



MultiControl

Directions for Use

Software version 1.2



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1. Introduction

All electronic components of the aquarium computer must only be operated in sound condition. If the feeder is damaged please have this replaced by a technician or send us the equipment for repair. Continued operation may cause a fatal electric shock. Ensure that the controller (1) and power unit (12) do not come into contact with water.

It is good practice to disconnect all electrical equipment from the mains before placing your hands in the aquarium.

Hint: It is recommended to use a separate or dedicated, safety-switch protected supply which disconnects the mains from the aquarium equipment in the event of an electrical fault.

1.2 Installation



Controller

The controller (1) has a mounting recess or slot (2) on the back, which mates with the mounting rail (3), and may therefore be mounted using the screw set, (4) to a wall or the aquarium cabinet. The 2 metre cable from the Power Unit, provides sufficient length to allow positioning of the controller outside the aquarium furniture, so that all values and switch states can be readily viewed.



Power unit

The Power unit (12) should be fixed onto the side of the aquarium cabinet, to minimise any chance of water contact in the event of a leakage from the aquarium or filter etc.



Temperature Sensor

Position the temperature sensor (11) at a place in the aquarium where there is a good water current. It should not be attached near heating. Be sure to mount it securely so that it cannot come loose nor emerge from the water - this could lead to inaccurate displayed values and overheating of the aquarium.



1.3 Controller and Power Unit

(1) Controller

(2) Mounting Slot

(3) Mounting Bar

(4) Screw Set

(5) Display Cover

(6) Display

(7) Keypad Cover

(8) "Menu" Key

(9) ▲ Key

(10) ▼ Key

(11) Temperature Sensor

(12) Power Unit

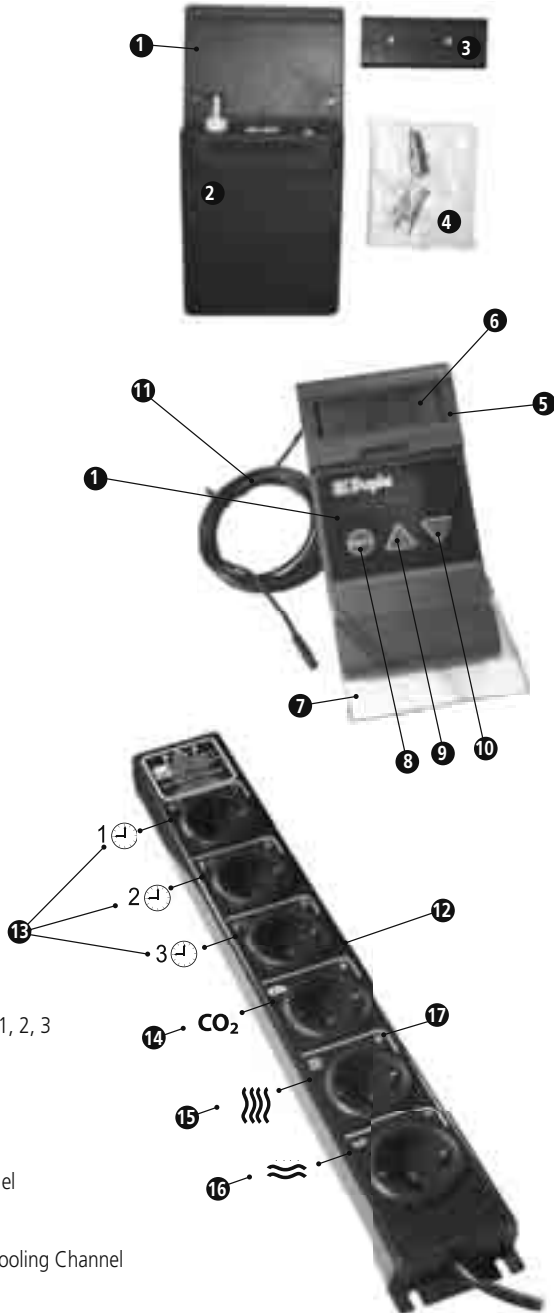
(13) Power Unit Interval Timer 1, 2, 3

(14) CO₂ Control Channel

(15) Water Temperature Channel









(16) Substrate Temperature / Cooling Channel

(17) LED



1.4 Display



-  = Animation effect, appears in association with display of the CO₂ symbol
- CO₂** = Symbol for CO₂ channel - control of a heating device magnetic valve / appears when programming and displaying CO₂ channel values
-  = Symbol for heating channel - control of a heating device / appears when programming and displaying water temperature values
-  = Symbol for substrate temperature channel or alternatively, cooling channel - control of a substrate heater or a cooling device / appears when programming and displaying substrate temperature / cooling values
- HEAT** = heating / heating function - indicates the "horizontal waves" channel is operating with a second heating device
- COOL** = heating /cooling function - indicates the "horizontal waves" channel is operating with a cooling device
- 1**  = Symbol of the 1st time-controlled channel / appears when programming and displaying the values of the 1st time-controlled channel
- 2**  = Symbol of the 2nd time-controlled channel / appears when programming and displaying the values of the 2nd time-controlled channel
- 3**  = Symbol of the 3rd time-controlled channel / appears when programming and displaying the values of the 3rd time-controlled channel
-  = Symbol for interval timer / displayed when programming time-controlled channels
- AUTO/ON/OFF** = Automatic mode display, permanent ON, permanent OFF when programming the time-controlled channels
-  = appears when programming and displaying the value of the pH alarm, temperature alarm or the calibration memory function
- On / Off** = indicates the activation or deactivation of functions
- Mo-Su** = Display of programmable circuit times / single days Mo-Su, Mo-Fr, Sa-Su / Display of week days in English
- Cal** = appears during calibration
- Set** = appears when entering set point
- °8** = shows the number of the switching time when programming
- 88:88** = Numeric display
- E01** = Temperature sensor – cable defect (open circuit)
- E02** = Temperature sensor – probe defect (short circuit)
- °C** = appears when programming and displaying the temperature
- Menu** = appears when accessing the menu structure
- pH** = appears when programming and displaying the pH value / appears in connection with **CAL** when calibrating the pH electrode
- CAL** = appears when programming and displaying the calibration memory function

2. Basic Functions

2.1 Safety shutdown during programming: When entering into programming mode, all slots are deactivated for safety reasons.

2.2 Function monitoring of external devices: The power unit is fitted with green LEDs (17). These indicate the active control of external devices. The three channels for the interval timer can be switched on and off nine times each, within 24 hours.

2.3 Malfunction and short-circuit recognition of temperature sensor: The temperature sensor (11) features recognition of sensor malfunction (open or short-circuit), which is displayed with **E01** or **E02**. For safety, the heater channel is switched „off“ in this event, so that the aquarium cannot overheat.

If the aquarium is not heated by a Dupla Therm cable heater but an immersion heater, it is recommended to only use such heaters with integrated thermostat and safety shutdown.

2.4 Self-calibration temperature sensor: The temperature sensor is a precision measuring instrument with a maximum tolerance of 1%. If replacement is required, calibration is not necessary.

2.5 Interval reset: Irrespective of the time of day, all programmed intervals start when the device is switched on or the menu is quit.

3. Programmable Functions

3.1 Control of water temperature: Water temperature is controlled with $\pm 0.1^\circ\text{C}$ accuracy.

Contact-less switching of the water temperature channel is achieved by use of an electronic triac switch.

The substrate temperature channel can be set within the range of 15°C to 35°C . The substrate temperature channel is automatically preset 0.1°C higher.

Example: You have set the water temperature to 25.0°C . At a measured 25.0°C , the water temperature channel switches off, however substrate heating continues. If the substrate heating is sufficient to raise the water temperature to 25.1°C , then the substrate heating channel also switches off.

Warmth in the substrate strengthens the plant roots, increases the biological activity of the substrate and creates circulation within the substrate for improved transportation of oxygen and nutrients. The best possible requirements for healthy plant growth are achieved.

Hint: Immersion heaters with an integrated thermostat should be set $3\text{--}4^\circ\text{C}$ higher than the required temperature, so that electronic control via the MultiControl can operate correctly.

3.2 Cooling operation: An inverting function can be enabled to change the substrate heating channel to a cooling channel. In this way, instead of floor heating, an external cooling unit or a cooling fan can be connected to combat the temperature rise in summer.

3.3 Cooling device control: Via the water temperature channel, the immersion heater heats the water up to the preset temperature. If the temperature then increases more than the preset difference, a cooling device can be controlled via the substrate temperature channel. When the cooling option is selected, the differential between heating and cooling can be set as required. The control accuracy is 0.1°C .

*Example: If the water temperature is at 25.0°C in **C00L** operation and the differential to the substrate heating is 3.0°C , the immersion heater is switched off at 25.0°C . If, due to higher summer temperatures, the aquarium continues to heat up to 28.0°C due to the summer temperature, cooling is activated.*

3.4 Temperature Alarm: When the water temperature falls below, or exceeds the programmed temperature set-point, an audible and visual temperature alarm is activated. This can be set to mute until the set-point is reached by pressing the ▲ or ▼ key. The alarm window can be preset between +/- 1° and 5° C. +/-3° C is set as the factory default. The alarm function can be switched "On" or "Off".

By default the function is set to "Off", to prevent the alarm operating on initial use when the sensor is not yet positioned in the aquarium and the room temperature is too high or too low.

3.5 Circuit Times: Via 3 time-controlled channels, for example, day and night lighting, circulation pumps or filters can be switched on and off, up to 9 times each, per day. After the 9th programmable switching time, an interval can be programmed, determining after how many hours/minutes/seconds a circulation or dosing pump, for example, should switch on for how many hours/minutes/seconds. The interval can be programmed by the day or by blocks of days. In case of overlaps, the interval function dominates normal switching times. External devices can be programmed daily, **Mo-Su, Mo-Fr, Sa-Su**. The weekdays are abbreviated on the display. Alternatively to the weekday, "Off" permanently switches off *individual switching times*. If all switching times of the channel are to be switched off permanently, select "OFF" alternatively to "R U T O" before entering the switching times. "ON" switches the channel on permanently. The capacity of the entire Power Unit is 1,500 Watt total. With individual channels having a maximum capacity of 1,000 Watt each.

3.6 pH Set Point: The pH set point can be adjusted within the limits of 4.0 - 9.9. Outside of these limits, the pH channel is switched off. With the connection of a Dupla pH electrode, the pH level, may be continuously monitored, and with a Dupla Magnetic Valve also connected to the Multicontrol, pH-controlled CO₂ fertilisation may be utilised. Switch hysteresis (the difference between the switching point and the triggering point) is 0.1 pH, and the control accuracy is +/- 0.1 (reference value). In order to ensure the accuracy of measurement and therefore the control circuit, the MultiControl provides an optional six-week calibration memory function

CAUTION: If no pH electrode is connected to the MultiControl, so that the BNC socket is open, inevitably, fictitious pH values will be displayed in individual as well as toggle mode (where the displayed values change from one to the next in a 2 second cycle). As a factory default, the display of the pH value is hidden. If you want them to be displayed, please select "On" when programming the pH point setting.

3.7 pH Alarm: When the programmed pH set-point is either not met or exceeded, there is an acustical and optical pH alarm. The alarm window can be set between 0.5 and 4.0 pH deviation from the set point. By default, a deviation of pH 0.5 is preset. The alarm function can be enabled or disabled (switched "On" or "Off"). The beep can be silenced by pressing the ▲ or ▼ key.

3.8 Calibrate pH Electrode: The factory setting of the calibration points is pH 7 and pH 4, the calibration sequence first is pH 7, then pH 4. The calibration process can be cancelled by pressing the ▲ and ▼ key simultaneously.

3.9 Calibration Memory Function: With this feature enabled, every six-weeks "CAL" and "pH" flashes on the display as a reminder to check the pH electrode calibration. In order to calibrate the pH electrode, enter programming mode by pressing the "Menu" key and go to the menu item "CAL" and "pH".

To disable of the calibration memory function, continue to scroll through the menu items and set the function to "off". If you prefer not to carry out a calibration at the moment, the memory display clears after activating any key and reappears in another 6 weeks.

3.10 Time: The MultiControl has a built-in real-time clock. Changing from summer time to winter time must be done manually.

4. Quick Start Guide to Programming

- Switch display lighting 'on' or 'off': Press and hold the ▼ key = on/off.
- Toggle mode: Temperature and time of day are displayed alternately in a 2 second rhythm (factory preset).
- Single mode: Optionally either pH value, temperature or time of day are displayed continuously (by pressing the ▲ and ▼ key).
Hint: Shall the pH value be displayed in the toggle and single mode, please select "On" when programming the pH set-point in the menu item.
- Changing from toggle to single mode: Press and hold the ▲ key.
- Audible acknowledgment: Press key for a moment , i.e. a 'tap' = short sound.
Hold key down, i.e. for 2 seconds = long sound.
- Switching to programming mode: A) Pressing the **"Menu"** key enters the main programming menu. During programming the symbol **Menu** is displayed.
- Moving within the menu structure: B) It is possible to scroll through the menu items with the ▲ and ▼ keys (Sequence: Water temperature – HEAT/COOL mode - Difference HEAT/COOL mode - Temperature alarm - Switching times - pH set-point - pH alarm - Calibrate pH electrode - Calibration reminder - Time).
- Modifying programming: C) Quickly pressing **"Menu"** enables the modification of programmed values, the changeable value flashes.
D) Increase or decrease required values with the ▲ and ▼ keys.
E) Acknowledge by activating the **"Menu"** key.
For modification of other programmed values continue from step B).
- Quitting the programming mode: F) Quitting the programming mode and accessing the operational mode is done automatically after 3 minutes of inactivity or **"Menu"** by holding down the key.

- | | | | | |
|----|---|---|---|---|
| A) | ① | △ | ▽ | Enter programming menu |
| B) | ○ | △ | ▽ | Scroll up or down in menu |
| C) | ③ | △ | ▽ | Enable change in value |
| D) | ○ | △ | ▽ | Increase or lower value |
| E) | ⑤ | △ | ▽ | Acknowledge value change |
| F) | ⑥ | △ | ▽ | Press & hold key, to quit programming and access operating mode |

5. Programming Instructions

First tap **"Menu"** key to start the programming mode.

*Hint: The symbol Menu indicates you are in the programming mode. By holding down **"Menu"** it is possible to quit the programming mode at any time.*

5.1 Control of Water Temperature



When pressing the **"Menu"** key, **"25"** flashes on the display.
Set the required value with the ▲ or ▼ key.
Acknowledge with **"Menu"** key, **"0"** will flash.
Set the required value with the ▲ or ▼ key.
Acknowledge with the **"Menu"** key to return to the main menu.
Scroll through to the next menu item with the ▲ key.

5.2 Switch to Cooling Operation



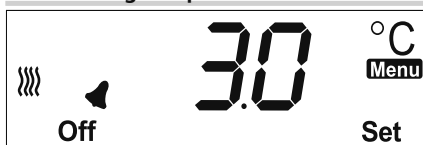
If the alternate cooling operation is not desired, scroll directly to the next menu item by pressing the ▲ key.
Otherwise press the **"Menu"** key - **"HEAT"** flashes.
Change to **"COLD"** with the ▲ key
Acknowledge with **"Menu"** to return to the main menu.
Scroll through to the next menu item with the ▲ key.

5.3 Control of a Cooling Device



Press the **"Menu"** key, **"3.0"** flashes.
Set the required value with the ▲ or ▼ key.
Acknowledge with the **"Menu"** key to return to the main menu.
Scroll through to the next menu item with the ▲ key.

5.4 Setting Temperature Alarm



Press **"Menu"** key, **"3.0"** will flash.

Set the required value with the ▲ or ▼ key.

Acknowledge with **"Menu"**, **"Off"** will flash.

To activate the temperature alarm, set display to **"On"** with the ▲ or ▼ key.

Acknowledge with **"Menu"** to return to the main menu.

Scroll to the next menu item with the ▲ key.

5.5 Setting Switching Times



Press the **"Menu"** key, **"Auto"** for automatic mode will flash.

Press ▲ key, **"On"** for duration of switch-on time of the slot will flash, or press ▼ key and **"Off"** for duration of switch-off time of the slot will flash. If no duration for switch-on or switch-off time is required, acknowledge with **"Menu"** when **"Auto"** flashes, **"1"** will flash.

Press the **"Menu"** key to set the switch-on time of the " 1⊕ " slot, **"00:"** will flash.

Set the desired hour switching-on time with the ▲ or ▼ key.

Acknowledge with **"Menu"** key, **":00"** will flash.

Set the desired minutes switching-on time with the ▲ or ▼ key.

Acknowledge with **"Menu"**, **"S:00"** will flash.

Set the desired seconds of switch-on time with the ▲ or ▼ key.

Acknowledge with **"Menu"**, display **"Off"** flashes, **"00:"** flashes.

Now set switching-off time of slot " 1⊖ ".

Set the desired hour switching-off time with the ▲ or ▼ key.

Acknowledge with **"Menu"**, **":00"** will flash.

Set the desired minutes switching-off time with the ▲ or ▼ key.

Acknowledge with **"Menu"**, **"S:00"** will flash.

Set the desired seconds of switch-off time with the ▲ or ▼ key.

Acknowledge with **"Menu"**, **"MoTuWeThFrSaSu"** will flash.

Use the ▲ or ▼ key to change day blocks, days or deactivation in the order of **„MoTuWeThFr“**, **„SaSu“**, **„Mo“**, **„Tu“**, **„We“**, **„Th“**, **„Fr“**, **„Sa“**, **„Su“**, **„Off“**.

*Note: Contrary to **"OFF"** which permanently switched off the whole channel when selected before programming the switching time, **"Off"** here only deactivates an individual function.*

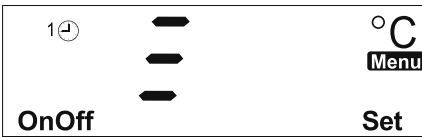
Acknowledge with **"Menu"**, **"1"** will flash.

If you want to set (up to 8) other switching on/off times of the slot " 1⊕ ", press ▲ and program in the same way.

In order to quit sublevels of switching times of " 1⊕ ", hold down **"Menu"** to return to the main menu.

Scroll through to the next menu item with ▲.

5.6 Set intervals



After the 9th programmable switching time, "≡" will flash (see 5.5).

Press the **"Menu"** key to set the spacing of intervals, **"00:"** will flash.

Use the ▲ or ▼ key to specify after how many hours an interval should be activated.

Acknowledge with **"Menu"**, **"00:"** will flash.

Use the ▲ or ▼ key to specify after how many minutes an interval should be activated. Acknowledge with **"Menu"**, **"S-:00"** will flash.

Use the ▲ or ▼ key to specify after how many seconds an interval should be activated. Acknowledge with **"Menu"**, **"00:"** will flash.

Use the ▲ or ▼ key to specify how many hours the interval should last.

Acknowledge with **"Menu"**, **"00:"** will flash.

Use the ▲ or ▼ key to specify how many minutes the interval should last.

Acknowledge with **"Menu"**, **"S-:00"** will flash.

To quit the sublevel of the switching times, hold down **"Menu"** to return to the switching menu.

Use the ▲ or ▼ key to change between the time-controlled slots and briefly press **"Menu"** to program further switching times as per 5.5 or intervals as per 5.6.

Hold down **"Menu"** to leave programming of a time-controlled slot and scroll through to the next menu item with the ▲ key.

Please note: Irrespective of the time of day, all programmed intervals start when the device is switched on or the menu is quit. If a precise daytime control is required, set the switching time appropriately, e.g. at 2.30pm for 5 seconds.

5.7 pH Program Set Point



Press the **"Menu"** key, **"7.0"** flashes.

Set the required value with the ▲ or ▼ key.

Acknowledge with the **"Menu"** key, **"Off"** flashes.

Use ▲ or ▼ to set button to **"On"** to activate pH display in toggle mode.

Note: Acknowledge with "Menu" - "Off" flashes. Set to "On" if a pH electrode is connected. If pH electrode is not connected, leave on "Off" to ensure that open input on controller does not display fictitious pH values in normal or toggle mode.

Acknowledge with the **"Menu"** key to return to the main menu.

Scroll to the next menu item with the ▲ key.

5.8 Setting pH Alarm



Press the **"Menu"** key, **"0.5"** flashes.

Set the required value with the **▲** or **▼** key.

Acknowledge with **"Menu"**, **"Off"** will flash.

To activate the pH alarm, set the display to **"On"** with the **▲** or **▼** key.

Acknowledge with the **"Menu"** key to return to the main menu.

Scroll through to the next menu item with the **▲** key.

5.9 Calibrating pH Electrode



1. Connect the pH electrode to the MultiControl and remove the protective cap from the electrode tip.
2. Rinse electrode tip briefly with Dupladest.
3. Press the **"Menu"** key – **"7"** appears at the top left of the display.
4. Dip the electrode into the pH 7 solution. When the displayed measurement has settled, press and hold the **"Menu"** key (until long beep) to accept value; **"7"** is displayed.
5. Rinse electrode tip briefly with Dupladest.
6. Press the **"Menu"** key – **"4"** will flash. When calibrating the electrode for freshwater aquaria, acknowledge with **"Menu"**, **"4"** will stop flashing. For saltwater aquaria use the **▲** or **▼** key until **"9"** flashes at the top and acknowledge with **"Menu"**, **"9"** will stop flashing.
7. Dip the electrode into the pH 4 solution for freshwater calibration or into the pH 9 solution for saltwater calibration. When the displayed measurement has settled, press and hold the **"Menu"** key (until long beep) to accept value; **"4.00"** for freshwater calibration or **"9.00"** for saltwater calibration is displayed. Press **"Menu"** to return to the main menu.
8. Rinse electrode tip briefly with Dupladest.
9. Fix electrode in the aquarium with suction cups.
10. Scroll through to the next menu item with the **▲** key.

The calibration can be interrupted at any time by pressing the **▲** or **▼** key at the same time.

5.10 Setting Calibration Memory



Press **"Menu"** key, **"On"** display flashes.

Set key to **"Off"** with the **▲** or **▼** key to turn off memory function.

Acknowledge with **"Menu"** to return to the main menu.

Scroll through to the next menu item with **▲** key.

5.11 Setting Time



Press **"Menu"** key, **"00:"** flashes.

Set the current time in hours with the **▲** or **▼** key.

Acknowledge with **"Menu"**, **":00"** flashes.

Set the current time in minutes with the **▲** or **▼** key.

Acknowledge with **"Menu"**, **"Mo"** flashes.

Set the current week day with the **▲** or **▼** key.

Acknowledge with **"Menu"** to return to the main menu.

Scroll through to the next menu item with the **▲** key.

To finish programming, hold **"Menu"** key down until display changes.

6. Manual switching of time-controlled slots

Press the **▲** and **▼** keys simultaneously, slots 1-3 are shown one above the other.

Press **"Menu"** to switch slot **"1☺"** on or off manually.

Press **▲** to switch slot **"2☺"** on or off manually.

Press **▼** to switch slot **"3☺"** on or off manually.

After pressing the appropriate key, the device will return to operating mode, manually switched slot will flash as a symbol.

Repeat the process for manual switch-off.

Note: Manual switching immediately dominates normal switching times or interval function. It is automatically cancelled when programmed switching or intervals are activated. Permanent on or off is set in the programming mode. If no switching times are set in the programming mode, manual switching equates permanent on or off.

7. Factory Setting

- | | | | |
|--|--------------|--------------------------------|-----------|
| • Target temperature water heating: | 25.0° C | • Time switch position 2: | Off |
| • Target temperature substrate heating: | 25.1° C | • Time switch position 3: | Off |
| • HEAT/COOL-Modus: | HEAT | • Target pH control: | 7.0 |
| • Difference heating / cooling differential: | 3.0° C | • pH Alarm: | 0,5 (off) |
| • Temperature Alarm: | 3.0° C (off) | • Calibration memory function: | On |
| • Time switch position 1: | Off | | |

8. Reset

Should your aquarium computer not be working correctly, please carry out a reset as follows:

1. Switch off power to MultiControl.
2. a) General reset: pull the power plug. Press and hold down the **"Menu"** key and reconnect power plug. Release the key. All programmed settings are deleted.
b) Reset the time-controlled slots: pull the power plug. Press and hold down the **▲** key and reconnect power plug. Release the key. Only programmed settings for the time-controlled slots are deleted, all other settings are maintained.
3. Release **"Menu"** key.

Caution: Activating the reset function will result in a loss of all programmed settings.

9. Source of Fault

In the case of a problem, first reset to the factory settings. If this does not solve the problem, please search for the fault in the following table:

Fault	Possible cause	Solution
Temperature control is not working	Immersion heater thermostat overriding MultiControl	Set heater thermostat 3-4° C higher than the MultiControl
Display E01	Temperature sensor cable break / Temperature sensor not connected	Replace or connect temperature sensor
Display E02	Temperature sensor hot-wired	Replace temperature sensor
Alarm cannot be deactivated	Temperature sensor defect	Replace temperature sensor
External devices are not operated at the preset time	Time setting inactive	Check time setting and selection of week-day
Fluctuating temperature display	Temperature sensor cable too close to a power cable	Re-locate temperature sensor differently
pH value is not displayed	Display was switched off	Switch display on
pH value is not controlled	pH control is not activated	Activate pH control
Fluctuating pH value	pH electrode cable too close to a mains cable or a CO ₂ reactor / the values displayed during calibration did not steady sufficiently	Re-locate pH electrode cable / re-calibrate pH electrode - if necessary, 2-3 times

If repair is required, please return to where purchased.

10. Technical Specifications

Operating voltage:	230 V / 50 Hz
Operating temperature:	0-60° C
Power Unit total load capacity:	1,500 W
Power Unit total fuse rating:	6.3 A/T
Data storage:	power failure safe with E-Prom parameter memor

pH Control

pH control range:	4.0 - 9.9
Control accuracy:	+/- 0.1 (reference value)
Alarm window:	0.5-4.0
Switching:	contact-less, electronic triac
Switching hysteresis:	0.1 pH
Connection power:	1,000 W
Calibration memory:	Six-week

Water Temperature

Temperature control range:	15 – 35° C
Control accuracy:	+/- 0.1° C
Alarm window:	1.0 – 5.0° C adjustable
Switching:	contact-less, electronic triac
Switching hysteresis:	0.1° C
Connection power	1,000 W

Substrate Temperature / Cooling

Switching:	contact-less, electronic triac
Differential to water temperature:	1.0 – 5.0° C adjustable
Connection power:	1,000 W

Time-controlled slots

External equipment:	user-defined
Connection power:	1,000 W

11. EC Declaration of Conformity

The manufacturer declares that the equipment meets the requirements of the applicable EHC standards and therefore satisfies the provisions of the EC directives 89/336/EG.

Subject to technical modifications.

