

## Operation manual for



## Aquarium Computer AT Control

AT Control is a measuring and control system with nearly unlimited possibilities for the electronic control of aquariums and terrariums. The basic version comprises a temperature controller, multiple timer functions and a PC connection for programming and data display. Optional accessories are a pH control, Redox (ORP) control, density control (for marine aquariums), conductivity control (for pure and freshwater) and a level control. The parameter can be connected and the set points can be adjusted as fix points or as a curve in the day-night-cycle. The complete programming can be made from the Controller or directly from the keyboard of the PC.

### 1. Description of the system

The aquarium computer AT Control is a modular system. Starting from a basic unit, it can be enlarged almost indefinitely.

The minimum for starting is the AT control set and one Power Box. Interface Boxes (for measuring of pH, Redox (ORP), conductivity, density and level) can be added. If more mains sockets are needed, more Power Boxes can be added as well. All system components are connected by USB connectors. A USB Hub can be used to multiply these connections, if more, than the supplied 8 are needed.

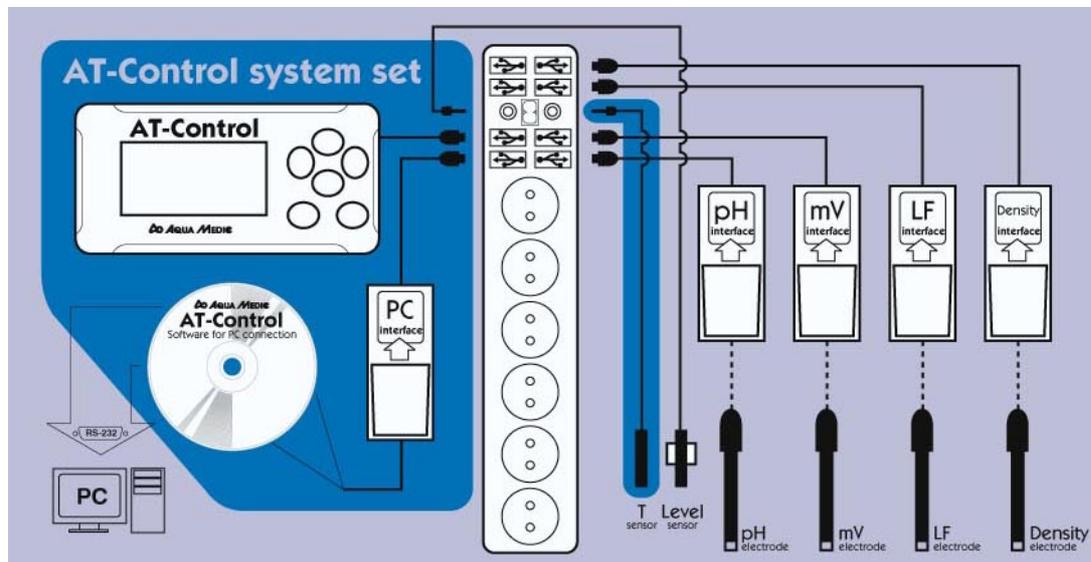


Foto 1: AT Controller components and Connections

1. Controller
2. Power Box
3. USB Connections
4. PC Interface
5. CD ( Software for PC)
6. pH Interface (with connected probe)
7. mV Interface (with connected probe)
8. Conductivity Interface (with connected probe)
9. Density Interface (with connected probe)
10. Temperature and level probes
11. PC

# 1. Delivery

The **AT Control Set** comprises:

- The controller with battery and lid
- Holder for the controller
- USB cable to connect the controller with a Power Box
- PC Interface ( with serial connector) to connect the AT Control directly to a PC
- USB adapter to connect the PC Interface with a USB socket of a PC
- CD with AT Control software
- CD with Software for the USD adapter
- Temperature sensor with holder
- Short manual
- Operation manual

The **Power Box** comprises the power box and 2 holders.

The **Interface Boxes** for pH, Redox (ORO), Conductivity, Density and temperature/level are accessories. To operate them the corresponding probes are needed as well.



Foto 2: Front of the AT Controller

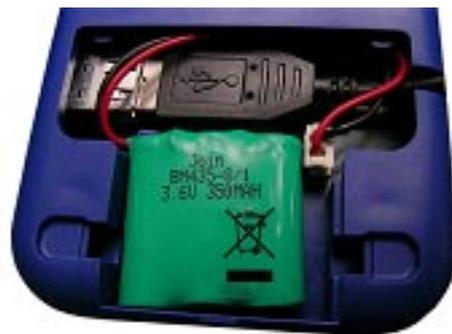


Foto 3: Back of the AT Controller

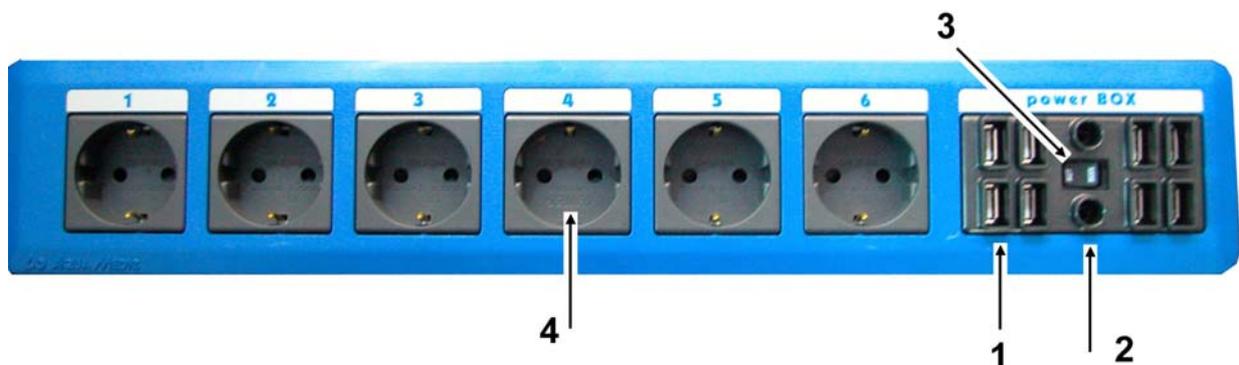


Foto 4: Power Box: 1 USB Ports 2. Audi Jack ports for Temperature and Level probes  
3. Automatic/Manual Switch 4. Power Sockets

## 2. Connection.

At first the batteries are placed into the controller (1) and the USB cable is connected, before the lid is closed. Then all components are secured safely near the aquarium. The Power Box (2) and the Controller (1) can be clipped into the holders, the Interface Boxes (5-8) can be fixed to smooth surfaces with Velcro.

All components are now connected with the Power Box using the USB cables. The temperature sensor (10) and if included the level sensor are directly connected with the Power Box, using the audio jacks between the USB plugs. If more than 2



Foto 5: Interface Box

temperature or level probes are used, an additional T/Lv- Interface Box is needed.

All other probes are connected to their corresponding Interface Boxes. To reach the sockets, the Interface Box can be opened and the sensor can be connected to the plug. If closed again, the sensitive connections are protected.

If all internal connections are done, the Power Box can be connected to the mains. The unit is switched on. One after the other, the connected sensors and components are recognised by the controller. By pressing the Enter button, the components are activated. Now, the corresponding measuring values are already displayed.

## 4. List of the Icons used in the controller

The Icons are displayed in the screen of the controller directly above the sockets and at the left lower corner.

	Attention, an alarm value is over/under the limits		Socket wave effect
	Manual operation		Socket tide effect
	Function button is activated		socket
RX	Redox (ORP) socket is active (on)		Agenda
pH	pH socket is active (on)		Agenda with sound alarm
$\mu$ S	Conductivity or density socket is active (on)		Summer mode
	Timer socket active (on)		Sound alarm activated
	Temperature socket is active (on)		Power Box manually blocked (switch on "man")
	Level socket is active (on)		Socket blocked by blackout
	Level socket is blocked		Unknown accessory

## 5. Connection of the AT Control to a PC

For the connection of the AT Control to a PC, an IBM compatible PC is needed. The PC Interface is connected to the Power Box with the USB cable that is included in the Interface Box. A standard USB cable, up to 10 m of length may be used as well. The serial connector of the Interface Box is now connected to the corresponding socket of a PC or laptop. If the Computer is not supplied with a serial connection, the USB adapter can be used to connect the Interface Box with the USB socket of the PC. Now, the AT Control Software has to be installed on the PC, from the delivered CD. If the USB adapter is used, the USB software from the 2 nd CD has to be installed as well.

The program creates an icon on the desktop. After the start of the program, the display shows at the lower edge: "not connected". At the upper edge of the display, a row of icons is placed, among the AB logo. By pressing this button, the connection between AT Control and PC via performed. Make sure, that the AT control is showing the basic screen with the measuring values. If other screens are active, the connection is not successful. The rest of the programming is self explaining and explained in a special manual.

## 6. Overview about the menu of the AT Control

<b>Main menu</b>		page
<b>settings</b>	<ul style="list-style-type: none"> <li>• language            Deutsch            7</li> <li>                         English</li> <li>• Date/Time            time            7</li> <li>                         date</li> <li>• Graphic period      Temperature      7</li> <li>                         pH value</li> <li>                         Redox (ORP)</li> <li>                         Density</li> <li>                         Conductivity</li> <li>• Password            8</li> <li>• Display            Brightness      8</li> <li>                         Contrast          8</li> <li>                         Screen Mode      8</li> <li>                         Scrolling Time    9</li> <li>• Reset settings      9</li> <li>• About                9</li> </ul>	
<b>Power Box</b>	<ul style="list-style-type: none"> <li>• Change Name        Power Box        10</li> <li>                         plugs            11</li> <li>• Manual Commands    11</li> <li>• Program Timer        12</li> <li>• Wave effect          13</li> <li>• Tide effect            14</li> <li>• Power Cut            14</li> <li>• Summer function     14</li> <li>• About                14</li> </ul>	
<b>Function Keys</b>		15
<b>Agenda</b>		17
<b>Temperature*</b>	<ul style="list-style-type: none"> <li>• Change name        18</li> <li>• Programs            18</li> <li>• Data record         19</li> <li>• Alarm                20</li> <li>• Calibrate Sensor    20</li> <li>• Measuring unit      20</li> <li>• Remove temperature sensor    21</li> <li>• About                21</li> </ul>	

<b>Level *</b>	• Change name	21
	• Programs	22
	• Alarm	22
	• Measuring unit	22
	• Remove level sensor	23
	• About	24
<b>pH value*</b>	• Change name	25
	• Programs	25
	• Data record	26
	• Alarm	26
	• Calibrate Sensor	26
	• Remove pH sensor	27
	• About	27
<b>Redox (ORP)*</b>	• Change name	28
	• Programs	28
	• Data record	29
	• Alarm	29
	• Calibrate Sensor	29
	• Remove Redox sensor	30
	• About	30
<b>Density*</b> <b>Conductivity*</b>	• Change name	31
	• Programs	31
	• Data record	32
	• Alarm	32
	• Calibrate Sensor	32
	• Measuring unit	33
	• Remove density sensor	33
	• About	33

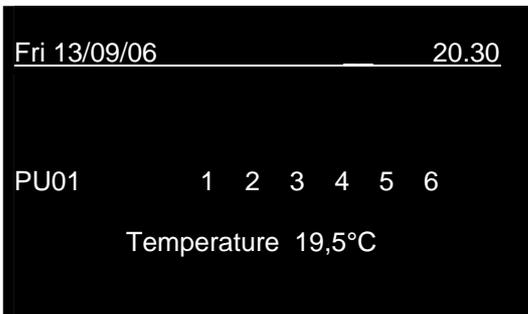
\* is only displayed, if the corresponding sensor is connected

## 7. Programming.

There are 2 possibilities to program the AT Control. If The AT Control is connected to a PC, the complete programming can be performed via the keyboard of the PC. The AT Control Software has to be installed before the unit can be connected to the PC. It is also possible to program the AT control via the buttons of the controller.

### Programming the AT Control via the buttons on the Controller.

When all components are connected and the Power Box is connected to the mains, the screen of the controller displays the basic screen:



In the first line time and date are displayed, below the number of the Power Box and the sockets 1 – 6. In the bottom line, the connected sensor values are shown – one by one. By pressing the Enter key, the main menu is opened.

Fig 1



In the Main Menu several menus can be opened. With the arrow keys ↑ and ↓ The desired menu can be chosen and confirmed with “Enter”

The main Menu can be left by pressing the ESC key.

Fig2

# Settings Menu



In the menu settings, the basic adjustments are chosen. With the arrow keys ↑ and ↓ the desired menu is chosen and confirmed with “Enter”

The main Menu can be left by pressing the ESC key.

Fig 3



In this menu, the language can be chosen. The desired language is chosen by the arrow keys ↑ and ↓ and confirmed with “Enter”

The Menu can be left by pressing the ESC key.

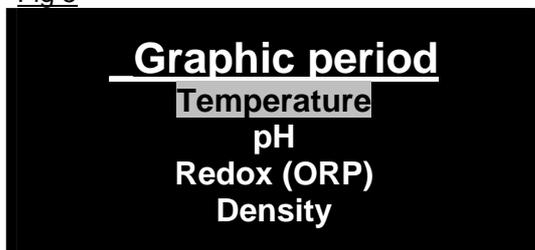
Fig 4



In this menu time and date can be adjusted. With the arrow keys ↑ And ↓ the desired values can be chosen. The cursor is moved with the ← and → keys to the next number.

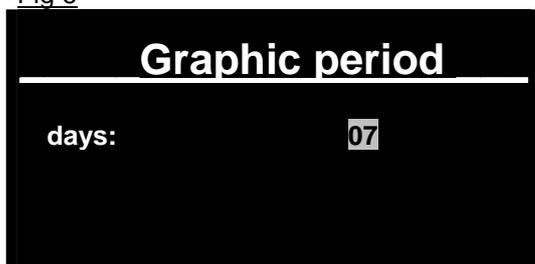
The Menu can be left by pressing the ESC key.

Fig 5



In this menu it is confirmed, how long the data of the single parameter are saved. With the arrow keys, the desired parameter is chosen (e.g. temperature) and confirmed with “Enter”. The saved values can be displayed in the menus of the parameter (temperature menu, pH menu...) in the line “Data Record”

Fig 6



In this screen, the period can be chosen from 3 different standard periods: 1 day, one week (7 days) or one month (30 days). This period can be adjusted individually for each parameter. For the better display at the screen (esp if connected to a PC) we recommend to use the same period for all parameters.

The Menu can be left by pressing the ESC key.

Fig 7



With this menu, the AT control can be protected with a password against undesired changes by accident or by purpose!

Move the cursor to “activate Pin” and press “Enter”

The Menu can be left by pressing the ESC key.

Fig 8



By pressing the ↑ - key and confirming with “Enter” a screen is opened asking for a PIN. With the arrow keys, the Pin can be created as a combination of the number 0, 1, 2 and 3. After pressing “Enter”, the key has to be repeated, and then it is activated.

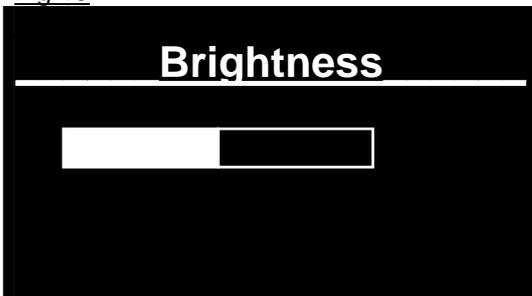
Fig 9



In this menu, the different properties of the display can be adjusted. The cursor is moved to the desired line and confirmed with “Enter”

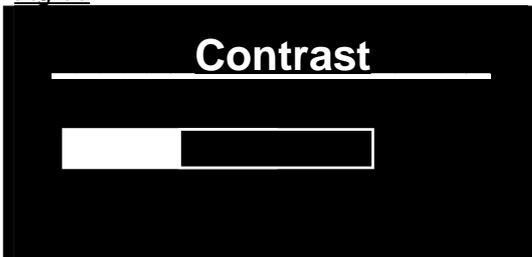
The Menu can be left by pressing the ESC key.

Fig 10



In this menu, the Brightness of the screen can be adjusted. Therefore, the ↑ and ↓ keys are pressed, until the desired brightness is reached. Confirm with “Enter”. The Menu can be left by pressing the ESC key.

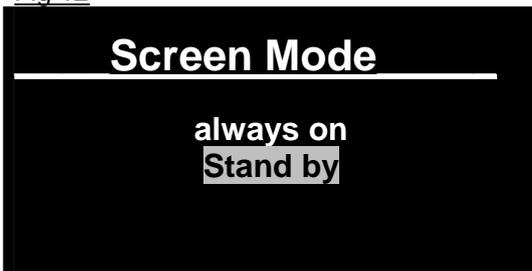
Fig 11



In this menu, the Contrast of the screen can be adjusted. Therefore, the ↑ and ↓ keys are pressed, until the desired Contrast is reached. Confirm with “Enter”.

The Menu can be left by pressing the ESC key.

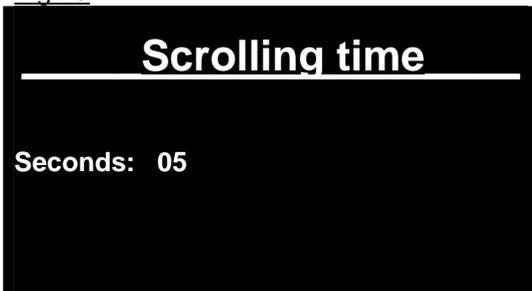
Fig 12



In this menu, the display mode can be adjusted. In the “always on” mode, the display is illuminated continuously, in the stand-by mode the screen is switched off after 3 minutes after the last pressing of a key. To switch it on again, press any key. You can choose between “always on” and “Stand by” with the ↑ and ↓ keys and confirm with “Enter”.

The Menu can be left by pressing the ESC key.

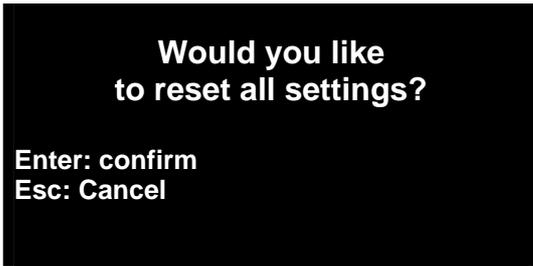
Fig 13



In the basic screen, the display switches from one parameter to the next every some seconds – the scrolling time. In this menu this time can be adjusted. The basic setting is 5 sec. It can be changed with the arrow keys, Confirm with Enter.

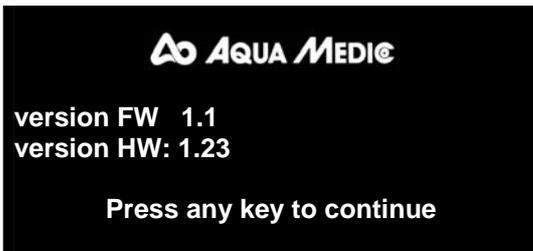
The Menu can be left by pressing the ESC key.

Fig 14



In this menu all settings can be reset to the pre-set values. Just move the arrow keys to confirm and press Enter. The Menu can be left by pressing the ESC key..

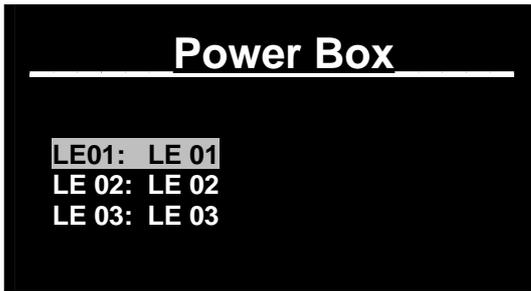
Fig 15



“about“  
This last screen of the settings menu shows the firmware and hardware versions which are installed.

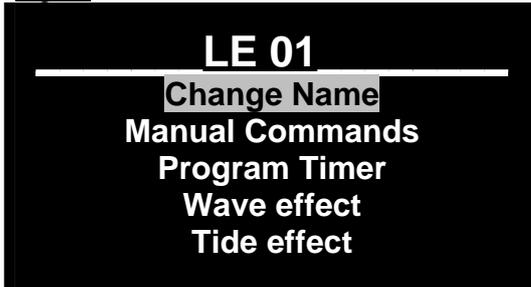
Fig 16

# Menu Power Unit



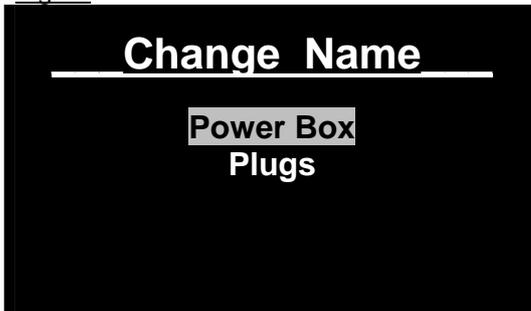
This screen is only displayed, if more than one power box is connected. Choose the desired box with the arrow keys and press "Enter". The Menu can be left by pressing the ESC key. The following screen appears.

Fig 17



This is the menu of the – previously addressed – Power Box. The Power Boxes and the single sockets can be given individual names. The Timer programs can be adjusted in this menu, as well as some special effects – which are tier programs as well. With the arrow keys the desired menu is chosen. Confirm with "Enter". The Menu can be left by pressing the ESC key.

Fig 18



The name of the Power Box and the Name of the plugs can be changed here. With the arrow keys the desired menu is chosen. Confirm with "Enter".

The Menu can be left by pressing the ESC key.

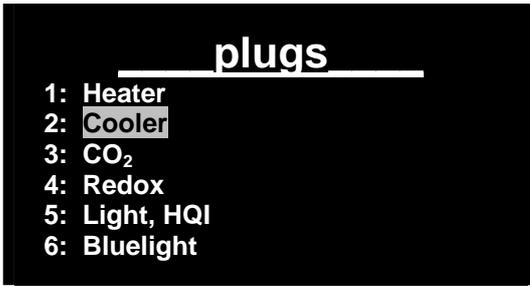
Fig 19



The Power Box. (Here: LE 01) can be renamed. The cursor is moved with the arrows to the first letter (here L) With ↑ and ↓ a letter can be chosen. With → the next letter is addressed. If the name is completed, it is confirmed with "Enter".

The Menu can be left by pressing the ESC key.

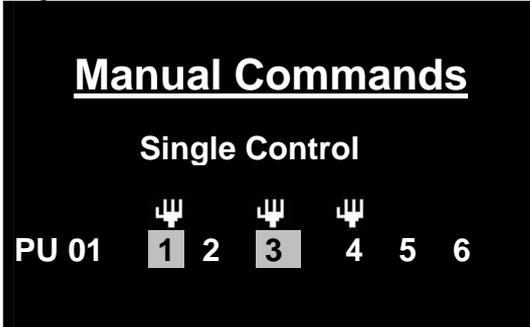
Fig 20



In this screen, the single plugs can be renamed. Choose a plug with the cursor. As described above, a letter can be chosen with ↑ and ↓. The next letter is addressed with → Enter. If the name is completed, it is confirmed with “Enter”.

The Menu can be left by pressing the ESC key.

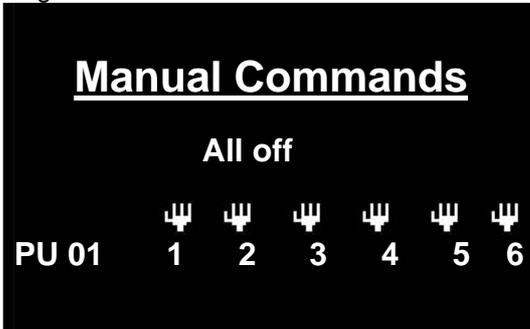
Fig 21



In this screen, the single plugs can be manually switched on or off. Choose “single control” in the screen Manual Commands with the arrow keys ↑ and ↓. Address a plug e.g. (1) with the → and ← keys. The desired mode can be chosen with the arrow keys ↑ and ↓: If the number of the plug is marked (here 1 and 3) the plug is switched on manually, if it is not marked (here 4), it is switched off.

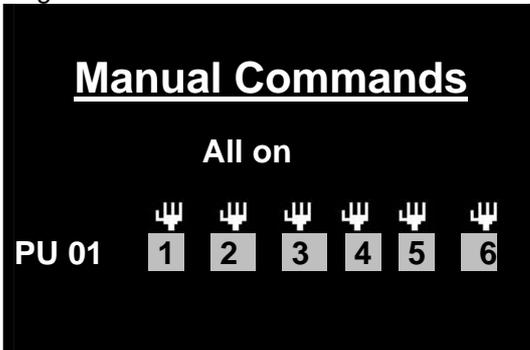
The Menu can be left by pressing the ESC key.

Fig 22



It is also possible to switch all plugs on or off simultaneously. In the Menu Manual Command you can choose with the arrow keys ↑ and ↓ between “all on”, “all off”, single control” and “restore all”. The manual symbol in then displayed above the numbers of the plugs like in fig 22. Restore all means, all plugs work automatically as programmed in the other programs. The Menu can be left by pressing the ESC key.

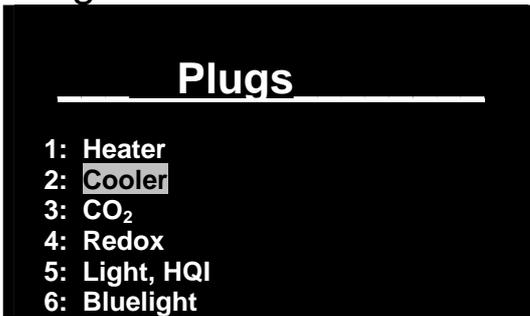
Fig 23



Now all plugs are switched on manually. If you press “restore all”, the manual icons disappear.

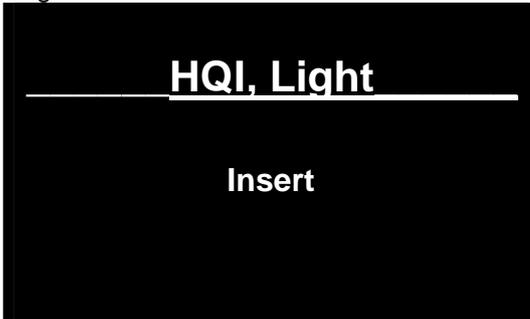
Fig 24

# Program Timer



If the menu "Program Timer" is chosen in the menu of the Power Box, the screen appears showing the plugs. Choose a plug with the arrow keys ( here (2) and confirm with "Enter"

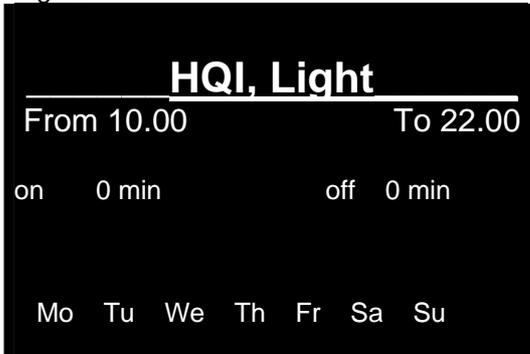
Fig 25



If no timer program is set on this plug, the display shows "Insert" If already a timer program is set on the plug, a second line is displayed showing: "show/Change/delete". If you want to program a new timer, choose "Insert" with Enter.

The following screen appears:

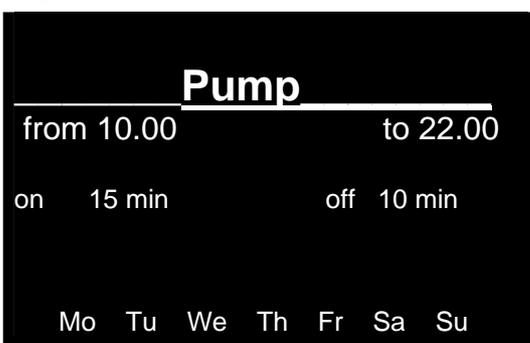
Fig 26



This screen allows several types of programs. At "From", the switching on time is adjusted, at "Off" the switching off time. The time is adjusted with the arrow keys. In the example shown, the plug is switched on from 10° to 22° (10 p.m.).

Days of the week. With the arrow keys, the single days of the week that is displayed at the bottom can be addressed and deleted. They disappear from the screen. The plug remains switched off on these days. For these days (e.g. on the weekend) other times can be programmed. To do this, the programming procedure is repeated and the other days are deleted. In this way as many different on and off times per day can be programmed as well.

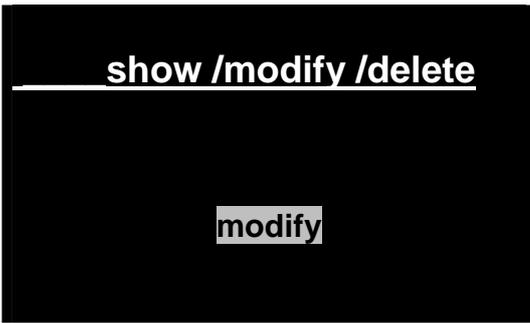
Fig 27



Interval. An Interval Timer can be programmed in this screen as well, e.g. as pump control. First a time period is set like in screen 27 (here from 10 am to 10 p.m.). Now, the fields "on" and "off" are filled with numbers using the arrow keys, In the example shown, the pump is switched on for 15 min and off for 10 min in the time from 10 am to 10 p.m. It is also possible to program the days of the week in this mode as well.

If the Interval Timer shall remain active for 24hrs, in the line "from" "to" data have to be inserted. E.g.: from 00.00 to 23.59

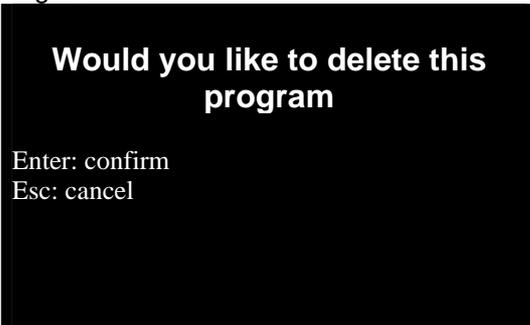
Fig 28



If you want to modify or delete an existing program, choose the line “show “modify/delete” with Enter. The first timer program, set on this plug is shown on the screen. By pressing the arrow buttons all timer programs set on this plus are displayed one by one. The program that you want to change or delete is addressed with Enter. It appears the screen 29.

If you want to change it, press “enter” The tier program is shown and you can change all adjustments with the arrow keys, like during the first programming.

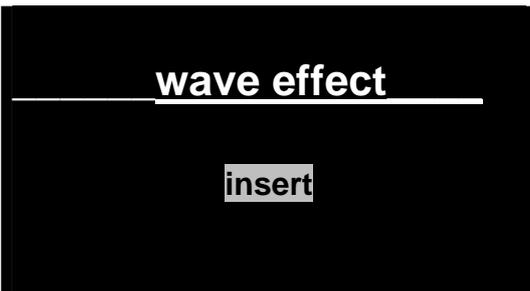
Fig 29



If you want to delete the program, press the ↓-key and confirm with Enter. Screen 30 appears If you are sure to delete the program press Enter If not, press ESC and you are back in the screen (29).

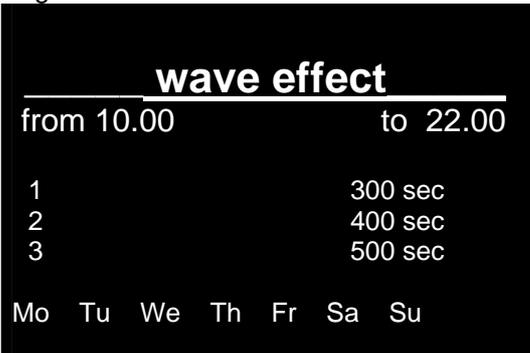
Fig 30

## Wave effect



In this screen up to 3 current pumps can be programmed to operate in intervals. Choose “wave effect” in the menu “Power Box” and confirm with “Enter”

Fig 31



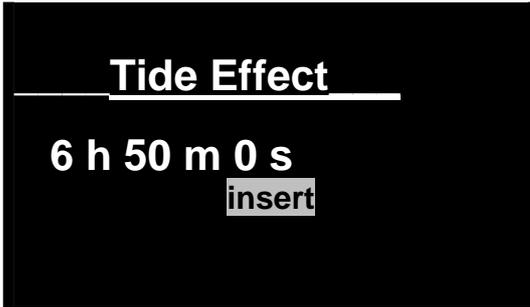
First you program the period, during which the pumps shall operate in Intervals (here 10 am to 10 p.m.) During the rest of the day, the pumps are switched off.

Now, you choose the plug with the arrow keys and adjust the on (or off) time. You can program 3 pumps (3 plugs) individually.

In the bottom line, you can delete days of the week as shown in screen 27 and 28.

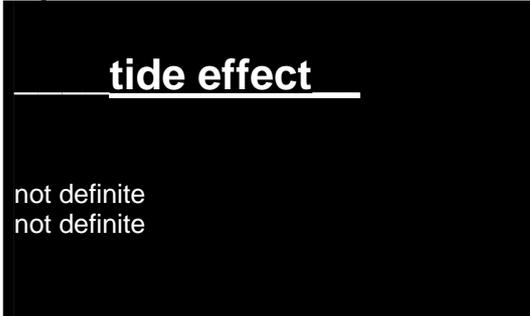
Fig 32

## Tide Effect



To simulate a tide effect, 2 pumps are switched alternately in periods of 6h 50 m. Choose "Insert" and confirm with Enter.

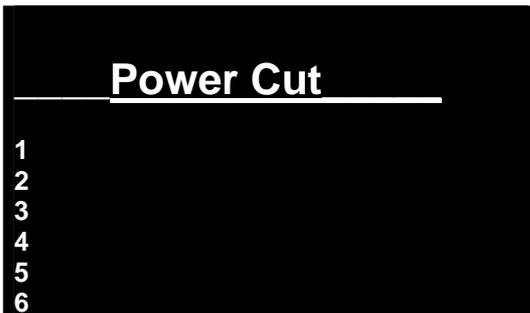
Fig 33



In this screen the two pumps (plugs) are addressed for the tidal pumps. With the arrow keys → ← one of the 2 pumps (line "not defined") are addressed and choose the corresponding plug with ↓↑. Confirm with Enter. A screen appears, where you can choose between: "Insert" to insert another tide program, "show/ modify /delete" to work on existing programs. With ESC you come back to the menu of the Power Box.

Fig 34

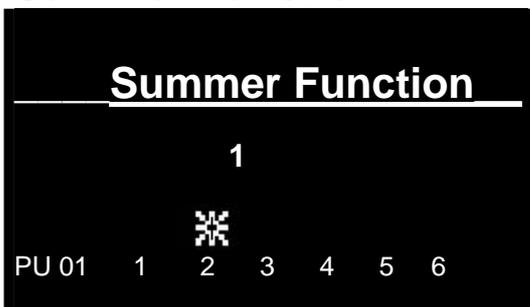
## Power Cut



If a power cut of more than an hour occurs, the plugs can be programmed with this function, so they remain off after the power is back. They have to be reactivated manually. To activate this function, choose "Power cut" in the menu of the Power Box. The screen 35 appears. With the arrow keys ↓↑ - the plugs, that stay off after the power cut can be chosen and confirmed with Enter. The Menu can be left by pressing the ESC key.

Fig 35

## Summer Function



This function can be used to heat planted aquariums with a heating cable (e.g. heating cable Aquatherm). In summer, when the aquarium is not heated and the heating cable remains off for a long time. The current through the gravel stops, the water in the gravel gets stagnant. Nutrients can no more be released from the gravel bed. With the Summer function one or more plugs can be addressed, that are activated for 5 min every hour to ensure a flow through the gravel bed.

To program it, a plug is addressed with ↑ and confirmed with Enter. A Summer icon appears above the plug ( see plug 2 in fig 36)

Fig 36

## Function keys



Fig 37

In the menu function keys, functions can be defined and addressed to arrow keys → ← and ↓ ↑. These functions are the switching on and off of plugs or groups of plugs for a defined time period (e.g. feeding break) or up to a manual command (maintenance break). The functions can be activated by pressing the corresponding arrow key for 2 sec.

To insert them, the function "Function Key" is addressed with the cursor and confirmed with Enter. The screen (fig 37) appears. With the arrow keys ↓ ↑ the cursor is moved to the desired arrow, where a function shall be inserted.



Fig 38

In this screen the function is first named: here: "feeding break". To name it, the arrow keys ↓ ↑ are used to define the letter and the → ← keys to switch to the next letter. Confirm the name with Enter. The Cursor jumps to "off". Here the mode of the function can be chosen with the ↓ ↑ keys: "off", "time", "Switch", "Hold".

- **off** : The function key is switched off
- **Time**: By pressing the function key, a plug or a combination of plugs will be switched off or on for a certain period of time. If the time is over, it switches back automatically. With this function, pumps can be switched off for some minutes for feeding the fish without currents.

If the mode is confirmed with →, the cursor jumps to "Max Time". Now, the period can be chosen with the ↓ ↑-keys that the plugs shall be switched on or off. Is the time period adjusted press → to go to the line with the plugs. The desired plug can be addressed with the → ← keys. The desired function can be chosen with the ↓ ↑ keys. An arrow icon appears above the chosen plug. If the number of the plug is marked, the plug is switched on, when you press the function key. If it is not marked, the plug is switched on for the programmed period, when the function key is activated.

In our example (fig 39), the plugs 1 and 2 are switched on for 20 min and the plugs 4 and 6 are switched off for 20 min, when the function key ↑ is activated.

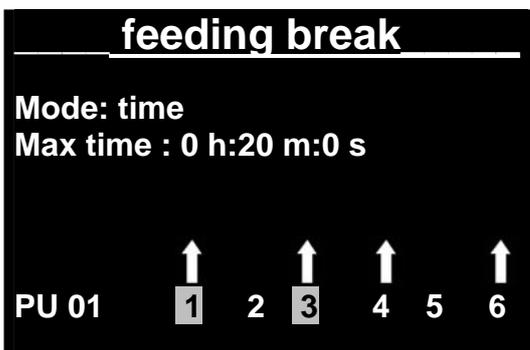


Fig 39

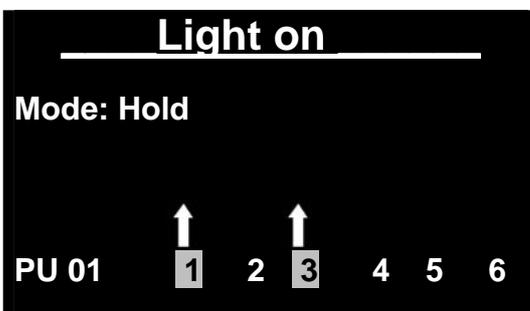


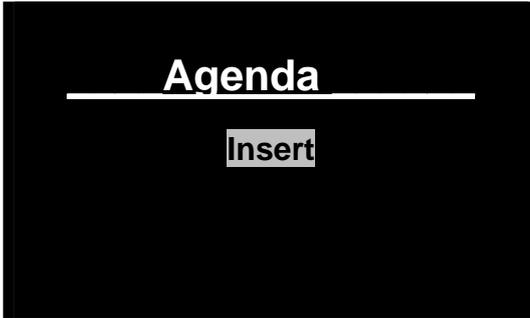
Fig 40

- **Switch**. If the mode for the function key is adjusted to "switch", the defined plugs are switched on or off - depending, if the number below the arrow is marked or not - after pressing the function key.

- **Hold**: If the mode is switched to hold, the plugs are activated (or deactivated, - depending, if the number below the arrow is marked or not) only as long as the function key is pressed.

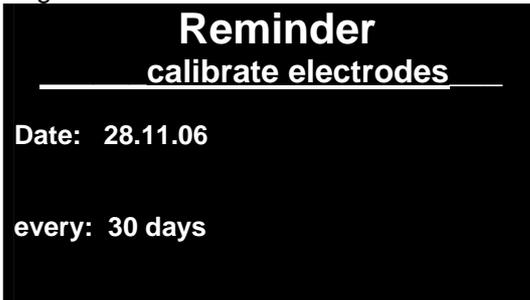
If the function key is activated, the function icon  is shown in the main menu in the left corner at the bottom.

# Agenda



In this menu, you can write down notes, which are displayed after a certain time or at a certain date as a reminder in the display. To write them into the Agenda, choose Agenda in the main menu and confirm with Enter. If you want to accompany the reminder with sound, choose now the line "with sound" and confirm with Enter.

Fig 41



Screen 42 opens. Here, you can enter the text for your reminder (here: "calibrate electrodes") in the next line, you can set the date, when the reminder is shown for the first time. In the last line, you can set the frequency, when the reminder is repeated (here: every 30 days).

To modify or delete the reminder, the line "Agenda" is chosen in the main menu and the cursor is moved to "show/modify/delete". Now, the message can be edited.

Fig 42

# Temperature control with the AQUA MEDIC AT Control

The  AQUA MEDIC AT Control is supplied with a very comfortable temperature control program, with almost unlimited possibilities. Several heaters or cooling devices can be connected to one sensor and operated individually. The set point can be varied in the day-night cycle, which a night shut down

Examples: **Gravel Heater for planted aquariums.** The Gravel Heater (cable heater) can be adjusted to a certain set point (e.g. 25°C). As the gravel heater is not designed to be the only heater for the aquarium, an additional water heater (Titanium or glass heater) can be added. This will be programmed to a lower set point, so the gravel heater is always preferred.(e.g. 24°C). It should be made sure, that the gravel heater is active in summer, at least from time to time, to keep the nutrient cycle in the gravel running. In order to ensure this, the menu “summer function” can be activated in the Power Box to the plug of the gravel heater. For both heaters (Gravel heater and water heater) a night shut down of 1 – 2 °C can be programmed.

**Temperature control for reptiles in Terrariums.** Here the night shut down is of even more importance, than in aquariums. During the day, a heat lamp or hot stone can be used as heater. During the night, the temperature is actively decreased – by a fan or a water cooler.

## Temperature menu

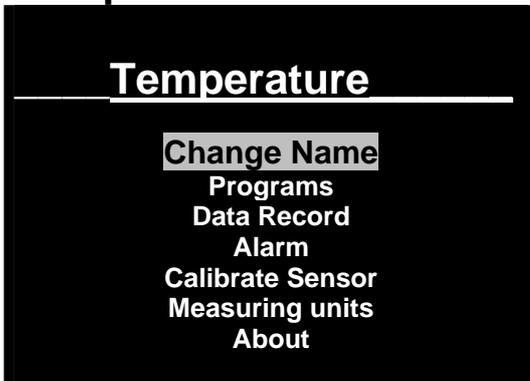


Fig 43

To enter the Temperature Menu, choose the corresponding line in the main menu and confirm with Enter. In this menu, you can program a temperature control – if you have connected at least one temperature sensor. Screen 43 opens. With the arrow keys ↓↑ you can choose the desired line and confirm with Enter.

**“Change Name”.** Here, you can change the name (e.g. to “temp aquarium1”). To do this, choose the first line and confirm. “Temperature” is displayed. The first letter flashes. With the arrow keys ↓↑ you can choose a new letter. With the → ←- keys, you get to the next letter. If the new name is completed, confirm with Enter.

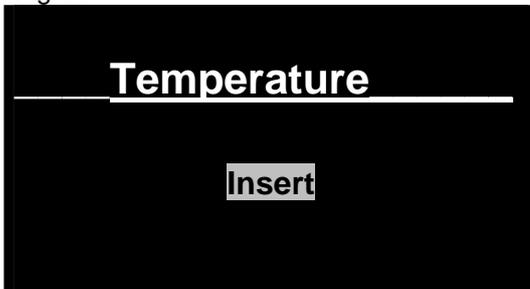


Fig 44

**Programs** Choose in the upper screen “programs” and screen 44 opens. Choose “Insert” to insert a program. If programs are existing already a second line “show/modify/delete” is displayed. Choose this line to edit an existing temperature program.

### Insert a set point for temperature:

If you choose “Insert, screen 45 opens, the line “Ref.” Is flashing. Here, you can edit the desired value for the set point. The actual temperature is displayed in °C. With Enter, you come to the reference value. You can change the value to the desired point with the arrow keys ↓↑. Confirm with Enter.

Now, the line Δ min. flashes. With the arrow keys ↓↑, you can add a value for the minimum deviation e.g. 0.2°C. If the actual temperature decreases below the set point for 0.2°C, the plug is switched on for the heater. With the → ←- keys, you get to the ΔMax value, for the cooler. If you have these 2 values (the hysteresis), confirm with Enter. Now you can program the plugs. (See screen 46).

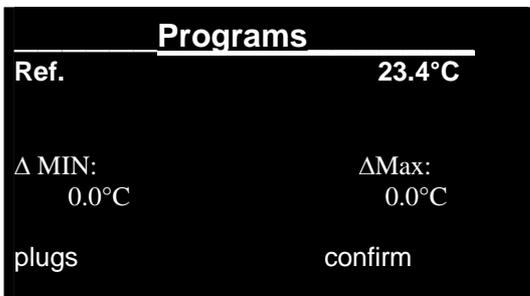


Fig 45

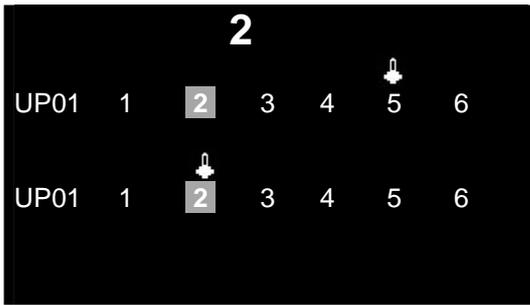


Fig 46

In Screen 46 the plugs for the heater or cooler are programmed. The chosen plug is marked (here no2). With the arrow keys → ← you can move the cursor to the desired plug. The upper line of plugs is for the cooler, the lower line for the heater.

To program a heater on plug 2 press the arrow key ↓. The thermometer icon appears above plug 2, lower line. – The cooler can be programmed in the same way: choose a plug, confirm with ↑. Now the thermometer icon appears above the no of the plug in the upper line (here No5). Now a heater can be connected to plug 2, a cooler to plug 5.

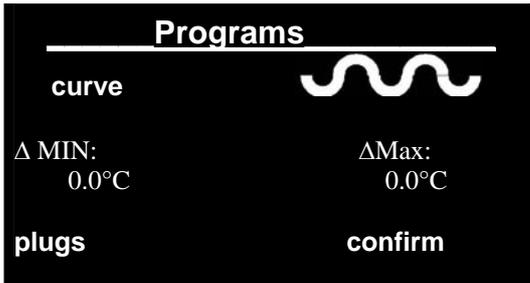


Fig 47

### Temperature curve in the day-night cycle - night shut down.

If the set point shall not remain constant in the day-night-cycle, a temperature curve can be programmed. This is of special importance in terrariums. But in aquariums, a night shut down of 1.5 - 2 °C gives often positive effects, too.

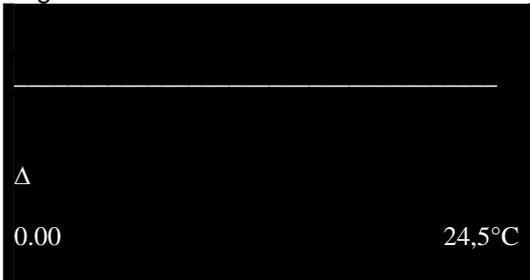


Fig 48

Choose in the menu temperature “programs” (fig 45) the “ref.”. With the ↓↑ keys, choose “curve”. Move the cursor with the → key to  and confirm with Enter. Screen 48 opens. The cursor Δ holds below the line at 00.00 h. With the ↓↑ keys, you can move the line at this point up and down. The corresponding temperature is shown at the right bottom. With the → ←- you move the cursor on the line to the left and the right. The corresponding time of the day is displayed at the left bottom.

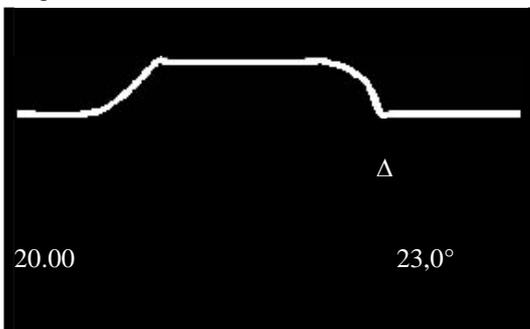


Fig 49

In this way, you can create e curve, - the cursor is shown as triangle, with the corresponding temperature and time. In the example, the temperature at 20°° (8pm) is decreased for approx. 2 ° - compared with the temperature in the afternoon. You can save the edited curve with Enter. The AT Control will now use the curve as set point and switch the heater and the cooler in a way that the actual temperature is close to the curve (+/- the edited hysteresis). Leave the screen with ESC and you go back into the main menu. If a temperature menu shall be edited, choose “show/modify” delete” in the temperature menu. The program can now be edited. If you choose again insert, another temperature menu can be inserted.

### Data Record

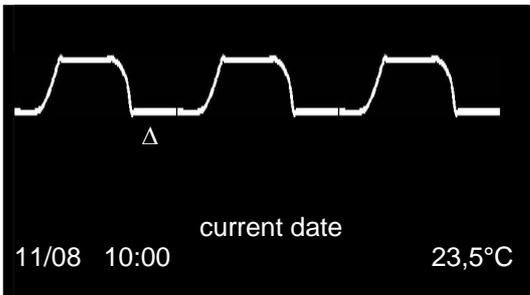
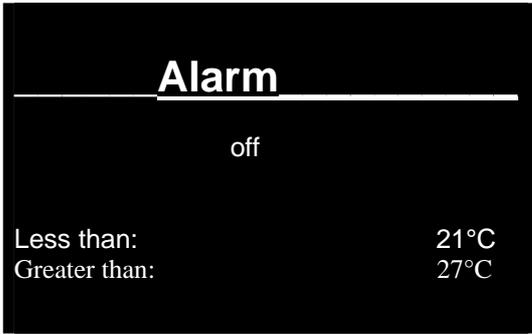


Fig 50

Move the cursor in the temperature menu to “Data Record” and confirm with Enter. The temperature curve of the last 24H is shown. With the ↓↑-keys, the minimum and the maximum temperature can be displayed. With the → ←-keys, the cursor can be moved through the day-night-cycle. The time of the day and the corresponding temperatures are displayed in the line below.

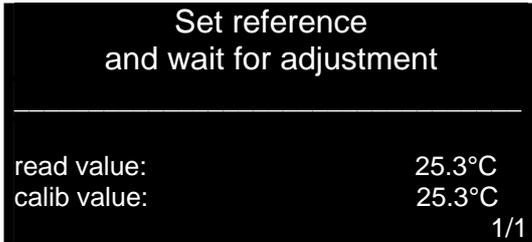


Independently from the programmed temperature set points, alarm values can be programmed. If these values are under or overcome, the AT Control shows Alarm. Either by flashing the display and/or by sound.

The screen for temperature alarm is chosen in the temperature menu and confirmed. The cursor jumps to "off". With the arrow keys ↓ ↑ You can choose between "off", "without sound" and "with Sound". With the → ← keys, you can move to the alarm temperatures, with the ↓ ↑ keys, the desired alarm values can be edited.

Fig 51

## Calibrate Sensor



If the displayed temperature is different from the actual temperature – controlled with an accurate thermometer - , the temperature sensor can be calibrated. Choose the line "Calib. Sensor" in the temperature menu and confirm. Screen 52 is opened. The calibration value flashes. With the ↓ ↑ keys, you can move it to the actual value, that has been determined with an accurate thermometer. The calibration is confirmed by pressing the Enter key.

Screen 53 opens, the calibration is made.

Fig 52

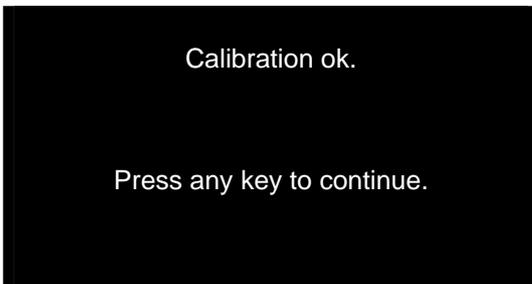
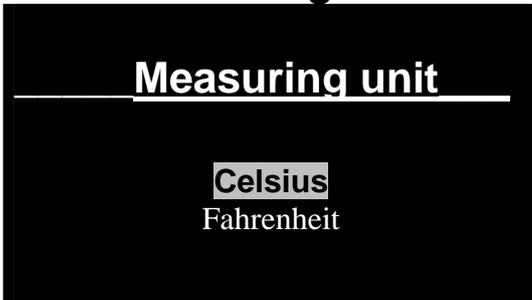


Fig 53

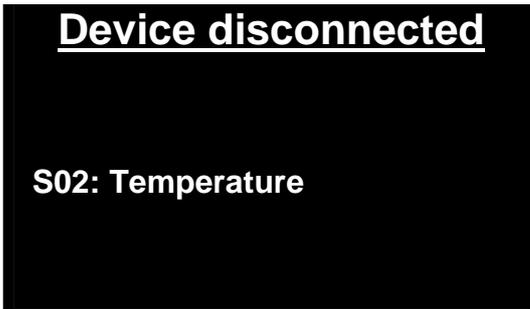
## Measuring unit



In this screen, the measuring unit for the temperature can be adjusted. The temperature can be displayed in ° Celsius or in ° Fahrenheit. Choose the desired name and confirm with Enter.

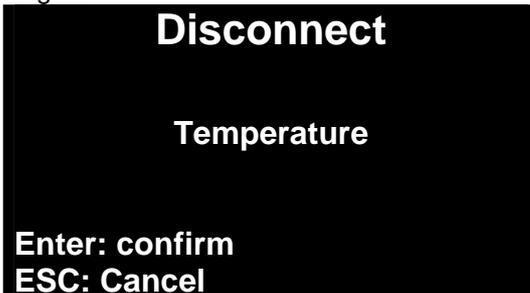
Fig 54

## Disconnect Temperature sensor



If the temperature sensor is disconnected from the Power Box (or the cable is damaged), the screen Device connected is shown. Confirm with Enter. The display switched s to the basic screen and a flashing? is shown at the left bottom. If the temperature sensor is reconnected, the? Sign disappears and the sensor is automatically recognised. If the component shall be removed from the system completely, choose the temperature menu --if the sensor is already removed. Choose the line"disconnect". Screen 56 appears.

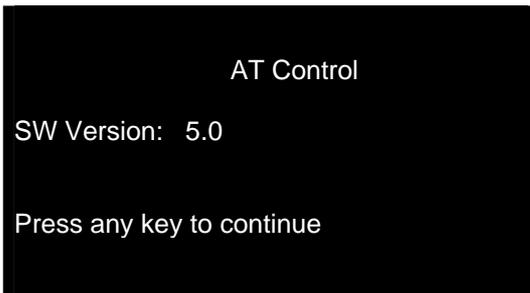
Fig 55



In this screen, the removal of the temperature sensor is confirmed with Enter – or everything is stopped with ESC. The temperature sensor is now removed from the system. In the main menu, the line "Temperature" disappears. If a temperature sensor is reconnected after some time, it will be automatically be recognised as new component.

Fig 56

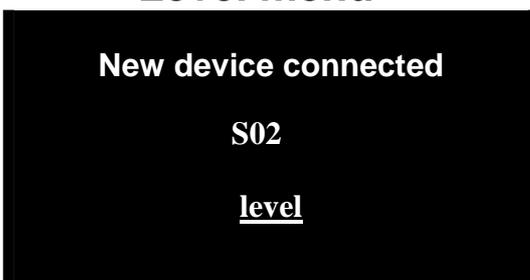
## about



The last screen of the temperature menu shows the software and the hardware version installed.

Fig 57

## Level menu



The menu for the level sensor is programmed similar to the temperature menu. The level sensors can either be connected directly to the Power Box – using the Audio Jack – or via a T/LV Interface Box. (Temperature/Level). Anyway, screen 58 will be shown. Confirm with Enter.

Now, you can choose the line "Level" in the main menu. Confirm with Enter to program the level sensor.

Fig 58



"Change Name". Here, you can change the name (e.g. to "level aquarium1"). To do this, choose the first line and confirm. "level" is displayed. The first letter flashes. With the arrow keys ↓↑ you can choose a new letter. With the → ←- keys, you get to the next letter. If the new name is completed, confirm with Enter.

Fig 59

## Level programs

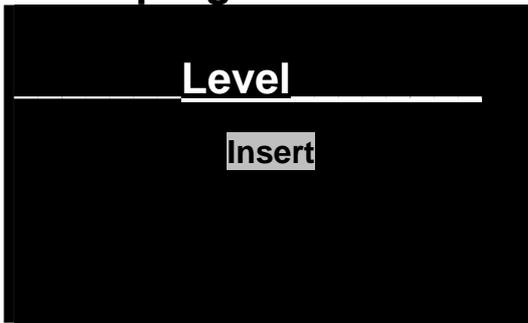


Fig 60

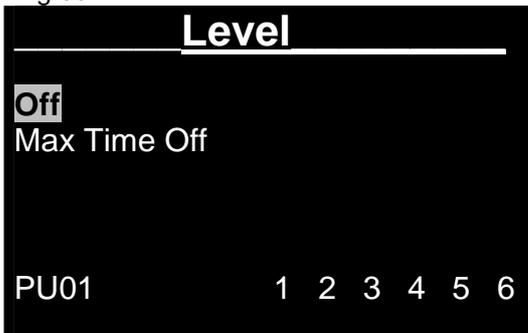


Fig 61

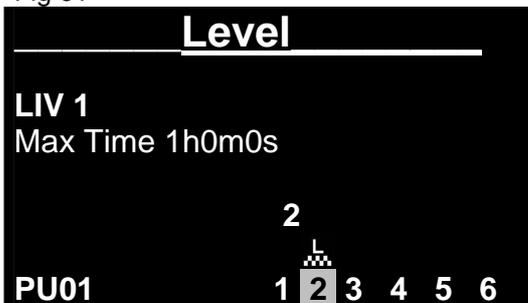


Fig 62

To program the level sensor, choose “insert” and confirm. In the next screen (61) the cursor shows “off” and flashes. With the ↓↑ keys, the display can be adjusted to „LIV 1“ and „LIV 2“ .

„off“ The level sensor is switched off.

„LIV 1“ **Minimum program.** If the water level is lower than the sensor, the programmed plug will be activated. This is the position for a top up program. If the level decreases, the pump is switched on.

„LIV 2“ **Maximum program.** If the water level is higher, than the level sensor, the plug is activated. This is the program for the dry running protection of a pump. (if the level sinks, the pump is stopped.)

By pressing the arrow keys → ←, the position “Max Time OFF” can be addressed. Here, the On-Time can be limited. If, e.g. the refill pump in a certain time (Max Time) did not reach the level LIV1, the plug is blocked and has to be manually deblocked. This is a security program In the “Off”-mode, it is deactivated.

Now the plugs can be addressed. Move the cursor to the desired plug, press the ↓↑ keys. Now, you have 3 choices:

1. The number of the plug flashes, there is no icon above the number. The plug is not activated
2. The number of the plug flashes, the position is marked. Above the number the level-icon appears (see fig 62) the plug is activated, if condition LIV1 is fulfilled. This is the standard set-up for controlling.
3. The number of the plug flashes, the position is not marked, above the number, the level icon appears. The plug is not activated, if the condition (here LIV1) is fulfilled. However, the level icon is shown on the main screen above the plug. – Alarm sign.

## Measuring unit



Fig 63

On this screen, the display of the levelcontrol can be specified. The basic adjustment is LIV. LIV1 means low (level below the switching point of the sensor), LIV2 means high (level above the switching point of the sensor). This reading can be adjusted to teh type of level control. If yuo have programmed a top up of a filter sump, you can choose „LOW/OK). Is the water level low and the refill pump activated, the display will show „LOW“ If the water level is above the switching point of the sensor, the display will show „OK“. In the same way the display can be adjusted to other types of level controls.

## Sensor program error

Level

If the level sensor activates the plug, however the connected device (pump) cannot reach the desired level in the programmed Max Time, the plug is blocked. The display shows: Sensor program Error – with sound. There is a problem. Solve the problem first and then deblock the plug. Therefore, choose level in the main menu and confirm. Move the cursor to “unlock program” and confirm with Enter.

Fig 64

## Unlock program

Enter: confirm  
Esc: Cancel

Now, screen 65 is opened. Press Enter to unblock the plug. If the problem is not solved, the screen can be left with Esc. If the plug is unblocked, without solving the problem, it will be blocked again, after the max- time.

Fig 65

## Alarm

LIV1: off  
LIV2: with sound

In the Level program, an Alarm can be integrated. Choose the line “Alarm” in the level menu. With the arrow keys, you can choose between LIV1 and LIV2. Then 3 positions can be chosen: “off” – no alarm  
“without sound” An alarm will be shown on the display – no sound  
“With sound” An alarm will be shown on the display – with sound. The Alarm is shown at the main menu at the bottom line

Fig 66

Tu 12/09/06 20:30

UP01

		3	4		6
---	---	---	---	---	---

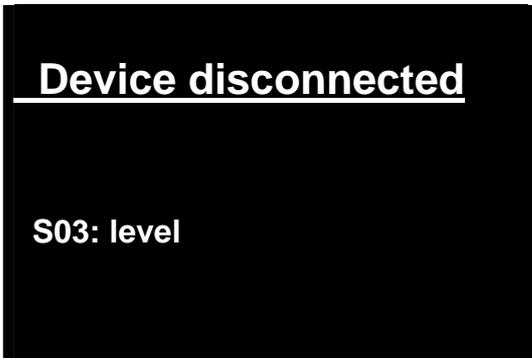
 

Alarm: The speaker icon at the left bottom (see fig 67) shows, that an alarm is programmed – this does not mean, the alarm is active. In the example (fig 67) a level sensor is programmed to plug1. This is active visible by the level icon above plug 1, the plug is switched on. At the same time, this is the alarm message. It is optically shown by the flashing triangle in the bottom line. In addition it is displayed by sound – the speaker is visible at the left bottom corner. If the level is back to normal, the icon disappears, the plug is switched off and the triangle disappears as well. The speaker remains – without sound.

In the example a heater is programmed to plug 2 and a timer to plug 5.

Fig 67

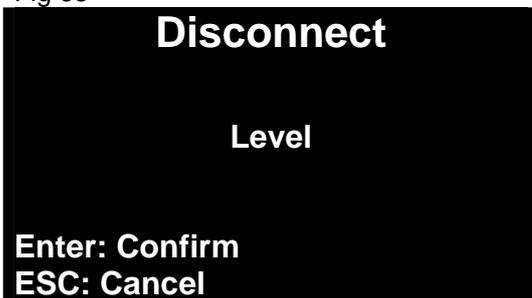
## Disconnect Level Sensor



If the level sensor is disconnected from the Power Box ( or the cable is damaged), the screen Device connected is shown. Confirm with Enter. The display switches to the basic screen and a flashing? is shown at the left bottom.

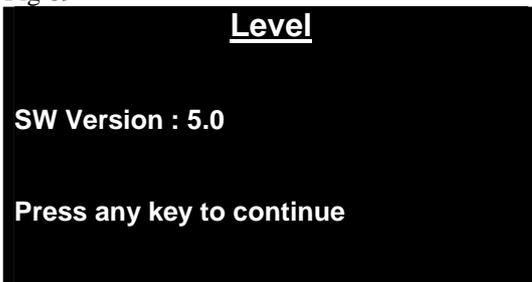
If the level sensor is reconnected, the? Sign disappears and the sensor is automatically recognised. If the component shall be removed from the system completely, choose the level menu --if the sensor is already removed. Choose the line "disconnect". Screen 69 appears.

Fig 68



In this screen, the removal of the level sensor is confirmed with Enter – or everything is stopped with ESC. The level sensor is now removed from the system. In the main menu, the line "level" disappears. If a level sensor is reconnected after some time, it will be automatically be recognised as new component.

Fig 69



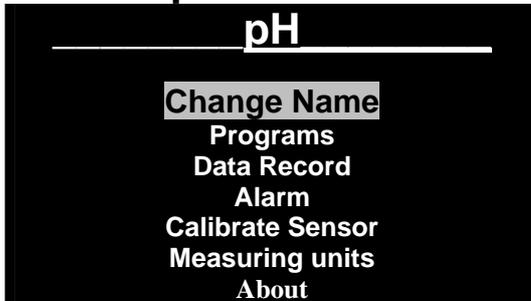
The last screen of the level menu shows the software and the hardware version installed.

Fig 70

## pH control with the AT Control

With the connection of a pH Interface Box and a pH electrode, the AT control can be supplied with a pH control. If both is connected to the Power Box, the pH control is automatically recognised. Like the temperature control, the pH control offer many varieties. The main purpose is the connection of a solenoid valve to control the pH value with CO<sub>2</sub>.

### pH Menu

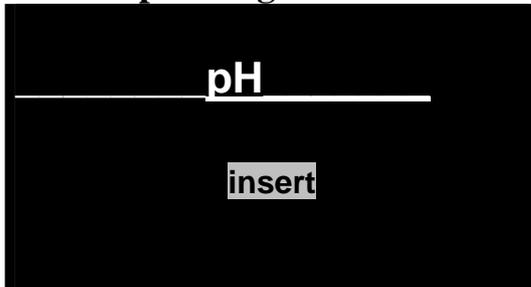


To get to the pH Menu, choose “pH” in the main menu. In this menu, you can program a pH control – if you have connected a pH Interface and a pH electrode. Screen 71 opens. With the arrow keys, you can address the desired line and confirm.

“**Change Name**”. Here, you can change the name (e.g. to “pH aquarium1”). To do this, choose the first line and confirm. “pH” is displayed. The first letter flashes. With the arrow keys ↓↑ you can choose a new letter. With the → ←- keys, you get to the next letter. If the new name is completed, confirm with Enter.

Fig 71

### pH Programs



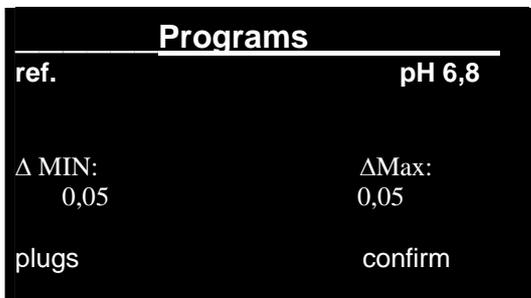
**Programs** Choose in the upper screen “programs” and screen 44 opens. Choose “Insert” to insert a program. If programs already exist a second line “show/modify/delete” is displayed. Choose this line to edit an existing pH program.

#### Insert a set point for pH:

If you choose “Insert, screen 73 opens, the line “Ref.” Is flashing. Here, you can edit the desired value for the set point. The actual pH value is displayed in °C. With Enter, you come to the reference value. You can change the value to the desired point with the arrow keys ↓↑. Confirm with Enter.

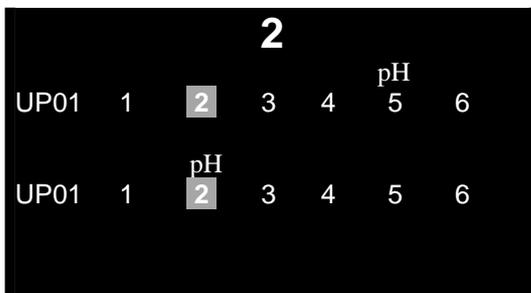
Now, the line Δ min. flashes. With the arrow keys ↓↑, you can add a value for the minimum deviation e.g. 0.2. If the actual pH value decreases below the set point for 0.2, the plug is switched on. With the → ←- keys, you get to the ΔMax value. If you have these 2 values ( the hysteresis), confirm with Enter. Now you can program the plugs.(see screen 46).

Fig 72



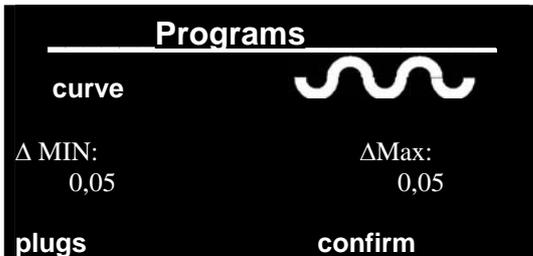
In Screen 74 the plugs for the devices (solenoid valve) are programmed. The chosen plug is marked (here no2) . With the arrow keys → ← you can move the cursor to the desired plug. The upper line of plugs is for control downwards (with CO<sub>2</sub>), , the lower line for the control upwards.

Fig 73



To program a solenoid valve on plug 2 press the arrow key ↑-. The pH icon appears above plug 2, lower line. There are 2 modes. If the number of the plug is marked, it will be activated. If it is not marked ( here plug 5) , there is just an alarm programmed. In plug 2 a solenoid valve can be inserted.

Fig 74



### pH-in the day-night cycle -

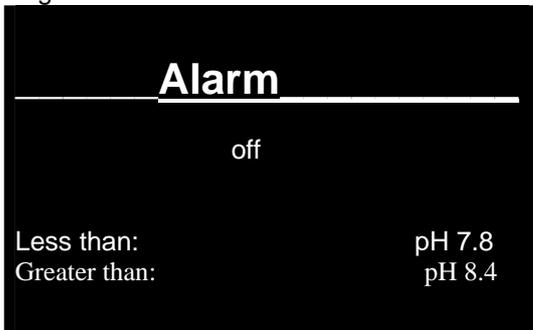
If the pH value shall not be held constant, a pH curve can be programmed. For the programming, see the temperature menu ( fig 46 – 48)

75



Choose in the pH menu the line “Data Record”. The curve appears with the saved data. See fig 7 and 47.

Fig 76

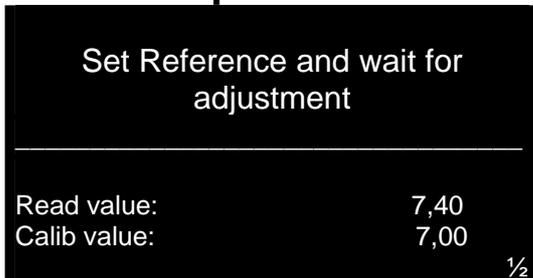


Independently from the programmed pH set points, alarm values can be programmed. If these values are under or overcome , the AT Control shows Alarm. Either by flashing the display and/or by sound.

The screen for pH- alarm is chosen in the pH- menu and confirmed. The cursor jumps to “off”. With the arrow keys ↓ ↑ You can choose between “off”, “without sound” and “with Sound”. With the → ←- keys, you can move to the alarm values, with the ↓ ↑ keys, the desired alarm values can be edited.

Fig 77

### Calibrate pH Sensor



pH electrodes have to be calibrated before the first use and from time to time to ensure correct readings. To calibrate a pH electrode, 2 test fluids are needed. We recommend to us pH 7.00 and pH 4.00. pH 7.00 is the zero point of the electrode ( 0 mV) and with pH 4.0, you adjust the steepness.

For calibration, you choose the line “Calibrate Sensor” in the pH menu. Screen 78 opens and the calibration value flashes. With the ↓ ↑ - keys, you adjust the value to the value of your test fluid (here 7.00). The pH electrode is rinsed with distilled water and placed into the test fluid pH 7.00. After some minutes ( 5 – 7 minutes) the displayed pH value (“read value”) stays constant. Press now the Enter key to calibrate the sensor at pH 7.00. The screen for the steepness opens. Here, the electrode is calibrated at pH 4.00. Take the probe out of the pH7.00 fluid, rinse it carefully with distilled water and dry it. Now, place it into the test fluid pH 4.00. After 5 – 7 minutes, when the reading remains constant, press Enter to calibrate the electrode at pH 4.00

Fig 78

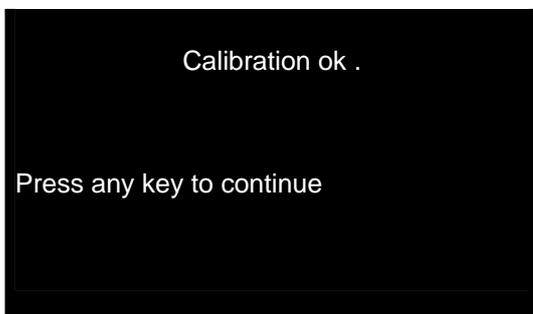


Fig 79

Screen 79 opens, “Calibration ok”. The pH electrode is now calibrated. If you want to check th3e accuracy of the calibration, rinse the electrode and put it back into the pH 7.00 test fluid. After 5 – 7 minute, the reading should show pH 7. If you calibrate the electrode when you have activated the pH control (e.g., connected a CO<sub>2</sub>- supply) shut off the plug for the pH control during calibration. You can use the Manual control (fig 22) or program a function key to the pH plug. (see fig 37)

## Disconnect the pH control from the system

### Device disconnected

S03: pH

If the pH sensor is disconnected from the Power Box (or the cable is damaged), the screen Device connected is shown. Confirm with Enter. The display switches to the basic screen and a flashing '?' is shown at the left bottom.

If the pH sensor is reconnected, the '?' sign disappears and the sensor is automatically recognised. If the component shall be removed from the system completely, choose the pH menu —if the sensor is already removed. Choose the line "disconnect". Screen 56 appears.

Fig 80

### Disconnect

pH

Enter: confirm

ESC: Cancel

In this screen, the removal of the pH sensor is confirmed with Enter – or everything is stopped with ESC. The pH sensor is now removed from the system. In the main menu, the line "pH" disappears. If a pH sensor is reconnected after some time, it will be automatically be recognised as new component.

Fig 81

### AT Control

SW Version : 7.0

Press any key to continue

About: Here, the software version of the pH control is shown.

Fig 82

## Redox (ORP) Menu

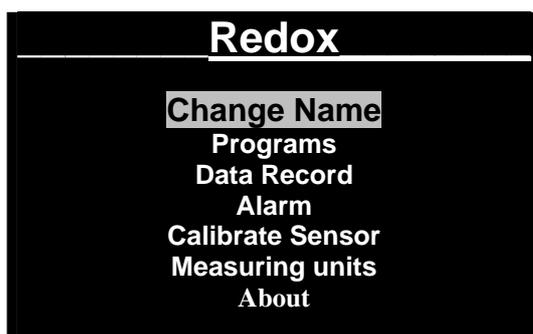


Fig 83

To get to the Redox (ORP) Menu, choose "Redox (ORP)" in the main menu. In this menu, you can program a Redox (ORP) control – if you have connected a Redox (ORP) Interface and a Redox (ORP) electrode. Screen 83 opens. With the arrow keys, you can address the desired line and confirm.

**"Change Name"**. Here, you can change the name (e.g. to "Redox (ORP) aquarium1"). To do this, choose the first line and confirm. "Redox (ORP)" is displayed. The first letter flashes. With the arrow keys  $\downarrow\uparrow$  you can choose a new letter. With the  $\rightarrow\leftarrow$  keys, you get to the next letter. If the new name is completed, confirm with Enter.

**Programs** Choose in the upper screen "programs" and screen 84 opens. Choose "Insert" to insert a program. If already programs are existing, a second line "show/modify/delete" is displayed. Choose this line to edit an existing Redox (ORP) program.

### Insert a set point for Redox (ORP):

If you choose "Insert, screen 85 opens, the line "Ref." Is flashing. Here, you can edit the desired value for the set point. The actual Redox (ORP) value is displayed in °C. With Enter, you come to the reference value. You can change the value to the desired point with the arrow keys  $\downarrow\uparrow$ . Confirm with Enter.

Now, the line  $\Delta$  min. flashes. With the arrow keys  $\downarrow\uparrow$ , you can add a value for the minimum deviation e.g. 10 mV. If the actual Redox (ORP) value decreases below the set point for 10 mV, the plug is switched on. With the  $\rightarrow\leftarrow$  keys, you get to the  $\Delta$ Max value. If you have these 2 values (the hysteresis), confirm with Enter. Now you can program the plugs.(see screen 86).

In Screen 86 the plugs for the devices (Ozone generator) are programmed. The chosen plug is marked (here no2). With the arrow keys  $\rightarrow\leftarrow$  you can move the cursor to the desired plug. The upper line of plugs is for control downwards, the lower line for the control upwards (e.g. with Ozone).

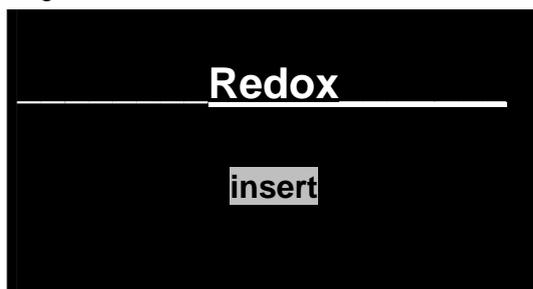


Fig 84

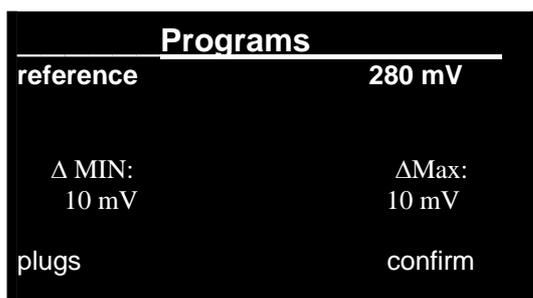


Fig 85

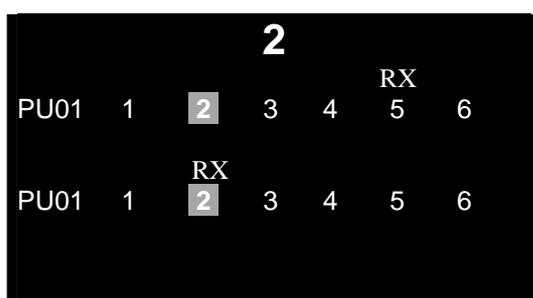


Fig 86

To program an ozone generator on plug 2 press the arrow key  $\downarrow$ . The Redox (ORP) icon appears above plug 2, lower line. There are 2 modes. If the number of the plug is marked, it will be activated. If it is not marked (here plug 5), there is just an alarm programmed. In plug 2 an ozone generator can be inserted.

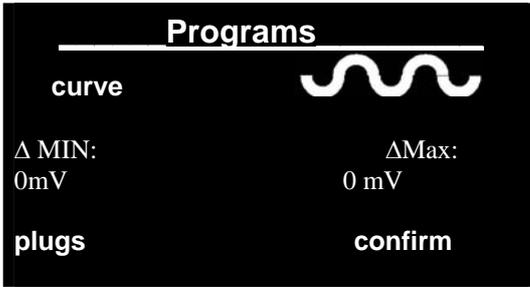


Fig 87

### Redox -in the day-night cycle -

If the Redox value shall not be held constant, a Redox curve can be programmed. For the programming, see the temperature menu ( fig 46 – 48)

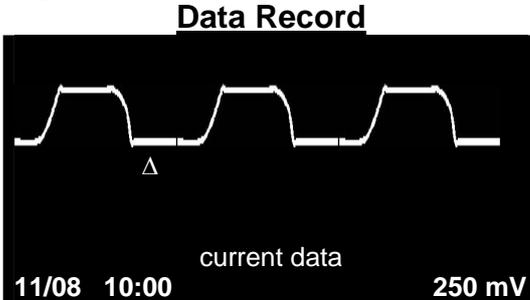


Fig 88

Choose in the pH menu the line “Data Record”. The curve appears with the saved data. See fig 88.

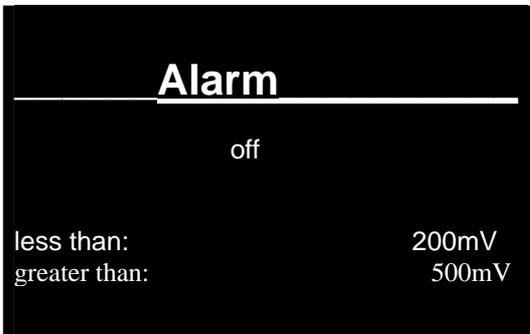


Fig 89

Independently from the programmed Redox set points, alarm values can be programmed. If these values are under or overcome, the AT Control shows Alarm. Either by flashing the display and/or by sound.

The screen for Redox- alarm is chosen in the Redox- menu and confirmed. The cursor jumps to “off”. With the arrow keys  $\downarrow\uparrow$  You can choose between “off”, “without sound” and “with Sound”. With the  $\rightarrow\leftarrow$  keys, you can move to the alarm values, with the  $\downarrow\uparrow$  keys, the desired alarm values can be edited.

### Calibrate Redox Sensor

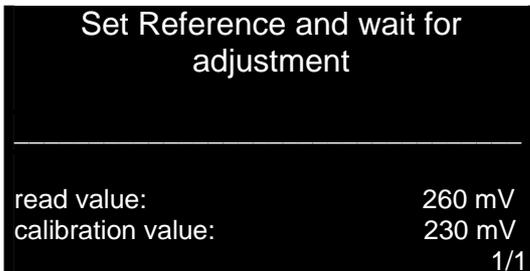


Fig 90

Redox electrodes should be calibrated before the first use and from time to time to ensure correct readings. To calibrate a Redox electrode, a test fluids is needed.. The Redox electrode is rinsed with distilled water and placed into the test fluid e.g. 230 mV. After some minutes (5 – 7 minutes) the displayed Redox value (“read value”) stays constant. Press now the Enter key to calibrate the sensor at 230 mV. Screen 91 opens – the calibration is ok.

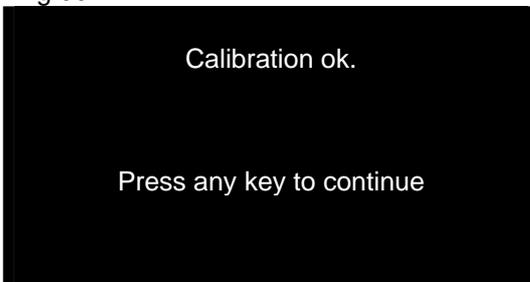


Fig 91

## Device disconnected

**S03: Redox**

If the Redox sensor is disconnected from the Power Box (or the cable is damaged), the screen Device connected is shown. Confirm with Enter. The display switched s to the basic screen and a flashing? is shown at the left bottom.

If the Redox sensor is reconnected, the? Sign disappears and the sensor is automatically recognised. If the component shall be removed from the system completely, choose the Redox menu —if the sensor is already removed. Choose the line”disconnect”. Screen 56 appears.

Fig 92

## **Disconnect**

**Redox**

**Enter: confirm**

**ESC: Cancel**

In this screen, the removal of the Redox sensor is confirmed with Enter – or everything is stopped with ESC. The Redox sensor is now removed from the system. In the main menu, the line “Redox” disappears. If a Redox sensor is reconnected after some time, it will be automatically be recognised as new component.

Fig 93

## AT Control

**SW Version : 7.0**

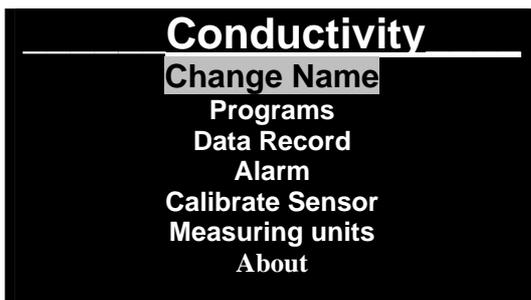
**Press any key to continue**

About: Here, the software version of the Redox control is shown.

Fig 94

## Conductivity menu – Density menu

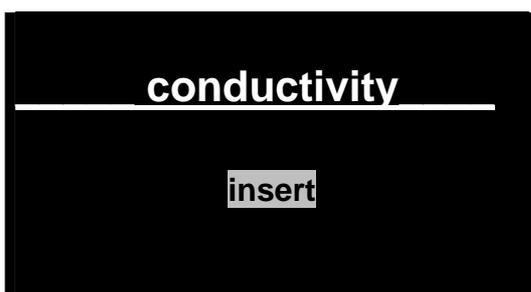
Conductivity and density are parameter to describe the amount of salts dissolved in water. Both are identical measurements. AT Control makes a difference between Conductivity and Density to achieve a better accuracy. The Conductivity measurement using the Conductivity interface and the Conductivity Electrode are used for low conductivity (freshwater and pure water). The Density measurement using the Density Interface and the Density Electrode are used for measuring in seawater. Both measurements can be displayed in  $\mu\text{S}/\text{mS}$ , g salt/l Or specific gravity in g/l. The programming is identical, so only the conductivity control is described.



To get to the conductivity Menu, choose "conductivity" in the main menu. In this menu, you can program a conductivity control – if you have connected a conductivity Interface and a conductivity electrode. Screen 95 opens. With the arrow keys, you can address the desired line and confirm.

"Change Name". Here, you can change the name (e.g. conductivity aquarium1"). To do this, choose the first line and confirm. "Conductivity" is displayed. The first letter flashes. With the arrow keys  $\downarrow\uparrow$  you can choose a new letter. With the  $\rightarrow\leftarrow$  keys, you get to the next letter. If the new name is completed, confirm with Enter.

Fig 95



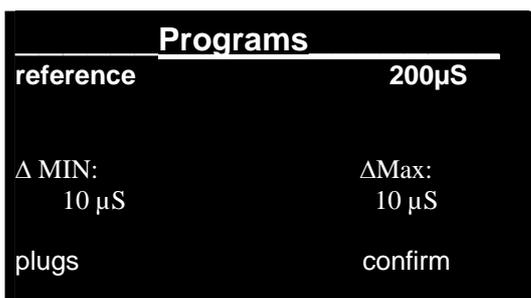
**Programs** Choose in the upper screen "programs" and screen 96 opens. Choose "Insert", to insert a program. If programs already exist, a second line "show/modify/delete" is displayed. Choose this line to edit an existing conductivity program.

### Insert a set point for conductivity

If you choose "Insert, screen 97 opens, the line "Ref." Is flashing. Here, you can edit the desired value for the set point. The actual conductivity value is displayed in  $^{\circ}\text{C}$ . With Enter, you come to the reference value. You can change the value to the desired point with the arrow keys  $\downarrow\uparrow$ . Confirm with Enter.

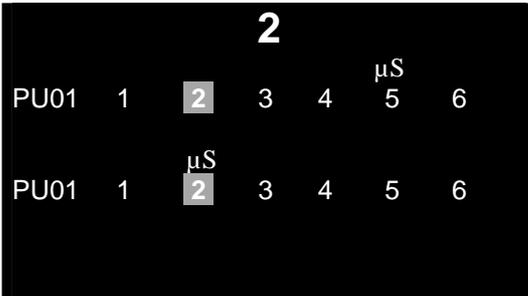
Now, the line  $\Delta$  min. flashes. With the arrow keys  $\downarrow\uparrow$ , you can add a value for the minimum deviation e.g.  $10\ \mu\text{S}$ . If the conductivity value decreases below the set point for  $10\ \mu\text{S}$ , the plug is switched on. With the  $\rightarrow\leftarrow$  keys, you get to the  $\Delta\text{Max}$  value. If you have these 2 values (the hysteresis), confirm with Enter. Now you can program the plugs.(see screen 86).

Fig 96



In Screen 86 the plugs for the devices (solenoid valve) are programmed. The chosen plug is marked (here no2). With the arrow keys  $\rightarrow\leftarrow$  you can move the cursor to the desired plug. The upper line of plugs is for control downwards, the lower line for the control upwards.

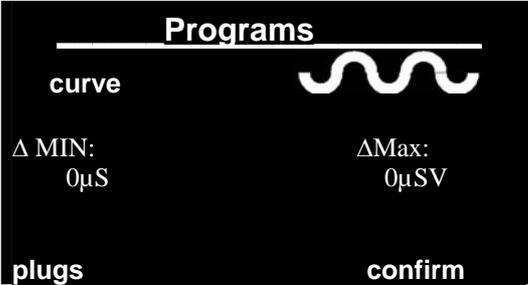
Fig 97



In Screen 98 the plugs for the devices are programmed. The chosen plug is marked (here no2). With the arrow keys → ← you can move the cursor to the desired plug. The upper line of plugs is for control downwards, the lower line for the control upwards.

To program a reverse osmosis unit on plug 2 press the arrow key ↓. The conductivity icon appears above plug 2, lower line. There are 2 modes. If the number of the plug is marked, it will be activated. If it is not marked (here plug 5) , there is just an alarm programmed.

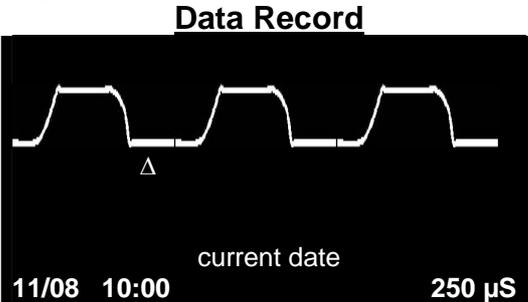
Fig 98



### Conductivity -in the day-night cycle -

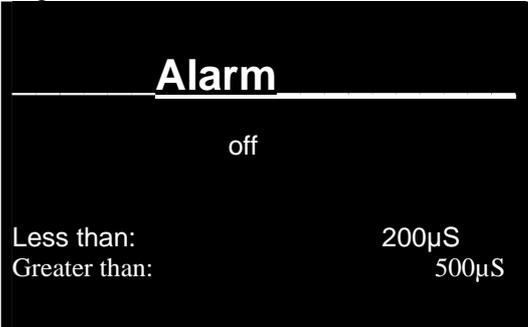
If the conductivity value shall not be held constant, a conductivity curve can be programmed. For the programming, see the temperature menu ( fig 46 – 48)

Fig 99



Choose in the conductivity menu the line “Data Record”. The curve appears with the saved data. See fig 100.

Fig 100

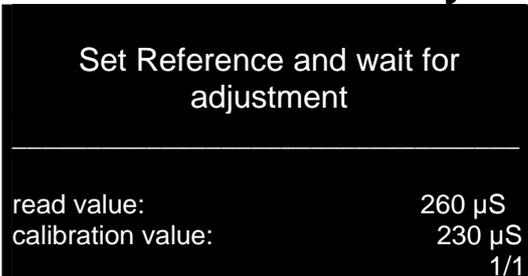


Independently from the programmed conductivity set points, alarm values can be programmed. If these values are under or overcome the AT Control shows Alarm. Either by flashing the display and/or by sound.

The screen for conductivity - alarm is chosen in the conductivity - menu and confirmed. The cursor jumps to “off”. With the arrow keys ↓↑ You can choose between “off”, “without sound” and “with Sound”. With the → ← keys, you can move to the alarm values, with the ↓↑ keys, the desired alarm values can be edited.

Fig 101

## Calibrate Conductivity Sensor



Conductivity electrodes should be calibrated before the first use and from time to time to ensure correct readings. To calibrate a conductivity electrode, a test fluids is needed.. The conductivity electrode is rinsed with distilled water and placed into the test fluid e.g. 250µS. After some minutes (5 – 7 minutes) the displayed conductivity value (“read value”) stays constant. Press now the Enter key to calibrate the sensor at 250µ. Screen103 opens – the calibration is ok.

Fig 102

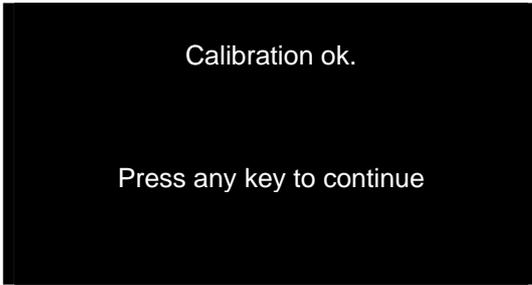


Fig 103

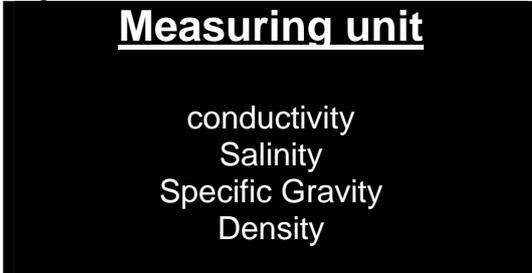


Fig 104

The Conductivity electrode measures the electric conductivity as a parameter for the salt concentration. This indirect value can be computed into other physical units:

- conductivity, measured as  $\mu\text{S}$  or  $\text{mS}$
- Salinity, measured as gram salt per litre water ( g/l)
- Specific Gravity (Kg/Litre)
- Density, in g/litre

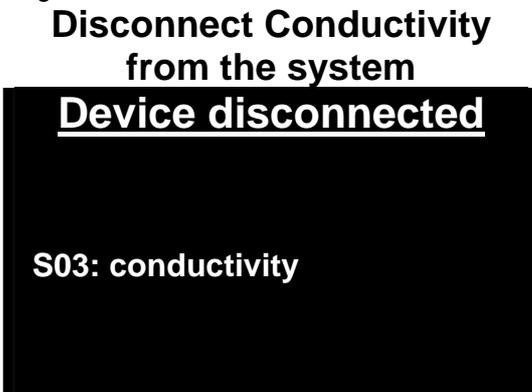


Fig 105

If the Conductivity sensor is disconnected from the Power Box ( or the cable is damaged), the screen Device connected is shown. Confirm with Enter. The display switched s to the basic screen and a flashing? Is shown at the left bottom.

If the Conductivity sensor is reconnected, the? Sign disappears and the sensor is automatically recognised. If the component shall be removed from the system completely, choose the Conductivity menu --if the sensor is already removed. Choose the line "disconnect". Screen 106 appears.

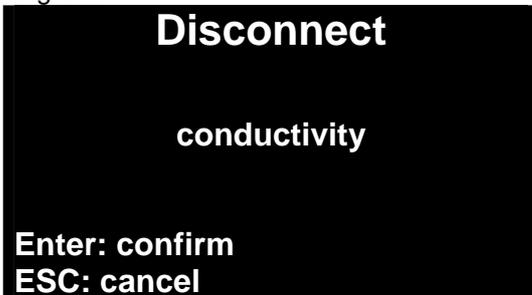


Fig 106

In this screen, the removal of the Conductivity sensor is confirmed with Enter – or everything is stopped with ESC. The Conductivity sensor is now removed from the system. In the main menu, the line "Conductivity" disappears. If a Conductivity sensor is reconnected after some time, it will be automatically be recognised as new component.

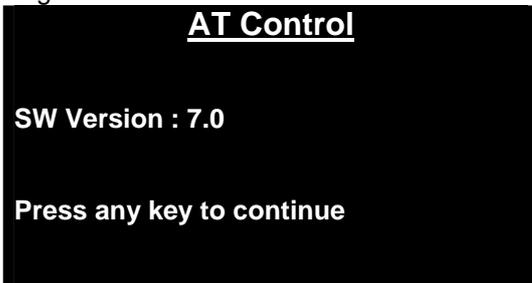


Fig 107

About: Here, the software version of the Conductivity control is shown.