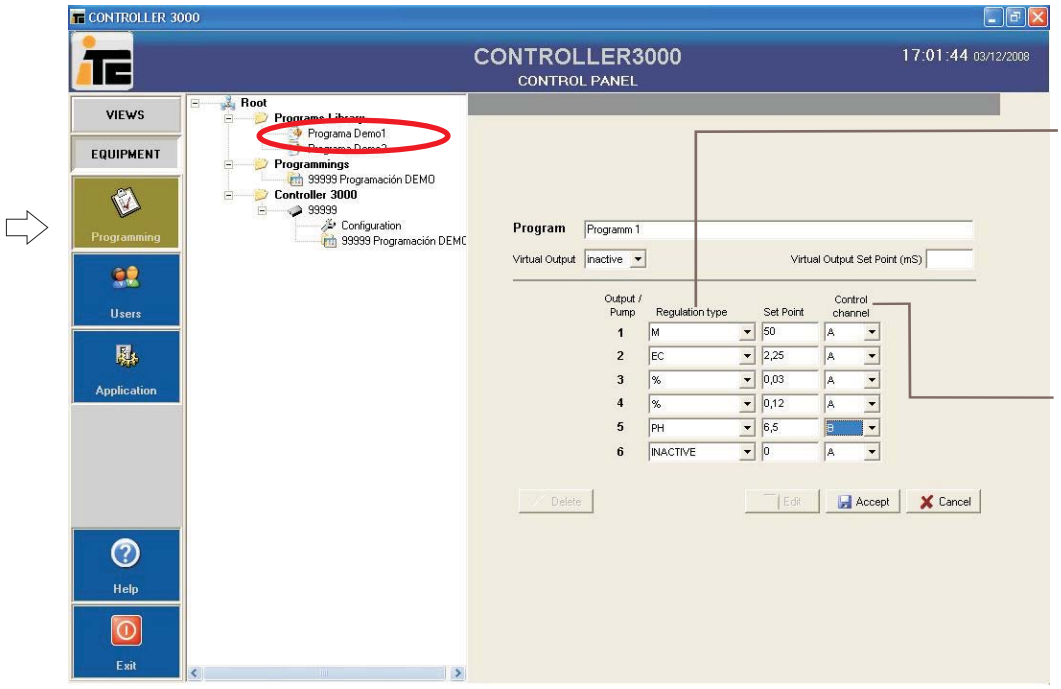


Change the Sample Frequency by pressing +/-.
In saving Period, the maximum Time stored for the introduced Sample Frequency is showed.
Validate by ENT.

5.1. CONTROL PARAMETERS.

MENU:EQUIPMENT>Programming.

Select an available program, or create one, and select Edit.

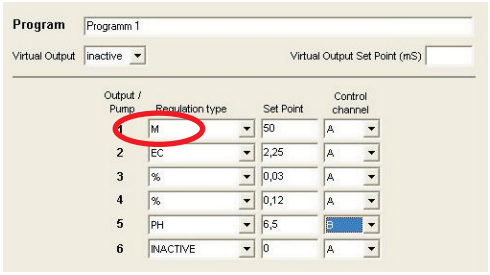


Type of regulation:
Manual (5.1.1)
Proportional (%) (5.1.2.)
Conductivity one product (5.1.3.)
Conductivity several products (5.1.4.)
PH Set Point (5.1.5.)

Control channel A/B (5.1.6.)

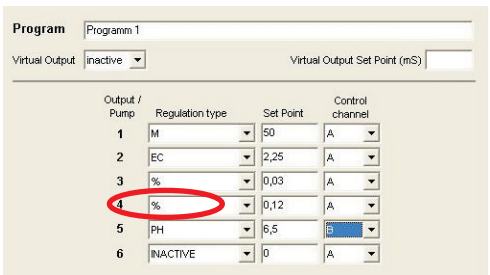
5.1.1. MANUAL CONTROL

Pump/servomotor works at value programmed. In the program, and Controller 3000, it is indicated with M (Manual). (See the examples on section 5.3)



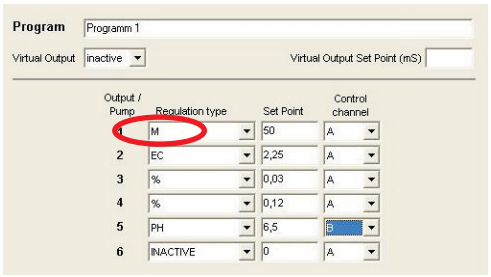
5.1.2. PROPORTIONAL CONTROL

The dosage depends on irrigation flow so a flowmeter is required. The equipment doses from 0.001 %, up to 9.999 % of the flow. In the program, and Controller3000, it is indicated by the symbol % (percentage of the flow). (See the example in section 5.3)



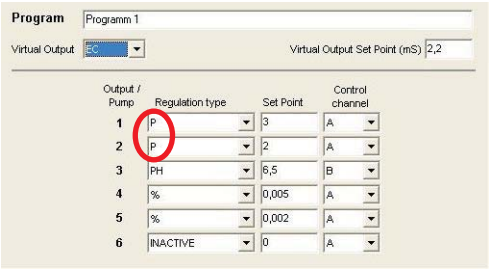
5.1.3. CONDUCTIVITY CONTROL. ONE PRODUCT.

Dosage depends on the electrical conductivity of water therefore a sensor of electrical conductivity is required. Conductivity value must be set, and the dosage of the fertilizer will be regulated to reach this set point. In the program, and Controller3000 it is named EC (Electrical Conductivity). It is possible to assign it to a pump.(See the examples in section 5.3)



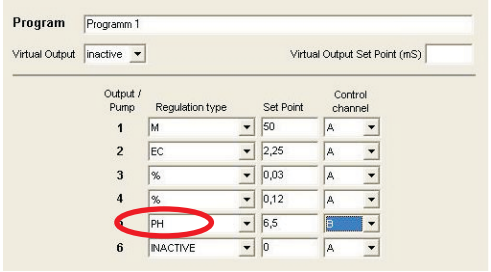
5.1.4. CONDUCTIVITY CONTROL. MORE THAN ONE PRODUCT.

Dosage depends on the electrical conductivity of water therefore a sensor of electrical conductivity is required. Conductivity value must be set, and the proportion between the pumps regulated by this Set Point. In the program, and Controller 3000, is indicated by EC (Electrical Conductivity) in the space saved for this virtual Set Point (not assigned to a pump in particular), or in the frequency variator for modular pumps, whereas in every pump or servomotor, it is necessary to indicate with the letter P (Proportion between pumps). (See the examples in section 5.3)

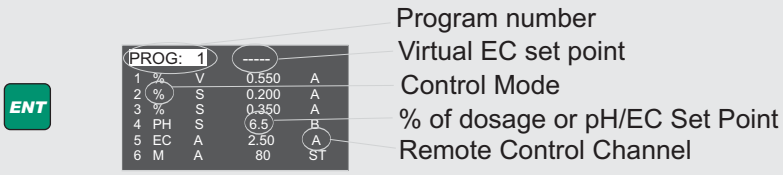


5.1.5. CONTROL FOR pH SET POINT .

Dosage depends on the pH of water therefore pH sensor is required. PH value must be set. In the program, and Controller 3000 is named PH. It is possible to assign only one pump for program of irrigation. (See the examples in section 5.3)



5.1.0.0. CONFIGURATION FROM CONTROLLER 3000.



Change the program to edit by pressing +/- and validate by ENT.
Use <> to scroll on the Menu and validate the Program by ENT

CONTROL MODE (See Performance)

M - Manual: Manual Adjustment of the Dosage, in %.

% - PROPORTIONAL: Proportional Dosage of the Irrigation Flow, in %.

EC - EC Set Point: Dosage of one or some Products to reach a certain EC Value (Set Point).

P - Dosify more than one Product by EC Set Point, a Proportion (P) between these Products must be established. In this case, **Virtual EC Set Point** must be used to introduce the EC Set Point, and specify a Proportion of Relation between the Outputs configured as P.

PH - PH Set Point: Dosage of one or some Products to reach a certain pH Value (Set Point).

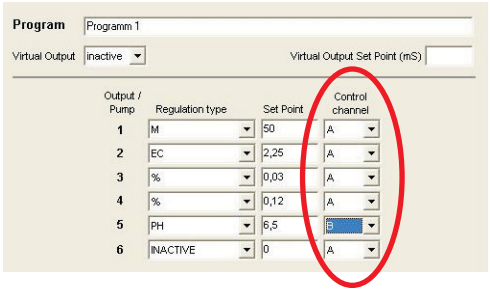
SET POINT OR DOSE IN % :
When the Outputs are configured as EC or pH, the Value for this field corresponds to the Set Point Value.
For Outputs configured as %, the Value of this Field corresponds to the Proportion Value.
For Outputs configured in manual Mode, the Value of this field corresponds directly to the % of Dosage Adjustment.

If an intermitent value appears when validating by ENT, it indicates the Program is not correct. Check for errors.

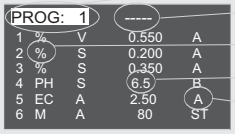
Errors of programming are available in section 5.8 Errors of programming.

5.1.6. CONTROL CHANNEL A/B.

Controller 3000 can activate different pumps with different inputs. Controller 3000 has two activation inputs corresponding to the channels A and B. In the program it is indicated next to the value of the Set Point under the name of Control Channel. Available values: To A (channel A), B (channel B), ST (Stop).



5.1.6.1. CONFIGURATION FROM CONTROLLER 3000.



Program number
Virtual EC Set Point
Control Mode
% of dosage or pH/EC Set Point
Remote Control Channel

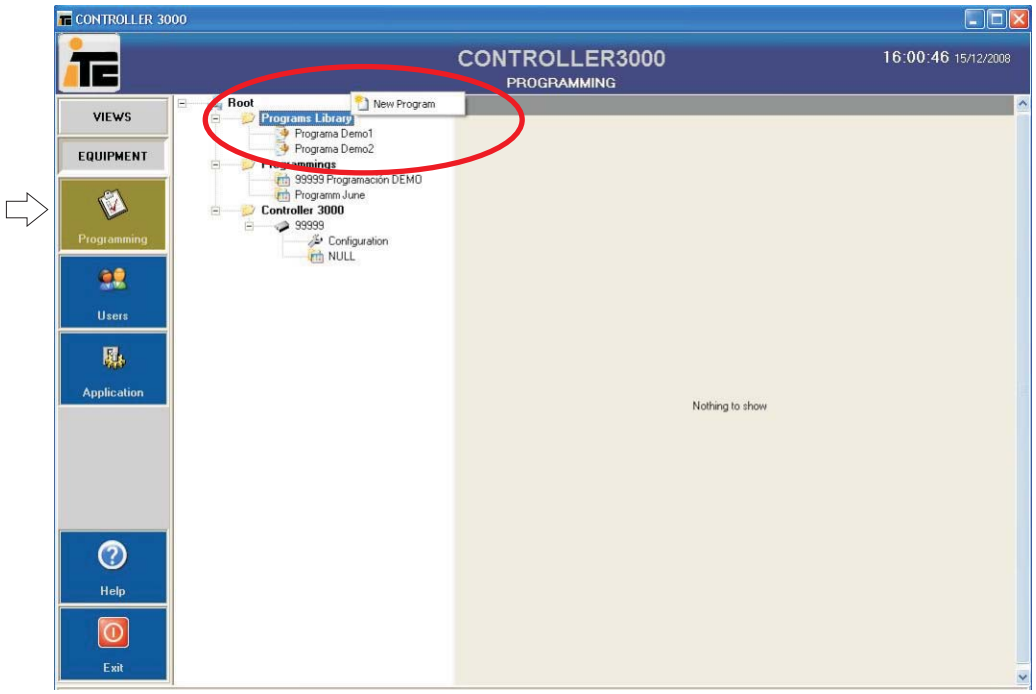
Change the program to edit by pressing +/- and validate by ENT.
Use <> to scroll on the Menu and validate the Program pressing ENT

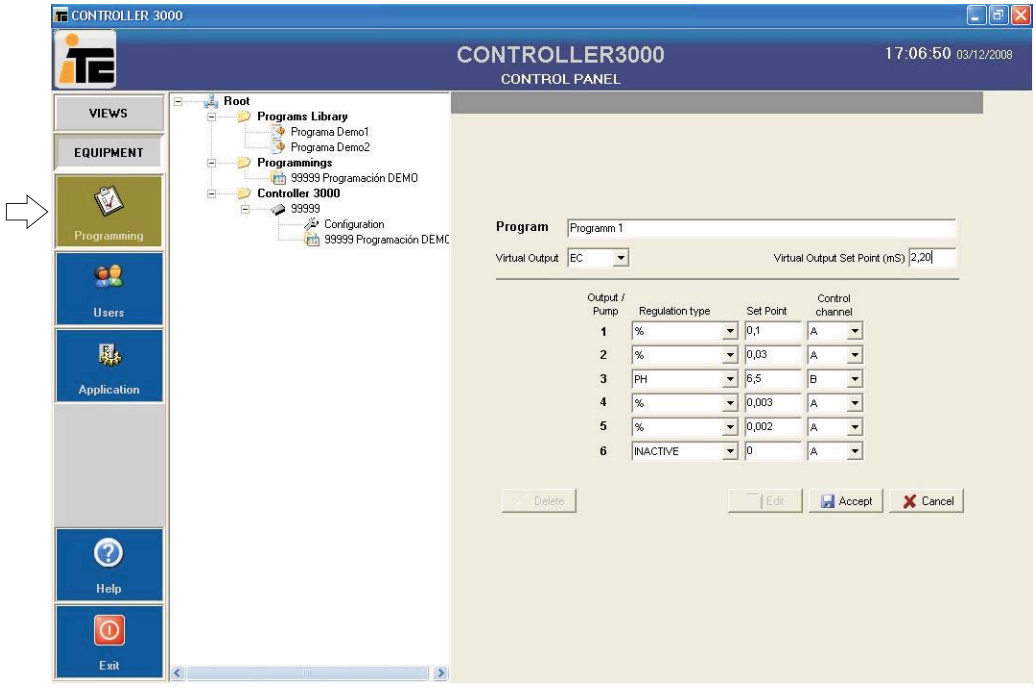
CONTROL CHANNEL A/B:
It is possible to select two different Remote Control Channels: A and B. Each Channel has an independent Activation Input, which allows to start-up the Pumps programmed for a Channel and keep the Pumps of the other Channel stopped.

Each Control Channel has its PI Control Parameters (see Control Menu), to see each adjustment, pH and EC.

5.2. PROGRAMS LIBRARY.

MENU:EQUIPMENT> Programming.
Create a program selecting with the right button of the mouse Programs Library. A program can be used several times for different programmings, it is important to name every program so that they are easily identifiable. In every program is defined the dosage for every pump, as well as how this dosage is applied at each pump.



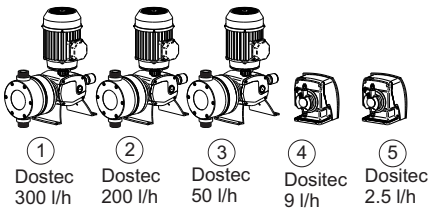


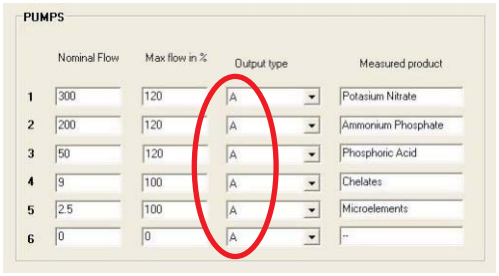
Programming according section 5.3.

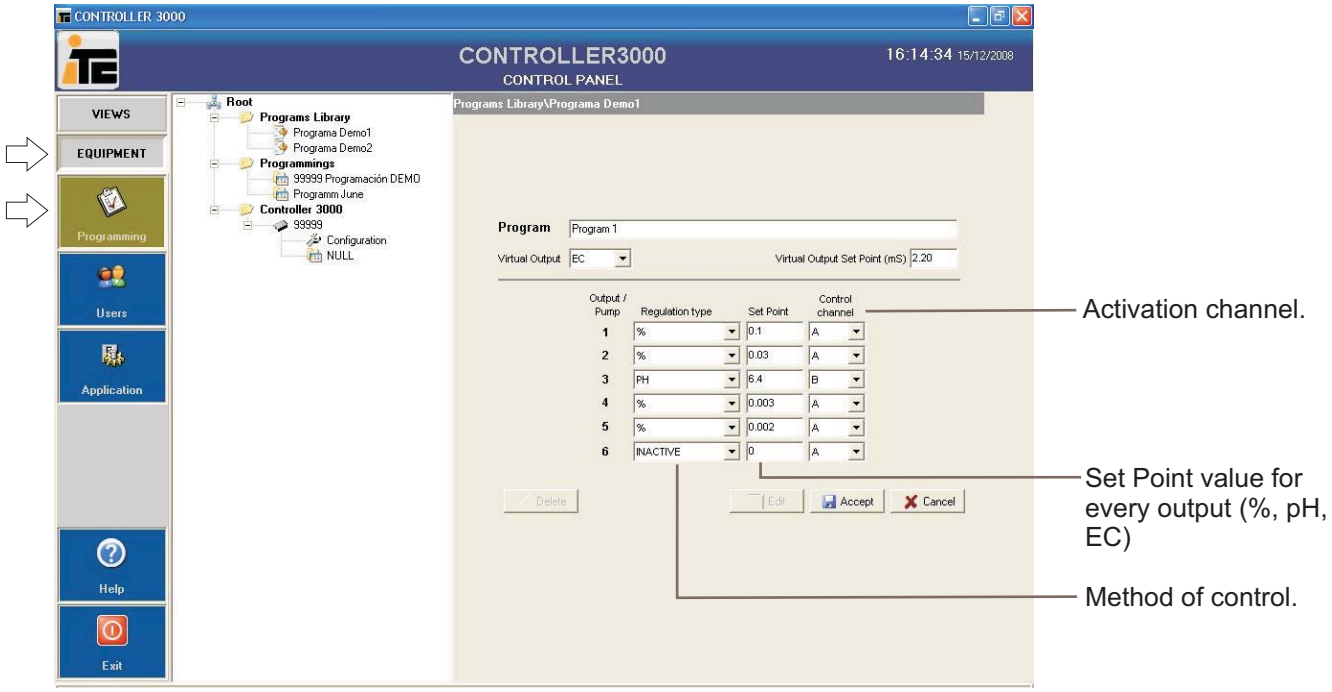
5.3. PROGRAMMING OF PROPORTIONAL DOSAGE AND CONTROL OF pH.

5.3.1INDEPENDIENT DOSING PUMPS.

5.3.1.1.EXAMPLE FROM SCADA.





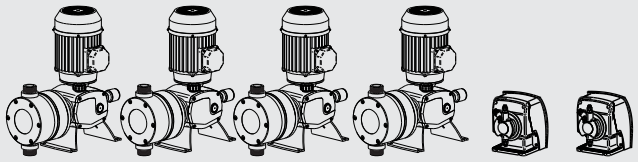


Activation of the program:
With the channel A activated: proportional dosage of the products 1,2,4,5.
With the channel B activated: dosage of acid (product 3).

NOTE: A value of conductivity EC in the Virtual Exit is defined for using the alarm of conductivity. Value 2.20 is the maximum value for water with the programmed dosage.

5.3.1.2.EXAMPLE FROM CONTROLLER 3000.

Independent Dosing Pumps
Proportional Dosage of the Products 1, 2,3,4,5 and pH Control by Pump 6.



1 Dostec 300 l/h
2 Dostec 300 l/h
3 Dostec 200 l/h
4 Dostec 100 l/h
5 Dositec 9 l/h
6 Dositec 2 l/h

Configuration of Pumps

PUMP			
1-	300 L / H	120 %	A
2-	300 L / H	120 %	A
3-	200 L / H	120 %	A
4-	100 L / H	120 %	A
5-	9.0 L / H	100 %	A
6-	2.0 L / H	100 %	A

Proportion of the Product 1: 0.200%
Proportion of the Product 2: 0.300%
Proportion of the Product 3: 0.100%
Proportion of the Product 4: 0.050%
Proportion of the Product 5: 0.020%
pH Set Point of the Product 6: 6.5

Programacion

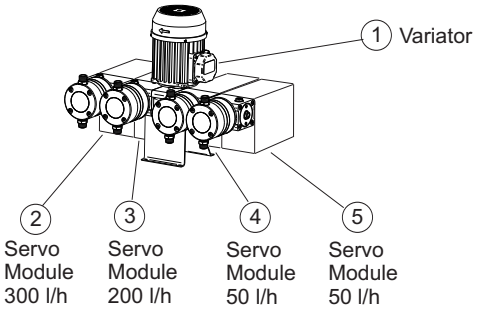
PROG: 1		EC 2.45	
1	% A	0.200	A
2	% A	0.300	A
3	% A	0.100	A
4	% A	0.050	A
5	% A	0.020	A
6	PH A	6.5	0 B

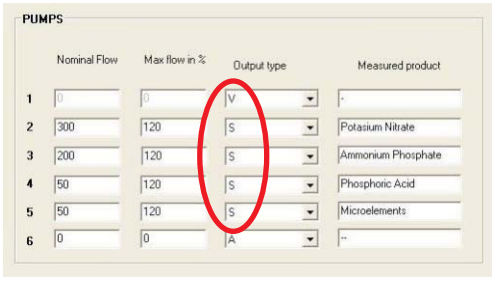
Remote Control:
To activate the pH Control accurately without dosing any other Product, the Outputs 1,2,3,4 and 5 should be programmed by selecting Channel A of the Remote Control, and the Output 6 will be regulated by Channel B.

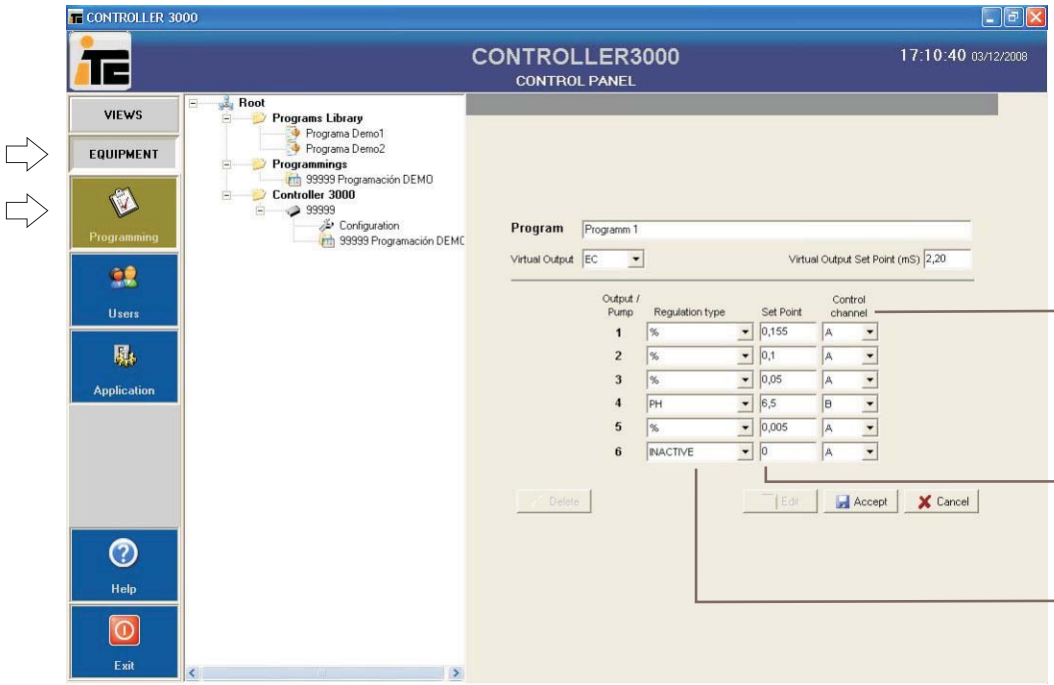
EC Alarm:
When a proportional Dosage is executed, no EC Set Point is introduced. However, if a value of 2.45mS is supposed to be when dosifing, it is good to have an EC Alarm, which warns about any variation of the System. Therefore, the Value 2.45mS should be introduced as virtual EC Set Point, which is only a Reference Value for the Alarm.

5.3.2. MODULAR DOSING PUMP.

5.3.2.1.EXAMPLE FROM SCADA.







Activation channel.

Set Point values for each output (%, pH, EC)

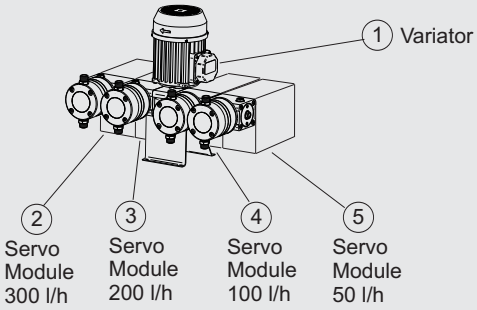
Method of control.

Activation of the program:
With the channel A activated: proportional dosage of the products 1,2,3,5.
With the channel B activated: dosage of acid (product 4).

NOTE: When a proportional Dosage is executed, no EC Set Point is introduced. However, if a value of 2.20mS is supposed to be when dosifing, it is good to have an EC Alarm, which warns about any variation of the System. Therefore, the Value 2.20mS should be introduced as virtual EC Set Point, which is only a Reference Value for the Alarm.

5.3.2.2.EXAMPLE FROM CONTROLLER 3000.

Mutifertic Metering Pump with 4 Modules and one Servo in each Module.
Proportional Dosage of the Products on Outputs 2, 3 and 4, and pH Control on Output 5.



Configuration of Pumps

PUMP			
1-	---- L / H	120 %	V
2-	300 L / H	120 %	S
3-	200 L / H	120 %	S
4-	100 L / H	120 %	S
5-	50 L / H	120 %	S
6-	--- L / H	-----	-

Programation

PROG: 1		EC 2.45	
1	% V	0.600	A
2	% S	0.200	A
3	% S	0.300	A
4	% S	0.100	A
5	PH S	6.5	B
6	---- --	---	--

Proportion of the Product on the Output 2: 0.200%
Proportion of the Product on the Output 3: 0.300%
Proportion of the Product on the Output 4: 0.100%
pH Set Point of the Product of the Output 5: 6.5

Remote Control:
With this Configuration and this Programming it is no possible to control only the pH, since the Master Output of the Variator will work by Proportionality. It allows deactivating the pH Control by keeping the proportional Dosage, simply by deactivating the Signal in Channel B.

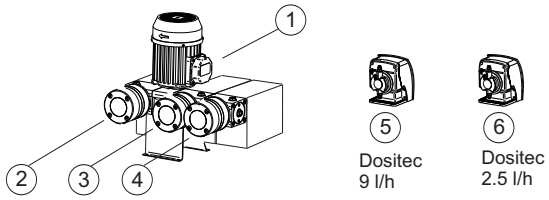
When you need a pH Control without proportional Dosage of Fertilizer, an special Programm should be executed only with Output 1 and 5 programmed. Output 1 set manually and output 5 by pH Set Point.

PROG: 2		----	
1	M V	100	A
2	-- S	----	A
3	-- S	----	A
4	-- S	----	A
5	PH S	6.5	B
6	---- --	---	--

EC Alarm:
When a proportional Dosage is executed, no EC Set Point is introduced. However, if a value of 2.45mS is supposed to be when dosifing, it is good to have an EC Alarm, which warns about any variation of the System. Therefore, the Value 2.45mS should be introduced as virtual EC Set Point, which is only a Reference Value for the Alarm.

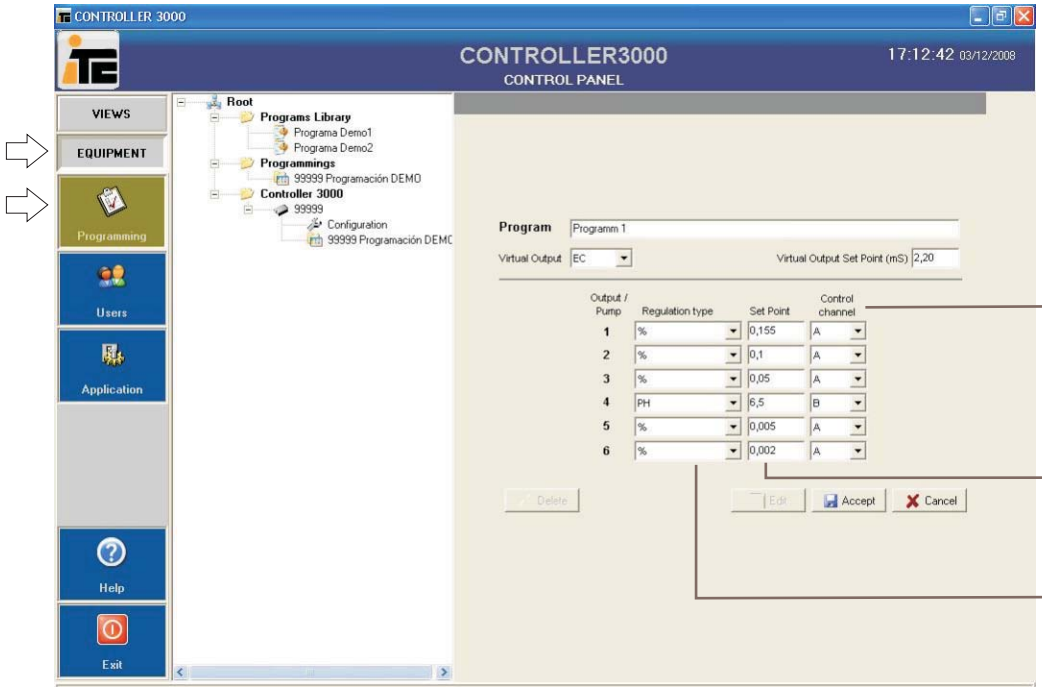
5.3.3.MIXED SYSTEM OF MODULAR AND INDEPENDENT DOSING PUMPS.

5.3.3.1.EXAMPLE FROM SCADA.



PUMPS

	Nominal Flow	Max flow in %	Output type	Measured product
1	0	0	V	-
2	300	120	S	Potasium Nitrate
3	200	120	S	Ammonium Phosphate
4	50	120	S	Phosphoric Acid
5	9	100	A	Chelates
6	0	100	A	Microelements



Activation channel.

Set Point values for each output (%, pH, EC)

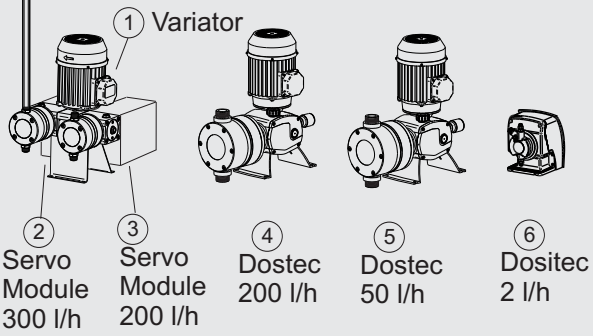
Method of control.

Activation of the program:
With the channel A activated: proportional dosage of the products 1,2,3,5 y 6.
With the channel B activated: dosage of acid (product 4).

NOTE: Working with P means we are not controlling EC, except when using this values as an alarm to stop pumps when EC is out of range. Therefore, the Value 2.20mS should be introduced as virtual EC Set Point, which is only a Reference Value for the Alarm.

5.3.3.2.EXAMPLE FROM CONTROLLER 3000.

Mutifertic dosing Pump with 2 Modules and one Servo in each Module, two Dostec and one Dositec.
Proportional Dosage of the Products on Outputs 2, 3,4 and 5, and pH Control on Output 5.



Configuration of pumps

PUMP				
1-	----	L / H	120 %	V
2-	300	L / H	120 %	S
3-	200	L / H	120 %	S
4-	200	L / H	120 %	A
5-	50	L / H	120 %	A
6-	2.0	L / H	100 %	A

Program

PROG: 1			EC 2.60	
1	%	V	0.500	A
2	%	S	0. 200	A
3	%	S	0. 300	A
4	%	A	0.100	A
5	%	A	0. 050	A
6	PH	A	6.50	B

Proportion of the product on output 2: 0.200%
Proportion of the product on output 3: 0.300%
Proportion of the product on output 4: 0.100%
Proportion of the product on output 5: 0.050%
Proportion of the product on output 6: 0.300%
Set Point of pH on output 6: 6.5

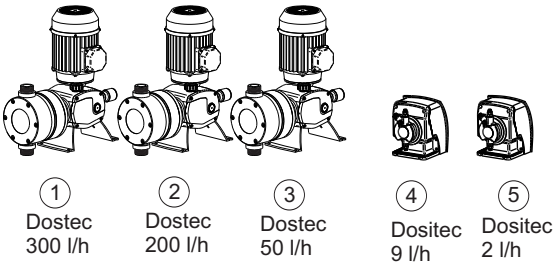
Remote control:
Fertilizers outputs are programmed to be controlled by channel A and acid control with channel B. Parameters of control PI of channel A will be used to EC control, and parameters of control PI of channel B will be used to pH control.

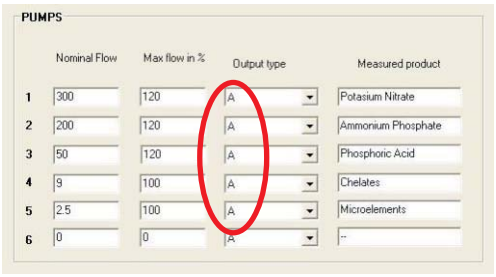
Alarm:
The value for the EC alarm is the virtual Set Point of EC.

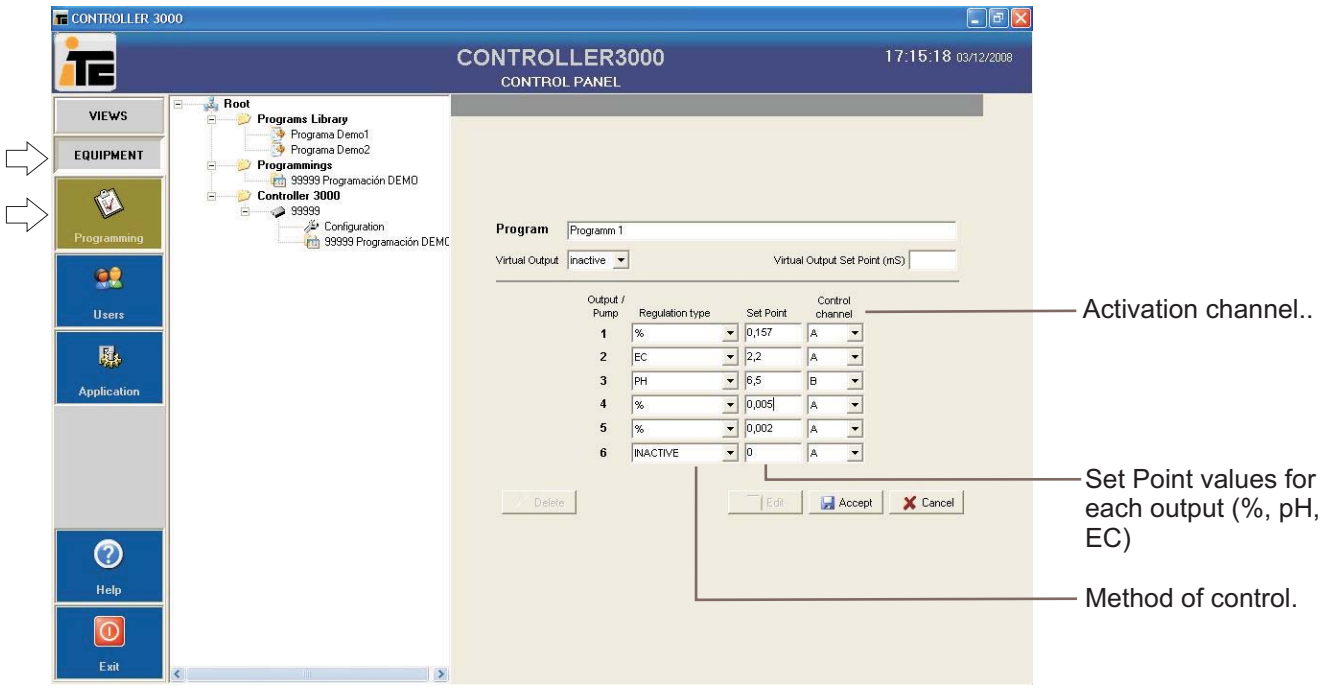
5.4. DOSING PROGRAMMING OF FERTILIZER FOR CONDUCTIVITY SET POINT, PROPORTIONAL DOSAGE OF MICROELEMENTS AND pH CONTROL.

5.4.1. INDEPENDENT DOSING PUMPS.

5.4.1.1.EXAMPLE FROM SCADA.



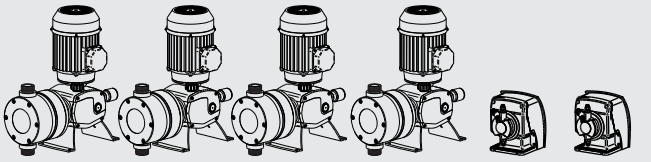




Activation of the program:
With the channel A activated: proportional dosage of products 1, 4, 5, and dosage of EC with product 2.
With the channel B activated: dosage of acid (product 4).

5.4.1.2.EXAMPLEFROM CONTROLLER 3000.

Independent dosing pumps.
EC dosage of the products 1,2 and 3, proportional dosage of 4 and 5, y pH control with pump 6.



1 Dostec 300 l/h
2 Dostec 300 l/h
3 Dostec 200 l/h
4 Dostec 100 l/h
5 Dositec 9 l/h
6 Dositec 2 l/h

Configuration of Pumps

PUMP				
1-	300	L / H	120 %	A
2-	300	L / H	120 %	A
3-	200	L / H	120 %	A
4-	100	L / H	120 %	A
5-	9.0	L / H	100 %	A
6-	2.0	L / H	100 %	A

EC Set Point: 2.50 mS
Relation of the Proportion between Products: 1, 2, 3:
Product 1: 20
Product 2: 30
Product 3: 10
Percentage of Product 4: 0.050%
Percentage of Product 5: 0.020%
pH Set Point of Product 6: 6.5

Program

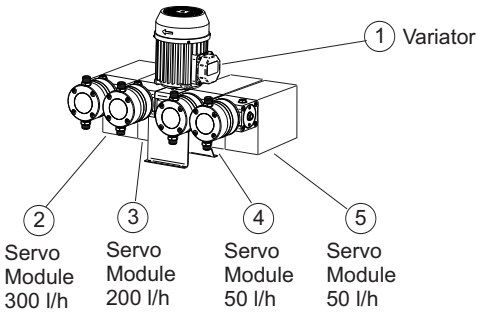
PROG: 1			EC 2.50	
1	P	A	20	A
2	P	A	30	A
3	P	A	10	A
4	%	A	0.050	A
5	%	A	0.020	A
6	PH	A	6.5	B

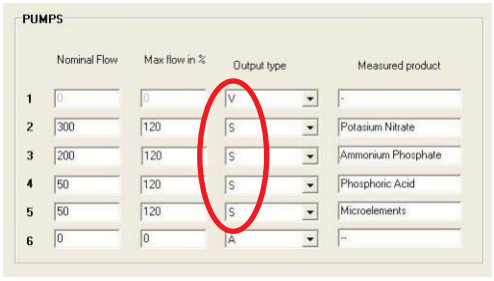
Remote Control:
To activate pH Control without dosing any other Product, Outputs 1,2,3,4 and 5 must be programmed with Channel A, and Output 6 with Channel B. EC Adjustment follow the Parameters of the PI Control in the Channel A, and the pH the Parameters in the Channel B.

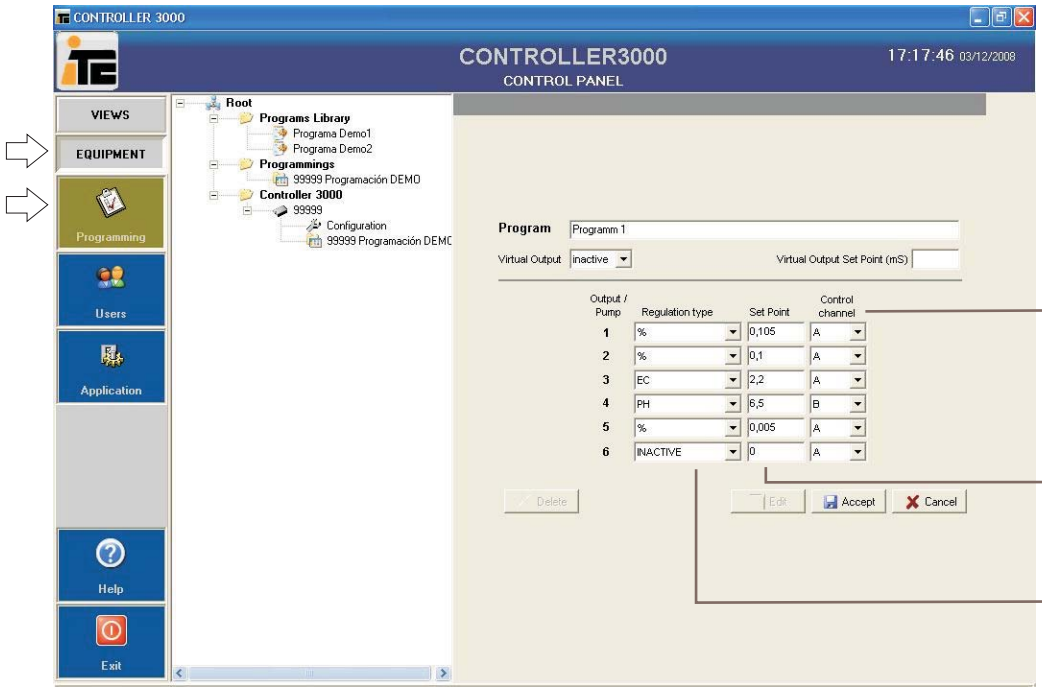
EC Alarm:
EC Set Point is for EC Alarm.

5.4.2. MODULAR DOSING PUMP.

5.4.2.1.EXAMPLE FROM SCADA.







Activation channel.

Set Point values for each output (%, pH, EC)

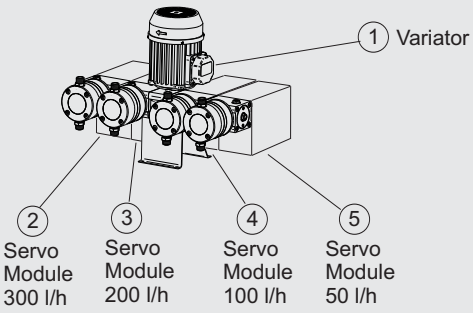
Method of control.

Activation of the program:
Channel A activated: proportional dosage of products 1, 2 and 5, EC dosage with product 3.

Channel B activated: Dosage of acid (product 4).

5.4.2.2.EXAMPLE FROM CONTROLLER 3000.

Multiferic dosing pump of 4 moduls with a Servo in each module.
EC dosage on output 4, and control of pH with output 5.



Configuration pumps

PUMP				
1-	----	L / H	120 %	V
2-	300	L / H	120 %	S
3-	200	L / H	120 %	S
4-	100	L / H	120 %	S
5-	50	L / H	120 %	S
6-	---	L / H	-----	-

Program

PROG: 1			-----	
1	%	V	1. 2	A
2	%	S	0.8	A
3	%	S	0.4	A
4	EC	S	2.3	A
5	PH	S	6.5	B
6	----	--	---	--

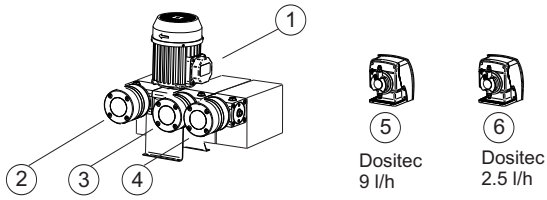
Proportion of the product on output 2: 0.800%
Proportion of the product on output 3: 0.400%
Set Point of CE of the product on output 4: 2.3
Set Point of pH of the product on output 5: 6.5

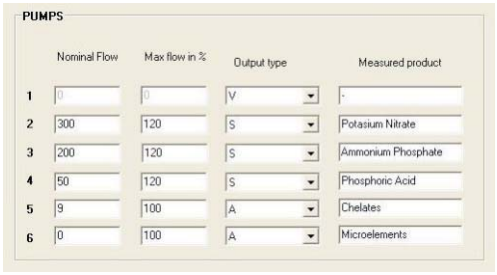
Remote control:
With this configuration and this programming it is not possible to control only pH since the output master of the frequency variador is assigned to EC.

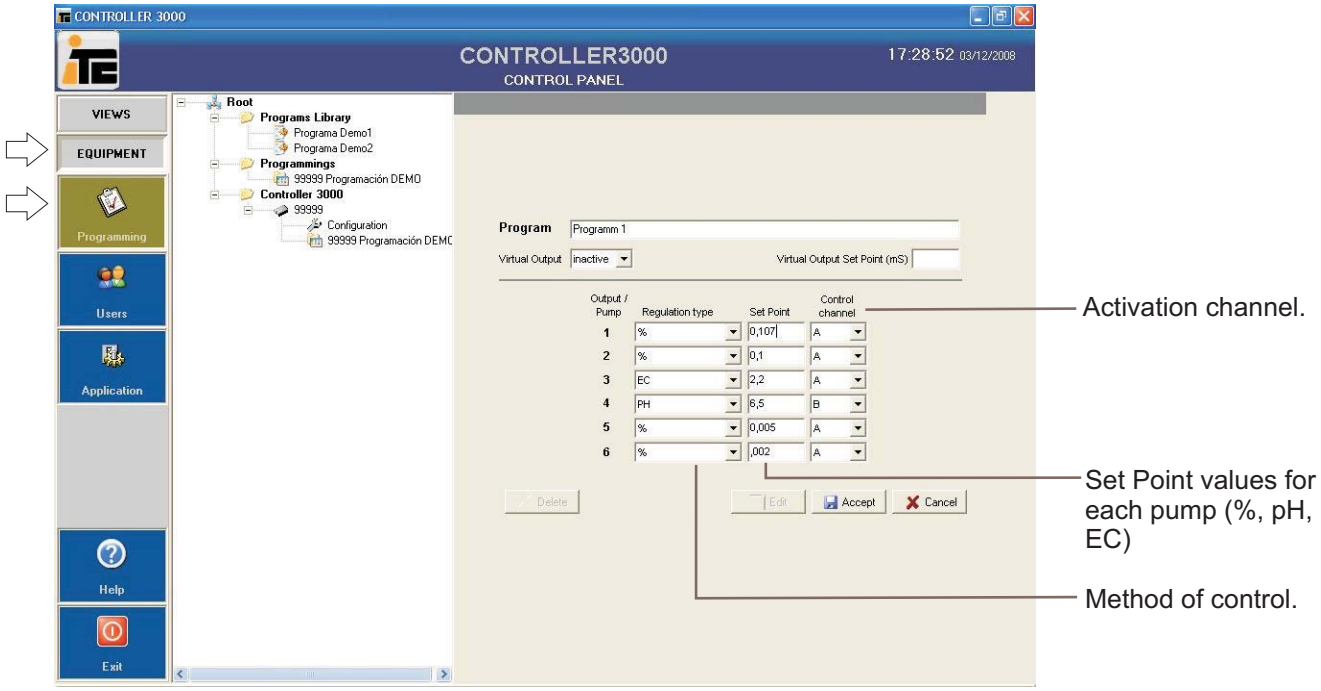
To control pH without proportional fertilizer dosage, another program must be done, Manual output 1(example at 80%), Manual outputs 2, 3, and 4 at 0% and output 5 with pH Set Point.

5.4.3. MIXED SYSTEM OF MODULAR AND INDEPENDENT DOSING PUMPS.

5.4.3.1.EXAMPLE FROM SCADA.



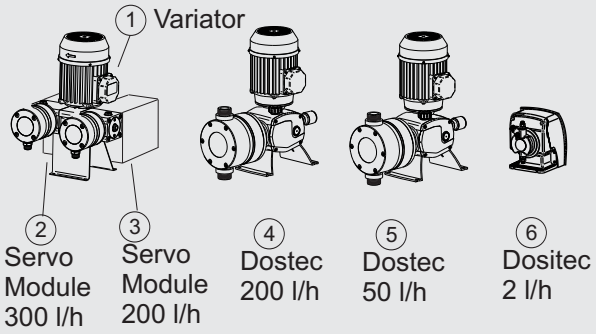




Activation of the program:
Channel A: proportional dosage of products 1, 2, 5, 6 and EC dosage of product 3.
Channel B: dosage of acid (product 4).

5.4.3.2. EXAMPLES FROM CONTROLLER 3000.

Multifertic dosing Pump with 2 Modules, one Servo in each Module, two Dostec and one Dositec.
Proportional Dosage of the Products on Outputs 2, 3 and 4. Product 5 will correct EC alterations. Output 6 will control pH.



Configuration pumps

PUMP				
1-	----	L / H	120 %	V
2-	300	L / H	120 %	S
3-	200	L / H	120 %	S
4-	200	L / H	120 %	A
5-	50	L / H	120 %	A
6-	2.0	L / H	100 %	A

Program

PROG: 1			------	
1	%	V	0.500	A
2	%	S	0. 200	A
3	%	S	0. 300	A
4	%	A	0. 100	A
5	EC	A	2.500	A
6	PH	A	6.50	B

Proportionality of the Product on Output 2: 0.200%
Proportionality of the Product on Output 3: 0.300%
Proportionality of the Product on Output 4: 0.100%
EC Set Point of Product 5: 2.50mS
pH Set Point on Output 6: 6.5

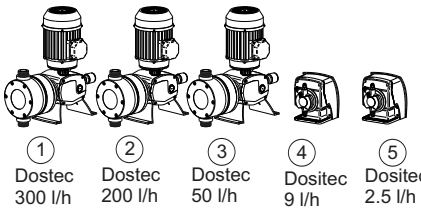
Remote Control:
Outputs of Fertilizers are programmed to be controlled by Channel A, and Acid Control by Channel B. Therefore, EC Adjustment are with PI Control Parameters of Channel A, and pH Adjustment with Control Parameters of Channel B.

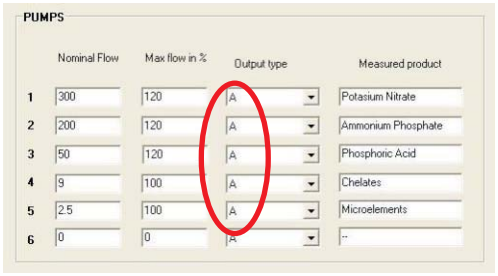
Alarm:
EC Set Point is the Reference Value for EC Alarm.

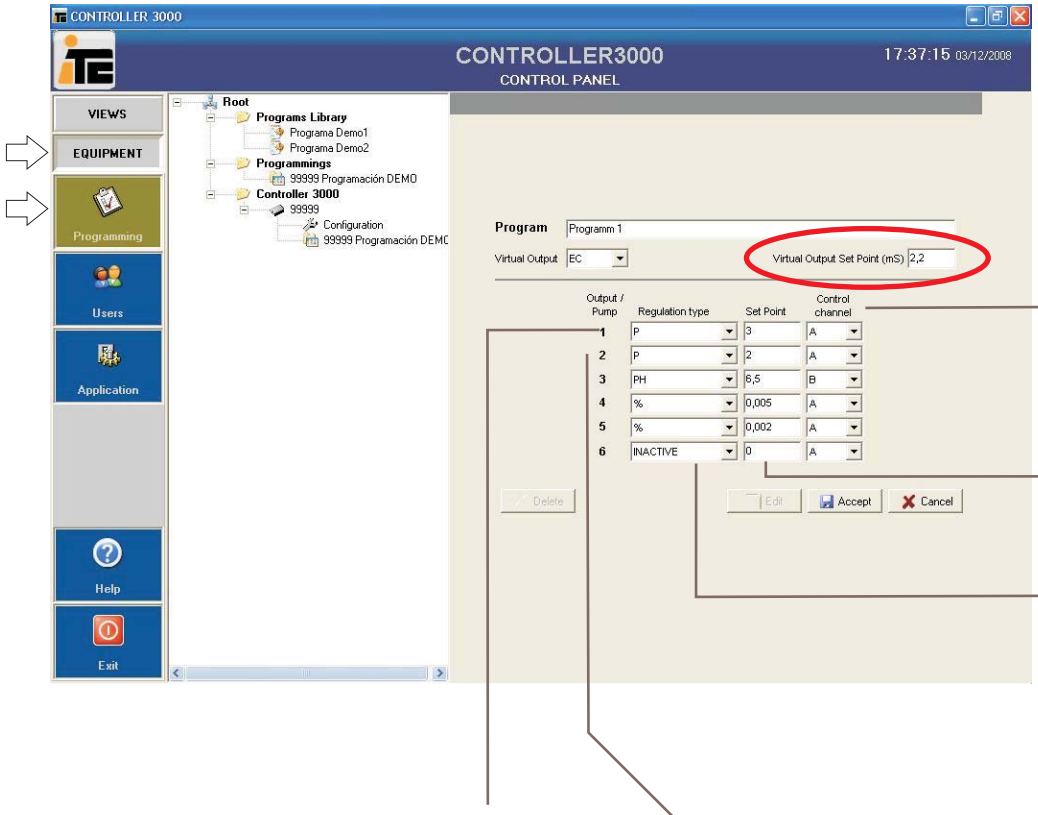
5.5. DOSAGE PROGRAMMING OF SEVERAL FERTILIZERS FOR CONDUCTIVITY SET POINT, PROPORTIONAL DOSAGE OF MICROELEMENTS AND pH CONTROL.

5.5.1. INDEPENDIENT DOSING PUMPS.

5.5.1.1.EXAMPLE FROM SCADA.







Activation channel.

Set Point values for each output (%, pH, EC)

Method of control.

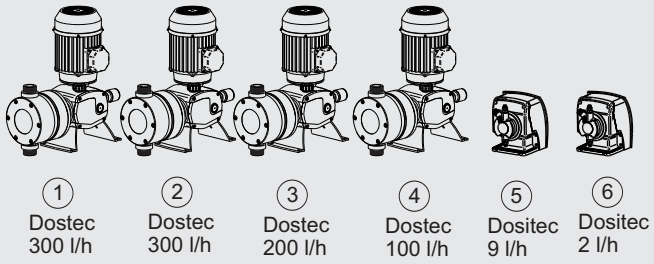
Proportional dosage of 3 parts to 2 referred to pump 2, to reach a conductivity of 2.2mS. Conductivity is programmed in the virtual Set Point.

Proportional dosage of 2 parts to 3 referred to pump 1, to reach a conductivity of 2.2mS. Conductivity is programmed in the virtual Set Point.

Activation of the program:
Channel A activated: proportional dosage of products 4, 5, EC dosage with products 1, and 2.
Channel B activated: dosage of acid (product 3).

5.5.1.2. EXAMPLE FROM CONTROLLER 3000.

Independent dosing pumps.
EC Dosage of products 1,2 and 3, proportional dosage of 4 and 5, and pH control with pump 6.



Configuration of the Pumps

PUMP			
1-	300 L / H	120 %	A
2-	300 L / H	120 %	A
3-	200 L / H	120 %	A
4-	100 L / H	120 %	A
5-	9.0 L / H	100 %	A
6-	2.0 L / H	100 %	A

Program

PROG: 1		EC 2.50	
1	P A	20	A
2	P A	30	A
3	P A	10	A
4	% A	0.050	A
5	% A	0.020	A
6	PH A	6.5	B

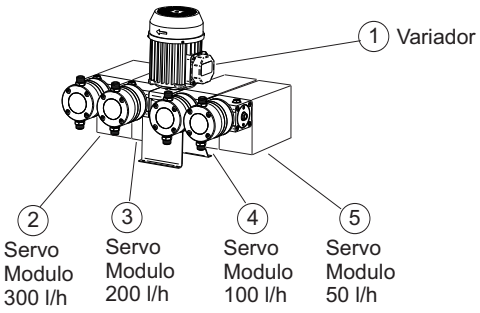
EC Set Point: 2.50 mS
Relation of the Proportion between Products: 1, 2, 3:
Product 1: 20
Product 2: 30
Product 3: 10
Proportion of Product 4: 0.050%
Proportion of Product 5: 0.020%
pH Set Point of Product 6: 6.5

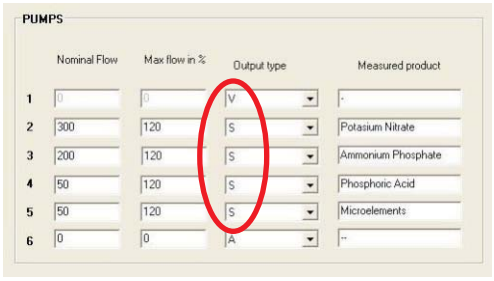
Remote Control:
To activate pH Control without dosing any other Product, Outputs 1,2,3,4 and 5 must be programmed selecting Channel A, and Output 6 must be regulated by Channel B. Therefore, EC Adjustment are with PI Control Parameters of Channel A, and pH Adjustment with Control Parameters of Channel B.

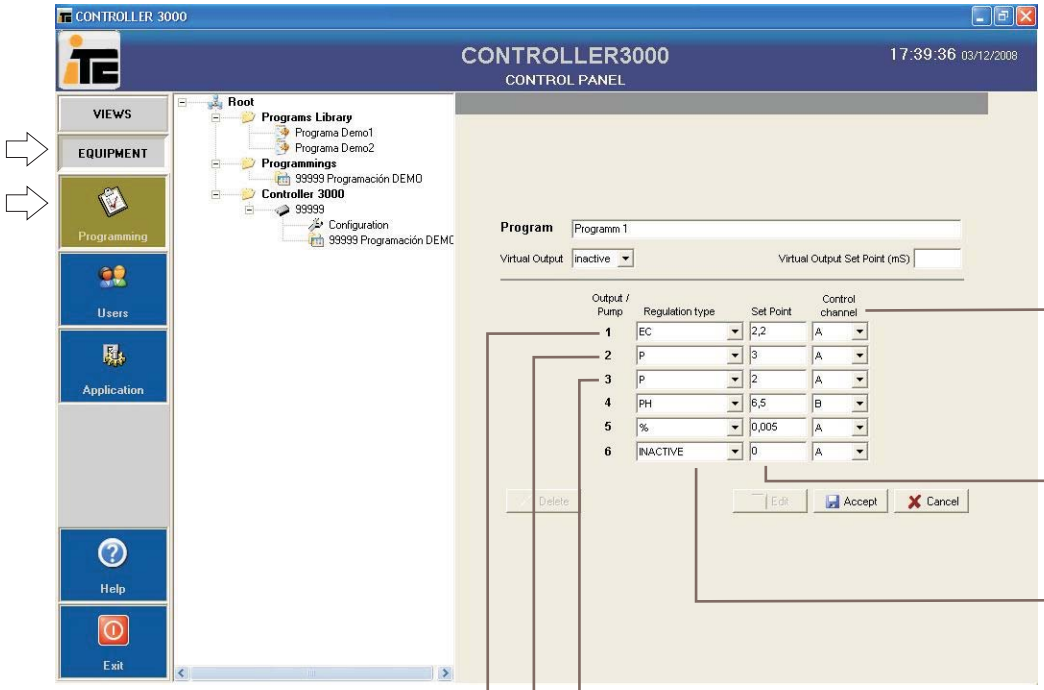
EC Alarm:
EC Set Point is the Reference Value for EC Alarm.

5.5.2. MODULAR DOSING PUMP.

5.5.2.1.EXAMPLE FROM SCADA.







Activation channel..

Set Point values for each output (%, pH, EC)

Method of control.

Proportional dosage of 2 parts to 3 from pump 2, to have a conductivity of 2.2mS. Conductivity is indicated in output 1(frequency variator).

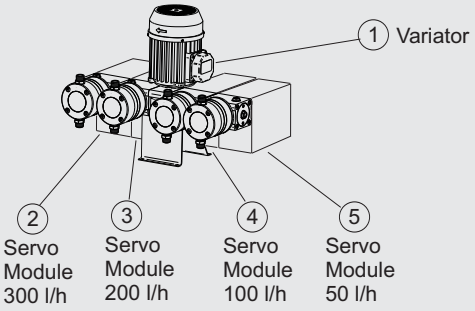
Conductivity set point, it has two servomotors to control EC.

Proportional dosage of 3 parts to 2 from pump 3, to have a conductivity of 2.2mS. Conductivity is indicated in output 1 (frequency variator).

Activation of the program:
Channel A: proportional dosage output 5, CE control with outputs 2, and 3 from Set Point indicated in the frequency variator.
With channel B activated: dosage of acid (output 4).

5.5.2.2. EXAMPLE FROM CONTROLLER 3000.

Multifertic dosing Pump with 4 Modules and one Servo in each Module.
EC dosage of products on outputs 2, 3 and 4, and pH Control on Output 5.



Configuration of Pumps

PUMP				
1-	----	L / H	120 %	V
2-	300	L / H	120 %	S
3-	200	L / H	120 %	S
4-	100	L / H	120 %	S
5-	50	L / H	120 %	S
6-	---	L / H	-----	-

Program

PROG: 1			-----	
1	EC	V	2.50	A
2	P	S	20	A
3	P	S	30	A
4	P	S	10	A
5	PH	S	6.5	B
6	----	--	---	--

EC Set Point: 2.50mS
Relation of the Proportion between products on outputs 2,3 and 4:
Product of Output 2: 20
Product of Output 3: 30
Product of Output 4: 10
pH Set Point of Output 5: 6.5

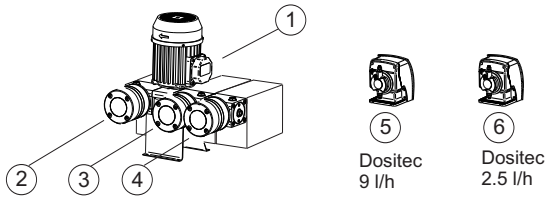
Remote Control:
With this Configuration and this Programming it is not possible to control only pH, since the frequency Variator will work by Proportionality. PH control can be deactivated, deactivating Channel B.

To control pH without proportional Dosage of Fertilizer, a special programm is requiredy with the Output 1 and 5 programmed. The Output 1 set manually and 5 by the pH Set Point.

EC Alarm:
EC Set Point is the Reference for the Alarm.

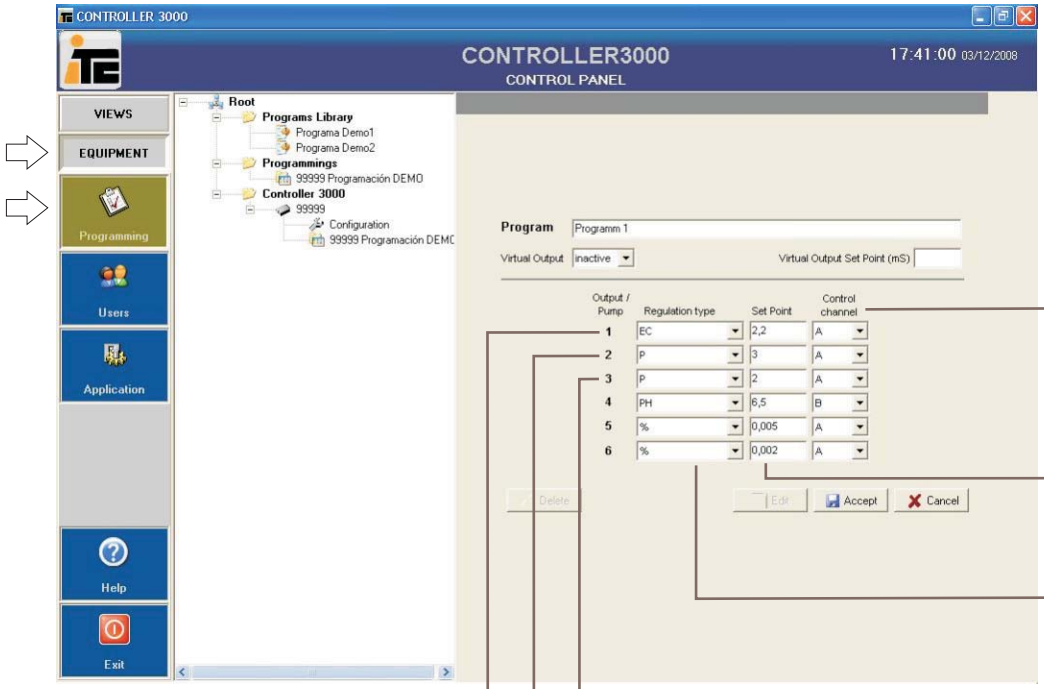
5.5.3. MIXED SYSTEM OF INDEPENDENT AND MODULAR DOSING PUMPS.

5.5.3.1.EXAMPLE FROM SCADA.



PUMPS

	Nominal Flow	Max flow in %	Output type	Measured product
1	0	0	V	-
2	300	120	S	Potasium Nitrate
3	200	120	S	Ammonium Phosphate
4	50	120	S	Phosphoric Acid
5	9	100	A	Chelates
6	0	100	A	Microelements



Activation channel.

Set Point value for each output (%, pH, EC)

Method of control.

Proportional dosage of 2 parts to 3 from servomotor of output 2, to get a conductivity of 2.2mS. Conductivity is shown at the output 1(frequency variator).

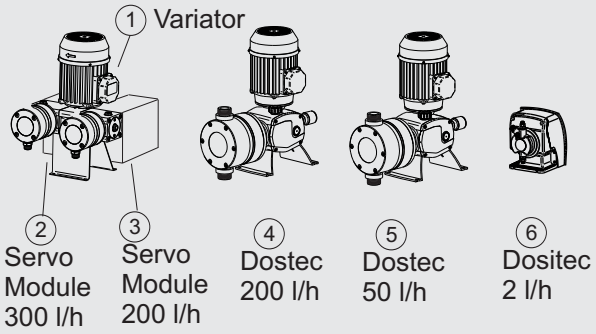
Conductivity set point, uses two servomotors.

Proportional dosage of 3 parts to 2 from the servomotor of output 3, to reach a conductivity of 2.2mS. Conductivity setpoint is shown at the output 1 (frequency variator).

Activation of the program:
Channel A: proportional dosage of outputs 5, 6 and dosage of CE with outputs 2, y 3.
Channel B: dosage of acid (product 4).

5.5.3.2. EXAMLE FROM CONTROLLER 3000.

Multiferic dosing pump of 2 moduls with a servo in each module, two Dostec and one Dostec.
Proportional dosage with outputs 4, and 5. Output 6 controls pH.



Configuration of pumps

PUMP				
1-	----	L / H	120 %	V
2-	300	L / H	120 %	S
3-	200	L / H	120 %	S
4-	200	L / H	120 %	A
5-	50	L / H	120 %	A
6-	2.0	L / H	100 %	A

Program

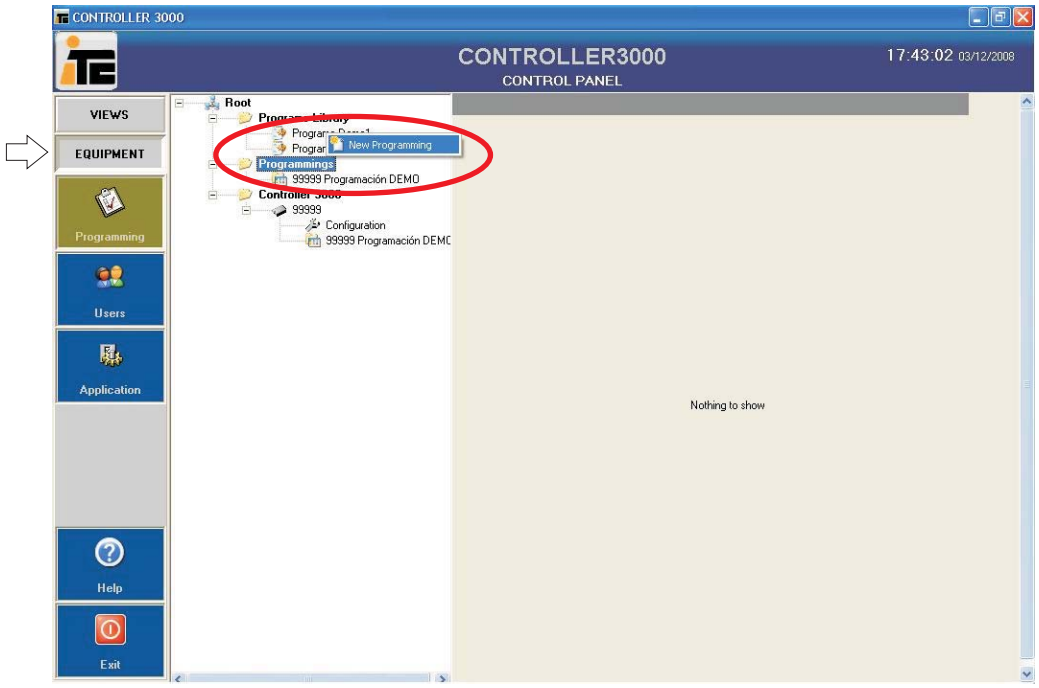
PROG: 1				
1	EC	V	2.40	A
2	P	S	2	A
3	P	S	3	A
4	%	S	0. 100	A
5	%	A	0.150	A
6	PH	A	6.50	B

Set Point of EC: 2.40 mS.
Relation of proportion between outputs 2, and 3:
Output 2 product: 2
Output 3 product: 3
Proportionality of output 4: 0.100 %
Proportionality of output 5: 0.150 %
Set Point of pH at output 6: 6.5

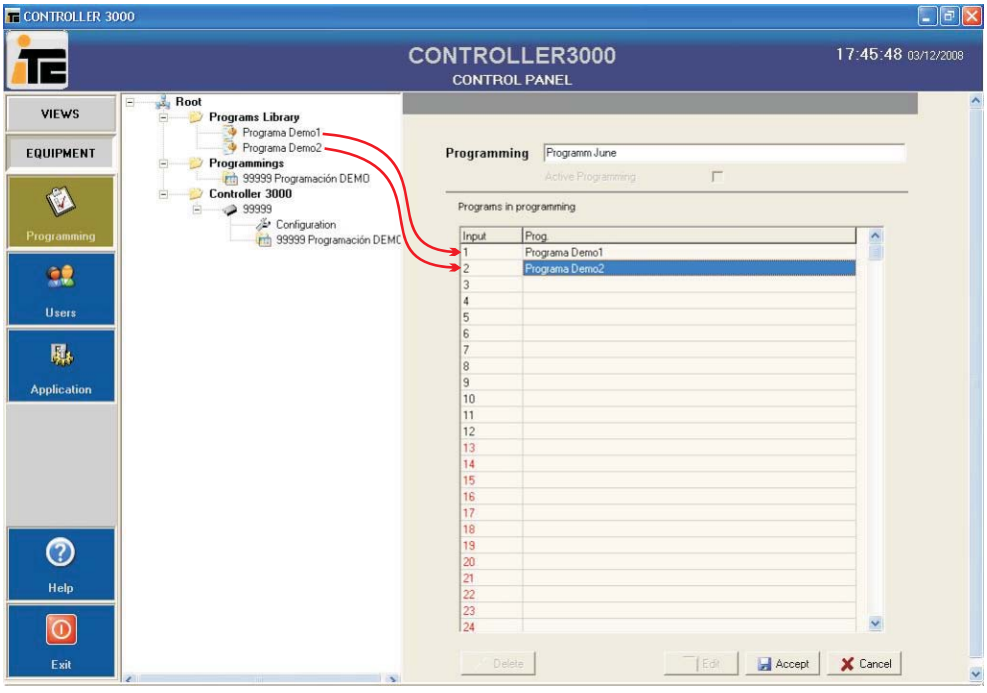
Remote control:
Channel A controls fertilizer products, channel B controls acid. EC regulation uses parameters of the control PI of channel A, and the regulation of the pH uses parameters of control of channel B.

5.6. PROGRAMMING

MENU:EQUIPMENT>Programming.
Create a Programming selecting Programming with the right button of the mouse.

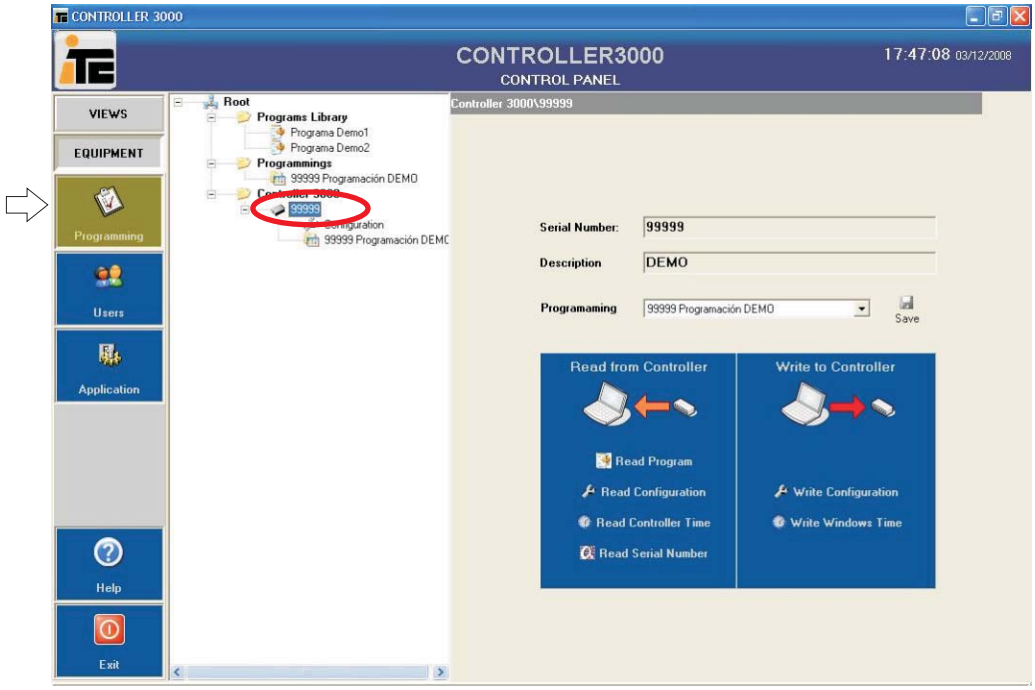


Once created, select the programs dragging them with the cursor from the Library of programs. Remember the importance of introducing descriptive names that allows an easy identification.

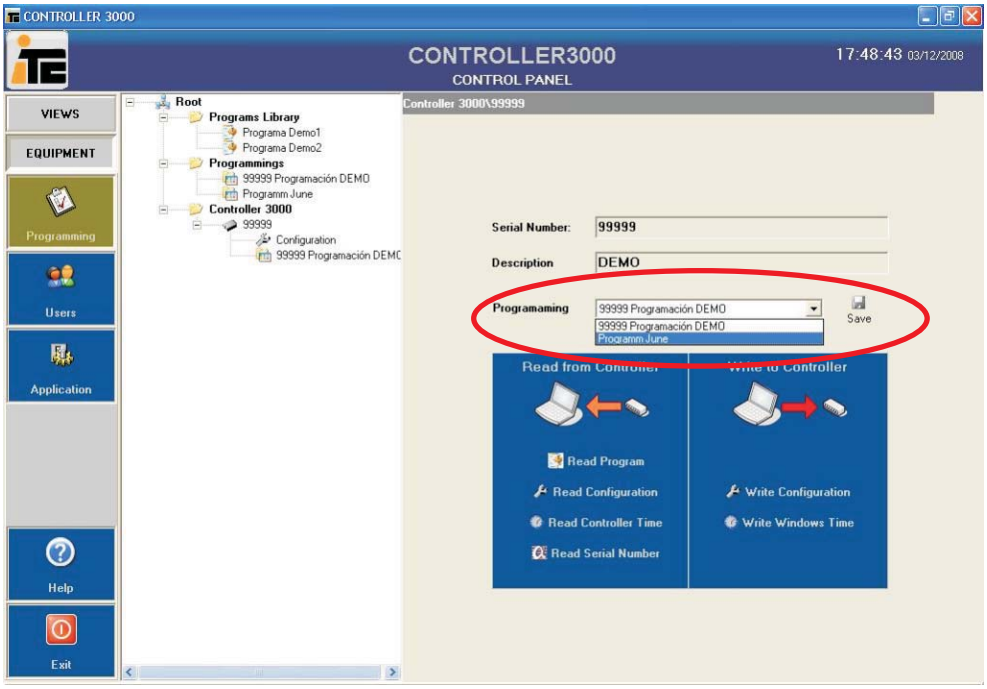


5.7. ASSIGN A PROGRAMMING TO A CONTROLLER 3000.

MENU:EQUIPMENT> Programming.
Once available at least one Programming, assign a Programming to a Controller 3000, selecting and dragging the Programming wished up to the serial number of the Controller (option 1), or to select the serial number of the Controller 3000, and assigning it in the menu of Programmings that appears (option 2), save and confirm. In this point the program revises the programming for the detection of errors (see section 5.8. Errors of programming).



Option 2:



5.8. ERRORS REGARDING THE PROGRAMMING.

Errors referred to EC Programming:

-Only one EC Set Point is possible

-If there is any Output configured as P (Proportion), an Ec Set Point must have been introduced.

If Control Outputs configured as P (Proportion) are Servo Outputs (S) the EC Set Point must be introduced in the V Output.

If Control Outputs configured as P (Proportion) are independent analogue Outputs (A) the EC Set Point must be introduced as Virtual EC Set Point. It is not possible to assign EC Set Point to an Output between 1 and 6.

-To establish a Relation between some Products that regulate to get the EC Set Point, each output of these products must be programmed with P. Therefore, it is necessary at least two Outputs configured as P.

-An Output configured as V (Variator for Multifertic on Servos) programmed to work with EC Set Point, allows only the Servos Outputs (S) to be programmed as P (Proportion), PH, or M (manual), but not as %.

-Only one pH Set Point is possible.

Errors referred to pH Programming:

-Only one pH Set Point is possible.

Errors referred to % Programming (Proportionality)

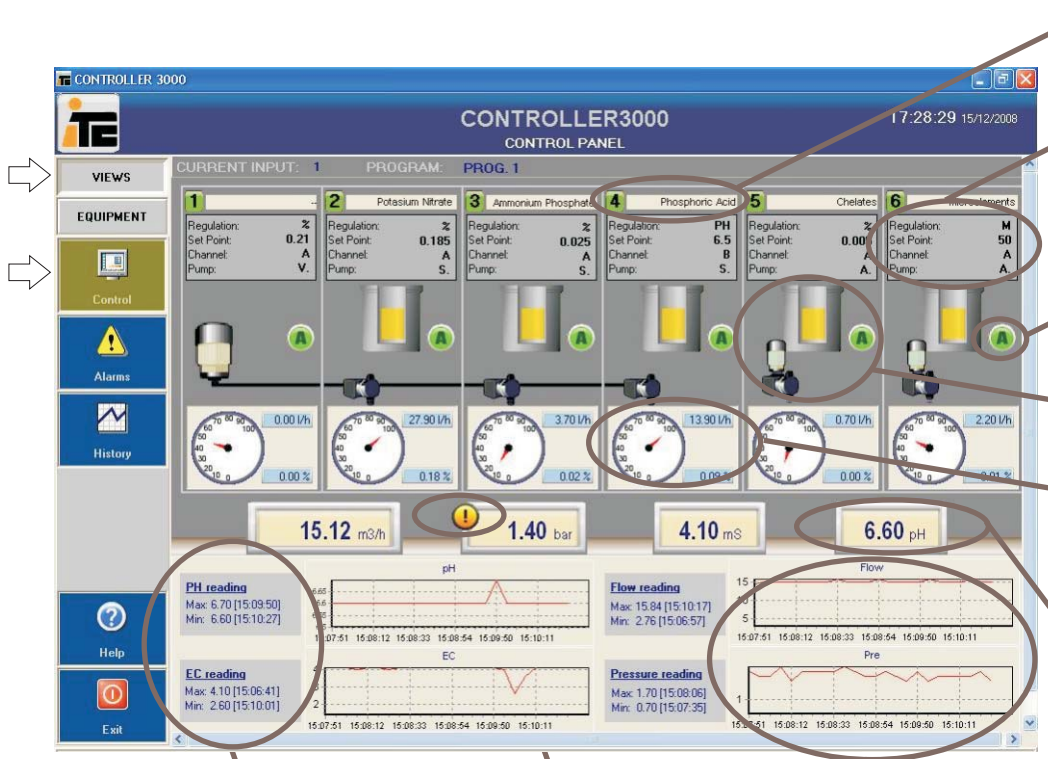
-When there is a Control Output configured as V, and it is programmed by Proportionality (%), Servos Outputs (S) must be programmed as % (Proportionality), PH, M (manual) or also a Servo Output as EC, but never as P (Relation of Proportion).

Errors referred to manual Programming (M)

-When there is a Control Output configured as V, and it is programmed as manual (M), Servo Outputs (S) must be programmed as M (manual) or PH.

6.1.CONTROL PANEL

MENU: VIEW>Control.
This scren shows the Controller 3000 situation with his constant readings of his values.



Number of each output with the product that it doses.

Programming assigned to each output (Regulation, Set Point, activation channel, Type of pump..

Activated channel (A/B)

Type of pump associated with the output.

Percentage of the pump

Current readings of parameters (flow, Pressure, Conductivity, and acidity (pH)).

Lowest and highest readings, and time, of the pH, flow, Conductivity, and Pressure parameters.

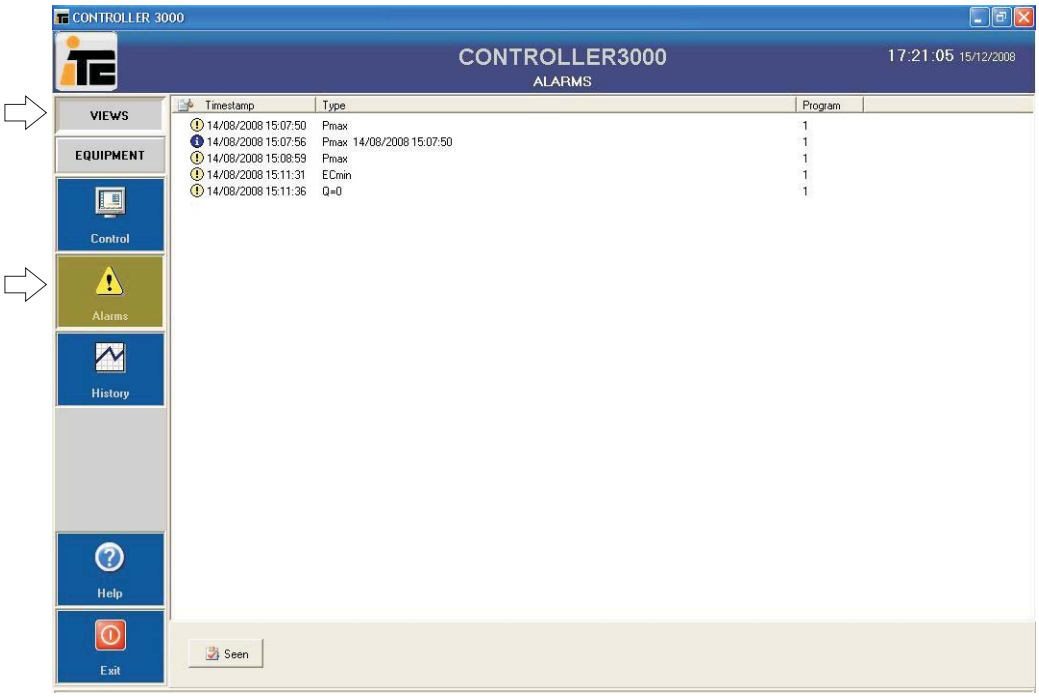
Alarm warning, only disappears when selected with the mouse.

Dynamic graphs, show values through time of each parameter (pH, flow, EC and Pressure). Select them with the mouse to zoom them.

6.2.ALARMS CONSULTING

MENU:VIEW>Alarms.
It shows a list with alarms, date, time, alarm type and program working.

There are two different symbols with alarms:
A yellow sign with a circle, means an alarm.
A blue sign with an **i** sign of information, means the user has detected the alarm, and with the mouse has cancelled the alarm sign of the screen.

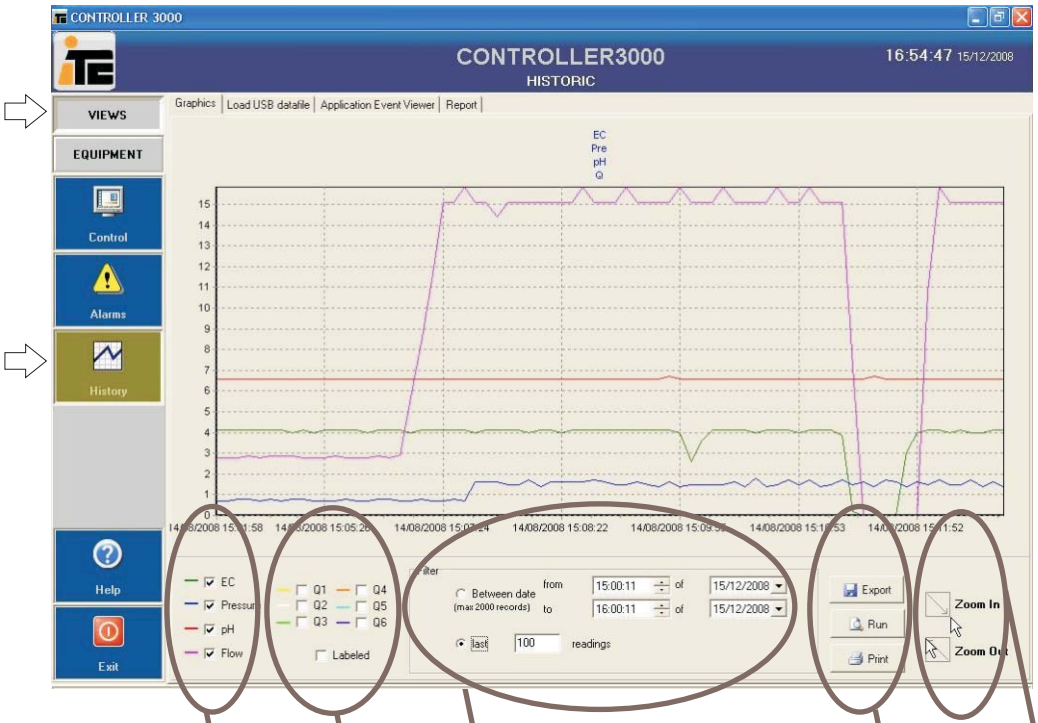


The button Seen deletes the alarms on the screen, not of the history.

6.3. HISTORICS CHECK

6.3.1. EVOLUTION GRAPHICS

MENU: VIEW>Historical
In the graphics section:



Explanatory image to zoom out and in the image of the graph.
To zoom out the image, select a top left point with the cursor of the mouse, and select the area to see.
To zoom in, select the low right point with the mouse, and then a top left point.

Select the registers to see.

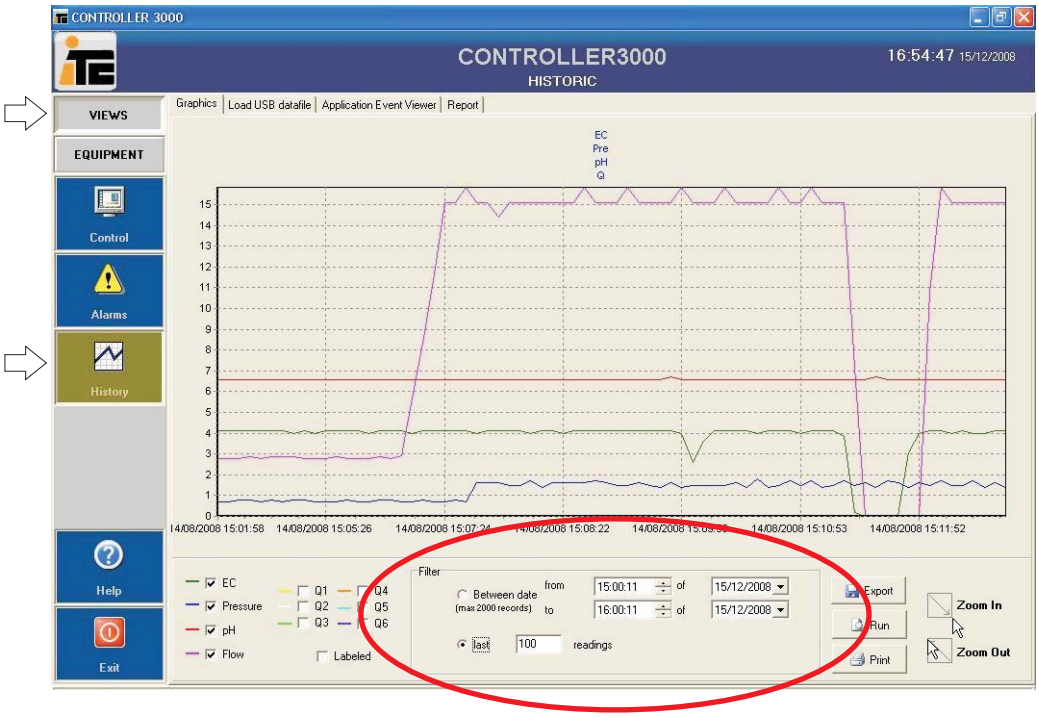
Select the parameters to see.

Select the flow of every pump to see. The selection of Labelled adds information about the graph.

To export: It exports to a datasheet file.
To see: It updates the graph with the information requested.
To print: Prints the information.

6.3.2. TO EXPORT LAYOUT SPREADSHEET.

MENU: VIEW>Historical.
In the graphics section:



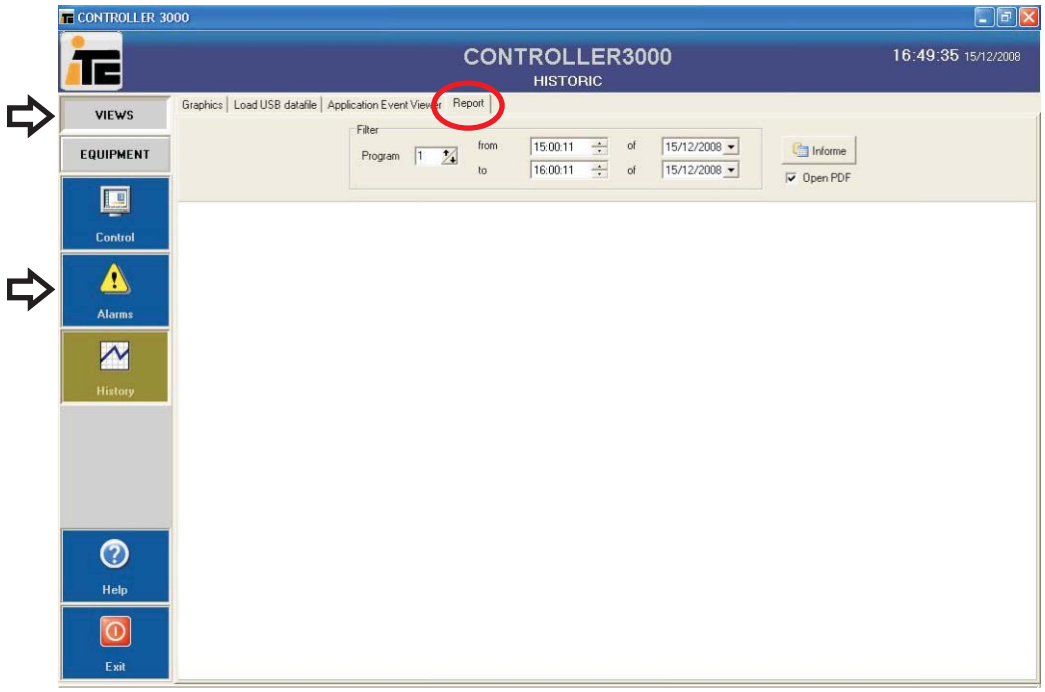
Select data to export and select See to show the information on the screen. Once on the screen, select export to export this information to a datasheet.

Controller 3000 stores information even when it is not dosing (the first 3 lines of program 0). When it happens, flow, pH, EC, and water pressure values are obtained, with the output dosing parameters at zero.

	CONTROLLER	SECTOR	TIM	Q	PH	EC	P	Q1	Q2	Q3	Q4	Q5	Q6	ALARM
2	65535	0	14/08/2008 15:01	2,759	6,6	4,1	0,7	0	0	0	0	0	0	
3	65535	0	14/08/2008 15:02	2,759	6,6	4,1	0,7	0	0	0	0	0	0	
4	65535	0	14/08/2008 15:02	2,759	6,6	4,1	0,8	0	0	0	0	0	0	
5	65535	1	14/08/2008 15:04	2,89	6,6	4,1	0,8	0	5,2	0,7	3	0,1	2,2	
6	65535	1	14/08/2008 15:04	2,759	6,6	4,1	0,7	0	5,1	0,6	3	0,1	2,2	
7	65535	1	14/08/2008 15:04	2,89	6,6	4,1	0,8	0	5,1	0,6	3	0,1	2,2	
8	65535	1	14/08/2008 15:05	2,89	6,6	4,1	0,7	0	5,2	0,7	3	0,1	2,2	
9	65535	1	14/08/2008 15:05	2,89	6,6	4	0,8	0	5,2	0,7	3	0,1	2,2	
10	65535	1	14/08/2008 15:05	2,759	6,6	4,1	0,8	0	5,1	0,6	3	0,1	2,2	
11	65535	1	14/08/2008 15:05	2,759	6,6	4	0,7	0	5,1	0,6	3	0,1	2,2	
12	65535	1	14/08/2008 15:05	2,759	6,6	4,1	0,7	0	5,1	0,6	3	0,1	2,2	
13	65535	1	14/08/2008 15:05	2,89	6,6	4,1	0,7	0	5,2	0,7	3	0,1	2,2	
14	65535	1	14/08/2008 15:05	2,759	6,6	4,1	0,8	0	5,1	0,6	3	0,1	2,2	
15	65535	1	14/08/2008 15:05	2,759	6,6	4,1	0,7	0	5,1	0,6	3	0,1	2,2	
16	65535	1	14/08/2008 15:06	2,759	6,6	4	0,7	0	5,1	0,6	3	0,1	2,2	
17	65535	1	14/08/2008 15:06	2,89	6,6	4,1	0,8	0	5,2	0,7	3	0,1	2,2	
18	65535	1	14/08/2008 15:06	2,759	6,6	4,1	0,8	0	5,2	0,7	3	0,1	2,2	
19	65535	1	14/08/2008 15:07	2,922	6,6	4,1	0,7	0	5,1	0,6	3	0,1	2,2	
20	65535	1	14/08/2008 15:07	5,684	6,6	4	0,7	0	5,5	0,7	3	0,2	2,2	
21	65535	1	14/08/2008 15:07	8,314	6,6	4,1	0,8	0	15,3	2	7,6	0,4	2,2	
22	65535	1	14/08/2008 15:07	11,351	6,6	4,1	0,7	0	19	2,5	9,5	0,5	2,2	
23	65535	1	14/08/2008 15:07	15,12	6,6	4,1	0,7	0	27,5	3,7	13,7	0,7	2,2	
24	65535	1	14/08/2008 15:07	15,12	6,6	4,1	0,8	0	27,9	3,7	13,9	0,7	2,2	
25	65535	1	14/08/2008 15:07	15,84	6,6	4,1	0,7	0	29,2	3,9	14,6	0,7	2,2	
26	65535	1	14/08/2008 15:07	15,12	6,6	4	1,6	0	27,9	3,7	13,9	0,7	2,2	
27	65535	1	14/08/2008 15:07	15,12	6,6	4,1	1,6	0	27,9	3,7	13,9	0,7	2,2	
28	65535	1	14/08/2008 15:07	14,4	6,6	4,1	1,6	0	26,6	3,5	13,3	0,7	2,2	Pmax
29	65535	1	14/08/2008 15:07	15,12	6,6	4,1	1,5	0	27,9	3,7	13,9	0,7	2,2	Pmax
30	65535	1	14/08/2008 15:08	15,12	6,6	4,1	1,5	0	27,9	3,7	13,9	0,7	2,2	Pmax
31	65535	1	14/08/2008 15:08	15,12	6,6	4	1,7	0	27,9	3,7	13,9	0,7	2,2	Pmax
32	65535	1	14/08/2008 15:08	15,12	6,6	4,1	1,4	0	27,9	3,7	13,9	0,7	2,2	Pmax

6.3.3.TRACEABILITY REPORT

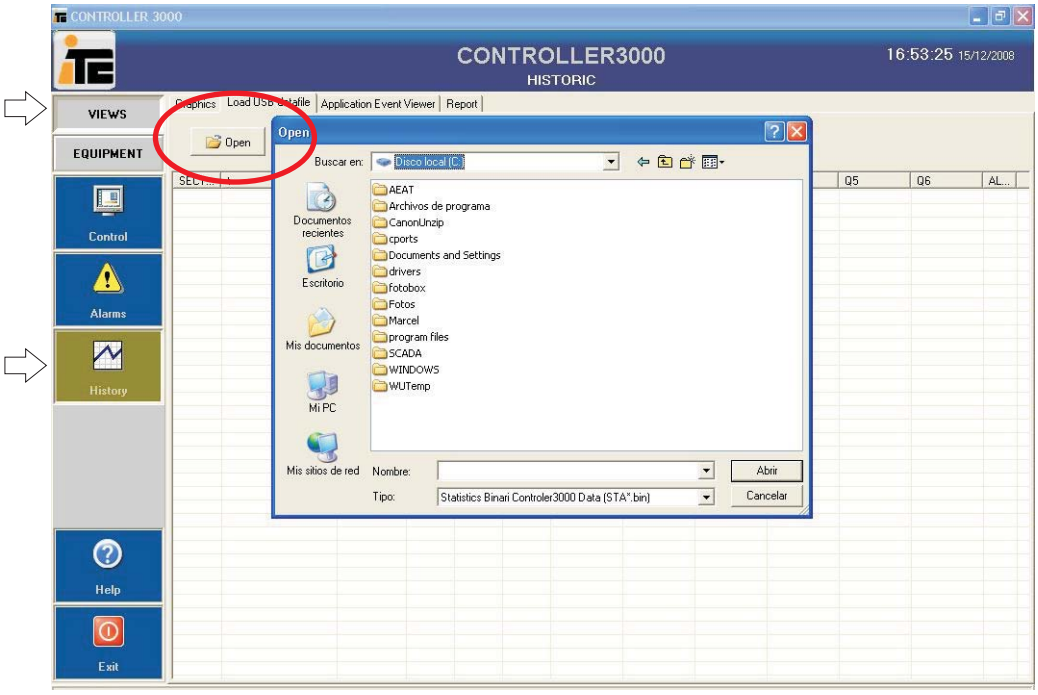
In Report section, it is possible to select a period of time, and a program.Selecting Informe a PDF file will be created with all the information referred to the program selected in this period of time.



There are some samples of traceability reports on the following pages.

6.3.4.IMPORT INFORMATION FROM FILE. PORT USB1.

MENU:VIEWS> Historical.
To import a file select Open. The file is from Controller 3000 using the USB port. Once Open is selected, it is necessary to select the file and press open, as it is shown in the image.



Selecting export to file before opening the file, when the file is open a datasheet file is generated automatically.

6.3.5. FROM CONTROLLER 3000.

HISTORICAL

Controller 3000 has 1Mb ofl storage memory, which can store sensor values and products dosed.
Options in History menu can configure Sample Frequency, download Data to a USB Memory Device (pendrive), and check the Records of each Fertigation Programm on the Screen.

SAMPLE FREQUENCY

Change the Sample Frequency by pressing +/-.
In saving Period, the maximum Time stored for the introduced Sample Frequency is showed.
Validate pressing ENT.

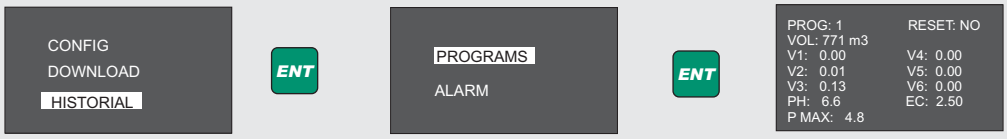
SAMPLE DOWNLOAD IN PENDRIVE

Insert the pendrive in the USB1 Port and press ENT to start the Download. Some minutes are required.

Internal memory will keep latest values. When the memory is full, the oldest Value will be overwritten.

There is the option to download just data not transferred previously.

HISTORICS DATA CHECK



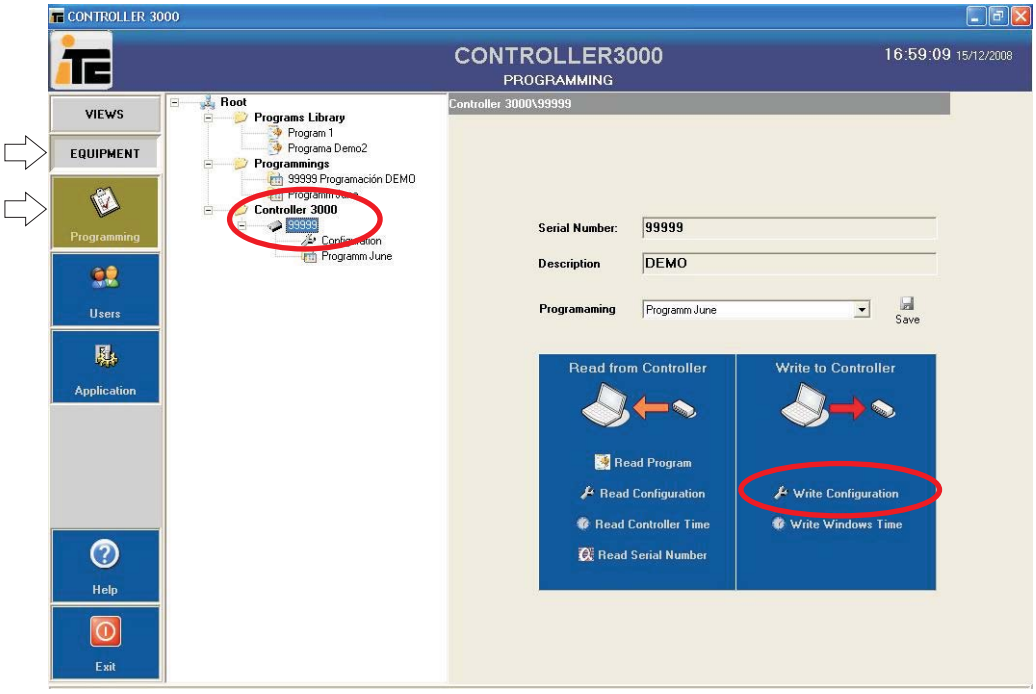
To change program number, press +/- and the information of the selected program will be displayed:
Accumulated volum of water and each product in m3.
PH and EC from last reset.
Maximum pressure reached from last reset.

Shows the last 5 registered Alarms: Date, Time, Parameter and Program Number.

6.4. COMUNICATION PC - CONTROLLER 3000.

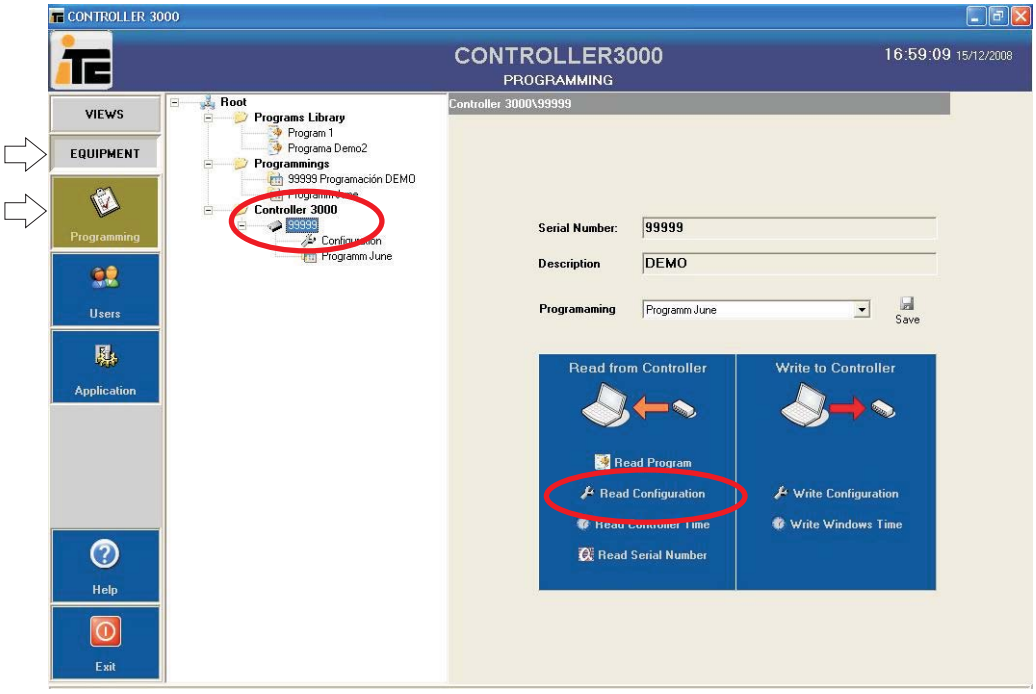
6.4.1. IMPORT INFORMATION FILE FROM USB2 PORT.

MENU:EQUIPMENT> Programming.
Select Controller 3000 using its serial number. Write configuration windows will be shown. From the option Write Configuration, it sends the configuration of the computer to Controller3000 overwritting its configuration.



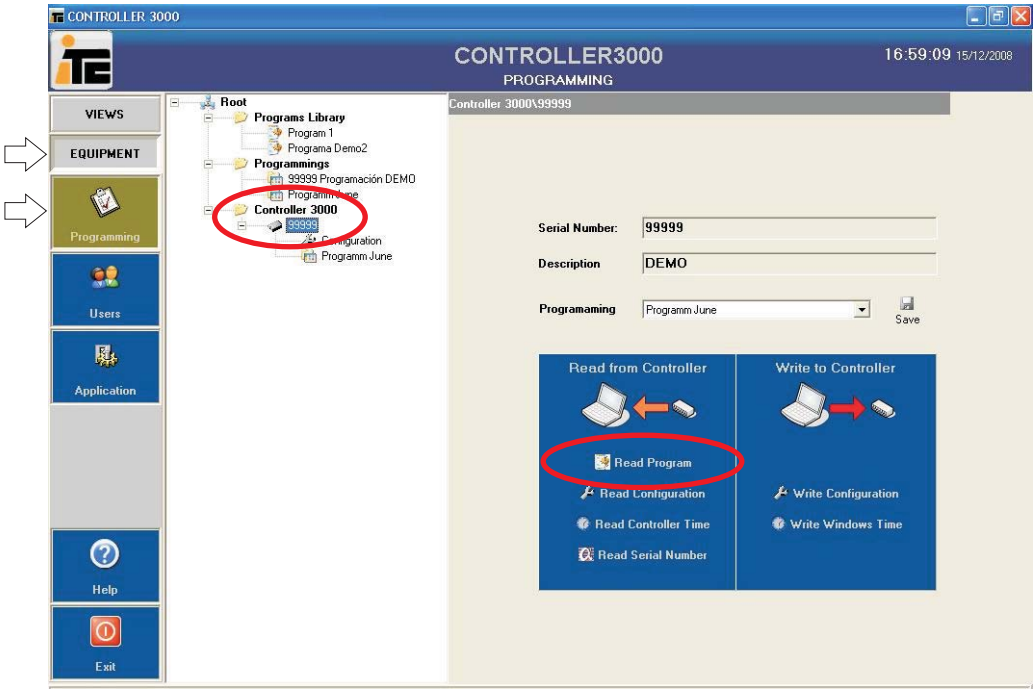
6.4.2. READ THE CONFIGURATION OF THE CONTROLLER 3000 THROUGH USB2 PORT.

MENU:EQUIPMENT> Programming.
Select Controller 3000 using its serial number. Read configuration windows will be shown. From the option Read Configuration, Controller 3000 sends the configuration of the Controller3000 to the computer (Scada).



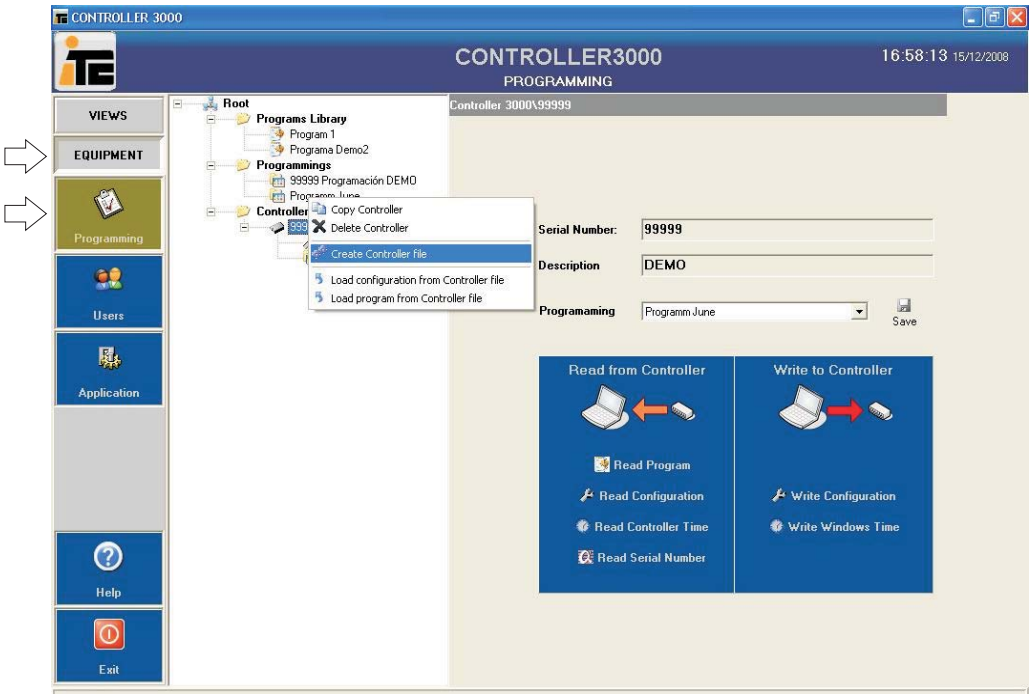
6.4.3. READ THE CONFIGURATION OF THE CONTROLLER 3000 ROUTE PORT USB2.

MENU:EQUIPMENT> Programming.
Select Controller 3000 using its serial number. Read Program windows will be shown. From the option Read Program, select the program number required, and Controller 3000 sends the configuration of the program to the computer (Scada). To name the program is required, and it will be available in the programs library.



6.4.4.GENERATE CONFIGURATION FILE FROM PC.

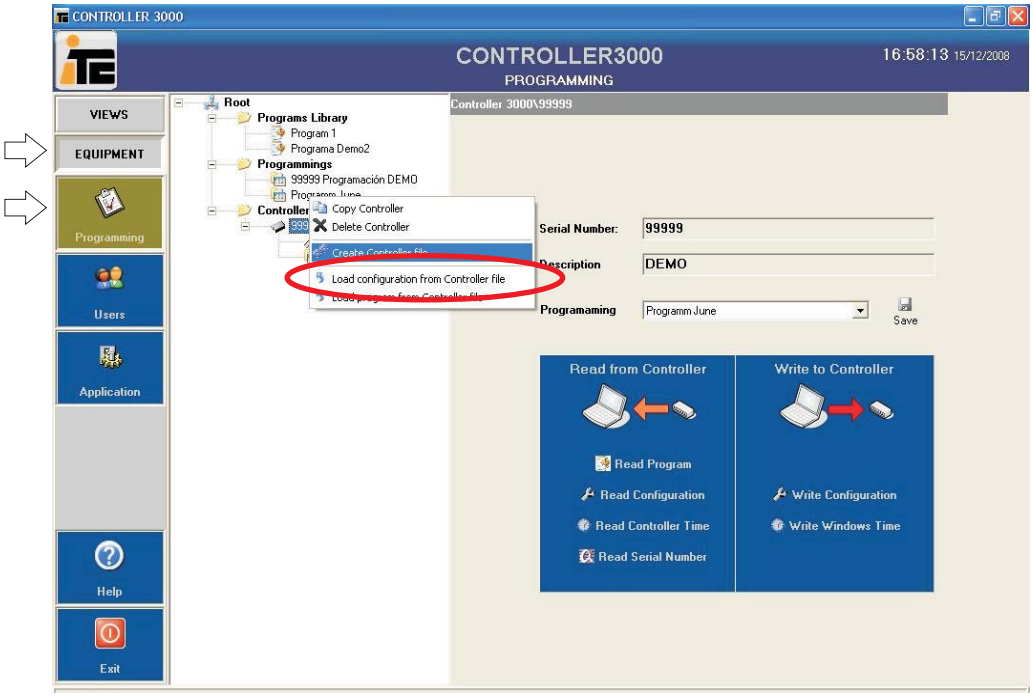
MENU:EQUIPMENT> Programming.
Select Controller 3000 using its serial number , to see the generation of files menu select again Controller 3000 with the right button of the mouse. Select Generate Controller file. The file must be copied in a device of USB memory (pendrive), and import it in Controller 3000 to have the new configuration.



6.4.5. LOAD CONFIGURATION FILE IN THE PC.

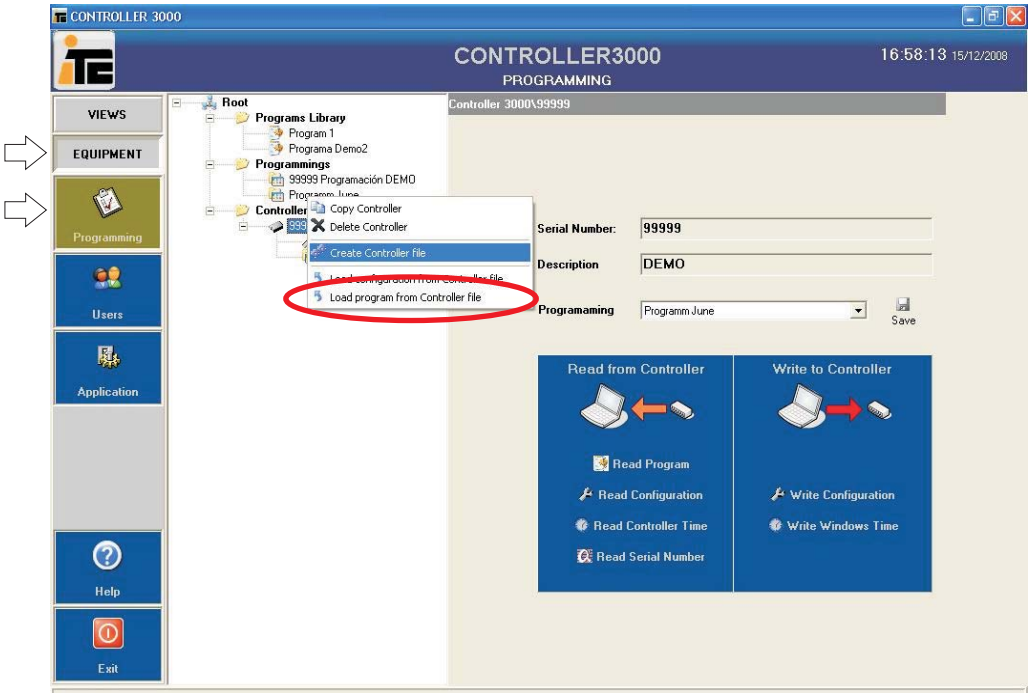
MENU:EQUIPMENT> Programming.

Select Controller 3000 using its serial number, to see Load Configuration file menu select again Controller 3000 with the right button of the mouse. Select Load Configuration from file Controller. A window is opened to select the file, which has the extension .BIN. This file is generated in Controller 3000, and it is exported to a USB memory device (pendrive), from this device of memory it is possible to import it to the Scada program.

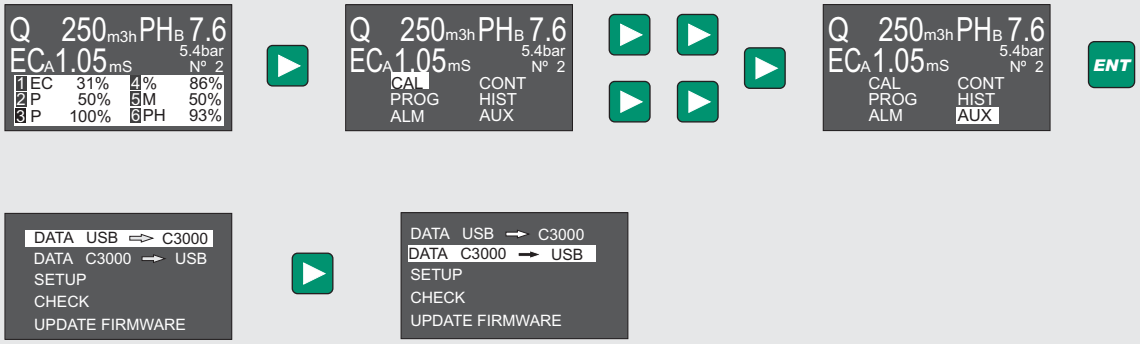


6.4.6. LOAD PROGRAM IN THE PC.

MENU:EQUIPMENT> Programming.
Select Controller 3000 using its serial number, to see Load Program from Controller file menu select again Controller 3000 with the right button of the mouse. A window is opened to select the file, which has the extension .BIN. This file is generated in the Controller 3000, and it is exported to a USB memory (pendrive). To import, each program number is required.

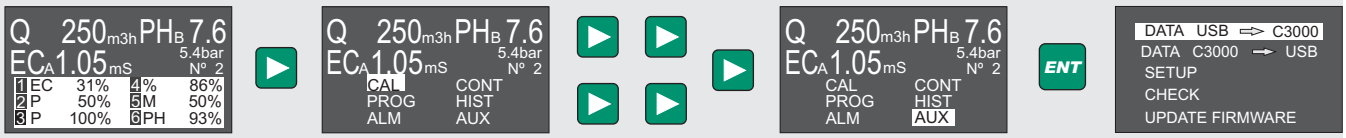


6.4.7.GENERATE CONFIGURATION FILE FROM THE CONTROLLER 3000. PORT USB1.



Option of downloading the Configuration and Programming to a pendrive.

6.4.8. LOAD CONFIGURATION FILE IN THE CONTROLLER 3000. PORT USB1.



Option to load the Configuration and Programming from a pendrive.

7. CONTROLLER 3000 SCADA TECHNICAL FEATURES.

Power supply: 230VAC (+/-20%) 50/60Hz
Protection: IP55
Working temperature: 0 -45ºC
Max relative humidity: 95% (without condensation)

Inputs:
-Pulse input flow optically insulated for high-frequency flowmeters (pallets or electromagnetic)
- EC: Input optically insulated for ITC conductivity sensor
- PH: Input optically insulated for connecting a pH sensor
- Pressure: 4-20mA analogue input for a pressure transmitter
- Activated area inputs (Controller 3000-6/12): 12-24 V AC/DC digital inputs

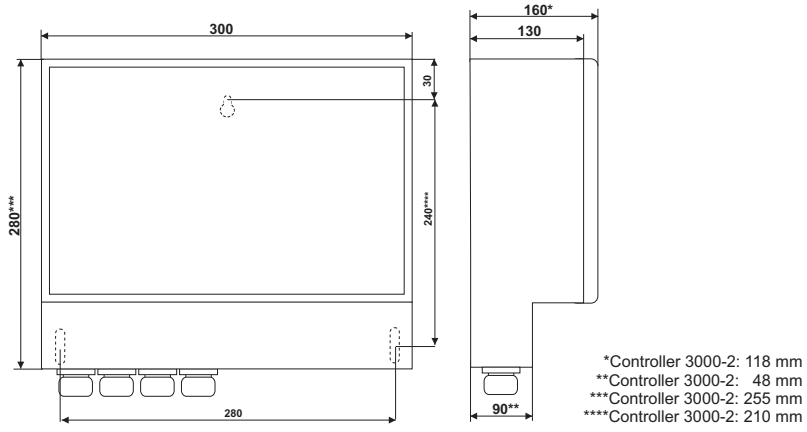
Outputs:
- 6 outputs 4-20mA for dosing pump.
- Flow alarm output: Relay output NO. 24 VAC -1A max
- EC alarm output: Relay output NO. 24 VAC -1A max
- PH alarm output: Relay output NO. 24 VAC -1A max
- Pressure alarm output: Relay output NO. 24 VAC -1A max

Communications:
-USB1: for USB Memory Device (pendrive).
-USB2: for permanent connection to PC.

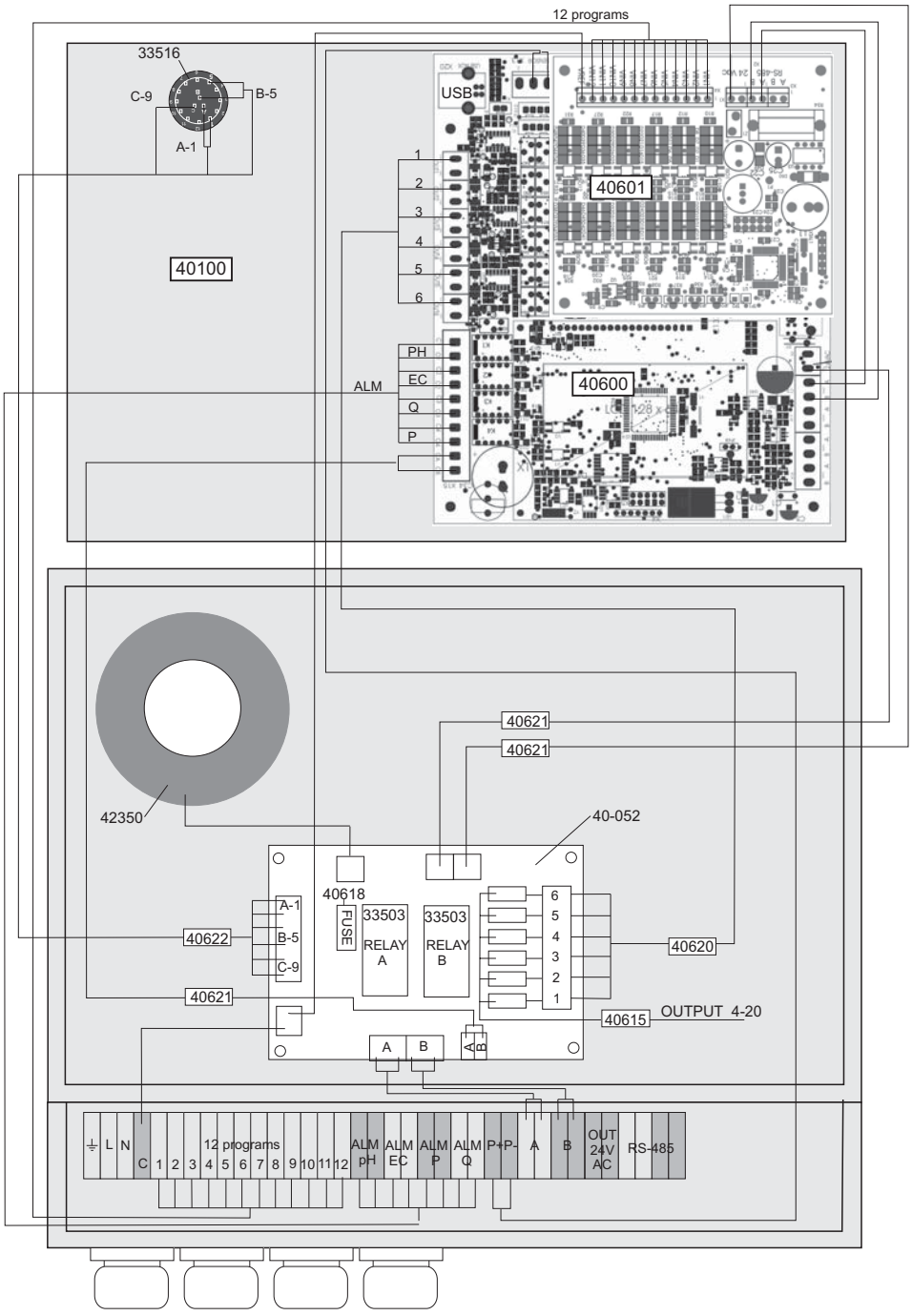
Do not use simultaneously the USB1 and USB2 Ports. Before connecting a pen drive to USB1 Port, disconnect USB2 port.

Do not use Ports USB1 and USB2 simultaneously. Disconnect Port USB2 before connecting a pendrive to Port USB1.

Size:



8. MAINTENANCE CONTROLLER 3000 SCADA.

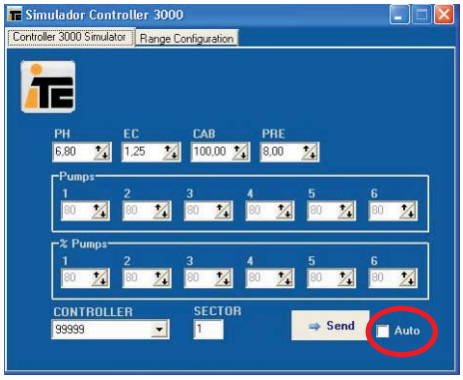


CODE	DESCRPTION	UNITS
33503	Relay 24Vac two circuits	2
33516	Rotative switch	1
40100	Frontal Controller 3000	1
40600	C3000 electronic board	1
40601	Electronic card 12 inputs module C3000	-/1
40615	Cable C3000 4-20 c-c5p	2/6
40618	Fuse 3A 25x5mm	1
40620	Cable 6 wires 90º female terminal	1
40621	Cable 2 wires 90º female terminal	3
40622	Cable C3000 6x0,25x150 switch	1
42350	Transformer toroidal 220-24v 80va	1
Assembly		
40-050	Electronic card C3000 assembly	0
40-051	Electronic card C3000 - 12 inputs assembly	-/1
40-052	Connection card C3000 assembly	1

9. FREQUENT ASKED QUESTIONS

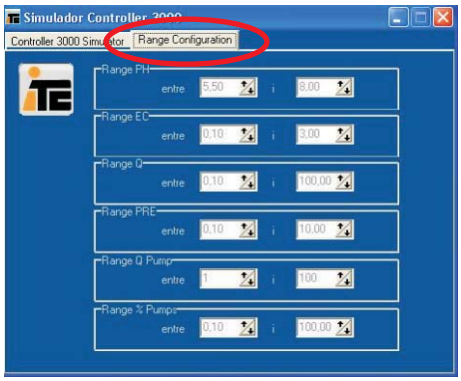
10. SIMULATOR.

Controller 3000 simulator works only with 99999 serial number Controller 3000. As its name suggests, the simulator makes it possible to emulate specific situations, without having the Controller 3000 connected to the computer.



Auto: Automatic generation according to the status defined in the “Range Configuration “ tab, the only valid values for this work method.

When Auto is not activated values are defined from this screen.
Values of pH, conductivity, flow, and pressure.
Values of the litres dosed for each of six possible pumps.
Percentage of product dosed.
"Send" option is used to update the introduced information, and always in “No Auto” mode.



Configuration of the limits of the random values generated for pH, conductivity, flow, pressure, pumps, and dosage percentage. This screen is only valid when the Auto option is activated.

Ed:02/11/11-An

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