Instruction manual

Measurement, control and dosing device for swimming pools

Analyt 2 / Analyt 3

GB

BAYROL

Contents

Danger:

Note: The dosing fluids used are corrosive and / or inflammable. Never allow the two ends of the delivery hoses on the vacuum pumps to hang loose, as this will permit the corrosive and/or inflammable fluids to escape.

Always observe the relevant health and safety regulations when installing and using the device. It must only be installed and operated by qualified expert personnel.

It must only be installed and put into operation by qualified technicians.

WARNING

Changing the system settings (default values) can be dangerous under certain circumstances. Therefore, changes must only be made by trained technicians. The operator assumes liability if settings are used improperly or modified.

Note: The use of other products such as hydrochloric acid to control the pH value can quickly result in serious damage. BAYROL recommends that the device be operated with BAYROL products only. BAYROL does not provide a guarantee or accept liability for problems caused by using other manufacturers' products.

Do not touch the screen of the device with anything else but the finger. Any contact with other objects such as pens, knives or nails may cause scratches or other damages of the surface.

Any damage caused by misapplication will result in loose of warranty!

Password for customer level :

Password "1234" (if not set differently on the factory level)

1 Overview

1.1 Analyt 2 and Analyt 3

The Analyt is a highly advanced measurement, control and dosing system for public and private swimming pools. Analyt 2 and Analyt 3 are in accordance with DIN 19643.

1.2 Maintenance program

Two types of device are available in the Analyt series; these can be enabled by simply configuring the software using the ident chip:

1. Analyt 2

- Water treatment by chlorine dosing
- Measurement and control of the chlorine level
- Measurement and control of the pH level
- Measurement of the water temperature

2. Analyt 3

- Water treatment by chlorine dosing
- Measurement and control of the chlorine level
- Measurement and control of the pH level
- Measurement of the redox level
- Measurement of the water temperature

1.3 Overview of features

Independent of the type of device, each controller provides the following features:

1.3.1 Display and operation

- High resolution 5.7“ screen, monochrome, blue background lighting
- Simple operation via touch screen
- Clear menu structure
- Menus can be changed to multiple different languages
- Screen with automatic switch-off to save energy (adjustable)
- Online help

1.3.2 Measuring and control

- Proportional control for all control modules
- All important control parameters can be programmed individually for each control module (setpoint, maximum dosing time, proportional range, dead zone (pH), basic dose (mV), dosing period, minimum switch-on/switch-off time
- Continuous display of current dosing rate
- Conversion of all measurements by high resolution 10-bit analogue/digital converters
- 1- or 2-point calibration for pH measurements
- 1-point calibration of mV and T measurements

1.3.3 Safety functions

- Comprehensive monitoring and alarm functions

  (upper and lower threshold alarms, flow alarm, level alarms, dosing time alarms, calibration time alarms, battery alarm, power-on delay, automatic blocking of dosing during critical alarm conditions
  and during power-on delay, alarm notification through

  - Ø display
  - Ø acoustic alarm signal
  - Ø alarm relay
- continuous monitoring of the correct program sequence and automatic reset in the event of an error (watchdog function)

1.3.4 PC communication (CommLink)

Optional PC communication via an RS-485 interface with logging, storage and graphic display of all relevant measurements, remote operation of the Analyt device (several devices can be connected to a single PC).

1.3.5 PoolConnect

Optional use of PoolConnect. PoolConnect is a GSM module used to communicate with Analyt. PoolConnect automatically provides information on the water quality.

2 Installation

The Analyt measurement, control and dosing device is a precise and sensitive system. Please handle it with care at all times.

Also be careful with the cover and do not let it drop or come into contact with chemicals. If the cover requires cleaning, always use a soft cloth and a small amount of water.

2.1 Wall installation

Firmly install the Analyt mounting plate on a wall. The installation site should be protected against dust and water as far as possible to ensure that the device functions properly. The ambient temperature should lie between -0 °C and + 50 °C and should be relatively constant. Direct solar and heat radiation onto the device should be avoided. In addition, the installation site should be close to where the measurement water is drawn. Please be careful to ensure that the amperometric measurement cell is horizontally positioned.

2.2 Installation in the circulation system

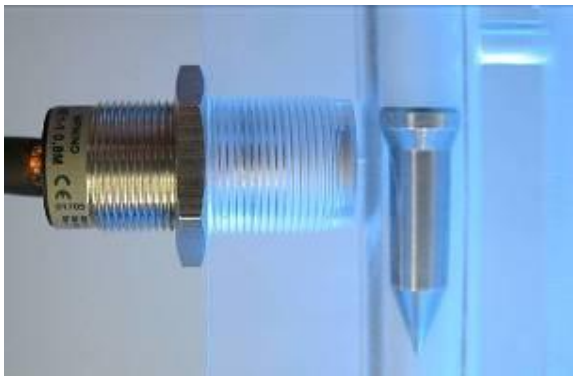
Perform all installation work carefully and comply with the applicable safety regulations. Disconnect the measurement, control and dosing device and all other electrical loads such as heating or circulation pump from the mains.

In addition, comply with the applicable regulations regarding the installation of electrical devices.

The earthing provided for the plexiglass measurement chamber MUST be installed. This earthing should NOT be connected in the Analyt (earthing via the power cable of the Analyt) but MUST be connected to a separate safe earthing. Make sure that the earthing is functioning properly.
Always ensure that fault current is not flowing into the water of the swimming pool. Professional measurement is recommended.

General notes on installation:

- Please ensure that the injection locations can opened and closed reliably.
- Ensure that all hoses are laid without kinking.
- Avoid laying the hoses over sharp edges.
- Carefully connect all hoses and check that all connections are firmly attached.
- Avoid unnecessarily long hose lengths.
- Do not guide the hoses directly over warm pipes or systems.
- When connecting the dosing pumps, please follow the operating and installation instructions of each unit.
- Regularly check that the float in the measurement chamber can float freely.
- Adjust the water flow through the cell so that there is a gap of about 1-2 mm between the top edge of the float and the top edge of the proximity switch. (See figure.)



- If you are using a Flockmatic pump for dosing of Quickflock Automatic, connect it to one of the connections controlled by the circulation pump (circulation OFF – flocculation OFF; circulation ON – flocculation ON)
- IMPORTANT: Always connect the earthing screw on the bottom of the measuring chamber with a reliable building earth.
  Do NOT connect earth in the controller housing!

3 Operation

3.1 Operating principles

3.1.1 Touchscreen

The touch screen is a high resolution screen with blue background lighting that responds to finger pressure. Please note that light pressure is fully adequate to achieve the desired reaction.

Although the screen is very robust and long-lived, please ensure that it is not scratched and that it does not come into contact with corrosive fluids (e.g. ChloriLiquid, pH plus/minus, etc.).

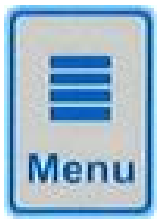
To clean the screen, use a mild cleaner on a soft cloth. Always wipe it with a damp cloth after cleaning.

In the normal display shown here, the screen is not pressure sensitive and settings cannot be changed accidentally.

Do not touch the screen of the device with anything else but the finger. Any contact with other objects such as pens, knives or nails may cause scratches or other damages of the surface.

Any damage caused by misapplication will result in loose of warranty!

3.1.2 Direct selection buttons



Menu button

To change from the normal display to the selection of further menus.

These are:

- Main menu (customer)
- Main menu (service)
- Alarms
- Service messages
- Contrast setting
- Operating mode (automatic/off)

Esc button

To return to the preceding menu.

Note : Changes are not saved.

Home button

To change back to the normal display from any menu page.

Help button

To display context-sensitive help on the current menu.

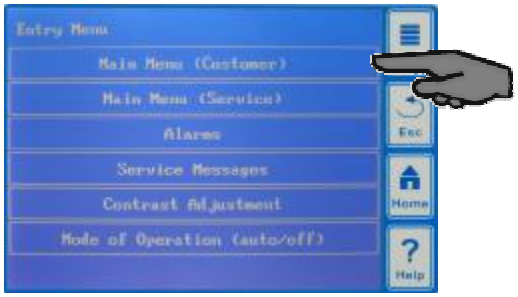
3.1.3 Entering data

Entries or changes are very easy to make and always involve the same steps.

In general: Any value or term surrounded by a white frame or inverted (blue type in white box) can be changed. If you wish to make a change, lightly touch the area within the frame on the screen with your finger. The display responds by opening the menu page with the desired content.

The method used to make an entry is illustrated in the following example, which shows how to change the pH setpoint:

Open the



Select the main menu (customer)

Enter 1234 – OK

Select the "Measuring & Control“ menu

Select the "pH" menu

Select the pH setpoint by placing your finger within the frame next to the term

Enter the desired pH setpoint (e.g. pH 7.4) using the numerical keypad that appeared and confirm with "OK"

The new pH value is accepted
(in this case, e.g. 7.4 pH)
You can now

- close the page step-by-step by pressing Esc (e.g. to make further changes in other menus)

or

- return to the normal display directly using the Home button

A context-sensitive help is available for every displayed menu page. It can be opened by simply touching the Help button.

3.1.4 Detailed online help

An important component of the Analyt software is the detailed online help. It is context-sensitive and offers additional assistance on every menu item.
Thus this manual is not essential for normal operation of the Analyt since all important information is contained in the software and can be accessed by pressing the Help button.

3.2 Commissioning menu

Analyt has a menu for use in commissioning the system. All parameters that are relevant to successfully installing the equipment can be set in this menu.

Despite the fact that this menu greatly facilitates commissioning, the procedure may only be performed by qualified technicians. All parameters to be set must be checked carefully. The conditions in and around the pool must be evaluated professionally and considered when programming the device.

The menu for commissioning appears when the device is first switched on. It can also be opened at any time using the Service Functions menu item in the main menu (service).

The following parameters can be set:

Action	Enter
Step 1: Language	
Select the menu language	
Step 2: Setting default parameters	
The default value set to be used can be selected here.	Select the location where the device is used. If unsure, check and change, if necessary, all default values to ensure they are correct for the respective installation. For added security, activation of the default values must be confirmed.
Step 3: Pool parameters	
Set up the pool and system parameters	• Volume of connected swimming pool • Hose configuration of the employed pump hoses. This display is used for monitoring. The settings are made at the factory for the respective device configuration.
Step 4: Calibration	
Calibrate (balance) the pH, Cl and redox (Analyt 3 only) measurements	• 1-point calibration for pH. Please proceed as described in this manual or in the help text in the device. • 1-point calibration for Cl. Please proceed as described in this manual or in the help text in the device. • 1-point calibration for mV. Please proceed as described in this manual or in the help text in the device.
Step 5: Control parameters pH	
Set up the main parameters for pH control	When the pool is refilled, it may be useful to extend the upper and lower thresholds of the pH value and to adjust the p-range since the pH value may fluctuate somewhat in the run-in phase. **ATTENTION:** If you adjust the parameters, ensure that the values are returned to their standard settings after the pool water has stabilised.
Step 6: pH adjustment	
Option to automatically/manually adjust the pH value of the pool water	The set pH setpoint and the current pH value of the pool water are displayed. **NOTE:** The pH value of the pool water **must** be adjusted to pH 7.2 to ensure that the redox values can be adjusted correctly. 1. Set the pH operating mode to Auto if Analyt is to make the adjustment automatically. The time the procedure takes depends on the pool size and the water quality. 2. Set the operating mode to Manual if you want to adjust the pH value by manually adding agents that raise or lower the pH value.
Step 7: Manual dosage Cl	
Adjust the correct chlorine content in the pool water	To adjust the chlorine content to the desired value (setpoint), proceed as follows:

	1. Adjust the pH value to pH 7.2 (see previous step) 2. Using manual dosage (or by adding chlorine manually), adjust the chlorine content to approx. 0.5-0.6 mg/l (value recommended in Germany) in the pool water. The dose amount of ChloriLiquid is determined by Analyt on the basis of the pool volume entered. The quantity can be overwritten manually and adapted.
Step 8: Control parameters Cl	
Set up the main parameters for chlorine control	Set the chlorine content to 0.5-0.6 mg/l. Adjust the lower and upper alarm thresholds accordingly. Check the p-range.

From each individual menu page, you can leaf forward and backward through the pages.

4 Software

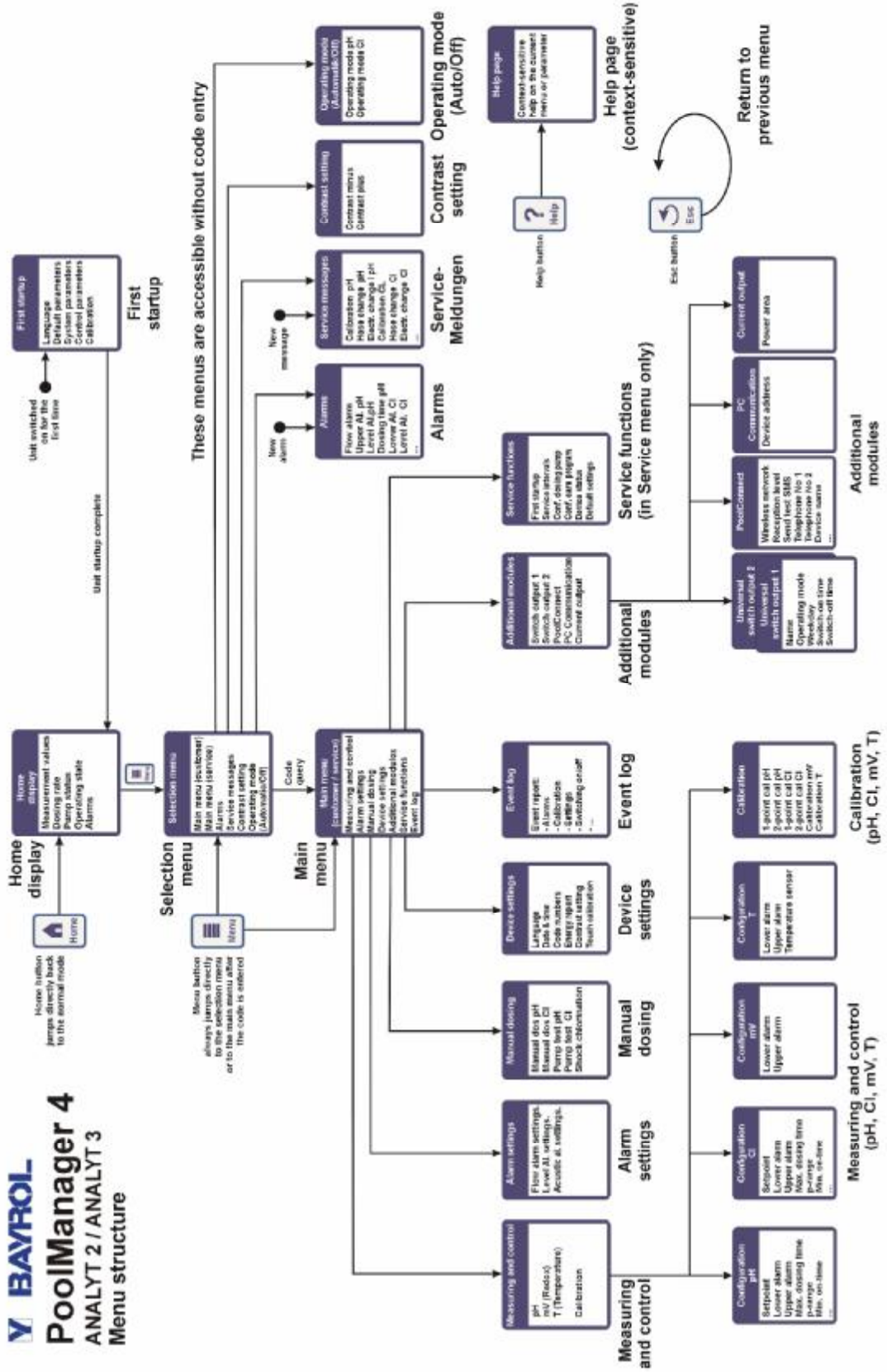
4.1.1 Menu structure

All menus and parameters in the software can be accessed on two levels.

- The "Main menu (customer)" access level (code no. "1234") displays all menu items and parameters relevant to the user.
- The "Main menu (service)" access level (code no. "5678") displays all menu items and parameters contained in the software.
- The "Entry menu", which appears immediately after the menu button is touched, is not protected by a code number and offers rapid and simple access to certain basic Analyt functions:
  - **Alarms**
    Displays all current alarms.
  - **Service messages**
    Displays all current service messages.
  - **Contrast setting**
    For adjusting the display contrast to an optimal level.
  - **Operating mode (automatic/off)**
    For switching the automatic dosage mode on and off.
    In the "Off" setting, the dosing pumps are switched off. Dosing does not take place.

AS A RULE, THE PARAMETERS IN THIS MENU MAY ONLY BE CHANGED BY QUALIFIED AND TRAINED TECHNICIANS!

4.2 Schematic diagram of menu structure

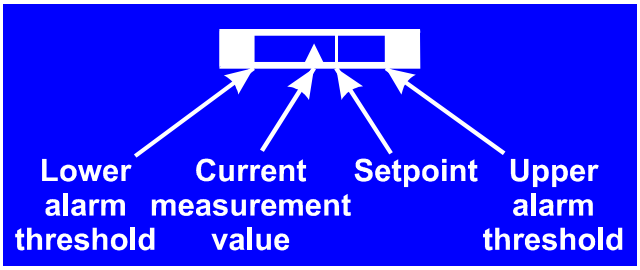


5 pH control

5.1 View in the home display

Pos.	Content	Remarks
1	Module name "pH"	
2	Current pH measurement value	0.00...9.99 pH
3	Measurement graphic	See description below
4	Current operating state	Auto / Off / Manual / Alarm (flashes!) / Flow / Power-on delay ("x min")
5	Pump symbol	The pump symbol rotates when the pump it represents is running.
	Current dosing direction	D- / D+
	Current dosing rate	0...100 pH
6	Alarms	All active alarms that pertain to the pH module are displayed. Alarms whose cause has been eliminated disappear from the display even if they have not yet been quit. If there are no active alarms, "OK" appears.

5.1.1 Measurement graph



The measurement graph shows the relationship between the current measurement value, the upper and lower threshold limits and the setpoint at a glance.

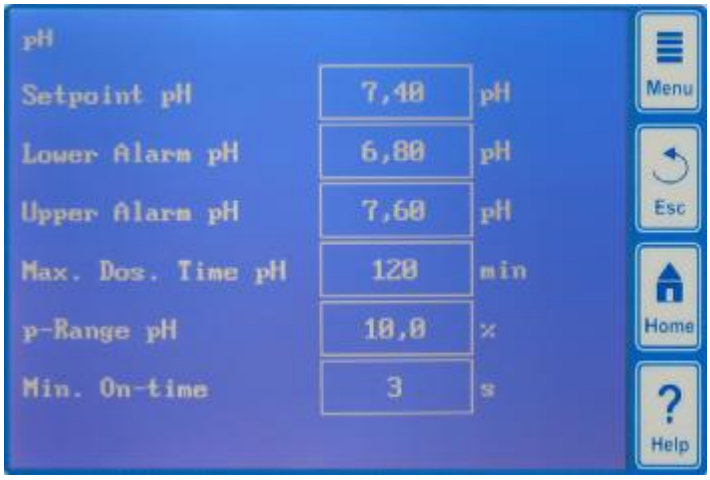
The graphic represents the area between the upper and lower thresholds.

It is easy to discern whether the current measurement value agrees with the desired setpoint or if the value lies within the threshold limits.

5.2 pH control configuration

5.2.1 Setpoint, limits, p-range

The pH control can be configured in the Commissioning menu or in the Customer menu under Measuring & Control (expanded parameter set) as described here.



pH control settings	
Parameter	**Purpose / effect**
Setpoint pH	The desired pH value of the swimming pool water. It is recommended that you aim for a pH value of 7.2 since water disinfection is most effective at this level.
Lower Alarm pH	The lower alarm threshold of the pH value. As soon as the pH value falls below the entered level, an alarm is output. The lower limit should lie 0.4 pH below the setpoint.
Upper Alarm pH	The upper alarm threshold of the pH value. As soon as the pH value rises above the entered level, an alarm is output. The upper limit should lie 0.4 pH above the setpoint.
Max. Dos. Time pH	The maximum duration for which an agent to raise or lower the pH value is dosed. If the set time is exceeded, an alarm is output and dosing of the agent is stopped.
p-Range pH	The p-range setting. The p-range defines the response speed of the controller. As a rule: • The smaller the percentage, the more product will be dosed. Advantage: the setpoint can be reached quickly. Disadvantage: the setpoint may not only be reached but may actually be exceeded. • The larger the percentage, the less product will be dosed. Advantage: the setpoint is reached and is not exceeded. Disadvantage: the setpoint is reached more slowly.
Min. On-time	Minimum time for which the dosing pump is switched on. If the current deviation of the pH value requires a dosing time that is less than the set on-time, dosing still takes place for the set on-time.

The country-specific default values for the individual parameters are provided in the country list in the appendix.

5.2.2 pH electrode calibration

The Analyt pH electrode must be calibrated once every three months to compensate for any deviations in its measurement behaviour. The electrode must be replaced once a year.

These maintenance and replacement intervals absolutely must be complied with to ensure that measurements are correct and that water quality is at its best.

As an example, the procedure for a 1-point calibration of the pH electrode is described here.

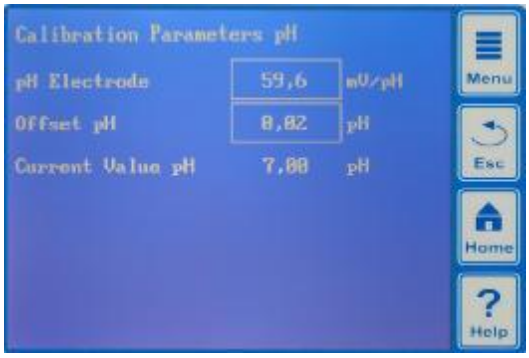
The 1-point calibration takes place in the main menu (customer). In this menu, select the Measuring & Control menu followed by the Calibration menu.

Procedure for the 1-point pH calibration:

- Dip the pH electrode in a buffer solution of pH 7.
- Wait until Current Value pH stabilises and remains constant.
- Under Cal. Value, enter 7.00 and confirm with "OK".
- Touch Next to start the calibration.
- The page that now appears shows the Electrode Slope and Offset parameters (zero shift). Although it is possible to adjust these values here, they do not need to be changed.
- Touch Ready to complete the calibration.

Alternatively, proceed as follows:

- Take a water sample from the pool and determine its pH value using a photometer. The measured value should lie around pH 7 to ensure that calibration will be correct.
- Dip the electrode into the measured sample. Wait until Current Value pH stabilises and remains constant.
- Under Cal. Value, enter the measured value and confirm with "OK".
- Touch Next to start the calibration.
- The page that now appears shows the Electrode Slope and Offset parameters (zero shift). Although it is possible to adjust these values here, they do not need to be changed.
- Touch Ready to complete the calibration.



Parameter	Purpose	Setting
Calibration Parameters pH		
pH Electrode	Slope of pH electrode	Not required because this is an electrode constant
Offset pH	Zero shift of pH measurement	Not required because this is compensated by the calibration
1-Point Calibration pH Calibration Data		
Cal. Value pH	pH reference value for calibration • pH 7 if using the buffer solution • pH value of water sample	 • 7.00 if using the buffer solution • pH value obtained from photometer
Current Value pH	Display of pH value currently measured	Not possible
pH Electrode	Slope of pH electrode	Not required
Current Signal pH	Current deviation of pH measurement signal	Not possible
1-Point Calibration pH Calibration Results		
pH Electrode	Slope of pH electrode	Not required
Offset pH	Calculated offset pH	Not required
Current Value pH	Display of pH value currently measured	Not possible

6 Chlorine (Cl) control

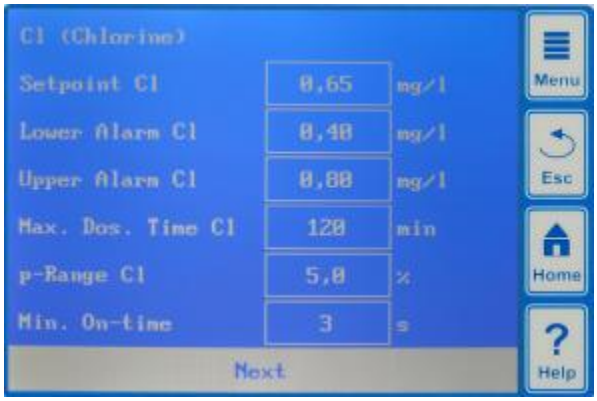
6.1 View in the home display

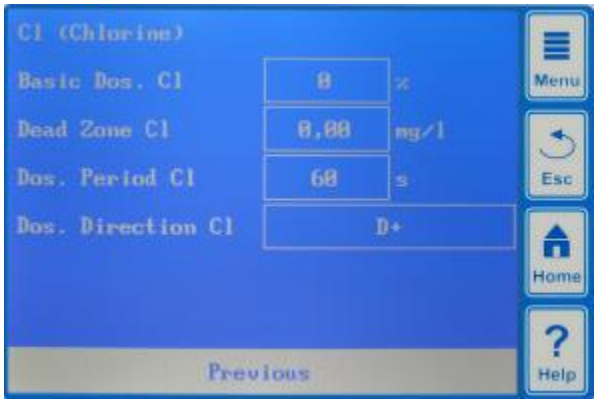
Pos.	Content	Remarks
1	Module name "Cl"	
2	Current chlorine measurement value (free chlorine)	0...9.99 mg/l
3	Measurement graphic	For a description, see "pH control"
4	Current operating state	Auto / Off / Manual / Alarm (flashes!) / Flow / Power-on delay ("x min")
5	Pump symbol	The pump symbol rotates when the chlorine dosing pump is running.
	Current dosing direction	D+ / D-
	Current dosing rate	0...100% (a dosing rate of 50% means that the dosing pump is running 50% of the time)
6	Alarms	All active alarms that pertain to the Cl (chlorine) module are displayed. Alarms whose cause has been eliminated disappear from the display even if they have not yet been quit. If there are no active alarms, "OK" appears.

6.2 Chlorine control configuration

6.2.1 Setpoint, limits, p-range

The chlorine control can be configured in the Commissioning menu or in the Service menu under Measuring & Control (expanded parameter set) as described here.





Chlorine control settings	
Parameter	**Purpose / effect**
Setpoint Cl	The desired chlorine value of the swimming pool water. The default value is 0.65 mg/l.
Lower Alarm Cl	The lower alarm threshold of the chlorine value. As soon as the chlorine value falls below the entered level, an alarm is output.
Upper Alarm Cl	The upper alarm threshold of the chlorine value. As soon as the Cl value rises above the entered level, an alarm is output.
Max. Dos. Time Cl	The maximum duration for which chlorine is dosed. If the set time is exceeded, an alarm is output and dosing of chlorine is stopped. If the maximum dosing time is set to 0, it is deactivated.
p-Range Cl	The p-range setting. The p-range defines the response speed of the controller. As a rule: • The smaller the percentage, the more product will be dosed. Advantage: the setpoint can be reached quickly. Disadvantage: the setpoint may not only be reached but may actually be exceeded. • The larger the percentage, the less product will be dosed. Advantage: the setpoint is reached and is not exceeded. Disadvantage: the setpoint is reached more slowly.
Min. On-time	Minimum time for which the dosing pump is switched on. If the current deviation of the chlorine value requires a dosing time that is less than the set on-time, dosing still takes place for the set on-time.

Chlorine control settings (continued)	
Parameter	**Purpose / effect**
Basic Dose Cl	Constant dosing rate that is always added to the calculated dosing rate. The basic dose can be set in the range of 0%-50%.
Dead Zone Cl	Chlorine range surrounding the setpoint within which a setpoint deviation does not trigger a chlorine dosing.
Dos. Period Cl	Fixed duration of a dosing cycle. The dosing cycle is the sum of the switch-on and switch-off time.
Dos. Direction Cl	Dosing direction of chlorine control: D+ : Chlorine value is raised when dosing (default) D- : Chlorine value is lowered when dosing

6.2.2 Calibration of chlorine measurement cell

The Analyt chlorine measurement cell must be calibrated once every three months to compensate for any deviations in its measurement behaviour. The electrodes must be replaced at least every two years and sometimes far more frequently if wear is excessive.

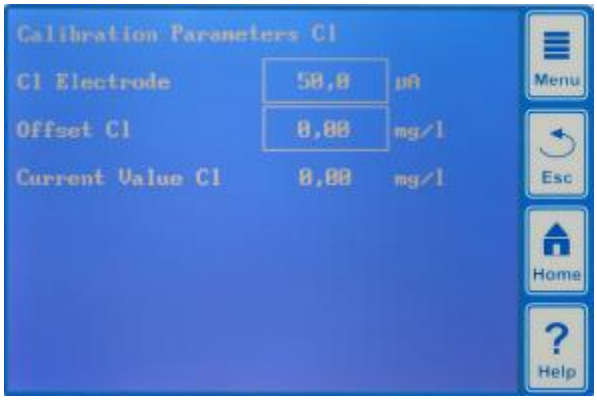
These maintenance and replacement intervals absolutely must be complied with to ensure that measurements are correct and that water quality is at its best.

As an example, the procedure for a 1-point calibration of the chlorine measurement cell is described here.

The 1-point calibration takes place in the main menu (customer) or in the main menu (service). In this menu, select the Measuring & Control menu followed by the Calibration menu.

Procedure for the 1-point chlorine calibration:

- Record the content of free chlorine using DPD measurement.
- Wait until Current Value Cl stabilises and remains constant.
- Under Cal. Value, enter the measured DPD value and confirm with "OK".
- Touch Next to start the calibration.
- The page that now appears shows the Electrode Slope and Offset parameters (zero shift). Although it is possible to adjust these values here, they do not need to be changed.
- Touch Ready to complete the calibration.



Parameter	Purpose	Setting
Chlorine calibration parameters		
Cl Electrode	Slope (sensitivity) of the chlorine electrode	Not required because this is an electrode constant
Offset Cl	Zero shift of chlorine measurement	Not required because this is compensated by the calibration
Current Value Cl	Display of current chlorine measurement value (in mg/l)	
1-Point Calibration for Cl Calibration Data		
Cal. Value Cl	Chlorine reference value for calibration	Free chlorine content in pool water, precisely determined using the DPD method
Current Value Cl	Display of chlorine value currently measured	Not possible
Cl Electrode	Slope of chlorine electrode	Not required
Current Signal pH	Current deviation of chlorine measurement signal	Not possible
1-Point Calibration for Cl Calibration Results		
Cl Electrode	Slope of chlorine electrode	Not required
Offset Cl	Zero shift of chlorine measurement Compensated by calibration.	Not required
Current Value Cl	Display of pH value currently measured	Not possible

7 mV (redox) measurement (Analyt 3 only)

7.1 View in the home display

Pos.	Content	Remarks
1	Module name "mV"	
2	Current mV measurement value	0...999 mV
3	Measurement graphic	For a description, see "pH control"
6	Alarms	All active alarms that pertain to the mV (redox) module are displayed. Alarms whose cause has been eliminated disappear from the display even if they have not yet been quit. If there are no active alarms, "OK" appears.

The redox value is only displayed by Analyt 3. It is not used as a control parameter. As in Analyt 2, water disinfection is performed by means of the chlorine level.

7.2 mV (redox) measurement configuration

In Analyt 3, the mv (redox) measurement is purely for display. The upper and lower alarm thresholds can be adjusted.

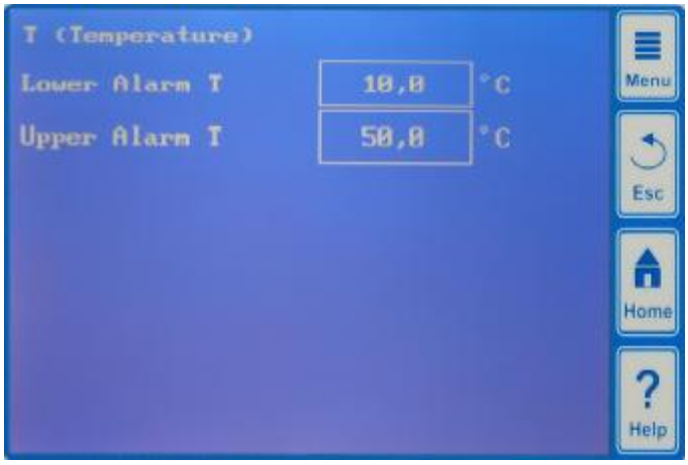
8 Temperature measurement

8.1 View in the home display

Pos.	Content	Remarks
1	Module name "T"	
2	Current temperature measurement value	0.0...99.9 °C
3	Measurement graphic	For a description, see "pH control". There is no setpoint display since the temperature is only measured.
6	Alarms	All active alarms are displayed that pertain to the temperature measurement (upper and lower threshold alarm). Alarms whose cause has been eliminated disappear from the display even if they have not yet been quit. If there are no active alarms, "OK" appears.

8.2 Temperature configuration

In Analyt 2 and Analyt 3, the temperature is for display only.



9 Alarm monitoring

9.1 Overview

Analyt continuously monitors all relevant data and operating states to ensure correct operation and good water quality.

If Analyt discovers a problem, it generates an alarm message that points to the problem. Some alarm conditions block product dosing until the alarm is eliminated.

The following alarm conditions are monitored by Analyt.

- **Upper and lower threshold alarms (pH, Cl, mV, temperature)**
  are generated when a measurement value lies outside of the alarm limits.
- **Flow alarm**
  is generated when there is no measurement water flow.
- **Level alarm (pH, Cl)**
  is generated when a pool care product canister (pH minus or ChloriLiquid) is empty.
  The suction lance in the product canister issues a canister empty signal.
  The level alarms can be deactivated individually in the "Alarm Settings" menu if a suitable empty signal is not available.
- **Dosing time alarm (pH, Cl)**
  is generated if, despite continuous dosing, Analyt is not able to achieve the desired setpoint within the specified time. In this case, Analyt assumes that there may be a problem and blocks any further dosing.

Battery alarm
is generated if the voltage of the buffer battery installed in the Analyt device falls below a limit value of 2.70 V. The buffer battery supplies the real-time clock and the non-volatile memory of Analyt when the device is shut off.

9.2 Flow alarm

Analyt offers two different variants for monitoring the flow alarm.

9.2.1 Automatic quitting of the flow alarm (default variant)

In this variant, Analyt evaluates a flow alarm not as a fault but as a normal operating state. In most swimming pool systems, circulation does not take place around the clock but is only switched on intermittently. In this case it is normal for Analyt not to receive a flow signal during times when there is no circulation.

Accordingly, Analyt signals the missing flow signal as a normal operating state and not as an alarm condition. The special mechanism for signalling alarms is not activated (flashing display, acoustic alarm, etc.).

Dosing is blocked as long as there is no flow signal. After the flow signal returns and after the power-on delay elapses, Analyt automatically returns to its normal control mode.

9.2.2 Manual quitting of the flow alarm

This variant is only intended for swimming pools in which circulation runs twenty-four hours a day without interruption. Analyt evaluates a missing flow signal as a serious fault condition that is signalled by various alarm mechanisms.

Important: Even after the flow signal is restored, dosing remains blocked in this variant. Blocking is only cancelled after the flow alarm is manually quit **and** the flow signal is restored.

9.2.3 Input terminals for the flow monitor

Analyt provides two separate inputs for flow monitoring:

9.2.3.1 Measurement water monitoring (default)

Measurement water flow is usually monitored using a signal transducer that is installed directly in the measurement cell. When the flowing water moves the float in the measurement cell to in front of the signal transducer, the transducer delivers a flow signal. The signal transducer is referred to as a proximity switch (NS). The proximity switch is usually a product from OMRON. It is equipped with three connection cables and is connected to Analyt terminals 25/26/27 (NS). The flow signal is ALWAYS monitored on the Analyt "NS" input and this function cannot be deactivated.

9.2.3.2 Circulation monitoring (optional)

As an option, an additional signal transducer can be used to monitor the circulation circuit. Usually a pressure switch is used for this purpose that is connected to Analyt terminals 28/29 (DS). By default, monitoring of the DS input is deactivated in Analyt and can be activated in the "Alarm Settings" menu when needed.

9.3 Power-on delay

After the Analyt device is switched on or after a flow alarm, the adjustable power-on delay time runs down. Analyt waits for this time to elapse to give all measurement values time to stabilise. Dosing does not take place during the power-on delay. Normal control mode only begins after the power-on delay has elapsed.

The power-on delay is displayed on the alarms page as follows:

```
Power-on delay      5 min

Power-on delay        Quit
```

The first line shows the time remaining of the power-on delay.
The second line lets you end the power-on delay prematurely by activating the quit button.

9.4 Alarm signalling

Analyt signals the alarm condition to the user by various mechanisms.

- **Noticeable flashing of the entire display**
  The flashing stops as soon as you touch the screen.
- **Automatic jump to the "Alarms" menu**
  The **"**Alarms" menu can be called up any time directly from the selection menu via the menu button .
- **Acoustic alarm signal**
  (provided that this function is activated for the respective alarm in the "Alarm Settings" menu)
  The acoustic alarm signal stops as soon as you touch the screen.
- **Switching of the alarm relay**
  (potential-free switch output (max. 230 VAC / 8 A) for connecting external systems for the signalling or recording of alarm conditions (connecting terminal 45/46))
- **Alarm display in home display**

The alarms are displayed on the alarm page as follows:

`Level Alarm pH` | Quit |

A new alarm occurred. The alarm cause has not yet been eliminated.
The alarm has also not been quit, which is why the quit button is displayed.

`Level Alarm pH`

The alarm cause has not yet been eliminated.
The alarm has already been quit, which is why the quit button is not displayed.

`(Level Alarm pH)` | Quit |

The alarm cause has already been eliminated, which is why the alarm appears in parentheses.
However, the alarm has not yet been quit, which is why the quit button is displayed.

When the alarm cause has been eliminated *and* the alarm has been quit by the user, it completely disappears from the alarm page.

The quit button does not appear for the flow alarm if "Automatic Quitting" is set.

9.5 Blocking of dosing by alarms

Alarms generally result in dosing being blocked. Blocking is automatically cancelled when the alarm cause is eliminated.
The alarm does not have to be quit by the user to end the blocking.

The following alarms are an exception to this rule:

- If "Manual Quitting" is set for the flow alarm, blocking of dosing is ended when the flow signal returns *and* the flow alarm was quit by the user. Dosing is resumed after the power-on delay has elapsed.
- If "Automatic Quitting" is set, blocking of dosing is ended when the flow signal returns. Dosing is resumed after the power-on delay has elapsed.
- In the "Alarm Settings" menu, it can be specified whether a level alarm should block dosing. By default, a level alarm blocks dosing of the corresponding control module (pH, mV, O2).

After the dosing time alarm, dosing is enabled again when the alarm is quit.

9.6 Overview table

	Blocking of dosing	Remarks
Upper Alarm (pH, Cl)	Only in dosing direction D+ (for the corresponding module only)	Blocking is cancelled as soon as the measured value drops below the upper alarm limit
Lower Alarm (pH, Cl)	Only in dosing direction D- (for the corresponding module only)	Blocking is cancelled as soon as the measured value rises above the lower alarm limit
Flow Alarm (Automatic Quitting)	Yes (for the corresponding module only)	When the flow signal returns, the power-on delay runs down. After it elapses, dosing is reenabled. The alarm does not have to be quit.
Flow Alarm (Manual Quitting)	Yes (for the corresponding module only)	When the flow signal returns *and* the alarm is quit, the power-on delay runs down. After it elapses, dosing is reenabled.
Level Time Alarm (pH, Cl)	Yes (for all control modules) can be deactivated in the "Alarm Settings" menu	When the level signal returns, dosing is reenabled.
Dosing Time Alarm (pH, Cl)	Yes (for the corresponding module only)	After the dosing time alarm is quit on the alarm page, dosing is reenabled.
Power-on Delay	Yes (for the corresponding module only)	The power-on delay elapses after Analyt is switched on and after a flow alarm. When the time has elapsed, dosing is enabled. The power-on delay can be ended prematurely by quitting.
Battery alarm	no	

Note:

- All alarms are displayed with an alarm delay of 5 s.
  Likewise, they are only deleted if the alarm cause has been eliminated for at least 5 s.
  The alarm delay for the flow alarm can be extended in the "Alarm Settings" menu.

9.7 Alarm settings

The following adjustments can be made in the "Alarm Settings" menu:

9.7.1 Acoustic alarms

The following acoustic alarms can be activated and deactivated individually:

- Acoustic signal for flow alarm
- Acoustic signal for level alarm
- Acoustic signal for other alarms
- Acoustic signal for service messages

9.7.2 Flow alarm settings (in Service menu only)

- Duration of power-on delay
- Alarm delay for the flow alarm
- Quitting of the "Automatic" or "Manual" flow alarm
- Activation of the pressure switch input DS (terminals 28/29)

9.7.3 Level alarm settings (in Service menu only)

- Level alarm pH active/inactive
  (level alarm can be deactivated if no empty signal is present)
- Level alarm Cl active/inactive
  (level alarm can be deactivated if no empty signal is present)
- Dosing in case of level alarm yes/no
  (if the empty signal occurs before the canister is completely empty,
  dosing can be continued despite the level alarm)

10 Service messages

10.1 Overview

The Service Messages function enables precise planning of certain service procedures:

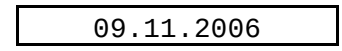
- **Calibration (pH, Cl, mV, T)**
  Recommended interval: pH, Cl, mV 3 months / temperature 12 months
- **Electrode replacement (pH, Cl, mV)**
  Recommended interval: 12 months
- **Hose replacement at dosing pump (pH, Cl)**
  Recommended interval: 12 months

For each service procedure, a time interval in months can be specified in the "Service Intervals" menu (only in the Service menu). After this period, Analyt automatically reminds you that the planned service procedure is due.

By default, all service intervals are set to 0 months and are thus deactivated. To activate this function, an interval of 1...60 months must be set for the required service procedures. A service message can be deactivated at any time by resetting the value to 0 months.

In the "Service Messages" menu, which can be opened directly from the selection menu, all planned service procedures are displayed with their due date. If necessary, the planning date calculated by Analyt can be changed manually.

A service procedure is displayed as follows:



The pH calibration is due on 09.11.2006.

When the due date is reached, the quit button appears instead of the planning date:

When the quit button is activated, the procedure is re-planned and the newly calculated due date is displayed.

10.2 Signalling of due service messages

Service messages that are due are indicated as follows:

- **Noticeable flashing of the entire display**
  The flashing stops as soon as you touch the screen.
- **Automatic jump to the "Service Messages" menu**
  The "Service Messages" menu can be called up any time directly from the selection menu via the menu button.
- **Acoustic alarm signal**
  (provided that this function is activated in the "Alarm Settings / Acoustic Alarms" menu)
  The acoustic alarm signal stops as soon as you touch the screen.

Note:

Service procedures that are due are indicated on the respective day beginning at 08:00.

10.3 Re-planning of service messages

Analyt determines the due date of a service message by adding the set service interval to the current date.

Example:

A service interval of 3 months is set for pH calibration.
A re-planning takes place on 06.12.2006.
The new due date is 06.03.2007.

Service message are re-planned in the following cases:

- Change in the service interval in the "Service Intervals" menu
- Activation of the quit button of a message that is due
- Successful performance of a calibration
  (for calibration message only)
- The "Re-plan service message" function is opened in the "Service Intervals" menu

11 Event log

11.1 Overview

The event log records all important events concerning Analyt. It is an important aid in monitoring the correct operation of the swimming pool system and analysing possible problems.

The event log can be opened from the main menu. It records up to 100 events with date and time.

The following events are recorded:

- Switching on and off of Analyt
- Alarm conditions (beginning and end)
- Calibration
- Parameter changes
- Default resets

Since all entries are displayed by Analyt in easily comprehensible text, a detailed depiction of the individual events will not content be provided here.

The following example illustrates the contents of the event log:

12 Manual dosing

12.1 Overview

For the pH, mV and O2 modules, an additional amount of care product can be added to the swimming pool water at any time by means of manual dosing.

Manual dosing is time-limited and is automatically ended after the selected dosing duration. In addition, manual dosing can be stopped any time. During manual dosing, the dosing pump runs continuously, i.e. at a dosing capacity of 100%.

12.2 "Manual Dosage" menu

A manual dosing can be started in the "Manual Dosage" menu.

The following settings are available:

Parameter	Value range	Standard settings (default) Default set for Europe
Current Measured Value pH / Cl		
Man. Dos. Direction	D- / D+	D-
	The dosing direction of the manual dosing can be selected if the pH control works in both directions. If dosing works in only one direction, manual dosing always takes place in the configured dosing direction (in the "Measuring & Control" menu).	
Hose Config. pH / Cl /	0.9 l/h / 6 l/h / ...	pH / mV: 0.9 l/h O2: 6 l/h
	⚠ The dosing rate of the corresponding BayroSoft pump is entered here. This setting must match the actual pump rate of the pump in use. Otherwise, Analyt will be unable to correctly calculate the required pumping duration for a manual dosing and the dosed amount of BayroSoft may be incorrect.	
Manual Dos. Amount	0.1...10.0 l	0.9 l
	The desired dose amount for the manual dosing is entered here. Analyt calculates the duration of the manual dosing from the dose amount and the hose configuration. **Example:** For a hose configuration of 6 l/h and a dose amount of 2.0 l, the duration of manual dosing is 20 min.	
Manual Dos. Time	1...240 min	60 min
	The duration of the manual dosing can be specified here. If the setting is changed, the Analyt also recalculates the dose amount on the basis of the hose configuration. **Example:** For a hose configuration of 0.9 l/h and a duration of manual dosing of 90 min, the dose amount is 1.35 l.	

Activating the "Start Manual Dosage" button starts dosing.

During dosing, the menu display changes. Only the data relevant to the dosing in progress are displayed:

- Current measured value pH / Cl
- Remaining time of manual dosing in minutes
- The amount already dosed in litres for the manual dosing in progress.

- Current dosing rate in %
  Only the values 0% or 100% can appear here. If a dosing rate of 0% is displayed, manual dosing is blocked by an alarm.
- Pump (on / off)
  The current status of the dosing pump in use. If "Pump off" is displayed, manual dosing is blocked by an alarm.
- Operating state pH / Cl (Manual / Flow / Alarm)
  While dosing is in progress, Analyt is in the "Manual" operating state.
  If "Alarm" or "Flow" is displayed instead, manual dosing is blocked by an alarm.

By activating the "Stop Manual Dosage“ button, manual dosing can be stopped at any time.

12.3 Blocking by alarms

Manual dosing is blocked by the following alarm conditions, as is normal automatic dosing:

- Missing flow signal
- Level alarm (depends on the configuration in the "Alarm Settings" menu)
- Upper alarm (only blocks manual dosing in the D+ dosing direction)
- Lower alarm (only blocks manual dosing in the D- dosing direction)

After the end of the alarm condition, manual dosing is unblocked and the remaining amount is dosed.

If manual dosing is started during the power-on delay, this prematurely ends the power-on delay.

12.4 Special case of shock chlorination

Shock chlorination is a special variant of manual dosing. Analyt offers shock chlorination in the "Manual Dosage" menu under the condition that the dosing direction is set to D+.

The dose amount of the shock chlorination is calculated using the pool volume. The calculation is based on a recommended amount of 0.2 litres of ChloriLiquid per 10 m³ pool volume.

The dose amount calculated in this way can be changed manually.

Activating the "Start Shock Chlorination" button starts dosing.

The shock chlorination procedure corresponds exactly to a normal manual dosing.

⚠ A shock chlorination is permitted to exceed the upper alarm limit.
It is *not* blocked by an upper alarm.

12.5 Special case of pump test (pH / Cl)

The Pump Test function is used to quickly test whether the individual dosing pumps are connected correctly and are fully functional.

The duration of the pump test is limited to 5 minutes at the most.

⚠ Alarms do *not* cause blocking during a pump test, i.e. the pump must run during a pump test.

The pump test procedure corresponds exactly to a normal manual dosing.

13 Plug-in modules

13.1 Universal switch outputs

13.1.1 Overview

Analyt offers two universal switch outputs that can be used to control additional attractions, e.g. pool illumination or a jet system.

The unit is connected to terminals 47/48 ("OUT1") or 49/50 ("OUT2").

Attention!

The universal switch outputs are potential-free switches, i.e. a simple on/off switch is connected between the two connecting terminals "OUT1" or "OUT2".

Analyt does ***not*** apply a 230 VAC line voltage to these terminals.

The relay contact of the potential-free switch can switch the following maximum voltages and currents:

- Max. 230 VAC / 5 A, AC voltage
- Max. 30 VDC / 5 A, DC voltage
- The universal switch outputs in Analyt are not equipped with an electrical fuse and must therefore be externally equipped with a fuse if necessary.

The equipment may only be installed by an qualified technician**.**

To use the universal switch outputs of Analyt, both relays (126 414 relay for PM4) "Option 1" (for output "OUT1") and "Option 2" (for output "OUT2") must be inserted in the device.

13.1.2 Programming the switch outputs

The switch outputs are programmed in the manner of an easy-to-operate timer. For every switch output there are up to three switching intervals.

The following settings can be made for each of these switching intervals:

- Switch-on time (time in hh:mm format)
- Switch-off time (time in hh:mm format)
- Selection of weekdays on which the respective switching interval is to be active.
  One or more weekdays can be selected.
  If no weekday is selected, the switching interval is inactive.

This concept permits a very flexible use of the universal switch outputs.

The following example illustrates this:

- Switch interval 1: 07:00 to 08:00, on every weekday
- Switch interval 2: 13:00 to 15:00, Saturdays and Sundays
- Switch interval 3: 18:00 to 20:30, Wednesdays

The corresponding switch output is activated daily from 7 a.m. to 8 a.m. and additionally on Saturdays and Sundays from 1 p.m. to 3 p.m. and on Wednesdays from 6 p.m. to 8:30 p.m.

13.1.3 Manual mode

The two universal switch outputs of Analyt can be manually switched on and off permanently (operating mode "On" or "Off"). In this case, time control is deactivated.

13.1.4 Blocking by flow

Blocking by the flow signal can be activated for both switch outputs. If blocking by flow is switched on, the respective switch output is only switched on if the flow signal is present. If the flow signal is missing (such as during power-on delay), the switch output is not switched on.

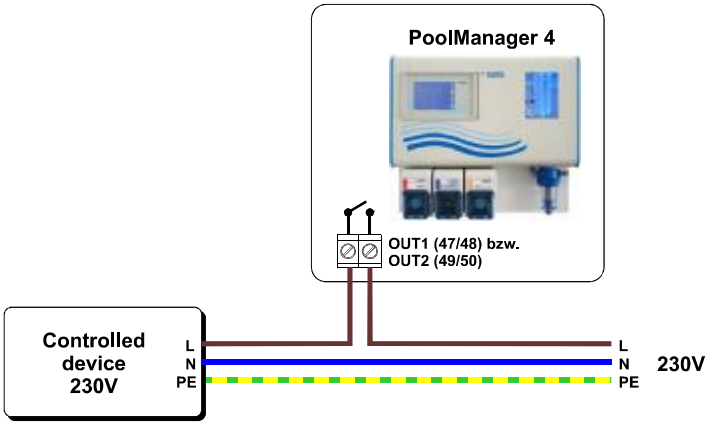
As a special case, it is possible to set the operating mode to "On" and to switch on blocking by flow. In this case, the respective output is always switched on when a flow signal is present. If the flow signal is not present, the output is switched off.

13.1.5 Application examples

13.1.5.1Control of a 230 V device

A 230 V device is connected between neutral N (blue) and phase L (brown) of the power supply, between which there is a voltage of 230 VAC (AC voltage). a protective conductor is generally present as well (yellow/green).

If a device of this type is to be controlled via a universal switch output of Analyt, it must be connected as follows:



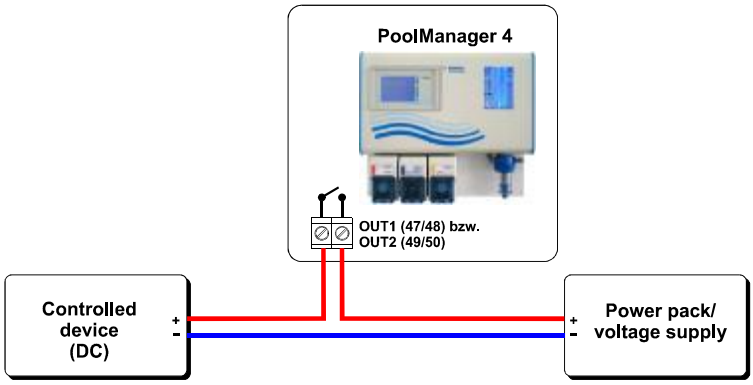
Note: The 230 V supply voltage can be picked up internally from the connection compartment of Analyt and wired to the controlled device.

For example, a ***Flockmatic pump*** or a ***filtering system*** can be controlled according to this scheme.

If the maximum current or voltage of the universal switch output should be inadequate for a certain application, an external relay with the required performance characteristics can be connected.

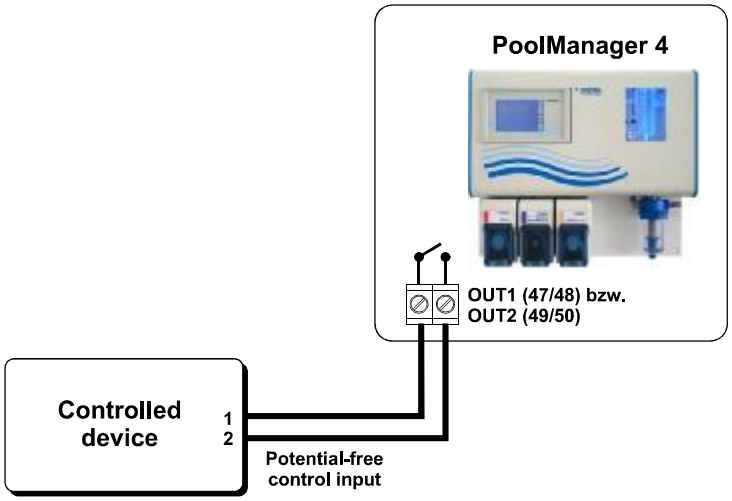
13.1.5.2Control of a device with a DC supply voltage (DC)

For devices with a DC supply voltage, the positive line of the supply voltage is simply connected via the universal switch output of Analyt:



13.1.5.3Control of a device with a potential-free control input

Some devices have a potential-free control input. The input can be connected directly to the universal switch output of Analyt:



If an input of this type is available, it should be used whenever possible instead of switching the power supply of the device on and off.

13.2 Relays

In addition to the relay outputs for disinfection and pH minus dosing and the alarm relay, Analyt is also equipped with three further relay outputs for optional use:

- pH plus dosing (pH+)
- Universal switch output 1 (OUT1)
- Universal switch output 2 (OUT2)

Detailed information on the position and replacement of the relays can be found in the Base PCB chapter.

13.3 Current outputs 0/4...20 mA

⚠ To use the current outputs, the optional "PM4-SA4" current converter must be plugged into the Analyt device.

Analyt provides optional current outputs that issue the measured values as a 0-20 mA or 4-20 mA current signal. This can be used to connect Analyt to a recorder or to a central building control system.

The connection is made to terminals 30 (pH), 32 (mV) and 33 (temperature) and to terminal 34 as a common earth connection.

The following measured values are output:

	Minimum value (corresponds to 0 mA or 4 mA)	Maximum value (corresponds to 20 mA)
pH	0.00 pH	10.00 pH
Cl	0.00 mg/l	1.00 mg/l or 10.00 mg/l (1)
mV	0 mV	1000 mV
T	0 °C	50 °C

13.4 PM4Comm PC communication package

⚠ To use the PC communication package, the optional "PM4-485" interface converter must be plugged into the Analyt device.

The optionally available PM4comm PC communication package enables the connection of one or more Analyt devices to a PC via an RS-485 / RS-232 interface.

The associated Windows software clearly displays all relevant Analyt data. In particular, all relevant data are stored cyclically and the measurement value trends over an extended period are displayed in a diagram.

All further information is contained in the PM4comm package documentation.

13.5 PoolConnect (remote maintenance via SMS)

⚠ To use the PoolConnect functionality, the optional "PM4-PoolConnect" plug-in module must be plugged into the Analyt device.

The optionally available PoolConnect package enables the exchange of data between the Analyt device and one or more mobile phones via SMS.

In particular, the Analyt device sends alarm messages to the mobile phone of the swimming pool owner or service technician.

In addition, important measuring and control parameters can be set via SMS. Also, alarms such as the dosing time alarm can be quit remotely.

All further information is contained in the PoolConnect package documentation.

14 External connections

Caution! Risk of fatal injury!

Only open the Analyt housing when it is deenergized. This should only be performed by trained and qualified personnel.

This applies to removing the connection compartment cover and to opening the device front with the display.

The following figure shows the base PCB with all connecting terminals.

Figure 1 Connecting terminals

14.1 Signal terminals (green terminal block, left)

No.	Pos.	Function	Signal	Remarks
1	Top	RS-485	X+	RS-485 data signal plus
2	Bottom	for PM4comm PC interface (optional)	X+	To use the RS-485 PC interface, the PM4-SKV485 (interface converter) module must be plugged into the device. On the last device of the RS-485 section, a 120 Ohm terminating resistor is connected between X+ and X.
3	Top		X-	RS-485 data signal minus
4	Bottom		X-	
5	Top		GND	Earth signal of the RS-485 connection
6	Bottom		GND	(electrically isolated from the device earth)
7	Top	CAN bus	CAN-HI	CAN data signal high
8	Bottom		CAN-LO	CAN data signal low

No.	Pos.	Function	Signal	Remarks
9	Top	Cl electrode	Cl+	Plus pole of the amperometric chlorine measuring cell
10	Bottom		Cl-	Minus pole of the amperometric chlorine measuring cell
11	Top	Temperature sensor	Temp. +	Temperature sensor (PT1000 or KTY83) plus
12	Bottom		Temp. -	Temperature sensor (PT1000 or KTY83) minus
13	Top	Option for future extensions	Option A	These connecting terminals can be used for future extensions and new functions of Analyt 2/3
14	Bottom		Option B	
15	Top		Option C	
16	Bottom		Option D	
17	Top	Switch input 1	Signal	Signal input of switch input 1 The input is electrically isolated.
18	Bottom		GND	Earth reference point
19	Top	Switch input 2	Signal	Signal input of switch input 2 The input is electrically isolated.
20	Bottom		GND	Earth reference point
21	Top	LED measurement cell illumination	LED1+	Plus pole of LED1 (white cable)
22	Bottom		LED1-	Minus pole of LED1 (brown cable)
23	Top		LED2+	Plus pole of LED2 (white cable)
24	Bottom		LED2-	Minus pole of LED2 (brown cable)
25	Top	Proximity switch for flow monitoring by measurement cell|	+	Positive supply voltage for proximity switch
26	Bottom		Signal	Switching signal input (switched to GND during flow) The input is electrically isolated.
27	Top		GND	Earth reference point
28	Bottom	Pressure switch for monitoring circulation (optional)	Signal	Signal input (switched to GND during circulation) The input is electrically isolated.
29	Top		GND	Earth reference point
30	Bottom	Current outputs 0-20 mA 4-20 mA (optional)	pH	Current output pH (0/4-20 mA corresponds to pH 0-10)
31	Top		Cl	Current output chlorine (0/4-20 mA corresponds to 0-10 mg/l or 0-1 mg/l)
32	Bottom		mV	Current output mV (redox) (0/4-20 mA corresponds to 0-1000 mV)
33	Top		Te	Current output temperature (0/4-20 mA corresponds to 0-50 °C)
34	Bottom		GND	Common earth connection of the four current outputs

14.2 Line voltage terminals 230 VAC (black terminal block, right)

No.	Function	Signal	Remarks
35	PE	PE	PE (protective conductor) connection for dosing pumps
36		PE	
37		PE	
38		PE	
39	Dosing output 230 VAC disinfection (Cl/Br/O2)	N1	Neutral conductor (connected internally with dosing input N1, terminal 51)
40		L1	Switched phase for the disinfection dosing output (from dosing input L1, terminal 52)
41	Dosing output 230 VAC pH-	N2	Neutral conductor (connected internal with dosing input N2, terminal 53)
42		L2	Switched phase for the pH minus dosing output (from dosing input L2, terminal 54)
43	Dosing output 230 VAC pH+	N2	Neutral conductor (connected internal with dosing input N2, terminal 53)
44		L2	Switched phase for the pH plus dosing output (from dosing input L2, terminal 54)
45	Alarm relay	1	Potential-free switch output, which is switched on when alarms are active
46		2	
47	Switch output 1 (OUT1)	1	Potential-free switch output for connecting water attractions or other components to be controlled by Analyt.
48		2	
49	Switch output 2 (OUT2)	1	Potential-free switch output for connecting water attractions or other components to be controlled by Analyt.
50		2	
51	Dosing input 230 VAC disinfection (Cl/Br/O2)	N1	Neutral conductor (connected internally with dosing output N1, terminal 39)
52		L1	Phase (switched to dosing output L1, terminal 40 (disinfection) during dosing)
53	Dosing input 230 VAC pH-	N2	Neutral conductor (connected internally with dosing output N2, terminals 41/43)
54		L2	Phase (switched to dosing output L2, terminal 42 (pH-) or terminal 44 (pH+) during dosing)
55	Mains supply 230 VAC of the Analyt 2/3	PE	PE (protective conductor)
56		N0	Neutral conductor
57		L0	Phase

Note

The line power supply (230 VAC) for the dosing pumps is provided via the disinfection dosing inputs (51/52) and pH (53/54).

This supply voltage must be switched so that it is only available when the circulation pump is running, e.g. by connecting it to the same timer as the circulation pump. This ensures that dosing can only take place while the circulation pump is running.

In addition, the proximity switch (terminals 25/26/27) monitors the measurement water circulation and blocks dosing if necessary.

14.3 Standard wiring (without plug-in options)

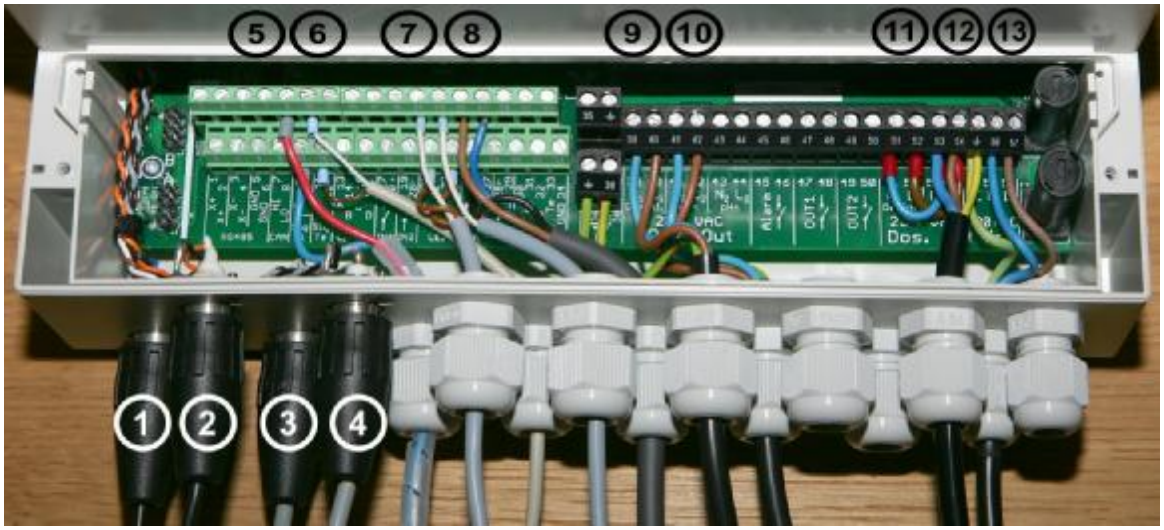


Figure 2: Standard connections on Analyt

No.	Function	Terminals	Remarks
1	pH Electrode	-	BNC connector
2	mV redox electrode	-	BNC connector
3	Level input pH	-	BNC connector
4	Level input disinfection (Cl/O2)	-	BNC connector
5	Chlorine electrode	9 (+) 10 (-)	Amperometric measuring cell, typically approx. 50 µA per mg/l of free chlorine
6	Temperature sensor	11 (+) 12 (-)	Standard: type PT1000 Alternative: type KTY83
7	Measurement cell illumination for main measurement cell and chlorine measurement cell (two blue LEDs)	21 (+) 22 (-) 23 (+) 24 (-)	Connecting cable: white = plus (to terminals 21/23) brown = minus (to terminals 22/24)
8	Proximity switch for flow monitoring in the measurement water circuit	25 (+) 26 (switching signal) 27 (-)	During flow, the proximity switch of the switching signal input (26) switches to GND (27)
8	Dosing output disinfection 230 VAC	39 (N1) 40 (L1)	L1 (terminal 40) is switched during dosing
10	Dosing output pH minus 230 VAC	41 (N2) 42 (L2)	L2 (terminal 42) is switched during dosing

15 Analyt interior

Caution! Risk of fatal injury!

Only open the Analyt housing when it is deenergized. This should only be performed by trained and qualified personnel.

This applies to removing the connection compartment cover and to opening the device front with the display.

15.1 Frontprint

The following figure shows the relevant component positions on the frontprint.

Figure 2 Component positions on the frontprint

No.	Description
1	**Buffer battery type CR2032**
2	**Ident chip Analyt** The component contains the configuration data for the Analyt.
3	**Serial number (e.g. B06CB0031)**

15.1.1 Changing the buffer battery

If the buffer battery voltage falls below 2.7 V, Analyt triggers a battery alarm. In this case, the buffer battery must be replaced within 2-3 weeks. Otherwise, Analyt may lose the date and time setting or data loss may occur.

The buffer battery (Type CR2032) is retained in a special holder and is easy to replace. The plus pole on the battery faces upwards. The holding bracket can be lifted with a screwdriver or a similar tool.

⚠ After the old battery is removed, the new battery must be inserted as quickly as possible to avoid the risk of data loss.

15.2 Back PCB

The following figure shows the relevant component positions on the base PCB.

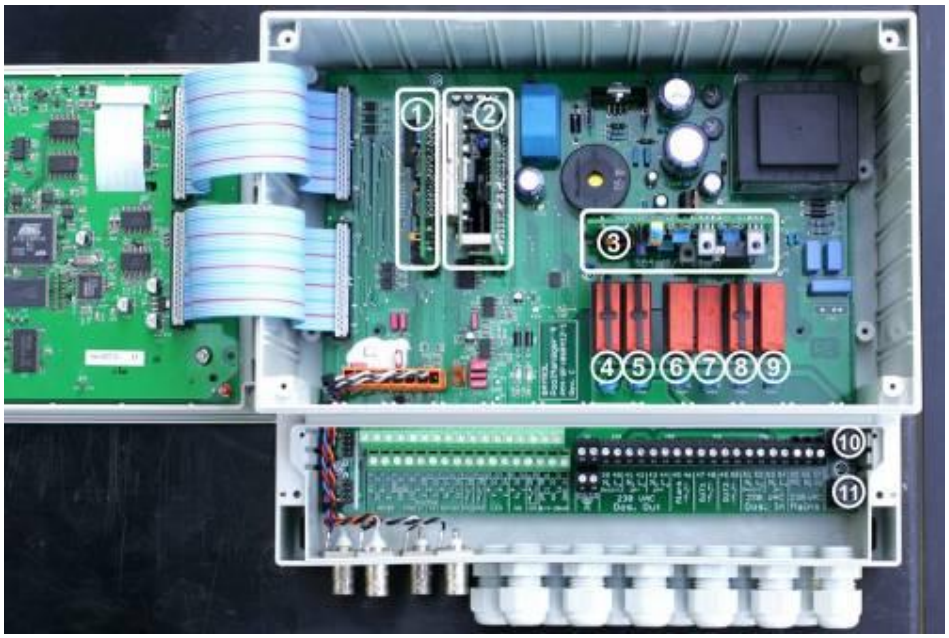


Figure 3 Module positions on the base PCB

No.	Description
1	Slot for optional interface converter PM4-485 (for PM4comm PC communication package)
2	Slot for optional PM4-PoolConnect module (for remote maintenance via SMS)
3	Slot for optional PM4-SA4 current converter (for current outputs 0/4...20 mA)
4	Relay with base for disinfection dosing output (mV-Cl / mV-Br / O2) (terminals 39/40)
5	Relay with base for pH minus dosing output (terminals 41/42)
6	Relay with base for pH plus dosing output (terminals 43/44, optional)
7	Alarm relay (no base, terminals 45/46)
8	Relay with base for universal switch output 1 (terminals 47/48 "OUT1")
9	Relay with base for universal switch output 2 (terminals 49/50 "OUT2")
10	Fuse 1A T for disinfection dosing output (mV-Cl / mV-Br / O2) (terminals 39/40)
11	Fuse 1A T for dosing outputs pH- and pH+ (terminals 41/42 or 43/44)

15.2.1 Interface converter PM4-485

The interface converter is simply plugged into the corresponding slot.
Coding on the connector prevents it from being connected incorrectly.

The plug-in plastic guide rails that are provided with the interface converter additionally ensure that the module is positioned correctly.

15.2.2 PM4-PoolConnect plug-in module

The PoolConnect plug-in module is simply plugged into the corresponding slot.
Coding on the connector prevents it from being connected incorrectly.

The plug-in plastic guide rails that are provided with the PoolConnect module additionally ensure that the module is positioned correctly.

Further installation information is provided in the PoolConnect package documentation.

15.2.3 Current converter PM4-SA4

The current converter is simply plugged into the corresponding slot.
Coding on the connector prevents it from being connected incorrectly.

The plug-in plastic guide rails that are provided with the current converter additionally ensure that the module is positioned correctly.

15.2.4 Replacing a relay

The switching relays of Analyt have individual bases and can therefore be easily replaced when faulty. The positions can be seen in the figure above. To replace a relay, the plastic holding bracket is first lifted slightly and then folded away to the side.

Then the old relay is removed and the new one is inserted. Finally, the plastic holding bracket is returned to its original position.

15.2.5 Replacing a fuse

Each of the 230 VAC supplies of the dosing outputs for pH-/pH+ and disinfection (Cl) is protected by a 1A T (20 mm, slow) fuse. The fuses are mounted in a special fuse holder and can be easily changed. The fuse holder is opened using a flat screwdriver.

The positions of both fuse holders can be seen in the figure above.

15.2.6 Software update

A new operating software can be uploaded via an SD card interface in the Analyt connection compartment when necessary. This requires a commercially-available SD card and a special SD card adapter for Analyt.

A software update can only be performed by trained and qualified personnel.

Further details are available in a separate manual on performing a software update.

16 Troubleshooting and fault elimination

The following table lists typical problems that may occur when operating Analyt. Each of these problems is accompanied by a description of its possible causes and measures to correct the fault.

The table is subdivided into the pH, mV (redox), O2 and temperature modules.

Type of problem	Possible causes	Elimination of problem
pH measurement		
pH control measurement and device display differ	Calibration is faulty or has not been performed for an excessively long time	Recalibrate the system
Calibration fault during the pH calibration	Faulty input of calibration values	Repeat the calibration
	Electrode is dirty or faulty	Clean the electrode in 5-10% hydrochloric acid and rinse with distilled water. If it is not possible to calibrate the electrode after this treatment, it must be replaced.
	Humidity in the cable combination	Dry or replace the cable combination
	Measuring amplifier is faulty	Device must be repaired or replaced
pH control / pH dosing		
A dosing rate of 0% is displayed on the device although there is a deviation between the actual value and the setpoint	Dosing is blocked by an alarm (flow, level or dosing time alarm)	Remove cause of alarm, quit alarm
	Power-on delay still running	Wait for the power-on delay to end
Dosing pump is not working although the dosing rate displayed on the device is not equal to 0%	Dosing pump fuse is blown	Replace the fuse (1A slow)
	Dosing relay is faulty	Replace the faulty relay
	Dosing pump is faulty	Replace the dosing pump
Dosing pump is working but there is no pH correction	Container is empty	Replenish the pool care product
	Dosing pump drew air and is no longer dosing	Purge the air from the dosing head
pH value is fluctuating around the setpoint	Dosing rate of the pH control is too high	Set the p-range to a higher value to reduce the dosing rate. A reduction in the minimum switch-on time prevents overdosing as well.
pH value differs from the setpoint over an extended period	Dosing rate of the pH control is too low	Set the p-range to a lower value to increase the dosing rate. As well, an increase in the minimum switch-on time results in a more rapid approach of the setpoint.

Type of problem	Possible causes	Elimination of problem
Chlorine measurement		
pH control measurement and device display differ	Calibration is faulty or has not been performed for an excessively long time	Recalibrate the system
	Measurement water intake is too little or switched off (cleaning balls are not rotating throughout the entire cell)	Check measurement water intake, then re-calibrate
	Measurement water intake is not constant	Ensure that measurement water intake is constant, then recalibrate
	The wrong or old DPD chemicals are in use	Use new DPD chemicals, recalibrate
	Special copper electrode of the chlorine measurement cell is strongly discoloured	Clean the copper electrode in acid or with fine emery paper. After cleaning, adhere to the run-in period of the measurement cell.
Calibration fault during the chlorine calibration	Faulty input of calibration values	Repeat the calibration
	Chlorine content in water is too low for calibration	Recalibrate with a chlorine content of at least 0.6 mg/l
	Chlorine measurement cell is too old or faulty	Replace the chlorine measurement cell
	Measuring amplifier is faulty	Replace the device
Chlorine measurement in unstable	Measurement water intake is too little or switched off	Ensure that measurement water intake is sufficient so that the balls can rotate smoothly inside the cell
Chlorine control / Chlorine dosing		
A dosing rate of 0% is displayed on the device although there is a deviation between the actual value and the setpoint	Dosing is blocked by an alarm (flow, level or dosing time alarm)	Remove cause of alarm, quit alarm
	Power-on delay still running	Wait for the power-on delay to end
Dosing pump is not working although the dosing rate displayed on the device is not equal to 0%	Dosing pump fuse is blown	Replace the fuse (1A slow)
	Dosing relay is faulty	Replace the faulty relay
	Dosing pump if faulty	Replace the dosing pump
Dosing pump is working but there is no chlorine correction	Container is empty	Replenish the pool care product
	Dosing pump drew air and is no longer dosing	Purge the air from the dosing head
	Dosing pump drew air and is no longer dosing	Purge the air from the dosing head

Type of problem	Possible causes	Elimination of problem
Chlorine value is fluctuating around the setpoint	Dosing rate of the chlorine control is too high	Set the p-range to a higher value to reduce the dosing rate. A reduction in the minimum switch-on time prevents overdosing as well.
Chlorine value differs from the setpoint over an extended period	Dosing rate of the chlorine control is too low	Set the p-range to a lower value to increase the dosing rate. As well, an increase in the minimum switch-on time results in a more rapid approach of the setpoint.
Redox measurement		
Redox potential is not equal to the control measurement	Calibration is faulty or has not been performed for an excessively long time	Recalibrate the system
Calibration fault during redox calibration	Faulty input of calibration values	Repeat the calibration
	Electrode is dirty or faulty	Clean the electrode in 5-10% hydrochloric acid and rinse with distilled water. If it is not possible to calibrate the electrode after this treatment, it must be replaced.
	Humidity in the cable combination	Dry or replace the cable combination
	Measuring amplifier is faulty	Device must be repaired or replaced
Temperature measurement		
Temperature display is faulty	Temperature sensor is faulty	Replace the temperature sensor
	Humidity in the cable combination	Dry or replace the cable combination
	Sensor type is set incorrectly (PT1000 / KTY83)	Correct the setting in the "Temperature" menu (in the Service menu only)

APPENDIX:

17 Spare parts and operating materials for Analyt 2/3:

17.1 Spare parts for Analyt 2/3

Art.no:	Figure	Item
176 904		Analyt cover
185 301		pH electrode 0.85 with cable and BNC
130 099		Measuring water extractor
126 066		Plexiglass measuring chamber, complete
176 902		Temperature sensor, black
126 056		Induction switch

Art.no:	Figure	Item
123 035		**Prefilter complete**
126 414		**Relay for PM4**
Analyt 3 only		
185 300		**Redox electrode 0.85 with cable and BNC**

17.2 Operating materials for Analyt 2/3

Art.no:	Figure	Item
186 060		pH buffer pH 7.00
186 061		pH buffer pH 9.00
186 089		Cleaning solution for electrodes
Analyt 3 only		
184 843		Redox buffer 465 mV

17.3 Options for Analyt 2/3

Art.no:	Figure	Item
172 700		PoolConnect
176 880		PC-Communication
126 414		Relay for PM4 (second switch output and pH dosage in second direction)
152 002 152 020		Flockmatic Flockmatic Vario
41 95 125		Quickflock Automatic+ 1 canister - 20 kg
Spare parts for Flockmatic (152 002) and Flockmatic Vario (152 020)		
171 212		Suction set, rigid, 420 mm, for: Quickflock Automatic+
171 219		Replacement hose set 1.6 x 1.6 / 0.9 l (chlorine and pH plus/minus)