Measuring, control and dosing technology
for private pools

POOLKLAR Touch XL V3
As of 06/2019 serial no. 72612

Measuring, control and dosing technology for pH correction and disinfectants

Subject to technical modifications

Table of contents

1   About this manual

1.1   Scope of applicability

This manual describes the installation, commissioning and operation of the device.
The manual covers the *POOLKLAR Touch XL* starting with version -> see footer and cover sheet.

1.2   Target group

Only persons who have received proper instructions regarding the device functions may operate the device. Electrical and water-side connection work may only be conducted by appropriately trained specialists.

1.3   Storage of the manual

All manuals for the device as well as those for the installed components must be stored in the immediate vicinity of the device and be accessible to the operating personnel at all times.

1.4   Further information

Further information about special topics, e.g., design of the dosing performance or description of the operating parameters, is available from your specialist dealer.

1.5   Symbols used

This document uses the following types of safety notices as well as general notices:

DANGER!
"DANGER" denotes a safety notice whose non-observance will directly result in
death or **serious injury**!

WARNING!
"WARNING" denotes a safety notice whose non-observance may result in death or **serious injury**!

CAUTION!
"CAUTION" denotes a safety notice whose non-observance may result in minor or **moderate injury**!

ATTENTION!
"ATTENTION" denotes a safety notice whose non-observance may result in **property damages**!

Notice
A notice denotes information whose non-observance may result in **operational disruptions**.

Tip
A tip denotes information that may result in improvements in the operating process.

2   Safety

2.1   <u>Intended use</u>

The *POOLKLAR Touch XL* device is designed for carrying out measuring and control tasks when treating swimming pool water in private swimming pools.

2.2   <u>Safety notices</u>

The operation manual must be consulted prior to installation, commissioning and maintenance work. Following the commissioning, the manual must be made available to the operator. In your own interest, please observe the safety notices contained in this manual.

Always handle chemicals with special care!
Please contact your chemicals supplier for information about the safe handling of chemicals.

⚠️ **WARNUNG!**	**WARNING!** There is a risk of chemical burns and poisoning!

Observe the relevant regulations when handling chemicals!

- Never mix different chemicals with each other.
- Only use chemicals that have been approved for the treatment of swimming pool water
- Wear suitable protective clothing when conducting maintenance work.

Further information about the chemicals used is available from your chemicals supplier.

3   Important facts about swimming pool water properties

3.1 Auxiliary hygiene parameters

The following information is meant to offer a preliminary overview about the most important auxiliary hygiene parameters in the treatment of swimming pool water. Further information is available from your swimming pool dealer, the chemicals supplier, or the book trade. The information provided here refers to DIN 19643 for swimming pool water in public pools.
Devices that are installed outside of Germany should comply wit the county-specific regulations and statutes, e.g., ÖNORM, etc.

3.1.1   pH value

The pH value has a decisive effect on the chemicals added to the swimming pool cycle. If the pH value is too high, it negatively affects the germ-killing speed of disinfectants containing chlorine. The likelihood of lime precipitation and water clouding increases. If the pH value drops too low for an extended time, there is a risk that the treatment system and the basin may be damaged.
According to the DIN, a pH value around **pH7** should be aimed for.
Values below pH6.5 and above pH7.6 should be avoided.

3.1.2   Redox voltage

The redox voltage indicates the ratio between reducing substances (organic contaminations) and oxidising power (active chlorine content) in the pool water. The redox voltage serves as a measure for assessing the hygienic basin water quality. The higher the redox voltage, the faster germs and bacteria will be killed. To achieve a sufficiently fast germicidal effect, the redox voltage in private pools should also comply with the values specified by the DIN. In this context, the amount of free chlorine measured with the DPD1 method should be between 0.3 and 0.6 mg/l.
The chlorine's disinfecting power essentially depends on the basin water's pH value. The higher the pH value, the lower the disinfecting power; if the pH value decreases, the disinfecting power increases at a constant chlorine level.
If the redox voltage is far below 700 mV at a free chlorine content between 0.3 and 0.6 mg/l, the complete function of the swimming pool water treatment must be checked.
According to the DIN, a redox voltage around **750 mV** should be aimed for.
Values below 650 and above 800 mV should be avoided.

3.1.3   free chlorine

The chlorine available for disinfection in the pool water is called *free chlorine*. Free chlorine is detected by means of the DPD1 method.
According to the DIN, the free chlorine content should be kept between **0.3 and 0.6 mg/l**.
Values below 0.2 and above 1.2 mg/l should be avoided.

3.1.4   combined chlorine

Combined chlorine is the product of a reaction between organic contamination introduced in the pool and a chlorine-containing disinfectant. Combined chlorine causes the characteristic indoor pool smell and may lead to skin irritation and red eyes.
Ideally, the organic chlorine compounds will be retained in the swimming pool filter system and flushed out via the regular backwashing. If the filter system does not work correctly, or if the backwashing is not conducted in a proper fashion, combined chlorine may accumulate in the swimming pool cycle. If the water starts smelling of chlorine, it is high time to conduct a chlorine measurement by means of the DPD3 measuring.
The concentration of combined chlorine results from the difference between the overall chlorine content and the amount of free chlorine in the water. Observe the instructions of the analytic device's manufacturer when determining the concentration.
Combined chlorine can only be reduced by dilution, i.e., with vigorous backwashing or by a shock chlorination, if applicable. Consult your swimming pool dealer.
According to the DIN, a combined chlorine content below **0.2 mg/l** should be aimed for.
"Chlorine odours" can result above a combined chlorine content of approx. **0.3 to 0.4 mg/l.** (characteristic indoor pool smell)

Tip Since the pH value is an elementary factor in the swimming pool treatment, the dosing of chlorine-containing disinfectants is only released once the pH value has entered the control range!	

4   Scope of delivery – device description

4.1   Scope of delivery

The *POOLKLAR Touch XL* is delivered with the following standard accessories.
- Buffer solutions pH7, pH4, redox test solution
- Electrode cleaner, distilled water
- Glass beads, electrolyte solution, replacement gaskets
- 2 pc. ½" measuring water ball valve with immersion pipe
- 7 m each measuring water pipe 6x1 mm in PE and PTFE, respectively

Customer-specific or order-related modifications are possible.

4.2   Check for transport damage

Please check the device and all accessories immediately upon receipt for transport damage and completeness.

4.3   Identification of the device

For spare part orders and troubleshooting, it is useful to know the device serial number and software version. The device serial number is located on the identification plate on the right side of the control housing. The programme version can be called up via the menu item *Service → Info*.

4.4   Device description

1. Control *POOLKLAR Touch XL*
2. Dosing pumps Standard SR10 (optional Sa)
3. Buffer solutions
4. Redox test cylinder
5. pH electrode
6. Measuring cell illumination
7. Dosing valves
8. Flow control valve
9. Flow monitoring
10. Redox electrode
11. Test water tap
12. Measuring water inlet
13. Measuring water return flow
14. Suction set (not visible in image)

The *POOLKLAR Touch XL* is delivered as a ready-assembled unit. All parts are mounted on a plastic plate. This ensures a quick installation of the device. It also goes toward preventing potential execution errors on the part of the installation personnel, as far as possible.
For the transport, the factory merely removes the pH electrode from the measuring cell and delivers it in a separate protective box. In order to avoid deformation of the dosing hoses during extended storage, the two dosing cartridges have been pulled off the motor shaft.

The *POOLKLAR Touch XL* is equipped with a touch-sensitive touch screen. By touching a symbol or a numeric value, this will be activated for parametrisation. The adjustment menus come with additional text-based instructions.

In order to eliminate the risk of confusing both chemicals as far as possible, the dosing technology is colour-coded throughout. The colour-coding runs from the suction set over the associated dosing pump to the dosing valve.
The parts used for pH value control are located to the left and coded in red. The components used for disinfection are located on the right and coded in yellow.

⚠ Vorsicht!	CAUTION! If the two chemicals are switched, this leads to a malfunction of the addition of chemicals to the pool water! This may result in significant overdosing!

---

5   *Installation*

5.1   Select installation location

A freely accessible installation location should be selected to facilitate operation and subsequent maintenance tasks. The installation location must be protected from frost and the device may not be exposed to direct sunlight.

5.2   Mounting the device on the wall

Select the installation height so that the device is located at eye level. Measure the four drill holes on the mounting plate and mark their location on the wall. Use the included four black plastic spacers to ensure the required distance from the wall.

5.3   Voltage supply

The devices must be supplied with continuous voltage. I.e., the voltage supply must not be locked with the filter system. For locking with the filter system, please use the *external off* input.
The permanent voltage supply is required for the proper execution of the disinfection dosing by means of active oxygen. This also prevents condensation corrosion.

5.4   Assembly notices

Only "good" basin hydraulics can achieve a satisfactory control of the two auxiliary hygiene parameters, pH value and redox voltage. The dosed chemicals must reach all areas of the basin within a short time. Even under stress, the concentrations measured in different areas must be approximately the same. The measuring water should be as close to identical to the basin water as possible and must reach the measuring cell as quickly as possible. This is the only way to quickly detect and rebalance changes in the water quality.

If the basin water is conducted through an overflow gutter and a compensation basin (splash water), which is potentially also used for the freshwater feed-in, only the sampling of the measuring water directly from the basin will lead to satisfactory measuring and control results.

At very low temperatures <5°C, the touch screen may become impaired due to the stiffness of the frontal film!

5.5   Provide external prefilter

It is not possible for the pool operator to detect a contaminated prefilter below the new design cover. For this reason, an external prefilter must be integrated in the measuring water inlet. Depending on the local conditions, the prefilter can be installed directly at the device or at any other installation site along the measuring water inlet. This has the advantage of making it possible to select a more convenient access point for the pool operator.

5.6   Installation suggestion

The following sketch shows an example of the integration of the *POOLKLAR Touch XL* in the swimming pool's water treatment cycle. In most cases, a measuring water withdrawal between the filter pump and the filter boiler is sufficient. The water is recirculated into the clean water line downstream of the heat exchanger. Two ball valves ½" with immersion pipe for the connection to the filter piping are provided with the accessories. The immersion pipe of the two ball valves should be shortened so that it ends approximately in the middle of the pipe.
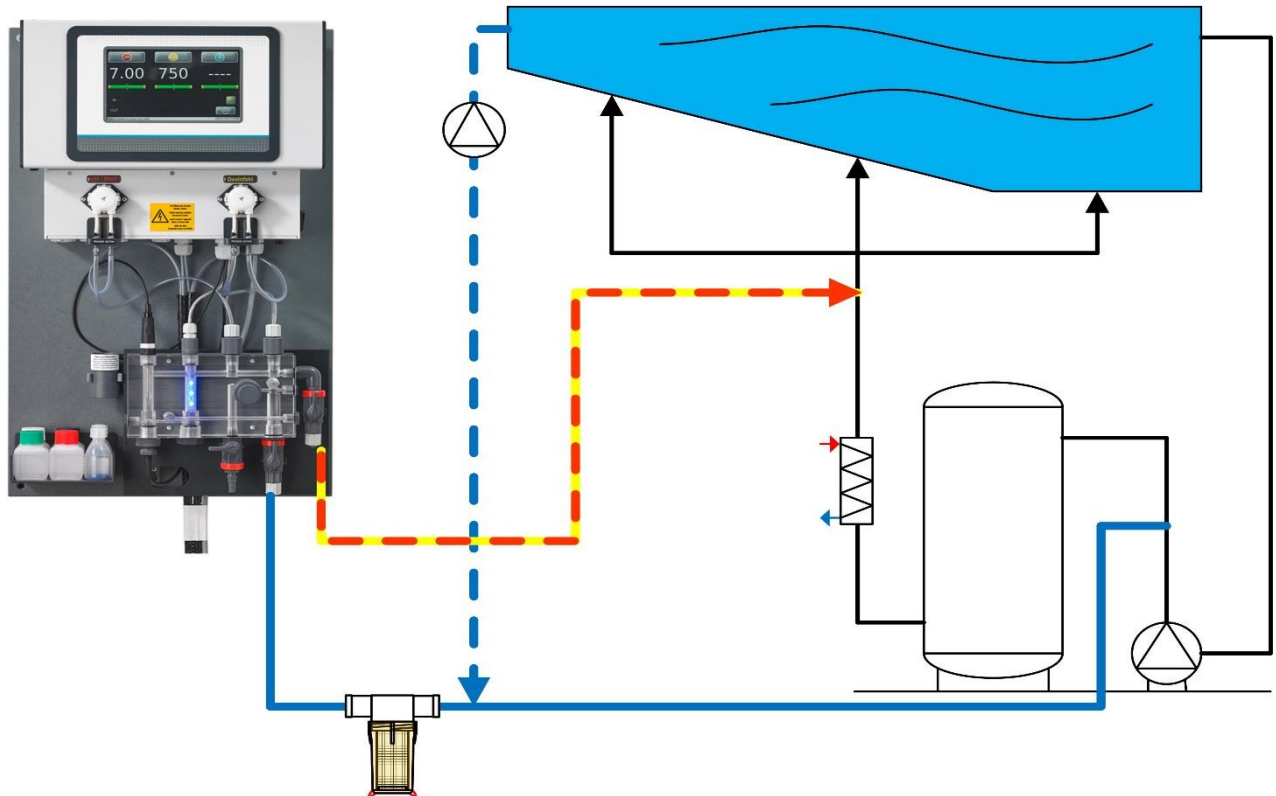
⚠️ Achtung!	**ATTENTION!** Since both chemicals are mixed in with the measuring water, the measuring water recirculation must occur in the direction of the flow downstream of the heat exchanger in order to prevent corrosion. If the pool is being operated with an overflow gutter and a splash water tank, into which freshwater is also allowed to enter, marked differences in the water quality on the measuring cell and in the basin must be expected. In order to ensure perfect control quality in this case, it is recommended that the measuring water is withdrawn directly from the basin, using a separate measuring water pump.

6   Commissioning - Notices

Before the device can be commissioned, the following measures must be implemented. You can find the position of the parts listed in the following under Item *4.4 Device description.*

6.1   Control parameters

The device is loaded with factory-defined control parameters; see Commissioning protocol on page 25/29. Please adjust the control parameters for your basin according to the required dosing performance and the desired setpoints. The factory setting for the dosing performance is 100%, which should be sufficient for an outdoor pool of approx. 100 m³.

	Tip
	Parameter changes are saved to the SD card with a time delay. This can take up to two minutes. If the voltage supply is interrupted prior to the backup on the SD card, the device continues to control using the values prior to the change. That means, if a voltage interruption occurred shortly after a parameter change, the changed parameters must be checked again and be readjusted, if necessary! The newly determined adjustment values are also saved to the SD card with a time delay.

6.2   pH electrode

Remove the pH electrode from the packing box and pull off the protective cap. Remove the electrode cable's union nut from the electrode by twisting it to the left and screw the electrode into the measuring cell from above. Subsequently, the electrode plug must be placed back onto the pH electrode and the union nut must be tightened.

	Tip
	Following a temperature adjustment and inflow time of approx. one hour, it should be checked whether the pH electrode needs to be calibrated. For this purpose, the pH electrode must be unscrewed from the measuring cell once again and be placed in the pH7 buffer solution. If the display value shows a deviation larger than 0.1pH, a calibration must be conducted.

6.3   Cleaning beads

The enclosed blue glass beads serve for cleaning the redox electrode's platinum surface. Pull the cable from the redox electrode and unscrew the electrode from the measuring cell. Place approx. 15 of the enclosed blue cleaning beads on the platinum surface so that this area is covered. Screw the redox electrode back into the measuring cell and plug the cable's black plug back into the electrode.
When screwing in the redox electrode, ensure that no glass beads are present in the thread.

	ATTENTION!
	Please ensure that all hose screw connections of the measuring water pipes are firmly tightened. Check all screw connections at the device and at the two measuring water ball valves ½". Plastic screw connections may only be fastened hand-tight!

6.4   Measuring cell flow

Once all electrodes have been screwed hand-tight into the measuring cell and the measuring water pipes have been connected, the ball valves may be opened. The measuring cell flow volume can be adjusted at the flow control valve. The flow mounting float must be pushed toward the top in order to release the dosing. In order to keep the redox electrode clean, the cleaning beads must rotate on the platinum surface, but they must not be allowed to lift off of the platinum surface.

6.5   Dosing cartridges

Push the two dosing cartridges onto the motor shaft.

6.6   Chemicals

Place the two chemical containers under the device. In order to protect the floor, it is recommended to place the containers in a protective tray. Please observe the proper positioning of the container; `red` → pH value regulation chemical on the left and `yellow` disinfection chemical on the right.

	ATTENTION!
	Please do not use hydrochloric acid for the pH value regulation. Hydrochloric acid diffuses through the dosing hose and corrodes the dosing motor. This, in turn, causes premature wear and tear of the dosing pump.

6.7 Disinfectants

	Notice Please find out which chemical was used to disinfect the basin water prior to the commissioning. If a different disinfectant is used from now on, the following must be observed.

If other disinfectants (e.g., organic chlorine (dichlorine) or "chlorine-free" disinfection chemicals) were used previously, a reduced redox voltage is displayed during commissioning. Without changes to the control parameters, this would result in significant overdosing. The breakdown of the disruptive chemicals can take several weeks.

That means, if other disinfection chemicals were used prior to the installation of the POOLKLAR for the dosing of inorganic chlorine, we recommend to run the device with removed dosing cartridges for about 0.5-1 hour to be able to see the redox status. The setpoint of the redox voltage should then be set at approx. 20-50 mV above the displayed value. The development of the chlorine concentration and the redox voltage must be observed during the subsequent period, and the redox voltage's setpoint must be increased so that the measured chlorine concentration approximates 0.5 mg/l.

In order to avoid this uncertainty, the basin water must be exchanged completely.

6.8 Swimming pool filter backwashing / vacuuming the floor

During a backwashing of the swimming pool filter, the dosing must be switched off. In case of electric locking with the filter pump, this is done by switching off the filter pump. This is followed by the dosing delay, which prevents the dosing during this time period. However, if the backwashing procedure takes longer than the set dosing delay, the measuring water intake to the device must be blocked.
If the basin floor is vacuumed via the filter system, the measuring water intake must also be interrupted during this time, due to the increased contamination load.

7.1 Open and close the casing
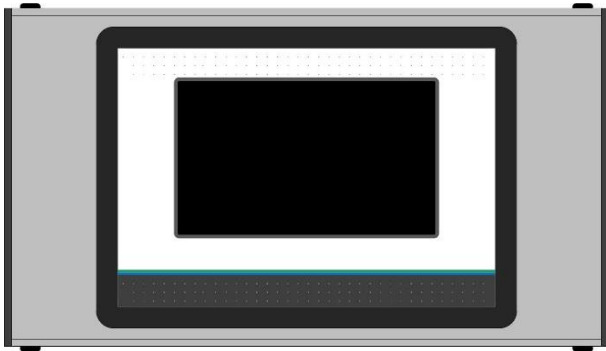
Picture of slotted screw head

Depending on the type of device, the display lid can be swivelled to the left or right for installation and maintenance work. The locking axle must be removed for swivelling. The locking axle is identified by the plastic slotted screws on both sides. The other side is equipped with two expanding rivets as pivot bearings.

Tip	It is not necessary to completely remove the display lid for maintenance tasks! Only the locking axle must be removed. Afterwards, the display can be swivelled to the side.

7.2 Insert lines
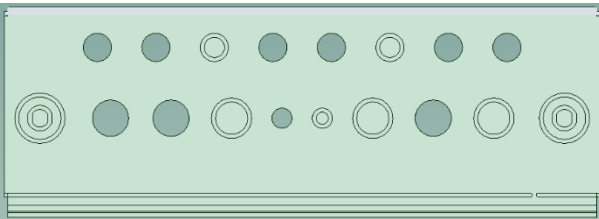
The casing comes with several factory-made free screw connections. Several push-outs for metric cable glands with a jam nut are available for additional insertions.

The two external screw connections with M25 are intended for the insertion of a preassembled interface cable with RJ45 plug.

You can run the additional lines introduced by you as well as the mains supply line downward behind the measuring cell. Alternatively, these lines can also be run laterally below the control housing to the left or right. Push-outs in the protective cover are provided for this purpose.

Tip	The design cover is equipped with one push-out of approx. 30 x 30 cm each on the left and the right, about 40 cm from the upper edge. This makes it possible to also run off the mains supply and other lines laterally.

ATTENTION!	Please pay attention to the spatial separation between energy and signal lines when inserting additional lines. The crossing of energy and signal lines must be avoided!

ATTENTION!	Upon completion of the work, the casing must be properly closed again!

7.3 Overview of the connection diagram

	DANGER!
GEFAHR!	Risk of death due to high voltage. All electrical work on the device may only be conducted by properly trained specialists under compliance with the applicable safety regulations!

7.3.1 The power pack NT_SCHW-8
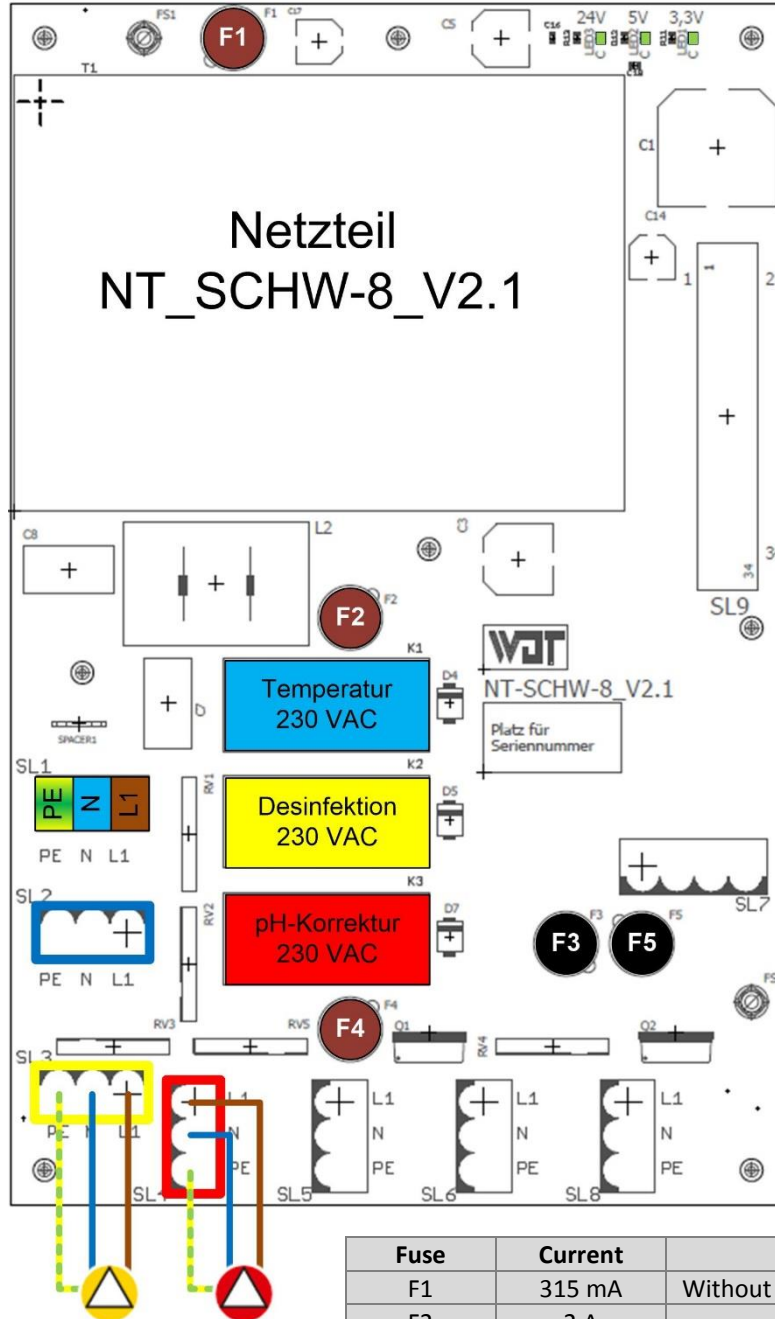
Fuse	Current	Function
F1	315 mA	Without function in this device series
F2	2 A	Primary fuse
F3	1 A	Without function in this device series
F4	4 A	230 VAC outlet relay K2 and K3
F5	1 A	Without function in this device series
Plug		**Function**
SL1		Power inlet 230 VAC
SL2		Relay - K1 – temperature 230 VAC
SL3		Relay - K2 - disinfection 230 VAC
SL4		Relay - K3 – pH regulation 230 VAC

The picture shows an example of the connection of two external 230 volt dosing pumps (dosing devices).

Fuses

ATTENTION!
Fuses are safety-relevant components!
Only fuses in the specified current range may be used.
Non-compliance poses the risk of fire or destruction of the circuit boards!

Fuse in the control unit housing (accessible from the outside)			
Fuse	**Current**	**Fuse type**	**Function**
	6.3 A	5 x 20 mm	Primary fuse mains supply
Fuses on the power pack			
Fuse	**Current**	**Fuse type**	**Function**
F1	315 mA	Micro fuse	24 VDC sensors (without function in the POOLKLAR Touch XL)
F2	2 A	Micro fuse	Primary fuse power pack
F3	1 A	Micro fuse	without function in the POOLKLAR Touch XL
F4	4 A	Micro fuse	230 VDC outlet relay K2 and K3
F5	1 A	Micro fuse	without function in the POOLKLAR Touch XL

Relay - outlets

The relay outputs K1 to K3 (SL2 to SL4) are non-potential-free 230 VAC. If a potential-free outlet is needed, an external relay must be used.

ATTENTION!
The maximum load per outlet is a maximum of 450 watts ohmic load. If a higher load is to be switched, this must be realised via an additional load relay.
The total output of all devices activated simultaneously may not exceed 900 watts (4 ampere)!

7.3.2 The I/O board IO_SCHW-8
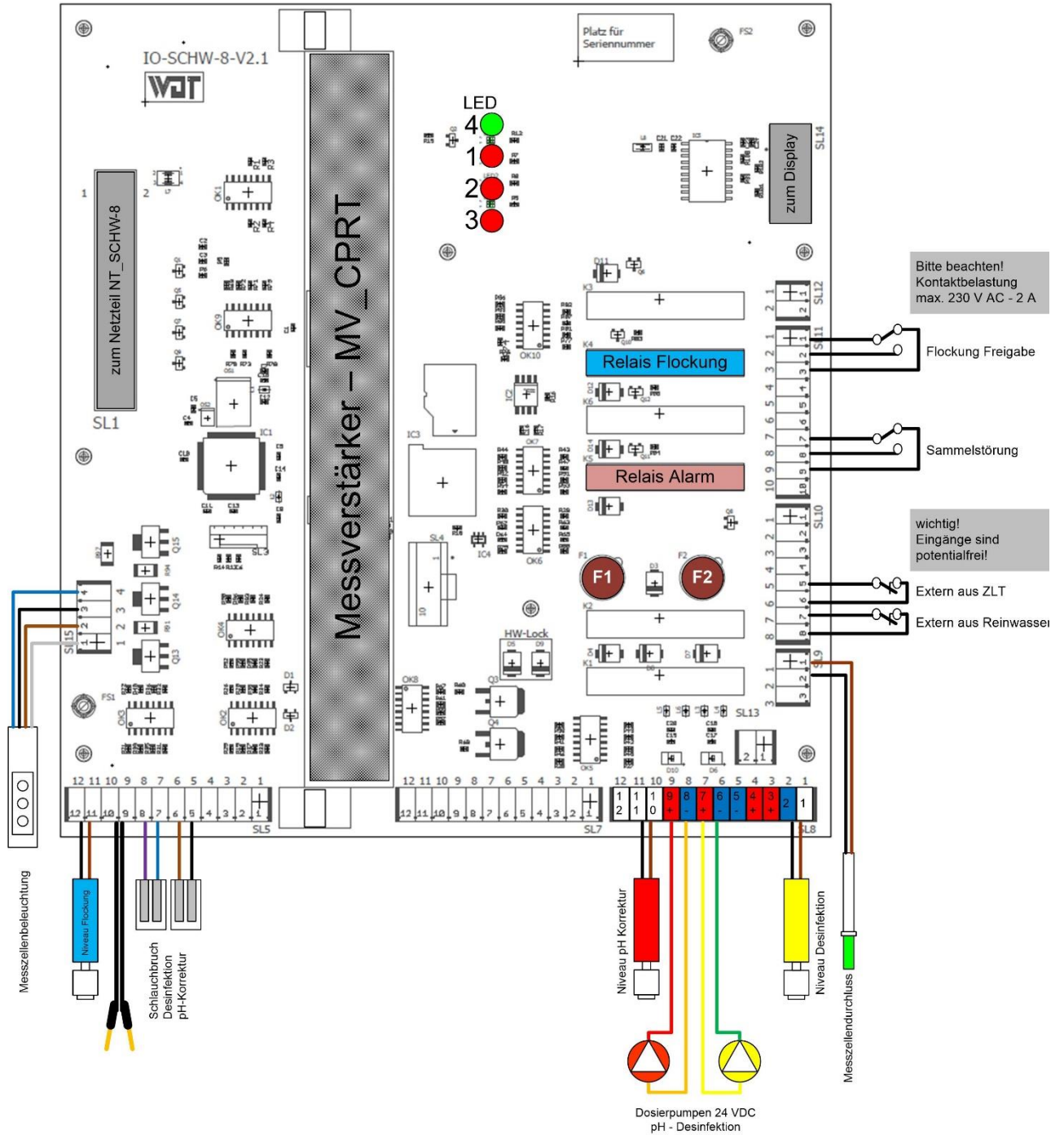
Fuses on the I/O board

Fuse	Current	Fuse type	Function
F1	315 mA	Micro fuse	Outlet disinfection 24 VDC
F2	315 mA	Micro fuse	Outlet pH regulation 24 VDC

7.3.3 The measuring amplifier MV_CPRT_V1
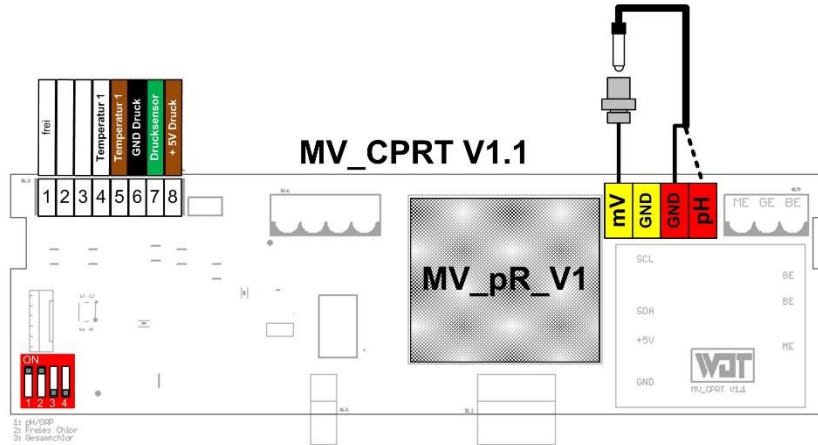
7.4   External functions

7.4.1   Central control technology off (external OFF)

The input **Central control technology off (external OFF)** is used for the controlled deactivation of the POOLKLAR Touch XL via the swimming pool filter system's central control. As long as the contact is open, there is **no** dosing, **no** heating of the basin water, **no** alarm message given.

7.4.2   Clean water external

A flow monitor with a potential-free contact can be connected to the input **Clean water external.** As long as the contact is open, there is **no** dosing, **no** heating of the basin water.

7.4.3   Temperature control

The device is equipped with a temperature control. This temperature control can be used to regulate the basin water temperature. If the basin is heated by means of a flow-through heat exchanger, it must be ensured that the associated heating circuit pump may only be activated when the filter system is in operation!
Please remember that the regulation of the basin temperature can only be guaranteed if the filter operation times are set to an appropriate duration.
In order to achieve a more precise measuring result, the sensor must be installed by means of an immersion sleeve in the swimming pool's piping upstream of the filter.

⚠️ Achtung!	**ATTENTION!** Immersion sleeves that come into contact with the swimming pool water must be corrosion-proof.

⚠️ Achtung!	**ATTENTION!** Please observe the safety notices regarding the topic of temperature control!

---

8   *Operating the touch screen*

The device is fitted with a touch-sensitive touch screen. Desired parameter changes, adjustments and tests can be done simply by lightly touching the corresponding symbol or the numeric value.

Quick Info

current
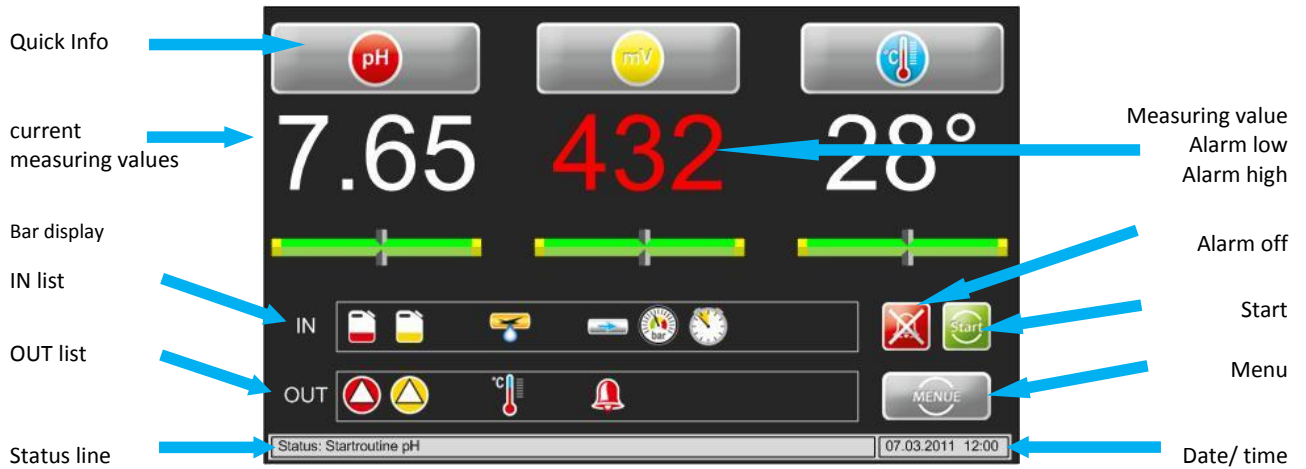measuring values

Bar display

IN list

OUT list

Status line

Measuring value
Alarm low
Alarm high

Alarm off

Start

Menu

Date/ time

Symbols used

IN list (inputs)	
	Chemical container empty red = pH regulation, yellow = disinfection, green = active oxygen, blue = flocculation
	Hose rupture – a chemical leak has occurred at one of the three dosing pumps Drop colour red = pH regulation, yellow = disinfection, blue = flocculant
	No measuring cell flow, or flow too low
	No flow in the clean water line to the pool, or flow too low (OPTIONAL if connected)
	The dynamic dosing time monitoring has been exceeded. Colour red = pH regulation, yellow = disinfection
	The POOLKLAR Touch XL has been deactivated by an external command from the swimming pool water treatment (filter system). There is no dosing, no heating of the basin water, no alarm message given.

OUT list (outputs)	
	red = pH output active yellow or green = disinfection output active blue = flocculation released
	Temperature output active
	Alarm relay output active
	Faulty O_2 dosing. The last dosing could not be completed correctly. The symbol automatically goes out after the next successful dosing.

| **on the right side**	
	DOS on/off for the manual temporary deactivation of the dosing (pH regulation and disinfection)
	Manually deactivate the alarm relay (it then remains deactivated until the next alarm)
	Cancel the dosing delay
	into the main menu

8.1 Operating programmes

Depending on the operation state, the display shows different views. The following describes the main display views.

8.1.1   Automatic (auto mode)
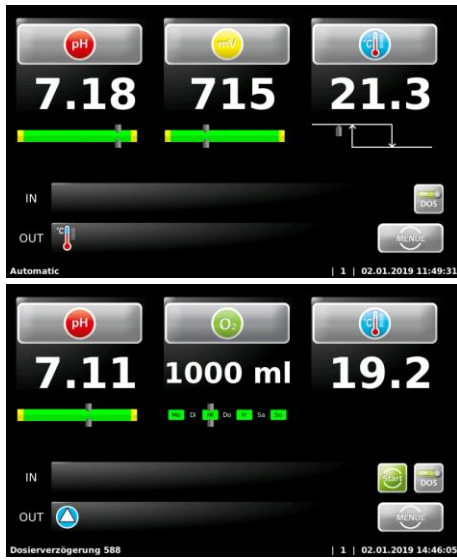
The device is in the status *Automatic* mode. The auxiliary hygiene parameters and the temperature (optional) are regulated based on set parameters.

There is no disruption.

The picture below shows the time control variant
In the example, dosing has been selected on four days.

During the dosing of the disinfectant (green pump symbol in the OUT list), the ml display is reduced by 50 ml per minute.

8.1.2   Quick Info
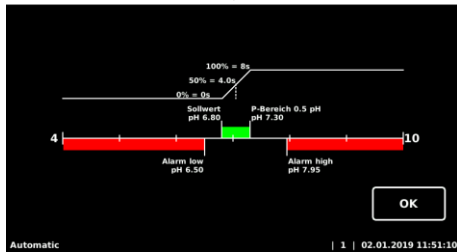
You can view the set control parameters quickly (without a password prompt) via the Quick Info function.
Quick Info only serves for the quick viewing of the control parameters e.g., by the end user; no changes can be made.

8.1.3   Dosing delay
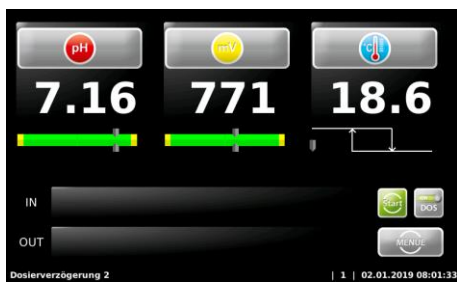
If the device is restarted, the dosing delay is running, during which time no dosing occurs.
Software alarms are suppressed during this time.
The dosing delay must be set high enough to ensure that after the start of the filter system actual basin water flows through the measuring cell.

The dosing delay can be cancelled with and the device is set to normal operation.

8.1.4   Start routine

If one of the two measuring values, pH or mV, falls outside the control range, the start routine is activated.
During the start routine, the dynamic dosing time monitoring is active. If the corresponding measuring value does not reach the control range within the selected time, e.g., due to a malfunction, the dosing stops with an alarm.

The dosing time monitoring alarm is signalled by . This malfunction can only be reset through a device restart or a manual acknowledgement.

8.1.5 Alarm
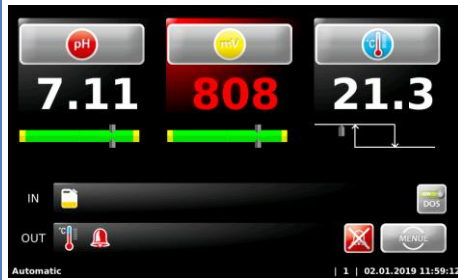
An alarm occurs; this is signalled by the 🔔 symbol in the OUT list. The alarm relay is activated.
A differentiation is made between alarms (software alarms, e.g., alarm high, alarm low) and disruptions (switch inputs).
In the event of alarms, the respective measuring value is illustrated in red.
In the event of disruptions, the corresponding symbol appears in the *IN list.*
Alarms or disruptions must be pending for approx. 5 seconds before an alarm is triggered.

Tip
An alarm will be automatically deleted when its cause has been remedied. This is the case, e.g., if the empty chemical container was replaced or if measuring water resumes its flow through the measuring cell.
However, the alarm *Switch-off time monitoring* must be acknowledged manually!

8.2 Main menu

Automatic
Returns to the automatic operation

Settings
For adjusting the control parameters and system settings

Service
Input and output test, system information

Login
Password entry for authorisation
The password level is displayed in the status line to the left of the date

Log
Event and calibration log, logging of measuring values, data export

Calibration
For calibration of the pH and redox electrode

8.2.1 Main menu → Settings

The picture below shows the time control variant

pH
Set pH regulation control parameter

Disinfection
Set disinfection control parameter

Dosing performance
Adjust the dosing performance to the basin size

Temperature
Set basin temperature control parameters

Dosing delay
Set the dosing delay

System
Date/ time, password, display, network, language, device ID

Flocculation
Activate the release for flocculation dosing

8.2.1.1 Main menu → Settings → pH

Alarm low → lower alarm value

Setpoint → the device attempts to reach this value
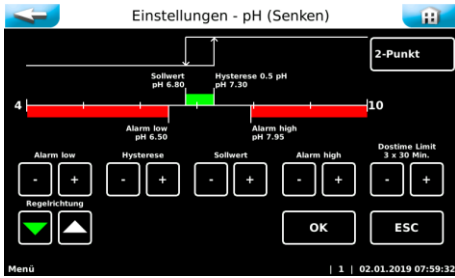
Control range → The dosing pumps work proportionally, i.e., the higher the difference between setpoint and actual value, the longer the dosing time (max. 50 seconds).
The smaller the selected control range, the faster the measuring value will react, which can easily lead to overdosing.

Alarm high → upper alarm value

Time control → if the control range is not reached within three times the set time, the dosing is blocked.
**Important:** This disruption must be acknowledged manually!

Tip
To protect against overdosing with disinfectants that contain chlorine, the dosing is only released once the pH value has entered the control range (pH priority dosing). For this reason, the selected control range must not be too high.

8.2.1.2 Main menu → Settings → Proportional disinfection, 2-point (chlorine, bromine)

The POOLKLAR Touch XL control is suitable for the dosing of different disinfectants. The disinfection outlet must be adjusted to the disinfectant used. According to the selected variant, the menu for setting the associated parameters changes.
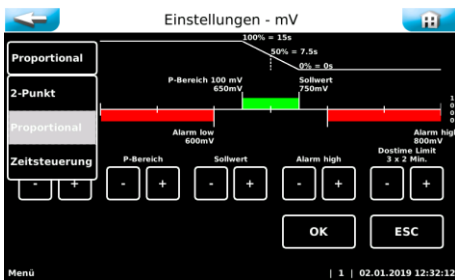
Alarm low → lower alarm value

Control range → The dosing pumps work proportionally, i.e., the higher the difference between setpoint and actual value, the longer the dosing time (max. 50 seconds).
The smaller the selected control range, the faster the measuring value will react, which can easily lead to overdosing.

Setpoint → the device attempts to reach this value

Alarm high → upper alarm value

Time control → if the control range is not reached within three times the set time, the dosing is blocked.
Important: This disruption must be acknowledged manually!

In the 2-point control (on/off), the control range becomes hysteresis. If the value stays below the control range, the output is activated until the setpoint has been reached.

Tip
To keep the disinfectant concentration at an even level, the factory-set control range must be reduced when using the 2-point function. In this case, a value between 10 and 20 mV should be selected.
If the selected hysteresis is too high, this can lead to a significant decrease in disinfecting power. If the hysteresis it too low, this may lead to a larger number of switching cycles.
Please observe the manufacturer's specifications for the connected dosing device.

Control types

The following control functions can be selected: proportional, 2-point (on/off) and time control. For the installed peristaltic pumps, either proportional (for liquid chlorine) or time control (for active oxygen O_2) is selected. When activating a solenoid valve (e.g., bromine dosing) or an electrolysis, 2-point (on/off) is selected.

Outlet 24 VDC – 230 VAC

As a rule, the devices are delivered with two installed peristaltic dosing pumps. Alternatively, it is also possible to activate external dosing pumps. For this purpose, two outlets 230 VAC are available on the power pack. These outlets are activated parallel to the 24 VDC outlets.

8.2.1.3 <u>Main menu → Settings → Disinfection O2 (active oxygen)</u>
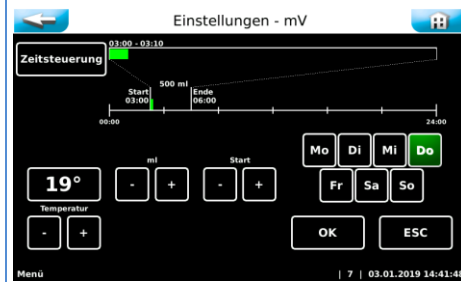
Einstellungen - mV Zeitsteuerung 03:00 - 03:10 500 ml Start 03:00 Ende 06:00 00:00 24:00 Mo Di Mi **Do** 19° - + - + Fr Sa So Temperatur - + OK ESC Menü | 7 | 03.01.2019 14:41:48	ml → enter required dosing volume Start → select the start time for the dosing Temperature → select the starting value for additional dosing Select the week day(s) for a dosing on the right (green is active)

If active oxygen is used as a disinfectant, the disinfection outlet is set to time control. This deactivates the measuring of the redox voltage, and the operating menu is changed accordingly.

	Notice
Hinweis	Please use the disinfectant manufacturer's specifications as a guideline for the required dosing volume. In most cases, the addition of 0.5 litres per 10 m³ basin volume is recommended. Since January 2017, the permissible proportion of active ingredients may no longer exceed 12 % in Germany. Accordingly, the dosing volume must be increased approximately by a factor of three!

	Notice
Hinweis	We point out that active oxygen preparations only have a limited disinfection effect. Therefore, particularly in outdoor pools the water quality may be adversely affected despite a sufficient amount of added disinfectant. This does not constitute a malfunction of the measuring and control unit!

Select dosing volume and start time

We recommend that you allow the determined overall dosing volume to be dosed over several days (3 days as a rule).
Example:
At a pool volume of 40 m³ times 0.5 l/ 10 m³, the calculated overall dosing volume is 2 litres. The added dosing volume on day 1 is 1,000 ml, on day 4 500 ml, and on day 6 another 500 ml. The week days can be freely selected in this regard. The dosing is done on the selected day at the selected time.
This should lead to a relatively even disinfectant concentration in the pool.

Temperature-dependent additional dosing

Rising basin temperatures increasingly diminish the disinfectant's efficiency. For this reason, it is recommended to increase the dosing volume with rising basin temperatures. For this function, temperature measurement must be activated! A start temperature is specified for controlling the additional dosing. A mean value is determined for the measured temperature. The actual dosing volume is increased depending on the temperature, in accordance with the following table.

	≤ 24°C	25°C	26°C	27°C	28°C	29°C	30°C	31°C	32°C	≥ 33°C
Factor	1.00	1.06	1.10	1.15	1.20	1.28	1.40	1.57	1.80	2.00

If a value other than 24°C is selected as the starting temperature, the factor for the additional dosing shifts by the difference between the new value and 24°C.
Example: the selected starting temperature is 26°C

	≤ 26°C	27°C	28°C	29°C	30°C	31°C	32°C	33°C	34°C	≥ 35°C
Factor	1.00	1.06	1.10	1.15	1.20	1.28	1.40	1.57	1.80	2.00

Manual additional dosing - Manual dosing

There are situations when manual additional dosing may be required. For example, if the disinfection container was not replaced in due time and the next regular disinfection would only take place several days later. The operator determines by other means that the disinfection effect could be too low. Or during commissioning, if the regular dosing will not take place until some time far in the future. In this case, the *Service* menu provides the possibility to initiate a manual dosing. Upon completion of the manual dosing, the controller automatically returns to the normal control operation.

Dosing impediments

There are situations where no disinfection dosing is possible or where the dosing cannot be properly completed. This may be the case in the event of an empty disinfection container, a disruption in the measuring cell flow or a voltage failure, e.g. The controller stores the already dosed amount and attempts to add the remaining amount at the next possible point in time on the same day. If the controller is unable to dose the remaining amount by the end of the day at 12 AM, the remaining amount will be discarded. The faulty dosing is signalled by a symbol in the IN list. This disruption can be acknowledged manually, or it will be deleted following the next regular dosing.

Select the proper dosing times

Please also consider the filter running times when setting the staring times for the O_2 dosing. The filter pump's running time must be selected in a way that ensures the proper distribution of the disinfectant during the filter running time and upon completion of the dosing.

Hinweis	**Notice** Please supply the device with permanent voltage; this is the only way to ensure that the mean value for temperature-dependent additional dosing can be properly determined.

The pH start routine blocks or stops the O_2 dosing. The controller stores the already dosed daily amount. I.e., if the dosing volume is increased on a day during which a disinfectant dosing has already taken place, "only" the remaining amount will be added.

### 8.2.1.4 Main menu → Settings → Dosing performance
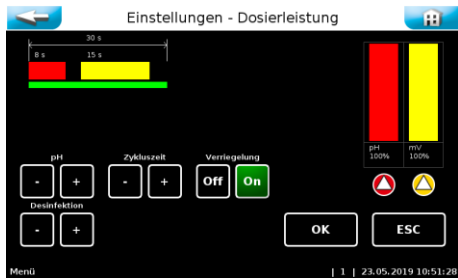
The Dosing performance menu serves for adjusting (reducing) the dosing performance.
The dosing volume to be provided must be determined by means of the commonly used calculation methods. The dosing performance must be set according to the determined dosing volume under consideration of personal experience.

The picture shows the standard value with installed dosing pumps.

If external (less efficient) dosing devices are activated, it may be necessary to deactivate the mutual locking.

The locking may only be deactivated if the dosing points lead directly into the basin piping!
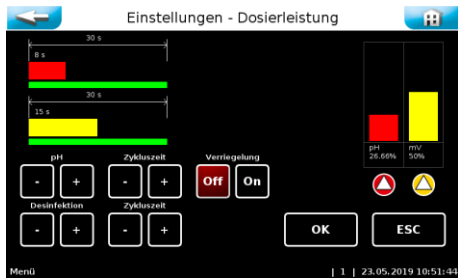
The picture below shows the Dosing performance menu when the control type 2-point or time control was selected for the disinfectant dosing.

In this case, it is only possible to adjust the dosing performance of the pH regulation pump. The disinfection volume is exclusively controlled via the Disinfection settings menu. The connected dosing device may provide a setting option for this.
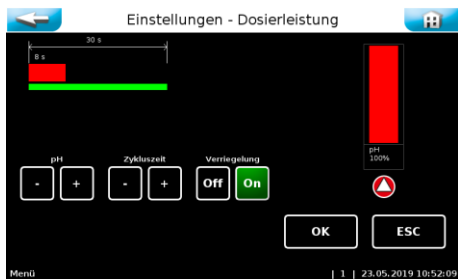
Cycle time

The shortest cycle time is 30 seconds; i.e., every 30 seconds the dosing is activated for a varying length of time, depending on the deviation from the setpoint.
It is divided into a maximum of 8 seconds dosing time for the pH regulation, followed by a pause of 3.5 seconds and then a maximum dosing time of 15 seconds for the disinfection dosing, followed again by a pause of 3.5 seconds.
An extension of the cycle time extends the second pause time, thus reducing the maximum available dosing performance.
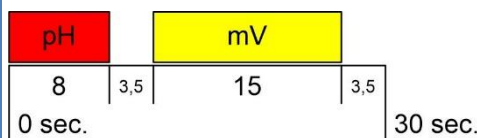
Example 1	Example 2
Example 1 shows the cycle time with 30 seconds = maximum dosing performance.	Example 2 shows a cycle time of 60 seconds. The extension of the pause time reduces the maximum available dosing performance to 50%.

At standard SR10
  - pH regulation approx. 0.7 l/h
  - Disinfection approx. 1.2 l/h
	At standard SR10
	  - pH regulation approx. 0.35 l/h
	  - Disinfection approx. 0.6l/h

The *POOLKLAR Touch XL* device series is delivered with a maximum dosing performance. Please determine the maximum available dosing performance by means of the commonly used calculation methods in accordance with the applicable national standards.
(e.g., DIN HB = 2 g/m³ or FB = 10 g/m³ filtrate). Reduce the maximum dosing performance according to the determined values.
Due to the lower frequency, these stipulated dosing volumes are usually not needed in the private sector.

ATTENTION!
If the dosing performance is not reduced in the event of low requirements (indoor pool, low basin content), this can lead to undesirable overdosing in case of unfavourable basin flow.

8.2.1.5 Main menu → Settings → Temperature
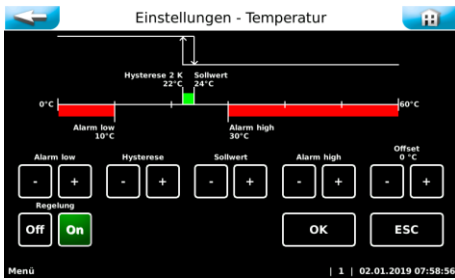
Alarm low → lower alarm value

Setpoint → the device attempts to reach this value

Control range → if the temperature falls below the setpoint minus the control range (hysteresis), the Temperature output will be activated
Example: Setpoint 25 °C – 2.0 K → actual value ≤ 23 °C = output active

Alarm high → upper alarm value

Offset → for fine-tuning the temperature display

If an abnormal temperature, e.g., > 150°C, is displayed, this can be caused by the following.

3. A sensor or a cable is broken. >1650 Ω ≈ 170 °C
4. There is a short circuit in a sensor or cable. < 880 Ω ≈ -30 °C

ATTENTION!
"Danger of frost" If the temperature control is used for the overwintering of an outdoor pool, it must be considered that too short filter running times, an extended voltage interruption or a device failure can lead to a failure of the pool heating!
This may result in frost damage to the pool! For this reason, it is recommended to conduct regular checks of the pool system or use other safety measures (e.g., ice pressure cushions).

8.2.1.6 Main menu → Settings → Dosing delay
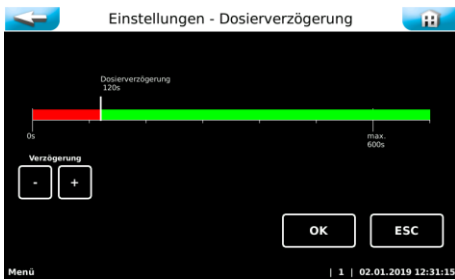
Dosing delay
If the device is restarted, the dosing delay is running, during which time no dosing occurs. Software alarms are suppressed during this time. The dosing delay must be set high enough to ensure that after the start of the filter system actual basin water flows through the measuring cell.

8.2.1.7 Main menu → Settings → System

Date/ time
Set date and time

Password
Assign a password – there is no factory setting for a user password

Display
Adjust the display brightness to the ambient conditions

Network
Set the network addresses

Language
Select the user language

Device ID
Device ID

8.2.1.8 Main menu → Settings → System → Password End user – Password level 1

There is no factory setting for an end user password.
Without an end user password, the controller assumes password level 1, i.e., normal parameter changes are possible.

The four-digit password can be individually chosen and must be a number between 0000 and 9999.
The desired new password must be entered in both lines.

By assigning an end user password, the device control is protected against unauthorised access.

Reset, deactivate, remove,... the end user password.

To reset the end user password, enter the current end user password in the uppermost "Old password" line; the two "New password" lines remain empty; acknowledge with OK.

Tip
Please keep the individually chosen end user password in a safe location; a lost password can only be reset with the Technician 1 authorisation or by the factory customer service!

8.2.1.9 Main menu → Settings → System → Password Technician 1 – Password level 2

The factory-assigned Technician 1 password is 01234.

The five-digit password can be individually chosen and must be a number between 00000 and 99999.

To reset the Technician 1 password, enter the current Technician 1 password in the uppermost "Old password" line; enter the desired new password in both "New password" lines; acknowledge with OK.

The Technician 1 password is required for the following functions.
- Conduct a reset
- Delete log data
- Carry out extended network settings (modbus)

Tip
Please keep the individually chosen Technician 1 password in a safe location; a lost password can only be reset by the factory customer service!

Tip
Explanation of the password levels: The password level is displayed in the status line to the left of the date.
Password level 0 = Menu protected by end user password → no changes to the menu possible
Password level 1 = allows access to all standard menu items
Password level 2 = allows full access to all menu items (plus reset, delete log files, expand network)

8.2.1.10 Main menu → Settings → System → Network
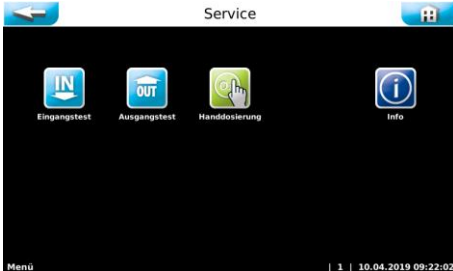
The control unit has a web front-end. The current measuring values and status reports can be transmitted to a home network via the network interface with an RJ45 socket. The terminal device can be a browser-enabled device such as a PC monitor, a tablet PC or a smartphone, e.g.

TIP!
Further information can be found in the *Visualisation* instructions at the end of this operation manual.

8.2.2   Main menu → Service

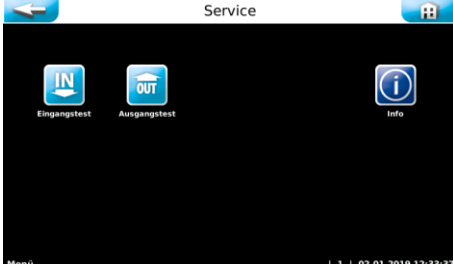|	
	Input test a test programme for switch inputs
	Output test a test programme for pumps and relay outputs
	Info for the query of firmware versions
	Manual dosing O₂ For carrying out a manual disinfectant dosing The desired disinfectant volume must be set For commissioning or if additional disinfectant is required The default value is 3,000 ml

The picture below shows the time control variant

8.2.2.1 Main menu → Service → Input test

The input test serves for checking the connected inputs (switches). The changing activation of the switches is indicated by 0 (open) or 1 (closed).

The switch function has a wire-break proof design (pH regulation level, disinfection level, measuring cell flow, central control technology off and clean water external). I.e., these functions are closed in the operating state; in the event of a disruption (e.g., container empty, or wire break) the input opens, resulting in an error message.

8.2.2.2 Main menu → Service → Output test

The output test is used for checking the connected outputs (pumps and relays). The selected output is activated for 30 seconds. The activation time can be selected between 5 and 120 seconds. The activation can be cancelled at any time with `Stop`.

For safety reasons (generation of chlorine gas), the output test only functions if it has been ensured that the dosed chemicals are being removed.
Therefore, no disruption, e.g., "Measuring cell flow", may be pending!

8.2.2.3 Main menu → Service → Info

Info allows you to query the currently used versions of the two firmwares, DSP and IO.

8.2.2.4 Main menu → Service → Manual dosing O2

There are situations when manual dosing may be required. For example, if the disinfection container was not replaced in due time and the next regular disinfection would only take place several days later. The operator notices an insufficient disinfection effect (slick basin walls). Or during commissioning, if the regular dosing will not take place until some time far in the future. In this case, the *Service* menu provides the possibility to initiate a manual dosing. Upon completion of the manual dosing, the controller automatically returns to the normal control operation.

Proceeding:
- Select the Manual dosing menu
- Enter the desired or required dosing volume
- Acknowledge with `Start`

- Upon completion of the dosing delay, the manual dosing starts (may be skipped with)
- Upon completion of the manual dosing, the device automatically returns to the normal automatic operation
- The manual dosing may be terminated at any time with the MENU button

The icon is displayed below the remaining dosing volume to signal an active manual dosing.

8.2.3 Main menu → *Login*
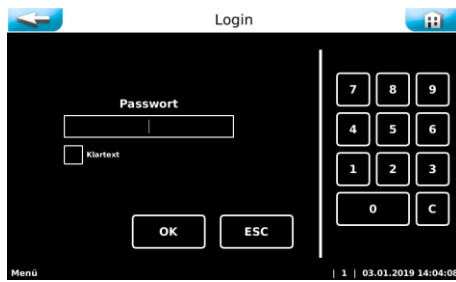
The controller can be protected by a password against unauthorised access. For rules for password assignment, see 8.2.1.8

If a password has been assigned, this password must be entered under Login for future parameter changes.

There is no factory setting for a user password

8.2.4 Main menu → Log

Event Log
The Event Log is used to chronologically list any events, disruptions and alarms that have occurred.
The storage depth is 100 entries

Event Log Adjustment
The Event Log Adjustment is used to chronologically list any adjustments that were made.
The storage depth is 50 entries

Data Log
In the Data Log, logged measuring values can be displayed in graphs or tables.
The storage depth is a little over one year

Export
Via Export, logged data can be transferred to a USB stick for data backup.

Delete
All logged data can be deleted with Delete. To delete the log data, you must sign in with the Technician password.
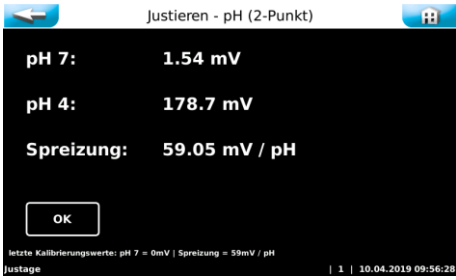
8.2.5 Main menu → Calibration

	pH (2-point) for calibration of the pH electrode
	pH (phenol red) For adjusting the pH display value according to a phenol red measurement
	mV - Redox for calibration of the redox electrode Not available for the time control O$_2$ disinfection process

The calibrations are text-guided; the most important steps are explained in brief texts. Completed steps are acknowledged with the OK button. Values are adopted automatically once the measured electrode voltage remains stable for approx. 15 seconds.

8.2.5.1 Main menu → Calibration → pH 2-point (pH electrode)

	pH7 = Offset voltage The optimal offset voltage is at 0 mV ± 30 mV. **pH4** = second buffer solution for determining the conductance voltage **Inclination mV/pH** = conductance voltage The optimal conductance voltage at 25°C is approx. 59 mV/pH. Example: (pH7 – pH4 = 3 pH x 59 mV = 177 mV) The values of the most recent successful calibration are displayed below.

At the end of the pH calibration, the measuring results of the offset voltage and the conductance voltage are displayed and an electrode evaluation is carried out. In case of minor deviations, the calibration is adopted immediately. In case of "medium" deviations, a cleaning notice is displayed. In case of major deviations, the exchange of the pH electrode is suggested. If the exchange of the electrode does not remedy the problem, the fault may be with the electrode cable or the measuring amplifier.

	Notice - Evaluation of the electrodes: *Cleaning notice* At an offset voltage > ± 61 mV, the voltage value is shown in <mark>yellow</mark> and the calibration ends with a cleaning notice. At a calibration voltage < 52 mV or > 63 mV/pH, the voltage value is shown in <mark>yellow</mark> and the calibration ends with a cleaning notice. *Error notice* At an offset voltage > ± 91 mV, the voltage value is shown in <mark>red</mark> and the calibration is rejected with an error notice! At a calibration voltage < 50 mV or > 65 mV/pH, the voltage value is shown in <mark>red</mark> and the calibration is rejected with an error notice! If the calibration is rejected with an error notice, the device continues the regulation using the values from the most recent successful calibration. It is necessary to investigate the cause of the failed calibration!

8.2.5.2 Main Menu → Calibration → pH - phenol red (tablet measurement)

	Carry out phenol red measurements according to the manufacturer's specifications and enter the determined value. Please note the limited measuring range and other characteristics of the phenol red measurement. Calibrations above <mark>± 0,6 pH</mark> (offset 40 mV) end with a notice. Calibrations above <mark>± 1,0 pH</mark> (offset 60 mV) are rejected.

8.2.5.3 Main menu → Calibration → Redox electrode

As a rule, the *POOLKLAR Touch XL* device series is delivered with the ½" redox electrode. Therefore, the menu on the left must be selected.

In the event that the device works with the classic redox combination electrode, please select the menu on the right.

The Calibration → redox electrode menu enables a fine-tuning of the redox measurement. The redox test solution supplied by WDT supplies a voltage of 468 mV at 25 °C, see bottle label.
Since the voltage can be chosen freely, the fine-tuning may also be done with other redox test solutions, e.g., 220 mV or 640 mV.

When making a comparison, please note the temperature dependence of the test solution! See label

At the end of the menu, the set deviation is shown as Offset. In case of minor deviations, the calibration is adopted immediately.
In case of deviations larger than ± 41 mV, a cleaning notice is displayed.
In case of deviations larger than ± 61 mV, the calibration is rejected and an exchange of the *pH electrode* is suggested. The controller continues to work with the values of the most recent successful calibration.
If the exchange of the electrode does not remedy the problem, the fault may be with the pH electrode cable or the measuring amplifier.

9   Network connection - Visualisation

Exemplary display on the monitor or smartphone

The *POOLKLAR Touch XL* device series has an implemented web interface. Access occurs via an Ethernet (LAN) interface. If a POOLKLAR Touch XL is integrated in an existing home network, authorised network devices will be able to access it. This only requires that a common web browser is installed on the terminal devices, such as a PC laptop, tablet or smartphone. The browser shows a picture of the device's display view. This allows the remote viewing of the measuring values, settings (control parameters), log data as well as operating states, alarms and disruptions.

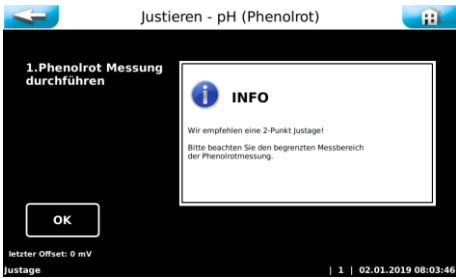The data transmission from the device occurs via a cable. For this, a network cable with an RJ45 plug is required. Outside of the device, the further transmission can be realised via a cable to the router or wirelessly, e.g., with a wireless access point via WLAN.

Access is restricted to a simple remote display; no parameter changes can be made externally.

The web browser used must at least comply with the HTML5 standard. Due to the large number of available web browsers and their versions, it is not possible to guarantee the suitability of each browser!
Should your browser not allow a proper display, please try another browser.

	Notice
Hinweis	The devices are not DHCP-enabled: therefore, they cannot be registered with the network via Plug and Play. Accordingly, a certain amount of technical knowledge in the area of IT networks is required. If needed, please consult your network administrator, who is familiar with your home network.

	Notice
Hinweis	The devices are not DHCP-enabled: therefore, they cannot be registered with the network via Plug and Play. Accordingly, a certain amount of technical knowledge in the area of IT networks is required. If needed, please consult your network administrator, who is familiar with your home network.

	Notice
Hinweis	Outside of your home network, access is also possible via the internet. However, a DynDNS service must be established for this purpose. If needed, please consult your network administrator, who is familiar with your home network.

	Notice
Hinweis	For security reasons, we recommend that you establish a safe VPN connection (virtual private network) to access the internet.

	Notice
Hinweis	We, the company WDT, cannot assume any liability for the safety of the data transmission. The evaluation of the need for and implementation of safety measures such as VPN connection, password assignment and updating of the corresponding systems is the sole responsibility of the user or the persons authorised by the user for this purpose!

9.1   Network installation

9.1.1   Insert the network line into the control housing

The lower connection room of the control housing is equipped with a pre-moulded push-out for a 25 mm screw connection with a jam nut. A normal RJ45 plug can be directly inserted into the housing via a 25 mm screw connection. A multiple sealing insert 2 x 6 mm is used for sealing instead of the normal rubber gasket. The multiple sealing insert's second orifice is closed with a 6 m plug. Alternatively, a network line without a plug can be inserted in a smaller screw connection, and the plug can be crimped on the wire inside of the device.

Due to their size, RJ45 plugs for field assembly are not suitable.

9.1.2   Localise the LAN interface

All POOLKLAR Touch XL devices are equipped with a LAN interface, which is located on the lower front side.

Exemplary picture of the interface as of 04/2013

9.2 Establish network access at the device

9.2.1 Main menu → Settings → System → Network
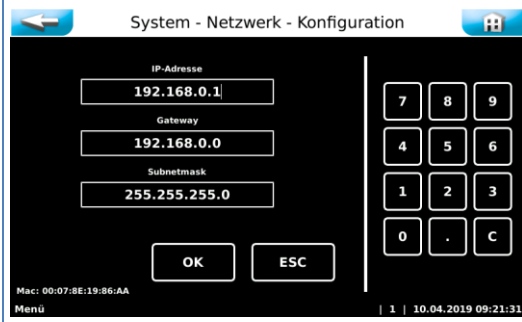
Based on the network topology, the corresponding numeric blocks for IP address, gateway and subnetmask must be assigned under the _Network_ menu item.

The specified numeric blocks are only exemplary; they must correspond to the network topology!

9.2.2 IP-address

The transmission occurs via a static IP address; this must be assigned manually. The devices are not DHCP-enabled (automatic assignment of an IP address). If multiple devices are installed in a network, each device must be assigned its own IP address.

9.2.3 Gateway

The gateway enables the connection of different computer networks with different network protocols.

9.2.4 Subnetmask

All network participants should use the same subnetmask.

9.3 Establish network access at the terminal device

9.3.1 Open the browser
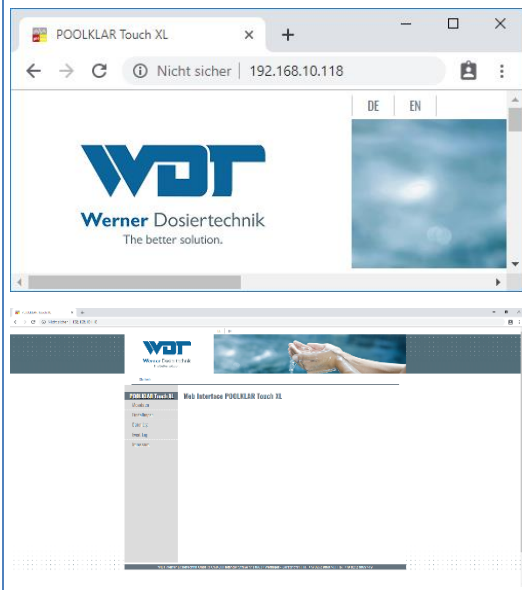
Open a suitable browser and enter the IP address previously assigned at the controller, e.g., 192.168.10.118, in the address line.

If the connection is successful, the browser displays the web interface implemented in the device.

9.3.2 Internet access via DynDNS service

As mentioned above, a DynDNS service is required for access via the internet. Please contact your system administrator for establishing a DynDNS service, if required. The following information is helpful for establishing the service.

Server: http   Protocol: http   Port: http uses Port 80

9.4 Visualisation views	

9.4.1   Measuring data

The device is in the *Automatic* status (see status line).

There is no disruption or alarm.

The symbols' meanings are explained in the device's operation manual.

9.4.2   Settings

The control parameters are displayed under Settings.

9.4.3   Data Log

Under Data Log, the logged measuring values can be displayed in graphs or tables.

9.4.4   Event Log

Under Event Log, the logged events can be viewed.

9.4.5   Imprint

Imprint displays the different firmware versions.

9.4.6   Status: Menu

If the remote display shows ---- instead of the numeric values, the control is currently located in the menu. I.e., someone selected the main menu at the device for parameter changes, calibrations or for other reasons.

10   Maintenance and cleaning

All required maintenance and repair tasks may only be done by properly qualified personnel. Required spare parts are available from your specialist dealer.
Please observe the safety notices when handling chemicals and wear appropriate protective clothing.

The following maintenance tasks must be carried out.
-   Clean the fine filter in case of obvious contamination
-   Calibrate the pH electrode in case of a deviation >0.2 pH compared to the phenol red measurement or a successive increase of the free chlorine in the basin water (due to an increasing pH value)
-   Replace the dosing valves' valve hoses in each season
-   Replace the dosing cartridges in each season
-   Replace the redox electrode in each season
-   Replace the flow control valve's maintenance set about every two to three years

10.1 Fine filter

The fine filter prevents the contamination of the measuring cell. It must be inspected at regular intervals and cleaned as needed. Especially in the spring and fall, a higher level of contamination due to flying seeds and falling leaves can occur in outdoor pools. During these times, shorter cleaning intervals must be applied.

	Notice
	A contaminated fine filter may lead to a chlorine depletion. This leads to reduced redox voltage and subsequently to an increase in the pool's chlorine content.

10.2 pH electrode

	ATTENTION!
	During all work on the pH electrode, it must be ensured that neither the electrode's screw plug head nor the plug of the electrode cable are exposed to moisture! Even the smallest amount of moisture in the electrode head may lead to a distortion of the measuring value or even to a premature failure of the electrode! All contacts in the electrode's plug head and on the electrode plug must display a shiny golden colour and may not show any signs of corrosion.

Each pH electrode is a wear part. It is subject to a certain degree of ageing, which is due to a variety of factors. In the area of swimming pool water treatment, the electrode should be functional for approximately 6 months to 2 years.
The contamination of the diaphragm may be another reason for measuring value deviations. These contaminations can usually be removed by means of the included diaphragm cleaner. For this purpose, the glass shaft of the pH electrode is submerged in the cleaning solution for a few minutes.
Depending on the state and age of the electrode, the electrode's characteristics may change. This leads to measuring value deviations, which can be offset by a calibration.

	Notice
	After each cleaning or exchange of the electrode, a calibration must be carried out! Do not touch the glass top (sensor part) and the diaphragm with your fingers or with cleaning materials.

10.3 Dosing valves

The disinfection dosing valve is subject to encrustation when chlorine-containing disinfectants are being used. The level of encrustation depends on the dosed volume, the temperature at the dosing point, the chlorine solution's components and the water hardness. The maintenance intervals are several weeks to multiple months. The encrustation in the valve body (part 2) can be removed with a lime-dissolving acid. As part of the annual maintenance, the rubber gaskets of both dosing valves must be replaced.

10.4 Flow control valve

The diaphragm in the flow control valve hardens over time. This results in a reduced control behaviour of the flow. For this reason, the diaphragm should be replaced every two to three years.

	Notice
	When replacing the diaphragm, please note its installation position. The blue spring must press down on the larger spring plate. Otherwise, the function of the flow control valve will be disrupted.

10.5 Dosing cartridges

Expansion tab

As part of the annual maintenance, the two dosing cartridges should be replaced. To do so, compress the two lateral expansion tabs and pull the head from the motor shaft toward the front. Unwind the two black cable ties from the hose end and pull the hoses from the hose nipples.

Push the new dosing cartridges' hoses back onto the hose nipples and fasten them with the black cable ties. Then push the dosing cartridge back onto the motor shaft until it snaps into place.

10.6 Redox electrode

As part of the annual maintenance, the flat gasket in the redox electrode and the corresponding O-ring in the measuring cell must be replaced.

11   Decommissioning - Overwintering - Storage

If the device is decommissioned for an extended period of time, the following tasks should be conducted.

- Flush the dosing valves, including the suction sets; for this purpose, remove the suction sets from the chemical container and place it in a container filled with water. Close the chemical container. Manually start both dosing pumps with the test function. Repeat the process twice to ensure that the chemicals are completely flushed through. In conclusion, pull both dosing cartridges from the motor shaft.
- The diaphragm of a glass electrode must never dry out; therefore, the protective cover must be filled with a small amount of electrolyte and pushed onto the pH electrode's glass shaft. The pH electrode is frost-resistant to approx. -15 °C; if the temperature falls below this value, the electrode must be stored in a frost-safe environment.
- If condensation moisture can be expected in the storage space, the device must be supplied with continuous voltage.
- If frost can be expected in the storage space, all water-conveying parts such as the measuring cell, the measuring water piping and measuring water lines must be emptied completely. Alternatively, the device may be dismounted from the wall and stored in a frost-safe room.

12   Technical data

Dimensions: approx.		Electrical data:		Dosing performance: Standard	Measuring ranges	
Width:	480 mm	Voltage:	230 V – 50 Hz	Disinfection SR10 approx. 1.2 l/h	pH	2.0 ... 9.9
Height:	670 mm	Current:	max. 2 A	pH regulation SR10 approx. 0.7 l/h	mV	0 ... 990
Depth:	170 mm	Performance:	7 W standby		Temperature °C	-30 ... 170
Weight:	11 kg		8 W dosing			

Ambient temperature: - 5 °C to + 40 °C
Humidity: 95% non-condensing

13   Change history - POOLKLAR Touch XL device series

As of 07/2019 Device generation V3 – Display type SANTINO – Firmware V4.x

As of July 2019, the *POOLKLAR Touch XL* device series V3 (Ser. no. > 73000) is being delivered with a new, capacitive display type. This display type is inserted in the front and can be identified by a silver metal frame visible from the control side. **The conversion results in an adaptation of the firmware from V3.x to V4.x.**

	Notice
☝ Hinweis	The firmware V4.x is <u>not</u> downward compatible; i.e., it <u>**cannot**</u> be used in devices of the lower versions V1.x to V3.x! Please take note of this for future orders of replacement parts and support queries!

As of 06/2019 Device generation V3 – new hardware SCHW-8 – new firmware V3.x

As of June 2019, the revised POOLKLAR Touch XL device version V3 is being delivered. Beginning with this version, a new hardware SCHW-8 (electronic) is being used. The conversion resulted in an adaptation of the firmware from V2.x to V3.x.
During the adaptation of firmware V3.x to the new hardware, new functions were implemented.

The following changes were made.
- Complete revision of the hardware (electronic circuit boards) PKT → SCHW8
- Wire-break proof flow monitoring NC
- Revision of the firmware (operating software) V2.x → V3.x
  Temperature control can be switched off, Dosing off, increase pH control direction, higher disinfection dosing performance, second password level, network access via browser with parameter change, measuring value and adjustment log, phenol red calibration

Further details can be found in the corresponding menu descriptions.

	Notice
☝ Hinweis	The hard- and firmware of device generation V3 is <u>not</u> downward compatible; i.e., it <u>**cannot**</u> be used in devices of the previous generations POOLKLAR Touch XL V2 and POOLKLAR Touch XL! Please take note of this for future orders of replacement parts and support queries!

As of 05/2015 Device generation V2 – with design cover

As of May 2015, the revised device generation POOLKLAR Touch XL V2 was delivered. Beginning with this generation, the devices are equipped with a design cover. In this context, the PMMA measuring cell block was also revised. **This resulted in changes to certain wear and replacement parts.**

The following changes were made.
- With design cover
- Compact PMMA measuring cell block
- Maintenance-friendlier dosing valves
- Magnetic hose bracket

	Notice
☝ Hinweis	Please take note of the changes for future orders of wear or replacement parts and support queries!

As of 05/2013 Firmware version V2.x – Display type CUPID (closed metal casing)

As of May 2013, a new display type is being used. This can be recognised from the back by a closed metal casing. The conversion resulted in an adaptation of the firmware from V1.x to V2.x.
During the adaptation of firmware V2.x to the new display, new functions were implemented.

The following additional functions were implemented in the firmware (operating software).
- External off
- Disinfection 2-point control (electrolysis, bromine)
- Disinfection time control O2 (active oxygen)

	Notice
Hinweis	The new firmware V2 is **not** downward compatible; i.e., it **cannot** be used in devices with the initial display type of the first device series V1! Please take note of this for future orders of replacement parts and support queries!

Firmware - versions

FW V4.0.0   07/2019 first available version for display SANTINO 7.0 in combination with I/O-Board SCHW-8
Compatibility: May only be used with display SANTINO 7.0 with I/O_SCHW-8.

FW V4.x   07/2019 – new display type SANTINO 7.0 capacitive (panel mount - inserted from the front)

FW V3.0.2   07/2019 – last available version for display CUPID 7.0 in combination with I/O-Board SCHW-8
Compatibility: May only be used with display CUPID 7.0 with I/O_SCHW-8.

FW V3.x   06/2019 – new hardware I/O-Board SCHW-8 with display CUPID 7.0

FW V2.1.2   01/2018 – last available version for display CUPID 7.0 in combination with I/O-Board PKT_V2
Compatibility: May only be used with display CUPID 7.0 with I/O_PKT.

FW V2.x   05/2013 – new display type CUPID 7.0 resistive (closed metal casing) 05/2013 to 07/2019

FW V1.4.2   06/2015 – last available version for 7" Touch Screen Clemens - first generation
Compatibility: Can be used on all Clemens displays.

FW V1.x   02/2011 – first display type Clemens 7" resistive (open conductor plate - electronic) 02/2011 to 05/2013

	Notice
Hinweis	The above listing shows the most important cornerstones of the firmware versions, including the publication date and notices about the reasons for the change. Please take note of this for future orders of replacement parts and support queries!

14   Commissioning protocol

> During a *"reset"*, all parameters are reset to the factory setting. After a "reset", all parameters must therefore be checked and readjusted to the basin. We therefore recommend that you enter the optimised, basin-specific parameters in this list.
> In addition, the electrodes must be calibrated after a *"reset"!*

Settings menu	Ex works setting	Setting range	Step	during commissioning	Optimised during operation
Parameter pH					
- Setpoint	7.0 pH	6.0 – 8.0 pH	0.05		
- P-range	0.50	0.1 – 1.0	0.05		
- Alarm low	6.5 pH	4.0 – 8.0 pH	0.05		
- Alarm high	8.0 pH	6.0 – 10 pH	0.05		
- Dosing time limit	30 minutes	off – 60 min	2		
- Control type	Proportional	Proportional 2-point			
- control direction	reduce pH	reduce - increase			
Disinfection parameter					
- Setpoint	750 mV	500 – 900 mV	5		
- Control range	100 mV	10 – 100	10		
- Alarm low	600 mV	400 – 900 mV	10		
- Alarm high	800 mV	500 – 1000 mV	10		
- Dosing time limit	30 minutes	off – 60 min	2		
- Control type	Proportional	Proportional 2-point Time control			
Disinfection O$_2$ parameter					
- Week day	Mon				
- ml	0 ml	0 – 9,000 ml	50		
- Start	12:00	00:00 – 21:00	10		
- Temperature	24°	19 – 30°	1		
- Week day	Tue				
- ml	0 ml	0 – 9,000 ml	50		
- Start	12:00	00:00 – 21:00	10		
- Temperature	24°	19 – 30°	1		
- Week day	Wed				
- ml	0 ml	0 – 9,000 ml	50		
- Start	12:00	00:00 – 21:00	10		
- Temperature	24°	19 – 30°	1		
- Week day	Thu				
- ml	0 ml	0 – 9,000 ml	50		
- Start	12:00	00:00 – 21:00	10		
- Temperature	24°	19 – 30°	1		
- Week day	Fri				
- ml	0 ml	0 – 9,000 ml	50		
- Start	12:00	00:00 – 21:00	10		
- Temperature	24°	19 – 30°	1		
- Week day	Sat				
- ml	0 ml	0 – 9,000 ml	50		
- Start	12:00	00:00 – 21:00	10		
- Temperature	24°	19 – 30°	1		
- Week day	Sun				
- ml	0 ml	0 – 9,000 ml	50		
- Start	12:00	00:00 – 21:00	10		
- Temperature	24°	19 – 30°	1		

Settings menu	Ex works setting	Setting range	Step	during commissioning	Optimised during operation
Dosing performance					
- pH	8 sec. = 100%	1 – 8 sec	1		
- Disinfection	15 sec. = 100 %	1 – 15 sec	1		
- Cycle time - locked	30 seconds	30 – 360 sec	10		
- Cycle time - pH	30 seconds	30 – 360 sec	10		
- Cycle time - disinfection	30 seconds	30 – 360 sec	10		
- Locking	On	On - Off			
Temperature °C parameter					
- Setpoint	25 °C	5 – 40 °C	0.1		
- Control range	1 °C	0.1 – 10 K	0.1		
- Alarm low	10 °C	1 – 50 °C	0.1		
- Alarm high	30 °C	15 – 55 °C	0.1		
- Offset	off	-5 °C ... +5 °C	0.1		
- Control	On	Off - On			
Dosing delay					
- Dosing delay	600 seconds	10 – 600 sec	10		
System - Password					
- End user	----	0000 ... 9999	1		
- Technician 1	01234	00000 ... 99999	1		
System - Display					
- Screensaver	20 %	12 ... 100 %	2		
- Delay	00:05 minutes	00:00 – 23:59	1		
- Backlight	75 %	24 ... 100 %	2		
System - Network					
- IP-address	192.168.0.1				
- Gateway	192.168.0.0				
- Subnetmask	255.255.255.0				
System - Network browser					
- Port	12345				
System - Network modbus					
- Port	502				
- IP-address	0.0.0.0				
System - Language		D – GB – F – S			
Device ID	POOLKLAR Touch XL				
Flocculation	Off	Off - On			

Additional remarks:

| -------------------- | --- | -------------------------------- | ------------------------------------- |
| Date | Place | Installer | Operator |

15   Spare part list

The spare parts listed in the following are available through your specialist dealer. Please always include the exact product designation and the device serial number with your orders.

Tip	Please note that as a rule, the spare parts list only contains replacement parts for the standard devices. Customer-specific or order-specific special articles are not taken into account.

Tip	When ordering replacement parts for POOLKLAR Touch XL devices, please note that not all of the articles are suitable for all three device versions, POOLKLAR Touch XL (2011 – 05/2015), POOLKLAR Touch XL-V2 (05/2015 – 05/2019), POOLKLAR Touch XL-V3 (as 06/2019). The special articles are marked with the notice (as of 05/2015) or (new as of 06/2019) , respectively.

The item numbers on a blue background denote wear parts. Wear parts are **excluded** from the 2-year warranty!

Dosing technology	Item number	Article	
	10039	Dosing cartridge SR10 3.0 mm white rollers	(standard)
	12500	Dosing motor SR10 3.0 mm	(standard)
	12472	Suction set NF d16 x 500 yellow - 2 m cable length	(standard)
	12473	Suction set NF d16 x 500 red - 2 m cable length	(standard)
	24717	Hose bracket SR10 with hose rupture contacts	(as of 05/2015)
	18860	Valve rubber set 9 x 1.5 - 14 for both dosing valves	(as of 05/2015)
	24718	Dosing valve 3/8" - 4 x 1 - Si 9 x 1.5	(as of 05/2015)
Flow-through fitting	**Item number**		
	12023	Ball valve PVC ¼" – 6 x 1 mm (inlet and drain)	
	24271	Measuring cell CPR – PKT	(as of 05/2015)
	11017	Test water tap PVC ¼"	(as of 05/2015)
	24716	Maintenance set for flow controller	(as of 05/2015)
	10480	Filter cup transparent	(standard ¼" filter)
	10481	Filter cup gasket	(standard ¼" filter)
	10482	Filter element 300 µ	(standard ¼" filter)
Electrodes	**Item number**		
	10933	pH electrode PG13.5 60 mm	(standard)
	11984	Redox electrode ½" complete	(standard)
	11986	Redox electrode insert d14	(standard)
	11985	Gasket set for redox electrode	(standard)
	11964	Cleaning beads 5 ml	
	15945	Electrolyte solution KCl 3 mol/l - 30ml for overwintering	
	10383	Buffer solution ph4 50 ml	
	10384	Buffer solution ph7 50 ml	
	10385	Redox test solution +468 mV 50 ml	
	11962	Electrode cleaner - diaphragm cleaner 50 ml	
	11963	distilled water 500 ml	
Control unit/ electronics	**Item number**	**Depending on the version** → see label and serial number on the electronic circuit board	
	Depending on version	Power pack – NT-SCHW-8_V2.1	(new as of 06/2019)
	Depending on version	I/O- Board – I/O-SCHW-8_V2.1	(new as of 06/2019)
	Depending on version	Measuring amplifier – MV_CPRT	(as of 05/2015)
	Depending on version	Control panel – DSP_S4 CUPID (resistive)	(until 06/2019)
	Depending on version	Control panel– DSP_S5 SANTINO (capacitive)	(new as of 07/2019)
	24759	Light rod with RGB LED (black line)	(new as of 06/2019)
	12006	pH electrode cable with screw plug head	
	12009	Redox electrode cable 4 mm MC plug 90 cm	
	24681	Temperature sensor 6 x 25 mm in measuring cell	(as of 05/2015)
	10489	Measuring water flow switch d6 x 30 mm green NC	(new as of 06/2019)

OPTIONS	Item number	
	24854	OPTIONAL for POOLKLAR Touch XL V3 - 2 Sa dosing pumps instead of SR10 (Dosing performance 150 up to 2200 ml/h – hose kit 08./1.6/3.2 x 1.6)
	14140	Pump housing Sa grey/anthracite
	13039	Roller support for peristaltic pump Sa blue
	13482	Hose set Sa 0.8x1.6-Ph blue marking
	13412	Hose set Sa 1.6x1.6-Ph black marking
	13413	Hose set Sa 3.2x1.6-Ph green marking
	upon request	Suction set NF d16 x 500 – yellow 3 m cable length (special length)
	upon request	Suction set NF d16 x 500 – red 3 m cable length (special length)
	24871	Fine filter 300 µ ¼" 6x1 complete (½" design upon request)
	21531	Temperature sensor 6 x 50 mm 2 m line length (special length) (with 12910 for external installation)
	12910	Temperature sensor sleeve PVC ½" x 60 mm (for external installation)

16   Personal notes

You can use the following lines for personal notes, e.g., regarding conducted service tasks or extensions and device modifications.