WALLACE & TIERNAN® MEASURING, CONTROL AND DOSING SYSTEM
DEPOLOX® POOL COMPACT
Version 1.05 and later

INSTRUCTION MANUAL

Please note

Original instruction manual!

Contents

1. Introduction

1.1 Documentation

1.1.1 Target groups

This instruction manual provides the information required by installation, operating and maintenance personnel for operation and maintenance of the DEPOLOX® Pool Compact.

All persons working with the DEPOLOX® Pool Compact must have read and understood the instruction manual, in particular, the safety instructions it contains.

1.1.2 Structure of the documentation

This instruction manual contains important information for the safe, trouble-free and economical use of the DEPOLOX® Pool Compact. Observing these instructions will help prevent risks, reduce repair costs and downtimes, and increases the reliability and service life of the DEPOLOX® Pool Compact.

The Chapters Installation and Maintenance are intended only for trained and authorized service personnel. These chapters contain important information on the installation, configuration, commissioning, maintenance and repair of the DEPOLOX® Pool Compact, which are essentially carried out by this target group.

Please consult the table of contents and the index to quickly find the information you require.

1.2 Conventions

Please note

This instruction manual contains a number of notes with different priorities that are marked with symbols.

Pictogram	Note	Meaning
	*Danger!*	Immediate danger to life and limb! If the situation is not corrected, death or serious injury will result.
	*Warning!*	Danger to life and limb! If the situation is not corrected, death or serious injury can result.
	*Attention!*	If this note is not observed, moderate or minor injury or damage to equipment can result.
	*Warning!*	Electrocution hazard.
	*Please note*	These notes indicate a material risk or provide useful information to make working with the device easier.
	*Attention!*	Environmental hazard! Do not throw away or burn the batteries! Batteries must be disposed of at a collection point.

1.3 Disclaimer

We are not liable for any damages incurred during installation or use of these hardware and software components. This applies specifically to trouble-free interaction with the software and hardware components you choose.

We cannot be held liable for damage incurred by the user (in particular, lost profits, lost information and service interruptions) when using the DEPOLOX® Pool Compact or for other damage. You are solely responsible for the installation!

The content of the instruction manual has been checked to make sure that it matches the hardware and software described. Nevertheless, deviations cannot be ruled out, and we therefore assume no liability for full conformity. The details in this instruction manual are checked regularly and any necessary corrections included in subsequent issues.

2. Safety

2.1 Intended use

The DEPOLOX® Pool Compact intended exclusively for measurement and control tasks during the treatment of water in swimming pools and baths and saline pools.

The operational safety of the DEPOLOX® Pool Compact is only guaranteed if it is used in accordance with its intended application. The system may only be used for the purpose defined in the order and under the installation, operating and ambient conditions specified in this instruction manual.

All inspection and maintenance work must be carried out at the specified intervals.

Compliance with the intended use also includes reading this instruction manual and observing all the instructions therein.

The owner/operator of the installation bears sole responsibility for consequences of any use that does not conform with the installation's intended use.

Danger!

Risk of injury or death!

The unit must not be operated with flammable liquids.

2.2 General safety instructions

The manufacturer attaches great importance to ensuring that work on its device is always perfectly safe. This is taken into account, starting with the design of the installation, by the integration of safety features.

Safety regulations

The safety instructions in this documentation must be observed at all times. Additional industry-wide or in-house safety regulations also continue to apply.

Safety instructions on the unit

All safety instructions attached to the unit itself must be observed. These instructions must always be clearly legible and complete.

State-of-the-art technology

The unit has been constructed in accordance with state-of-the-art technology and the accepted rules of safety engineering. However, if the unit is used by persons who have not been adequately instructed, danger to the life and limb of such persons or third parties and damage to the unit itself or to other property cannot be ruled out. Work not described in this instruction manual must be performed only by authorized personnel.

Personnel

The operator of the overall system must ensure that only authorized and qualified specialist personnel are permitted to work with and on the unit within their defined scope of authority. “Authorized specialist personnel” are trained, skilled personnel employed by the owner/operator, the manufacturer or, if applicable, the service partner. Work on electrical components must be carried out by qualified electricians.

Spare parts / components

Trouble-free operation of the unit is only guaranteed if original spare parts and components are used in precisely the combination described in this instruction manual. Failure to observe this instruction may lead to malfunctions or damage to the unit.

Extensions and conversions

Never attempt to perform any modifications, extensions or conversions on the unit that could have an adverse affect on safety without the written approval of the manufacturer.

Electrical power

Only qualified electricians or trained personnel supervised by a qualified electrician are permitted to perform any work on electrical components and must do so in accordance with valid electro-technical regulations.

During normal operation, the controller must remain closed. Connect power cables in accordance with the wiring diagram.

Danger!

Risk of injury or death!

External voltages may still be connected even if the operating voltage is switched off. In the event of a fault in the electrical power supply, switch the DEPOLOX® Pool Compact off immediately.

IT security

The manufacturer offers IT security mechanisms for its products to support secure system operation. We recommend checking on a regular basis to see what information is available regarding IT security developments for your products. Information on this can be found on the Internet.

Moreover, for the safe operation of an installation, it is also necessary to integrate the automation components into a holistic IT security concept which comprises the entire system and is in accordance with the state of the art in IT technology. Integrated products from other manufacturers should also be taken into account.

During commissioning of the DEPOLOX® Pool Compact, the factory-configured passwords and user names should be replaced with individual ones and the user administration activated.

Disposal

Ensure safe and environment-friendly disposal of agents and replacement parts.

Attention!

Environmental hazard!

Dispose of the electronics waste in accordance with valid local and national regulations.

2.3 Unit-specific notes

2.3.1 Sample water monitoring

Danger!

Risk of injury or death

If there is a shortage of sample water or the flow rate is too low, there is a risk of uncontrolled dosing of chemicals. To ensure safe operation and prevent injury, the sample water monitoring must never be disabled.

The sample water monitoring must be checked regularly. Without automatic detection of a shortage of sample water or an excessively low flow rate, there is a risk of uncontrolled dosing of chemicals. Never disable the sample water monitoring - even temporarily, e.g. by bridging the signal input. The sample water monitoring deactivates dosing if there is a shortage of sample water and prevents the uncontrolled dosing of chemicals.

2.3.2 Circulation monitoring

Danger!

Risk of injury or death

Chemical dosing must switch off if the circulation is switched off or the circulation rate is too low. To ensure safe operation and prevent injury, it is essential to install circulation monitoring.

The circulation monitoring must be checked regularly. A circulation monitoring device must be installed in the unit and connected to the DEPOLOX® Pool Compact. The input used must be configured as “Controller Stop.” The dosing of chemicals must switch off if the circulation is deactivated or the circulation output is too low, e.g. dosing switches off with digital input 2 used as “Controller Stop.”

2.4 Specific operating phases

Normal operation

Never employ any working methods which could affect safety!

The device must not be used with flammable liquids.

The DEPOLOX® Pool Compact may only be operated with the housing closed!

Inspect the DEPOLOX® Pool Compact at least once daily for externally visible damage and faults! Inform the responsible person/authority immediately of any detected changes (including any changes in the operating performance)!

In the event of malfunctions, always switch the electronics module off immediately! Have malfunctions remedied immediately!

Installation and maintenance work

During installation and maintenance work, secure the DEPOLOX® Pool Compact against being switched back on!

If stipulated, disconnect all parts of the electronics module from the power supply before performing any inspection, maintenance or repair work. Then first test the disconnected components to ensure they do not carry any voltage.

Never use corrosive cleaning agents (e.g. spirit, scouring agents)! We recommend that you use a moist cloth with a neutral household cleaning agent.

2.5 Warranty conditions

The following must be observed for compliance with warranty conditions:

- Installation and commissioning by the manufacturer or trained and authorized specialist personnel, e.g. from contracted companies
- Intended use
- Observation of the operational parameters and settings
- The unit may only be operated by trained personnel
- An operating log book must be kept (only in the public sector)
- Only approved calibration chemicals may be used
- The unit must not be exposed to frost.
- The prescribed maintenance work must be carried out
- Use of original spare parts

If any of the above conditions are not met, the warranty is void.

3. Description

3.1 General

The DEPOLOX® Pool Compact comprises a flow cell (module type D02) and an electronics module (module type E02). The electronics module, together with the flow cell and the installed sensors, measures and controls the auxiliary hygiene parameters free chlorine, pH value, ORP (Redox) voltage and temperature (depending on the scope of delivery).

As a rule, the water in swimming pools is disinfected by adding chlorine, sodium hypochlorite or non-organic chlorine compounds. Precise dosing is of vital importance here, as disinfection may not be successful if the concentration is too low, whereas excessively high concentrations can lead to odor contamination, corrosion and damage to pipework.

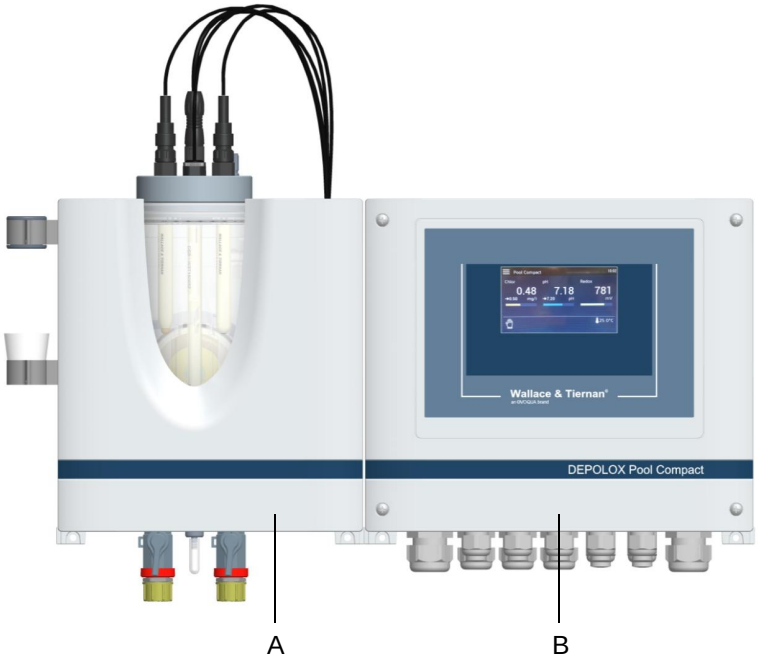


Image 1 DEPOLOX® Pool Compact with sensors

A Flow cell with sensors
B Electronics module

The DEPOLOX® Pool Compact complies with the following standards:

- DIN 19643 “Treatment of water of swimming pools and baths”
- OENORM M 5872 “Equipment of water treatment plants for swimming pools with measuring and control instruments”

Please note

The addition and presence of so-called “chlorine stabilizers” (isocyanurates) in the pool water, e.g. in public outdoor swimming pools, disturbs chlorine measurement. Chloroisocyanurates are also sold as “organic chlorine products” in the form of fully soluble granulate or poorly soluble tablets. These products are not approved for the disinfection of the water in swimming pools and baths as defined by DIN 19643. A dosing system controlled by the measurement of excess chlorine can only be operated with these products if the hydrolysis balance, i.e. the concentration of isocyanuric acid, is taken into consideration. If hydrolysis of these organic chlorination agents is incomplete, only the chlorine released by hydrolysis is detected by the chlorine electrode and not the entire quantity (in accordance with the DPD method).

As a result of the integrated process management, the following functions can be realized:

- Measurement of the hygiene parameters and control
- Dosing of disinfectants
- Correction of the pH value
- Limit value monitoring
- Data transfer to higher-level systems
- Integrated safety functions

3.2 Versions

The DEPOLOX® Pool Compact is available as a complete system in the following four versions:

Part No.	Description
W3T391852	DEPOLOX® Pool Compact for measurement of free chlorine and pH value
W3T391853	DEPOLOX® Pool Compact for measurement of free chlorine and pH value with 4-way mA output card
W3T391854	DEPOLOX® Pool Compact for measurement of free chlorine, pH value and ORP voltage
W3T391855	DEPOLOX® Pool Compact for measurement of free chlorine, pH value and ORP voltage with 4-way mA output card

The DEPOLOX® Pool Compact can be expanded at any time later:

Part No.	Description
W3T391868	Sensor measuring module ORP comprising: ORP sensor card, ORP sensor, sensor cable and calibration solution
W3T391865	4-way mA output card A 4-way mA output card is required for data registration and transfer.

3.3 Optional accessories

The following optional accessories are available:

- Mounting plate with accessories

  For simple mounting of the flow cell and electronics module, strainer and up to four hose dosing pumps.

- Impedance converter

  In cases where the sensor cable is not long enough and an extension is required, one impedance converter must be screwed onto the pH sensor and one onto the ORP sensor. The impedance converter converts the very high-resistance sensor signal into a low-resistance signal. The impedance converter is supplied by a built-in battery with a battery service life of approximately 5 years. At the end of this time, the impedance converter should be returned to Evoqua Water Technologies GmbH Günzburg for replacement of the battery.

- Extension cable for sensors

  If the flow cell and electronics module are mounted in separate locations, the use of sensor extension cables is required.

- Strainer

  To protect the flow cell module against contamination, an external strainer with a mesh width of 0.5 mm should be provided on the sample water inlet.

- Booster pump

  If the admission pressure is below 0.25 bar, a booster pump must be used.

- Pressure reducing valve

  If the admission pressure exceeds 3.0 bar, a pressure reducing valve must be used.

- Hose and hose connection

  PVC or PE version

Please note

For order numbers, see Chapter 8. “Spare parts, accessories and retrofit kits”.

3.4 Flow cell

3.4.1 Design

The structure of the flow cell (module type D02) is as follows:

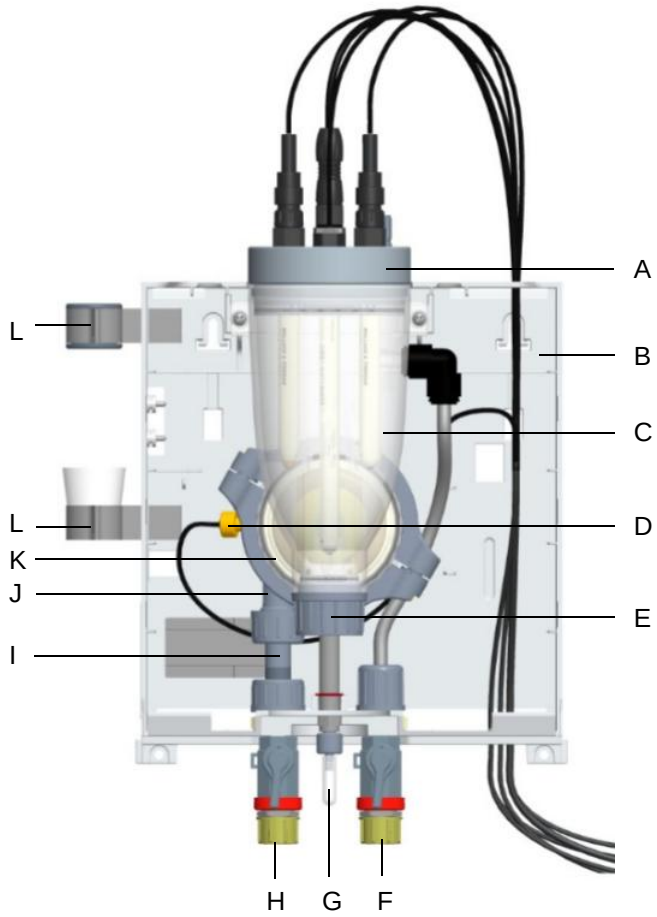


Image 2 Flow cell (without housing cover)

A Cover to hold the sensors and LED glow stick
B Plastic housing with removable housing cover
C Cell body
D Multi-sensor
E Flow distributor cap
F Sample water outlet with ball valve
G Sample extraction unit (drain)
H Sample water inlet with ball valve
I Filter unit without fine filter
J Check valve housing
K Flow control valve
L Calibration holding clips

3.4.2 Function

The following section describes the functional principle of the flow cell from the sample water inlet to the sample water outlet (see Image 2 on page19).

Sample water inlet The sample water supply is connected on the input side via the G1/2" connection to the ball valve (H). The input pressure must be around 0.25 to 3.0 bar. To guarantee a constant flow, the minimum input pressure must not be less than 0.25 bar. If the pressure is lower, an optional booster pump must be used. If the admission pressure exceeds 3.0 bar, an optional pressure reducing valve must be used.

Strainer (optional) The sample water flows over the strainer, which prevents dirt particles penetrating into the flow cell module.

Check valve housing In the direction of flow, the sample water flows via the filter unit to the check valve housing (J). The check valve housing offers a non-return function and guides the ball for flow rate monitoring.

Multi-sensor The multi-sensor (D) monitors the correct flow following the float principle with reed switch and records the temperature with a Pt1000 sensor. Large-area sample water earthing is via the stainless steel sensor housing.

Flow control valve The flow control valve (K) ensures a flow of the sample water that is not dependent on the operating pressure. The correct sample water flow of 33 l/h is preset, checked and documented at the factory. If the admission pressure rises, the valve ball moves toward the closing direction, if the admission pressure drops, the ball moves toward the opening direction.

Cell body The clear cell body (C), which can be illuminated, holds the sensors and due to its design, offers good cleaning and service options. The sensors are installed in the mount hole in the cell body cover (A) with standardized threaded connections or in special sensor holders. The LED glow stick is installed in the cell body cover to visually monitor the sensors, sand cleaning and to signal messages and errors in color.

The flow distributor cap screwed into the cell body from the bottom allows continuous hydro-mechanical cleaning of the electrode of the chlorine sensor using special cleaning sand and thereby effectively prevents the natural contamination of the electrode surfaces. Clean electrode surfaces and a constant flow of sample water are decisive criteria for high-quality chlorine measurement and quick responsiveness.

Sample water outlet The sample water supply is connected on the output side via the G1/2" connection to ball valve (F). At this point, a maximum back pressure of 1.5 bar is permitted.

Sample extraction unit (drain)

A sample extraction unit (G) is provided for calibration. It is used to draw sample water from the cell body through the low-pressure side of the flow control valve or to drain the cell body for servicing purposes.

Calibration holding clips

Two calibration holding clips (L) are attached in the cover of the flow cell. For “hands-free” calibration of the sensors with buffer solution or calibration solution (bag or beaker), the two calibration holding clips are pushed into the side of the basic housing at the back.

3.5 Sensors

The sensors are screwed into the cover of the flow cell and connected to the electronics module.

3.5.1 Chlorine sensor

The chlorine sensor consists of a amperometric 3-electrode systems with potentiostatic connection. The free chlorine reacts at the working electrode (cathode) and a current proportional to the chlorine concentration is measured.

The chlorine sensor consists of the measurement or working electrode, the counter electrode and a reference electrode. The potentiostatic connection maintains the potential between working electrode and reference electrode at the level necessary for the reaction. The current flows via the counter electrode. This measurement method ensures a precise and reproducible reading and a stable zero point.

The reference electrode is a silver/silver chloride electrode (Ag/AgCl) that remains de-energized. The electrolyte is a potassium chloride solution (KCl = 3 mol/l). A plastic membrane permeable for the electrolyte provides the electrical connection to the measuring solution.

Direct contact with the sample water to be examined can lead to inactivation of the electrode surfaces as a result of dirt deposits or electrochemical side reactions. The flow of sample water in the flow cell ensures continuous cleaning of the electrodes with a special cleaning sand. Turbulence ensures constant contact of the cleaning particles with the surfaces of the electrodes and keeps them free of contamination.

In as-delivered status, the chlorine sensor is equipped with a watering cap over the electrodes and the membrane. It contains diluted potassium chlorine solution which keeps the membrane moistened, ensuring that the chlorine sensor is ready for immediate use. When the chlorine sensor is not in use, for example during the winter, we recommend fitting the watering cap, filled with diluted potassium chloride solution.

3.5.2 pH sensor

The pH sensor consists of a pH combination electrode. The glass electrode is the most powerful sensor for pH measurement, with a working range that covers almost the entire pH spectrum.

The pH-sensitive element is the membrane made of special silicate glass, a rounded tip at the lower end of the pH sensor. The reference electrode is a silver/silver chloride electrode (Ag/AgCl) and, together with the pH electrode, forms the measuring chain. The reference electrode is the stable electrical reference point for voltage measurement.

The electrolyte is a concentrated potassium chloride solution (KCl = 3 mol/l). As the chloride concentration of the electrolyte remains almost constant, the potential of the reference electrode is also constant. Salt rings as an additional salt depot further increase the service life of the pH sensor.

A ceramic membrane permeable for the electrolyte provides the electrical connection to the measuring solution. This ceramic membrane is particularly suitable for the treatment of drinking water and water in swimming pools and baths, as the electrolyte can only flow slowly through the pores of the ceramic pin, thus ensuring very long service life for the entire measuring chain.

The pH sensor is installed in an electrolyte container with diluted electrolyte which protects the sensitive membrane, keeps the membrane moist and thus ensures that the measuring cell is ready for immediate use. When the pH sensor is not in use, for example during the winter, we recommend storing it in the transport container in diluted electrolyte.

3.5.3 ORP sensor

The ORP sensor consists of a ORP combination electrode. The ORP sensor consists of a glass shaft with a platinum or gold tip fused into its lower end.

Together with a silver/silver chloride electrode (Ag/AgCl) as a reference electrode, it forms a measuring chain. The task of the reference electrode is to provide a constant potential during potentiometric measurements. This potential is measured against the potential of the metal electrode.

The electrolyte is a concentrated potassium chloride solution (KCl = 3 mol/l). As the chloride concentration of the electrolyte remains almost constant, the potential of the reference electrode is also constant. Salt rings as an additional salt depot further increase the service life of the ORP sensor.

A ceramic membrane permeable for the electrolyte provides the electrical connection to the measuring solution. This ceramic membrane is particularly suitable for the treatment of drinking water and water in swimming pools and baths, as the electrolyte can only flow slowly through the pores of the ceramic pin, thus ensuring very long service life for the entire measuring chain.

The ORP sensor is installed in an electrolyte container with diluted electrolyte which protects the sensitive membrane, keeps the membrane moist and thus ensures that the measuring cell is ready for immediate use. When the ORP sensor is not in use, for example during the winter, we recommend storing it in the transport container in diluted electrolyte.

The following reference values apply for quick and complete disinfection of the water in swimming pools and baths:

Fresh water	pH 6.5 – 7.3	UG > 750 mV
	pH 7.3 – 7.6	UG > 770 mV

3.6 Electronics module

3.6.1 Design

The electronics module (module type E02) essentially consists of:

- Plastic housing with removable housing cover
- Motherboard with power supply, terminal strips, electronic components and relays
- Touchscreen
- Cable terminal screws

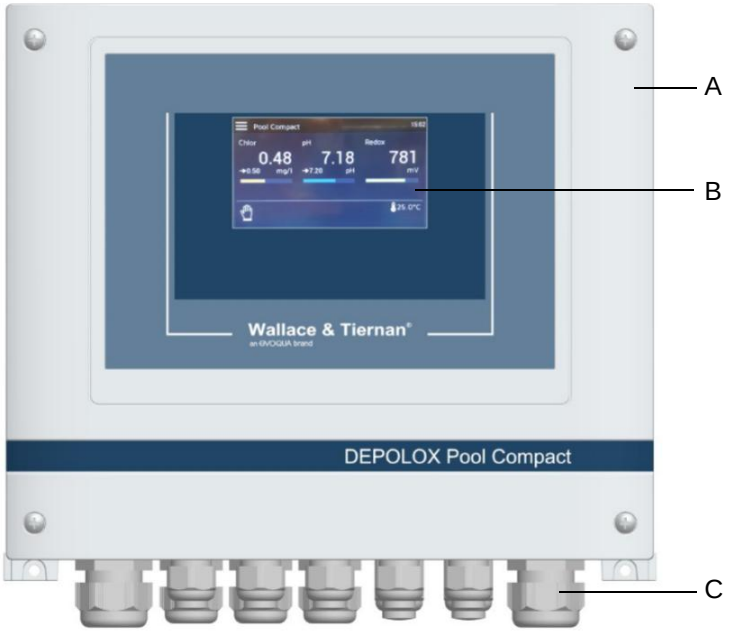


Image 3 Electronics module

A Plastic housing
B Touchscreen/display
C Cable terminal screws

3.6.2 Functions

The DEPOLOX® Pool Compact is used for measurement and control of auxiliary hygiene parameters in swimming pool and swimming baths applications.

Examples of typical applications are:

- Measurement and control of chlorine, pH and ORP (Redox) in the swimming pool
- Actuation of dosing pumps or chlorine gas metering systems
- Monitoring and raising of alarm if limit values exceeded
- Data visualization
- Data transfer to higher-level systems

Potential process measurements include:

- Free chlorine
- pH value
- ORP voltage
- Temperature

The color touchscreen shows the following:

- Measured values
- Operation mode and switching states
- Display of limit values
- Setpoint and measurement range
- Customer-specific measuring point designation
- Messages and errors
- Date/Time

The menus are used by means of direct entry on the display or by touching the display.

There are 4 mA outputs (optional), an RS485 interface and an Ethernet interface available for connection to visualization systems.

3.6.3 Controller outputs

The DEPOLOX® Pool Compact is equipped with an integrated controller for the chlorine value and a controller for the pH value. The chlorine value is held constant at the setpoint using PI single feedback closed-loop control. The pH value is held constant at the setpoint using proportional control. The following controller outputs are supported:

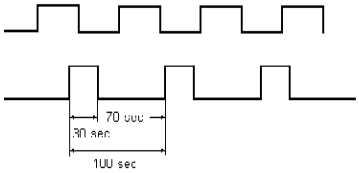
Controller for	Type	Parameter designation	Action
Positioner without feedback	3-point	Positioner wo. Ym	Dosing Cl_2 pH correction ↑
Motor dosing pump (pulse-duration controller)	2-point	Dosing pump 2P	Dosing Cl_2 pH correction ↓ or pH↑
2 motor dosing pumps (pulse-duration controllers)	3-point	Dosing pump 3P	pH correction ↓ and pH↑
Solenoid pump (pulse-frequency controller)	2-point	Solenoid pump 2P	Dosing Cl_2 pH correction ↓ or pH↑
2 solenoid pumps (pulse-frequency controllers)	3-point	Solenoid pump 3P	pH correction ↓ and pH ↑

Positioner without feedback

With the selection of the integrated controller for "positioner", for example, it is possible to use chlorine overfeed control in connection with a positioner as an actuator of a chlorine gas dosing system.

2-point pulse-duration controller for dosing pumps

The dosing pump is switched on for the calculated time within an adjustable cycle period Tp (relay contact).
The cycle period is mainly determined by the reaction time of the connected system and entered as the cycle period Tp.



Example:

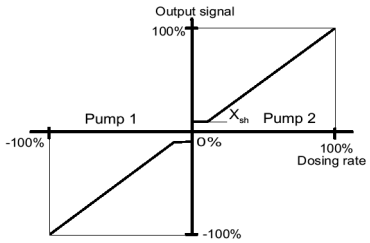
Cycle period Tp	=	100 s
Output value Yout	=	30 %
=> Duty cycle		30 s
Off-duty cycle		70 s

2-point pulse-frequency controller for solenoid pumps

Solenoid pumps are controlled with 0 to 100/120/140/160/180 pulses per minute, depending on the specification of the connected pump. The duty cycle during each dosing is 0.3 s. The pause time is calculated to be between 0.2 s and 60 s, depending on the dosing rate.
Example of a solenoid pump at 120 pulses/min:

Yout in %	100...	84...	72...	56	50...	33...	25...	10...	5...	1	0
Pulses/min	120...	96...	85...	75	60...	40...	30...	12...	6...	1	0

3-point pulse-duration controller for dosing pump and 3-point pulse-frequency controller for solenoid pump



Pump 1 decreases the control value,
Pump 2 increases the control value.

The control range is between –100 % (Pump 1) and +100 % (Pump 2); this range can also be set in manual mode.

If the setpoint = actual value, no pump is activated (neutral zone Xsh).

Output signals as for 2 point pulse-duration controller and 2-point pulse-frequency controller.

Dosing contact

A dosing contact can be used to actuate electrolysis systems for chlorine dosing. A special controller is required to drive these systems in order to prevent frequent switching on or off (reason: start-up time of electrolysis systems).
The contact is enabled or disabled within the set control parameters.
If the entered setpoint minus hysteresis (e.g. 0.20 mg/l) is not reached, the controller output switches on for at least the minimum duty cycle. The controller output remains switched on as long as the setpoint is not reached.
If the setpoint is exceeded, the controller output switches off immediately (provided that the minimum duty cycle has elapsed). Renewed activation if the value is below the setpoint hysteresis is only possible when the minimum off-duty cycle has elapsed.

Please note

In manual mode, the minimum duty cycle and the minimum off-duty cycle are ignored!
For dosing contact, there is no monitoring of the max. dosing time.

Controller STOP function

When the controller Stop function is active, all controller outputs are switched off (positioner closed, dosing pump off, solenoid pumps off, dosing contact off).
Controller Stop is triggered by the digital inputs, e.g. by sample water Stop, circulation off, external Stop.

Standby function

When the Standby function is active, all controller outputs are switched off (positioner closed, dosing pump off, solenoid pumps off, dosing contact off). The function is triggered by the digital input function Standby, which is used when circulation is switched off and no sample water is flowing through the flow cell over an extended period. The measured value display is hidden during Standby.

3.6.4 Control parameters

Control parameters are setting values used to determine the control response of a controller. Different parameters apply depending on the type of controller. Depending on the selection, the different settings menus are displayed.

Please note

The control parameters are listed alphabetically.

Max. pulses/min

Maximum number of pulses	
Description	The max. pulses/min parameter only applies to solenoid pumps. This parameter is used to set the maximum number of pulses per minute in accordance with the pump used.
Setting range	The parameter Max. pulses/min can be set to 100/120/140/160/180.

Setpoint

Setpoint	
Description	Specified value at which the control value (chlorine, pH) can be maintained by the controller.
Setting range	The setting range corresponds to the respective measuring range.

Tn

Integral action time (I-element) of the PI controller	
Unit	Minutes (min)
Description	On the basis of the integral action time Tn, the dosing rate changes constantly until the setpoint is reached. The higher the value of Tn, the longer it takes until the controller increases the dosing rate. Tn higher: Control response is slower Tn lower: Control response is faster
Setting range	The parameter Tn can be set from 0 to 100 min (Tn = 0 means that the "I-element" is deactivated, i.e. a pure P-control response applies). It may not be possible to reach the setpoint value.

Tp

Cycle period	
Unit	Seconds (s)
Description	The parameter Tp only applies to dosing pumps. The cycle period Tp defines a switching period, which must be coordinated with the respective pump type.
Setting range	The parameter Tp can be set between 10 and 180 s.

Example:
Fast dosing pumps can be actuated by a low Tp, slow dosing pumps can be actuated by a high Tp.

The control parameter Tp must always be adjusted to suit the dosing pump used:

Dosing pump	up to 20 strokes/min	20 to 40 strokes/min	40 to 80 strokes/min	80 to 125 strokes/min	125 to 200 strokes/min
Tp value	120	100	60	30	15

Ts

Loop rise time	
Unit	Minutes (min)
Description	Time required to reach the end value of the measuring range with 100 % dosing rate. This time is defined automatically by the system for automatic tuning, but it can also be entered manually.
Setting range	The parameter Ts can be set between 1.0 and 480.0 min.

Tu

Loop dead time	
Unit	Minutes (min)
Description	Time required between start of dosing and clear recognition of an increase in the measured value. This time is defined automatically by the system for automatic tuning, but it can also be entered manually.
Setting range	The parameter Tu can be set between 1.0 and 60 min.

Please note

If the Tu and Ts values are modified manually, the control parameters Xp and Tn are re-calculated.

Ty

Running time of the positioner	
Unit	Seconds (s)
Description	The parameter Ty only applies to positioners. Ty is the time the positioner requires to adjust from 0 % to 100 %.
Setting range	The parameter Ty can be set between 10 and 180 s.

Control direc.

Control direction	
Unit	Acid / Alkali for pH control
Description	Defines which medium is used to perform the correction. Only for 2-point control for pH

Example:

pH	for control direction "Acid"	Lower pH value when adding acid

Xp

Proportional factor of the PI controller	
Unit	Percentage (%) with factor
Description	The control amplification is determined by means of the proportional factor. The lower the proportional factor Xp is selected in %, the greater the deviation from the setpoint is amplified, and the more quickly the controller attempts to control the deviation from the setpoint. The control amplification factor is calculated using the following equation: Factor = (1/Xp) x 100 %
Setting range	The parameter Xp can be set from 1 % (factor 100) to 1000 % (factor 0.1).

Xsh

Neutral zone	
Unit	Percentage (%)
Description	The parameter Xsh only applies to 3-point controllers. There is no control output within the neutral zone.
Setting range	The parameter Xsh can be set from 1 to 5 % (based on the measuring range).

3.6.5 Alarms

The DEPOLOX® Pool Compact supports up to eight freely configurable alarms. The alarms are output optionally via relay contacts and the color display. At the same time, a message is displayed in the message window. The number of available relays depends on the configuration. A minimum of two alarm relays and a maximum of six alarm relays are possible, depending on the dosing outputs used. The alarm relays can be used, for example, for Cl2 feed lockout activated of dosing when specific values are exceeded or not reached:

Each alarm can be assigned the following functions:

Limit value Min 1 Limit value Min 2	=>	all measuring values can be selected individually (Cl_2, pH, mV, Temperature)
Limit value Max 1 Limit value Max 2	=>	all measuring values can be selected individually (Cl_2, pH, mV, Temperature)
Digital inputs	=>	1 to 5 can be selected individually
Error		

Unlatched alarm without acknowledgment option

- The alarm symbol and the message light up in the event of an alarm and go out automatically when the condition is eliminated.
- The same applies to the relay.

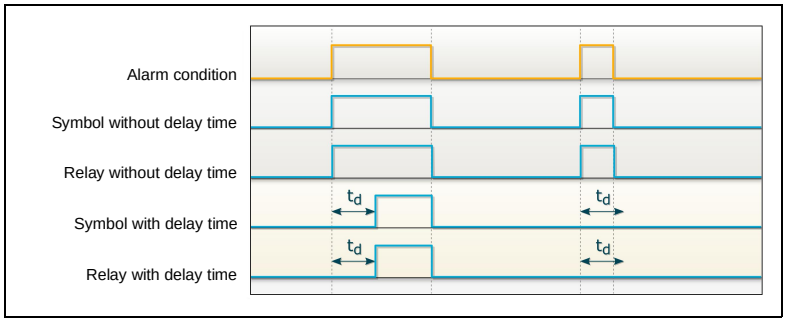


Image 4 Unlatched alarm without acknowledgment option

Latched alarm with reset acknowledgment option

- In the event of an alarm, the symbol and the message flash until the alarm is acknowledged.
- The alarm symbol and the message also go out even if the conditions still apply when the alarm is acknowledged.
- The relay becomes active even if the condition is still pending.

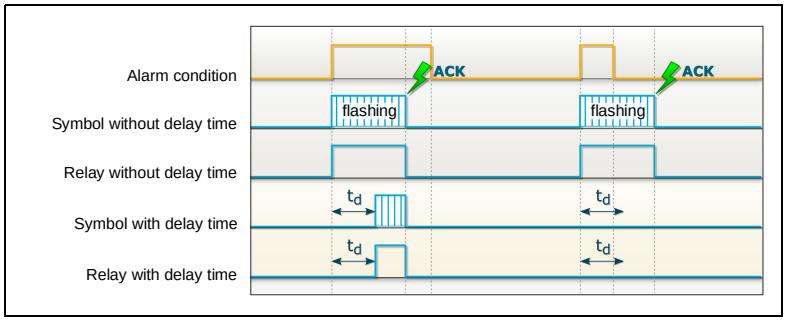


Image 5 Latched alarm with reset acknowledgment option

Latched alarm with confirmation (acknowledgment option)

- In the event of an alarm, the symbol and the message flash until the alarm is acknowledged.
- If the condition is no longer present when the alarm is acknowledged, the alarm symbol goes out and the message disappears.
- If the condition is still present when the alarm is acknowledged, the alarm symbol and the message are reset from flashing to a permanent state. The alarm symbol and the message light up until the condition is eliminated (auto-reset).
- The relay is only deactivated when the condition has been eliminated.

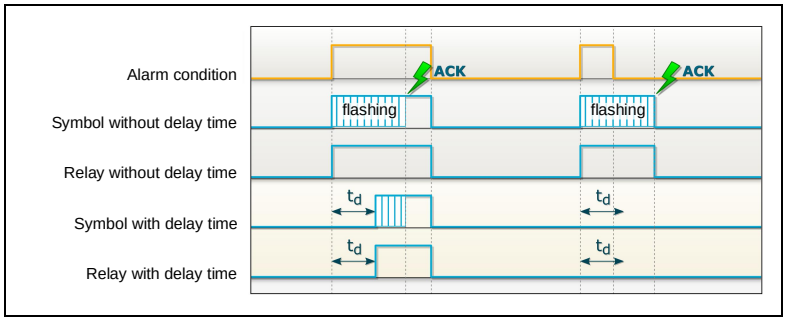
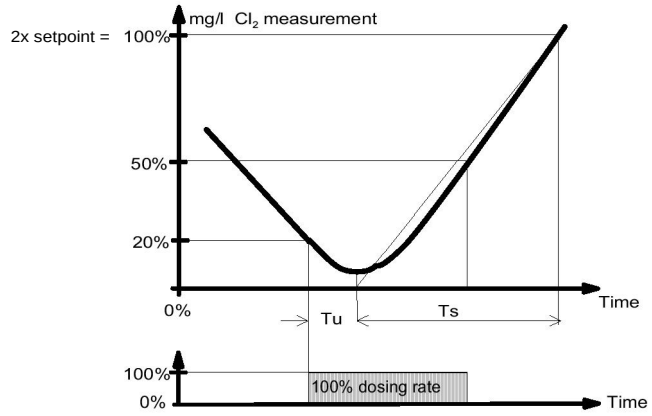


Image 6 Latched alarm with confirmation (acknowledgment option)

3.6.6 Auto tune (only applies to free chlorine)

The DEPOLOX® Pool Compact is equipped with an Auto tune function to facilitate commissioning and optimize operation. The Auto tune program automatically determines the control parameters XP and Tn for free chlorine control.



Please note

The control parameters Xp and Tn determined by the Auto tune program must be considered as a recommendation for first commissioning!
The control parameters Xp and Tn can be optimized manually to ensure maximum control quality.

Requirements

The following requirements must be met:

- pH value stably controlled and at the setpoint.
- Positioner set to automatic (manual wheel engaged)
- Dosing pump set to automatic
- Calibrated chlorine measurement (zero point and DPD value)
- Loop dead time < 60 min
- Loop rise time < 480 min (8 h) for 0 to 100 % Measurement range
- Decomposition time < 480 min (8 h) of the current measuring value to 20 % of the 2x setpoint
- Correct menu setting of the end value, control direction (direct or inverse), actuator (e.g. positioner), positioner running time (Ty)

Auto tune must not be started:

- if a large volume of fresh water is being added
- if the measuring cell has not been run in
- during cleaning work
- during filter backwashing
- while the circulation changes
- during peak chlorination

Starting Auto tune

Proceed as follows:

Main menu
Measurement menu field “Chlorine”
Symbol „Settings menu”
AUTO TUNE

1 Switch to the main view.

2 Press the measurement menu field “Chlorine.”

3 Press the ⚙ symbol.

4 Press “Auto tune.” The loop parameters Tu and Ts are displayed.

5 Press the “Start” button. The current phase (13 in total) of Auto tune is displayed.

6 Confirm successful Auto tune with “Auto tune OK.”

7 Press the Home key to return to the main view.

Error message during Auto tune

If Auto tune is not successful, the error message “AUTO TUNE?" is displayed. The reason for this may be problems with the dosing system or loop times. Errors must be rectified in order to carry out the Auto tune function. See also “Completing Auto tune with errors” on page 36.

Auto tune sequence

Each Auto tune phase is now displayed with a status message:

Display text	Explanation
1: Initialization	Start
2: Control signal Ym = 0 %	Chlorinator to 0 % or dosing pump off
3: Wait for act. value X = 20 %	Delay until act. value < 0.2 x 2xsetpoint
4: Set control signal 100 %	Chlorinator to 100 % or dosing pump on
5: Wait for control signal 100 %	Wait until chlorinator reaches 100 %
6: Init. dead time measurement Tu	Start dead time measurement
7: Dead time measurement Tu	Measurement of the loop dead time Tu
8: Check dead time Tu	Plausibility enquiry dead time
9: Calculate initial values Ts	Start of rise time measurement
10: Measure rise time Ts	Measurement of the loop rise time Ts
11: Calculate parameter	Calculate control parameters
12: Set control signal Y = 0 %	Chlorinator to 0 % or dosing pump off
13: Wait for control signal 0 %	Wait until chlorinator reaches 0 %

Various status messages can be read off, depending on the selection of the actuator. Different status messages also have different execution times. Some status messages may only be displayed briefly or not at all if the execution time is very short.

Attention!

Auto tune can take up to 13 hours, depending on the control loop. During this time no errors should occur on the control loop (e.g. filter backwashing, changes in the circulation speed or widely fluctuating number of visitors to the pool).

Please note

The Auto tune procedure can be terminated at any time with “ABORT.” The previously set parameters remain unchanged.

Completing Auto tune without errors

When the loop times (dead time Tu and rise time Ts) have been completed without error, calculation of the control parameters Xp and Tn commences. This is shown by “AUTO TUNE OK:”
The calculated parameters are entered in the menus. When Auto tune has been completed, the measuring amplifier adjusts with the newly calculated control parameters and continues in the selected operating mode (e.g. automatic).

To monitor the determined loop times, they are entered in the "Tu" and "Ts" menus.

If any errors in the control loop do occur during Auto tune (e.g. filter backwash or changes in the circulation speed), this may lead to incorrect loop times, resulting in the determination of incorrect control parameters.

Attention!

The remaining control parameters are not influenced when Auto tune is performed.

Completing Auto tune with errors

If errors occur in the control loop during Auto tune (e.g. filter backwashing, changes in the circulation speed or widely fluctuating number of visitors to the pool) or if the reaction times of the control loop are too long, Auto tune is interrupted.

Please note

If any of the error conditions described below occur, Auto tune is interrupted. The measuring amplifier displays a fault message. The original parameters Xp, Tn, Tu and Ts are not changed. The message must be acknowledged, the controller continues to operate with the previous settings.

Possible error conditions:

- Initial value not reached (display: “T = > 8h")

  When Auto tune has started and the dosing system has closed or the dosing pump has switched off, the measuring amplifier waits until the actual value has dropped below the initial value (0.2 x the measurement range value). This delay is indicated by “2: X = 20 %" on the display and must not exceed 8 hours.

- Loop dead time too long (display: “Tu = > 1h")

  The value determined by the time measurement between start-up of the dosing system, switch-on of the dosing pump and the rise of the actual value must not exceed 1 hour. This measured time is displayed by “6: Tu!” on the display.

- Loop rise time too long (display: “Ts = > 8h")

  The time required by the control loop to increase the actual value to 50 % of the measuring range at a 100 % dosing rate of the dosing system or the dosing pump. This measurement is indicated with “9: Ts!” on the display and must not take more than 4 hours.

Determination of the control parameters with known Tu and Ts times

If the loop times Tu and Ts are already known or if these cannot be determined automatically due to specific system conditions, the loop times can be entered in the “Tu” and “Ts” menus. When Tu or Ts are saved, the control parameters Xp and Tn are also calculated and entered in the menus.

3.6.7 Safety functions

The DEPOLOX® Pool Compact is equipped with various integrated safety functions to ensure system safety and minimize the risk of accidents. The following safety functions are integrated:

- Cl2 feed lockout activated if the circulation fails and/or if the dosing tank signals that it is empty and also if the sample water supply fails (depending on the configuration of the digital inputs)
- Maximum dosing time monitoring and the feed time delay (configurable)
- Alarms freely configurable
- External STOP for all controllers (depending on the configuration of the digital inputs)
- “Positioner closed” function in the event of a power failure (only if actuator has external power supply)
- If the pH value deviates too greatly from the pH setpoint, Cl2 feed lockout switches chlorine dosing off
- Password protection with three levels

3.6.8 Digital inputs

There are five integrated digital inputs on the CPU-board of the electronics module. They are provided for connection of voltage-free contacts (< 100 Ohm) and are supplied internally with 5 V.

Warning!

Do not apply voltages at the digital input terminals!

The functions of the digital inputs can be configured for the specific customer application in the "Input/Output" menu. Digital input 1 is used for sample water monitoring and cannot be changed.

Digital input DI 1

With the help of the voltage-free contact of the flow rate monitor on the flow fitting, the controllers can be influenced:

- Before expiry of the sample water monitoring delay time (0 to max. 10 min.):
  The chlorine dosing pump and the dosing pump for pH correction continue dosing at the same rate.
  The positioner remains unaffected.
  The symbol on the display flashes.
  Display:
- After expiry of the sample water monitoring delay time:
  The chlorine dosing pump and the dosing pump for pH correction are switched off.
  The positioner moves to 0 %.
  Display:
- Controller switch-off is only effective in automatic mode.

Digital input DI 2 to DI 5

Various functions can be assigned to the digital inputs. With the help of a voltage-free enabling contact, e.g. circulation off, the controllers can be stopped immediately:

- The chlorine dosing pump and the dosing pump for pH correction are switched off.
  The positioner moves to 0 %.
  Display: DI 2 (example)
- Controller switch-off is only effective in automatic mode.
- Empty signal contact of the chemical tank(s).
  The chlorine dosing pump and the dosing pump for pH correction are switched off.
  The positioner moves to 0 %.
  Display: DI 3 (example)
- Cl_2/pH tank monitoring
  If the Cl_2/pH tank monitoring is activated, DI 3 to DI 5 are used for connection of the chlorine and pH suction lances. At minimum fill level, a message is generated for each tank, and if one of the two tanks is empty, chlorine and pH dosing switches off.
- Standby function
  When the Standby function is activated, all controllers are switched off and dosing is deactivated. The alarms are disabled. Measured value displays are hidden. This function is used to switch off the measuring and control system when circulation and the sample water are switched off simultaneously.

Please note

When the contact closes, restart of the controller may be delayed due to the dosing delay time. In as-delivered status, the digital inputs are disabled. To activate the function, connect an external contact and configure the digital input in the menu. The digital inputs can also be assigned as alarms.

3.6.9 Relay outputs

The electronics module has a maximum of six relays, each with a changeover contact. These switches are assigned various switching tasks depending on the respective application.
The corresponding diagrams are defined in Chapter 9. “Wiring diagrams”. In order to switch larger capacitive loads, we recommend installing an additional switching element such as a contactor or load relay to guarantee longer service life for the contacts. For details of contact load capacity, see Chapter 3.7 “Technical data” - Relay outputs. To protect radio interference suppression, the relay contacts are protected internally by suppressor diodes. The relay contacts of the alarm or controller outputs are protected by fuses. They act as overcurrent limiters protecting the terminal and relay connections. The fuses are pluggable and replaceable (replacement fuses Type TR5 3,15AT, see Chapter 8. “Spare parts, accessories and retrofit kits”).

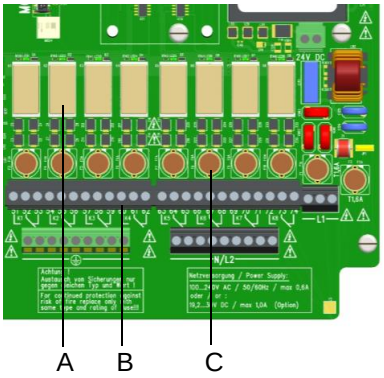


Image 7 Detail of PCB - relay outputs

A Relay
B Terminal strips
C Fuses

Please note

When using internal power (L1 and N/L2) for power supply of dosing machines or external devices the power consumption must not be higher than 6 A in total.

3.6.10 Interfaces

The following interfaces are available:

- USB interface
- RS485 interface
- Ethernet interface

Please note

The interfaces are described in detail in Chapter 4. “Interfaces”.

3.7 Technical data

3.7.1 Flow cell (module type D02)

Housing

Dimensions (WxHxD)	253 x 375 x 163 mm
Weight	approx. 2.5 kg

Connections

Pressurized version	Inlet and outlet: G 1/2” A thread connection

Flow control valve

Sample water flow	33 l/h, controlled, preset at the factory
Flow control range	0.25 to 3.0 bar
Back pressure	pressurized version: max. 1.5 bar

Multi-sensor

Switching point	21 l/h ±3 l/h
Switching hysteresis	2 l/h
Temperature sensor	Pt1000

Operating conditions

Water quality	Brine and pool water acc. to standard
Storage temperature	–20 to +70 °C

3.7.2 Electronics module (module type E02)

Housing

Dimensions (WxHxD)	320 x 311 x 153 mm
Weight	approx. 3.5 kg
Protection rating	IP66
Mains connection	100 to 240 V AC ± 10 % 50 to 60 Hz, 15 W

Display

4.3” graphic color display with LED backlighting and capacitive touchscreen behind shatterproof glass panel, resolution 480 x 272 pixels

Insulation

Overvoltage category	2
Contamination level	2
Protection category	1

Operating conditions

Ambient temperature	0 to 50 °C
Humidity	< 80 %, non-condensing
Environment	No direct sunlight
Atmospheric pressure	75 to 106 kPa
Max. working height (altitude)	2000 m
Storage temperature	–20 to +70 °C
Noise emission	<45 dB

Digital inputs of the electronics module

5x for voltage-free contact (internal 5 V power supply)	
Freely selectable function in menu	
When input open	DI active
When input closed	DI inactive

Measurement inputs

- Free chlorine for 3-electrode sensor (measuring range 0 ... max. 10 mg/l, end value can be set)
- pH value (measuring range pH 0 ... pH14, initial and end value can be set)
- ORP voltage (measuring range 0 ... max. 1000 mV, initial and end value can be set)
- Temperature (measuring range 0...50 °C/32...122 °F)

Relay outputs

6x changeover contact with integrated 3.15 A slow-blow fuse
5 A, 125/250V AC (contact load capacity of the relays in general use)
1/6 HP (122 VA) 125/250V AC
5 A, 30V DC (contact load capacity of the relays at resistive load)
30W max., 1 A, 30V DC – 0.24 A, 125V DC (inductive load)
B300

Please note

When connecting inductive or capacitive loads (e.g. load with integrated switching power supply), an additional power relay with suitable specification must be provided. Each relay output has an integrated 3.15 A fuse as overcurrent protection.
Typical use of relays: enable contact for dosing device, control of motors or dosing pumps.

Analog outputs

4-way mA output card 0/4 to 20 mA (optional)
Freely configurable signal assignment
Load max. 500 ohm, accuracy < 0.5 % FS
Galv. isolated up to 50 V relative to earth

Interfaces

RS485 interface with Wallace & Tiernan protocol for connection to ChemWeb server, OPC server, Process Monitoring System or control system for data visualization
Ethernet interface (HTTP protocol/Modbus TCP protocol)
USB interface for firmware update

3.7.3 Sensors

Chlorine sensor (free chlorine in platinum version - W3T160652)

Version	Amperometric 3-electrode sensor with platinum electrodes, salt reserve, zirconium dioxide diaphragm, polymerized solid electrolyte, Ag/AgCl reference electrode
Measurement range	0 to 50 mg/l Cl_2
Working temperature range	–5 to +80 °C (23 to 176 °F)
Operating pressure	0 to 6 bar (6 x 10^5 Pa)
Minimum conductivity of the sample water	50 µS/cm
Installation length	165 mm
Screw-in thread	PG 13.5
Storage temperature	–5 to +30 °C (23 to 86 °F)

Chlorine sensor (free chlorine in gold version - W3T160991)

Version	Amperometric 3-electrode sensor with gold electrodes, salt reserve, zirconium dioxide diaphragm, polymerized solid electrolyte, Ag/AgCl reference electrode
Measurement range	0 to 50 mg/l Cl_2
Working temperature range	–5 to +80 °C (23 to 176 °F)
Operating pressure	0 to 6 bar (6 x 10^5 Pa)
Minimum conductivity of the sample water	50 µS/cm
Installation length	165 mm
Screw-in thread	PG 13.5
Storage temperature	–5 to +30 °C (23 to 86 °F)

Please note

When disinfecting with inline electrolysis systems or hydrogen drainage into the pool water, the gold version of the chlorine sensor must be used.

pH sensor (W3T169297)

Version	combination electrode with universal membrane glass, salt reserve, zirconium dioxide diaphragm, polymerized solid electrolyte, Ag/AgCl reference electrode
Measurement range	pH 0 to 12 (temporarily to pH 14)
Working temperature range	–5 to +80 °C (23 to 176 °F)
Operating pressure	0 to 6 bar (6 x 10^5 Pa)
Minimum conductivity of the sample water	50 µS/cm
Installation length	120 mm
Screw-in thread	PG 13.5
Storage temperature	–5 to +30 °C (23 to 86 °F)

ORP sensor (platinum version - W3T169298)

Version	combination electrode with platinum electrode, salt reserve, zirconium dioxide diaphragm, polymerized solid electrolyte, Ag/AgCl reference electrode
Measurement range	±2000 mV
Working temperature range	–5 to +80 °C (23 to 176 °F)
Operating pressure	0 to 6 bar (6 x 10^5 Pa)
Minimum conductivity of the sample water	50 µS/cm
Installation length	120 mm
Screw-in thread	PG 13.5
Storage temperature	–5 to +30 °C (23 to 86 °F)

ORP sensor (gold version - W3T172356)

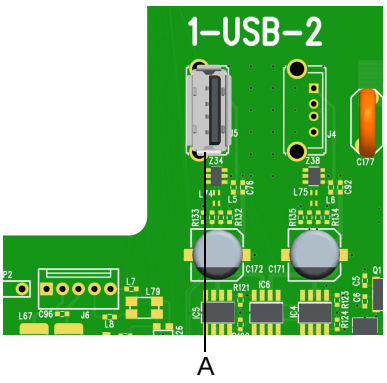
Version	combination electrode with gold electrode, salt reserve, zirconium dioxide diaphragm, polymerized solid electrolyte, Ag/AgCl reference electrode
Measurement range	±2000 mV
Working temperature range	–5 to +80 °C (23 to 176 °F)
Operating pressure	0 to 6 bar (6 x 10^5 Pa)
Minimum conductivity of the sample water	50 µS/cm
Installation length	120 mm
Screw-in thread	PG 13.5
Storage temperature	–5 to +30 °C (23 to 86 °F)

Please note

When disinfecting with inline electrolysis systems or hydrogen drainage into the pool water, the gold version of the ORP sensor must be used.

4. Interfaces

4.1 USB interface

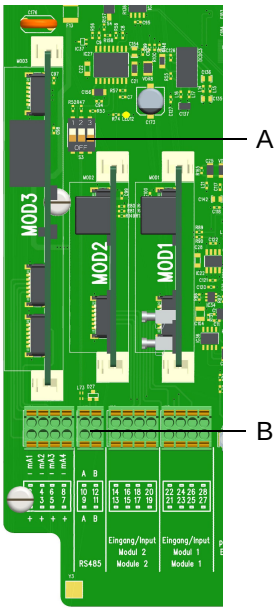


The electronics module is equipped internally with a USB interface. It is used to update the firmware via USB stick (see Chapter 6.5 “Firmware update”).

Image 1 Detail of PCB - USB interface

A USB interface

4.2 RS485 interface



The RS485 interface is used for data transfer to higher-level control systems such as the Process Monitoring system or other systems that support the Wallace & Tiernan RS485 protocol. For more detailed information, please refer to the instruction manual “RS485 interface.” You can request this instruction manual from your affiliate or download it from our homepage, www.evoqua.com.

The RS485 interface is electrically isolated. It has four integrated terminals, a terminating resistor R_t and balancing resistors R_u and R_d for incorporation into a Wallace & Tiernan bus system.

Image 2 Detail of PCB - RS385 interface

A DIP switch for activating the balancing resistors R_t (middle), R_u (left) and R_d (right)
B Terminals, RS485 interface

Please note

For installation at the end of the bus, the dip switch R_t must be activated (position ON). For installation in the middle of the RS485 bus, R_t must be set to OFF.

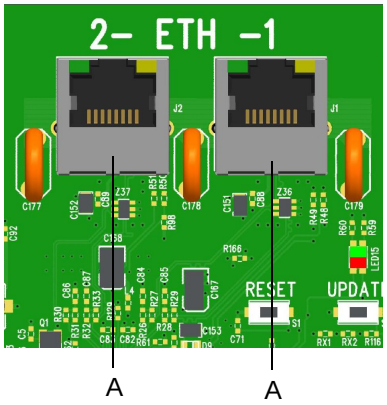
A shielded, twisted 2-wire cable (twisted pair) with a wire cross-section of at least 0.22 m^2 (e.g. Li2YCY(TP) 2x0.22 mm² - Item No. W2T505559) must be used as the transfer medium.
The shielding improves the electromagnetic compatibility (EMC).
The bus cable is always wired as a bus from device to device.
Any stub cable to the bus device must not exceed a length of 0.3 m.

Please note

Longer branch-offs in the bus cable are not permissible!

The characteristic impedance of the cable must be between 100 ohms and 130 ohms, the cable capacity if possible < 60 pF/m and the wire cross-section at 0.22 mm² (24 AWG). We recommend the cable W2T505559 - Li2YCY(TP) 2 x 0.22 mm².

4.3 Ethernet interface



The DEPOLOX® Pool Compact has two integrated Ethernet interfaces (ETH 1 and ETH 2). They are connected internally via an Ethernet switch. The device has an MAC address. The MAC address is displayed in the menu “Settings - Connections - Network.” The installed LAN interface allows data visualization via Internet-capable devices and HTTP protocol or standard browser. The LAN interface also supports data communication via the Modbus TCP protocol, see Chapter 4.4 “Modbus TCP interface”.

Image 3 Detail of PCB - Ethernet interface

A Ethernet connections

Visualization and operation are effected via the web pages integrated in the DEPOLOX® Pool Compact. Wireless access via mobile devices such as tablet computers or smartphones is possible by installing a wireless router on-site and connecting it to the DEPOLOX® Pool Compact. The Ethernet- interface supports a transmission rate of 10 or 100 Mbit/s. There are two integrated Ethernet connections. The integrated 2-port switch replaces additional external switch assemblies.

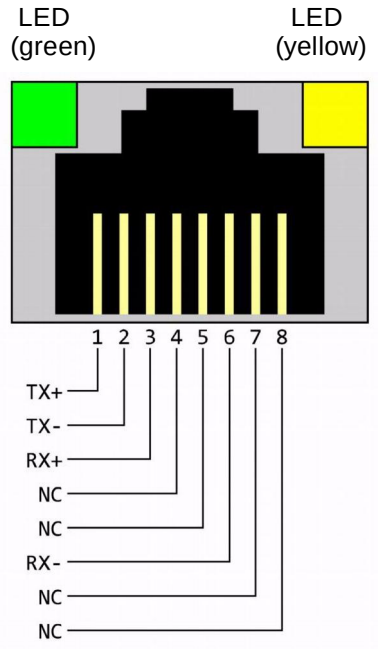
Connection is via a standard Ethernet connection cable.
Two special M25 cable connections with slit rubber seals and larger grommets are installed to allow the use of pre-terminated Ethernet cables with connectors. The Ethernet connectors can be inserted through these fittings. For Ethernet connection, see “Configuring direct network connection” on page 50.

Please note

This instruction manual does not cover installation and commissioning in combination with routers or wireless routers. Responsibility for this lies with the operator.

Please note

For security reasons, access to the device should only be granted to authorized personnel. Permanent, unsafe connections via the Internet or WLAN are not permitted. Safe connections can, for example, be set up via a VPN-secured communication channel or an encoded WLAN connection. The DEPOLOX® Pool Compact only supports the unencrypted communication protocol “http” and is designed for operation within an Intranet (closed network). Please observe Chapter 2.2 “General safety instructions”, section “IT safety.“



The Ethernet connection is designed in accordance with IEEE 802.3. There are two I8P8C sockets (often referred to as RJ45 sockets) installed. Connection to the HUB or switch can be realized with a 1:1-wire and screened patch cable. Direct connection to a PC network card is possible using a patch cable (1:1) or a crossover cable (crossed network cable). The LEDs are fitted in the 8P8C socket. They display the interface statuses. The meaning of the LEDS is as follows:

Green: lights up	Ethernet connection established
Green: flashes	Data being transferred
Yellow: off	10 Base-T
Yellow: lights up	100 Base-T

The connection runs in Auto negotiation mode. The data transfer rate and full or half duplex are defined automatically with the connected switch/HUB.

The adjacent drawing shows the RJ45 terminal assignment.

4.3.1 Ethernet configuration

The DEPOLOX® Pool Compact is delivered with a fixed IP address, i.e. The device can only be addressed via a fixed IP address.

The Ethernet settings of the electronics module can be configured via the menu. The customer-specific IP address and the subnet mask can be entered. To do so, contact the network administrator if the DEPOLOX® Pool Compact is being integrated in a network. The MAC address is also displayed in the Network menu.

A direct Ethernet connection line to a PC or laptop computer must be installed for data visualization via Internet browser and an Internet-capable device. See Chapter 4.3.2 “Configuring direct network connection”.

IP address (factory setting)	192.168.200.11
Subnet mask	255.255.255.0

4.3.2 Configuring direct network connection

The network cable provided is always used to set up a direct network connection between a PC or laptop computer with Ethernet interface (10/100 MB/sec) and the DEPOLOX® Pool Compact. A direct connection is a precondition for initial commissioning.

Proceed as follows:

1. Using a network cable, connect the electronics module to a PC or laptop computer.
2. Assign a fixed IP address and subnet mask to the PC or laptop (see next chapter).

   Only then is a data connection set up under the factory-defined network settings.

Please note

The DEPOLOX® Pool Compact and the PC or laptop computer must always have the same subnet mask and an IP address in the same IP address range. The IP address must not be identical.

Example:

	DEPOLOX® Pool Compact	Laptop or PC
IP address	192.168.200.11 (factory setting)	192.168.200.1
Subnet mask	255.255.255.0 (factory setting)	255.255.255.0
Gateway	0.0.0.0 (factory setting)	

3 Start the browser, e.g. Firefox or Internet Explorer and enter the IP address “http://192.168.200.11/“ (factory setting).

After successful connection, the start screen of the DEPOLOX® Pool Compact appears.

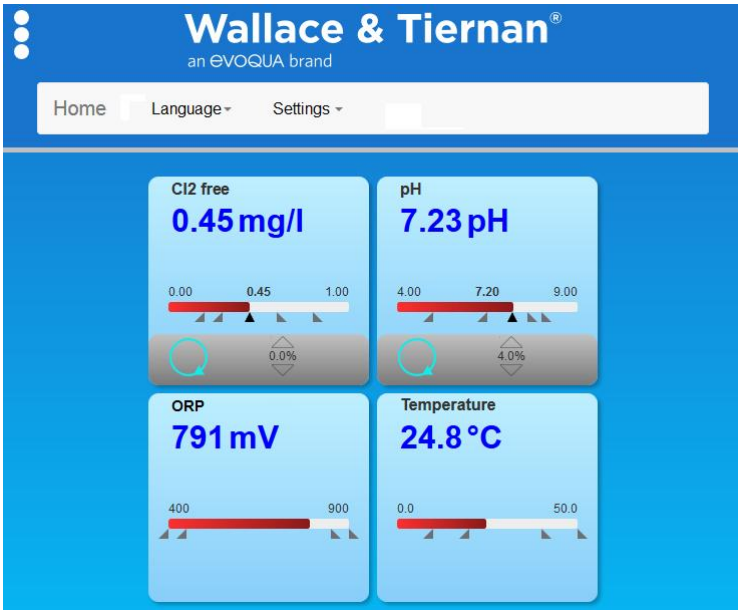


Image 4 Example, web view, DEPOLOX® Pool Compact

Depending on the size of the operating device, the measurement windows are displayed side by side or one below the other. The current value, range, setpoint and limit values as arrows are displayed for each measurement. The operation mode and dosing output for the available controllers are also displayed.

Please note

A network connection or connection via WLAN router is required in order to access the web views of the DEPOLOX® Pool Compact.

4 If necessary, change the IP address and subnet mask of the DEPOLOX® Pool Compact.

4.3.3 Network setting under Windows 10

Windows 10 automatically establishes a network connection as soon as a network card is detected in the PC or laptop computer. All you need to do is assign a fixed IP address and a subnet mask.

Windows 10 allows you to define two different configurations, e.g. if a laptop is used in different network environments:

- Windows 10 with static (fixed) IP address
- Windows 10 with an alternative configuration if a DHCP server is available

The network connection can be configured on the PC or laptop under “Settings” – ”Network and Internet” – ”Ethernet” – ”Network and Sharing Center“ – ”Ethernet.” All network connections can be checked and adjusted in the lower window.

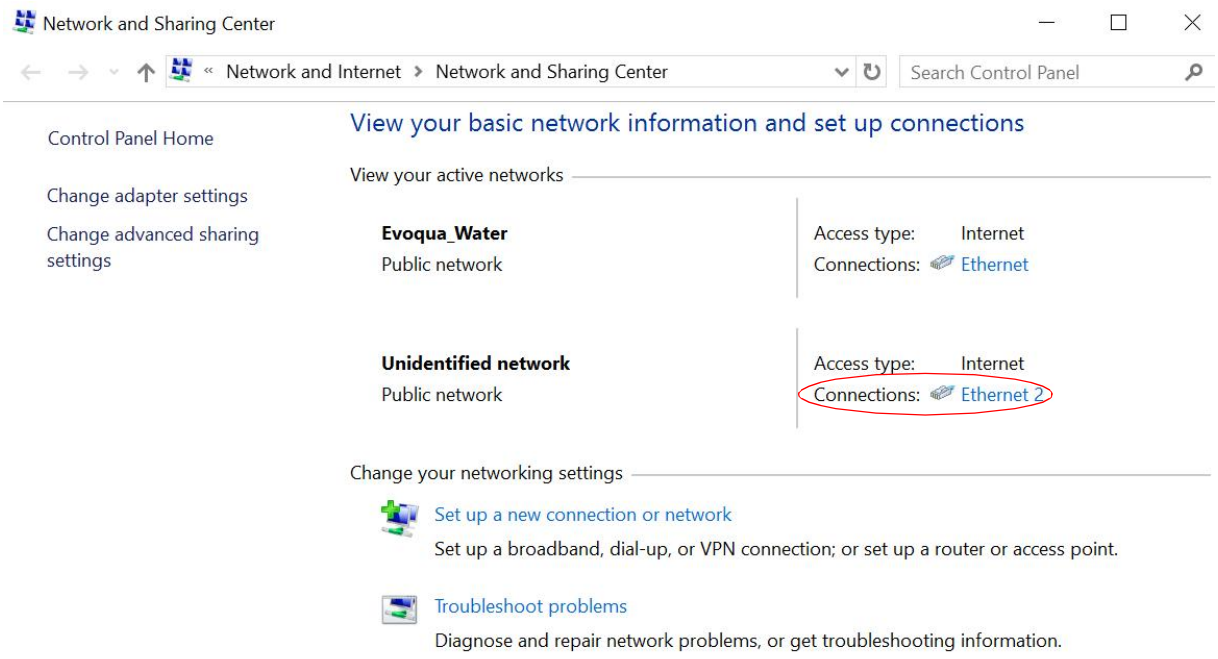


Image 5 Network and Sharing Center

Please note

If the PC or laptop is connected to a network, further elements that must not be deleted or changed may be present! In this case, consult your network administrator!

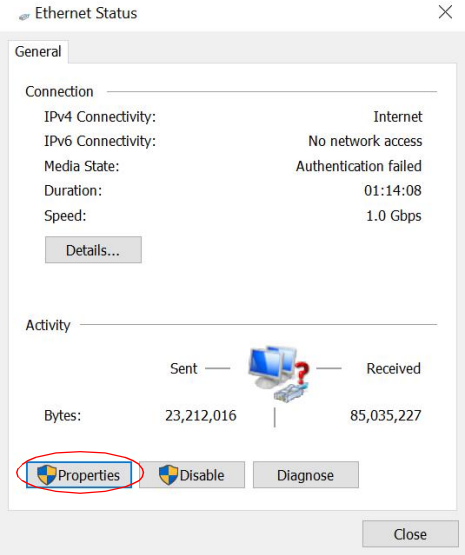
Windows 10 with static (fixed) IP address

Windows 10 with static (fixed) IP address

With the setting, a fixed IP address is always assigned to the PC or laptop computer.

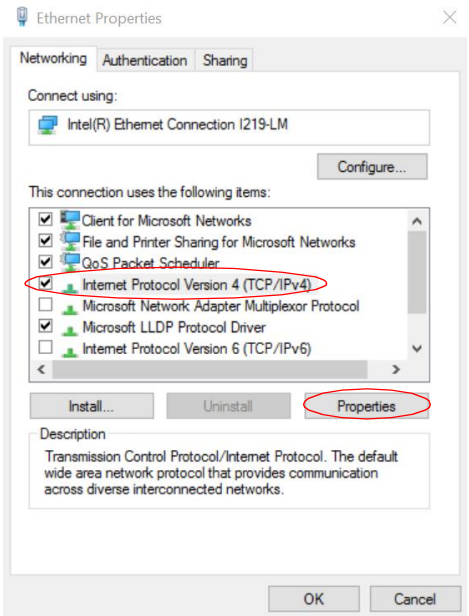
Proceed as follows:

1 Under “Connections,” click “Ethernet” (see red marking in the illustration). A further menu, “Ethernet status,” opens.



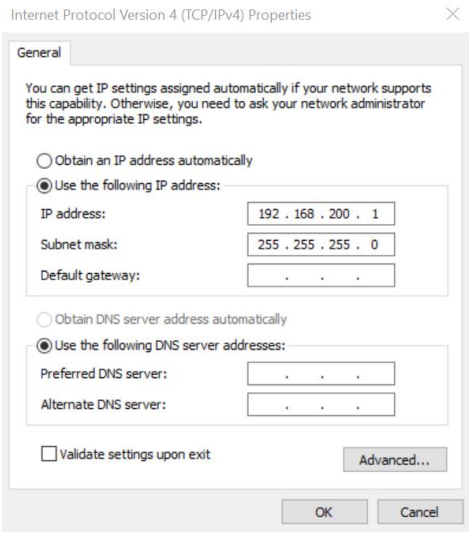
2 Click the “Properties” button.

3 Under the menu “Ethernet properties,” select the element “Internet protocol Version 4 (TCP/Pv4).” Only the element “Internet protocol Version 4 (TCP/IPv4)" is required; all other elements are not necessary for operation of the DEPOLOX® Pool Compact.



4 Click the “Properties” button to configure the element “Internet protocol Version 4 (TCP/Pv4).”

5 Activate the selection “Use following IP address.”



6 Assign a fixed IP address and subnet mask. Do not change any other settings.

7 Tap the “OK” button twice to confirm and save the entry. In some Windows configurations, it may be necessary to reboot Windows.

Windows 10 with an alternative configuration

Windows 10 with an alternative configuration

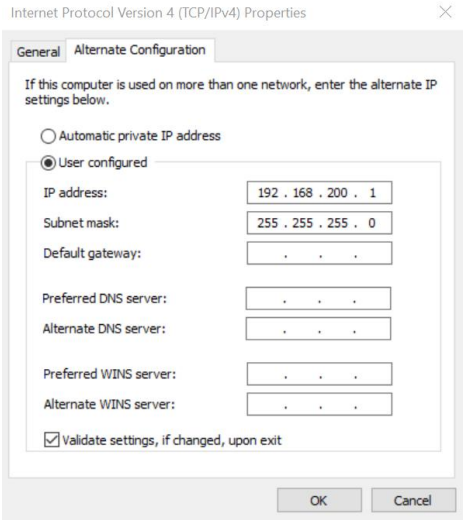
With Windows 10, it is also possible to set an alternative configuration.

Proceed as follows:

1 Carry out steps 1 to 4 as described under “Windows 10 with static (fixed) IP address” on page 53.

2 Now click the “Alternative configuration” button.

3 Activate the selection “User-defined.”



4 Assign a fixed IP address and subnet mask. Do not change any other settings.

5 Tap the “OK” button twice to confirm and save the entry. In some Windows configurations, it may be necessary to reboot Windows.

The settings of the DEPOLOX® Pool Compact for the TCP/IP connection can be made in the menu Connect - Network:

IP address (factory setting)	192.168.200.11
Subnet mask	255.255.255.0

4.4 Modbus TCP interface

The Ethernet interface integrated in the electronics module supports data communication via Modbus TCP protocol. Various data points are available for data exchange, see “Data formats” on page 57.

Transmission technology	Ethernet in accordance with IEEE802.3
Connection	RJ45 socket, internal
Communication	Supported commands: FC03: Read Multiple Registers FC16: Write Multiple Registers FC06: Write Single Register

The DEPOLOX® Pool Compact works as a Modbus TCP slave (server). The data packages are transferred as TCP/IP data packages via the Ethernet interface. Access is via the Modbus register.

The reference tables have the following structure:

Column	Description
Modbus register	Modbus register address
E-byte	Byte address input data
A-byte	Byte address output data
Module name Profibus DP	Name of the module in the GSD file
Description	Name of the data point
Length	Number of bytes in the data point
Format	Data format of the data point (see “Data formats” on page 57)
Access	Access right R = Read W = Write RW = Read & Write
Description	Additional information on the data point

4.4.1 Data formats

The table below contains the data format used for transmission of the process data:

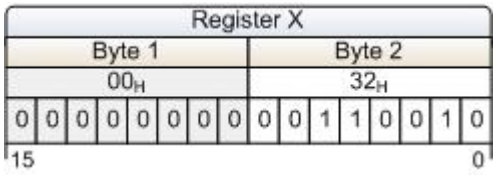
Data type	Size (bit)	Typical names	Signed	Value range min	Value range max
INT8	8	(signed) Character, Byte	yes	-128	127
UINT8	8	unsigned Char, Byte	no	0	255
INT16	16	(signed) Integer, Word	yes	-32,768	32,767
UINT16	16	unsigned Integer, Word	no	0	65,535
LONG	32	(signed) Long, Double Word, DWord	yes	-2,147,483,648	2,147,483,647
ULONG	32	unsigned Long, Double Word, DWord	no	0	4,294,967,295
FLOAT	32 (8/23)*1	Float, Real, Floating Point	yes	$3.4*10^{-38}$ ($-3.4*10^{-38}$)	$3.4*10^{38}$ ($-3.4*10^{38}$)
ASCII	n * 8	ASCII, String, Character String	no	– –	– –

*1 exponent / mantissa

For the byte sequence in which the various data types are saved in the memory or transferred, see the following chapters.

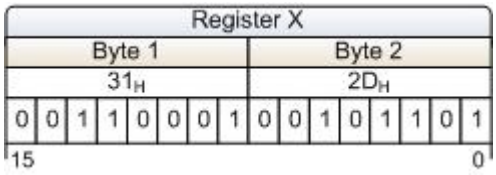
Data type INT8 / UINT8

Example using the figure 50 (32_H):



Data type INT16 / UINT16

Example using the figure 12.589 (31 $2D_H$):



Data type LONG / ULONG

Example using the figure1.212.117.675 (48 3F 72 AB_H):

Register X																Register X+1															
Byte 1								Byte 2								Byte 1								Byte 2							
72_H								AB_H								48_H								$3F_H$							
0	1	1	1	0	0	1	0	1	0	1	0	1	0	1	1	0	1	0	0	1	0	0	0	0	0	1	1	1	1	1	1
15								0								31								16							

Data type FLOAT

The Float or Real values are transferred in accordance with the IEEE754 Standard Format for 32-bit values. Example using the figure 1.25:

Hexadecimal: 3F A0 00 00

Signed (S)	0	(0: + ; 1: -)
Exponent (E)	011 1111 1	
Mantissa (M)	010 0000 0000 0000 0000	

																Sign															
Register X																Register X+1															
Byte 1								Byte 2								Byte 1								Byte 2							
Mantissa																Exponent :								Mantissa							
M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	E	E	E	E	E	E	E	M	M	M	M	M	M	M	M
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0
15								0								31								16							

Data type ASCII

The characters are transmitted in accordance with ASCII Codepage 437. Example "mg/l":

Register X		Register X+1	
Byte 1	Byte 2	Byte 1	Byte 2
$6D_H$	67_H	$2F_H$	$6C_H$
'm'	'g'	'/'	'l'

4.4.2 Reference list

The following reference list contains all available data points and values that can be read and written via Modbus TCP.

Modbus register DEPOLOX Pool Compact
IP address: IP address of the device, e.g. 192.168.200.11 Port: 502

MB register	Description	Type	No. byte	Access	Max.	Min.	Description
	[400001-400099] Info area (read only)						
400001	System name	Ascii	20	RD			e.g. “DEPOLOX Pool Compact”
400011	Software version	Ascii	10	RD			e.g. "V:1.00"
400016	Current date	Ascii	10	RD			e.g. "21.02.17"
400021	Current time	Ascii	6	RD			e.g. "13:16"
400024	Serial number	Ascii	16	RD			
	[400100-400299] Measurements (read only)						
	(Ch.1) Chlorine						
400100	Measured value	float	4	RD	-	Lower range	
400102	Measurement unit	Ascii	10	RD	-	-	mg/l
400107	Lower range	float	4	RD	-	-	
400109	Upper range	float	4	RD	-	-	
400111	Current setpoint	float	4	RD	Upper range	Lower range	Normal/Eco/Setpoint
400113	Current dosing rate / control value Yout	float	4	RD	100.0 %	0.0 %	
	(Ch.2) pH						
400115	Measured value	float	4	RD	-	-	
400117	Measurement unit	Ascii	10	RD	-	-	pH
400122	Lower range	float	4	RD	-	-	
400124	Upper range	float	4	RD	-	-	
400126	Current setpoint	float	4	RD	Upper range	Lower range	
400128	Current dosing rate/control value Yout	float	4	RD	100.0 %	0.0 %	
	(Ch.3) ORP						
400130	Measured value	float	4	RD	-	-	
400132	Measurement unit	Ascii	10	RD	-	-	mV
400137	Lower range	float	4	RD	-	-	
400139	Upper range	float	4	RD	-	-	
400141	-		4	RD			
400143	-		4	RD			
	(Ch.4) Cl2 / CLN / Conductivity (not yet available)						
400145	Measured value	float	4	RD	-	-	
400147	Measurement unit	Ascii	10	RD	-	-	mg/l µS/cm mS/cm
400152	Lower range	float	4	RD	-	-	
400154	Upper range	float	4	RD	-	-	
400156	Current setpoint	float	4	RD	Upper range	Lower range	
400158	Current dosing rate / control value Yout	float	4	RD	100.0 %	0.0 %	

	(Ch.5) Temperature						
400160	Measured value	float	4	RD	-	-	
400162	Measurement unit	Ascii	10	RD	-	-	°C
400167	Lower range	float	4	RD	-	-	
400169	Upper range	float	4	RD	-	-	
400171	--		4	RD			
400173	--		4	RD			
	[400300-400399] Status messages (read only)						
400300	Limit contact states	uint16	2	RD			0x0001 - Limit contact 1 0x0002 - Limit contact 2 0x0004 - Limit contact 3 0x0008 - Limit contact 4 0x0010 - Limit contact 5 0x0020 - Limit contact 6 0x0040 - Limit contact 7 0x0080 - Limit contact 8
400301	Digital input	uint16	2	RD			0x0001 - Sample water Stop - DI1 0x0002 - DI 2 0x0004 - DI 3 0x0008 - DI 4 0x0010 - DI 5 (open=1, closed=0)
400302	Relay outputs K1..K8	uint16	2	RD			0x0001 - Relay K1 0x0002 - Relay K2 0x0004 - Relay K3 0x0008 - Relay K4 0x0010 - Relay K5 0x0020 - Relay K6
400303	---	uint16	2	RD			
400304	Operation mode controller 1 (Chlorine)	uint16	2	RD			0x0001 - Manual 0x0002 - Automatic 0x0004 - Controller Off 0x0008 - Auto tune running 0x0010 - 0x0020 - Controller Stop (Yout=0 %) 0x0040 - Freeze controller (Yout=Yout) 0x0080 - Controller Yout=100 % 0x0100 - 0x0200 - 0x0400 - 0x0800 - Eco Mode switchover 0x2000 - Controller Standby
400305	Operation mode controller 2 (pH)	uint16	2	RD			Bit coding as for controller 1
400306	--						
400307	Operation mode controller 4 (CIN or Conductivity)	uint16	2	RD			Bit coding as for controller 1
400308	--						

400310	Error code chlorine (Ch.1)	uint32	4	RD			0x00000001 - Zero point calibration 0x00000002 - DPD calibration 0x00000004 - pH7 calibration 0x00000008 - pHX calibration 0x00000010 - Calibration error e.g. ORP 0x00000020 - Offset calibration 0x00000040 - -- 0x00000080 - Cell error 0x00000100 - Factory calibration error 0x00000200 - -- 0x00000400 - -- 0x00000800 - Setpoint error 0x00001000 - Limit value error 0x00002000 - Peak chlorination error (Cl2++) 0x00004000 - Combined chlorine error 0x00008000 - Overfeed (max. Dosing time) 0x00010000 - Auto tune error 0x00020000 - 0x00040000 - Temperature error 0x00080000 - Tank empty message 0x00100000 - No sample water 0x00200000 - 0x00400000 - 0x00800000 - mA output 1 Load error 0x01000000 - mA output 2 load error 0x02000000 - mA output 3 load error 0x04000000 - mA output 4 load error 0x08000000 - Dosage analog error 0x10000000 - Flocculation error 0x20000000 - Peak chlorination error 0x40000000 - Analog hardware error 0x80000000 - Data storage error (SD/EEprom)
400314	Error code pH (Ch.2)	uint32	4	RD			Bit coding as for error code chlorine
400318	Error code ORP (Ch.3)	uint32	4	RD			Bit coding as for error code chlorine
400322	Error code total chlorine (Ch.4)	uint32	4	RD			Bit coding as for error code chlorine
400326	Error code temperature (Ch.5)	uint32	4	RD			Bit coding as for error code chlorine
	[401000-401049] Controller parameters (read and write)						
	(Ch.1) Chlorine						
401000	Setpoint (W)	float	4	RW	Upper range	Lower range	
401002	P-element (Xp)	float	4	RW	1000 %	0 %	
401004	I-element (Tn)	float	4	RW	100.0 min	0.0 min	0.0 min means Tn inactive
	(Ch.2) pH						
401006	Setpoint (W)	float	4	RW	Upper range	Lower range	
401008	P-element (Xp)	float	4	RW	1000 %	0 %	
401010	I-element (Tn)	float	4	RW	100.0 min	0.0 min	0.0 min means Tn inactive
	---						
401012	---						
401014	---						
401018	---						
	(Ch.4) Cl2 / CLN / Conductivity						
401018	Setpoint (W)	float	4	RW	Upper range	Lower range	
401020	P-element (Xp)	float	4	RW	1000 %	0 %	
401022	I-element (Tn)	float	4	RW	100.0 min	0.0 min	0.0 min means Tn inactive

	[401050-401149] Limit value parameters (read and write)						
	(Ch.1) Chlorine						
401050	Min. value 1	float	4	RW	Max. value 1	Lower range	mg/l
401052	Max. value 1	float	4	RW	Upper range	Min. value 1	
401054	Hysteresis value 1	float	4	RW	25-digit	1-digit	
401056	Min. value 2	float	4	RW	Max. value 2	Lower range	
401058	Max. value 2	float	4	RW	Upper range	Min. value 2	
401060	Hysteresis value 2	float	4	RW	25-digit	1-digit	
	(Ch.2) pH						
401062	Min. value 1	float	4	RW	Max. value 1	Lower range	pH
401064	Max. value 1	float	4	RW	Upper range	Min. value 1	
401066	Hysteresis value 1	float	4	RW	25-digit	1-digit	
401068	Min. value 2	float	4	RW	Max. value 2	Lower range	
401070	Max. value 2	float	4	RW	Upper range	Min. value 2	
401072	Hysteresis value 2	float	4	RW	25-digit	1-digit	
	(Ch.3) ORP						
401074	Min. value 1	float	4	RW	Max. value 1	Lower range	mV
401076	Max. value 1	float	4	RW	Upper range	Min. value 1	
401078	Hysteresis value 1	float	4	RW	25-digit	1-digit	
401080	Min. value 2	float	4	RW	Max. value 2	Lower range	
401082	Max. value 2	float	4	RW	Upper range	Min. value 2	
401084	Hysteresis value 2	float	4	RW	25-digit	1-digit	
	(Ch.4) Cl2 / CLN / Conductivity						
401086	Min. value 1	float	4	RW	Max. value 1	Lower range	mg/l µS/cm mS/cm
401088	Max. value 1	float	4	RW	Upper range	Min. value 1	
401090	Hysteresis value 1	float	4	RW	25-digit	1-digit	
401092	Min. value 2	float	4	RW	Max. value 2	Lower range	
401094	Max. value 2	float	4	RW	Upper range	Min. value 2	
401096	Hysteresis value 2	float	4	RW	25-digit	1-digit	
	(Ch.5) Temperature						
401098	Min. value 1	float	4	RW	Max. value 1	Lower range	°C
401100	Max. value 1	float	4	RW	Upper range	Min. value 1	
401102	Hysteresis value 1	float	4	RW	25-digit	1-digit	
401104	Min. value 2	float	4	RW	Max. value 2	Lower range	
401106	Max. value 2	float	4	RW	Upper range	Min. value 2	
401108	Hysteresis value 2	float	4	RW	25-digit	1-digit	

5. Installation

5.1 Scope of delivery

The scope of delivery includes the following, depending on the version selected (see Chapter 3.2 “Versions”):

- Flow cell (module type D02), pressurized
- Electronics module (module type E02)
  (sensor cable pre-wired)
- LED glow stick (pre-wired)
- Sensors (depending on selected version):
  - Chlorine sensor (free chlorine)
  - pH sensor
  - ORP sensor
- Multi-sensor
- 4-way mA output card (depending on selected version)
- Top-hat rail
- Assembly accessories
- Instruction manual

Optional:

- Sensor measuring module Redox
- 4-way mA output card
- Strainer

5.2 Transport and storage

Transport

The DEPOLOX® Pool Compact is shipped in standard packaging. During transport, the packaged system must be handled carefully and should not be exposed to wet weather or moisture.

Check that the transport packaging is undamaged. In the event of damage, please inform the transport company immediately, as your rights to compensation will otherwise be lost.

If a component is damaged, please contact your affiliate immediately.

Keep the packaging until the system has been commissioned and put into operation.

Storage

Flow cell, electronics module and sensors must be stored in dry condition without any residual water in a dry place that is not exposed to the elements. For storage temperature, see Chapter 3.7 “Technical data”.

Shut-down

The DEPOLOX® Pool Compact may only be taken out of operation by trained and authorized personnel.

5.3 Requirements for the environment

Please note

Correct and safe operation can only be guaranteed if the requirements for the ambient conditions are met. All applicable national and local regulations must be observed!

Installation location

The following points must be observed when installing the DEPOLOX® Pool Compact:

- The DEPOLOX® Pool Compact must be protected against moisture, rain, frost, heat and direct sunlight and may therefore not be installed outdoors.
- Do not use the DEPOLOX® Pool Compact Do not use the Pool Management system in environments where there are flammable gases, fumes or dust or conductive dust.
- Do not subject the system to strong shocks or vibrations.
- The air in the room must be non-condensing.

5.4 Mechanical installation

The following installation variations are available for the mechanical installation of the DEPOLOX® Pool Compact:

- with top-hat rail
- without top-hat rail

Warning!

Risk of injury or damage to the installation!

Only authorized and qualified personnel are permitted to the DEPOLOX® Pool Compact. All electrical work on the DEPOLOX® Pool Compact must be carried out by authorized and qualified electricians. Modifications to the device other than those described in this instruction manual are not permissible.

Please note

The DEPOLOX® Pool Compact comprises a flow cell and an electronics module. We recommend that you install the flow cell to the left of the electronics module. Leave a clearance of at least 250 mm above the flow cell for working with the sensors.

Please note

The electronics module is not suitable for electrical connection with permanently installed cable conduits. If the cable glands do not meet local installation rules and regulations, these glands must be replaced with suitable ones.

Please note

If the flow cell and electronics module are mounted in separate locations, the use of sensor extension cables (optional) is required. A length of 50 m must not be exceeded. An impedance converter (optional) is required with pH and ORP sensors.

5.4.1 Procedure for mechanical installation

Mechanical installation is performed in accordance with the following checklist.

Ser. No.	Work step	Chapter	Done
1	Installation of the modules • with top-hat rail or • without top-hat rail	 5.4.2 5.4.3	
2	Remove the housing cover of the flow cell	5.4.5	
3	Install strainer (optional)	5.4.7	
4	Connect the sample water inlet • with hose connection or • with rigid pipework	5.4.6	
5	Connect the sample water outlet	5.4.8	
6	Insert electrode cleaning sand	5.4.10	
7	Install LED glow stick, sensors and multi-sensor	5.4.11	
8	Install calibration aids	5.4.12	
9	Fit housing cover	5.4.5	

5.4.2 Mechanical installation with top-hat rail

Proceed as follows, see 5.4.4 “Dimensional drawings”:

1 Secure the top-hat rail to a solid wall using the dowels and screws supplied. (Screws and dowels for fixing to a solid wall are included in the scope of delivery.)

Please note

If the device is to be installed on a suitable lightweight wall, use the corresponding mounting fixtures (not included in the scope of delivery).

2 We recommend that you hook the flow cell on the top-hat rail to the left of the electronics module.

3 Fasten the flow cell to the solid wall at the bottom by the holders using dowels and screws.

4 Hook the electronics module onto the top-hat rail so that it is flush at the right.

5 Fasten the electronics module to the solid wall at the bottom by the holders using dowels and screws.

5.4.3 Mechanical installation without top-hat rail

Instead of hooking the DEPOLOX® Pool Compact onto the top-hat rail, it can also be hooked onto the top holding clips with suitable tallow-drop screws.

Please note

The dimensions for the drilling pattern can be found on the back of the plastic housing.

Proceed as follows:

1 Attach the tallow-drop screws and dowels provided to the solid wall (tallow-drop screws and dowels for fixing to a solid wall are included in the scope of delivery.)

Please note

If the device is to be installed on a suitable lightweight wall, use the relevant mounting fixtures (not included in the scope of delivery).

2 Hook the flow cell onto the tallow-drop screws.

3 Fasten the flow cell to the solid wall at the bottom by the holders using dowels and screws.

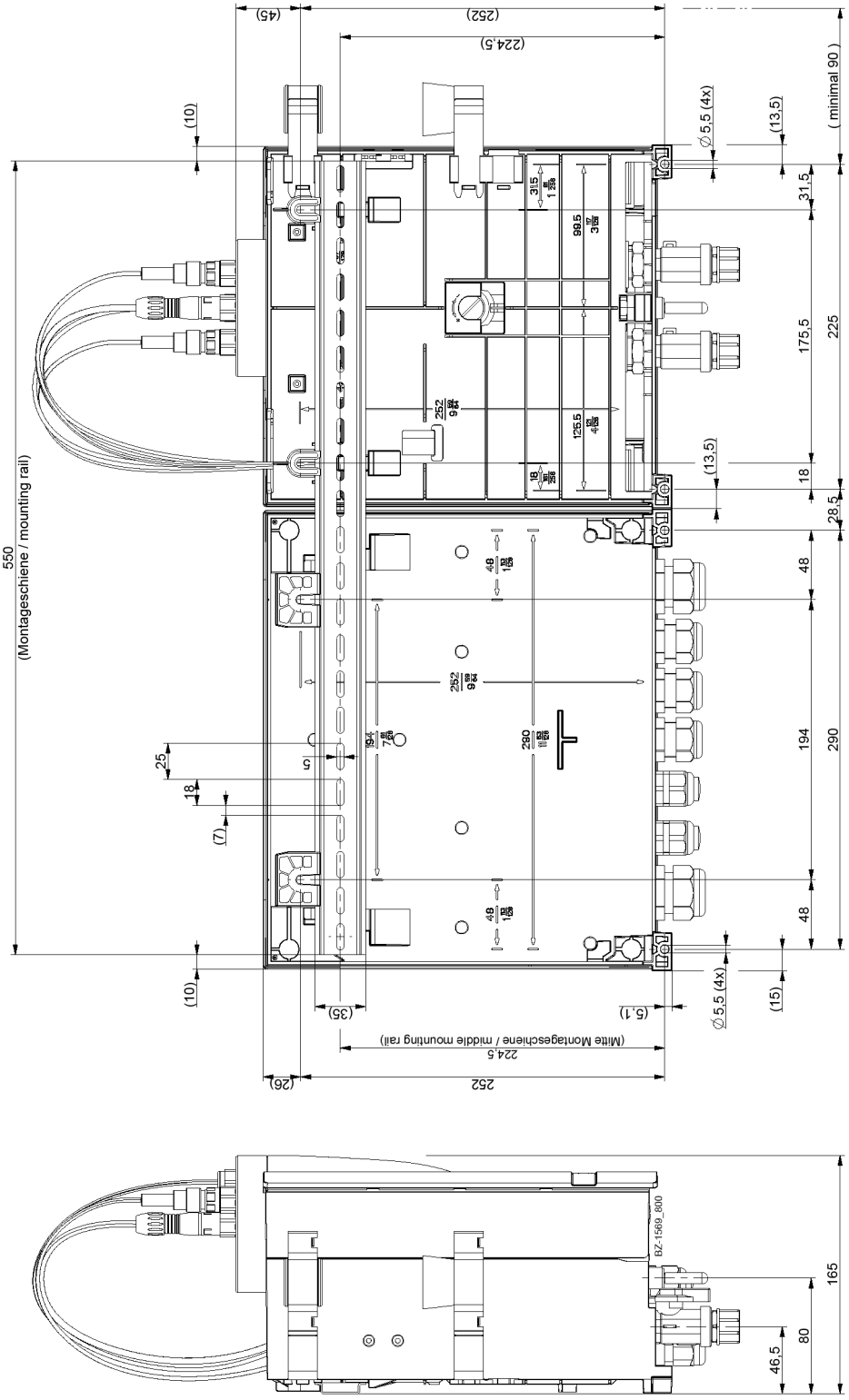
4 Hook the electronics module onto the tallow-drop screws.

5 Fasten the electronics module to the solid wall at the bottom by the holders using dowels and screws.

Please note

If the flow cell and electronics module are mounted in separate locations, the use of sensor extension cables (optional) is required. A length of 50 m must not be exceeded. An impedance converter (optional) is required with pH and ORP sensors.

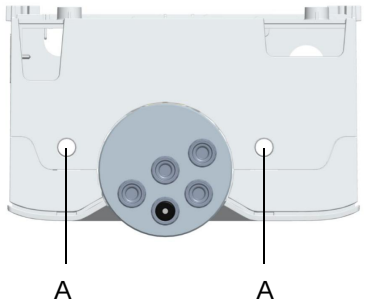
5.4.4 Dimensional drawings



Please note

Measurement are shown in millimeters. To convert to inch measurement, divide by 25.4 (1 inch = 25.4 mm).

5.4.5 Removing and fitting the housing cover of the flow cell



1 Remove the housing cover of the flow cell. To do this, press both unlocking buttons on the top of the housing and carefully remove the cover toward the front.

2 Fit and engage the housing cover of the flow cell. To do this, position the housing cover at the bottom and carefully press it upward until the housing cover engages on the unlocking buttons.

Image 1 View of top of housing cover

A Unlocking buttons

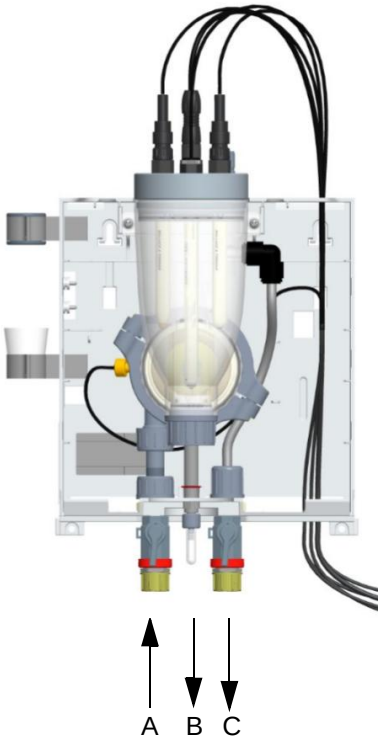
5.4.6 Connecting the sample water inlet

Please note

No water pipes made of copper may be fitted in the installation. These would distort the measurement.

When connecting the sample water inlet, note the following:

- The sample water inlet must be installed upstream of the flocculant dosing station. Otherwise, it could influence the measurements.
- The sample water inlet must be installed according to the local regulations in the pool return or as a pool extraction.
- The sample water inlet must be chosen to ensure that the water sample is representative with a constant, bubble-free flow and a constant pH value (range from 6 to 8).
- A distinction must be made between a sample water inlet with hose connection and one with rigid pipes.
- The sample water inlet should be designed with PVC hose ø 6x3 or PVC tube DN 6 and be as short as possible in order to avoid long measuring dead times. Long measuring dead times mean poorer control quality!
- To prevent long loop dead times, ensure that the lines in the sample water inlet are as short as possible and do not have a large line cross-section.



- The pressure in the sample water inlet must always be within a range of min. 0.25 to max. 3.0 bar. At the same time, the pressure in the sample water inlet must generally be 0.25 bar higher than in the sample water outlet.
- If the admission pressure is below 0.25 bar, a booster pump must be used. See Chapter 4.4.5 “Example for sample water extraction using a booster pump”.
- If the admission pressure exceeds 3.0 bar, an optional pressure reducing valve must be used. See Chapter 4.4.5 “Example for sample water extraction”.
- An optional strainer with a mesh width of 0.5 mm is provided for the sample water inlet. See Chapter 5.4.7 “Installing strainer (optional)”.

Image 2 Flow cell (without housing cover)

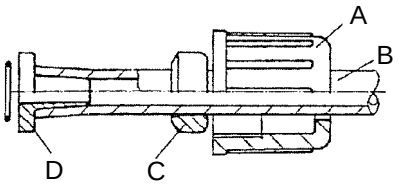
A Sample water inlet with ball valve
B Sample extraction unit (drain at the drain screw)
C Sample water outlet with ball valve

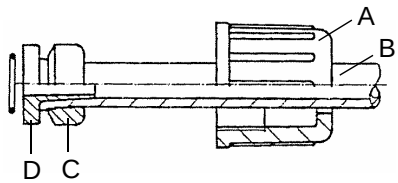
Sample water inlet with hose connection

Please note

The water-tightness of the hose screw connection is only guaranteed if the following installation instructions are followed!

Proceed as follows:





1 Release union nut (A) on the hose screw connection.

2 Insert the hose (B) until it meets the hose bushing (D).

3 Push the locking ring (C) out until the union nut (A) engages the connecting threads.

Image 3 Detail of hose screw connection

A Union nut
B Hose
C Locking ring
D Hose bushing

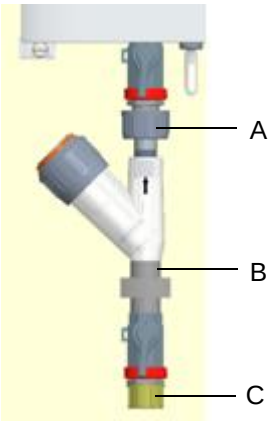
Sample water inlet with rigid pipes

Proceed as follows:

1 Connect the sample water pipework to the connection thread (G1/2” A) of the ball valve.

2 Ensure that the sample water pipes are installed free of mechanical stress.

5.4.7 Installing strainer (optional)



The strainer is available as an option. Proceed as follows to install the strainer in the sample water inlet:

1 Release the screw joint on the sample water inlet with ball valve (A) (G 1/2” connection).

2 Connect strainer with pipe clamp (B).

3 Connect sample water inlet (C).

Image 4 Section, installation of strainer, straight

A Screw joint on sample water inlet with ball valve
B Strainer with pipe clamp
C Sample water inlet

5.4.8 Connecting the sample water outlet

Please note

No water pipes made of copper may be fitted in the installation. These would distort the measurement.

Proceed as follows:

1 On the pressurized version, a maximum back-pressure of 1.5 bar is permitted on the sample water outlet.

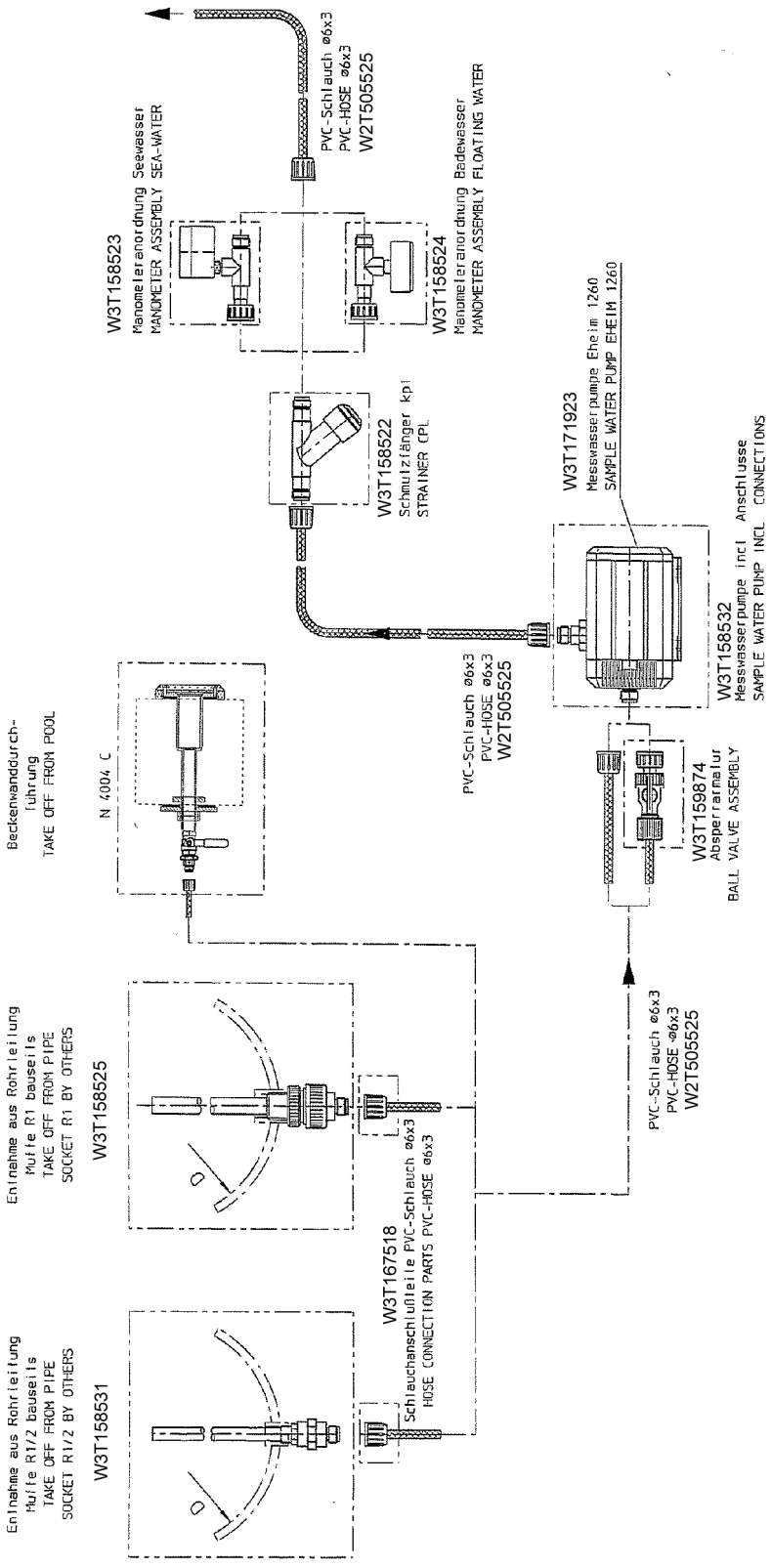
2 Ensure that the drain screw (sample extraction unit) is always closed.

Image 5 Flow cell (without housing cover)

A Sample water inlet with ball valve
B Sample extraction unit (drain at the drain screw)
C Sample water outlet with ball valve

5.4.9 Sample water extraction options

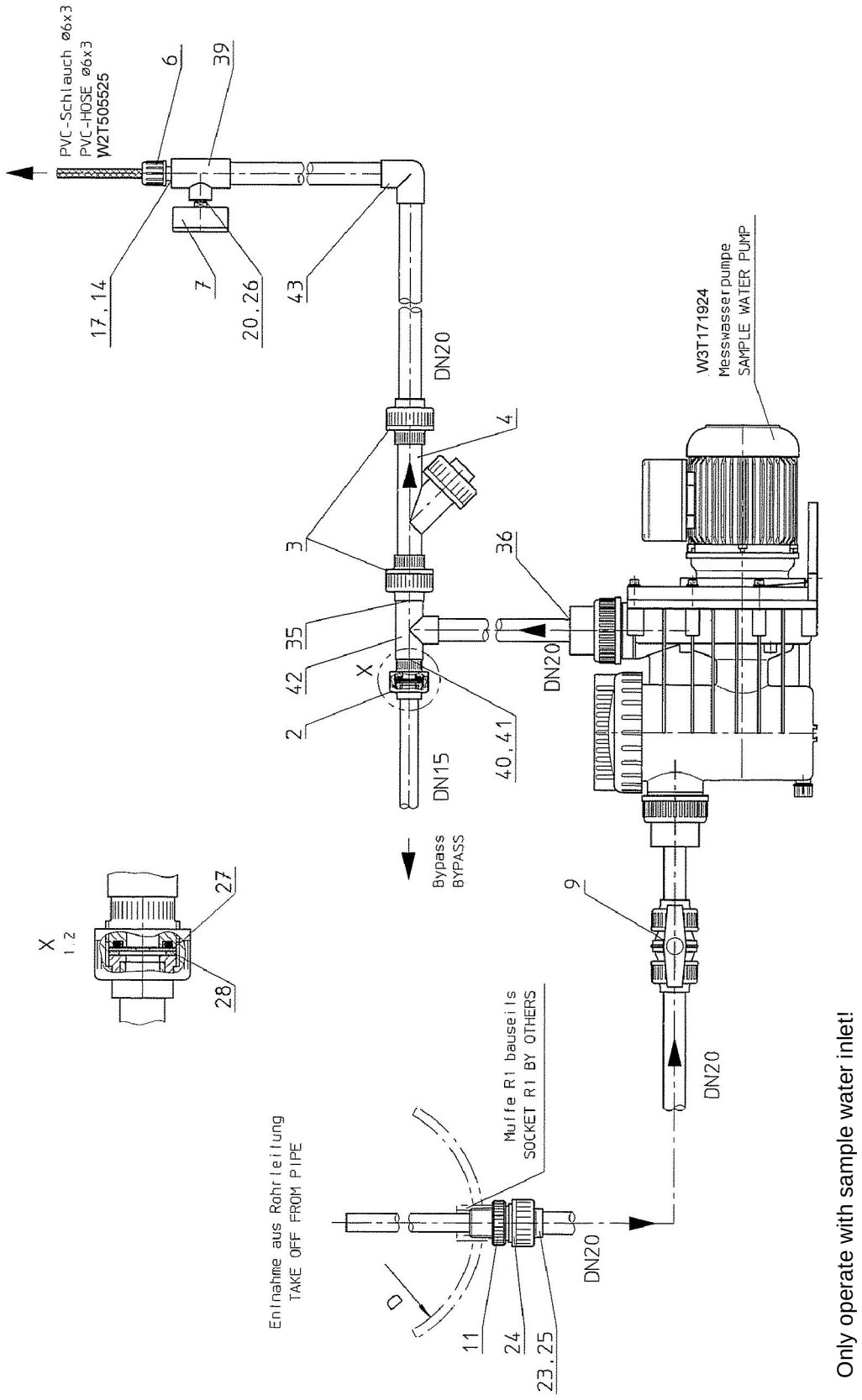
Example for sample water extraction using a booster pump



Only operate with sample water inlet!

Example for sample water extraction

See “Parts list” on page 75.

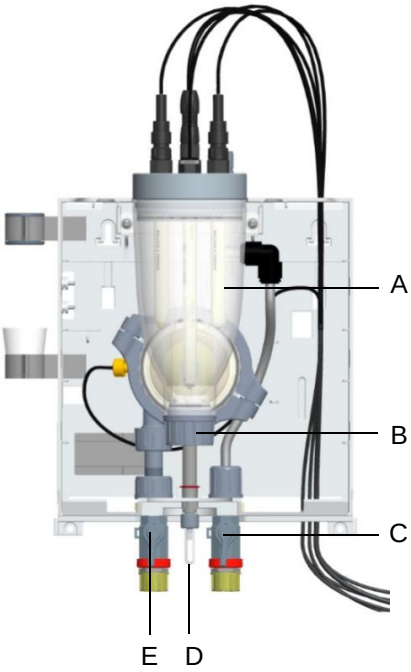


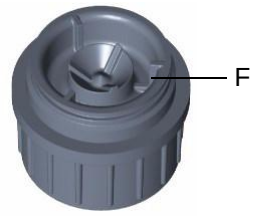
Parts list

Sample water extraction for fresh water (part no. W3T158528)
Sample water extraction for salt water (part no. W3T158529)

Item	Quantity	Part No.	Description
2	1	W2T505181	Screw joint
3	2	W2T505182	Screw joint
4	1	W3T171416	Strainer complete
6	1	W3T167518	Hose connection parts
7	1	W3T173160 W3T173198	Pressure gage (fresh water) Pressure gage (salt water)
9	1	W2T505945	Ball valve
11	1	W3T163670	Sample pipe
14	1	W3T172948	Threaded part
17	1	W2T505600	Reduction
20	1	W3T163500	Reduction nipple
23	1	W2T507288	Insert
24	1	W2T506934	Union nut
25	1	W3T172720	O-ring
26	1	W3T161254	Flat gasket
27	1	W3T171146	Nozzle washer
28	1	W3T172727	Flat gasket
35	1	W3T166090	Pipe segment
36	2	W2T506782	Reducing junction, short
39	1	W2T506527	T-piece
40	1	W3T166089	Pipe segment
41	1	W2T506778	Reducing junction, short
42	1	W2T507525	T-piece
43	1	W2T507535	Elbow bend

5.4.10 Inserting electrode cleaning sand





The electrode cleaning sand (part no. W3T171317) is supplied in a plastic bottle, the cap serves as a measure.

Proceed as follows:

1 Close the ball valve on the sample water inlet (E) and outlet (C).

2 Open the drain screw on the sample extraction unit (D) and empty the cell body. To do so, temporarily loosen a plug or sensor to allow air to flow in.

3 When the cell body (A) is empty, close the drain screw once more.

4 Remove the housing cover of the flow cell.

5 Unscrew the flow distributor cap (B). Hold a container underneath, as the remaining water will drip out.

6 Fill the cap of the cleaning sand bottle until it is one-third full and then pour it into the middle of the flow distributor cap (F). The inner indentation of the flow distributor cap is filled roughly half-way with electrode cleaning sand.

7 Screw the flow distributor cap (B) back on.

8 Open the ball valve on the sample water inlet (E) and outlet (C).

9 The cell body (A) fills with sample water again.

10 Replace and engage the housing cover of the flow cell.

11 After 2 to 3 hours running-in time, perform a chlorine calibration. If necessary, repeat the chlorine calibration after 24 hours. See Chapter 6.6 “Calibration”.

Please note

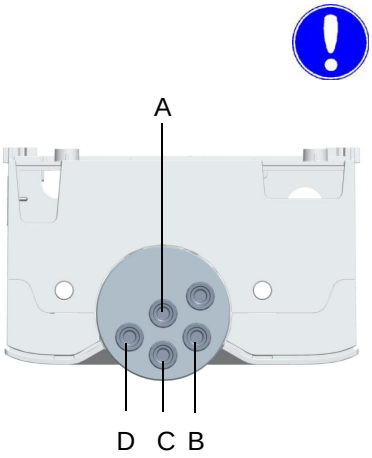
An initial rotating air bubble at the bottom of the cell body does not affect the measurement.

Image 6 Flow cell (without housing cover)

Image 7 Flow distributor cap

A Cell body
B Flow distributor cap
C Ball valve on the sample water outlet
D Sample extraction unit (drain)
E Ball valve on the sample water inlet
F Middle of the flow distributor cap

5.4.11 Installing and connecting sensors



Please note

The sensors must be prepared accordingly. Keep the watering cap of the chlorine sensor and the transport container of the pH and ORP sensors in a safe place for later use. Please follow the relevant operating instructions for the sensors!

Proceed as follows:

1 Remove the plug from the mount hole on the cover of the cell body.

2 Remove the watering cap from the chlorine sensor and screw the sensor into the mount hole (A) in the cell body cover.

3 Remove the pH and ORP sensors from the KCl tank with stand and screw them into the mount holes (B and C) in the cell body cover.

4 Connect the sensors to the electronics module with the pre-fitted cables. To do this, feed the cables through the lower hole (E) into the housing of the flow cell and connect to the sensors as described below:

- Feed the LED glow stick through the opening (E) and out of the housing and screw it into the mount hole (C) in the cell body cover.
- Feed the multi-sensor (G) through toward the left behind the cell body and plug it into the flow control valve (remove blind plug first).
- Route sensor cables upward and out of the housing through opening (E), and connect the ‘free chlorine” sensor cable with the chlorine sensor and the pH and ORP sensor cable connectors with the pH and ORP sensors.

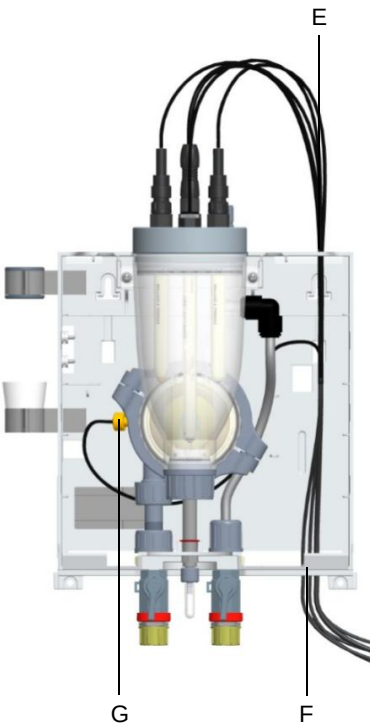
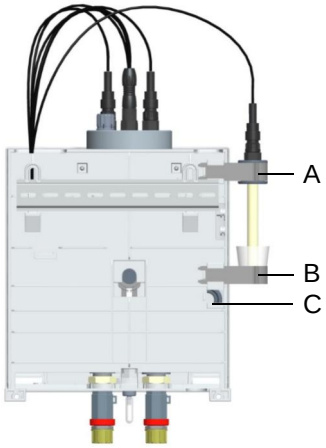


Image 8 View of top of housing cover

Image 9 Flow cell (without housing cover)

A Chlorine sensor (free chlorine)
B ORP sensor
C LED glow stick
D pH sensor
E Housing opening for sensor cables (upper bore hole)
F Housing opening for sensor cables (lower bore hole)
G Multi-sensor

5.4.12 Installing calibration aids



Two calibration clips are installed in the housing cover. They are pushed into the side of the basic housing at the back. The clip with the plastic insert for the sensor is pushed into the top catch (A). The second clip is for holding calibration solution or buffer solution in a bag or beaker. For solution in a bag, fit the clip in the top position of the bottom catch (B). For solution in a beaker, select the position below this (C).

Image 10 Rear side of flow cell

A Top holding clip for sensor mounting
B Position of holding clip for bag
C Position of holding clip for beaker

5.5 Electrical installation

Danger!

Risk of injury or death!

External voltages may still be connected even if the operating voltage is switched off. Disconnect all power sources before opening the electronics module.

Warning!

Risk of injury or damage to the device!

Only authorized and qualified electricians are permitted to install the DEPOLOX® Pool Compact and open the housing. The electronics module may only be put into operation when the housing is closed, and must be connected to protective earth. Modifications to the device other than those described in this instruction manual are not permissible.

The DEPOLOX® Pool Compact may only be wired in de-energized state. Connect the electronics module in accordance with the wiring diagrams and applicable national and local regulations.

Warning!

Risk of injury or damage to the device!

The DEPOLOX® Pool Compact is not equipped with a mains switch and is in operation as soon as the supply voltage is applied. For this reason, an external switch or circuit breaker with a clearly identifiable “Off” switch position is necessary.

Line cross-section for the mains input side at least 0.75 mm² (AWG 18), on-site mains fuse 6 A with 100 to 240 V AC supply.

When connecting system components (e.g. devices, motors, pumps) as well as when entering operating data, the system components must be switched off in order to prevent uncontrolled activation or incorrect operation.

Installations with internal supplied loads (e.g. dosing machines) or models with fixed installed connection wires (plug connection) must not have a current consumption higher than 6 A.

Please note

The electronics module is not suitable for electrical connection with permanently installed cable conduits. If the cable glands do not meet local installation rules and regulations, these glands must be replaced with suitable ones.

Warning!

Risk of injury or damage to the device!

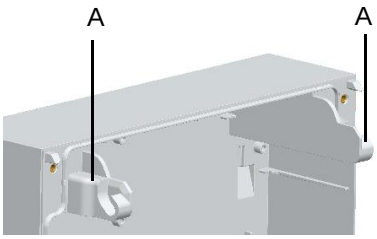
High temperatures at the terminals of the relays and the mains supply!

At high ambient temperatures, high temperatures can occur at the terminals, and the connected cables must be designed to withstand such temperatures.

Please note

The electronics module is equipped with a flexible voltage supply input and accepts AC voltages from 100 to 240 volts. Take the power consumption into account when dimensioning. See Chapter 3.7 “Technical data”.

5.5.1 Electrical installation electronics module



Proceed as follows:

1 Open the housing cover of the electronics module. To do so, unscrew the housing cover and hook into the holders (A) on the basic housing.

2 Connect the power supply in accordance with the wiring diagram (see Chapter 9. “Wiring diagrams”).

Please note

Note the correct polarity of the voltage connections and the correct dimensioning of the wire cross-sections (see „Chapter 3.7 “Technical data” - Power consumption).

3 Wire the CPU-board in accordance with wiring diagram Chapter 9. “Wiring diagrams” and Chapter 5.5.2 “Control of chlorine electrolysis system OSEC-A”, Chapter 5.5.3 “pH safety deactivation chlorine electrolysis system OSEC-A” and Chapter 5.5.4 “pH safety deactivation on control of dosing pumps”.

4 Make sure that all cable glands are installed correctly.

5 Fit the housing cover of the electronics module again. Tighten the housing screws to a maximum torque of 0.7 Nm (± 0.15 Nm).

6 Then put the DEPOLOX® Pool Compact into operation. See Chapter 5.6 “Startup”.

5.5.2 Control of chlorine electrolysis system OSEC-A

The following electrical wiring must be carried out for controlling a chlorine electrolysis system OSEC-A with the DEPOLOX® Pool Compact:

1 Connect relay output K2 (chlorine dosing terminals 54 and 55) of the DEPOLOX® Pool Compact to the chlorine electrolysis system OSEC-A terminals 1 and 2 (external release).

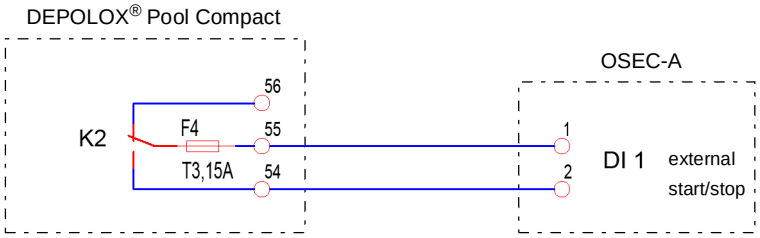


Image 11 Plan of terminal assignment

2 Set the control parameters of the DEPOLOX® Pool Compact as follows:

Actuator	Dosing pump 2P
Cycle period	60 s
Adjust Xp and Tn of the pool hydraulics, if necessary start an auto tune	

Please note

The chlorine electrolysis system OSEC-A supports demand -dependent output control as dosing pump 2P from firmware version 1.06 onwards.
The chlorine electrolysis system OSEC-A with an older firmware version must be controlled as a dosing contact.

Alternatively, the chlorine electrolysis system OSEC-A can also be controlled in on/off mode (dosing contact function). The control result in this case leads to chlorine values that are within a defined range on either side of the setpoint.

Function:
The chlorine electrolysis system OSEC-A is switched on below the setpoint (setpoint hysteresis). At the setpoint, the chlorine electrolysis system OSEC-A is switched off (connection identical to activation as dosing pump 2P).

Control parameters	
Actuator	Dosing contact
Hysteresis	0.1 mg/l
min. On	5 min.
min. Off	5 min.

5.5.3 pH safety deactivation chlorine electrolysis system OSEC-A

For safe operation, we recommend that you interlock the chlorine electrolysis system OSEC-A by means of an alarm contact that is configured as a pH Min contact. This means the chlorine dosing switches off after the pH Min limit value has been undershot so as to prevent an impermissible addition of acid. Alternatively, activate the safety deactivation Cl_2 (see Chapter 6.3.6 “Menu “Settings”” under menu - Settings - Safety - Safety deactivation Cl2).

Connection example:

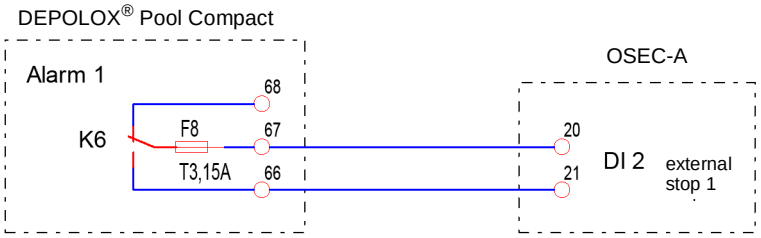


Image 12 Plan of terminal assignment

Proceed as follows:

1 Make the following alarm contact settings on the DEPOLOX® Pool Compact:

Limit values pH Min 1	e.g. 6.50 pH
Alarm 1 assignment	pH Min 1
Acknowledge	without
Delay time	0:00:00 h
Relay	K6
Relay function	Normally open contact

2 Make the following setting on the chlorine electrolysis system OSEC-A:

Setting on the chlorine electrolysis system OSEC-A	Releases ext. Stop1: N.O. (factory setting)

5.5.4 pH safety deactivation on control of dosing pumps

For safe operation, we recommend that you switch off the dosing pump for chlorine and if appropriate pH by means of an alarm contact that is configured as a pH Min alarm and pH Max alarm. This means the chlorine and pH dosing switches off automatically in the event of a fault so as to prevent an impermissible dosing of chemicals.

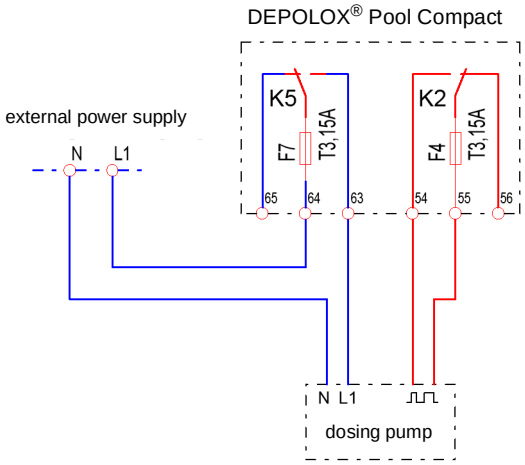


Image 13 Plan of terminal assignment

Proceed as follows:

1 Make the following alarm contact settings on the DEPOLOX® Pool Compact:

Alarm 2 assignment:	pH Min 1, pH Max 1, if appropriate also Chlorine Max 1
Acknowledge:	without
Delay time:	0:00:00 h
Relay:	K5
Relay function:	Normally closed contact

Please note

If the pH Min limit value is undershot, the pH Max limit value is exceeded or, if appropriate, if the Chlorine Max limit value is exceeded then the dosings are switched off.

2 In addition, we recommend you make the following settings:

- Setting of the limit values:

pH Min 1:	pH 6.5
pH Max 1:	pH 7.6
Chlorine Max 1:	0.7 mg/l

- Activation of the "Safety deactivation Cl2" function so as to prevent uncontrolled dosing of chemicals.

5.6 Startup

Danger!

Risk of injury or death!

The unit must not be operated with flammable liquids.

Attention!

Risk of injury or damage to the device!

To ensure safe and correct commissioning, knowledge of the operation, connected electrical load, measurement signals, cable assignment and fuse protection of the connected devices and machines and the relevant safety regulations is required.

Startup of the DEPOLOX® Pool Compact may therefore only be performed by qualified and authorized electricians.

Incorrectly connected devices can be damaged, possibly irreparably, or cause faults in other equipment when they are switched on or in operation. Ensure that the measuring and control cables are not confused or make contact with one another. Never connect or disconnect any cables to which voltage is applied.

Warning!

Risk of injury or damage to the device!

When connecting the DEPOLOX® Pool Compact to the power supply, a 6A back-up fuse must be used in the mains supply line.

Procedure for startup

After completing mechanical and electrical installation of the DEPOLOX® Pool Compact, commissioning can be performed following the individual steps in the order shown in the table below. Please check that the following conditions are met:

- The electronics module is wired in accordance with the wiring diagram (circuit diagram).
- The housing cover of the electronics module is fitted.
- The flow cell is installed.
- Sample water inlet and outlet are connected.
- Sensors are installed in the flow cell.
- The sensors are connected to the electronics module.
- Ensure that all transport protection was removed.
- Check all connections for leakage.

Ser. No.	Procedure	Done
1	Switch on power supply.	
2	Perform initial configuration: • Set “MANUAL” mode • Select the language • Set the date and time • Enter the system name	
	Chlorine measurement	
3	Set the dosing output for Cl_2, if necessary set positioner running time “Ty,” “Tp” or “Max. pulses/min.”	
4	Check setpoint for Cl_2 control, change if necessary (only for Cl_2 closed-loop control).	
5	Adapt values for “Xp” and “Tn” to control loop. *Note* These values may be optimized later by Auto tune or manually.	
6	Check the limit values 1 and 2 for Cl_2 (“Min" and “Max"), adjust if necessary.	
7	Check the measurement range for Cl_2, adjust if necessary.	

Ser. No.	Procedure	Done
	pH measurement	
8	Set the dosing output for pH, if necessary set positioner running time “Ty,” “Xsh,” “Tp” or “Max. pulses/min.”	
9	Set the control direction (for pumps 2P).	
10	Check the setpoint for pH control, adjust if necessary	
11	Adapt the values for "Xp" and "Tn" to the control loop, if necessary optimize in small steps.	
12	Check the limit values 1 and 2 for pH (“Min" and “Max"), adjust if necessary.	
	ORP measurement (if available)	
13	Check the limit values 1 and 2 for ORP (“Min" and “Max"), adjust if necessary.	
14	Check the measurement range for ORP, adjust if necessary.	
15	Configure alarms as required.	
16	Configure analog outputs as required.	
17	Define function DI2 and DI3.	
18	Parametrize interfaces.	
19	In Manual mode, check all connected dosing devices for correct functioning.	
20	Test Cl2 feed lockout activated functions such as circulation monitoring and Sample water Stop.	
21	Carry out initial calibration of the sensors after a running time of approx. one hour (see Chapter 6.6 “Calibration”).	
22	Switch to Automatic mode and monitor system for correct functioning.	
23	Repeat calibration after a running-in time of approx. 24 hours.	

5.7 Retrofit kits

5.7.1 Installing 4-way mA output card (optional)

The 4-way mA output card is available as an optional retrofit kit. Proceed as follows to install it:

1 Disconnect the electronics module from the power supply.

2 Remove the housing cover of the electronics module. To do this, unscrew the housing cover and remove carefully. Hook into holder on the basic housing.

3 Install mA output card at position A and make sure that the holders engage. Note the correct installation direction.

4 Plug in terminal block at position B.

5 Wire in accordance with the wiring diagram (see Chapter 9. “Wiring diagrams”).

6 Fit the housing cover of the electronics module again. Tighten the housing screws to a maximum torque of 0.7 Nm (± 0.15 Nm).

7 Connect the electronics module to the power supply again.

8 The electronics module automatically detects the installed modules and enables the corresponding settings menus.

9 Configure mA outputs as required.

Image 14 View, installation of the 4-way mA output card

5.7.2 Installing the ORP sensor measuring module (optional)

The ORP sensor measuring module is available as an optional retrofit kit. Proceed as follows to install it:

1 Disconnect the electronics module from the power supply.

2 Remove the housing cover of the electronics module. To do this, unscrew the housing cover and remove carefully. Hook the housing cover into the holders on the basic housing.

3 Feed the ORP sensor cable through the cable gland together with the pH sensor cable with double sealing insert.

4 Connect sensor cable to the ORP sensor card (A) as shown.

5 Insert sensor card into Mod1 slot (B). Ensure that the holders engage. Rout the sensor cable upward and around the sensor module to the cable gland.

6 Remove the cover of the flow cell. To do this, press both unlocking buttons on the top of the housing and carefully remove the cover toward the front.

7 Install ORP sensor in the flow cell. Please remove the blind plug first (note position!).

8 Feed the sensor cable through the hole at the bottom into the housing of the flow cell and route upward to the sensor.

9 Connect sensor cable to the ORP sensor.

10 Fit the housing cover of the electronics module again. Tighten the housing screws to a maximum torque of 0.7 Nm (± 0.15 Nm).

11 Fit the housing cover of the flow cell again. To do this, position the housing cover at the bottom and carefully press it upward until the housing cover engages on the unlocking buttons.

12 Switch the device on.

13 The sensor card is automatically detected and the ORP measurement is displayed.

14 Calibrate the ORP sensor.

15 Set the limit values and perform ORP settings.

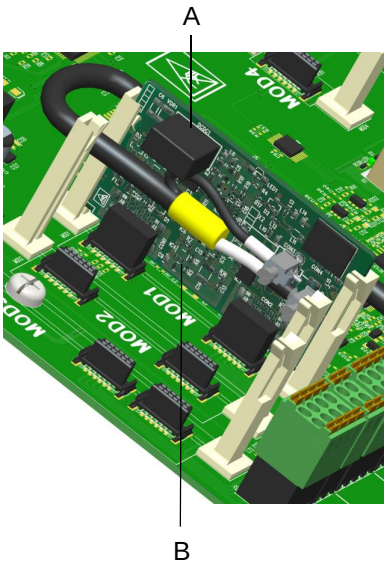


Image 15 Section ORP sensor module with sensor cable in slot

5.8 Shut-down

Danger!

Risk of injury or death!

External voltages may still be connected even if the operating voltage is switched off.

To shut down, proceed as follows:

1 Disconnect the electronics module from the power supply.

2 Drain the sample water supply line and drainage line.

3 Remove the housing cover of the flow cell.

4 Drain the cell body via the sample extraction unit.

5 Flush out the cleaning sand.

6 Dismantle the filter unit and the check valve housing.
See Chapter 5.7, “Cleaning the flow rate monitor and non-return ball valve.”

7 When the remaining water has drained from the flow control valve, refit the filter housing and the check valve housing.

8 Remove the sensors from the mount hole in the cover of the cell body and disconnect from the electronics module.

9 Shut down the sensors. See relevant operating instructions for the sensors.

For the chlorine sensor and pH or ORP sensors, proceed as follows:

- Fit watering cap to the chlorine sensor.
- Install pH or ORP sensor in the KCl tank and stand with KCl solution.
- Store the sensors in a frost-free place.

10 Replace and engage the housing cover of the flow cell.

5.9 Renewed start up

Please note

See Chapter 5.6 “Startup”.

6. Operation

6.1 Display and control elements

6.1.1 General

The colored graphic display with capacitive touchscreen is the display and control element. It is used by means of direct entry on the display, i.e. by touching using your finger or a pen (PDA pen) for capacitive touchscreens. As soon as you touch an area on the display, the electronics module reacts and switches to subordinate views or operating menus. Swipe functions for switching between screens or moving parameter lists upward or downward are also supported.

Please note

Damage to the touchscreen!

Touching the touchscreen with pointed or sharp objects or striking the touchscreen with hard objects will damage the glass surface. Only touch the touchscreen with your finger or a pen (PDA pen).

6.1.2 Main display (Home view)

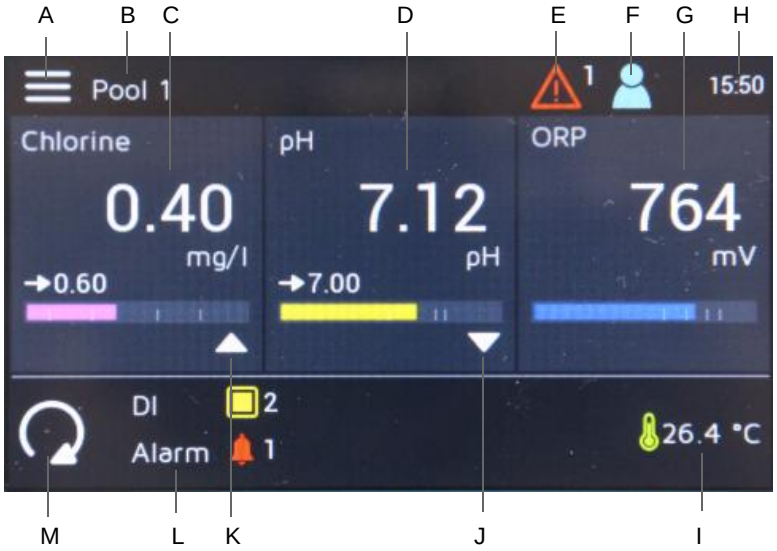


Image 1 Main menu showing an error message (example chlorine, pH and ORP measurement)

A System menu
B Device name
C Menu field Measurement with current measured value for chlorine, setpoint display and bar graph
D Menu field Measurement with current measured value for pH, setpoint display and bar graph
E Error message
F Logout/Login Level
G Menu field Measurement with current measured value for ORP (Redox) and bar graph
H Current time
I Current temperature
J Symbol Dosing on (reduce/positioner closed)
K Symbol Dosing on (raise/positioner open)
L Display area for alarms/digital inputs
M Operation mode

Please note

If the DEPOLOX® Pool Compact is only equipped with two sensors (chlorine and pH), the menu fields Measurement with the current measured value are shown wider on the screen.

Menu fields The menu fields are used to carry out functions and to switch between the menu fields, menus and screens.

Buttons The buttons are used to perform functions.

Symbols The symbols display functions. Functions can also be carried out or changed by pressing certain symbols.

The following symbols are used:

Symbols	Meaning
	Numeric keypad
	Enter key - save entry
	Upper-case character keypad
	Delete previous keypad entry
	Limit value Min. 1/2 not reached
	Limit value Max. 1/2 exceeded
	Menu Information
	Temperature display
	Setpoint controller
	Dosing on (raise/positioner open)
	Dosing on (reduce/positioner closed)
	Raise value
	Reduce value
	Change main menu
	Switch to previous screen
	Logout and Login levels Level 1 = white symbol Level 2 = green symbol Level 3 = blue symbol
	Message/error active Press the symbol to open the message window. Yellow symbol = alarm that cannot be acknowledged is active Red symbol = alarm that can be acknowledged is active or error message is active
	Menu Alarms

Symbols	Meaning
	Digital input active
	Sample water Stop
	Alarm active (1 to 8)
	Change calibration menu
	Change settings menu
	Acknowledgment button
	Selection disabled
	Selection enabled
	Controller Stop
	Controller manual mode
	Controller constant
	Controller automatic mode
	System menu
	Menu/Measurements display
	Confirmation prompt
	Information
	Note
	Abort/Close

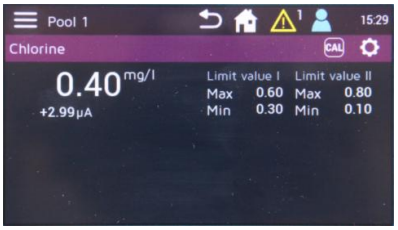
6.2 Menu structure

The following menus are available in the main menu:

- Chlorine (free chlorine)
- pH
- ORP
- Messages
- Operation mode
- System menu
- Logout and Login levels screen

From the main menu, you can call up the system settings, the measured values menus and the controller menus. Tap the measurement menu fields or tap the symbol ☰ „System menu" to access the corresponding menus. The layout of the measurement and control menus for Free chlorine, pH and ORP (Redox) is the same. If all sensors are connected, the following main menu appears on the electronics module.

Main menu
Menu field Measurement (chlorine, pH or ORP)
CHLORINE (EXAMPLE)

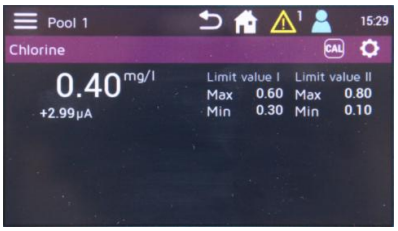


The preceding screens are listed in the margin to show the user how to access the current screen. Screenshots of the various controller screens are shown, with the name immediately above the screenshot.

6.2.1 Menu “Measurement”

The menu “Measurement” shows the current measured value and the sensor signal. The menu “Measurement” contains all settings relating to measured values and also the calibration of the corresponding sensor. All settings relating to measured values, such as measuring range, limit values and controller setting, must be performed via this menu.

Main menu
Menu field Measurement (chlorine, pH or ORP)
CHLORINE (EXAMPLE)



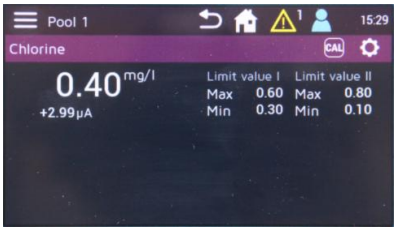
To access the menu “Measurement,” proceed as follows:

1. Switch to the main display.
2. Press the desired measurement (chlorine, pH or ORP). The menu “Measurement” opens.
3. Press the ⚙ symbol. The settings menu for the selected measurement opens.
4. To switch to other menus, press the desired symbol. The following menus are available:

Display	Meaning
☰	System menu
↩	Back to previous menu level
⌂	Main display (Home view)
CAL	Sensor calibration level (see Chapter 6.6 “Calibration”)
⚙	Settings menu

6.2.2 Menu “Settings”

Main menu
Menu field Measurement (chlorine, pH or ORP)
CHLORINE (EXAMPLE)

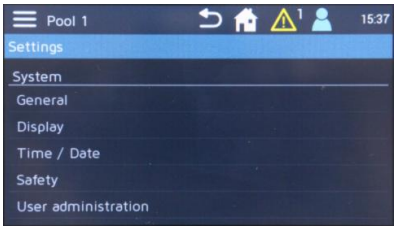


To access the “Settings” menu for a specific measurement, proceed as follows:

1 Switch to the main display.

2 Press the desired measurement (chlorine, pH or ORP). The menu “Measurement” opens.

Symbol „System menu”
SETTINGS



3 Press the ⚙ symbol. The settings menu for the selected measurement opens.

Depending on the measurement selected, different setting parameters are displayed. Swipe upward on the touchscreen to access further setting parameters which are further down the list and not currently visible on the screen. You can scroll upward and downward to the top and bottom of the parameter list (length of list depends on the measured value) at any time. The settings menus are subdivided into various areas such as Measurement, Controller and Dosing. To change values, press the corresponding parameter.

Please note

Depending on the user administration configuration and the currently registered users, the changes that can be made are limited. In order to change parameters, login on the corresponding user level is required (see Chapter 6.3.8 “Menu “User administration””).

Chlorine measurement

The following parameter settings are possible for chlorine measurement:

Measurement	
Range	1, 2, 3, 5 and 10 mg/l
Unit	mg/l, ppm
Measurement filter	off/low/middle/strong
Limits	
Limit values I	
Max	Within range
Min	Within range
Hysteresis	0.01...0.25
Limit values II	
Max	Within range
Min	Within range
Hysteresis	0.01...0.25
Controller	
Setpoint	Within range
Proportional factor Xp	1...1000
Integral action time Tn	0...100.0 min
Auto tune	Start
Dead time Tu	1...480 min
Rise time Ts	1...60 min
Dosing	
Actuator	Dosing pump 2P, solenoid pump, positioner wo. Ym, analog output mA, dosing contact
Cycle period Tp	10...180 s
Max. Pulse	100/120/140/160/180
Running time Ty	10...180 s
Hysteresis	0.01...0.50
min. duty cycle	00:00...10:00 h
max. off-duty cycle	00:00...10:00 h

pH measurement The following parameter settings are possible for pH measurement:

Measurement	
Upper range	pH 8...14
Lower range	pH 0...6
Measurement filter	off/low/middle/strong
Limits	
Limit values I	
Max	Within range
Min	Within range
Hysteresis	0.01...0.25
Limit values II	
Max	Within range
Min	Within range
Hysteresis	0.01...0.25
Controller	
Setpoint	Within range
Proportional factor Xp	
Integral action time Tn	
Dosing	
Actuator	Dosing pump 2P, dosing pump 3P, solenoid pump 2P, solenoid pump 3P, positioner wo. Ym, analog output 2P, analog output 3P, dosing contact
Direction	Acid/Alkali
Cycle period Tp	10...180 s
Max. Pulse	100/120/140/160/180
Running time Ty	10...180 s
Hysteresis	0.01...0.50
min. duty cycle	00:00...10:00 h
max. off-duty cycle	00:00...10:00 h

ORP measurement

The following parameter settings are possible for ORP measurement:

Measurement	
Upper range	600/700/800/900/1000
Lower range	0/100/200/300/400
Measurement filter	off/low/middle/strong
Limits	
Limit values I	
Max	Within range
Min	Within range
Hysteresis	1...25
Limit values II	
Max	Within range
Min	Within range
Hysteresis	1...25

Temperature measurement

The following parameter settings are possible for temperature measurement:

Limits	
Limit values I	
Max	0...50 °C
Min	0...50 °C
Hysteresis	0.1...2.5 °C
Limit values II	
Max	0...50 °C
Min	0...50 °C
Hysteresis	0.1...2.5 °C

6.3 System menu

Access to the operating and configuration level of the electronics module is possible via the System menu. All setting parameters not relating to measured values, for example, Alarms, I/O inputs and outputs, interface parameters etc., are parametrized via the System menu.

Main menu
Symbol „System menu"

SYSTEM MENU

Proceed as follows:

1 Switch to the main display.

2 Press the ☰ symbol.

3 Press the desired menu. The following menus are available:

Symbol/Menu	Meaning
Measurements	Main menu
Operation mode	Menu "Operation mode" (see Chapter 6.3.1 "Menu "Operation mode"")
Calibration	Menu "Calibration"
Login	Login screen for entry of the password or unlock code
I/O inputs/outputs	Configuration of inputs and outputs
Alarm configuration	Configuration of alarms
Settings	Menu "Settings"
Information	Info display

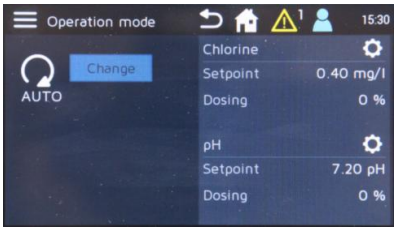
Please note

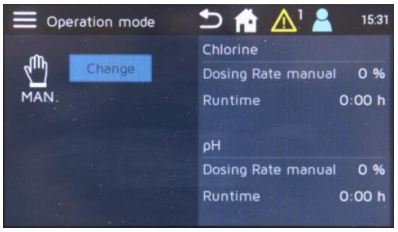
The individual menus are described in the following chapters.

6.3.1 Menu “Operation mode”

The device offers two options for changing the operation mode.

Main menu
Symbol „Auto/Man” or symbol „Setting menu”
-> menu „Operation mode”
OPERATION MODE





Proceed as follows:

1 Switch to the main display.

2 Press symbol or .

or

Press the symbol and then press the menu Operation mode.

3 To switch to “Manual mode,” press the “Change” button. An additional prompt appears, i.e. in order to change the operation mode, you need to confirm the prompt with “Yes” or “No”.

4 In “Manual mode,” it is possible to set a manual dosing rate for the controller outputs. The following settings are possible:

Manual dosing rate chlorine	0...100 %/open/closed
Manual dosing rate pH	–100...+100 %/open/closed

Furthermore, a runtime limitation can be set for manual dosing (not with positioner). Dosing is switched off after expiry of this time. If the running time is set to 00:00, it is inactive and manual dosing is in continuous mode.

Running time chlorine	00:00...11:59 PM h
Running time pH	00:00...11:59 PM h

5 In “Automatic mode” it is possible to switch to the settings level by pressing the symbol.

6.3.2 Menu “Calibration”

In the “Calibration” menu, the measurements are compared in compliance with the prescribed maintenance intervals using calibration solution or buffer solution or via comparative measurements, see Chapter 6.6 “Calibration”. The date of the last calibration and the calibration value entered are displayed. Depending on the desired measurement, the corresponding calibration menus can be selected.

The “Calibration” menu can be opened in two ways:

- via the System menu
- via the menu field Measurement

System menu

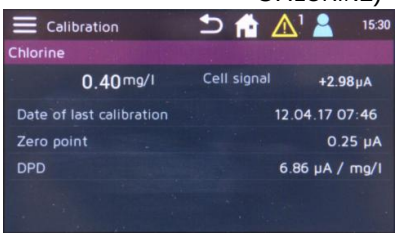
Main menu
Symbol „Settings menu”
SYSTEM MENU

To perform calibration via the System menu, proceed as follows:

1 Switch to the main display.

2 Press the ☰ symbol.

Menu „Calibration”
Measured value (Chlorine, ORP, Redox)
CALIBRATION (EXAMPLE CHLORINE)



3 Press the menu CAL Calibration.

4 Press the desired measurement (chlorine, pH or ORP). The menu “Measurement” opens; the example here shows Chlorine:

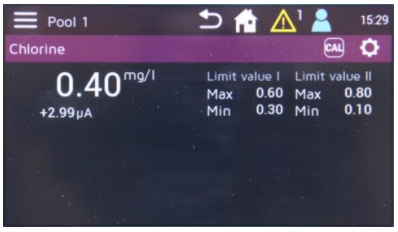
5 Press calibration selection, see “Calibration selection” on page 104.

6 Carry out sensor calibration as described in Chapter 6.6 “Calibration”. See also “Example “Chlorine calibration”” on page 105.

Menu field Measurement

To perform calibration via the menu field Measurement, proceed as follows:

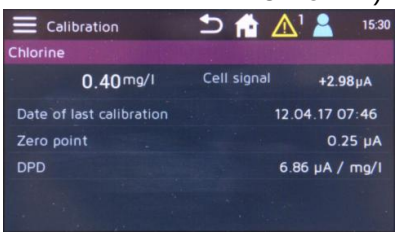
Main menu
Menu field Measurement (chlorine, pH or ORP)
CHLORINE (EXAMPLE)



1 Switch to the main display.

2 Press the desired measurement (chlorine, pH or ORP). The menu “Measurement” opens.

Symbol „Calibration”
CALIBRATION (EXAMPLE CHLORINE)



3 Press the CAL symbol. The corresponding menu opens; the example here shows Chlorine.

4 Press calibration selection, see “Calibration selection” on page 104.

5 Carry out sensor calibration as described in Chapter 6.6 “Calibration”. See also “Example “Chlorine calibration”” on page 105.

Calibration selection

The following calibration selections are available, depending on the selected measurement:

Chlorine	
Zero point	Calibration of the zero point current of the chlorine measurement cell
DPD	DPD calibration of the chlorine measurement cell

pH	
pH7	pH7 calibration with buffer solution
pHX	Span calibration of the pH sensor with buffer solution
Offset	Offset calibration of the pH sensor

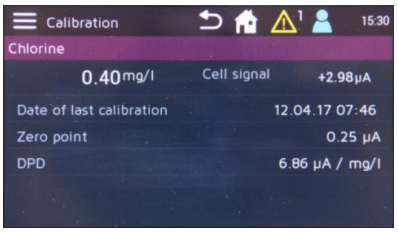
ORP	
Cal. value	ORP calibration with buffer solution

Temperature	
Cal. value	Temperature calibration for entry after comparative measurement

Example “Chlorine calibration”

Main menu
Symbol „Settings menu” or Menu field Measurement
Symbol „Calibration”

CHLORINE CALIBRATION(EXAMPLE)

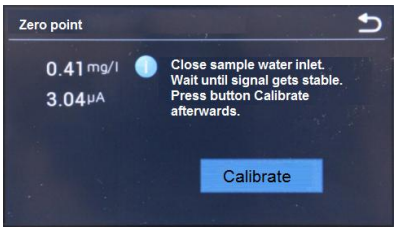


To perform the desired calibrations, proceed as follows:

1 Press the menu CAL Calibration in the System menu or the CAL symbol in the menu Measurement. The menu “Calibration” opens.

Calibration selection (example „Zero point”)

ZERO POINT



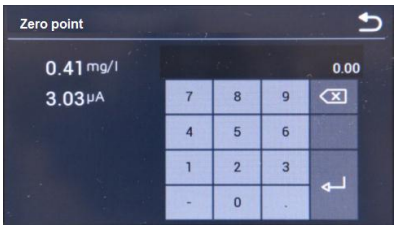
2 Press the desired calibration selection. The example here shows chlorine zero point calibration. A further screen opens with information describing the calibration process.

Please note

Other calibration selections are performed in a similar way and are not described individually.

Button „Calibrate”

INPUT MENU



3 Press the “Calibrate” button to open the input menu.

4 Enter the desired values in the input field and save with the Enter key.

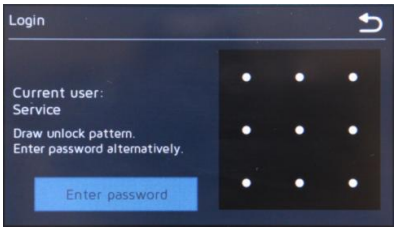
5 Make any further entries (e.g. DPD).

6.3.3 Menu “Login”

Log in on the desired user level in the “Login” menu.

Main menu
Symbol „Settings menu”
Menu „Login”

LOGIN



To access the Login menu, proceed as follows:

1 Switch to the main display.

2 Press the symbol.

3 Press the menu Login. The “Login” menu opens.

4 Enter locking code or password.

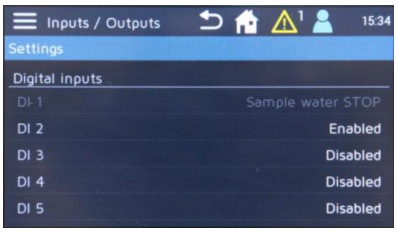
Please note

Depending on the user administration configuration (see Chapter 6.3.8 “Menu “User administration””), three user levels with different rights are available. You can enter either a locking code or a password. The currently logged in user is also displayed in this screen. If the locking code entry is corrected, the pattern is displayed in green. If an incorrect locking code is entered, the pattern is displayed in red. If the user data can no longer be found, please contact your service partner.

6.3.4 Menu “Inputs and outputs”

The digital inputs and the mA outputs are configured in the “Inputs and outputs” menu.

Main menu
Symbol „Settings menu”
Menu „Inputs/Outputs”
INPUTS / OUTPUTS



Proceed as follows:

1 Switch to the main display.

2 Press the ☰ symbol.

3 Press the menu I/O I/O inputs/outputs.

4 Press the desired menu “Digital inputs” or “mA outputs”. The following settings can be realized:

Digital inputs	Settings
Cl_2/pH tank monitoring	On/Off This parameter is used to switch the min. and empty fill level monitoring for the chlorine and pH tank (acid or alkali). With this function, digital inputs 3 and 4 are used for recording of the tank minimum fill level. Digital input 5 is used as an empty signal input (see Chapter 9. “Wiring diagrams” - Digital inputs). If this function is not used, digital inputs 3 to 5 are freely assignable. When the minimum fill level is reached, an error message appears in the message window. When the empty level is reached, dosing switches off and an error message appears in the message window.
DI 1	Measurement Stop (cannot be changed)
DI 2	Disabled, Enabled, Controller Stop, Standby
DI 3	Disabled, Enabled, Controller Stop, Standby
DI 4	Disabled, Enabled, Controller Stop, Standby
DI 5	Disabled, Enabled, Controller Stop, Standby

Explanation of digital input settings	
Disabled	Changes at the digital input have no effect.
Enabled	Changes at the digital input have an effect if they are used in the alarm configuration. Active = contact open at digital input
Controller Stop	The controllers switch to Stop (Dosing off) if the digital input is opened (e.g. Circulation off).
Standby	All controllers switch to Dosing off if the digital input is opened. The measured value display is hidden. Standby is used when circulation is switched off and no sample water is flowing through the flow cell.

mA outputs 1 / 2 / 3 / 4	Settings
mA output	off, 0 ... 20 mA, 4...20 mA
Measurement	Chlorine, pH, ORP, Temperature
Signal	Measured value, Yout

Example:
To transfer a measurement signal, e.g. Chlorine, via the mA output, the following setting is required:

mA output	Settings
mA output	0/40 ... 20 mA
Measurement	Chlorine
Signal	Measured value

Please note

The settings menus for the mA outputs are only displayed with an installed mA output card.

6.3.5 Menu “Alarm configuration”

Alarms 1 to 8 are configured in the “Alarm Configuration” menu. The DEPOLOX® Pool Compact allows you to set various alarm configurations. It is not necessary to assign a relay switching function to every alarm. An alarm can also be used as an alarm message without a relay. The number of available relays that can be used as alarm relays depends on the dosing output. The use of relays for dosing output takes priority. For example, if analog mA is used as dosing output for chlorine, relays K1 and K2 can be used as alarm relays. If dosing pump 2 is used for chlorine dosing, relay K1 can be used as an alarm relay. The pH dosing output also influences the assignment of alarm relays. K3 and K4 can be used as alarm relays if they are not used for dosing output.

When the alarms become active, they are displayed in color via the message symbol ⚠ and shown in the display area for alarms as an alarm symbol. Pressing the message symbol ⚠ opens the message window. Here, the alarm is displayed with time-stamp and description. Alarms that can be acknowledged can be confirmed by pressing the green Acknowledge button ACK in the message window.

Proceed as follows:

Main menu
Symbol „Settings menu”
Menu „Alarm configuration”
ALARM CONFIGURATION

1. Switch to the main display.
2. Press the ☰ symbol.
3. Press the menu ⚙ “Alarm configuration”. See also Chapter 3.6.5 “Alarms”.
4. Enter the desired setting. The following alarm events can be realized:

Alarm 1/2/3/4	Setting
Name	A customer-specific alarm name can be defined. This name is displayed in the message window (main menu) when the alarm becomes active.
Assignment	Assignment of the alarm cause. All min. or max. limit values, digital inputs, errors (general) can be assigned as alarm causes. Multiple assignment is possible.
Acknowledge	Input specifies whether an alarm is defined as an alarm without acknowledgment, an alarm with simple acknowledgment or acknowledgment with Reset.
Delay time	Switch-on delay time.
Relay	Disabled 1/2/3/4/5/6
Relay function	Normally Open / N.O Normally Closed / N.C

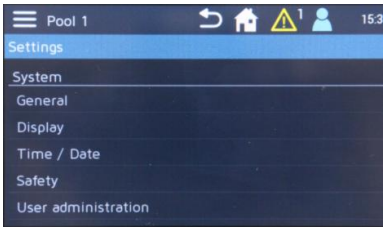
6.3.6 Menu “Settings”

The device settings not relating to measured values are configured in the “Settings” menu.

Proceed as follows:

Main menu
Symbol „Settings menu”
Menu „Settings”

SETTINGS



1 Switch to the main display.

2 Press the ☰ symbol.

3 Press the menu “Settings”.

4 Enter desired settings. The following settings must be entered:

- System
- Connections
- Backup and Reset

System	
General	
System name	Freely definable
Language	German/English/French
Hold function	On/Off The hold function is used to either buffer all measured values or keep them constant during calibration. This prevents the output of invalid control signals by the sensor during the calibration process and also the output of erratic values from measurements via mA-signal and communication interfaces. The function is enabled when the calibration menu is opened and disabled when the menu is closed.
Display	
Brightness	0...100 %
Screensaver	Off, 30 sec, 1/5/15/30 min, 1 h
Color scheme	Design 1...5
Calibrate LED	This setting can be used for white balance of the LED glow stick color if color deviations occur. Red 50...100 % Green 50...100 % Blue 50...100 %

Date/Time	
Date	
Time	00:00 ... 24:00 / 00:00 ... 12:00
24h Format	On/Off
Safety	
Sample water delay time	00:00 ... 10:00 min The sample water delay time determines the time after which dosing is deactivated, e.g. in the event of sample water Stop. While the delay time is running, “Const.” is displayed in the Automatic symbol.
Feed delay time	00:00 ... 60:00 min The feed delay time delays the start of dosing when the device is switched on, after switch-on, when the operating mode has been changed, after Controller Stop or Standby. The rundown of the selected time can be interrupted by selecting the “Start now!” button.
Maximum dosing time	00:00 ... 10:00 h The maximum dosing time determines the length of time that all control outputs can work at 100 % dosing rate in both manual mode and automatic mode. The respective controller output is switched off after this time. When the setting is “00:00:00,” this function is switched off.
Cl2 feed lockout	On/Off If this function is switched on, chlorine dosing switches off automatically if the pH value deviates too far from the pH setpoint. The switch-off limits are defined by the pH setpoint and the parameter “Switch-off range.” Example: Setpoint = 7.20 pH Switch-off range = 0.40 pH Chlorine dosing switches off at: pH value > 7.20 + 0.40 = 7.60 pH or pH value > 7.20 - 0.40 = 6.80 pH
pH switch-off range	0.2 ... 1.5 Defines the permissible deviation from the pH setpoint for Cl2 feed lockout activated.

User administration	
Access control	This parameter is used to switch the user administration on and off. Disabled = no user administration, all parameters can be changed without entering a password Enabled = user administration enabled, password protection or Level 1, 2 and 3 can be configured
Level 3	If access control is enabled, as least Level 3 must be used or configured. Level 3 comprises read and write access to all setting parameters of the device.
Unlock pattern	Menu for entry/definition of a Level 3 unlock pattern. The entry must be repeated as confirmation.
Password	Menu for entry/definition of a Level 3 password. The entry must be repeated as confirmation.
Level 2	If access control is enabled, Level 2 can be enabled or disabled. Level 2 allows access to setting parameters such as limit values, setpoint, date, time and calibration. If Level 2 is enabled, an unlocking pattern and/or a password must be defined.
Unlock pattern	Menu for entry of a Level 2 unlock pattern. The entry must be repeated as confirmation.
Password	Menu for entry of a Level 2 password. The entry must be repeated as confirmation.
Level 1	If access control is enabled, Level 1 can be enabled or disabled. Level 1 allows access to calibration. If Level 2 is not enabled, access to limit values and setpoints is also possible on Level 1. If Level 1 is enabled, an unlocking pattern and/or a password must be defined.
Unlock pattern	Menu for entry/definition of a Level 1 unlock pattern. The entry must be repeated as confirmation.
Password	Menu for entry/definition of a Level 1 password. The entry must be repeated as confirmation.

Please note

For a detailed description of the user administration, see “Menu “User administration”” on page 114.

Connections	
Network	
IP address	Enter a fixed IP address (if necessary, contact network administrator)
Subnet	Enter the subnet mask (if necessary, contact network administrator)
Gateway	Gateway setting
RS485 Interface	
Function	Selection of the RS485 Interface function. The RS485 Interface supports bus communication with the Process Monitoring System or other higher-level systems that support the RS485-WT protocol (1-address operation). RS485 WT protocol/Off
Bus address	Bus address setting at the RS485 Interface (RS485 WT) 00...31

Backup and Reset	
Reset to factory settings	Under Reset to factory settings, the device can be reset to the factory settings. When the factory settings have been restored, the reset settings have to be entered again. You can select which settings are to be reset.
Reset measurement & control parameters	☑ ☐
Reset system settings	☑ ☐
Reset user administration	☑ ☐

Please note

To reset the selected setting to the factory setting, press the “Execute” button.

6.3.7 Menu “Information”

Various device features, e.g. the installed software version, are described in the “Information” menu.

6.3.8 Menu “User administration”

The device offers the option of using up to three user levels. Different rights are assigned to each user level. The colored user symbol (A) in the main menu shows on what level the user is logged in.

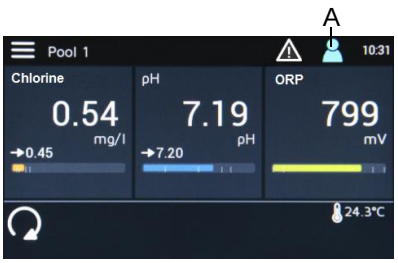


Image 2 Main menu (example Chlorine)

A User administration display

Please note

The user administration of the web visualization via Internet browser differs from the user administration on the display or on the device itself (see Chapter 6.3.9 “User administration via web visualization”).

The following user levels are possible in the main menu:

Symbol	Explanation
No symbol	User logged out, read rights for all settings and change of operation mode No symbols are displayed also with disabled access control; in this case, write access to all settings is possible.
User symbol white = Level 1	User logged in on Level 1, read rights for all settings, sensor calibration and change of user
User symbol green = Level 2	User logged in on Level 2, read rights for all settings, sensor calibration, change of operation mode, change limit values and setpoints and change date and time
User symbol blue = Level 3	User logged in on Level 3, read rights for and write access to all device settings

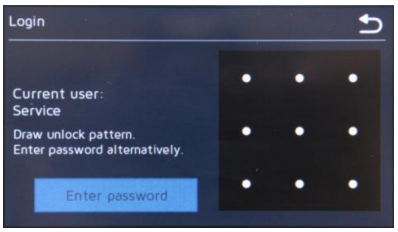
Please note

In as-delivered status, access control and user administration are switched off. We recommend that you enable access control after commissioning and create the desired users.

Login

Proceed as follows to log in:

Main menu
Symbol „Settings menu”
Menu „Login”
LOGIN



1 Switch to the main display.
2 Press the ☰ symbol.
3 Press the “Login” menu.
4 Enter locking code or password. See Chapter 6.3.3 “Menu “Login””.

Logout

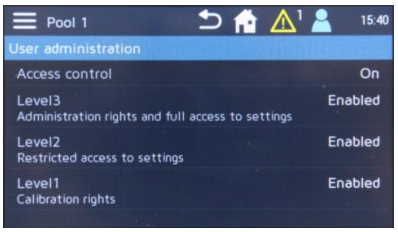
Symbol „Settings menu”
Symbol „Logout” and Menu „Login-Level”

Proceed as follows to log out:

1 Press the user symbol. The user is logged out and the user symbol is no longer displayed.

Create users

Main menu
System „Settings menu”
Menu „Settings”
Parameter „User administration”
USER ADMINISTRATION



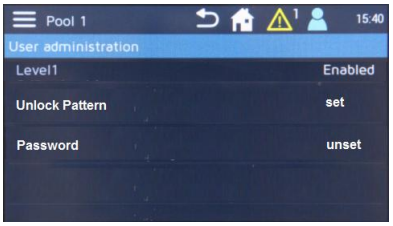
In order to create or change the users, log in on Level 3 is required and access control must be enabled. Proceed as follows:

1 Switch to the main display.
2 Press the ☰ symbol.
3 Press the ⚙ menu “Settings”.
4 Press the “User administration” parameter.
5 Set the parameter “Access control” to “On”.
6 To define or change a password or locking code, the password “3000” (factory setting for Level 3) must be entered.

   As an alternative, Level 1 and Level 2 can be enabled. However, this is not mandatory. If Level 1 or Level 2 are not enabled, the device must be operated via the next highest user level.

Please note

When access control is disabled, all passwords and locking codes entered are deleted. “3000” is therefore again enabled as the Level 3 password.



7 Press the desired parameter Level 1/Level 2 or Level 3 to enable or change the desired Level, 1, 2 or 3. The screen changes to the settings menu for the corresponding level (Example. Level 1).

The parameter Level 1/Level 2 or Level 3 is used to enable or disable user level 1,2 and 3. Enter the setting “enabled” to use the Level. After enabling, an unlock pattern and/or password for login must be defined (at least one of these two login options must be set).

To enter an unlock pattern, proceed as follows:

1 Press the “Unlock pattern” parameter.

2 Define unlock pattern using the 9 points displayed.

3 Press the "Retry" button to correct your entry.

4 Press the "Next" button to confirm the entry a second time.

5 Enter the same pattern again and save with the “OK” button. The unlock pattern is now set and valid.

To enter a password, proceed as follows:

1 Press the parameter “Password”.

2 Enter the desired password via the input keypad.

3 Confirm with the Enter key.

4 Enter the same password again.

5 Confirm with the Enter key.

6 Press the "OK" button to save the changes. The password is now set and valid.

6.3.9 User administration via web visualization

User administration via web visualization comprises two levels. At the factory, these two user levels are disabled and preset to “0”. For security reasons, the user levels must be enabled during commissioning. The padlock symbol in the menu bar shows whether the user is logged in. Depending on the specific user, the various menus are shown or hidden.

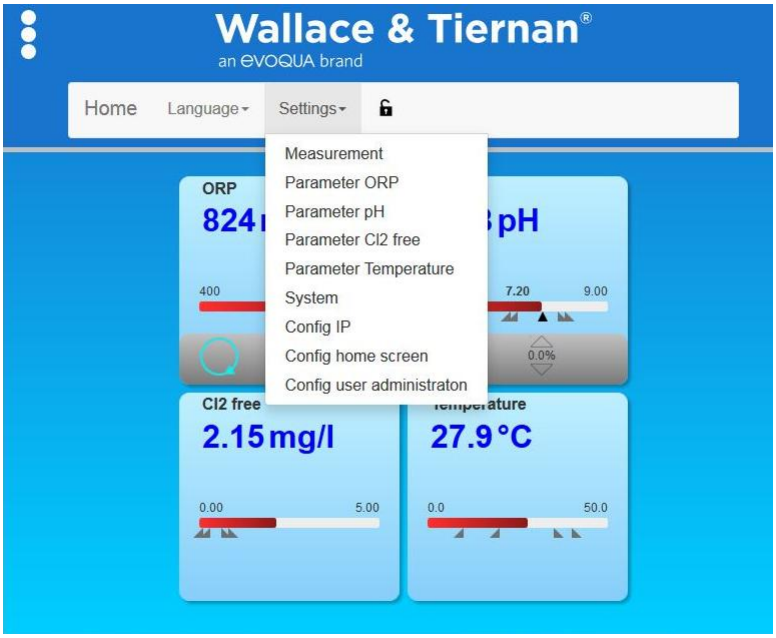


Image 3 Web visualization view in Login Level 2

Symbol	Explanation
Padlock symbol red, closed	User logged out, read rights only
Padlock symbol black, open	User logged in on Level 1 or 2
No padlock symbol	User administration not enabled

Login

Proceed as follows to log in:

1 Press the red padlock symbol. Login window for password entry opens.

2 Enter password.

3 Confirm with the “Save” button.

Logout

Proceed as follows to log out:

1 Press the black padlock symbol. User is logged out.

Enable user levels

To enable the user levels, proceed as follows:

1 Open menu “Settings” - “Configure user administration”.

2 To change/enable the password on Level 1, click the value for the Level 1 password. The input menu opens.

3 Enter a combination of numbers and letters with a maximum of ten characters.

4 Confirm with the “Save” button.

5 To change/enable the password on Level 2, click the value for the Level 2 password. The input menu opens.

6 Enter a combination of numbers and letters with a maximum of ten characters.

7 Confirm with the “Save” button.

Please note

To define or change the passwords at a later time, Login on Level 2 is required. To disable the passwords, define the password as “0”.

6.4 Web visualization

The web views integrated in the DEPOLOX® Pool Compact allow you to visualize the measurements and setting parameters via a standard browser and Internet-capable devices.

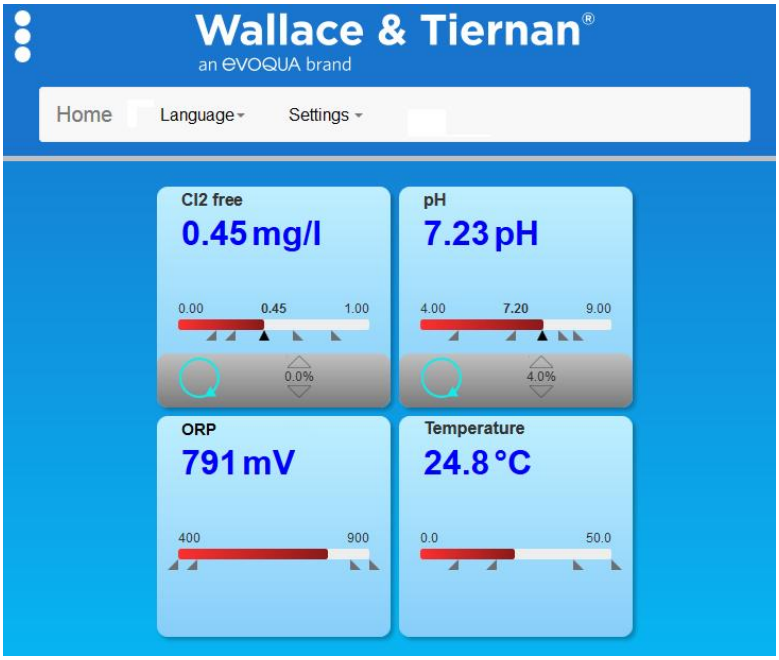


Image 4 DEPOLOX® Pool Compact web visualization view

The menu bar is divided into two main menus:

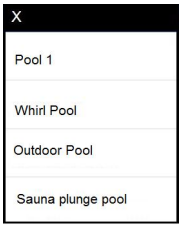
- Language
- Settings

The following settings can be configured from the „Language”:

Language	German English French This selection defines the user language for the web visualization.

The following settings can be configured from the „Settings”:

Parameter Cl2 free	
Setpoint	within measurement range
Xp	1...1000
Tn	0...100.0 min
Limit Max 1	within measurement range
Limit Min 1	within measurement range
Limit Max 2	within measurement range
Limit Min 2	within measurement range
Parameter pH	
Setpoint	within measurement range
Xp	1...1000
Tn	0...100.0 min
Limit Max 1	within measurement range
Limit Min 1	within measurement range
Limit Max 2	within measurement range
Limit Min 2	within measurement range
Parameter ORP	
Setpoint	within measurement range
Xp	1...1000
Tn	0...100.0 min
Limit Max 1	within measurement range
Limit Min 1	within measurement range
Limit Max 2	within measurement range
Limit Min 2	within measurement range
Parameter Temperature	
Setpoint	within measurement range
Xp	1...1000
Tn	0...100.0 min
Limit Max 1	within measurement range
Limit Min 1	within measurement range
Limit Max 2	within measurement range
Limit Min 2	within measurement range

System	
System name	Customizable, customer-specific device name
Date	Date setting
Time	00:00...24:00
Software version	Display software version
Software number	Display software number
Serial number	Display device serial number
IP configuration	
IP	Enter a fixed IP address (if necessary, contact the network administrator)
Network mask	Enter the subnet mask (if necessary, contact the network administrator)
Gateway	Gateway setting
Mac	Display the device Mac address
IP password	124 In order to change the IP address of the device via the web visualization, the IP password must first be set to “124.”
IP link 1...3	Enter the IP address for up to three devices with the integrated web visualization. These devices can then be called directly from the selection menu  (top left of the web view) via the name Link 1...3.
Name link 1...3	Freely configurable menu name for the devices of the IP link 1...3. A maximum of three IP links is possible. This name is displayed in the menu. See example:
Menu IP link 	

Please note

If several DEPOLOX® Pool Compact devices are connected via IP link, enter the IP address followed by „/main.shtml”.
Example: 192.168.200.12/main.shtml

6.5 Firmware update

The firmware for the device is updated using a commercially available USB stick. The memory size should be at least as large as the firmware file itself. For a firmware update, the firmware file “*.SREC” and the file “Bootload.ini” must be copied to the USB stick. Do not use subdirectories.

Please note

A firmware update can be downloaded free of charge from the homepage of Evoqua Water Technologies GmbH.

Warning!

Risk of injury or damage to the device!

Only authorized and qualified electricians are permitted to connect the DEPOLOX® Pool Compact electrically and to open the housing.

Danger!

Risk of injury or death!

External voltages may still be connected even if the operating voltage is switched off.

Proceed as follows:

1 Disconnect the electronics module from the power supply.

2 Remove the housing cover of the electronics module. To do this, release the four screws on the housing cover and remove the cover carefully. Hook into the housing cover into the holders on the basic housing.

3 Insert the USB stick into the USB port (A).

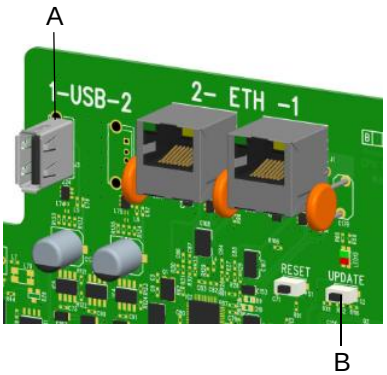
4 Switch on mains voltage.

5 Using an insulated screwdriver or similar tool, briefly press the left Update button (B) on the motherboard.

6 The update takes approximately 1 to 2 minutes. The LED flashes green while the update is in progress.

7 The update is complete when the green LED no longer flashes.

8 The USB stick must now be removed.



9 Close the housing cover of the electronics module again. To do this, place the housing cover carefully on the basic housing. Tighten the four housing screws to a maximum torque of 0.7 Nm (± 0.15 Nm).

10 Switch the device on.

11 All settings must now be entered again. See Chapter 5.6 “Startup”.

12 If necessary, calibrate the sensors.

6.5.1 LED glow stick color signaling

The color of the LED glow stick switches between white, yellow and red depending on the operating state, see Chapter 6.3.6 “Menu “Settings””.

The different colors have the following meanings:

White	• All OK. • The device is working trouble-free. • No active errors or currently no message in the message system.
Yellow	• Alarm that is configured as “unlatched” has been activated. As soon as the cause was rectified and the alarm is inactive, the yellow color signal changes again. • Fault message became active (only with activated container monitoring and if the Min message from the Cl_2 or pH container is present).
Red	• Error message present. • Alarm that is configured with acknowledgment has been activated.

6.6 Calibration

When calibrating the measurements, variations in the calibration solutions, buffer solutions or comparative measurements are adjusted. Calibration is performed for new devices (first commissioning) and to recalibrate existing measuring instruments in accordance with maintenance regulations. See also Chapter 6.3.2 “Menu “Calibration”” and Chapter 5.4.12 “Installing calibration aids”.

Please note

Calibration must be carried out on first commissioning.
The calibration intervals are defined depending on the area of application and water quality. Please observe the prescribed maintenance intervals.

Please note

Before calibration of the pH or redox value, the ball valves on the sample water inlet and sample water outlet must be closed and the pressure released. Open the ball valves again after calibration.

Attention!

Damage to sensor!

Electrodes are highly sensitive! Do not soil or damage! Comply with the safety data sheets for the buffer solutions or calibration solutions.

6.6.1 Chlorine calibration

Free chlorine (Cl2) calibration

During calibration for free chlorine, a zero point calibration and a measured value calibration (DPD1) must be carried out.

Please note

To prevent non-permissible control signals being output during calibration, the "Hold function" in the system menu should be set to "On". mA-outputs and controller outputs then remain constant as long as a calibration menu is open.

Zero point calibration

System menu
Calibration
CHLORINE MEASUREMENT MENU

Proceed as follows:

1 Press the ☰ symbol.

2 Press the menu CAL Calibration.

3 Tap the measurement “Chlorine”.

4 Press the parameter “Zero point”.

5 Close the ball valve on the sample water inlet.

Please note

Make sure that the chlorine sensor is firmly screwed in. Otherwise the measurement accuracy will be affected by inhomogeneous flow and inadequate sand cleaning.
When the sample water supply has been stopped, the display first drops rapidly, and after approximately one minute slowly approaches zero. During first commissioning, it is essential to wait for 5 minutes, even if the display shows “0.00” or flashes after a few seconds.

6 Wait until the displayed chlorine value no longer changes.

7 Press the “Calibration” button. An input field opens.

8 Press "Enter" to save the zero point.

9 Open the ball valve on the sample water inlet.

Measuring value calibration (DPD)

10 After zero point calibration, wait at least 2 minutes.

11 Open the sample extraction unit (drain) by approximately 1 turn and extract a specimen of the sample water.

12 Determine the content of free chlorine in the sample using a photometer.

13 Press the parameter “DPD”.

14 Press the “Calibration” button. An input field opens.

15 Use the input keys to enter the determined value.

16 Press "Enter" to save the entry.

This concludes the calibration for free chlorine.

6.6.2 pH calibration

Please note

During pH calibration, the buffer solution and the sample water should have the same temperature. If there is a temperature difference of > 5 °C, first bring the buffer solution to the same temperature as the pool water.

System menu
Calibration
pH MEASUREMENT MENU

Proceed as follows:

1 Press the ☰ symbol.

2 Press the menu CAL Calibration.

3 Tap the measurement “pH”.

pH 7 alignment

4 Press the parameter “pH 7”.

5 Close the sample water inlet and sample water outlet and briefly open the sample extraction unit (drain) to release the pressure. Close the sample extraction unit (drain) again.

6 Place the beaker into the bottom clip and fill with buffer solution "pH 7.00" or clamp the bag with buffer solution "pH 7.00" into the bottom clip.

7 Unscrew the pH sensor from the cover of the cell body of the flow cell.

8 Dip the pH sensor through the top clip at least 2 cm deep into the buffer solution and move slightly until the indicated pH value remains constant.

9 Press the “Calibration” button. An input field opens.

10 Use the input field to enter the value to be calibrated for the buffer solution.

11 Press "Enter" to save the entry.

pH X-span alignment

12 Remove the buffer solution “pH 7.00” from the bottom clip.

13 Wash the sensor in distilled water to prevent carryover of buffer solution.

14 Press the parameter “pH X”.

15 Place the beaker into the bottom clip and fill it with buffer solution "pH 4.65" or clamp a bag with buffer solution "pH 4.65" into the bottom clip.

Please note

If buffer solutions other than those stated are used, the pH value of the buffer solution must be lower than pH 6 or higher than pH 8.

16 Dip the pH sensor at least 2 cm deep into the buffer solution and move gently until the indicated pH value remains constant.

17 Press the “Calibration” button. An input field opens.

18 Use the keypad to enter the value to be calibrated.

19 Press "Enter" to save the entry.

20 Remove the pH sensor from the top clip.

21 Screw the pH sensor into the cover of the cell body of the flow cell.

22 Open the sample water inlet and outlet again.

The pH measurement has now been calibrated.

Offset compensation

If external influences result in a constant difference between the displayed pH value and a pH value measured manually, this difference can be compensated and the comparative value entered in the Offset menu.

System menu
Calibration
pH measurement menu

OFFSET

Proceed as follows:

1 Press the ☰ symbol.

2 Press the menu CAL Calibration.

3 Tap the measurement “pH”.

4 Press the parameter “Offset”.

5 Use the keypad to enter the value from the comparative measurement.

6 Press "Enter" to save the entry.

This concludes the pH offset.

Please note

The offset entry is deleted each time a new pH-7 alignment or span alignment is performed.

6.6.3 ORP calibration (Redox)

Please note

ORP sensors have long running-in times. This means that after calibration with calibration solution, it can take several hours for the measured value to stabilize.

System menu
Calibration
ORP (REDOX) MEASUREMENT MENU

Proceed as follows:

1 Press the ☰ symbol.

2 Press the menu CAL Calibration.

3 Select the “ORP” measurement menu.

4 Press the parameter “Cal. value”.

5 Place the beaker into the bottom clip and fill it with calibration solution "478 mV" or clamp a bag with calibration solution "478 mV" into the bottom clip.

6 Close the sample water inlet and sample water outlet and briefly open the sample extraction unit (drain) to release the pressure. Close the sample extraction unit (drain) again.

7 Screw the ORP sensor into the cover of the cell body of the flow cell.

8 Dip the ORP sensor through the top clip at least 2 cm deep into the calibration solution and move it slightly until the indicated pH value remains constant.

9 Press the “Calibration” button. An input field opens.

10 Use the keypad to enter the value to be calibrated.

11 Press "Enter" to save the entry.

12 Remove the ORP sensor from the top clip.

13 Screw the ORP sensor into the cover of the cell body of the flow cell.

14 Open the sample water inlet and outlet again.

This concludes the ORP calibration.

6.6.4 Temperature calibration

System menu
Calibration
TEMPERATURE MEASUREMENT MENU

Proceed as follows:

1 Press the ☰ symbol.

2 Press the menu CAL Calibration.

3 Tap the measurement “Temperature”.

4 Press the parameter “Cal. value”.

5 Perform comparative temperature measurement.

6 Use the keypad to enter the value to be calibrated.

7 Press "Enter" to save the entry.

This concludes the temperature calibration.

6.7 Faults and remedies

6.7.1 Messages, alarms and errors

Messages, alarms and errors are displayed on the electronics module with the colored message symbol ⚠. Error messages can occur that can be acknowledged or that can not be acknowledged. If several messages occur at the same time, the number of messages appears next to the symbol. Press the message symbol ⚠ to display the message window. Configured alarms, messages that can be acknowledged and errors are displayed as clear text. A time-stamp shows when the message was activated.

Acknowledgeable messages

Acknowledgeable messages are displayed in red. They are acknowledged via the message window and the green ACK button.

Error message	Cause	Remedy
Maximum dosing time?	The maximum dosing time set for a control output has been exceeded.	Determine the cause, e. g. chemical tank empty. Check the dosing pump.
Auto tune error	Auto tune terminated with error.	See Chapter 3.6.6 “Auto tune (only applies to free chlorine)”.

Non-acknowledgeable messages and errors

Error messages are displayed in red in the message window and can only be rectified by eliminating the cause.

Error message	Cause	Remedy
Measured value display flashes	Measured value is outside the measurement range.	Check measurement range and change, if necessary. Check dosing or controller settings.
DI 1 flashes	Sample water flow rate recently insufficient (delay time running).	Check the sample water flow rate (approx. 33 l/h). Clean or replace strainer. Multi-sensor incorrectly connected or defective.
DI 1	Sample water flow rate insufficient for some time (delay time elapsed).	
DI 2 DI 3	Digital input 2 active Digital input 3 active	Check the cause depending on the use of digital input 2 and 3, e.g. circulation off, remedy fault in the circulation, chemical tank empty, change tank.
Zero point calibration ?	Chlorine Sensor: Zero current of sensor > +5 µA or < –5 µA	Upot potential voltage set incorrectly; change if necessary. Electrodes of chlorine sensor are dirty, if necessary clean / service. Sample water is not turned off or check valve leaks; turn off sample water if necessary.
DPD calibration ?	Slope error The current difference required for span alignment over the entire measurement range was less than the minimum value. Range: Minimum current difference	Check chlorine sensor. Clean electrodes. Check the pH value of the water (< pH 8).
	Organic chlorine compound (e.g. chlorine stabilizer chloroisocyanurate) in the water.	Do not add any chlorine stabilizers to the water.
	Chlorine sensor: Slope error - the sensor current based on 1 mg/l has fallen below the required minimum.	Clean chlorine sensor, replace cleaning sand.

Error message	Cause	Remedy
pH7 calibration ? pHX calibration ? Calibration ? Offset calibration ?	pH: In pH 7 calibration, the sensor signal is outside the range -100 to +100 mV or the sensor issues a signal outside the range 46 to 70 mV per pH increment, the calibration point distance is smaller than 1 pH increment.	Check the electrode. Check buffer solutions, replace if necessary.
	mV: The mV sensor correction offset is outside the range –50 to +50 mV.	Check the electrode. Check calibration solutions, replace if necessary.
Factory calibration ?	Hardware or electronic error	Contact Service.
Setpoint ?	Due to modification of the measurement range, the controller setpoint is outside the range.	Reset the controller setpoint or adjust the measurement range.
Limit value ?	Due to modification of the measurement range, the limit value is outside the range.	Reset the limit value or adjust the measurement range.
Temperature error ?	Interruption in the temperature sensor or cable of the multi-sensor.	Check multi-sensor and cable.
mA Output 1 ? mA Output 2? mA Output 3 ? mA Output 4 ?	Load error The mA output cannot drive its mA output current through the connected current loop (500 ohm at 20 mA max.).	Check whether the mA signal is required at all (e.g. for plotter). If not, switch off the output signal in the “INPUTS/OUTPUTS” menu, “Analog output”. Check mA signal cable for interruption.
Hardware ?	Hardware or electronic error	Contact Service.
Data storage ?	Hardware or electronic error	Contact Service.
Dosage analog	No mA output assigned to actuator.	Check mA output or dosing output.
Cell ?	Chlorine sensor: Chlorine sensor not screwed in. No sand cleaning. Sensor, sensor cable or sensor measuring module defective. Sensor measuring module µA measuring range exceeded. pH, F^- and mV modules: Sensor, sensor cable or sensor measuring module defective.	Screw in sensor correctly. Check sand cleaning. Check the sensor, sensor cable or sensor measuring module, replace if necessary. Select higher µA measurement range. Check the sensor, sensor cable and sensor measuring module, replace if necessary.

Error message	Cause	Remedy
Range?	Min. or max. limit value is outside the measuring range.	Check the min/max limit values and change if necessary.
Cl2 feed lockout activated	Deviation of measured pH value from setpoint greater than the set switch-off range (Cl2 feed lockout activated). pH tank may be empty pH measurement may be faulty	Check pH dosing Check/replace pH tank Check pH measurement

6.7.2 Messages

Message	Cause	Remedy
pH tank level min. reached!	Suction lance pH min. fill level reached	Replace pH tank
Cl2 tank level min. reached!	Suction lance Cl2 min. fill level reached	Replace Cl_2 tank
Cl2 tank level empty!	Suction lance Cl2 empty fill level reached	Replace Cl_2 tank
pH tank level empty!	Suction lance pH empty fill level reached	Replace pH tank
Sample water	Sample water flow rate too low, dirt filter soiled, sample water inlet or sample water outlet ball valve closed, dirt in inlet, flow control valve or check valve housing.	Open ball valves, clean dirt filter, remove dirt

6.7.3 Faults

The table below shows and explains possible faults. If it is not possible to remedy the fault or error yourself, please contact your affiliate.

Error	Cause	Remedy
No indication on device	No power supply.	Turn external switch or fuse on.
	Device fuse defective.	Check the power supply and replace fuse if necessary (electrician).
Device not showing a measurement.	Sensor measuring module has been changed or added.	Start device again.
Displayed/output value incorrect.	Change on sensor or in the sample water.	Calibrate
Low control quality (controller oscillates, setpoint not reached)	Incorrect controller parameters for Xp or Tn.	Check, adjust controller parameters; perform automatic adaption on single feedback closed-loop control.
	Dosing chemical tank empty.	Fill, replace.
	Incorrect actuator selected.	Check, correct actuator.
	Positioner or pump defective.	Check, replace positioner/pump.
Measured value display not available, although the appropriate sensor measuring module is installed	Sensor measuring module defective or not installed correctly.	Check, replace sensor measuring module (electrician).
Positioner/pump does not work	Positioner in manual mode.	Engage manual knob.
	Dosing device selected incorrectly.	Select correct dosing device.
	Positioner/pump incorrectly connected.	Connect positioner/pump correctly (electrician).
	Relay defective.	Check (electrician).
	Fuse at relay output defective.	Check (electrician), if necessary, replace fuse and eliminate cause.
Positioner runs in wrong direction	Positioner incorrectly connected.	Correct connections (electrician).
Digital inputs without function	Digital inputs not enabled.	Enable digital inputs, assign function.
Relay switches, but no output.	Relay defective. Fuse on relay defective.	Check (electrician), if necessary, replace fuse.

7. Maintenance

Danger!

Risk of injury or death!

External voltages may still be connected even if the operating voltage is switched off.

7.1 Maintenance intervals

Please note

Liability for defects can only be accepted if maintenance work is performed as specified. Adhere to the applicable standards and national and regional regulations.

Activity	Period/Interval	Chapter
Sample water monitoring	regular intervals	7.2
Circulation monitoring	regular intervals	7.3
Check the flow cell, including all screw connections, for leakage	daily	7.4
Comparative measurement of chlorine and pH, if necessary calibration	In acc. with standard or local standards	7.9
Check the electrode cleaning sand	weekly	7.5
Replace the electrode cleaning sand	every six months	7.5
Check ORP in calibration solution	every 4 to 6 weeks or local standards	See instructions on sensors
Clean or replace the strainer (optional)	as required	7.8
Replace battery of the electronics module	Replace the battery after 5 years	7.10

Please note

The parts required for servicing of the flow cell are included in the maintenance parts kits. Here, we distinguish between maintenance parts kits for wear parts for 1 year and for 4 years. For details, see Chapter 8. “Spare parts, accessories and retrofit kits”.

7.2 Sample water monitoring

Danger!

Risk of injury or death

If there is a shortage of sample water or the flow rate is too low, there is a risk of uncontrolled dosing of chemicals. To ensure safe operation and prevent injury, the sample water monitoring must never be disabled.

The sample water monitoring must be checked regularly. Without automatic detection of a shortage of sample water or an excessively low flow rate, there is a risk of uncontrolled dosing of chemicals. Never disable the sample water monitoring - even temporarily, e.g. by bridging the signal input. The sample water monitoring deactivates dosing if there is a shortage of sample water and prevents the uncontrolled dosing of chemicals.

7.3 Circulation monitoring

Danger!

Risk of injury or death

Chemical dosing must switch off if the circulation is switched off or the circulation rate is too low. To ensure safe operation and prevent injury, it is essential to install circulation monitoring.

The circulation monitoring must be checked regularly. A circulation monitoring device must be installed in the unit and connected to the DEPOLOX® Pool Compact. The input used must be configured as “Controller Stop.” The dosing of chemicals must switch off if the circulation is deactivated or the circulation output is too low, e.g. dosing switches off with digital input 2 used as “Controller Stop.”

7.4 Checking for leakage

Check the entire flow cell every day, including all screw connections, for leakage. Repair any leaks immediately.

Please note

Ascending air bubbles in the cell body influence the measuring accuracy. The cause must be determined and remedied.

7.5 Checking the electrode cleaning sand

At weekly intervals, check that there is enough electrode cleaning sand in the cell body. The cleaning sand must be swirled around in the bottom part of the cell body. The electrode cleaning sand is necessary for cleaning the electrode of the chlorine sensor and must be replenished or replaced if necessary.

7.6 Replacing the electrode cleaning sand

The electrode cleaning sand used for constant cleaning of the chlorine sensor grinds itself down with time. The cleaning sand must be replaced regularly. For details of the procedure, see Chapter 5.4.10 “Inserting electrode cleaning sand”.

Please note

After adding fresh electrode cleaning sand or replacing it, the electrode current can increase slightly for approximately 2 to 3 hours. Calibration is needed after this. See Chapter 6.6 “Calibration”.

7.7 Cleaning the flow rate monitor and check valve

Proceed as follows:

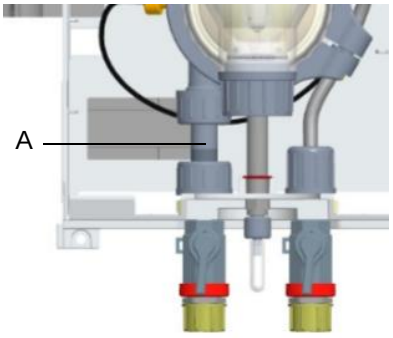
1 Switch off the power supply.

2 Drain the sample water supply line and drainage line.

3 Remove the housing cover of the flow cell.

4 Remove the filter unit. To do this, release both knurled nuts.

5 Carefully pull the complete check valve housing (A) down and out.



6 Turn the check valve housing upside down and catch the flow ball (B) or if the ball is jammed, release it with a slight knock.

7 Now use a suitable blunt tool to push out the ball seat (D) and glass ball (C) against the direction of flow.

8 Clean the empty check valve housing, flow ball, ball seat and glass ball with clear water.

9 During reassembly, make sure that the ball seat and ball are correctly positioned.

10 To help push the assembled check valve housing back into the control valve, we recommend slightly lubricating the gaskets with the Unisilikon grease provided.

11 Check that the check valve housing is correctly positioned by the guide lugs on the housing.

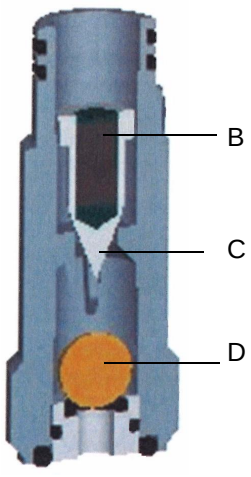
12 Fit the filter unit again. To do this, tighten the knurled nuts.

13 Fit and engage the housing cover of the flow cell.

14 Connect the sample water supply line and drainage line again.

15 Reconnect the power supply.

top



bottom

Image 1 Section, installation position of the check valve housing

Image 2 Cross-section of the check valve housing

A Check valve housing (overall view)
B Flow ball
C Ball seat
D Glass ball

7.8 Clean or replace the strainer (optional)

The (optional) strainer must be cleaned or replaced regularly to avoid contamination or blockages. The frequency of cleaning or replacement depends on the degree of contamination caused by the sample water.

Proceed as follows:

1. Close the ball valve on the sample water supply and drainage line. The unit must be unpressurized and drained.
2. Unscrew the strainer and rinse it with water. Catch any water that emerges in the tank.
3. Remove the strainer screen and rinse it under running water or replace it.
4. Fit the strainer screen again and reinstall the strainer.
5. Open the ball valve on the sample water supply and drainage line again.

7.9 Changing the fuses on the CPU-board

Warning!

Only authorized and qualified electricians are permitted to open the housing. The electronics module is not equipped with a mains switch.

The mains input and all relays are protected by fuses of type TR5. 3.15 A (slow-blow) fuses are used for the relays and 1.6 A (slow-blow) fuses for the mains input. Spare fuses are included with the accessories.

Danger!

Risk of injury or death!

External voltages may still be connected even if the operating voltage is switched off.

Proceed as follows:

1. Disconnect the electronics module from the power supply and check that it is de-energized.
2. Remove the housing cover of the electronics module. To do this, unscrew the housing cover and remove carefully. Hook into holder on the basic housing.
3. Pull the defective fuse (A) out of the fuse holder and insert new fuse, making sure that the rated data match!
4. Fit the housing cover of the electronics module again. Tighten the housing screws to a maximum torque of 0.7 Nm (± 0.15 Nm).

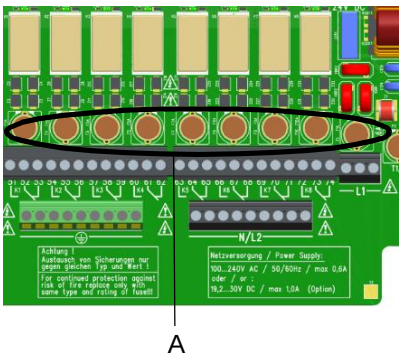


Image 3 Section, electronics module - fuses

7.10 Replacing the battery

Warning!

Risk of injury!

Only authorized and qualified electricians are permitted to open the housing. The electronics module is not equipped with a mains switch.

Danger!

Risk of injury or death!

External voltages may still be connected even if the operating voltage is switched off.

The battery is required for the real time clock in case of a power failure. If the time is not correct or if time-controlled functions show faulty behavior, the battery must be changed. After five years at the latest.

1. Disconnect the electronics module from the power supply.
2. Remove the housing cover of the electronics module. To do this, unscrew the housing cover and remove carefully. Hook into holder on the basic housing.

3 Remove the battery from the holder and dispose of it in accordance with the regulations.

Attention!

Environmental hazard!

Do not throw away or burn batteries. The batteries must be disposed of in accordance with environmental protection regulations.

4 Insert the new battery, type CR2032.

5 Fit the housing cover of the electronics module again. Tighten the housing screws to a maximum torque of 0.7 Nm (± 0.15 Nm).

6 Switch on mains voltage.

7 Set date and time, no other settings need to be made.

7.11 Cleaning

Never use corrosive cleaning agents (e.g. spirit, scouring agents)! We recommend that you use a moist cloth with a neutral household cleaning agent.

8. Spare parts, accessories and retrofit kits

Please note

For reasons of safety, only use original spare parts. Please contact our customer service if you need any spare parts.

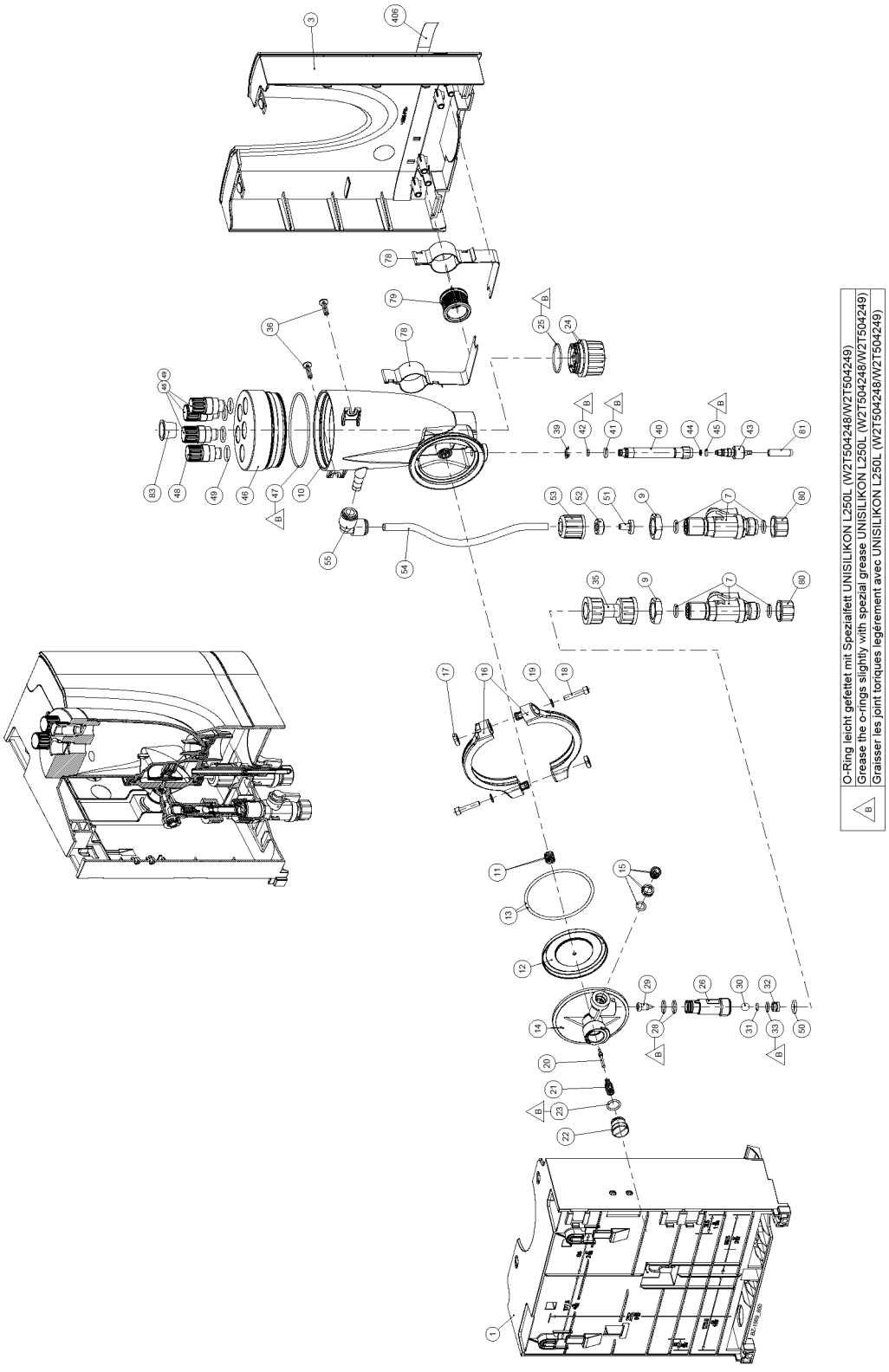
8.1 Spare parts

8.1.1 Electronics module (module type E02)

Part No.	Description
W3T391851	Electronics module for Cl2/pH, spare part
W3T391862	CPU-board (motherboard spare part)
W3T395075	Operating front panel with cover and display
W3T160551	M20x1.5 hex nut
W2T504179	M20x1.5 cable gland
W2T504212	M20 blind plug
W3T160552	M25x1.5 hex nut
W2T542498	M25x1.5 cable gland for assembly of cables with pre-assembled connectors
W2T833447	Cable gland M20 for sensor cable
W3T172625	Lithium coin cell battery CR2032
W2T821593	RJ45 connection cable CPU-board/HMI
W2T839300	Fuse TR5 3,15A T
W2T839299	Fuse TR5 1,6A T
W3T364410	Sensor cable for chlorine sensor
W3T173161	Sensor cable for pH sensor
W3T173161	Sensor cable for ORP sensor
W3T391866	LED glow stick
W3T391865	4-way mA output card
W3T391864	Sensor card for ORP sensor
W3T364409	Multi-sensor
W2T505559	RS485 data cable (1 m)

8.1.2 Flow cell (module type D02)

Drawing flow cell



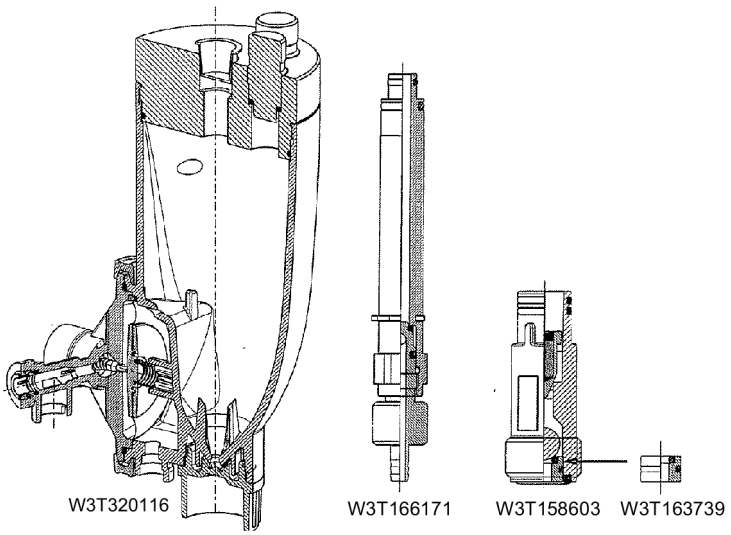
Parts list flow cell

Item	Part No.	Description
1	W3T247776	Basic housing
2	W2T507548	Type plate
3	W3T247777	Housing cover
7	W3T166170	Shut-off valve
9	W2T507615	Flat nut
10	W3T158559	Cell body
11	W3T164226	Compression spring
12	W3T158569	Membrane unit
13	W3T160654	O-ring
14	W3T158595	Control valve body
15	W2T504209	Plastic cartridge
16	W3T160649	V profile clamp
17	W3T158567	Square nut
18	W2T504659	Cheese-head screw
19	W2T506019	Washer
20	W3T158572	Valve pin
21	W3T172795	Compression spring
22	W3T158573	Adjusting screw
23	W3T160357	O-ring
24	W3T160650	Flow distributor cap
25	W3T160655	O-ring
26	W3T160648	Check valve housing
28	W3T161396	O-ring
29	W3T169827	Cone
30	W3T172946	Ball
31	W3T172949	O-ring
32	W3T159707	Insert
33	W3T172975	O-ring
35	W3T158602	Filter unit
36	W2T505463	Pan head screw
39	W3T172041	Securing ring
40	W3T158576	Outlet drain pipe

Item	Part No.	Description
41	W3T172997	O-ring
42	W3T164597	O-ring
43	W3T158575	Drain screw
44	W3T166160	EPDM flat gasket
45	W3T172556	O-ring
46	W3T320101	Cell body cover
47	W3T160657	O-ring
48	W3T161450	Plug
49	W3T168859	O-ring
50	W3T172861	O-ring
51	W3T161501	Hose bushing
52	W3T169815	Locking ring
53	W3T161502	Union nut
54	W3T158601	Hose
55	W2T505093	Angle-reducing connector
78	W3T166169	Clip
79	W3T172045	Electrode mount
80	W3T161561	Screw cap
81	W3T168162	Protective cap
83	W3T161453	Protection plug
406	W3T341070	Empty strips

8.1.3 Cell body, flow cell

Drawing



Pre-installed assembly groups

Part No.	Description
W3T320116	Cell body, fully pressurized version
W3T166171	Sample extraction unit
W3T158603	Back pressure unit with float
W3T163739	Spherical set cpl.

Maintenance parts kits

Part No.	Description
W3T158874	Maintenance parts kit, annual maintenance
W3T158878	Maintenance parts kit, 4 years
W3T158882	Spare parts set for flow control valve

8.2 Sensors

8.2.1 Chlorine sensor (free chlorine)

Part No.	Description
W3T160652	Chlorine sensor (free chlorine in platinum version)
W3T160991*	Chlorine sensor (free chlorine in gold version)
W3T164482	KCl tank with stand and 5 ml KCl solution
W3T160410	Electrolyte solution 3 mol/l KCl, bottle 250 ml
W3T171317	Electrode cleaning sand, white
W3T158600	Measuring beaker (5 pcs)
W3T164515	Extension cable 5 m (with 1 connector)
W3T164516	Extension cable 10 m (with 1 connector)
W3T164547	Extension cable 15 m (with 1 connector)
W3T164548	Extension cable 25 m (with 1 connector)
W3T164549	Extension cable 50 m (with 1 connector)

Please note

***Sensor in gold version**

When disinfecting with inline electrolysis systems, the gold version of the chlorine sensor must be used.

8.2.2 pH sensor

Part No.	Description
W3T169297	pH sensor
W3T165076	Buffer solution pH 7.00, bottle 250 ml
W3T165084	Buffer solution pH 4.65, bottle 250 ml
W3T161181	Buffer solution pH 7.00, bag 12 ml
W3T161189	Buffer solution pH 4.65, bag 12 ml
W3T164482	KCl tank with stand and 5 ml KCl solution
W3T160410	Electrolyte solution 3 mol/l KCl, bottle 250 ml
W3T158600	Measuring beaker (5 pcs)
W3T164517	Extension cable 5 m (with 2 connector)
W3T164518	Extension cable 10 m (with 2 connector)
W3T164544	Extension cable 15 m (with 2 connector)
W3T164545	Extension cable 25 m (with 2 connector)
W3T164546	Extension cable 50 m (with 2 connector)

8.2.3 ORP sensor

Part No.	Description
W3T169298	ORP sensor (platinum version)
W3T172356*	ORP sensor (gold version)
W3T165048	Calibration solution 478 mV, bottle 250 ml
W3T161182	Calibration solution 478 mV, bag 12 ml
W3T164482	KCl tank with stand and 5 ml KCl solution
W3T160410	Electrolyte solution 3 mol/l KCl, bottle 250 ml
W3T158600	Measuring beaker (5 pcs)
W3T164517	Extension cable 5 m (with 2 connector)
W3T164518	Extension cable 10 m (with 2 connector)
W3T164544	Extension cable 15 m (with 2 connector)
W3T164545	Extension cable 25 m (with 2 connector)
W3T164546	Extension cable 50 m (with 2 connector)

Please note

***Sensor in gold version**

When disinfecting with inline electrolysis systems, the gold version of the ORP sensor must be used.

8.3 Accessories

8.3.1 Mounting plate

Part No.	Description
W3T395161	Mounting plate with accessories for simple mounting of the flow cell and electronics module, strainer and up to four hose dosing pumps

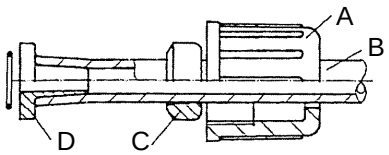
8.3.2 Impedance converter

Part No.	Description
W3T165563	Impedance converter for pH or ORP sensor

8.3.3 Strainer

Part No.	Description
W3T158721	Strainer with ball valve, straight
W3T389201	Set of fittings for strainer

8.3.4 Hose and hose connection



A Union nut
B Hose
C Locking ring
D Hose bushing

PVC hose, fabric-reinforced (internal diameter x wall thickness)	ø 4 x 3	ø 6 x 3	ø 10 x 3
Hose	W2T505524	W2T505525	W2T505334
PVC hose connecting parts comprising:	W3T167626	W3T167518	W3T167590
O-ring	W3T172861	W3T172861	W3T169068
Locking ring	W3T163417	W3T161436	W3T159622
Union nut	W3T161502	W3T161502	W3T167297
Hose bushing	W3T172945	W3T161501	W3T167293

PE hose (internal diameter x wall thickness)	ø 4 x 1	ø 6 x 1	ø 6 x 2	ø 10 x 2
Hose	W2T507155	W2T505784	W2T505676	W2T505734
Hose connecting parts made from PVC comprising:	W3T163752	W3T171453	W3T163796	W3T163825
O-ring	W3T172861	W3T172861	W3T172861	W3T169068
Locking ring	W3T172891	W3T169815	W3T163436	W3T163437
Union nut	W3T161502	W3T161502	W3T161502	W3T167297
Hose bushing	W3T172945	W3T161501	W3T161501	W3T167293

8.4 Retrofit kits

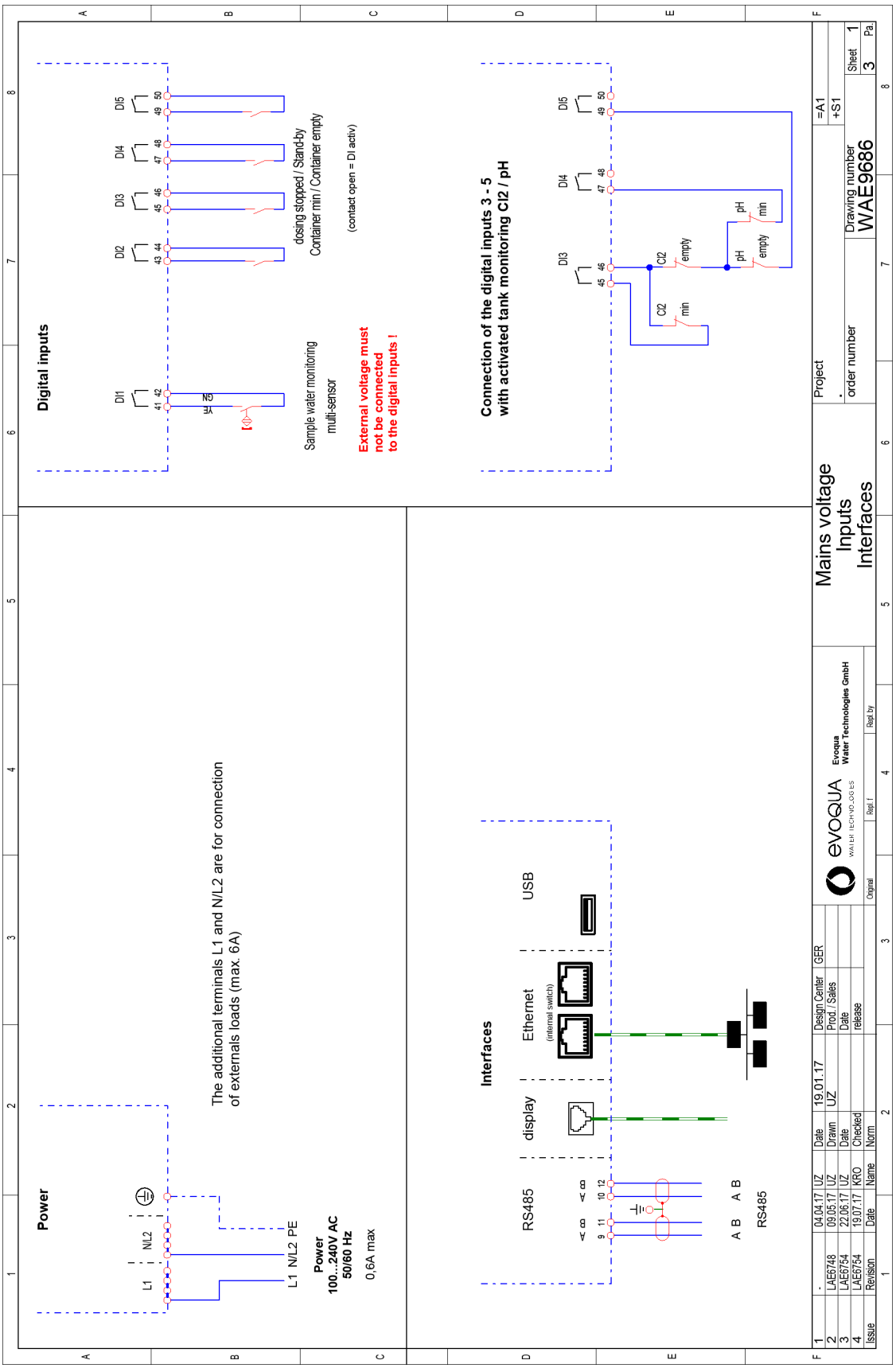
8.4.1 Sensor measuring module ORP

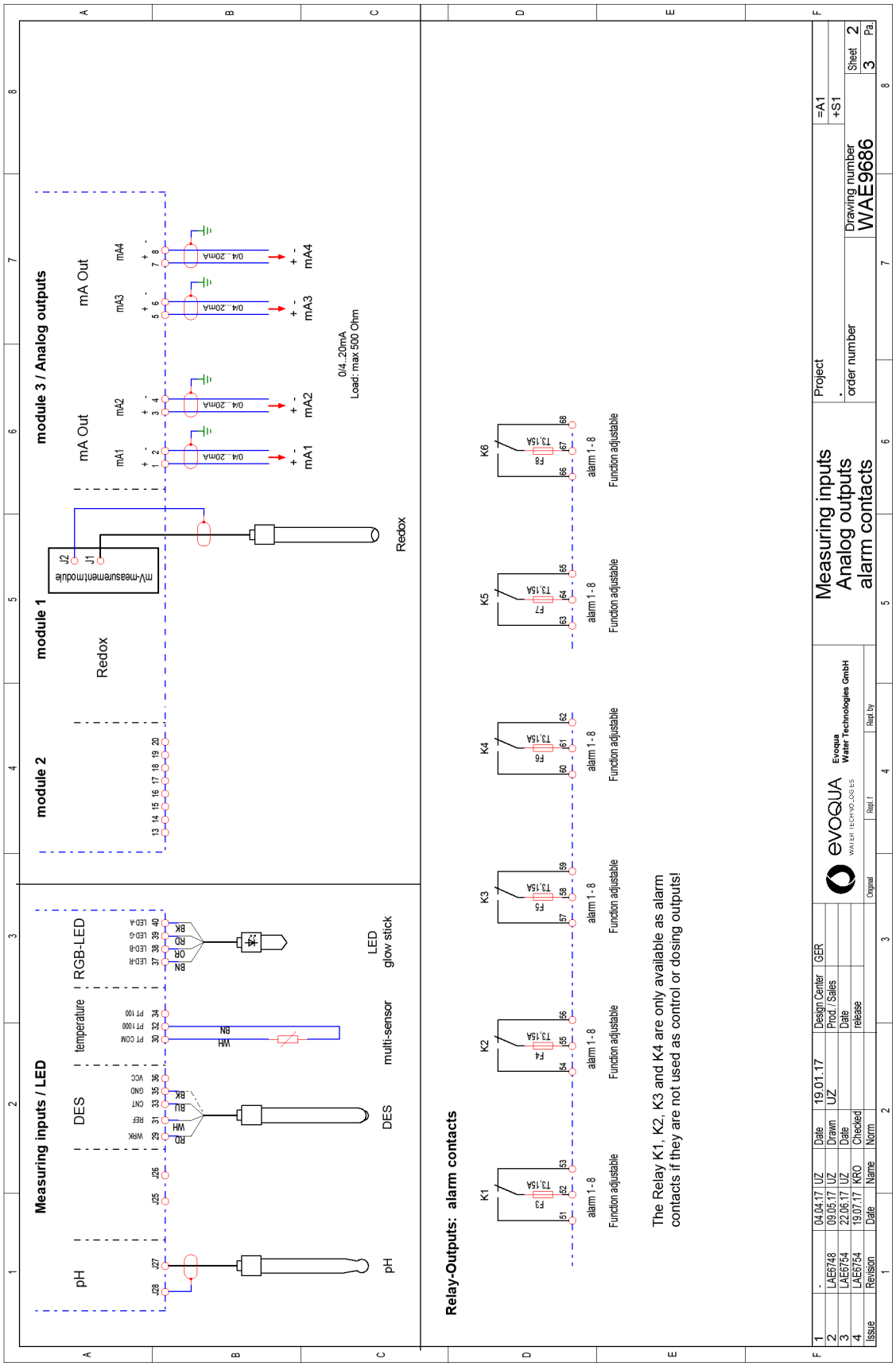
Part No.	Description
W3T391868	ORP sensor card, ORP sensor, sensor cable, calibration solution

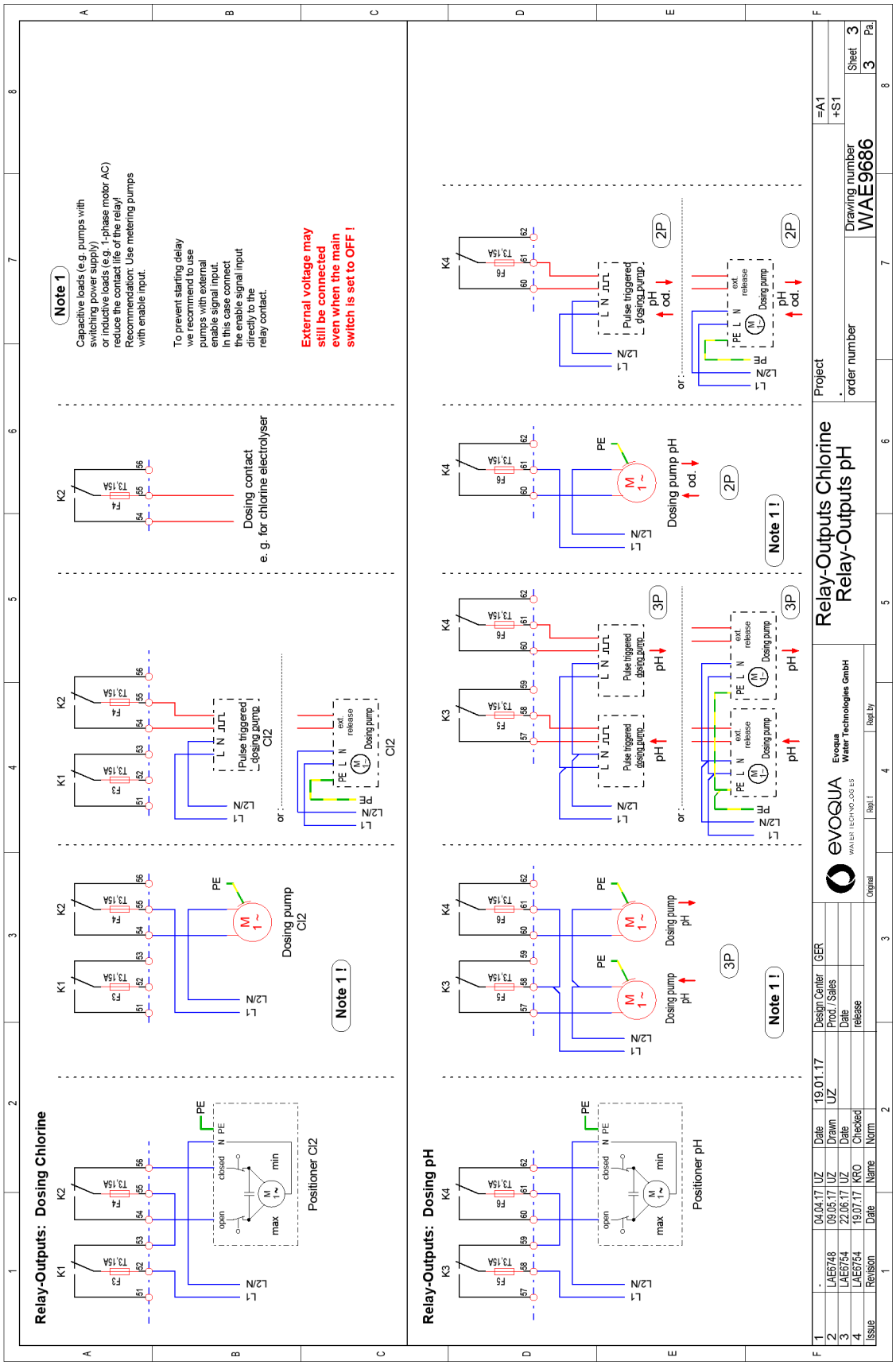
8.4.2 4-way mA output card

Part No.	Description
W3T391865	4-way mA output card, terminals

9. Wiring diagrams




Measuring inputs / LED
pH
DES
temperature
RGB-LED
module 2
module 1
Redox
mV-measurement module
module 3 / Analog outputs
mA Out
mA1
mA2
mA3
mA4
0/4..20mA
Load: max 500 Ohm
Redox
LED
glow stick
multi-sensor
DES
pH
Relay-Outputs: alarm contacts
K1
K2
K3
K4
K5
K6
alarm 1 - 8
Function adjustable
The Relay K1, K2, K3 and K4 are only available as alarm contacts if they are not used as control or dosing outputs!
Measuring inputs
Analog outputs
alarm contacts
Evoqua Water Technologies GmbH
Project
order number
Drawing number
WAE9686
=A1
+S1
Sheet 2
Pa 3


Relay-Outputs: Dosing Chlorine
Relay-Outputs: Dosing pH
Note 1
Capacitive loads (e.g. pumps with switching power supply) or inductive loads (e.g. 1-phase motor AC) reduce the contact life of the relay! Recommendation: Use metering pumps with enable input.
To prevent starting delay we recommend to use pumps with external enable signal input. In this case connect the enable signal input directly to the relay contact.
External voltage may still be connected even when the main switch is set to OFF !
Dosing contact e. g. for chlorine electrolyser
Dosing pump Cl2
Pulse triggered dosing pump Cl2
Positioner Cl2
Dosing pump pH
Pulse triggered dosing pump pH
Positioner pH
Note 1 !
2P
3P
or :
Relay-Outputs Chlorine
Relay-Outputs pH
evoqua Water Technologies GmbH
Project
order number
Drawing number
WAE9686
=A1
+S1
Sheet 3
Design Center GER
Prod. / Sales
Date
release
Original
Repl. f
Repl. by
Drawn UZ 19.01.17
Checked KRO 19.07.17
Norm
Name
Date
Revision
Issue
LAE6748 09.05.17 UZ
LAE6754 22.06.17 UZ
LAE6754 19.07.17 KRO

10.Declarations and certificates

10.1 Declaration of Conformity

EVOQUA WATER TECHNOLOGIES

EG-Konformitätserklärung
EC Declaration of Conformity
Déclaration CE de conformité

No. MAE1828

Ausgabe/*issue*/**édition** 02

Hersteller/*Manufacturer*/**Constructeur:**	Evoqua Water Technologies GmbH
Anschrift/*Address*/**Adresse:**	Auf der Weide 10, D-89312 Günzburg
Produktbezeichnung: *Product description:* **Description du produit:**	Mess-, Regel- und Dosiersystem DEPOLOX® Pool Compact bestehend aus: Elektronik-Modul (E02) und Durchfluss-Modul (D02) *Measuring, control and dosing system DEPOLOX® Pool Compact comprising: Electronics module (E02) and flow cell (D02)* **Dispositifs de mesure, regulation et de dosage DEPOLOX® Pool Compact comprenant : Module électronique (E02) et module de la cellule de mesure (D02)**

Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender europäischer Richtlinien überein:
The product described above in the form as delivered is in conformity with the provisions of the following European Directives:
Le produit désigné est conforme, dans la version que nous avons mise en circulation, avec les prescriptions des directives européennes suivantes :

2014/30/EU	Richtlinie des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit. *Directive of the European Parliament and of the Council of 26 February 2014 on the approximation of the laws of the Member States relating to electromagnetic compatibility.* **Directive du Parlement européen et du Conseil du 26 février 2014 relative au rapprochement des législations des Etats membres concernant la compatibilité électromagnétique.**
2014/35/EU	Richtlinie des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen. *Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.* **Directive du Parlement européen et du Conseil du 26 février 2014 concernant le rapprochement des législations des Etats membres relatives au matériel électrique destiné à être employé dans certaines limites de tension.**

CE-Kennzeichnung / *CE marking* / **Marquage CE:** 2017

Ersteller : SR
Ausgabe : 13.05.2014
Dokument: VD130-1_CE_Konformitätserklärung.doc

Evoqua Water Technologies GmbH
Auf der Weide 10
89312 Günzburg
Deutschland

Tel.: +49 (8221) 904-0
Fax: +49 (8221) 904-203
www.evoqua.com

Seite 1 von 2

Die Konformität mit den Richtlinien wird nachgewiesen durch die Einhaltung der in der Nachweisdokumentation aufgelisteten Normen.
Evidence of conformity to the Directives is assured through the application of the standards listed in the relevant documentation.
La conformité avec les directives est assurée par le respect des normes listés dans la documentation téchnique correspondante.

Benannte Person für technische Unterlagen:
Authorized person for the technical file:
Personne désignée pour la documentation technique:

Name / *name* / **nom:** Evoqua Water Technologies GmbH

Adresse / *address* / **adresse:** Auf der Weide 10, D-89312 Günzburg

Günzburg, den / *the* 2017-07-12

Evoqua Water Technologies GmbH

i.V. Klaus Andre

Klaus Andre
Technischer Leiter / *Director Engineering*

Unterschrift
signature / **signature**

i.V. Helmut Fischer

Helmut Fischer
Leiter QM / *Quality Manager*

Unterschrift
signature / **signature**

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie nach §443 BGB. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
This declaration certifies the conformity to the specified directives but does not imply any warranty for properties. The safety documentation accompanying the product shall be considered in detail..
La présente déclaration atteste de la concordance avec les directives citées, elle n'offre cependant pas de garantie quant à la nature ou la durabilité selon l'article 443 du code civil allemand. Les consignes de sécurité de la documentation du produit fournie sont à respecter.

Dokument: VD130-1_CE_Konformitätserklärung.doc Seite 2 von 2

10.2 CSA-Zertifikat

Certificate of Compliance

Certificate: 70027582 **Master Contract:** 226676

Project: 70138021 **Date Issued:** 2017-07-14

Issued to: **Evoqua Water Technologies GmbH**
Auf der Weide 10
Gunzburg, 89312
GERMANY

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

C US

Issued by: Jean-Philippe Laplante
Jean-Philippe Laplante

PRODUCTS

CLASS - C363106 - ELECTRICAL MEASUREMENT AND TEST EQUIPMENT

CLASS - C363186 - ELECTRICAL EQUIPMENT FOR MEASUREMENT USE-Certified to US Standards

Water management system, Models:

Main units: W3Ta E01 b; rated: 100-240Vac, 50/60Hz, 48W or 24Vdc, 30W /
W3Ta E02; rated: 100-240Vac, 50/60Hz, 24W **or** 24Vdc, 15W;
all models: 6A max rating including external loads supplied from the mains input circuit of the main units via cord outlets or permanently wired

Flow-through units: W3Tc D01 / W3Tc D02, supplied by the main units.

(Where a, b & c are alphanumeric placeholders (different length; including blanks) for non-safety-critical properties and configurations like user interface design and water analysis functions)

DQD 507 Rev. 2016-02-18 Page 1

Certificate: 70027582 **Master Contract:** 226676
Project: 70138021 **Date Issued:** 2017-07-14

Notes:

1. The above models are permanently connected or non-detachable cord (model dependent) Equipment Class I, Pollution Degree 2, Overvoltage category II
2. Mode of operation: Continuous
3. Environmental Conditions: Extended: 0 to 50°C, 2000m max, maximum 80% RH non-condensing.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 61010-1-12 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements

UL Std. No. 61010-1 (3rd Edition) - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

CONDITIONS OF ACCEPTABILITY

1. The input pressure for the water management system shall be externally limited to 3 bars (300kPa).
2. The equipment shall be installed to the mains supply system using a disconnecting device with the off-position clearly marked and a 6A back-up fuse must be used in the main supply line (for permanently connected only)
3. Relay connections to external devices shall be connected using 5A fuses as overcurrent protection (model E01 only)
4. This product has not been evaluated for rigid conduit installation. The product shall not be installed using conduits.
5. Equipment is only to be installed by authorized qualified electricians.
6. Maintenance of equipment (including fuse and battery replacements) is only to be performed by authorized qualified electricians.
7. Equipment is not to be used with flammable liquids.

DQD 507 Rev. 2016-02-18 Page 2

Supplement to Certificate of Compliance

Certificate: 70027582 **Master Contract:** 226676

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70138021	2017-07-14	CSA c/us report update for alternate construction (new models E02 & D02) on a Water management system, Models: W3Ta E01 b, W3Ta E02 with flow-through modules: W3Tc D01 / W3Tc D02
70095602	2016-10-19	CSA c/us report update for alternate construction (relay) and model naming changed on a Water management system, Models: W3Txxxxxx-E01 / W3Txxxxxx-D01
70027582	2015-07-09	CSA (c/us) certification of a pool management system for water treatment based on the acceptance of CB test report.

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11.Index

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an EVOQUA brand

EVOQUA WATER TECHNOLOGIES

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WT.050.500.000.DE.IM.0817
W3T387173 Issue 03-0817