

AGRÓNIC

2000

INSTRUCTION

MANUAL

VERSION 4

INDEX

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PRESENTATION

We wish to take this opportunity to thank you for the confidence in us which you have demonstrated in expressing interest or acquiring the AGRÓNIC 2000.

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

This manual will explain the specification of the equipment as well as its installation and use.

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

1. BASIC FUNCTIONAL DESCRIPTION

This equipment is for the control of the irrigation system, fertilization, fertilizer mixing, pumps and the cleaning of the filters, with the detection of malfunctions and visualization of data.

There are models with 6, 12, 18, and 26 independent outlets plus 5 signal inputs.

Programmable for time or volume.

IRRIGATION

The system has a capacity for 31 independent or sequential programs.

Programming can be for daily or weekly action or with several activations every certain period of time on the program number 1.

Up to 8 sectors can be operated simultaneously.

Grouping sectors together to simplify programming.

Also manual activation and deactivation of programs, outlets and filters.

Irrigation program starting by input connected to an external sensor, being able to do an irrigation sequence to be disconnected in manual mode.

FERTILIZATION

The equipment can be configured from 0 to 4 fertilizers, in separate tanks, with the following configuration possibilities:

- post-irrigation minutes.
- separation minutes between fertilizers.
- fertilizers pump, when there are more than one fertilizer tanks.
- mixers for each fertilizer tanks.
- pre-mixing minutes.
- continuous, intermittent or stopped mixing while it fertilizers.

The value of application of each fertilizer can be programmed independently for each program.

The fertilizers can be applied in "series" one after the other with only one injector, and if it is working by volume only one counter.

Also can be applied in "parallel", several fertilizers at once, with one injector for everyone, and always by time.

PUMPING

The system can govern an electro-pump or a general valve. To avoid problems of the water hammer in the pump, special temporization sequences are provided between the opening of the sector valves and the starting of the pump, and also between its stopping and the closing of the valves. The same applies to the changes of sector.

In diesel engine (optional) the unit realize a complete control, with several start attempts, pre-heating, automatic stop, malfunction detection, etc.

CLEANING OF FILTERS

This can be configured from 0 to 9 filters, with variable washing time. Pause time between filters.

The washing sequence can be started by the pressure difference and/or the time or volume of water circulation.

Irrigation sectors can be stopped while filters are being cleaned.

While the cleaning is carried out, the fertilization is stopped.

ALARMS

By means of corresponding sensors, the equipment detects malfunctions and acts accordingly, on the basis of pre-established parameters, meanwhile leaving a visual record (the input signal may be delayed).

The clock can be set to stop or not, in case of failure of the electricity supply.

There are five input signals, which can be configured for the following functions: irrigation volumetric counter, fertilizer volumetric counter, differential pressure gauge of filter cleaning, temporary malfunction, general malfunction, conditional stop and program starting.

VISUALIZATION

Complete visualization in 40 character alphanumeric LCD screen and a 14 function key waterproof keyboard. All information concerning one program is displayed on the screen.

You can consult, correct and erase by programs. While a program is being executed, all information concerning it is being displayed.

It controls and registers electricity supply cuts, simultaneous working of more than eight sectors, the overlap of two or more programs with fertilizer, external malfunctions with general or temporary stop, etc.

There are counters for the totals of the units of water and fertilizer application for each sector, as well as another general counter for water and fertilizers.

MODELS AND VERSIONS

- Models for 6, 12, 18 and 26 outlets.
- Version with power 220 Vac and outlets 24 Vac.
- Version with power 115 Vac and outlets 24 Vac.
- Version with power 12 Vdc and outlets 12 Vdc.
- Option for power at 12 Vdc, 220 Vac and 115 Vac and outlets at 12 Vdc and 24 Vac, respectively, for generating sets.
- Equipment version provided in a box with transparent front cover.
- Equipment version prepared to building-in a cupboard or desk.
- Option of automatic start of engine or diesel generating set.
- Option for two independent pumps.

- Option with outlets for latch valves (pulses) and minimum electric consumption. Due to its low electric consumption of the equipment and its electrovalves, this version is very suitable for installations which work with a battery and which have not got diesel engines or solar panels.
- Optional distance management via SMS messages, with modem GSM/GPRS included. Also, optional links to a PC or an irrigation network program.

WARRANTY

The AGRÓNIC 2000 irrigation controller meets all the norms set by the EC.

The products created by PROGRÉS enjoy a two-year warranty against all manufacturing defects.

Compensation for direct or indirect damage caused by the use of the equipment is excluded from the warranty.

2. INTRODUCTION TO THE MANUAL

AGRÓNIC 2000 is a complete irrigation system whose capacity and specifications the user and installer should know in order to get the most out of it. For this, we recommend a detailed reading of this manual.

The most important chapters are:

- 2 Introduction
- 4 Installation
- 6 Parameters
- 7 Use

The INTRODUCTION is where you are at this moment and we recommend a thorough reading both for installers and users.

The INSTALLATION is the chapter directed at the installer who has to connect the equipment to the other elements, which comprise the automatic irrigation system.

PARAMETERS is the chapter which explains how to configure and set up the system for the particular needs of each installation. This is work for the installer but it is also interesting for the user in case any parameters have to be modified after the installation of the equipment.

The USE is the chapter aimed basically at the user where all the instructions for programming will be found.

Start reading the chapter which best suits you, according to your condition of installer or user.

Before installing the unit, it should be checked to see that it corresponds with your requirements.

This can be done by checking that the identification labels correspond with the desired model.

To decide on the necessary model (number of outlets), the irrigation sectors needed, the number of fertilizers, mixers, fertilizer pump and filters which are to be used, have to be added up.

Examples:

- If we have 2 irrigation sectors, 1 fertilizer and 2 filters, the model 2006 is sufficient ($2+1+2=5$).
- If we have 3 sectors, 2 fertilizers, 1 mixers and 2 filters, the model 2012 is needed ($3+2+1+2=8$).

The equipment has an alphanumeric screen with 40 characters, which shows: the questions that the controller asks the user, his answers, the stored parameters and programs, the current performances, the applied water and fertilizer quantities, the malfunctions and incidents, etc.

It has also got a keyboard with 14 keys, which is used to access the equipment, to configure, program, correct, consult, erase, activate, deactivate, etc.

The keys from 0 to 9 should be pressed whenever it is necessary to enter a number.

The same keys also show the initials of the days of the week and they will be used whenever it is necessary to enter one day in the controller.

There are two keys with the words "YES" and "NO" which will be pressed, in a few cases, when one option or other has to be chosen (and when indicated on the screen).

There is also a key with an arrow which is used for moving fast through the sector numbers and programs as will be explained later.

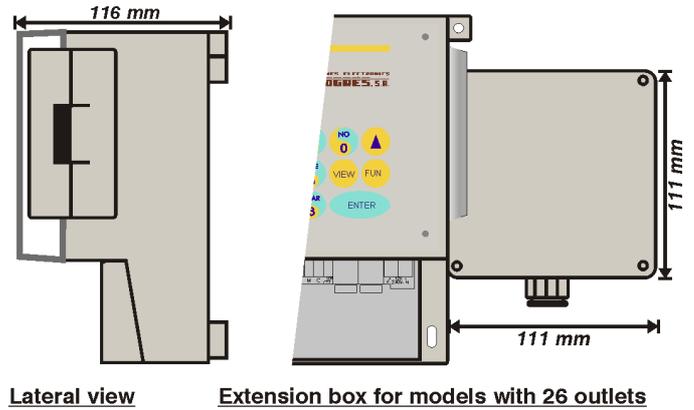
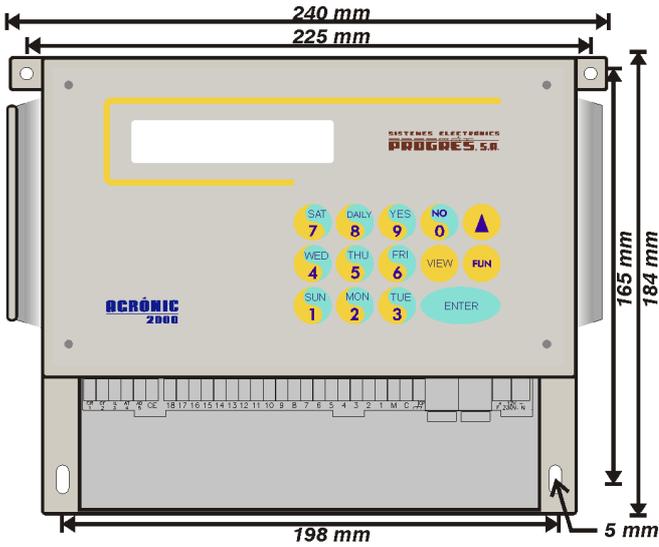
The "ENTER" key is used to confirm the validity of the data previously entered and shown on the screen with the cursor below it or displayed intermittently on the screen. This key is bigger as it is used constantly.

The "VIEW" key is used to consult anomalies stored in the controllers memory, the current state of the inputs/outlets, etc.

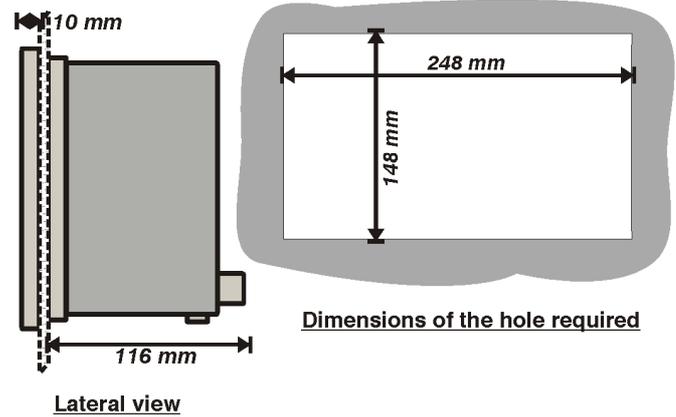
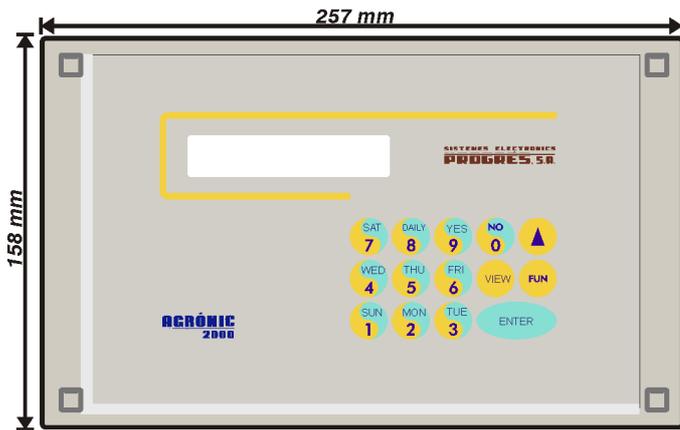
The "FUN" key is used for entering into the four basic functions of the controller: PROGRAMS (automatic control by means of the programs entered), MANUAL (control by manual orders to be carried out immediately), PARAMETERS (configuration of the equipment to the particular needs of the installation) and TOTALS (access to the internal counters for the time and volume of the water and the fertilizer applied).

3. DIMENSIONS

Model: "Mounting box"



Model: "Build-in"



4. INSTALLATION

4.1. PLACING THE UNIT

Place the unit at the right position and height. Avoid direct sun exposure, humidity, dust and vibrations.

Avoid proximity to any source of interference which could affect the correct working of the unit.

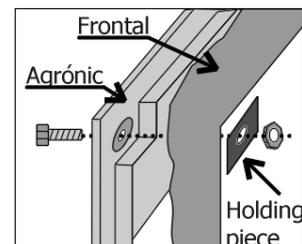
In the version with "box", the equipment is provided in a hermetically sealed box (IP65) with a transparent front cover for the keyboard/display and an opaque cover for the connection housing. In the model with 26 outlets, a second additional box is provided.

To maintain the isolation of the unit, it is essential to keep the panels closed, as well as to install cable glands at the cable outlets, which are provided with the equipment.

For the wall-mounting of the unit, there are two holed pieces in the upper corners.

There are also two more holes in the inside of the connection housing.

In the "built-in" model, a hole is to be done in the frontal part of the wall or desk, according to the measures in the section DIMENSIONS. It will be held with the screws at the corners, using the four pieces provided with the unit.

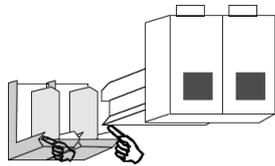


4.2. CONNECTION

The unit has to be installed following the prevailing regulations for electrical installations.

In the "box" model, the cable glands provided with the unit are to be installed, removing the relevant dies (this should be done with the connection cover in place and screwed to avoid possible breakage).

In the "built-in" model the terminals are placed at the back and they are the connector type. On placing the terminals check that they have been introduced in the guides, as it is shown in the figure.



It is advisable to connect the cables to the terminals with terminal connections, which are also included with the unit.

There is also a protection box for all the terminals, in case there is a risk of electrical sparks from storms entering the cables.

4.2.1. Supply to the equipment

Before connecting the unit, it is necessary to check its identification label where the characteristics of the power supply are to be found.

- Power supply at 220 Vac or for model at 115 Vac:
A 6 amp magnetothermic switch is to be included in the installation. It will be used as a disconnection device and it has to be placed near the unit and at an accessible place for the user.
It is recommendable to do this as directly as possible, avoiding that the same cable supplies other sections. Use cable of the H05VV-F type, 1mm².
A fuse (general fuse) and a varistor protect the mains input. The varistor might short-circuit the fuse automatically, on detecting an overload on the line (lightning, etc.); replace it with one of the same characteristics.
For unstable or fluctuating voltages use grid stabilizers.
If the unit is to be disconnected from the power line during several weeks, it is advisable to remove the bridge marked as "J4" (next to the battery) in the circuit placed behind the keyboard, and insert it again before connecting it to the power line.

- Power supply at 12 Vdc:
Check the polarity of the terminals.
Connect two direct cables from the battery to the equipment power (± 12) avoiding that those cables supply other units or elements.
If the battery is far away from the controller, use high section cables and make a reduction when entering the equipment.
The input is also protected with a fuse and a varistor.
Avoid, if there is a diesel engine working, that this one works without the battery, as the alternator

would increase the equipment power tension momentarily.

To replace the fuse, half turn the fuse cover and insert another of the same value.

4.2.2. Connecting the earth terminal

The "built-in" model has a terminal screw to connect the protection earth terminal, and which is placed near the power terminals.

In the "box" model, a protection terminal is not needed, but it has got a box terminal marked **CP** to be connected to the earth terminal.

Both the earth and box terminals are used to protect the unit by directing all electrical sparks produced by the internal gas discharger to the earth. These sparks can come in through the outlet cables.

4.2.3. Connecting inputs

The contacts that join the inputs with the input common, have to be normally open and free of voltage.

The inputs are optically insulated from the internal circuitry, except in the version with power supply at 12 Vdc and latch outlets.

There are five inputs marked as **E1 E2 E3 E4 E5**, plus the input common marked as **CE**.

Every input can be configured for one of the following functions:

- **IC Irrigation counter**. Working by volume, connect to this input the volumetric counter with pulse input of the irrigation water.
- **FC Fertilizer counter**. Working by volume, connect the fertilizer counter to this input.
- **SC Start cleaning**. If there is any, connect the differential pressure gauge to start the cleaning of the filters; joining the input to the input common (CE), and after a fixed temporization of 30 seconds, the cleaning is started, if there is any irrigation program working.
- **TM Temporary malfunction**. The union of this input with the common CE activates the temporary malfunction ("temporary malfunction" is that which produces a stopping of the irrigation program being carried out and which reactivates the system with the beginning of the next program). There is a programmable delay for the detection of this malfunction.
- **GM General malfunction**. Joining this terminal with the common CE, it activates the general malfunction ("general malfunction" is that which produces the complete stopping of the system until it is reactivated manually by the user). There is a programmable delay for the detection of this malfunction.
- **CS Conditional stop**. The union of this input with the common will interrupt the program being carried out. On taking away the union of the input with the common, working is restarted at the

same units where it stopped. There is a programmable delay for this detection.

- **PS Program start.** A program will be activated by external order when this input is joined to the common, the programmed delay has gone by and the clock has changed minute. The input can not start again until the program or its sequence of programs has finished.

4.2.4. Connecting outlets

Connect the solenoids, relays, etc. between the common of outlets "C" and the corresponding outlet.

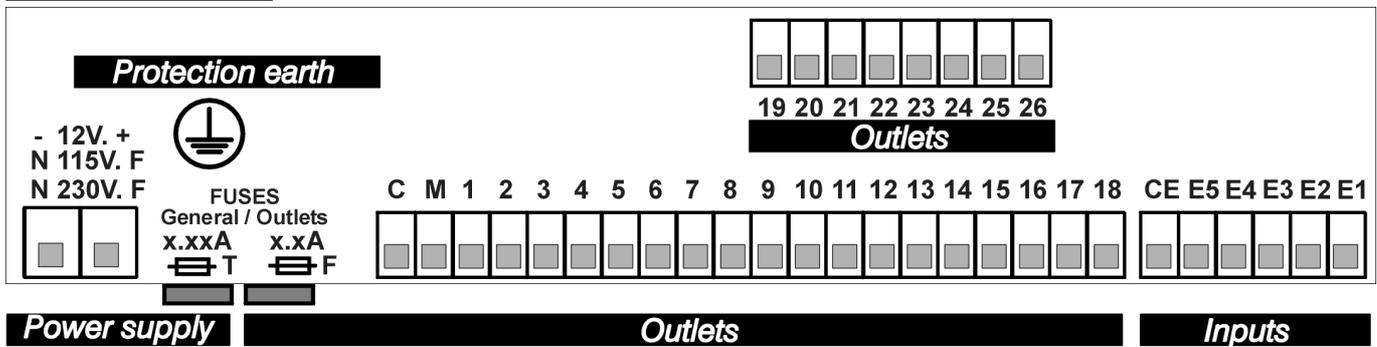
Do not surpass the charge per outlet and common. In case of more intensity, insert external re-lays.

The "outlet fuse" protects from overloads and short-circuits. To change it, just half turn the cover of the fuse holder, take it out and replace it with a similar one.

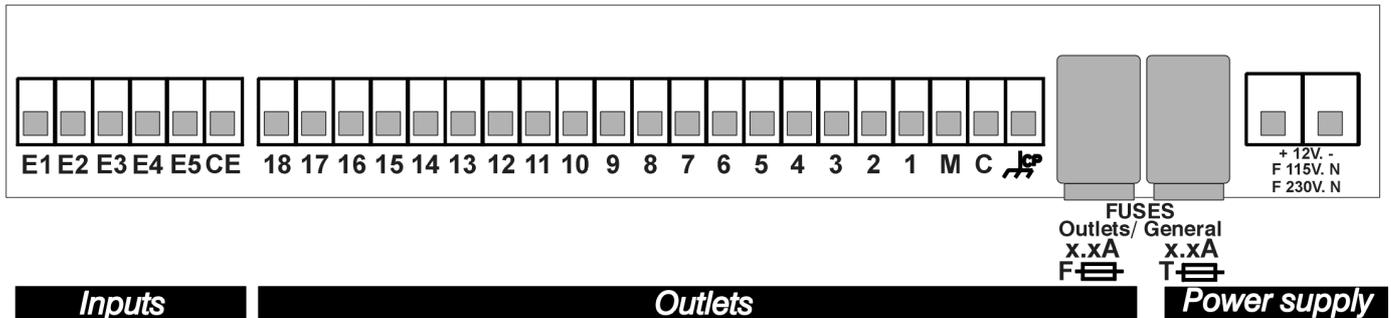
The outlets are isolated from the interior circuitry by relays and protected by a varistor in each one.

- **C Outlet.** Outlet common.
- **M Outlet.** It belongs to the pump or general valve, and it is activated whenever an irrigation program is being carried out.
- **Outlets 1 to 6, 12, 18, 26,** according to model. Everyone of them corresponds to an irrigation sector or a general outlet such as fertilizers, mixers, fertilizer pump and filters, which are automatically assigned to an outlet number in the "FUNCTION" - "PARAMETERS" - "VARIOUS" section.

Model "Build-in"



Model "Mounting box"



Outlet assignation tables according to unit models.

<i>Model</i>			
<i>Outlets</i>	Input 230 V or 115 V, Outlets 24 V	Input 12 V, Outlets 12 V	Input 12 V, Outlets 12 V Latch Option 3 cables
 CP	Box terminal, connected to earth (Built-in model)		Stop common
C	Outlet common 24 V.	Outlet common 12 V.	Start common
M	Pump/General valve		
1-6	Irrigation sectors and general outlets, according to configuration.		
1-12			
1-18			
1-26			

<i>Model</i>		
<i>Outlets</i>	Input 12 V, Outlets 12 V. Diesel version	Input 12V/230V or 115V, Outlets 12V/24V. Diesel version with double tension
 CP	Box terminal, connected to earth (Built-in model)	
C	Outlet common 12 V	Outlet common 24 V
M	Engine starter, position 15/54 of the engine key (12 V)	
1-6	6 = Start, 5 = Stop (Pre-heating / Electro-pump)* Rest = Sectors and general outlets	6 = Start (12 V), 5 = Stop (12 V) (Pre-heating** (12V) / Electro-pump (24V)) Rest = Sectors and general outlets (24 V)
1-12	12 = Start, 11 = Stop (Pre-heating / Electro-pump)* Rest = Sectors and general outlets	12 = Start (12 V), 11 = Stop (12 V) (Pre-heating** (12V) / Electro-pump (24V)) Rest = Sectors and general outlets (24 V)
1-18	18 = Start, 17 = Stop (Pre-heating / Electro-pump)* Rest = Sectors and general outlets	18 = Start (12 V), 17 = Stop (12 V) (Pre-heating** (12V) / Electro-pump (24V)) Rest = Sectors and general outlets (24 V)
1-26	26 = Start, 25 = Stop (Pre-heating / Electro-pump)* Rest = Sectors and general outlets	26 = Start (12 V), 25 = Stop (12 V) (Pre-heating** (12V) / Electro-pump (24V)) Rest = Sectors and general outlets (24 V)

* When any outlet it is used for pre-heating and/or electro-pump, the outlet number occupied will be the afterward of start and stop outlet of the determined model.

** The pre-heating outlet for equipment with dual voltage option is not standard and must be indicated by the installer when the equipment is purchased.

4.3. GUIDE TO MALFUNCTIONS

- Valves do not work:
 - Check the state of the fuses.
 - Check if any cable is disconnected or cut.
- The equipment does not work properly:
 - a) There is a black stripe on the screen:
 - o Disconnect the power supply of the unit.
 - o Remove the "J4" bridge (battery bridge) for one minute.
 - o Connect the power supply.
 - o Replace the "J4" bridge.
 - o Finally assemble the equipment.
 - b) The screen is completely blank:
 - Check if the power reaches the equipment.
 - Check the state of the fuses.
- The unit fuses the general fuse constantly:
 - The protector of overloads is short-circuited, it is necessary to replace it. This happens when the unit is supplied at 380V, for example, or there is an overload due to a storm and the "general fuse" is superior to the one indicated in the section about technical characteristics.

4.4. ADDITIONAL INFORMATION FOR THE INSTALLATION OF OPTIONS

4.4.1. Diesel version

When connecting the version with diesel starting engines, we have to take into account the following details:

A. INPUTS

OP oil pressure gauge. In the diesel starter version, the function of input of pressure gauge is automatically connected to input 5. There is a delay of 10 seconds in the detection. The pressure gauge can only be connected to this input.

B. OUTLETS

The M outlet corresponds to the order of contact of diesel engine; it will be connected with the cable of the terminal "15/54" of the key. The unit starts and stops the contact, so the key has to be left at rest position.

A supplementary relay will be placed at the starter outlet, and it must have a capacity of 20 to 30

amps. Its outlet has to be connected to the terminal cable "50" of the key.

If the engine stops by electromagnet, a supplementary relay will be installed between the former one and the stop outlet.

If the stop is done by cutting the oil supply with an electrovalve, this electrovalve should be installed as close as possible to the injector, so that the stop is as quick as possible. When the electrovalve is normally open, it has to be connected to the stop outlet directly. If the electrovalve is normally closed, it has to be connected to the contact outlet (M).

In case of pre-heating, an outlet relay will be intercalated for its working.

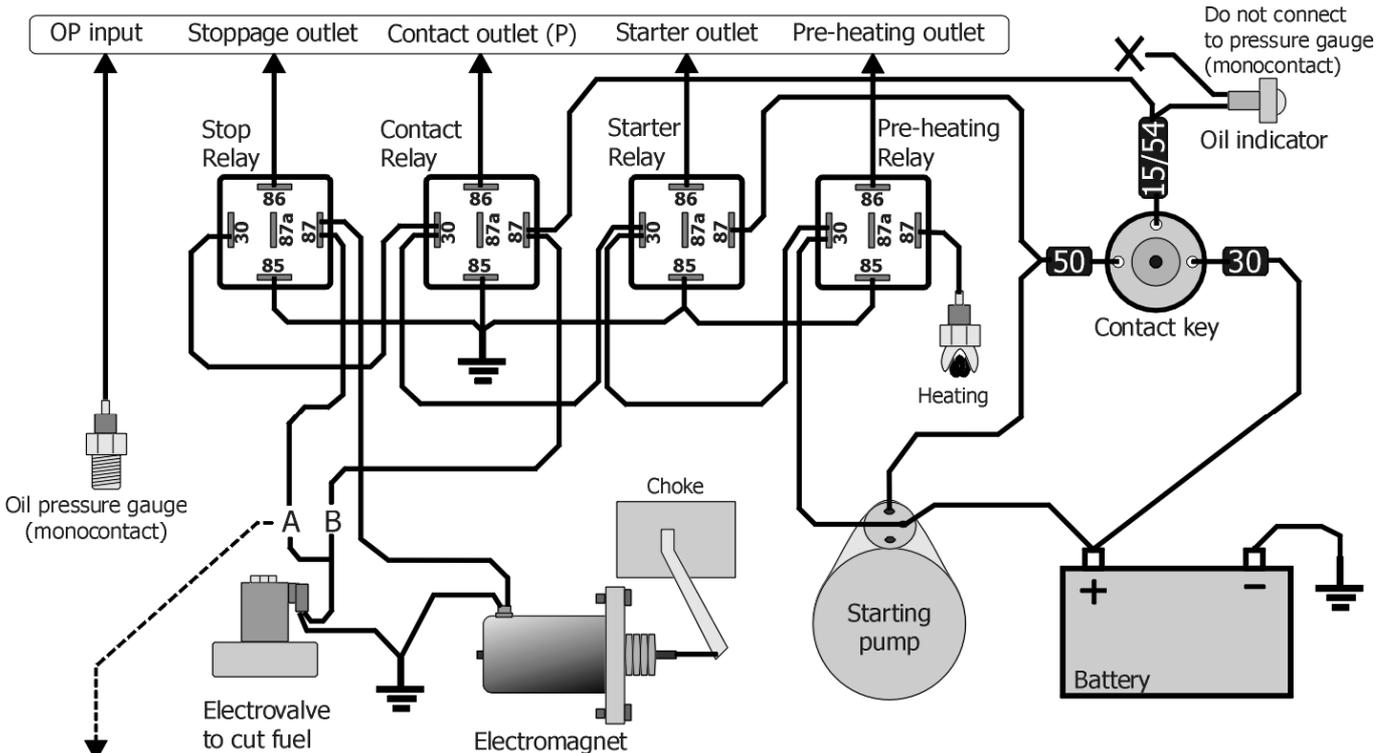
C. GUIDE TO MALFUNCTIONS "DIESEL VERSION"

- All the attempts are made, even when the unit has been started at the first try:

The oil pressure gauge does not work properly, it continuously connected to the common or box.

- The battery runs down:

The contact signal is not given to the engine, or the battery is faulty.



"A" = To stoppage key, when there is no electromagnet. Valve normally open.

"B" = To contact relay, when there is electromagnet. Valve normally closed..

4.4.2. Latch option

The low consume of the equipment (0.12 watts/hour), and its latch electrovalves, make this option suitable for those installations which work with battery. It is not indispensable, but a small solar panel can be mounted to avoid the normal manual loading of the battery.

To reduce consumption, the controller has a system which switches the screen off when the keyboard is not in use. To activate the display, simply press any key on the Agrónic.

A. LATCH ELECTROVALVES WITH TWO CABLES

This electrovalve model works reversing the polarity between the two cables, to activate or deactivate it.

One of the cables is to be connected to the outlet common "C" and the other one to the corresponding outlet.

If the electrovalve does the opposite of what the controller has ordered it to do, it would be necessary to reverse the cables that are connected to the common and outlet.

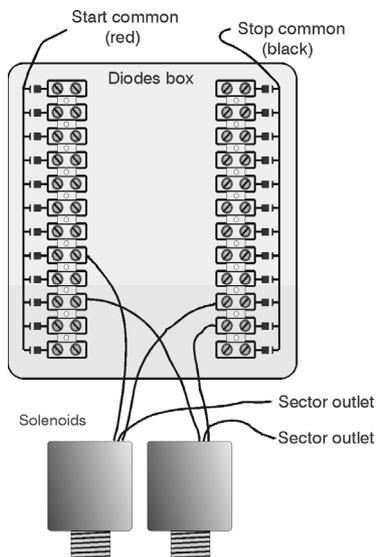
B. LATCH ELECTROVALVES WITH THREE CABLES

This models have a bridge in the right superior part of the base card to change the working voltages to the outlets (see indicative stick). Without the bridge the outlets are working to 12 Vdc and with the bridge installed they will have a voltage near to 24 volts. From the company the units are delivered with the bridge connected. The voltage depends on the type of solenoids, by this, it can be changed depending on your needs.

Also it is included for this version a diode box, to which two of the three cables, the red and the black one, belonging to each solenoid have to be connected. The red one will be connected to the group of terminals linked to the red cable which goes to the controller (start common). The black one will be connected to the other group of terminals (stop common).

The order of the sector numbers is not taken into account in the terminals of the diode box.

Example of connection:



The other cable, normally white, will be connected to the controller, to the outlet corresponding to its sector or to the "M" general valve outlet.

4.4.3. Two pump option

In this option the second pump or general valve 2 will be connected to the last outlet of the controller.

A group of correlative sectors is assigned to every pump, pump 1 is for the group of the first sectors and pump 2 for the rest.

This assignation will be done in the configuration of the installer.

4.4.4. Installer configuration

To go to installer configuration, follow the next instructions: In function 3, "Parameters", pressing "ENTER", and pressing "9" and "ENTER", then it is needed to enter an access code.

Continuously, it will ask several question that it only must be entered when it will necessary in order to not erase any data or cause any malfunction in the unit or in the installation. Pressing only the key "ENTER" it will go through the question without doing anything.

The question are asked like this:

- "Ram to 0", answer with "YES" to erase all the programs information in course, anomalies and totals.
- "Eeprom to 0", to erase all programs and parameters.
- "M1 Sectors": we will indicate the number of sectors that will activate engine 1, the number entered here will correspond to section 1, the rest are excluded or activate engine 2 in the case of the 2 engine option.
- "Sector limit": by default a maximum of 8 sectors are allowed to act simultaneously, enter the appropriate value to reduce this.
- "Fertilization, 1: series 0:parallel" entering a 1 it will do series with one fertilizer after the other, with 0, several at once.
- "Fertilizers stop" To stop or not the fertilization while the cleaning filter is carried out.
- "Conditional stop is System stop", when the conditional stop will take place it will work like a system stop (Function-Manual), with this function it keeps discounting the irrigation program time, but without deactivate the outlets.
- "Frequency h:mm", answer "YES" if you want the activation frequency in hours and minutes; if you answer "NO", the frequency will be in hours.

Pressing "ENTER" again, it goes back to view, in the main screen.

5. TECHNICAL CHARACTERISTICS

<i>Power supply</i>		Units for alternating current	Units for direct current
Voltage		230 Vac or 115 Vac +5%-10% CAT II	12 Vdc +10% -5%
Frequency		50-60 Hz	-----
Energy consume		Below to 58 VA (at rest 2.7 VA)	Below to 7 W (at rest 0.6 W)
Fuses	Input	0,630 A, T type, 250 V (slow)	0,8 A, T type, 250 V (slow)
	Outlet	2 A, F type, 250 V (fast)	3,15 A, F Type, 250 V (fast)
Keeping the memory which can be erased when there is a power cut		Battery, more than 72 hours	Condenser, 24 hours

<i>Outlets</i>	Number	6, 12, 18, 26+1 (according to model)
	Type	By relay contact, with potential of 24 Vac (Internal transformer) or 12 Vdc
	Limits	40Vac/30Vdc, 1 Amp

<i>Inputs</i>	Number	5
	Type	Optocoupled, to connect to contacts free of potential

<i>Atmosphere</i>	Temperature	0°C to 45°C
	Humidity	< 85%
	Height	2000m
	Pollution	Grade II

<i>Weight</i> (approximate)	Unit in box	2,2 Kg
	Unit to built-in	2,7 Kg

<i>Memory backup</i>	Clock, consults	Battery or condenser
	Program, parameters	Non erasable

<i>DECLARATION OF CONFORMITY</i>			
It follows the 89/336/CEE Guidelines for the Electromagnetic Compatibility and the 73/23/CEE Guidelines of Low Tension for the Fulfillment of the Product Security. The fulfillment of the following specifications was demonstrated as indicated in the Official Diary of the European Communities:			
Emissions	EN 50081-1:94 EN 55022:1995 Type B	Radiated and conducted emissions.	
Immunity	EN 50082-1:94 EN 61000-4-2 (95)	Immunity to electrostatic discharges.	
	EN 61000-4-3 (96)	Immunity to the electromagnetic field of radioelectric frequency.	
	EN 61000-4-4 (95)	Immunity to fast transitional in common way.	
	EN 61000-4-5	Immunity to overloads in the power supply.	
Harmonics	EN 61000-4-11	Immunity to lacks and power cuts.	
	EN 61000-3-2 (95)	Current harmonics.	
Fluctuations	EN 61000-3-3 (95)	Tension fluctuations.	
Low tension guidelines	EN 61010-1	Security requirements of measurement electric units, control and use in laboratory.	

<i>Symbols which may appear in the product</i>	Protection earth terminal		Danger, risk of electroshock		Double insulation	
--	---------------------------	---	------------------------------	--	-------------------	---

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

To do any work with the controller, except "view", press the FUN key (Functions) and the following screen, with the first two options, is displayed:

```
FUN:"1" = PROGRAMS
FUN:"2" = MANUAL
```

The PROGRAMS function is used to enter, erase or read the automatic working orders.

The MANUAL function is used to activate or deactivate at the moment, manually.

When pressing the FUN key again, the following screen with the other two options is displayed:

```
FUN:"3" = PARAMETERS
FUN:"4" = TOTALS
```

The PARAMETERS function is used to adapt the unit to the specific needs of every installation.

The TOTALS function is used to consult the total working units in general and sector by sector.

As we have already said, PARAMETERS are the data which customizes the irrigation controller to the particular needs of the installation it is destined for.

This data will be fed in by the installer of the irrigation system on mounting the equipment, and they will be fixed in the memory.

Resume of the parameters which can be configured in the "by time" version.

FERTILIZERS:

- Number of fertilizers (0 to 4).
- Post-irrigation minutes (0 to 99).
- Separation minutes between fertilizers (0 to 99) in serial fertilization.
- Fertilizer pump (yes or no).
- Mixer to fertilizer 1, 2, 3, or 4 (yes or no).
- Pre-mixing minutes (0 to 99).
- Mixing minutes start/stop (99/99).

CLEANING:

- Number of filters (0 to 9).
- Working time per filter (3 to 999 seconds).
- Pause between filters (0 to 99 seconds).
- Time between cleaning cycles (0 to 9999 minutes).
- Stop of sectors when cleaning filters (yes or no).

VARIOUS:

- By volume (yes or no).
- Irrigation pulse value (0 to 10000 liters).

- Fertilizer pulse value (0 to 1000 cl).
- Assignment of functions to the inputs.
- Delay for temporary malfunction TM (0 to 999").
- Delay for general malfunction GM (0 to 999").
- Delay for conditional stop CP (0 to 999").
- Delay for program start PS (0 to 999").
- Delay/ advance between outlets (0 to 250").
- Automatic assignment of general outlets.
- Assigning sectors to groups.

CLOCK:

- Setting the clock (day, hour, minute).
- Start/stop clock, when the unit is disconnected.

The following notes show how to fix the different parameters and enter them.

To enter into PARAMETERS, press the FUN key, the number 3 key and the ENTER key.

The following screen, showing the Parameters menu, is displayed.

```
Fertil.:1          Clean.:2
Various:3         Clock:4
```

Option n.1 refers to the FERTILIZATION parameters; option n.2 refers to the FILTER CLEANING parameters; option n.3 to the VARIOUS parameters and n.4 to the setting of the CLOCK.

6.1. FERTILIZER PARAMETERS

If option n.1 is chosen (Fertilizer parameters), we are asked, in the following screen, the number of fertilizers to be used.

```
Number of
fertilizers, 0 to 4 = 2
```

If there are fertilizers choose, this screen appears asking how many minutes of post-irrigation are wanted, between 0 and 99 minutes.

(Post-irrigation is the time without fertilizer before the end of the irrigation for the cleaning of the pipe lines).

```
Minutes of
post-irrigation = 05
```

If more than one fertilizer has been chosen, it will ask for the minutes of separation between the end of one fertilizer and the beginning of the other (only in series fertilization).

```
Minutes of
separation = 02
```

If there are several fertilizers, the unit allows a pump outlet of fertilizer, which is connected whenever one of them is connected (for various tanks connected to the same injector).

Fert. Pump (Y/N) = Y

An mixer outlet can be assigned to every one of the possible fertilizers.

Mixer 1 = No
Mixer 2 = Y

The "pre-mixing" is the time the corresponding fertilizer tank will be mixed, before it is injected.

For the pre-mixing time to take place, the pre-irrigation and the fertilizer separation have to be higher or equal to the pre-mixing minutes.

Minutes of pre-mixing = 02

The mixing can be continuous, intermittent or stop (at "stop", only the pre-mixing is carried out).

If it has to work continuously, only enter the minutes at start; if it has to work intermittently, the desired value will be entered for the working and stop minutes; and for it to remain at rest after the pre-mixing, the desired value will be entered for the stop minutes.

Mixing minutes on/off = 02/10

6.2. FILTER CLEANING PARAMETERS

To enter the parameters corresponding to the Filter Cleaning, option n.2 must be selected in the Parameters menu. First, it will ask the number of filters to be used (between 0 and 9).

Number of filters = 3

If the previous screen shows that there are filters, the following question corresponds to the working time for everyone of them (3 to 999 seconds) and the pause between them (from 0 to 99 seconds), the pause is also applied when the first filter starts.

Working time per filter = 067"

Pause between filters = 07"

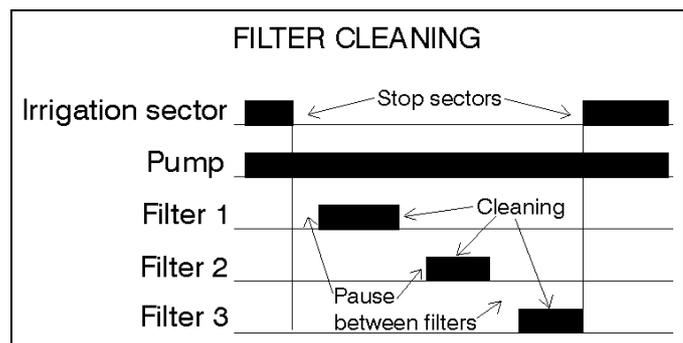
The following question refers to the irrigation time between two cleaning cycles, going from 0 to 9999 minutes. Setting the value at 0000, the "by time" cleaning will not work.

Apart from this, the unit will carry out the cleanings ordered by external input or manual control, in which case, the counter will return to 0, and the temporization will start again.

Irri. minutes between cleaning cycles = 0120

The following screen will ask if the irrigation sectors should be stopped while the filter cleaning is carried out.

Stop sectors = No



6.3. VARIOUS PARAMETERS

In the section VARIOUS of the Parameters menu, we are asked whether the irrigation and fertilization units will be by volume. By volume, the units will be in cubic meters (m³) for the irrigation and liters (L) for the fertilizers. By time, the unit is hours/minutes (hh:mm).

By volume (Y/N) = Y

If the unit works by volume, we have to program the value of every pulse of the volumetric counter. For example, if the counter emits a pulse every m³, 1000 has to be entered.

Irrigation pulse value = 01000 L.

For the fertilizer counter, the pulse value is in centiliters. For example, if the counter emits a pulse every liter, the value will be 100 CL.

Fertilizer pulse
value = 0100 cl.

The following screen is used to assign a function to everyone of the five inputs. The functions are as follows:

- **IC Irrigation counter.**
- **FC Fertilizer counter.**
- **SC Start Cleaning:** to connect a differential pressure gauge and start the filter cleaning; it will be done after the set temporization of 30 seconds has gone by and if any irrigation program is being carried out.
- **TM Temporary malfunction:** it produces the stop of the program being carried out, but reactivates the system with the beginning of the next irrigation.
- **GM General malfunction:** it produces a total stop of the system until the user manually reactivates it.
- **CS Conditional stop:** while the order is carried out the program carried out is stopped, and on disappearing the order at the input of conditional stop, it continues at the same place where the irrigation was stopped. While being at conditional stop, it allows the starting by temporization.
- **PS Program start:** It will activate an irrigation program by external order when the programmable delay has gone by and the clock has changed minute. The input will not start again until the program or its sequences of programs have finished.

IC	FC	SC	TM	GM	CS	PS
1	2	0	5	0	3	4

The following screens correspond to the detection delay temporizations of some of the input functions, asking how long an input signal has to last for the unit to consider it valid and act consequently.

TM	Input Detection Delay = 025"

GM	Input Detection Delay = 150"

CS	Input Detection Delay = 008"

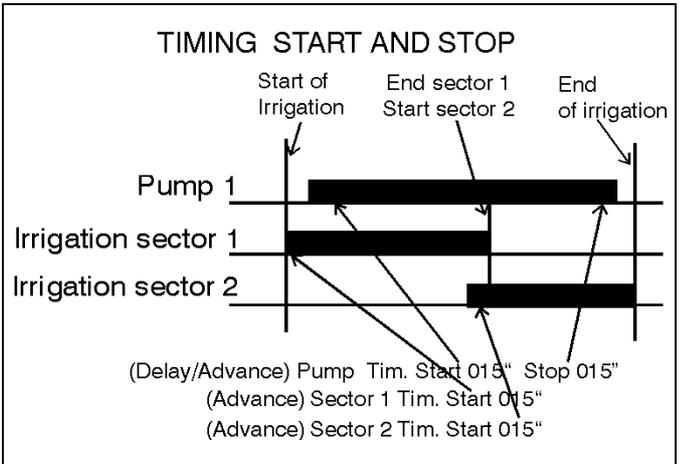
PS	Input Detection Delay = 300"

While a filter cleaning is being carried out, the temporary malfunction or general malfunction inputs are not taken into account.

As a precaution against pump water hammer, there is an advance between the opening of the sector valves and the start of the pump, between the stopping of the pump and the closing of the valves and a delay between the closing of one sector and the opening of another.

Valid temporization between 0 and 250 seconds.

Advance/delay
outlets = 005"



To know which terminals are to be connected to the general outlets, it is necessary to consult the automatic assignments of the unit in the following screen.

An outlet not assigned is shown with "--".

F1, F2, F3, F4 = fertilizers
FP = fertilizer pump (injector)
M1, M2, M3, M4 = mixers

C1-Cx = filter cleaning from filter n.1 to the last set one

F1	F2	F3	F4	FP
18	17	16	--	15

M1	M2	M3	M4	C1 - C3
--	14	--	--	13 11

To assign sectors to the groups, respond affirmatively to the question.

Enter groups
(Yes/No)= Yes

Between 1 and 4 sectors may be associated to the four groups.

```
Group 1 :
02 03 06 00
```

In the program referring to the groups of sectors, we will add 70 to the number of the group, group 1 = 71, group 2 = 72, etc. In the example on the previous screen, a program will activate sectors 2, 3 and 6 when the value 71 is programmed in the risk sector section.

6.4. CLOCK PARAMETERS

The CLOCK option of the Parameters is used to enter or modify the day of the week and the time.

To synchronize the seconds, do not press the ENTER key at the minutes until the real seconds are 00.

```
Enter: Day, Hour, Min.
Mon.17:43
```

Next, the following screen is displayed, asking if the clock should be interrupted in case of a failure in the power supply.

```
Clock stop on power
failure, Yes/No = No
```

If we choose the clock to be interrupted (answering "yes"), a cut in the supply will stop the clock, and the programs in progress at the moment, and it will not start again until the current returns.

In this case, all the programs will be completed, although it will not be in real time. The user should correct the clock, as soon as possible after the cut.

If, on the other hand, the non interruption of the clock is chosen, then if the cut in the supply is less than 24 hours, when it returns, the unit will take up the program at the corresponding chronological point. If the shortcut is for more than 24 hours, when it returns, all the outlets will be deactivated in wait for another start.

SUMMARY PARAMETERS SCREENS

FERTILIZATION	FILTER CLEANING	VARIOUS	CLOCK
Number of fertilizers, 0 to 4 = 3	Number of filters = 3	By volume (Y/N) = Yes	Enter: Day, Hour, Min. Mon. 17:43
Minutes of post-irrigation = 05	Working time per filter = 067"	Irrigation pulse value = 01000 L.	Clock stop on power failure, Yes/No = No
Minutes of separation = 02	Pause between filters = 07"	Fertilizer pulse value = 0100 cl.	
Fert. Pump (Y/N) = Yes	Irrigation minutes bet. cleaning = 0120	IC FC SC TM GM CS PS 1 2 0 5 0 3 4	
Mixer 1 = Yes Mixer 2 = Yes Mixer 3 = Yes Mixer 4 = No	Stop sectors = No	TM Input detection delay = 025"	
		GM Input detection delay = 150"	
Minutes of pre-mixing = 02		CS Input detection delay = 008"	
Mixing minutes on / off = 02 / 10		PS Input detection delay = 300"	
		Advance/Delay outlets = 005"	
		F1 F2 F3 F4 FP 12 11 10 -- --	
		M1 M2 M3 M4 C1- C3 -- 09 -- -- 08 06	
		Enter groups (Yes/No) = Yes	
		Group 1 : 02 03 06 00	

6.5. ADDITIONAL INFORMATION FOR DIESEL OPTION PARAMETERS

The oil pressure gauge "OP" will be connected to input n.5. It has a double function, first it detects the engine starting and, once the engine has started, it detects the malfunctions of oil pressure of the engine.

At the section various parameters, it will ask if it is necessary to realize pre-heating and if there is a generating set with electro-pump.

Pre-heating
(Yes/No) = No

Electropump
(Yes/No) = Y

To know which terminals are to be connected to the outlets of the diesel option, it is necessary to consult the automatic assignments of the unit in the following screen.

- St = Start outlet.
- Sp = Stop outlet.
- Pr = Pre-heating outlet
- Ep = Electro-pump outlet.

St	Sp	Pr	Ep
18	17	16	15

In the diesel version it asks for the start and stop times.

When temporization the stop, it is advisable to give it some extra time, to ensure the stop.

Setting the start up seconds at 0 will cancel the control for the engine start and the oil pressure switch.

Starter time= 04"
Stop time= 035"

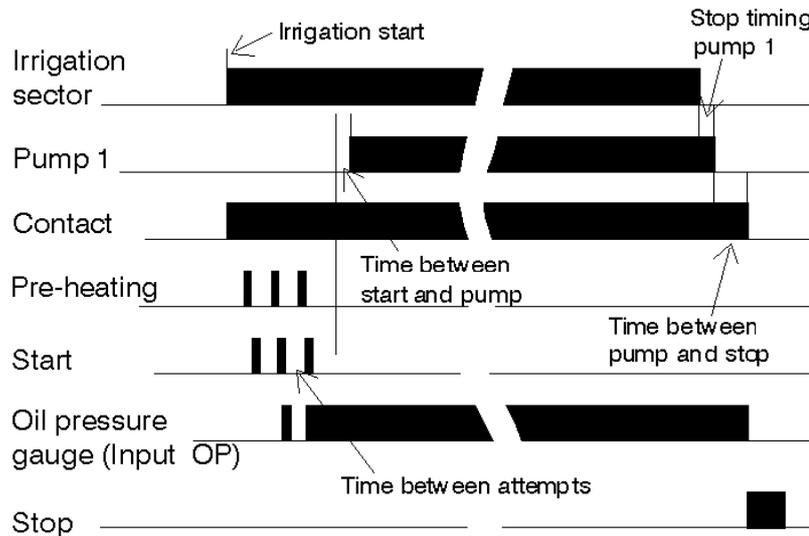
When the unit will be prepared to realize pre-heating, it will ask the working time for pre-heating.

Pre-heating = 12"

In the diesel version with electro-pump control, it will ask for the delay of the electro-pump once the diesel engine (P.) has started and the delay to stop the diesel engine when the electro-pump finishes.

P. input delay= 240"
P. end delay= 050"

Start / Stop of generating set



7. USE

This is the chapter the user should mainly know as it contains the instructions which will be used more frequently.

Press the FUN key (Functions) to do anything with the controller, except "consult".

The following screen with the first two options will appear:



The PROGRAMS function is used to enter, erase or read the automatic working orders.

The MANUAL function is used to activate and deactivate at the moment, manually.

On pressing the FUN key again, the following screen appears with the other two options:



The PARAMETERS function is used to adapt the unit to the particular necessities of every installation.

The TOTALS function is used to consult the total working units in general and sector by sector.

7.1. PROGRAMS

The PROGRAMS function is used to enter, erase or read the automatic working orders.

The memory of the controller has a capacity for 31 independent or sequential programs.

An "independent program" is a complete working order which includes:

The number or reference of the program; the irrigation sector to be activated; the day or days of the week when it should be repeated; the starting time; the duration of the irrigation and the duration of each of the fertilizers (if there are any).

Choosing option n.1 of the FUNCTIONS menu, the screen will ask for the program number.

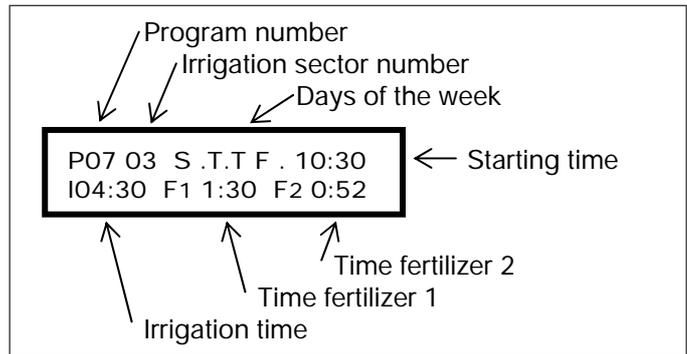


Introducing the desired number, all the information of this program will be displayed. With the key marked with an upwards arrow, the different programs will be displayed.

When the program has been chosen, and the ENTER key pressed, we are now inside and the screen will ask for the remaining details, placing the cursor (_) on every one of the values.

After introducing the first figure of an existing value, it will show a zero plus the new figure.

Complete screen of programs:



The volume is explained in section 8 of this manual.

The unit will only accept sector numbers which have not been configured as general outlets in "PARAMETERS". There is the possibility of working with four sector groupings that are identified by the codes 71 to 74. To do this, the risk sector will be substituted by the number of the group. In "Parameters - Various" the sectors are assigned to the group.

If two zeros (00) are introduced followed by ENTER, this program will be erased after confirmation (as explained in the Erase section 7.1.4.).

Every day of the week (starting at Sunday) is indicated with a spot (inactive day) or with the initial of the corresponding day (active day). They become active or inactive pressing the key of the corresponding day and ENTER.

One, various or every day of the week can be chosen. Press the Daily key to activate or deactivate all the days.

The starting time is on the 24 hour system (00:01 to 23:59 hours). The 00:00 value is not valid as irrigation starting time. A program can be started by an order of the PS input (program start), setting the starting time at the 88:00 value.

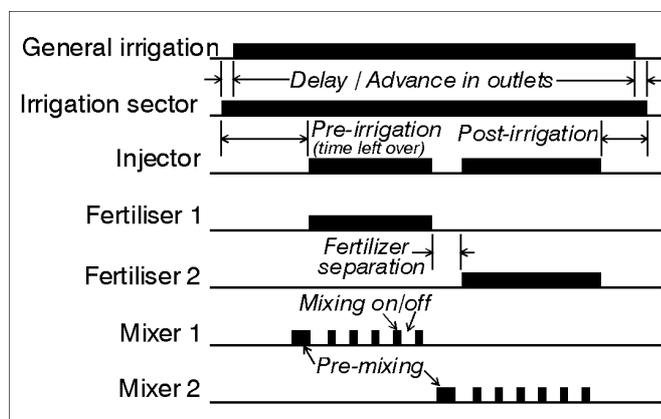
The irrigation time can go from 1 minute to 99 hours and 59 minutes, and the time of every fertilizer can go from 1 minute to 9 hours and 59 minutes.

After entering the last data of a program, the cursor will be placed again in the program number.

In series fertilization, the sum of the times of different fertilizers and plus the configured post-irrigation time, plus the separation time between fertilizers (if more than one is used), must be inferior or equal to the irrigation time.

The controller calculates this value when the last fertilizer has been programmed and, if the total is incorrect it will ask for the first fertilizer again.

The controller automatically distributes the fertilizer in the following way (if only one fertilizer is programmed it will occupy the second place in the example).



When the fertilizer number is 3 or 4 the program information it is distributed in 2 screens, one for the fertilizers 1 and 2, plus a second for the rest. The two screens have in common the sector, day, start hour and irrigation time.

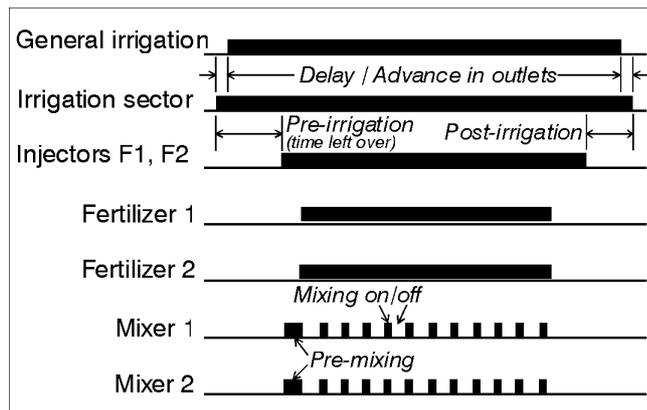
Thereby, when more than two fertilizer will be programmed, always it will shown two screens by program. The two of them will be similar with the only difference of fertilizers as it is in the example, that it is the second screen of program 7 showed in the last example.

P07 03 S . T . T F . 10:30
I04:30 F3 0:25

For the fertilization in parallel, first of all in "installer configuration", it has to be defined that the fertilizers will be injected like this. The programming will be the same as in series.

The fertilization in parallel can be done through a multihead injector or with one injector for each one of the installation fertilizers.

The fertilizer will be applied like it is shown in the next picture.



Parallel fertilization is only possible within a single program. If fertilizations have been programmed in various programs which coincide in time, fertilization error will occur.

7.1.1. Sequential programs

When various sectors have to be irrigated, one after the other, the SEQUENTIAL PROGRAMMING can be used. This consists on completely filling in the program for the first sector as shown in the previous section (7.1.), and omitting the days and operating times of the following programs.

To convert a program into sequential with another, the code "99" must be entered in place of the starting hour, and the number of the program which precedes and initiates it in place of the minutes of the starting time. In this case, it is not necessary to enter the days of the week.

Example of the first irrigation of a sequence

P02 04 . M . W . F . 08:15
I02:45 F1 0:40 F2 0:30

Example of the second irrigation of a sequence

P03 06 99:02
I03:00 F1 1:20 F2 0:52

Example of the third irrigation of a sequence

P05 07 99:03
I01:38 F1 0:25 F2 0:00

In the previous example, we can see that program n.2 will irrigate sector 4 on Mondays, Wednesdays and Fridays at 8:15; program n.3 will irrigate sector 6 at the end of program n.2 and program n.5 will irrigate sector 7 when program n.3 finishes.

When we want to stop a program sequence (which will not work until new order, but without erasing), it is sufficient to cancel the days of the week of the first pro-

gram of the sequence. To reactivate it, the day or days of the week should be re-entered.

Example of stop of the previous sequence

```
P02 04 . . . . . 08:15
I02:45 F1 0:40 F2 0:30
```

When a sequential program is running and there is a **TM** temporary stop, the program running will stop and it will continue into the next sequence.

If the malfunction did not disappear, all the sub-programs of the sequence would not be executed and this would be recorded.

7.1.2. Program start by input

If an input for program start **PS** has been configured, the irrigation program can be started by external order (thermostat, humidistat, level, etc.). In order to do so all the days of the week have to be entered and the code **88:00** has to be introduced at the starting time, to identify the fact that the program will be started by external order.

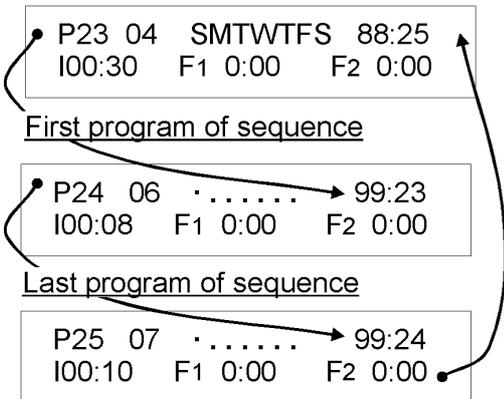
The start input **PS** will not re-start until the program and its sequences have finished.

In case of a infinite sequence of several irrigation programs activated by external order will be required, the start program have to have the code 88 in the start hours position and the last program of the sequence in minutes. When the start program will be finished, the next program of the sequence will start independently of the input PS state, having the programs in an infinite sequence. Once the start program will be started the code 88 for PS will actuate as code 99 of sequence.

The irrigation have to be stopped manually.

Sequence example of three programs started by external order in case of anti-frost.

Program by PS with infinite sequence



....And they are following until will be stopped manually.

7.1.3. Program by frequency activation

In order to make different irrigations activations in one sector or in a group of sectors, only the program 1 have the variable of activation number and frequency between them.

The frequency time between activations may be "hours:minutes", or "hours", depending on the selection made in the installer's configuration.

To realize more than one activation, when the signal will be in the weekly days, it should be pulsed the key "arrow", will be shown the activation values.

Let see and example for sector 4, irrigation all the days of a week with 3 activations each 3 hours 45 minutes; starting the first activations at 8:15 the second one at 12:00 and the last one at 15:45; the irrigation time for every activation will be 1 hour 30 minutes.

```
P01 04 SMTWTFS 08:15
I01:30 F1 0:12 F2 0:22
```

```
P01 04 03 - 3:45 08:15
I01:30 F1 0:12 F2 0:22
```

If it is necessary irrigate more sectors in a sequence, only is needed to link programs with the first one in order to use this activations. The program 1 will continue its activations independently of the programs that are in the sequence.

When the irrigation time will be superior to the frequency time between activations, the program 1 will not start again until the irrigation time will be finished, keeping in "view" the frequency time in 0:01.

In view, it will show the information of pending activations to realize and the time (frequency) to realize the next one. If there is no activations pending, nothing will be shown in the view screen.

```
P01 Activations : 02
Frequency : 1:53
```

7.1.4. Erase

If we want to erase a program, when the screen asks for the sector number, enter two zeros (00) and ENTER, being followed by a confirmation screen.

If we confirm with the "YES" key, the program will be erased. If the "NO" key is pressed, the previous screen will reappear.

```
P07 00
```

Erase previous
program (Yes/No) ?

Outlet number = 00
08 03 00 00 00 00

7.2. MANUAL

If we choose Function 2 (MANUAL) of the functions menu, this screen will appear asking what we want to do with the manual control.

System:1 In course:2
Prog.:3 Clean.:4 Outl:5

The first option "System", allows the unit to work, but the outlets are disconnected. To stop, press "1" and "ENTER".

However, if it is in the Consultation section, the following screen will be shown to inform that it is at "manual stop of the system". From here, to finish press "ENTER".

WARNING !
Manual system stop

The second option is "stop in course". With this option we can cancel the irrigation units which are to be applied and which correspond to the programs which are being carried out in this moment.

With the third option "programs", a program can be activated or deactivated. The number program will be asked: if the program is already working, it will be stopped, if it is not working, it will start it.

In sequential programs, the chosen program will be activated and, on finishing, the sub-program which follows will also be activated, and so on, until the sequence has finished.

Program number = 00

Option number 4 "cleaning" activates the filter cleaning, or it stops it if it is already working.

Option 5 "outlets" activates any outlet of the controller. The outlet is asked, allowing a maximum of 6. The general outlet has number "99".

This option has to be used very carefully, due to the fact that when an outlet is activated in this way, the control of malfunctions, anomalies, totals, etc. is not carried out.

To cancel them, enter the outlet number again, and it will deactivate.

In the CONSULT screen, "MANUAL" will be displayed to show that an outlet is activated in this way.

In case of power cut all the outlets will be cancelled.

Mon.18:14 - MANUAL -

7.3. TOTALS

If option n.4 of the Functions menu is chosen, this screen will appear asking if we want to read the accumulated quantities or erase them.

TOTALS
Reading:1 Erasure:2

If "Reading" has been chosen, this screen will appear showing the hours and minutes of water application in all the sectors, and also those of fertilizers number 1 and 2 (General).

When various sectors work simultaneously, only the data of one of them is accumulated.

- General - I = 0087:51
F1 = 0012:05 F2 = 0009:24

If with the previous screen, ENTER or the arrow key are pressed, this screen appears with the information of the sectors.

If we continue pressing the key arrow, the information of the other sectors is displayed.

To finish, press the FUN or VIEW key.

Sector: 01 I=0023:12
F1= 004:35 F2=0003:09

If there are more than 2 fertilizers, the information of a sector or the general one, it will shown in two screens, F1-F2 in the first one and F3-F4 in the second one.

If on the first Totals screen, the ERASURE option has been chosen, then this screen will appear asking if the general total is to be erased.

Erase everything
(Yes/No) = No

7.4. CONSULTATION

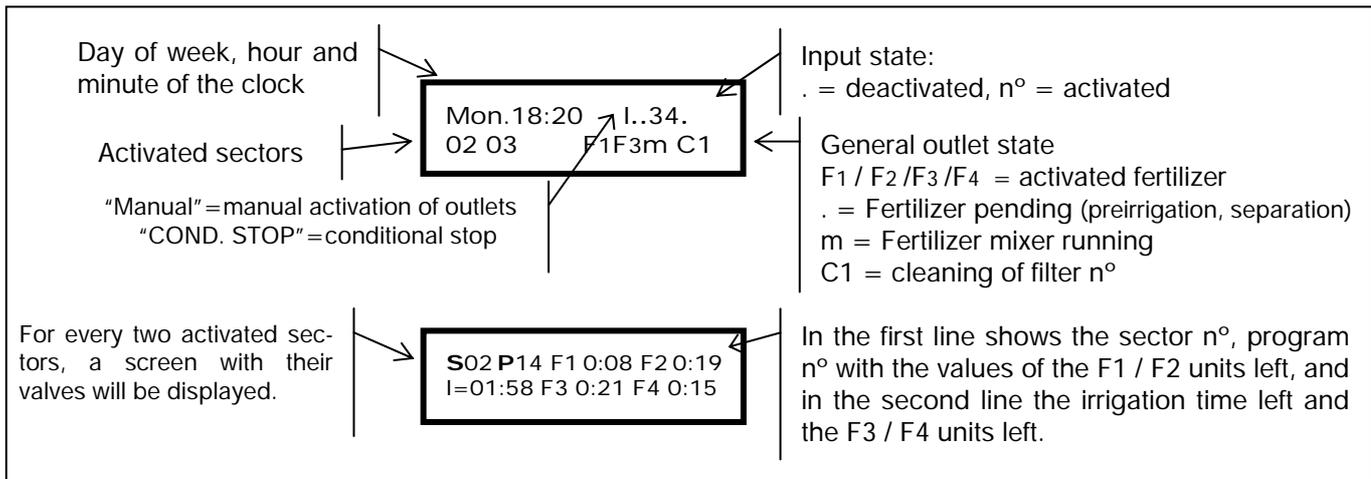
The work of the controller can be reached with the VIEW key.

Pressing the VIEW key several times, different messages and data will appear on the screen.

In the first touches of the VIEW key, messages about different anomalies which the unit has suffered might appear (this will be seen later).

If the controller has not suffered any anomalies, it will show the data of the work being carried out at that moment.

In the first consult screen the clock will appear, together with the state of the 5 inputs, the irrigation sectors and the general outlets.



7.4.1. Anomalies

On pressing the "VIEW" key, if there are any anomalies, the first will be shown on the screen, if not, it will go to general consultation (7.4.).

On having an anomaly on the screen and pressing "VIEW", the unit will ask if we want to erase it. Answer yes or no.

Erase previous anomaly (Yes/No) ?

Up to ten screens with recorded anomalies may appear. If there are more than 10, the last one would always remain recorded on the tenth screen.

The anomalies that the unit can store in its memory are:

- POWER SUPPLY FAILURE.
- TEMPORARY MALFUNCTION.
- FERTILIZER LEFT OVER.
- PROGRAM DOES NOT ENTER.
- FERTILIZER DOES NOT ENTER.
- INTERFERENCE.

The unit records power cuts superior to a minute and inferior to 24 hours. The following screen informs

We have to take into account that every input has a function assigned in the "parameters" section.

If the filter cleaning is being carried out, the fertilizer (if there is one) is stopped temporarily and the unit will not accept either temporary nor general malfunctions.

If there is a sector being irrigated, pressing "VIEW" again will make another screen appear with detailed information of every sector.

If there are more than two sectors being irrigated, the 3rd and 4th will appear on the screen after pressing "VIEW" again.

Pressing "VIEW" again, the unit will start the consultation cycle again.

that there was a cut in the power supply from 12:57 on Monday to 2:45 on Tuesday.

* Power cut *
Mon.12:57- -Tu.02:45

Every time a program finishes through the input of temporary malfunction, a recording takes place. This anomaly indicates a stop for temporary malfunction at 23:45 on Monday, canceling the irrigation of program n.3.

Temporary malfunction
Mon.23:45 P03

If at the end of the irrigation program there is fertilizer left over, the following anomaly will be shown, indicating the program and the fertilizer units left.

Fertilizer left
P02 F1 0:02 F2 0:34

The following screen informs that program n.14 can not enter as there are already 8 sectors working simultaneously (the limit of the number of sectors that

can work at the same time is set in the installer configuration).

Program not enter
P14

This screen informs that the fertilizers for program n.12 can not be entered as it is already being used for other program (however, the irrigation sector has been entered).

Fertili. not enter
P12

This screen informs that at 05:33 on Tuesday, there was an electromagnetic or electrostatic interference, re-starting automatically.

Interference
Tu.05:33

Once all the anomalies have been shown, the screens with the state of the controller will be displayed.

7.4.2. Malfunctions

If any of the following malfunctions happens, the controller will automatically flash the message intermittently on the screen until the "ENTER" key is pressed (maintain the key pressed down for at least one second). Until the malfunction is cancelled, the unit does not allow any activation of the irrigation programs.

If the general malfunction input was activated, all the outlets will be deactivated and the screen will show this message with the day and time when it occurred.

General malfunction
Sat.19:01

If this message appears, the internal battery has completely run down with the loss of the time and the data of the current operation plus the totals, but not the irrigation programs.

WARNING!
Set clock

The battery can keep this data for a minimum of 3 days, without external power. The parameters and the programs are never erased from the memory due to a cut of the electricity supply.

The following screen warns that there has been a stop of the unit by MANUAL CONTROL, waiting to be reactivated.

The outlets are deactivated but the program runs its course.

WARNING!
Manual system stop

On connecting the unit to the mains, this screen might appear for a few seconds, while the timetable of the irrigation programs is brought up to date.

Set timetable
10:33

8. ADDITIONAL INFORMATION FOR VOLUME

When configuring the unit to irrigate and fertilize in volume units, m³ and liters respectively, the following changes in the "functions" of the controller take place:

8.1. PARAMETERS

In the irrigation programming by time, the pre-irrigation is calculated automatically from the entered irrigation value, as the irrigation and the fertilizer are applied on the same base, which is the minute.

By volume, the pre-irrigation and post-irrigation values have to be entered in "m³".

It will start to fertilize once the irrigation has finished the pre-irrigation plus the pre-mixing time, if there is one, and it will make sure that the fertilizer application does not overlap with the post-irrigation volume, in this case, the unit would stop fertilizing and the anomaly would be recorded.

The volume units in fertilizer parameters are:

- Pre-irrigation 0 to 999 m³
- Post-irrigation 0 to 99 m³
- Separation between fertilizers 0 to 99 m³

The volume units in filter cleaning parameters are:

- Irrigation volume between cleaning cycles: 0 to 9999 m³.

In various parameters, the irrigation and the fertilization are configured plus the value of the counters (as already explained in section 6.1.).

8.2. PROGRAMS

The differences in an irrigation program by volume are:

- Irrigation units 0 to 999 m³
- Fertilizer units 0 to 999 liters

P02 04 SMTWTFS 08:15
I084 F1 014 F2 009

The modality of parallel fertilization can not be done in volume units.

8.3. TOTALS

In the totals, the information will be shown in m³ units for the irrigation and in liters for the fertilizers.

8.4. CONSULTATION

For every sector being irrigated, it will display the quantity of cubic meters left to irrigate and the liters of fertilizer which are still to be applied.

S02 P14 F₁026 F₂ 000
I=083 F₃ 007 F₄ 012

8.5. ANOMALIES

If no pulses are received from the irrigation water counter for more than ten minutes, while any program is working, the program will be stopped and the following anomaly will appear.

* I. counter malfunction *
Mon. 11:28

If the controller is fertilizing and no pulses are received from the volumetric fertilizer counter, for more than ten minutes, the fertilization program being carried out would be stopped and the following anomaly would be recorded.

* F. counter malfunction *
Sun. 07:33

9. ADDITIONAL INFORMATION FOR DIESEL OPTION

This option increases the functions of the AGRÓNIC 2000 with the control of an internal combustion engine (diesel or petrol) with an electronic starter.

The operating theory is the following: on activating the first irrigation program, the corresponding irrigation sector is activated and, after the temporization of the "advance/delay in outlets", the pump outlet "M" or contact, is activated and the starter while there is no oil pressure; if there is pressure, a "malfunction" will be activated.

If oil pressure appears during the starter temporization, the attempt will finish after 3 seconds, if it did not on finishing temporization, not to damage the starter engine.

If, 30 seconds after the attempt at starting, the unit detects oil pressure, it will stop trying and accept the malfunction. If after this time there is no pressure, the unit will try again, and so on up to a total of 4 attempts. If, after these 4 attempts pressure does not appear, the program will be omitted and the "starter malfunction" message will appear.

Pre-heating is carried out prior to starter.

9.1. CONSULTATION

In the first screen of consult the letters **OP** will be shown at the end of the first line, to indicate that the engine is working and there is oil pressure, at the end of the second line the letters **A**, **S** or **P** will be shown when the start ("A" for activation), stop or pre-heating takes place.

Mon.	18:20	I	OP
8 14	F1a	C1	ASP

9.2. ANOMALIES

If, having made 4 attempts at the starting and having passed 30 seconds, the engine is not working, the program is omitted, and the anomaly recorded, showing the day and time when it took place.

* Malfunction at Start *
Wed. 18:05

When detecting a failure of the oil pressure, an anomaly will be recorded, showing the day and time when it took place. The detection is delayed 10 seconds.

* Oil pres. malfunc. *
Mon. 11:15

9.3. MALFUNCTIONS

When the first attempt is made at starting, if the unit detects that there is already pressure in the pump, all the outlets will be deactivated, and this message will appear.

* There is oil pressure *
Thu. 10:30

If, while attempting to start up, the unit detects a fall in the voltage to below 8 V all the outlets are disconnected, and this screen appears, with the day and time when it took place.

A discharged battery or incorrect wiring could be causes of this.

* Power failure *
Sat. 08:14

NOTES:

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