Handbook for

System D2NA

Model

LCD 1999/2000

ArSilicii

Warnings

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SUMMARY

DETAILS ABOUT THE STRUCTURE OF THE AS D2NA SYSTEM

Description of the system

This introductory document describes the structure of the AS D2NA system; please refer to the following chapters of this manual for details about the types of connectors and wire size specifications.

The AS D2NA system mainly comprises 5 devices, a power unit model AL310X, and two distributors one for the distribution and protection of the floor services, model PH300S2-T and one for the distribution and protection of the ceiling services, model PH300S2-C; the system also includes a display and control panel model CNLCD-99/00 and an actuator node model NSA10.

Connections of the devices

Because of the technology on which the AS D2NA system is based, the devices which form part of it can be located in any position, as no maintenance operations are needed and there is decidedly less wiring than with conventional systems.
The wiring that leads from the distributors is all of the "star" type, composed of point-point connections, namely without "Tees" or secondary branches.
The distributors, in particular, can be set in a central position in relation to the loads connected, thereby shortening the distances of the connections.
Fig. 1 shows the overall view of the whole AS D2NA system.

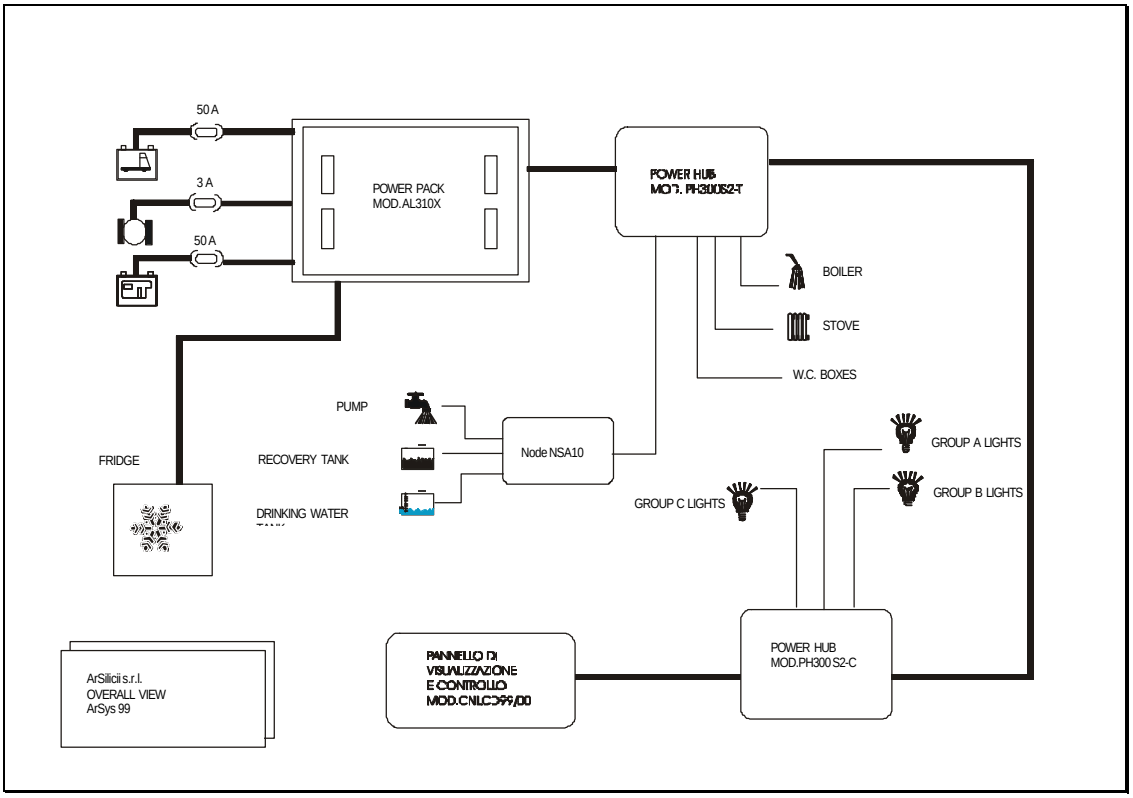


Fig. 1"Overall view of system "

Batteries and Alternator – Power Unit Connection
The services battery is connected to the power unit by a cable with two large dia. wires (+12 and GROUND) and through a fuse with adequate cut-off power (50 A), in series with the wire connected to the battery positive terminal. Connection to the power unit is with the special connector. The battery negative terminal is connected to the vehicle frame next to the battery itself.
The engine battery and engine on signal (D+) are connected to the power unit by a cable with three wires (+12, GROUND, D+). On the wire connected to the battery positive terminal (+12) a fuse with adequate cut-off power (50

A) is necessary. The third wire, associated with the engine on signal (D+), must also have a suitable protection fuse in series with the connector itself (2 A). The battery negative terminal, should be connected to the vehicle frame, if it is not already.
The Schuko plug through which the power unit is connected to the 220V mains, should be connected at the output to the differential switch that protects it and with the characteristic grounding.

If the AL310X power unit is connected to the outside 220V mains it is a completely autonomous source of energy and is therefore capable of delivering power even if the batteries are not present or are damaged, or even if the fuses towards the batteries have blown. This feature guarantees further sturdiness for the user.

Power Unit – Fridge Connection

The point – point connection of the power unit, model AL310X with the Fridge is to be made using a cable with 3 adequately-sized wires (+12, +12D+ and GROUND).

Power Unit – Floor Power Hub Connection

The point – point connection of the power unit, model AL310X with the Floor Power Hub model PH300S2-T is to be made using a cable with 4 adequately-sized wires, two of which for power (+12 and GROUND) and two for signal (BUS_A and BUS_B).

Floor Power Hub – Floor Services Connection

The connections (all point – point) of the Floor Power Hub, model PH300S2-T with the various floor services are made with a four-wire cable, two for power (+12 and GROUND) and two for signal (BUS_A and BUS_B).
Making a wiring completely with cables with four connectors (Smart Ready), it is possible to install *intelligent services*, also at a later time, and exploit all the potential of the AS D2NA system.

Node NSA10 Pump and Level Sensors Connection

This type of connection is the one that exploits the potential of the AS D2NA system. In fact the loads or sensors are connected directly to the node NSA10 which may be located near them and exploit the potential of the control panel for displaying the status of the items connected and their cutting in.

Floor Power Hub – Ceiling Power Hub Connection

The point – point connection of the Floor Power Hub model PH300S2-T with the Ceiling Power Hub model PH300S2-C is to be made using a cable with 4 adequately sized wires, two for power (+12 and GROUND) and two for signal (BUS_A and BUS_B); the connection is made through the special connectors.

Ceiling Power Hub – Ceiling Services Connection

For the connections of the ceiling services to the Ceiling Power Hub model PH300S2-C (all point-point connection) the same considerations apply as for the connection of the Floor Power Hub with the floor services. When the system is installed, Ceiling Power Hub connections with the ceiling services are provided with four wires (Smart Ready); it is therefore possible also at a later time to connect *intelligent services* and fully exploit the potential of the AS D2NA system [1].

Ceiling Power Hub – Display and Control Panel Connection

The connection (point – point) of the Ceiling Power Hub model PH300S2-C with the display and control panel model CNLCD-99/00 should also be made with a cable with 4 wires, 2 for power (+12 and GROUND) and two for signal (BUS_A and BUS_B) headed with the special connectors.

Advice for maintenance

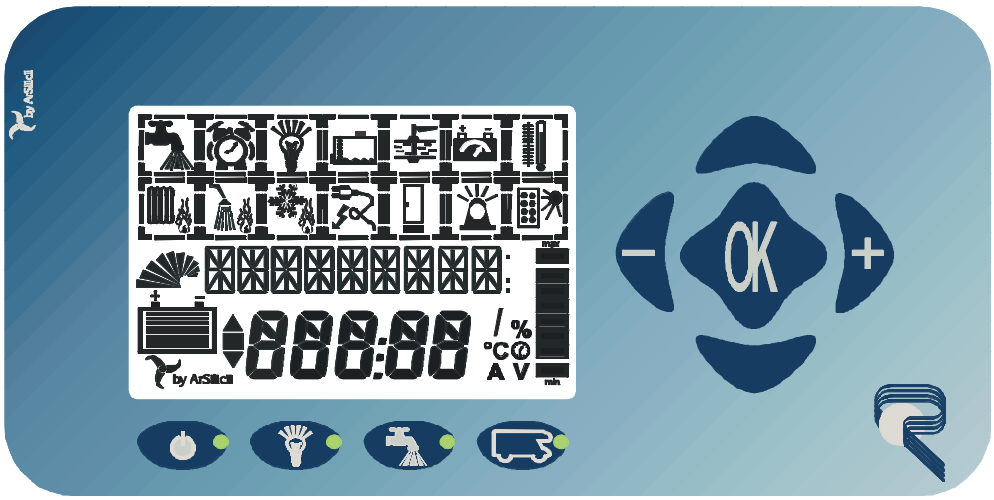
- Never do any work on the system without firstly disconnecting the 220V mains, the solar panels and the batteries.
- Check the acid level of the batteries at regular intervals.
- During prolonged parking and stowage of the vehicle, in the lack of external power sources (220V mains or solar panels) it is advisable to disconnect the positive terminal of both the engine battery and services battery.
- Any repairs on the electric system should only be carried out by skilled personnel.

[1] Example: insert a dioxide sensor that works not only as stand-alone device but integrated directly with the AS D2NA therefore automatically with the statuses that can be displayed and set also by the control panel without having to lay any wire between the sensor and control unit.

STRUCTURE OF THE CONTROL PANEL AND HOW IT WORKS

The **Control panel** has a liquid crystal display (LCD), which shows the main electrical ratings and the "conditions of health" of the system. It differs from conventional ones because it is connected to the system only through a single 4-lead cable.

The front panel, shown in the following illustration, comprises two keypads, one at the right of the LCD, named *navigation* and one, under the display, named *direct* or *fast.*



MAIN CONTROL PANEL COMPONENTS

Keypads

Navigation Keypad

This has 4 keys (Fig. 2) around a centre OK button on the right of the display and it is illustrated below.

Fig. 2

Their function varies depending on the context and is described below:

Fig. 3

With the buttons of Fig. 3 it is possible:

- To scroll the icons horizontally
- After selecting an icon, to choose from the alternatives of the menus (eg. ON/OFF) or set new values (eg. clock).

Fig. 4

With the buttons of Fig. 4 it is possible:

- to scroll the symbols on the display vertically;
- After selecting a symbol, to scroll the items of the menus associated with each icon

With the button of Fig. 5 it is possible:

- To select a symbol to access the menus associated with it;
- Carry out the command set, and, at the same time, return to the symbol navigation mode.

Fig. 5

Fast Keypad

This comprises 4 buttons (shown in Fig. 6) to be found just under the LCD.

Fig. 6

Each key has a small light (also called LED) which represents the status of the icon shown on it. Now let's take a detailed look at the functions connected with these keys.

P1	Makes it possible to cut off the energy or supply all the services, therefore, it is a true and proper main switch. The light on indicates that there is voltage on the electric system, vice versa all the services are not supplied. If the led flashes it means that there is a failure on a part of the system.
P2	Indicates the main lights switch, it makes it possible to power all the lights on the vehicle home cell ceiling or not. **Green light on** = ceiling distributor ACTIVE, off= CEILING DISTRIBUTOR deactivated, flashing = PROBLEMS.
P3	This is the remote button for turning the pump on and off. Green light on = PUMP ON, off = PUMP OFF, flashing = PROBLEMS.
P4	If the light is on it means that one of the following cases has occurred: service batteries flat, drain water tank in reserve, recovery tank full, pressing the button it is possible to learn in detail which of the previous situations has occurred. This button is active only when not in the navigation mode, i.e. when the time is shown on the display.

LCD display
The structure of the LCD is shown in Fig. 7:

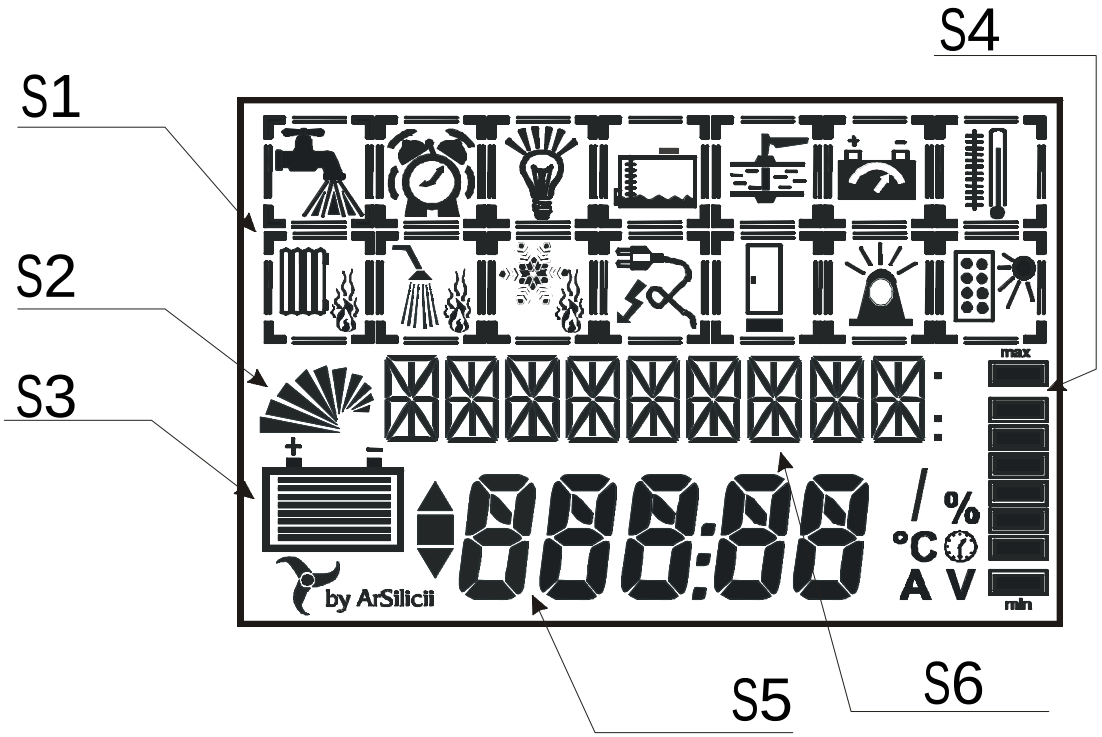


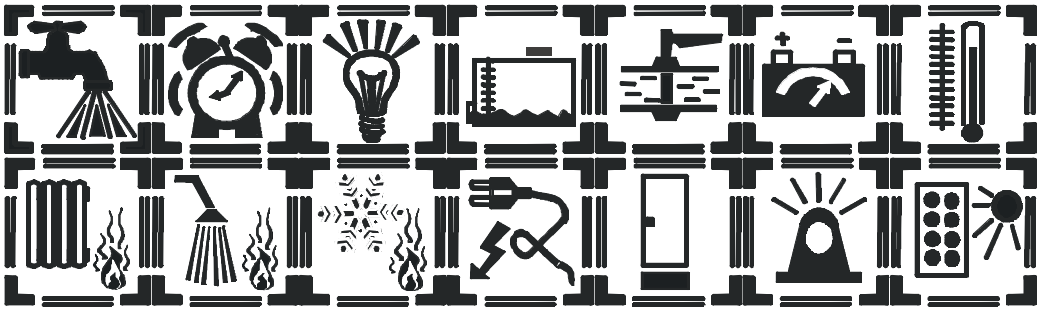
Fig. 7

S1	Icon
S2	Bar No.3
S3	Bar No.2
S4	Bar No.1
S5	Line No.2
S6	Line No.1

The upper part of the display graphically shows the symbols characterising the main functional areas offered by the system; these are called icons.
Immediately below there are two lines of alphanumerical characters (Line 1 and Line 2) which describe the various items of the menus selected. At the sides of the LCD display, there are graphic bars which make it possible to display the basic ratings immediately and constantly (e.g. service battery level, instantaneous current absorbed by the system, etc.).
Of course, the graphic symbols shown in the figure cannot all be shown at the same time.

Icons

There are fourteen icons and they schematically represent all the functions of the control panel.



Each icon comprises four parts (Main Body,Secondary Body, Corners and Bars, which are visible or not depending on the cases.
The icon shown in the figure, on the top left of the display, refers to the water pump.

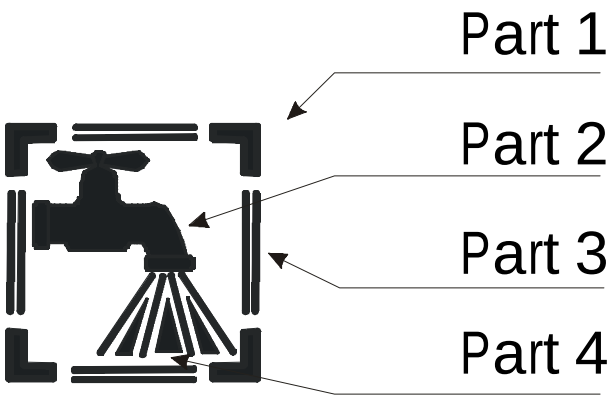


Fig. 8

Part 1	Corners
Part 2	Main body
Part 3	Bars
Part 4	Secondary Body

The parts that form an icon like the one of Fig. 7 are:
The **Main Body**, (the tap) indicates the function, in this case the water pump;
The **Secondary Body**, (water) summarises if the function is active or not. In this case, water can be seen coming out of the tap inside the icon only if the pump is oN.
The **Corners** indicate which icon is selected at the moment through the *navigation keypad.*
The **Bars,** if lit, indicate an alarm status or a fault relating to that function group (in this case, for example, it could be a short circuit on the pump).

Example: Switching the water pump on and off:

Fig. 9

Scrolling the display symbols using the *navigation* keys *(*Fig. 9*)*, we move to above the icon showing the tap. Pressing the OK key (the symbol is selected) additional information is shown in the form of alphanumerical characters. In this case the wording PUMP is shown (line 1) and its ON/OFF condition (line 2).

Fig. 10

Using the *navigation* keys (Fig. 10) scrolls the menu items: PUMP, PROTECTION and PROBLEMS. We are moving to PUMP**.**

Fig. 11

With the *navigation* keys (+ and - of Fig. 11) it is possible to select the condition required on the PUMP: **ON**/**OFF**

Fig. 12

Pressing the OK key (Fig. 12) applies the command chosen to the menu item and at the same time returns to the navigation mode.

GRAPHIC BARS

There are three graphic bars, Fig. 13, which give an evaluation "at a glance" (as they are always shown regardless of the operating mode), of the main ratings of the camper. These can be examined in more detail in the corresponding items of the special menus.

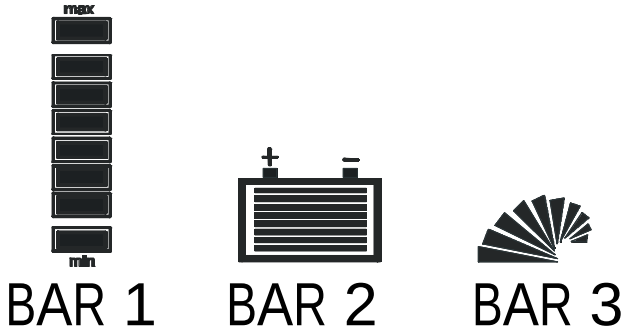


Fig. 13

Bar 1	Bar No.1	**Bar 1** indicates the **level of the drain water** The min. and max levels respectively indicate: drain water tank *Empty* and drain water tank *Full*. For more precise information it is necessary to select the symbol relating to the tanks and consult the special menu
Bar 2	Bar No.2	**Bar 2** indicates the **battery charge remaining in the battery** In this case too, it is possible to obtain more precise information, selecting the special symbol and consulting all the menus it contains.
Bar 3	Bar No.3	**Bar 3** indicates the **instantaneous absorption of the system** from the service battery. Its filling takes place *counter-clockwise*, a higher number of segments indicates higher absorption. It should be noted that if there is a form of outside energy, such as connection to the 200 V mains or solar panel, the bar in question is always "off", as the consumption of the services is supplied by the outside energy sources.

LINE 1 AND LINE 2 (ALPHANUMERICAL CHARACTERS)

The area devoted to representing characters and numbers is subdivided on two lines. Their behaviour changes in relation to whether a symbol is selected or not.
In the navigation mode (no symbol selected), the top line is off completely, while the bottom one shows the time .
Otherwise, the top line shows the name of the menu item, while the bottom one shows the alternatives to it.
Sometimes, if the symbol selected is associated with a rating (e.g. battery or tank), the top line shows the name of it, the bottom one its value and, at the side of this, the unit of measurement will be shown.

DETAILED DESCRIPTION OF THE FUNCTIONS

In this section we are giving a detailed description of the functions on the control unit. Please remember that some of them might not be present in the model in your possession, or refer to accessories that are not installed. For convenience, the functions are grouped according to the icons that contain them.

Functions

PUMP

Contains the items of the menu concerning the use and diagnostics of the water pump.
The bars around the symbol are shown only in the event of a Short Circuit on the pump.
The water flowing indicates that the pump is on

PUMP: ON/OFF
This makes it possible to set the on or off condition of the water pump. *Initially this menu item is positioned at OFF.*

PROT. ON/OFF
In addition to electrical protection on the PUMP (which is always activated due to the node), it is possible to set an additional one, This, if activated, prevents the pump from turning on if there is not enough water in the tank. *Initially this menu item is positioned at OFF*.

PROBLEMS: NO/SC
Indicates the presence or not of electric problems on the pump (NO = no problem, SC = Short Circuit).

CLOCK

Contains the menu items relating to the clock. It makes it possible to set the current time using the right and left arrow keys.

LIGHTS

Contains the items of the menus concerning the supply of the motorhome ceiling.
The bars around the icon are shown only in the event of an electrical fault concerning the upper part of the electric system. The rays indicate that the lamps on the ceiling, or at any rate all the loads connected to the output of the ceiling distributor, are receiving voltage

LIGHTS: ON/OFF
This makes it possible to supply or cut off power to all the loads connected to the output of the ceiling distributor of the vehicle. *Initially this menu item is positioned at ON.*

PROBLEMS: NO/SC
Indicates the presence or not of electrical problems in the ceiling (NO = no problem, SC = Short Circuit). A symbol next to the wording SC serves for auxiliary information about the location of the short circuit. In particular the following symbols are used (Fig. 14):

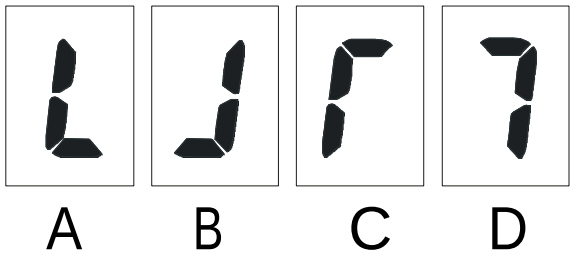


Fig. 14

A	short circuit on the floor distributor left channel
B	short circuit on the floor distributor right channel
C	short circuit on the ceiling distributor left channel
D	short circuit on the ceiling distributor right channel

In the event of more sources of short circuit there will be a combination of the above-mentioned symbols. As mentioned previously, as the cause of the short circuit ceases, the warning ceases and the system resumes correct operation without changing fuses.

LEVELS

This contains the items of the menus concerning the tanks.
The bars may indicate: the lack of drain water or a recovery tank overflow.

DRAIN: *X* %

This item of the menu gives the level of the drain water tank expressed in percentage of the total volume. (for a 4-level sensor (0%-30%-60%-90%)

SEWAGE 1: NO/FULL
Indicates if sewage recovery tank 1 is full or not.

SEWAGE 2: NO/FULL
Indicates if sewage recovery tank 2 is full or not.

GAS-SOLENOID VALVE

Functions that can be activated only through optional installation kits.

This contains the items of the menus associated with protections against gas leaks and the presence of carbon dioxide and it signals the condition of the gas solenoid valve.

GAS SENS : ON/OFF/GAS/--
The dashes (--) indicate that the sensor is not installed or not working properly. The word ON flashing means that the sensor is warming, and therefore it is unable to detect an alarm situation. After warming, ON stops flashing.
The word GAS appears when an alarm situation has occurred, i.e. a gas leak.

ALR SOUND: ON/OFF/--
The dashes (--) indicate that the sensor is not installed or not working properly. The ON control enables the buzzer on the sensor to sound in the event of an alarm, while OFF disables it.

BATTERIES

This contains the items of the menus concerning the voltage measurements on the two batteries (engine and services), the current delivered and the amount of charge stored.
The bars indicate that the services battery is beginning to undergo damage.

ENG BATT: *X* V
Shows the voltage rating, expressed in Volts, at the engine battery terminals.

SERV BATT: *X* V
Shows the voltage rating, expressed in Volts, at the services battery terminals.

CURRENT: *X* A
Displays the rating of the instantaneous current delivered, **if the rating is positive,** by the services battery. Conversely a **negative rating**, expresses the value of the charge current (of the services battery or both).

AMPERE H: *X*
Indicates the amount of charge, expressed in Ah, used or supplied to the battery from the last reset made.

RESETAMPH
Pressing the OK key resets the ampere/hour (Ah meter) mentioned above.

PROBLEMS: NO/LO
Indicates the presence or not of problems on the services battery (NO = no problem, LO = start of irreversible damage on the services battery).

TEMPERATURES

Functions that can be activated through suitable optional kits.

This contains the items of the menus which show the momentary inside and outside temperature.

IN TEMP: X °c / --
Shows the temperature in degrees centigrade, inside the home cell. The dashes indicate that the sensor has not been installed.

OUT TEMP : X °c / --
Shows the temperature in degrees centigrade, outside the home cell. The dashes indicate that the sensor has not been installed.

HEATING

Contains the items of the menus for remote control and timing of the electronic stove.
Function not active in this model.

BOILER

Contains the items of the menus for remote control and timing of the boiler.
Function not active in this model.

FRIDGE

Contains the items of the menus controlling the fridge.
Function not active in this model.

220 V MAINS

Contains the items of the menus concerning the presence of the external 220V mains and the power unit.

The bars indicate high internal temperature of the switching power unit.
The lightning flash indicates that the 220V line is connected.

EXT. PWR: ON/OFF
Shows whether the vehicle is connected to the 220V mains or not.

PARALLEL : ON/OFF
Makes it possible to decide, **if the vehicle is connected to the 220V line**, to put the engine battery in parallel with the services battery. *Initially this menu item is positioned at OFF.*

V MAX: *X* V
Shows the maximum voltage rating, expressed in Volt, set at the terminals of the services battery during charging.

PWR TEMP: *X* °C
Gives the temperature inside the power unit, expressed in degrees centigrade.
Readings below 70 °C are acceptable. Beyond this threshold, the situation is abnormal. However, the power unit begins to lower the power delivered in order to prevent damage. As soon as the temperature returns to normal the power unit starts working normally again with no action from outside.

FAST: ON/OFF
This makes it possible to set the charging cycle to be carried out on the battery/ies. *Initially this menu item is positioned at OFF.*
N.B.*: the use of fast ON is advisable only when the services battery starts having sulphation problems, for partial regenerating, or in cases of extreme need to charge quickly, because the normal charging cycle (fast OFF) has been specially designed for long battery life and is therefore to be preferred*

MAINT. ON/OFF
If an external source of energy is present, this makes it possible to set an alternative charging cycle other than fast. *Initially this menu item is positioned at OFF.*
N.B.*: this type of charge is to be used only for prolonged stops of the vehicle, as it is not an actual charge but makes up for battery self-discharging and can only be activated in the presence of an outside source of energy (220V mains or solar panels). It has been designed to prevent the battery electrolyte from being consumed during periods of inactivity.*

LANGUAGES

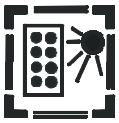
Contains the items of the menus through which it is possible to choose the language (ITALIAN, ENGLISH, FRENCH, GERMAN and SPANISH) , in which all the information is shown.

ALARMS

Contains the items of the menus connected to the alarms present in the motorhome.
The bars and rays indicate the presence of danger.

Functions that can only be activated through suitable optional kits.

SOLAR PANELS



Contains the items of the menus concerning the solar panels.
The sun (top right) indicates that the power delivered by the solar panels exceeds a determinate threshold, which implies the presence of solar panels operating.

SOLAR P: ON/OFF
For turning the solar panels on or off. *Initially this menu item is positioned at OFF*.

POWER: *X*
Shows the power, in Watt, delivered instantaneously by the solar panels.

GENERAL ADVICE ABOUT THE CORRECT USE AND MAINTENANCE OF THE SYSTEM:

- During prolonged halts (over one month), it is always wise to charge the batteries, to prevent discharging that could seriously compromise the storage capacity of the batteries themselves. If solar panels are installed, these keep the batteries under charge, therefore they can be kept in parallel through the special control of the control unit. If connection to the 220V mains is available, the maintenance charging system can be used to compensate for self-discharging of the batteries.
  In systems with the power unit without the main switch in the lack of external sources of energy (220V or solar panels) it is advisable to disconnect the positive terminal of both the engine battery and services battery, so that the batteries reduce their consumption at self-discharging.
- Do not use chemical substances, cleaning solvents or strong detergents for cleaning the control panel. To clean, use a lightly moistened, soft cloth.
- Avoid obstructing the power switching unit cooling vents.
- Prevent the power unit from coming into contact with fluids or anything else that can get inside the container through the air vents.
- Avoid pressing the keys of the control panel with screwdrivers, knives, blades, etc.
- Repairs on the electric system should only be carried out by skilled personnel.
- Should any emergency work be necessary, it is advisable to **disconnect both positive terminals of the batteries and if necessary connect to the 220V mains or solar panels.**

FEATURES OF POWER UNIT Mod. AL310X

Model AL310X

The power unit model AL310X is a device designed for energy control; it features the possibility to switch and adjust the various sources of energy available supplying stable and safe power on the outputs.
In a Motorhome we typically have the following sources of energy:

1. Engine battery/ies;
2. Services battery/ies;
3. Alternator;
4. External Electricity Mains;
5. Solar Panels;
6. Generating set;
7. Alternative sources (Wind generators, etc..)

And the outputs are typically considered:

- Services (the whole home cell at 12 V)
- Fridge

Specifications

Electric
The electric specifications of the device are the following:

- Supply voltage: 110-220 V, 50-60 Hz. In accordance with regulations
- Rated power:150 VA of battery charger @ 13.5 V.
- Services output : 13.5 Volts 30 Amperes.
- Fridge output : 13.5 Volts 20 Amperes.
- SMART active protections.
- If connected to the 110/220V external mains, the power unit delivers power even if the batteries are not connected

Sizes
Container: 220x195x82 Weight Kg. 1.5
Connections

- Cable (L. 150 cm) for connection to the 110/220V Mains, with selector, 50 – 60 Hz with Schuko plug

I. ***J1 Molex caimano mlx 94213 - 2014*** (connector "S" used for connecting the services battery), colour: white
   - contact No.4 → Negative
   - contact No.3 → Not Used
   - contact No.2 → Positive (+12)
   - contact No.1 → Not Used

II. **J2 *molex caimano mlx 94213 - 2014*** (connector "M" used for connecting the engine battery and engine on signal) colour: red
   - contact No.4 → Negative
   - contact No.3 → Not Used
   - contact No.2 → Positive (+12)
   - contact No.1 → D+ (Engine on signal)

III. **J3 *molex caimano mlx 94213 - 2014*** (connector "B" used for distributing energy to the home cell) colour: black
   - contact No.4 → Negative
   - contact No.3 → Bus_B
   - contact No.2 → Positive (+12)
   - contact No.1 → Bus_A

IV. **J4 *molex caimano mlx 94213 - 2014*** (connector “F” used for connecting to the Fridge**; not to be used for assembly of Fridge *AES***) colour: green
- contact No.4 → Negative
- contact No.3 → Positive +12 (Power)
- contact No.2 → Positive (+12) (Low Power)
- contact No.1 → Aux

V. **J5 *Amp Mate-N-Lock 2x1*** (connector “P” used for connecting the solar panel)
- contact No.1 → Negative
- contact No.2 → Positive

Conformity

The device meets the requirements of European Union Directive: 89/336 EMC Electromagnetic Compatibility, 73/23 and 93/68 EEC Safety of Electrical Products.

Advice

Before doing any maintenance work disconnect the 110/220V mains and all sources of energy.
Install the device in a dry, sufficently ventilated place.

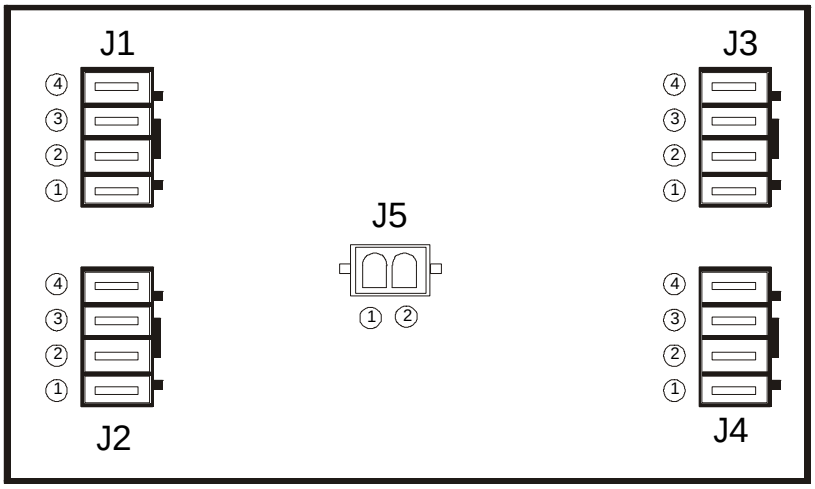


Fig. 15 "Connector Layout – Power Unit AL310X"

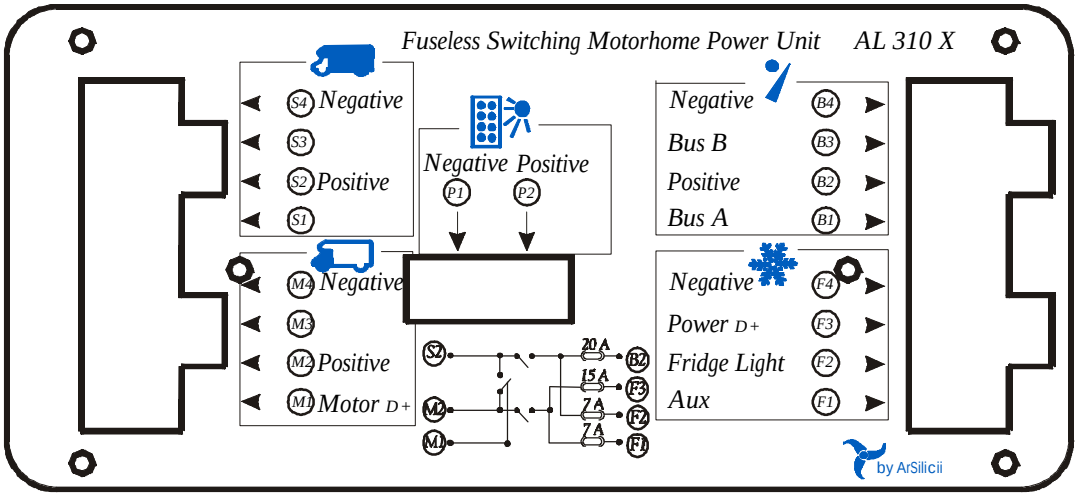


Fig. 16 "Power Unit AL310X Serigraph"

SPECIFICATIONS AND OPERATION O F POWER HUB PH300S2

Model PH300S2

The power-hub, also known as distributor, offers the possibility not only to distribute energy and information to the various devices connected on its outputs, but also to protect them against short circuits or abnormal overloads. The distributor can be controlled to enable/disable the flow of energy to the outputs in two ways: locally through a button (on/off) directly connected to the distributor, or by remote control, through the control unit with a special command. The control unit also displays the status of the distributor electrical protections.

Inputs

The device mainly comprises three types of connectors. Connector J1, Fig. 1, normally considered the device input, has the same terminals, i.e. shared, with connectors J2 and J3 which are considered purely as simple feedthroughs. The 2-pole connector J4 is usually used to connect the output control button.

Outputs

The device has a set of connectors for the outputs (from J5 to J12) logically formed of 2 subgroups that can be controlled independently[2], the first from J5 to J8 and the second from J9 to J12

Electrical Specifications

The electrical specifications of the device shown in Fig. 2 are the following:

- Supply voltage 12 V
- J1, J2 4-pole feedthrough connector with 30 A capacity
- J3 4-pole feedthrough connector with 3 A capacity protected by a 5A self-resetting fuse
- J5..J8 four outputs protected in pairs by 7A self-resetting fuses (F4 and F5); the group of four connectors is supplied by a line with a 10 A SMART protection (F2);
- J9..J12 four outputs protected in pairs by 7A self-resetting fuses (F6 and F7); the group of four connectors is supplied by a line with a 10 A SMART protection (F3).
- J4 control connector for sectioning switches I1 and I2

Connectors

The connectors used on the device are of three types (also see Fig. 2)

- J1..J2 Molex *"caimano "* code **mlx94213-2014** with the contacts arranged as follows (also see Fig. 1)

  1 - Bus A
  2 - Positive +12 V
  3 - Bus B

- J12 Molex *"mini-fit Jr"* code **MLX5569-04** with the contacts arranged as follows (also see Fig. 1)

  1 - Bus B
  2 - Ground
  3 - Bus A
  4 - Positive +12 V

- J12 Molex *"mini-fit Jr"* code **MLX5569-02A2** with the contacts arranged as follows (also see Fig. 1)

  1 – Pole A-Switch.
  2 – Pole B-Switch.

Conformity

The device meets the requirements of European Union Directive: 89/336 EMC Electromagnetic Compatibility, 73/23 and 93/68 EEC Safety of Electrical Products

Advice

Install the device in a dry and sufficiently ventilated place.

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[2] In the Power Hub model 300 S2 the two outputs are activated/deactivated in parallel

NB. If the device control “button” is not connected to connector J4 as standard it can be inserted at any time to be able to control the device locally and remotely.

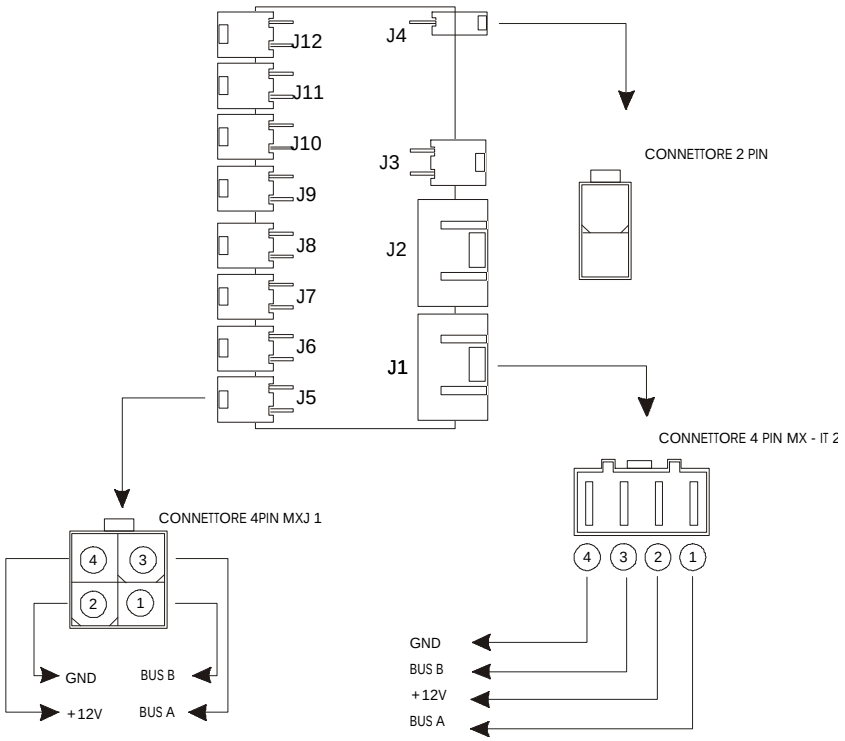

Fig. 17 "Power Hub"

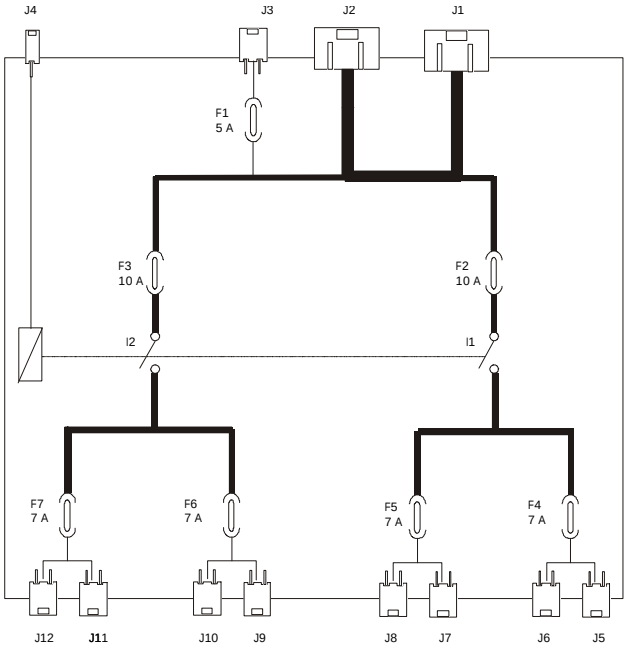

Fig. 18 " Power Hub Logic Layout"

FEATURES OF NODE Model NSA10

Model NSA 10

This system makes it possible to deliver power on a load, such as the water pump, connected to its output, but also to protect it against any short circuits or abnormal overloads.
This node is set to detect levels with discrete sensors (with 4 levels) and two overflow sensors.
The device can be controlled to enable/disable the flow of energy towards the pump in two ways: locally, through a normal switch (on/off), and remotely, via the control unit. The control unit displays the status (on/off) of the device and the status of its protections and level sensors.

Inputs

The device, as shown in Fig. 19, mainly comprises three types of connectors. Connector J1, the device input; connector J4 with six poles usually used to detect the levels of a tank with a discrete four-level sensor and connector J5 with 4 poles which is used to detect the overflow signal from two separate tanks.

Outputs

The output comprises connector J2, as shown in Fig. 1 (on certain models connector J3 may not be fitted); connector J2 will have the power output and two contacts (Wire A and Wire B) for connecting the control switch

Electrical Specifications

The electrical specifications of the device are the following:

- Supply voltage 12 V
- J1 6-pole connector input, capacity xx A
- J2, J3 the two possible outputs controlled respectively by the corresponding switch connected to contacts CON_01 and CON_02 respectively protected by a 3 A SMART fuse
- J4, J5 the two connectors for the level sensors.

Connectors

The connectors used on the device are of three types:

- J1 Molex *"mini-fit Jr"* code **MLX5569-04** with contacts arranged as follows (also see Fig. 20)
  1 - Bus B
  2 - Ground
  3 - Bus A
  4 - Positive +12 V
- J2, J3 Molex *"mini-fit Jr" code* **MLX5569-04** with contacts arranged as follows (also see Fig.1)
  1 - Wire_01
  2 - Ground
  3 - Wire_02
  4 - Positive +12 V

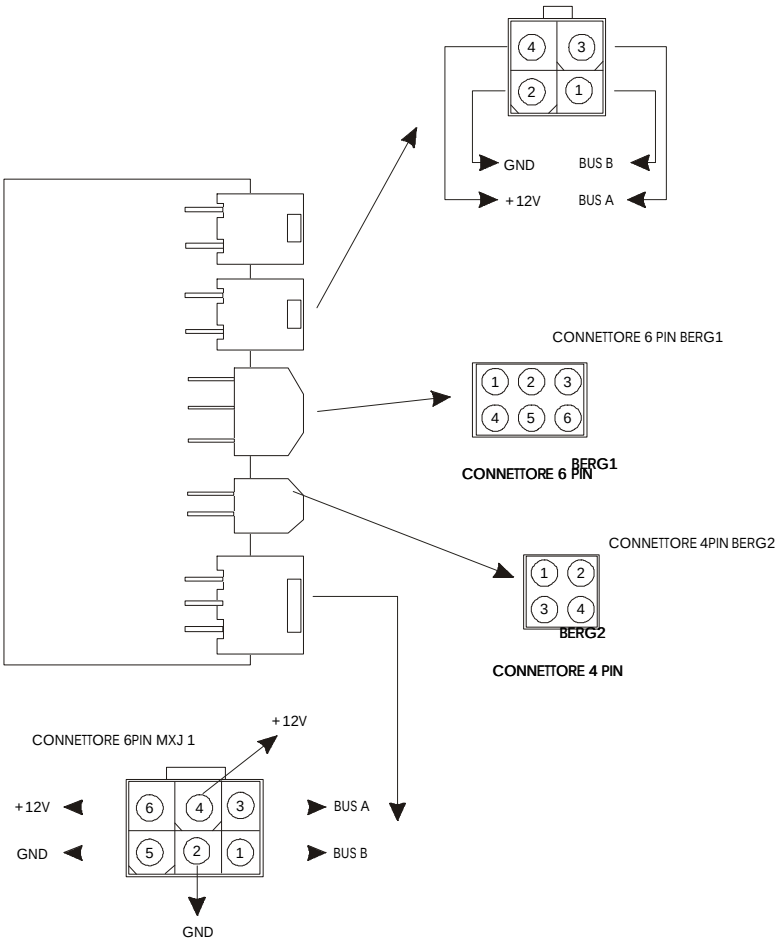

Fig. 19 “Node & connectors”

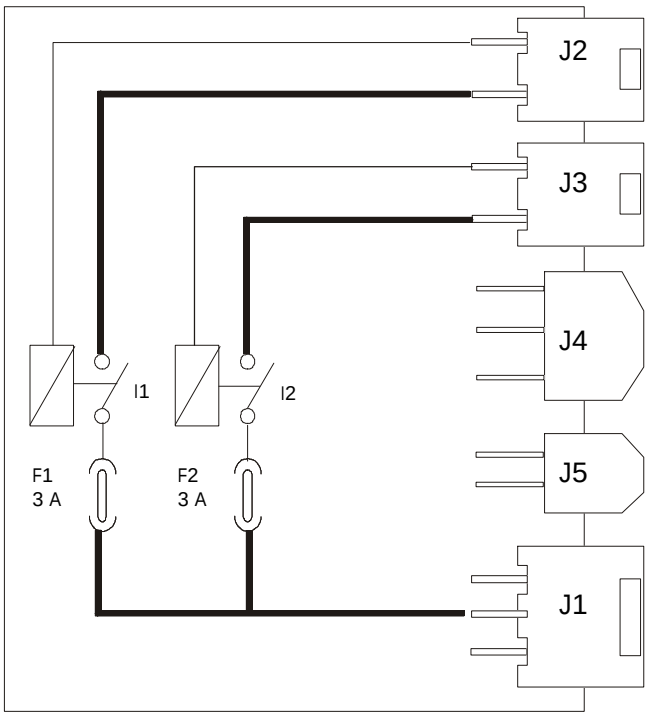

Fig. 20 “Node logic layout”

SOLUTION TO THE MORE COMMON PROBLEMS

SHOULD THE FOLLOWING OCCUR …..	WHAT TO CHECK…..AND…DO
The Services Battery fails to charge when the vehicle is travelling.	• Check the engine battery fuse (50 A reed in the black box on the battery positive terminal); • check that the connectors of the power unit are inserted in the correct positions (colours of male connectors same as colours of female connectors); • check that the 3 A fuse at the alternator output has not blown; • check that the "engine on" signal[3] (alternator output of mechanical unit, the one commonly called D+) is picked up correctly and that it reaches the power unit input; • check with the engine running that the engine and services battery have the same rating (around 13.5 V, apart from the differences due to voltage drop of the wires, typically a few tenths of volt); this can be checked in two ways: by reading directly on the control unit, on which we can read the voltage ratings of the engine and services batteries, otherwise measuring the voltage directly on the terminals; • contact skilled personnel.
There is no voltage on "all" the home cell (including the control unit).	• Check that the power unit switch is at *on*; • check that the services battery is charged and that the fuse (50 A reed) has not blown; • check the power unit output for short circuit[4]; • check with the engine running or 220 V on, that current reaches the home cell. If it does, the services battery may be flat or damaged; • contact skilled personnel.
The entrance light turns off on its own when the other lights are switched on	• Replace the "cherry" circuit.
The fridge is not working with the engine on	• check the fuse (3A engine compartment) of the engine on signal (D+) see note no. 5; • check the power unit fridge output for short circuit or that the supply positive is not cut off; • check that the "engine on" signal (engine alternator) is picked up correctly and reaches the power unit input; • check the connections to the power unit and fridge respectively following the instructions and in the fridge Instructions; • contact skilled personnel.
The fridge is working at 12 V with the engine off	• Check that the connections to the power unit and fridge respectively are correct (take care not to mistake the +12 wire with the D+ especially in AES models); • check that the "engine on" signal is picked up correctly and reaches the power unit input following the instructions and in the fridge Instructions;

[3] The "engine on" signal that reaches the power unit is usually picked up from the alternator output of the vehicle mechanical unit as shown in; in certain mechanical units there may be more than one wire at the alternator output; it is therefore necessary to make sure that the signal is picked up from the right one. In other mechanical units the signal is picked up from the ignition key.

[4] On power unit or later ones if, with the main switch at *on*, the warning led stays on permanently there is either a short circuit at the power unit output or it is damaged internally.

SHOULD THE FOLLOWING OCCUR …..	WHAT TO CHECK…..AND…DO
	• replace the power unit and check whether the problem persists; • contact skilled personnel.
The water pump is not controlled by the control unit	• Make sure that the switch on the power unit (main) is activated and that the warning led is off; • check in the pump menu that the pump protection has not been activated which prevents it from being turned on in the lack of water in the tank; • check the control node for damp owing to a water leak, then try drying it; • check the correct position of the cables at the sewage node (as mentioned in the manual); • check whether the other floor services (boiler, cisterns, stove) are working properly, i.e. if the floor distributor , usually near the power unit, is working properly. If the floor services are not powered, try operating the floor distributor through the button with which the vehicle is fitted. To do this (see section check the pump input for short circuit (from the control unit); • check that the pump can be operated from the local switch (not fitted on all models); • check whether the fault remains also after system *reset* • check the presence of the sewage node from the advanced menu, see 1.10; • if necessary use the direct *bypass* power connector of the pump with which the vehicle is fitted; • contact skilled personnel.
The water level is not indicated correctly.	• Check that the sensor has been connected to node NSA see 1.0 as specified; • check the level sensor electrodes for dirt[5]; • check the presence of the sewage node, see 1.10, from the advanced menu; • contact skilled personnel.
The flash is not displayed when connecting to the 220 V mains	• Check that the power unit plug is in its socket; • check that the differential switch is "armed"; • contact skilled personnel.
The ceiling lights fail to turn on	• Check that the upgoing line is not shorted and that the power unit supplies power at the output; • check that the ceiling distributor is on using the input button; • check the advanced menu for the presence of the ceiling distributor; • contact skilled personnel.
The floor services are not supplied	• Check that the upgoing line is not shorted and that the power unit supplies power at the output; to do this, check that the warning led on the power unit does not stay on permanently; • check whether the floor distributor, usually near the power unit, can be operated using the button with which the vehicle is fitted. To turn it on see section; • contact skilled personnel.
The current indicator on the control unit gives a reading other than zero Amperes even if **all** the loads of the cell have been switched off	• Make sure the solar panels, if fitted, have been switched off; • check directly on the service battery that it is delivering current (to do this, insert an ammeter in series with the wire connected to the services battery positive terminal); • Reset the current to zero from the advanced menu;

[5] For this reason, you are recommended to keep the four-level sensor electrodes clean.

SHOULD THE FOLLOWING OCCUR …..	WHAT TO CHECK…..AND…DO
	• contact skilled personnel.

System reset or re-arming procedure:

- move the power unit switchto *off;*
- make sure that the services output connector (the black one) is on;
- wait for a few seconds;
- move the switch back to*on;*
- the warning led should stay on for about 16 sec. then go out. During the 16 sec. there is no supply at the output and the powerunit performs the calibration stage;
- if the warning led stays on after 16 sec., this means a short circuit at the power unit output, exactly on the carrier line (therefore the whole home cell must be without power)