

# Operation Manual for the Aquaristic Computer aqualine C

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## 1. Product description

The aquaristic computer system aqualine C consists of:

- the central processing unit (basic box),

- the power box with 4 output channels,
- one graphic display with large LCD screen (display available in colour or black and white),
- remote control,
- stabilized power supply with 12 V DC,
- one (flat style) connection cable for basic and power box,
- one cable for connecting basic box and graphic display,
- various electrodes: 1 x pH, 1 x redoxpotential (ORP), 1 x temperature, 1 x conductivity,
- 2 niveau probes
- calibration fluids for pH 4 and 7, for redoxpotential (230 mV), for conductivity (250 and 500 m S as well as 35 and 50 mS),
- one electrode holder,
- one storage case.

## 2. Set-up and connections

- set up

The graphic display of the computer system has to be positioned in a way that it is accessible for later operation. It should be placed at the wall near the aquarium or at the aquarium cabinet or above the aquarium.

The other components may be mounted within the cabinet or near the aquarium.

- connections

The basic and power box are connected with the flat style cable. The respective sockets are located at the back panels of the devices.

Now the connection between basic box and graphic display can be made by putting the 5 pole DIN plug into the socket marked with "Display". CAUTION: This socket is the back resp. the lower one! The arrow on the cable plug must show to the front resp. to the top.

Then the cable can be laid to the graphic display. The computer plug is put into the socket on the back panel of the graphic display. The 12 Volt connection is put into the respective socket of the basic box ("Power").

Now the electrodes can be connected to the basic box.

The aqualine C has 4 so-called BNC channels which can be configured as pH or redox entrance channel. One pH and one redox probe are enclosed. These can be put either into channel 1 or channel 2. Channel 3 and 4 will remain for the extension with pH or redox probes.

The temperature probe is connected to "Temp", the conductivity probe to mS/m S". These two probes have DIN plugs. During the connection it has to be considered that the arrow on the socket shows to the front. Now the two level probes can be put into the sockets 1 and 2 resp. 3 and 4. The choice of the socket depends on the level function (see chapter "Niveau"). It is possible to extend the aqualine C with two further level probes.

At least, it has to be checked if the programme module sits firmly in the basic box - just press it once. Then the power box and the mains receiver can be connected to a 230 V power source.

- Preparation of programming

If all components are mounted correctly, the main menu is shown on the graphic display after a short time. It shows the measurement values of the individual channels and the condition of the assigned sockets.

The whole programming is controlled by the remote control.

By pressing the button ENTER, the main menu is shown. Here, the individual parameters PH, REDOX, TEMPERATURE, CONDUCTIVITY, LEVEL and TIMER are indicated. In the last line SYSTEM changes of the system can be programmed.

With the buttons + and – of the remote control, the cursor can be moved through the programme and be stopped at the desired point.

By pressing the + button on the remote control the second main menu appears which shows the condition of the timer and the level probes.

To ensure that the aqualine C shows correct measurement values, at first the individual channels must be calibrated. This is done via the remote control.

Procedure:

To calibrate the BNC channels it is necessary to configure them for the desired function. This is done by positioning the cursor via the plus button on SYSTEM. By pressing ENTER the system menu appears. Within this menu various adjustments are possible, i.e. statistics. With the + or -button the cursor must be positioned on BNC-CONFIGURATION. Through pressing of ENTER the menu BNC-CONFIGURATION is called up. Now the screen BNC –configuration appears.

Here the 4 BNC channels can be either programmed on pH resp. redox or shut down. All combinations are possible

With the + or - button on the remote control the cursor is positioned on the specific channel, e.g. channel 1. Through pressing ENTER once or several times it can be decided if either a pH or a redox electrode should be connected to this channel or if this channel should be shut down (off).

Programming example:

Channel 1: pH, channel 2: redox, channels 3 and 4: OFF.

The menu BNC-CONFIGURATION can be left through pressing the ON button. It appears again the menu SYSTEM which can also be left through pressing ON. Then the main menu is displayed.

Now the electrodes can be calibrated.

### 3. Programming of the aqualine C

#### 3.1. pH

Through pressing the + and - buttons the cursor is positioned on pH. The pH menu is released with ENTER and shown on the screen.

Within this menu it can be decided whether the desired value should be adjusted or the pH electrode should be calibrated.

Calibration:

The cursor is positioned with the + button on CALIBRATION and released with ENTER. It appears the calibration display for the pH.

Choose the BNC channel which has to be calibrated. Position the flashing cursor on the BNC field (+/-). Activate the EDIT mode through pressing ENTER. Now changes can be done in the respective field. The activation of this mode is clearly indicated through the red field EDIT shown in the right bottom edge of the screen. Through pressing + or - the BNC channel which should be calibrated, can be adjusted, e.g. channel 1. The EDIT mode is left through pressing ENTER. The adjusted value will be transmitted to the basic box and saved.

The second field shows the actual measured pH.

The two fields CAL.PT. 1 (calibration point 1) and CAL.PT. 2 indicate the values of the calibration fluids. If these values do not correspond with those of the used calibration fluids, the values can be changed. Therefore the cursor must be positioned via the + and - buttons on the respective value of the calibration fluid. After pressing ENTER, the computer switches to the EDIT mode and the value can be adjusted to the actual value of the calibration fluid (see label). The EDIT mode can be left by pressing ENTER:

Now put the pH electrode into the pH 7 fluid. Press + and - to position the cursor on the field PH 7 in the bottom line. Press ENTER to release the calibration; it appears "WAIT". After approx. 30-60 seconds the value changes to 7 in the field MEASURED. The word "WAIT" disappears and pH 7 is shown again in the bottom field. The electrode is now calibrated at pH 7. If the value on the display differs from the value of the calibration fluid, the calibration can be repeated, until the values are the same. This is necessary, esp. if the values show great difference, if you calibrate for the first time or after changing a channel from MV to pH.

Rinse the electrode in distilled water and put it into the calibration fluid pH 4. Position the cursor via the - button on field PH 4. Press ENTER to calibrate the electrode at pH 4.

This button should be released only if the pH shown in the upper field MEASURED does not change anymore. After a short time the calibration value pH 4 is shown in the field MEASURED and the word "WAIT" in the bottom line disappears. The pH electrode is now calibrated.

If further pH electrodes should be calibrated on other BNC channels, position the cursor back to the field BNC and adjust another BNC channel. The calibration is done according to the instructions described above.

The menu PH-CALIBRATION can be left through pressing the ON button or through pressing ENTER on the field BACK.

## SET POINT adjustment

Back in the pH menu, the desired value can be adjusted. Position the cursor on Set and release it through pressing ENTER. It appears the menu ADJUSTION PH-SET POINT. Choose the required BNC channel first. The aqualine C has a two channel control for the pH. The pH can be adjusted up as well as down. In the field of aquaristics only a downward adjustment of the pH is common (synthesis of CO<sub>2</sub>). However, an upward adjustment is also possible.

To adjust the desired value position the cursor on MAX. It should be adjusted a maximum pH which is hold constant with the use of CO<sub>2</sub>. Press ENTER to change to the EDIT mode. Adjust the desired value through pressing the + and - buttons. Save the correctly adjusted value by pressing ENTER again.

Then position the cursor on HYSTERESIS. In this field the allowed deviation from the desired pH before the controller starts can be adjusted. An useful value is a hysteresis of 0.05. This value avoids a switch of the controller at smallest variations. On the other hand, a precise control is still given. Press ENTER to change to the EDIT mode to adjust the hysteresis. Adjust the desired hysteresis value by using the + and - buttons. Press ENTER to save it.

Now a control channel has to be assigned to the pH. Press the + and - buttons to position the cursor

on the field PLUGS. Press ENTER to activate the EDIT mode. Choose the desired socket through pressing + and -, e.g. socket 1. Save the socket number through pressing ENTER again.

If the pH is only measured and not used for control functions the cursor must be positioned on the field X near the 4. In this case no socket is connected.

If you use more than one power box, the channel has to be set.

Press the + button to position the cursor on field K at the right side near the socket assignment. Here it is possible to adjust the respective channel in case of use of multiple power boxes. Choose channel 0 if only one power box is used.

Press the + button to get on the field for the adjustment of the desired minimum value, MIN. Also here a socket can be programmed or - if no minimum control is required - the cursor can be positioned on X and saved. The pH is set now.

If values for further pH electrodes should be programmed, the cursor must be positioned back on BNC to choose another pH channel. These values are programmed as described above.

Leave the menu PH-ADJUSTMENT through pressing the ON button.

The aqualine C is now ready for use of the pH channel.

If the pH should be decreased with the use of CO<sub>2</sub>, the solenoid valve for CO<sub>2</sub> dosage can be connected as programmed in the menu PH-ADJUSTMENT to socket 1 of the power box.

Press the ON button to go back to the main menu.

### 3.2. Redoxpotential

To calibrate the redox probe and to adjust the desired set-value position the cursor to REDOX in the main menu and release it with ENTER. The REDOX MENU will appear.

Calibration:

Choose CALIBRATION with the cursor and press ENTER. Now the screen CALIBRATION REDOX is shown

The calibration of the redoxpotential probes is carried out in the same manner as that of the pH probes.

Firstly, adjust the BNC channel which should be calibrated. Position the cursor on the field BNC, Press ENTER to change to the EDIT mode and press + and - to choose the respective BNC channel. Press ENTER again to save the BNC channel. The actual redox value is shown in the field MEASURE.

The field CAL.POINT shows the redoxpotential value of the calibration fluid. If this value does not correspond with the value of the used fluid, it must be corrected by positioning the cursor on the field CAL.POINT, switching with ENTER to the EDIT mode and adjusting the value with the + and - buttons. The value is saved by pressing ENTER again.

Put the redox probe into the calibration fluid.

Position the cursor on the field CALIBRATION and start the calibration process with ENTER. The word "WAIT" is shown. After a short time the correct value will be displayed in the field MEASURED and "WAIT" disappears. The redox probe is now calibrated.

The menu CALIBRATION REDOX is left through pressing the ON button.

Adjustment of the redox set point:

In the redox menu position the cursor on the field ADJUSTMENT and release it with ENTER. The menu REDOX-SET appears. The adjustment is made according to the menus of pH.

Move the cursor to BNC and adjust the redox channel which should be used for control.

Also the redox control can be used as + or - control. Move the cursor to the fields MIN or MAX and release the respective field through ENTER. Adjust the desired value with the + and - buttons.

Example: The redoxpotential in the tank should be increased by using Ozone to 400 mV. Move the cursor to MIN. Press ENTER to switch to the EDIT mode and adjust the desired value by using + and - to 400 mV. Save this value by pressing ENTER again.

The hysteresis resp. the control accuracy can be adjusted in the field HYSTERESIS. It should not be chosen too low to avoid an often on- and off-switching of the controller. An useful adjustment is 10 mV. To adjust this value move the cursor to HYSTERESIS and release it with ENTER. Save the hysteresis value of 10 mV through pressing ENTER again.

The assignment of sockets is also done according to the descriptions of those of the pH.

If, for example, socket 2 should be used for Ozone control, move the cursor to the field PLUGS and press ENTER to change to the EDIT mode. Use the + and - buttons to adjust socket 2, press ENTER to save it.

If no minimum limit is defined, the socket has to be adjusted to X in the MIN line. In the column K for channel the number of the power box is programmed. If only one power box is used, the value 0 has to be taken.

The adjustment of the desired redox value is now finalised and the menu ADJUSTMENT REDOX can be left through pressing the ON button. Press ON again to enter the main menu.

### 3.3. Temperature

Move the cursor to the TEMPERATURE line and release it with ENTER. The temperature menu is shown.

In this menu the adjustment of the set point and the calibration are possible.

#### CALIBRATION:

The aqualine C is delivered with a ready calibrated temperature probe. If the probe is changed or a recalibration is necessary, it is necessary to use a second precise (and calibrated) thermometer.

For calibration purposes choose the right line and release it with ENTER. The menu

CALIBRATION TEMPERATURE appears.

The temperature probe of the computer and the second temperature probe are put into a glass filled with water. When both displays stop indicating, the value of the computer can be read in the field MEASURED. The field CAL.POINT is now adjusted to the temperature of the second, precise thermometer. For doing this, choose this field with the cursor and press ENTER to change to the EDIT mode. Now the actual temperature can be adjusted and saved by pressing ENTER again.

Press the + button to move the cursor on the field CALIBRATION and release this function through pressing ENTER. The word "WAIT" appears. After a short time the displayed and the actual value are the same and "WAIT" disappears. Now the temperature probe is calibrated.

Press the ON button to leave the menu CALIBRATION TEMPERATURE.

## Set point adjustment

Back in the temperature menu , choose ADJUSTMENT and press ENTER to switch to the menu ADJUSTMENT TEMPERATURE. This screen looks different to that of the pH and redox adjustments. A heater as well as a cooler can be headed on. Furthermore, a night temperature set back can be defined.

Example: The temperature during the day should be 26° and during the night 23° C. In case of exceeding the temperature of 28° C the cooler should be switched on.

To ensure this, choose the field HEATER in the line DAY and press ENTER to switch to the EDIT mode. Now the desired temperature value for the day -26° C- can be adjusted. Press ENTER again to save this value.

Press the + button to move the cursor to the desired value NIGHT. Press ENTER to switch to the EDIT mode. Adjust the desired value for the night -23° C-. Press ENTER again to save this value.

The values for night and day for the cooler can be adjusted in the same way. For example, these values are 28° during the day and 24° C during the night.

For the cooler, the additional adjustment of a hysteresis (control accuracy) is necessary. This hysteresis should not be below 0.5° C to avoid a continuous switch of on and off of the cooler.

Press the + and - buttons to choose the field HYSTERESIS. Press ENTER to switch to the EDIT mode. Adjust the hysteresis to the desired value. Press ENTER to save the value.

For the adjustment of the heater the definition of a hysteresis is not required. The heater works with an hysteresis of 0,1° C.

Press the + button to enter the field NIGHT VALUE. Beginning and end of the night temperature set back can be defined. Choose either the field START or END. Press ENTER to switch to the EDIT mode. Press the + and - buttons to adjust the desired time period. Press ENTER again to save the time.

If no night temperature set back should be programmed, two possibilities exist:

either the day and night temperature are adjusted to the same value in the upper display or beginning and end of the night temperature set back are adjusted to the same time, i.e. 0.00 h.

Press the + button again to enter the field PLUGS to relate the sockets for the heater and cooler. Pay attention that no double occupation with other parameters occurs. If, for example, the heater should be programmed on socket 3, press the + button to move the cursor into the line MIN. Press ENTER to switch to the EDIT mode. Press the + button to move the cursor on field 3. Press ENTER to save it.

If only one power box is used, adjust the value to 0 in the field CHANEL K.

Now the programming of the desired temperature value is finished. Leave the menu through pressing the ON button. Press ON again to enter the main menu.

### 3.4. Conductivity value

Choose the line CONDUCTIVITY in the main menu and release it through pressing ENTER. The conductivity menu appears.

#### Calibration:

The conductivity probe has always be calibrated within two measurement ranges even if the measurement should be done only in fresh or in sea water.

$\mu$ S/freshwater:

For the calibration for fresh water, choose the line CALIBRATION m S and release it by pressing ENTER. The menu CALIBRATION CONDUCTIVITY m S is displayed.

For the calibration two different fluids are required, i.e. 250 m S and 500 m S. The conductivity probe is placed into the fluid 250 m S first. The actual value is shown in the field MEASURED.

Press the + button to enter the field CAL.PT 1 with the cursor. Press ENTER to switch to the EDIT mode and adjust the desired value 1 (250 m S) by using the + button. Press ENTER to save it.

Adjust the set value 2 (500 m S) in the same way.

Use the + button to move the cursor to the bottom line to the field 250 m S. When the probe is placed in the calibration fluid 250 m S and the displayed value stops varying, the calibration can be released through pressing ENTER. It appears "WAIT" as long as the the displayed value is switched to the actual value. As soon as "WAIT" disappears, take the probe out of the calibration fluid, rinse it thoroughly with distilled water and put it into the second calibration fluid (500 m S).

Press the + button to move the cursor on the field 250 m S. If the displayed value stops varying, release the calibration through pressing ENTER. The display is adjusted to 500 m S. As soon as "Wait" disappears, the calibration of the conductivity probe for the range of m S is finalised. Press the ON button to leave the calibration menu. The conductivity menu is displayed again.

mS/Seawater

If the conductivity probe should also be calibrated for the range of mS choose the line CALIBRATION (mS) and release it through pressing ENTER. The calibration in the range of mS is done in the same way as that of m S. The two calibration points 35 and 50 mS are saved. Press the ON button to leave the calibration menu.

Set point adjustment

If the conductivity should be used for control as well, a set value can be defined. Choose the line ADJUSTMENT in the conductivity menu and release it through pressing ENTER. A minimum as well as a maximum conductivity value can be defined, i.e. to add the amount of evaporated water or to change water. These values can be adjusted in the fields MIN and MAX. Move the cursor to the respective field and press ENTER to switch to the EDIT mode. Press the + and - buttons to adjust the value. Press ENTER to save the value.

The control accuracy is adjusted in the field HYSTERESIS. The value should not be too low to avoid an often switching of the regulator. Take for example 5 m S. Key this value in by using the EDIT mode. Press ENTER again to save the value.

Furthermore, the sockets which should be activated when the value either exceeds or falls below the desired value can be adjusted.

Press the ON button to leave the menu ADJUSTMENT. Press ON again to enter the main menu.

### 3.5. Niveau/Level

To programme the level, move the cursor in the main menu to the field NIVEAU and release it. The menu plugs Level control is shown.

The aqualine C has two separated level controls: one for refilling evaporated water and one water level control with minimum and maximum. All controls needs two level sensors. With the

enclosed two probes only one level control can be installed. The second can be added through the purchase of two further level probes .

### Refilling mode

For the refilling mode, the two entrance channels for the level probes in the basic boxes 1 and 2 are used.

The probe which marks the desired minimum water level in the aquarium resp. the filter tank is put into sensor entrance 1. The bottom tip of the glass probe where the initial sensor is located must mark the water level in the aquarium or filter tank exactly.

Probe 2 is a running-dry protection for the pump which pumps the water out of the storage tank into the aquarium or the filter chamber. It has to be installed in the storage tank in a way that it marks the minimum water level at which the pump which head up the water back to the aquarium does not run dry. Exactly this pump is controlled via one socket of the aqualine C.

This socket can be programmed by moving the cursor in the menue PLUG CONFIGURATION NIVEAUCONTROLLER into the field PLUG REFILLING. Press ENTER to use the EDIT mode and adjust the desired socket. Press ENTER again to save the value.

If the water level at probe 1 (in the aquarium or the filter) is to low, the pump in the storage tank will be activated to add this amount of water. If also the level in the storage tank which is marked by probe 2 is to low, the running dry protection of this pump will be activated and the pump will be switched off.

### Water Level Control Mode

The second level control (water level control) is a minimum/maximum control. This can be used to control the filling of a storage tank via a reverse osmosis unit. The two level entrances 3 und 4 belong to this level controller.

The minimum water level in the storage tank is marked with probe 3; the maximum water level with probe 4. If the water level drops down to the minimum water level, the socket of the aqualine C will be activated and the tank will be filled up to the maximum water level. Then the socket will be switched off again. It switches on again when the water level drops down to the level minimum. The respective socket can be marked through moving the cursor to the field PLUG RESERVOIR. Press ENTER to use the EDIT mode and adjust the required socket with the + and -buttons. Press ENTER to save it.

In the field CHANEL (K) the number of the power box on which the socket should be activated can be choosen. If only one power box is used, adjust the number to 0. The level controllers are now programmed.

Press the ON button to leave the menue PLUG CONFIGURATION NIVEAUCONTROLLER.

It is possible to create a linking between the conductivity measurement and the level control 1 (repeated dosage). This linking is adjusted in the menue SYSTEM (see respective chapter).

### 3.6. Timer

To adjust the timers choose the line TIMER in the main menue and release it through pressing ENTER. The timer menue is shown.

The aqualine C has 4 timers. These can be choosen within the timer menue.

Move the cursor to the desired timer number, i.e. timer No. 1 and release it with ENTER. The menue **TIMER 1** is displayed.

It is possible to programme two different adfjustments for each timer. Either an on- and an off-time or an interval control can be programmed. If both adjustments were made, the timer works in the interval mode during its on-time.

Adjustment of on- and off-times:

Press the + and -buttons to call up the respective line in the menue. Press ENTER to switch to the EDIT mode. Key in the desired time and save it through pressing ENTER. Now the timer works such as a standard timer which is used for switching the lightin system on and off.

Intervall

If it is desired to switch specific processes in regular periods on and off (interval pump control), move the cursor to the line **INTERVALL** and press ENTER to switch to the EDIT mode. Now the interval can be switched on or off. Press ENTER again to save the adjustment.

The on- and off-times of the interval can be programmed in the bottom field. This adjustment is right on the minute. It is possible to simulate alternating currents with pumps which can switch on and off every few minutes or every hours (ebb and flow).

Furthermore, it is possible to switch dosage pumps via this interval control which operate once or several times during the day and which have therefore long off-times.

Plug configuration

The socket which should be activated by the respective timer is called up in the bottom line. Move the cursor to die line **PLUGS**. Press ENTER to switch to the EDIT mode. Press the + and -buttons to select the desired socket. Press ENTER again to save it.

Speciality: Via the timer function other functions can be "masked".

If the timer function and the pH control are programmed on the same socket, the pH control will be activated only during the on-times of the timer. This means that for example a night switching-off of the pH control can be programmed.

The 4 timers can be switched to 4 different sockets. If all functions must be used only the timers will need the whole capacity of one power box.

Press the ON button to leave the menue of one timer. The timer menue will be shown and the remaining timers can be programmed according to the first one. Also this screen is left through pressing the ON button.

### 3.7. System

Choose the line **SYSTEM** in the main menue and press ENTER to enter the system menue. In this menue various adjustments can be done, i.e. the BNC configuration which is described within the defination of BNC channels.

System adjustments:

In the system menue, move the cursor to the line **BASIC SETTINGS** and press ENTER to release it. The menue **BASIC SETTINGS** is displayed.

- Time and date

Here the adjustment of the actual time and date can be done. Move the cursor in the line TIME to the desired parameter DATE or TIME. Press ENTER to switch to the EDIT mode. Key in the day and/or time and press ENTER to save it.

- Display

In the line DISPLAYTIMER the time at which the display switches to "stand by" mode (without use of the remote control) can be adjusted.

- History

In the line HISTORY all statistical data which are saved in the computer, can be deleted (CLEAR). Afterwards, the statistics start with new data.

Through pressing the ON button, the screen BASIC SETTINGS can be left. The display switches back to the system menu.

## Plug configuration

The second line in the system menu PLUG CONFIGURATION shows all programmed sockets. It can be chosen with the + button and released with ENTER. Then the screen PLUG CONFIGURATION is displayed.

This screen shows which sockets are related to the parameters. The assigned sockets can be either controlled or changed. A "quick adjustment" of the various sockets is possible.

- Channel/Power Box

The first column CH for "CHANNEL" means the number of chosen power box. If only one power box is in operation, channel 0 has to be keyed in.

Altogether, up to 8 power boxes can be connected.

- Plug

The second column PL for "PLUG" shows the socket which was related to the respective parameter. The numbers from 1 to 4 indicate the socket of the marked power box in the first column.

The symbol X (resp. the number 5) means that no socket has been programmed. The respective measurement function will not be used for control purposes.

To change a programmed socket, click it on with the + or - button. If the cursor blinks on the respective field -either CH "CHANNEL" or PL "PLUG", press ENTER to switch into the EDIT mode.

Now the socket can be changed by using the + and - button. Press ENTER again to save the changed value.

Furthermore, in this menu can be controlled whether socket were double occupied. This can also be corrected here.

Press the On button to leave the screen PLUG CONFIGURATION. The system menu appears again.

## Function Attachments

The third line in the system menu ATTACHMENTS enables an integration of the refill automatic

(level probes 1 and 2) and the conductivity. To activate this integration position the cursor on the line Attachments and activate it with ENTER. The screen ATTACHMENTS is displayed.

Firstly, the integration of refilling and conductivity measurement can be either switched on or off.

Move the cursor to the field STATUS. Press ENTER to change the status, either OFF or EINON.

The two sockets for salt or fresh water dosage can be programmed in the lower field.

Press the ON button to leave the screen ATTACHMENTS. The system menu is shown again.

## History

The measured data are recorded continuously by the aqualine C. These data can be called up via the statistic function.

To do this, use the + and - button to choose the line STATISTIK in the system menu and release it through pressing ENTER.

First the screen for the course of the temperature is displayed. The development of the temperature of the last 14 days is shown in a graphic. If the computer operated only a few days the data are only shown as numbers at the right side. The data moves gradually to the left side so that the graphic is completed after 14 days.

Press the + button to switch to the next screen (BNC 1). If the first BNC channel is programmed on pH, the course of the pH value is shown.

A second press of the + button leads to the screen BNC 2, here course of the redoxpotential.

Through pressing the + button again, the screens BNC 3 and BNC 4 can be entered, at least if these channels have been programmed. If these channels are not connected, the computer switches to the screen CONDUCTIVITY.

This consists of two screens. First, the course of the conductivity in salt water (mS) is shown. If the conductivity probe is located in fresh water, only a line in the bottom area of the screen is shown.

Press the + button again to switch into the conductivity area m S. Here the conductivity values during operation of the conductivity probe in fresh water can be recorded. Use the + and - buttons to switch from one diagram to the other.

The recorded data are saved in an unbuffered memory (RAM). This means that they will be lost during power interruption. Optionally, a battery buffered storage will be available as additional component.

The aqualine C can only save the measurement values of the last 2 weeks. In case of longer operation the oldest values in the memory are deleted and replaced by actual values so that always the data of the last 14 days are indicated.

Press the ON button to leave the statistic functions. The system menu is shown again.

## BNC-configuration

The four BNC-channels are programmed in the screen BNC-CONFIGURATION.

Move the cursor in the system menu to the line BNC-CONFIGURATION and release it with ENTER. The screen BNC-CONFIGURATION appears.

The programming is described in the chapter "pH value".

The four BNC channels can be programmed either on pH value or redoxpotential. All combinations

are possible, i.e. 4 x pH measurement or 4 x redoxpotential measurement or each combination in between. BNC channels which are not required are clicked on with the cursor and are adjusted to OFF through pressing ENTER.

For example, the aqualine C is able to measure the pH value in four different aquaria and to put the respective desired values on the four sockets of the power box. This means that the pH values can be controlled in four aquaria simultaneously and independantly.

#### Diagnose/ WA Redox

The last two lines in the system menue DIAGNOSE and WA REDOX are only required for internal adjustments of the aqualine C during repairs. It is not possible to make any adjustments.

Now the aqualine C is completely programmed. Press the ON button three times to switch to the main menue. Here the measurement parameters and values are displayed.

#### 4. POWER BOX

- Connection of multiple power boxes:

Up to 8 power boxes can be connected to the aqualine C. For the operation with multiple power boxes they have to be signed with different addresses.

A little switch with 10 adjustments is located on the back side of the power box -directly above the computer plug. In the middle is a turnable red point with an arrow. This arrow shows to the actually adjusted power box.

If only one power box is used, the arrow should be positioned on 0, the second power box on 1, the third on 2 etc. The power boxes are combined with the flat band cable. When you order the power box it is necessary to order a suitable cable with enough passes to ensure the adjustment of all power boxes.

If several Power Boxes are connected, make sure, that thea are all switched on. If a Power Box shall be disconnected, remove the computer plug at the back side of the Power Box ( or all other control functions will not be executed!) If you switch it on again, the regular functions are reestablished.

- Polarization Indicator

The power box has a polarization indicator This is the small lighting display located bottom left beside the first socket.

When the power box is connected to 230 V and switched on at the main switch, the lighting display shows if the power box is polarized in the right way. If the display lights up, the power box is polarized wrong. Then the 230 V plug has to be pushed and plugged in again by turning it by 180°. Now the red light should be gone out. If not, a disturbance in your electrical installation (leakage currents on the earth connection) is possibly the case. In this case contact a specialist for electrics.

If you connect consumers with high power to one ore more power boxes (i.e. HQI lightings or cooling devices) it will be reasonable to connect the single power boxes to different electrical circuits of your house. Also a separation between the electronic and the power box is possible. The electronic (power of the basic box) can be connected to one electrical circuit and the power box to another.

If you connect only small consumers like magnetic valves and pumps, the electronic and various power boxes can be connected to one electrical circuit.

#### 5. Maintenance

- Probes. Check all probes regually. The whole unit can only measure as exact as the probes

are maintained. The probes shall be cleaned, calibrated refilled ( if you have refillable pH and redox probes). As probes are consumer products, they have to be changed after some years.

## 6. Failures:

If used correctly your computer system aqualine C operates without failures for years. Any disturbances are mainly caused by defective contacts. In this case please check if all connected cables are in good condition and are plugged in correctly.

Check if the programme memory (EPROM) is correctly located in the basic box. Check further the connection of the cables at the back side of the graphic display.

If the remote control fails, replace the batteries. Open the back side of the remote control with a screw-driver. Then the two batteries type LR 1 Lady AM 5 can be replaced.

## 7. Warranty

This product is warranted for 12 months after date of purchase on material and production faults by ab aqualine gmbh.

Further claims, especially claims by improper use, will not be warranted.

Warranty only by proof of purchase with the original invoice.

- Technical changes reserved -

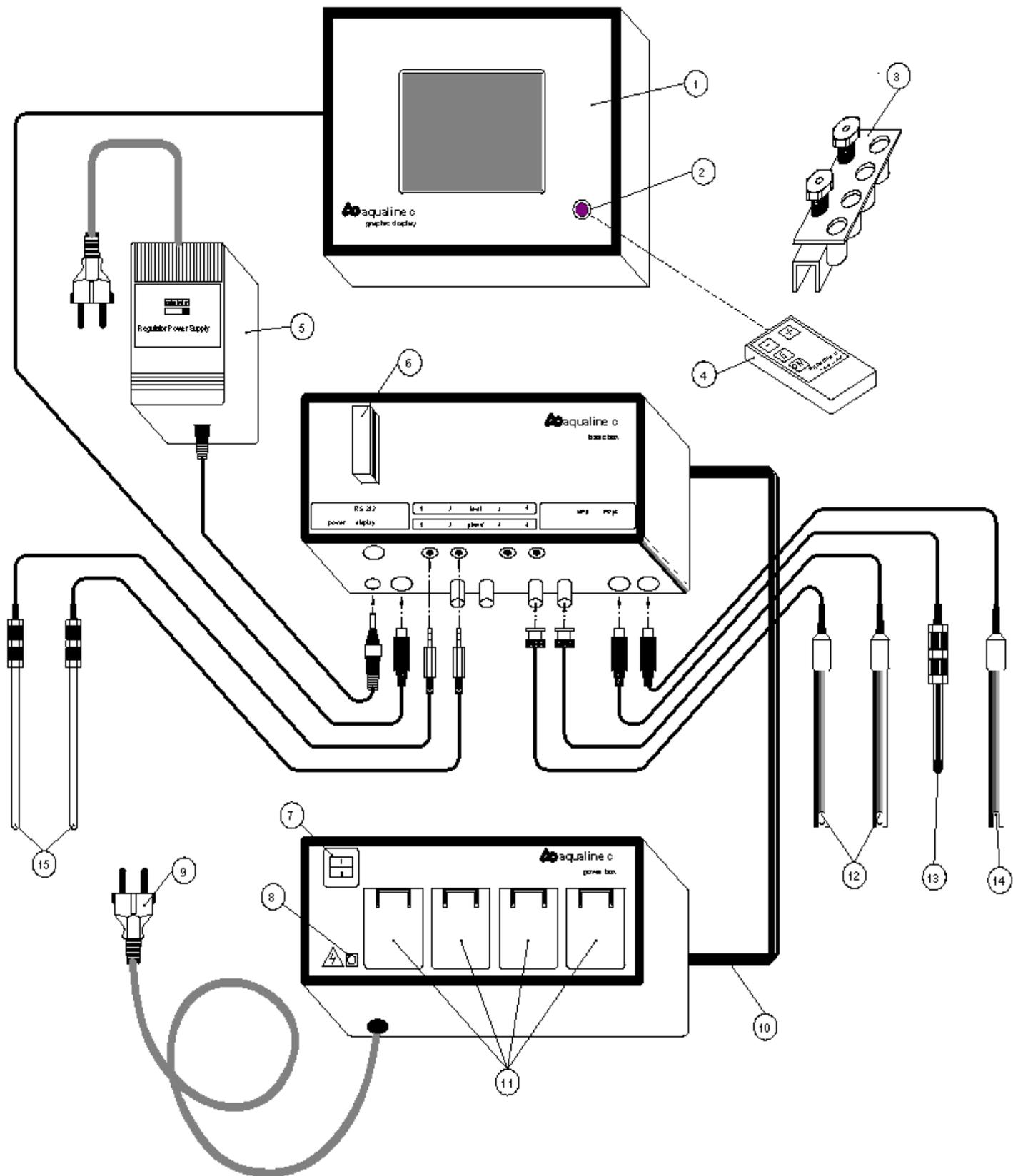


Fig1: Aqualine C

1 Display

2 Infrared receiver

3 Electrode holder

10 flat cable to connect Power and Basic Box

11 Plugs/Output

12 BNC probes

**4 Remote control**

**5 Power supply**

**6 Basic Box with program module**

**7 Power Box**

**8 Polarization indicator**

**9 Power cable**

**13 Temperature probe**

**14 Conductivity probe**

**15 Level probes**