

DEPOLOX[®] 400 M WALLACE & TIERNAN[®] DISINFECTION ANALYZER

Version 1.14 and later



INSTRUCTION MANUAL

NOTICE

Translation of the original instruction.

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1. Introduction

1.1 Target groups

This instruction manual provides the information required for installation, operating and maintenance personnel for the installation, operation and maintenance of the DEPOLOX® 400 M disinfection analyzer.

All personnel working with and on the DEPOLOX® 400 M must have read and understood the instruction manual, particularly the safety instructions.

1.2 Structure of the documentation

This instruction manual contains important information for the safe, trouble-free and economical operation of the DEPOLOX® 400 M. A thorough review of these instructions will help to prevent danger, reduce repair costs and downtimes and increases the reliability and service life of the DEPOLOX® 400 M.

The Chapters Installation and Maintenance are intended only for trained and authorized service personnel. These chapters contain important information on the assembly, configuration, start-up, maintenance and repair, which must be performed by this target group.

1.3 Conventions

This instruction manual contains a number of notes with different priorities that are labeled with pictograms.

WARNING

Electrocution hazard.

ATTENTION

Environmental hazard!

Do not throw away or burn the batteries! Batteries must be disposed of at a collection point.

NOTICE

These notes indicate a material risk or provide useful information to make working with the DEPOLOX® 400 M easier.

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.

2. Safety

2.1 Intended use

The DEPOLOX® 400 M disinfection analyzer with installed sensors is designed exclusively for measurement of the parameters free chlorine, total chlorine, chlorine dioxide, ozone, potassium permanganate, pH value, ORP voltage (Redox), fluoride and temperature in drinking water.

The operational safety is only guaranteed if the DEPOLOX® 400 M is used in accordance with its intended application. The DEPOLOX® 400 M 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 DEPOLOX® 400 M must not be operated with flammable liquids

2.2 General safety instructions

The manufacturer places great emphasis on safety when working on or with the DEPOLOX® 400 M disinfection analyzer. 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 DEPOLOX® 400 M

All safety instructions attached to the DEPOLOX® 400 M must be observed. These instructions must always be clearly legible and complete.

State-of-the-art technology

The DEPOLOX® 400 M has been constructed in accordance with the technological state-of-the-art and the accepted rules of safety engineering. However, if the DEPOLOX® 400 M 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 DEPOLOX® 400 M. "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 DEPOLOX® 400 M 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 DEPOLOX® 400 M.

Extensions and conversions

Any modifications, extensions or conversions to the DEPOLOX® 400 M that could impair its safety require 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® 400 M 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® 400 M, the factory-configured passwords and user names should be replaced with individual ones and the user administration enabled.

Disposal

Ensure safe and environment-friendly disposal of agents and replacement parts. Dispose of electronic waste in accordance with local and national regulations.

2.3 Specific operating phases

- Never employ any working methods which could affect safety!
- Never operated with flammable liquids.
- The DEPOLOX® 400 M may only be operated with the housing closed!
- Inspect the DEPOLOX® 400 M 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!
- During installation and maintenance work, secure the DEPOLOX® 400 M 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)!

2.4 Warranty conditions

The following must be observed for compliance with warranty conditions. If any of the conditions are not met, the warranty is void.

- 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.

2.5 Exclusion of liability

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 accept no liability for any loss sustained by the buyer (in particular, lost profits, lost information and service interruptions) arising through the use of the DEPOLOX® 400 M nor 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.

3. Description

3.1 General

The DEPOLOX® 400 M disinfection analyzer has a modular design structure and comprises:

- 400 M electronics module (module name E02)
- Flow cell (module name D02) or Y-style flow-through assembly
 - DEPOLOX® 5 C
 - non-pressurized or pressurized version
 - VariaSens C
 - non-pressurized or pressurized version
- Y-style flow-through assembly
 - non-pressurized version
- Sensors

Depending on the sensors installed, the DEPOLOX® 400 M can measure the parameters free chlorine, total chlorine, chlorine dioxide, ozone, potassium permanganate, pH value, ORP voltage (Redox), fluoride and temperature.

Depending on the sensors installed, the electronics module has two up to three measuring inputs. One measuring input is used to measure disinfectants such as free chlorine, total chlorine, chlorine dioxide, ozone or potassium permanganate. The second measuring input to measure the pH value or fluoride. The third measuring input to measure the ORP voltage (Redox).

Various flow cells are available. The DEPOLOX® 5 C flow cell has an open 3-electrode cell and the VariaSens C flow cell holds the membrane sensors. The flow cells can be fitted with several sensors. Depending on the application and the sensor used, a non-pressurized or pressurized flow cell must be used; see configuration overview on chapter 3.3. The transparent cell body allows visual monitoring of the sensors and the sample water. An LED glow stick signals the alarm, warning, and error messages by a change in color.

Free chlorine measurement with the DEPOLOX® 5 C depends on the pH value. By using a pH measurement, the pH dependency of the measurement can be compensated for within a range of pH 6.00 to pH 8.75 (Cl₂++).

The Y-style flow-through assembly is available in a non-pressurized version and can be used with a pH, ORP (Redox) or fluoride sensor.

3.2 Version

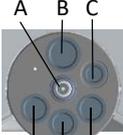
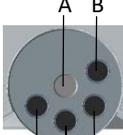
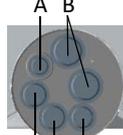
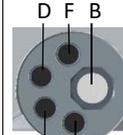
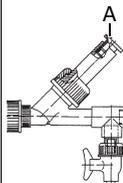
Part No.	400 M electronics module (module name E02)
W3T441932	2-channel disinfection analyzer and 4-way mA output module (factory installed)

Part No.	Flow cell (module name D02)
W3T389205	DEPOLOX® 5 C non-pressurized version
W3T389210	DEPOLOX® 5 C pressurized version
W3T440600	VariaSens C non-pressurized version
W3T440611	VariaSens C pressurized version

Part No.	Y-style flow-through assembly
W3T167442	non-pressurized version

Part No.	Sensor measuring modules
W3T441935	TC3 (total chlorine)
W3T441936	FC2 (free chlorine)
W3T443072	CD7 (chlorine dioxide)
W3T443073	OZ7 (ozone)
W3T441938	pH
W3T391868	ORP (Redox)
W3T441937	Fluorid

3.3 Configuration options

Designation	DEPOLOX® 5 C non-pressurized version	DEPOLOX® 5 C pressurized version	VariaSens C non-pressurized version	VariaSens C pressurized version	Y-style flow- through assembly non- pressurized version
					
	<p>A 3-Electrode cell (free chlorine)</p> <p>B Blind plug</p> <p>C Fluoride sensor (only on non-pressurized version)</p> <p>D pH sensor</p> <p>E LED glow stick</p> <p>F ORP sensor (Redox)</p>		<p>A Fluoride sensor (only on non-pressurized version)</p> <p>B Membrane sensors TC3, FC2, CD7, OZ7</p> <p>C LED glow stick</p> <p>D ORP sensor (Redox)</p> <p>E pH sensor</p> <p>F Blind plug</p>		<p>A pH-, ORP (Redox) or fluoride sensor</p>
3-electrode cell (free chlorine)	X	X	-	-	-
Membrane sensor TC3	-	-	X	X	-
Membrane sensor FC2	-	-	X	X	-
Membrane sensor CD7	-	-	X	X	-
Membrane sensor OZ7	-	-	X	X	-
pH sensor	X	X	X	X	X
ORP sensor (Redox)	X	X	X	X	X
Fluoride Sensor	X	-	X	-	X
Sample water temperature (multi-sensor)	X	X	X	X	-
Flow rate monitor (multi-sensor)	X	X	X	X	-
Sample water earthing (multi-sensor)	X	X	X	X	-
Sample water fine filter (fine filter), only when using membrane sensors	X	-	X	X	-
LED glow stick	X	X	X	X	-
Ball valve on the sample water inlet	X	X	X	X	-
Ball valve on the sample water outlet	-	X	-	X	-

3.4 Overview of sensors (DES sensors)

Designation	3-electrode cell (DEPOLOX® 5 C)	TC3 (total chlorine)	FC2 (free chlorine)	CD7 (chlorine dioxide)	OZ7 (ozone)
Measuring principle	Potentiostatic 3-electrode cell with platinum electrodes	Membrane-covered, amperometrically operating potentiostatic 3-electrode system with integrated electronics		Membrane-covered 2-electrode system	
Measured value	Free Cl ₂ , ClO ₂ , O ₃ , KMnO ₄ , Cl ₂ ++ for pH-compensated free Cl ₂ measurement	Total chlorine	Free chlorine	Chlorine dioxide (ClO ₂)	Ozone (O ₃)
Area of application	Drinking water, high level of hardness and fast reaction time	Drinking water, suitable for low conductivity and fluctuating pH value		In water with dirt particles < 0.8 mm	

3.5 Optional accessories

For part numbers, see chapter 8.

- Mounting plate with accessories (chapter 8.11)
- Impedance converter (chapter 5.4)
- Extension cable for sensors (chapter 5.4)
- Strainer (chapter 5.7)
- Booster pump (chapter 5.8)
- Pressure reducing valve (chapter 5.8)
- PVC- or PE version, hose and tubing connection (chapter 5.8)

3.6 400 M electronics module

3.6.1 Design

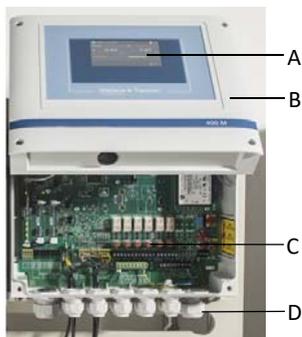


Fig. 1 400 M electronics module

- A Touchscreen/display
 B Plastic housing with removable housing cover
 C Motherboard with power supply, terminal strips, electronic components and relays
 D Cable glands

3.6.2 Functions

The electronics module is used for the measurement of auxiliary hygiene parameters in drinking water applications:

- Free chlorine, chlorine dioxide, ozone or potassium permanganate with 3-electrode cell (DEPOLOX® 5 C)
- Total chlorine measurement with membrane sensor TC3
- Free chlorine with membrane sensor FC2
- Chlorine dioxide with membrane sensor CD7
- Ozone with membrane sensor OZ7
- pH value
- ORP voltage (Redox)
- Fluoride
- Temperature

Typical applications:

- Measurement of chlorine, ORP (Redox) and pH
- Monitoring and notification of an alarm if limit values exceeded
- Data visualization
- Data transfer to higher-level systems

For connection to a visualization system, there is an optional 4-way mA output module, an RS485 interface and an Ethernet interface with Modbus TCP and HTTP protocol.

3.6.3 Controller outputs

The electronics module has a dosing contact for disinfection measurement.

3.6.4 Messages

Alarms, warnings, errors and messages are displayed using a colored message symbol (triangle with an exclamation mark).

Red symbol: alarm or error active

Yellow symbol: non-acknowledgeable alarms active

Orange symbol: maintenance interval or calibration interval has elapsed

Press the symbol and the message window opens. All active text messages are displayed. They are acknowledged via ACK button.

3.6.5 Alarms

The electronics module supports up to eight freely configurable alarms. The alarms can be assigned to a relay contact and noted on the color display. At the same time, a message is displayed in the message window and the message system is displayed. The number of available relays depends on the configuration. A maximum of six alarm relays are possible, depending on if the controller disinfection output is used. The alarm relays can be used, for example, for safety deactivation of dosing when specific values are exceeded or not reached.

Each alarm can be assigned the following functions. Multiple assignment is possible:

Limit value Min 1 and Min 2	=>	all measuring values can be selected individually
Limit value Max 1 und Max 2		
Digital inputs	=>	1 to 5 can be selected individually
Error		

Acknowledgment “none”

- The alarm symbol and the message symbol light up in the event of an alarm and go out automatically when the condition is eliminated.
- Unlatched alarms are displayed in yellow as messages.
- The relay is active when the alarm symbol is displayed and the alarm is active.

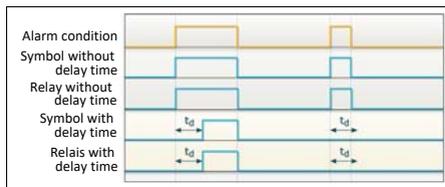


Fig. 2 Acknowledgment “none”

Acknowledgment “ACK with reset”

- In the event of an alarm, the alarm symbol and the message symbol flash and the relay is active until acknowledged.
- The alarm symbol and the message go out even if the conditions still apply when the alarm is acknowledged.
- Latched alarms are displayed in red as messages.
- The relay becomes inactive after acknowledgment if the condition is still pending.

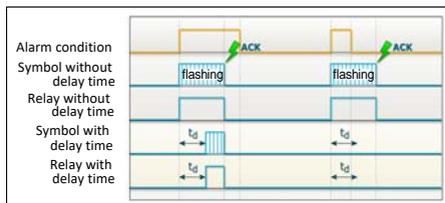


Fig. 3 Acknowledgment “ACK with reset”

Acknowledgment “simple ACK”

- The relay becomes active as soon as the alarm is active.
- In the event of an alarm, the alarm symbol and the message symbol 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).
- Latched alarms are displayed in red as messages.
- The relay is only deactivated when the condition has been eliminated and acknowledged.

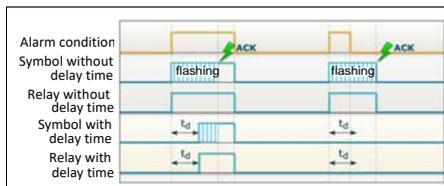


Fig. 4 Acknowledgment “simple ACK”

3.6.6 Safety functions

The electronics module is equipped with various integrated safety functions to ensure system safety and minimize the risk of accidents. The following safety functions are integrated:

- safety deactivation if the sample water flow is too low and/or if the dosing tank signals that it is empty (depending on the configuration of the digital inputs)
- alarms freely configurable
- external STOP for dosing (depending on the configuration of the digital inputs)
- password protection with three levels
- Safety MAN. mode
stops dosing with sample water stop or external stop

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. Never disable the sample water monitoring - even temporarily, e.g. by bridging the signal input.

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. The sample water monitoring deactivates dosing if there is a shortage of sample water and prevents the uncontrolled dosing of chemicals.

3.6.7 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 24 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.): Dosing continues at the same rate
The  symbol on the display flashes.
Display: 

- after expiry of the sample water monitoring delay time:
Dosing is switched off.
Display: 

NOTICE

Controller switch-off is only effective in "Safety MAN. 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:

- Use as an alarm (freely configurable).
- The chlorine dosing pump and the dosing pump for pH correction are switched off. The positioner moves to 0 %.
Display:  2 (example)

NOTICE

Controller switch-off is only effective in "Safety MAN. 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:  3 (example)
- 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 circulation to prevent measurements and incorrect controller outputs.

NOTICE

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.

3.6.8 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".

The connection and switching of non-permissible loads / loads destroys the relay contacts. The device works uncontrollably as a result!

In order to switch inductive loads or larger capacitive loads, which exceed the technical characteristics of the relay contact, an additional switching element must be installed. For example a contactor or load relay with suitable specification. Relay contact details see chapter 3.11 "Technical Data" - Relay outputs. To protect radio interference suppression, the relay contacts are protected internally by suppressor diodes. Relay outputs are protected by fuses. They act as overcurrent limiters protecting the terminal and relay connections. The fuses are replaceable. Spare fuses see chapter 8.

NOTICE

If the internal power supply L1 and N/L2 is used for dosing pumps or other devices, the total current consumption must not exceed 6 A.

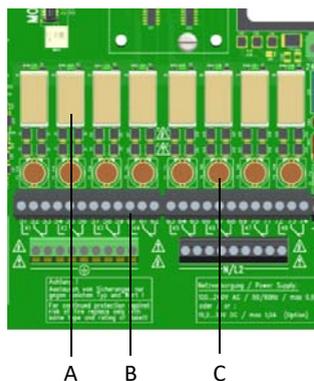


Fig. 5 Detail of PCB - relay outputs

- A Relay
- B Terminal strips
- C Fuses

3.6.9 Interfaces

The interfaces are described in detail in chapter 4. The following interfaces are available:

- USB interface
- RS485 interface
- Ethernet interface
- Modbus TCP interface

3.7 DEPOLOX® 5 C flow cell

The DEPOLOX® 5 C flow cell has a 3-electrode cell and is available in a non-pressurized or pressurized version. The versions also differ in the number and layout of the sensors that can be installed and in the design of the sample water outlet.

3.7.1 Design

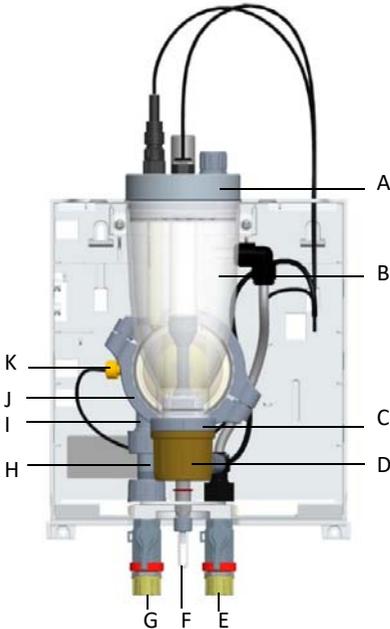


Fig. 6 Cross-section, DEPOLOX® 5 C flow cell, pressurized version

- A Cover to hold the sensors and the LED glow stick (cell body cover)
- B Cell body
- C 3-electrode cell with electrolyte storage tank
- D Cap of the 3-electrode cell
- E Sample water outlet with ball valve (on non-pressurized version without ball valve)
- F Flow cell drain valve
- G Sample water inlet with ball valve
- H Filter unit
- I Check valve housing
- J Flow control valve
- K Multi-sensor

3.7.2 Function

NOTICE

The DEPOLOX® 5 C flow cell can be used for the measurement of free chlorine, ozone, potassium permanganate and chlorine dioxide. It must be ensured that only one of these disinfection agents is present in the water.

The following section describes the functional principle of the DEPOLOX® 5 C flow cell from the sample water inlet to the sample water outlet.

The sample water is connected on the input side via the G1/2" connection on the ball valve. The input pressure must be around 4 to 45 psig (0.25 to 3.0 bar). To guarantee a constant flow, the minimum input pressure must not be less than 4 psig (0.25 bar). If the pressure is lower, an optional booster pump must be used. If the inlet pressure exceeds 45 psig (3.0 bar), an optional pressure reducing valve must be used.

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

The check valve ensures the sample water can only flow in the correct direction.

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

The flow control valve ensures a flow of the sample water that is not dependent on the operating pressure. The correct sample water flow of 0.15 gal/min (33 l/h) is preset, checked and documented at the factory.

The cell body contains the 3-electrode cell with external potentiostatic control loop and a refillable electrolyte storage tank. Working and counter electrode are designed as semi-annular electrodes and made from a special platinum alloy. A silver-silver chloride electrode connected to the sample water via two diaphragms serves as the reference electrode. The reference electrode is dipped into an electrolyte solution which can be refilled as needed.

The sample water flows tangentially into the 3-electrode cell ensures continual hydro-mechanical cleaning of the sensor electrodes with a special cleaning sand and thus prevents the natural contamination of the electrode surfaces. Clean electrode surfaces and a constant flow of sample water are critical for high-quality oxidant measurement and greater responsiveness.

The adjustable cell voltage U_{pot} is output via the potentiostatic control loop. The cell current (μA signal) is proportional to the concentration of disinfection agent in the sample water and is evaluated with the electronics module.

The HOCl characteristic curve describes the influence of the pH value on the DEPOLOX® 5 C and the influence of temperature.

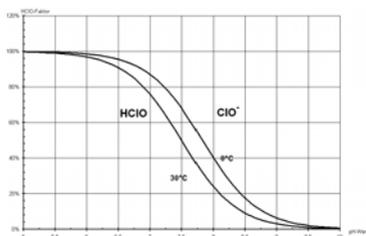


Fig. 7 HOCl characteristic curve

The cell body contains the sensors and the LED glow stick. The sensors are installed in the location holes in the cell body cover 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 and to signal messages and errors in color.

On the pressurized version, the sample water supply is connected on the output side via the G 1/2" connection on the ball valve. At this point, a maximum back pressure of 22 psig (1.5 bar) is permitted.

On the non-pressurized version, the sample water runs off via a drain connection for hoses with an internal diameter of 6 mm directly via the cell body outlet at the top.

The flow cell drain valve can be used to collect a sample 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.

3.8 VariaSens C flow cell

The VariaSens C flow cell is available in a non-pressurized or pressurized version. The versions also differ in the number and layout of the sensors that can be installed and in the design of the sample water outlet.

3.8.1 Design

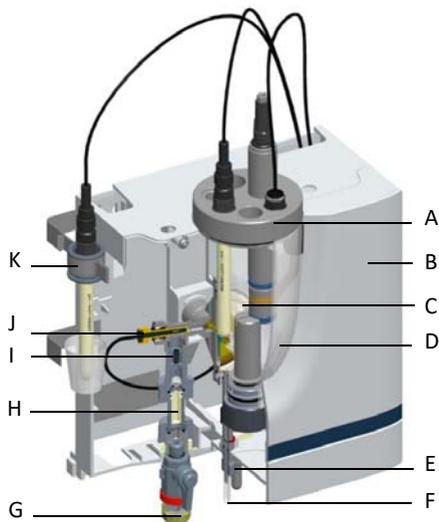


Fig. 8 Cross-section, VariaSens C flow cell, non-pressurized version

- A Cover to hold the sensors and the LED glow stick (cell body cover)
- B Plastic housing with removable housing cover
- C Flow control valve
- D Cell body
- E Sample water outlet (on the pressurized version, with ball valve)
- F Flow cell drain valve
- G Sample water inlet with ball valve
- H Fine filter
- I Check valve housing
- J Multi-sensor
- K Calibration holding clip

3.8.2 Function

NOTICE

The VariaSens C flow cell can be used in combination with membrane sensors for the measurement of free chlorine, total chlorine, ozone and chlorine dioxide. It must be ensured that only one of these disinfection agents is present in the water and that the cross-sensitivity of the sensors is allowed for.

The following section describes the functional principle of the VariaSens C flow cell from the sample water inlet to the sample water outlet.

The sample water supply is connected on the input side via the G1/2" connection on the ball valve. The input pressure must be around 4 to 45 psig (0.25 to 3.0 bar). To guarantee a constant flow, the minimum input pressure must not be less than 4 psig (0.25 bar). If the pressure is lower, an optional booster pump must be used. If the inlet pressure exceeds 45 psig (3.0 bar), an optional pressure reducing valve must be used.

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

In the direction of flow, the sample water flows through the filter unit or through the installed fine filter (only with membrane sensors) to the check valve housing. The check valve ensures sample water is only in the correct direction. The fine filter is only used in conjunction with membrane sensors.

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

The flow control valve ensures a flow of the sample water that is not dependent on the operating pressure. The correct sample water flow of 0.15 gal/min (33 l/h) is preset, checked and documented at the factory. If the inlet pressure increase, the control valve moves to keep the flow constant, if the inlet pressure drops, the control moves to keep the flow constant.

The cell body contains the sensors and the LED glow stick. The sensors are installed in the location holes in the cell body cover 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 and to signal messages and errors in color.

On the pressurized version, the sample water supply is connected on the output side via the G 1/2" connection on the ball valve. At this point, a maximum back pressure of 22 psig (1.5 bar) is permitted.

On the non-pressurized version, the sample water runs off via a drain connection for hoses with an internal diameter of 6 mm directly via the cell body outlet at the top.

The flow cell drain valve can be used to collect a sample 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.

3.9 Y-style flow-through assembly

The Y-style flow-through assembly is available in a non-pressurized version and can be fitted with a pH, ORP (Redox) or fluoride sensor.

3.9.1 Design

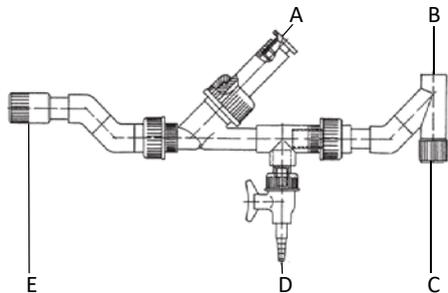


Fig. 9 Y-style flow-through assembly

- A Sensor holder
- B Outlet (open)
- C Output
- D Sample water valve
- E Sample water inlet

3.9.2 Function

The following section describes the functional principle of the Y-style flow-through assembly from the sample water inlet to the sample water outlet. The installation of a ball valve on the input side is recommended.

The sample water supply is connected on the input side via the 1/2" NPT connection. A ball valve for setting the sample water flow must be provided on site.

The sample water flows over the optional strainer, which has a mesh size of 0.2" (0.5 mm) and prevents dirt particles penetrating into the Y-style flow-through assembly. The strainer must be provided on site.

The sample water supply is connected on the output side via the 1/2" NPT connection. The sample water outlet is not pressurized.

The pH, ORP (Redox) or fluoride sensor is mounted in the sensor holder.

3.10 Sensors

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

The pH, ORP (Redox) and fluoride sensor can also be installed via the Y-style flow-through assembly and connected to the flow cell.

3.10.1 DEPOLOX® 5 C - 3-electrode cell

See chapter 3.7.2 "3-electrode cell".

3.10.2 pH sensor

NOTICE

The pH sensor can be installed in the non-pressurized and pressurized version of the DEPOLOX® 5 C and VariaSens C flow cells. The pH sensor can also be installed in the Y-style flow-through assembly for individual measurement.

The pH sensor is designed as a pH single-rod measuring cell.

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 cell. The reference electrode is the stable electrical reference point for voltage measurement.

The electrolyte is a saturated potassium chloride solution. 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 water in swimming pools and baths and drinking water, as the electrolyte can only flow slowly through the pores of the ceramic pin, thus ensuring very long service life for the entire pH sensor.

The pH sensor is installed in an electrolyte reservoir (transport 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. If the pH sensor is not used, e.g. over the winter, the pH sensor must be plugged in the transport container with diluted electrolyte (KCl tank with stand and 5 ml KCl solution).

3.10.3 ORP sensor (mV)

NOTICE

The ORP sensor (Redox) can be installed in the non-pressurized and pressurized version of the DEPOLOX® 5 C and VariaSens C flow cells. The ORP sensor (Redox) can also be installed in the Y-style flow-through assembly for individual measurement.

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 saturated potassium chloride solution. 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 to 7.3	UG > 750 mV
pH 7.3 to 7.6	UG > 770 mV

3.10.4 Fluoride sensor

NOTICE

The fluoride sensor can be installed in the non-pressurized version of the DEPOLOX® 5 C and VariaSens C flow cells.

The fluoride sensor can also be installed in the Y-style flow-through assembly for individual measurement.

Fluoride measurement using a fluoride-ion-selective electrode is used for continuous identification of fluoride ions in the solution. To obtain a correct reading, the pH value of the measured medium must be within a range from pH 5 to pH 8.

The reference system is filled with electrolyte.

ATTENTION

Rapid, repeated changes in temperature result in a constant change in the potential. This can cause functional failure of the electrode.

3.10.5 Membrane sensors TC3 (total chlorine) and FC2 (free chlorine)

NOTICE

The membrane sensors TC3 and FC2 can be installed in the non-pressurized and pressurized version of the VariaSens C flow cell.

The membrane sensor is a membrane-covered potentiostatic 3-electrode measuring cell with a specially positioned counter electrode. The measuring electrode is membrane-covered and located, together with the reference electrode, in an electrolyte chamber that is separated from the sample water and contains a special electrolyte.

In this measurement method, chlorine diffuses from the sample water through the membrane and, in combination with the electrolyte, triggers an electrical signal at the measuring electrode. This electrical signal is proportional to the chlorine concentration and is amplified by the membrane sensor electronics. As a result of integrated temperature compensation, the measuring signal is independent of the sample water temperature.

3.10.6 Membrane sensor CD7 (chlorine dioxide)

NOTICE

Membrane sensor CD7 can be installed in the non-pressurized and pressurized version of the VariaSens C flow cell.

Membrane sensor CD7 allows selective measurement of the chlorine dioxide content in all types of water, including ultrapure water (LF > 1µS/cm), without cross-sensitivity to chlorine, bromine and hydrogen peroxide, but cross-sensitive to ozone and peracetic acid. Membrane sensor CD7 does not exhibit pH-dependency and is therefore suitable for water with changing pH values.

3.10.7 Membrane sensor OZ7 (ozone)

NOTICE

Membrane sensor OZ7 can be installed in the non-pressurized and pressurized version of the VariaSens C flow cell.

Membrane sensor OZ7 allows selective measurement of the chlorine dioxide content in all types of water, including ultrapure water (LF > 1µS/cm), without cross-sensitivity to chlorine, bromine and hydrogen peroxide, but cross-sensitive to chlorine dioxide and peracetic acid. Membrane sensor OZ7 does not exhibit pH-dependency and is therefore suitable for water with changing pH values.

3.11 Technical data

3.11.1 400 M electronics module (module name E02)

Housing	Dimensions (WxHxD)	12.6" x 12.2" x 6" (320 x 311 x 153 mm)
	Weight	approx. 7.7 lbs (3.5 kg)
	Protection rating	IP66
	Mains connection	100 to 240 V AC \pm 10% 50 to 60 Hz or 24 V DC, 15 W
Display	4.3" graphic color display with LED backlighting and capacitive touch-screen behind shatterproof glass panel, resolution 480x272 pixels	
Insulation	Overvoltage category	2
	Contamination level	2
	Protection category	1
Approvals	CE, CSA	
Operating conditions	Ambient temperature	32°F to 122°F (0 to 50 °C)
	Humidity	< 80 %, non-condensing
	Environment	No direct sunlight
	Atmospheric pressure	22.14 to 31.30 in Hg (75 to 106 kPa)
	Max. working height (altitude)	2000 m
	Storage temperature	-4°F to 158 °F (-20 to +70 °C)
	Noise emission	<45 dB
Digital inputs	5x for voltage-free contact (internal 24 V power supply); Freely selectable function in menu; When input open: DI active; When input closed: DI inactive	
Measurement inputs	3-electrode sensor (measuring range 0 to max. 20 mg/l, end value can be set) or membrane sensor; pH value (measuring range pH 0 to pH 14, initial and end value can be set) or fluoride (measuring range 0 to 20 mg/l); ORP voltage (measuring range 0 to max. 1000 mV, initial and end value can be set); Temperature (measuring range 32 to 122°F / 0 to 50°C)	

Relay outputs	Type	6x changeover contact with integrated fuse, replaceable, type TR5 3,15 A T
	High nominal breaking	5A 250V AC, 1250VA max. (resistive load) 1A 250V AC, 250VA max. ($\cos \phi = 0,4$) 5A 30V DC, 150W max. (resistive load)
	Switching voltage max.	250V AC / 125V DC
	Switching current max.	5A AC / DC
	UL/CSA-rating	5A, 125/250V AC (general use) 1/6HP 125, 250V AC 5A 30V DC (resistive) 30W max., 1A, 30V DC – 0.24A, 125V DC (inductive) B300

NOTICE

When connecting inductive or capacitive loads (e.g. pump 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 the relay: Enabling contact for external alarm or trigger a dosing devices or dosing pumps in constant flow applications.

Analog outputs	4-way mA output module 0/4 to 20 mA; 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 OPC server, Process Monitoring System or control system for data visualization; Ethernet interface (HTTP protocol/Modbus TCP protocol); USB interface for firmware update

3.11.2 DEPOLOX® 5 C flow cell (module name D02)

Housing	Dimensions (WxHxD)	9.96" x 14.76" x 6.42" (253 x 375 x 163 mm)
	Weight	approx. 5.5 lbs (2.5 kg)
Connections	Non-pressurized version	Inlet: G 1/2" A thread connection Outlet: Connecting nipple for hoses ID 6 mm
	Pressurized version	Inlet and outlet: G 1/2" A thread connection
Flow control valve	Sample water flow	0.15 gpm (33 l/h), controlled, preset at the factory
	Flow control range	4 to 45 psig (0.25 to 3.0 bar)
	Back pressure	Non-pressurized version: free drain Pressurized version: max. 22 psig (1.5 bar)
Multi-sensor	Switching point	5.5 gal/hr \pm 0.8 gal/hr (21 l/h \pm 3 l/h)
	Switching hysteresis	0.53 gal/hr (2 l/h)
	Temperature sensor	Pt1000
Version	Potentiostatic 3-electrode cell with platinum electrodes, storage tank with reference electrolytes, two diaphragms, Ag/AgCl conductive system	
Range	0 to 50 mg/l (reference value chlorine)	
Working temperature range	32 to 122 °F (0 to 50°C)	
Area of application pH value	Constant, in a range from pH 4 to pH 9	
Influence of the pH value	HOCl characteristic curve (for chlorine)	
Measured value	Free chlorine, chlorine dioxide, ozone, potassium permanganate	
Conductivity	\geq 100 μ S/cm	
Response time	T ₉₀ = < 20 sec.	
Typical output signal	20 μ A/mg/l (for chlorine)	
Storage temperature	14 to 122°F (-10 to +50°C)	

3.11.3 VariaSens C flow cell (module name D02)

Housing	Dimensions (WxHxD)	9.96" x 14.76" x 6.42" (253 x 375 x 163 mm)
	Weight	approx. 5.5 lbs (2.5 kg)
Connections	Pressurized and non-pressurized version	Inlet and outlet: G 1/2" A thread connection
Flow control valve	Sample water flow	0.15 gpm (33 l/h), controlled, preset at the factory
	Flow control range	4 to 45 psig (0.25 to 3.0 bar)
	Back pressure	Non-pressurized version: free drain Pressurized version: max. 22 psig (1.5 bar)
Multi-sensor	Switching point	5.5 gal/hr \pm 0.8 gal/hr (21 l/h \pm 3 l/h)
	Switching hysteresis	0.53 gal/hr (2 l/h)
	Temperature sensor	Pt1000
Operating conditions	Water quality	Brine and pool water acc. to standard
	Storage temperature	-4 to 158 °F (-20 to +70°C)

3.11.4 Y-style flow-through assembly

pH/ORP (Redox)/ Fluoride	Back pressure	Non-pressurized version
	Sample water temperature	max. 122 °F (+50 °C)

3.11.5 Sensors

pH sensor	
Version	Single-rod measuring cell with universal membrane glass, salt reserve, zirconium dioxide diaphragm, polymerized solid electrolyte, Ag/AgCl reference electrode
Range	pH 0 to 12 (temporarily to pH 14)
Working temperature range	23 to 176°F (-5 to +80°C)
Operating pressure	6 x 10 ⁵ Pa (0 to 6 bar)
Minimum conductivity of the sample water	50 µS/cm
Installation length	4.72" (120 mm)
Screw-in thread	PG 13.5
Storage temperature	23 to 86°F (-5 to +30°C)

ORP sensor (Redox)	
Version	Combination electrode with platinum electrode, salt reserve, zirconium dioxide diaphragm, polymerized solid electrolyte, Ag/AgCl reference electrode
Range	±2000 mV
Working temperature range	23 to 176°F (-5 to +80°C)
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	23 to 86°F (-5 to +30°C)

Fluoride sensor	
Sensor input	Fluoride single-rod electrode
Range	0.2 to 20.0 mg/l
pH range	pH 5 to pH 8

	Membrane sensor TC3 (total chlorine)	Membrane sensor FC2 (free chlorine)
Measured value	Total chlorine (= free chlorine + combined chlorine)	Free chlorine
Range	0.05 to 20.00 mg/l (ppm)	
Area of application	Swimming pool, drinking and process water	Swimming pool and drinking water
Measuring principle	Membrane-covered, amperometrically operating potentiostatic 3-electrode system with integrated electronics	
pH measuring range	pH 4 to pH 12, reduced pH-value dependency	pH 4 to pH 9, reduced pH-value dependency
Conductivity of the sample water	10 µS/cm to 50 mS/cm	10 µS/cm to 2500 µS/cm
Max. permissible operating pressure	1.5 bar (21.76 PSI) with suitable flow cell, no pressure surges and/or vibrations. Observe the back pressure of the flow cell!	
Installation position	Vertical, measuring electrode pointing downward, flow from below	
Operating temperature	-	41 to 113 °F (5 to 45 °C)
Sample water temperature	32 to 113 °F (0 to +45 °C) (no ice crystals in the sample water)	-
Ambient temperature	32 to 131 °F (0 to +55 °C)	-
Temperature compensation	Automatic, through integrated temperature sensor. Sudden temperature changes must be avoided.	Automatic, through integrated temperature sensor.
Nominal span (with pH 7.2)	10 µA/ppm	10 to 15 µA/ppm
Running-in time	For first commissioning approx. 2 hours.	
Response time	T ₉₀ : approx. 2 min.	
Zero point alignment	Not necessary.	
Cross-sensitivity/impurities	ClO ₂ : Factor 1 O ₃ : Factor 1.3 Corrosion inhibitors can lead to measurement errors. Water hardness stabilizers can lead to measurement errors.	ClO ₂ : Factor 0.75 O ₃ : Factor 0.8 Combined chlorine can increase the measured value. Corrosion inhibitors can lead to measurement errors. Water hardness stabilizers can lead to measurement errors.
Absence of disinfectant	max. 24 h	
Power supply	10 to 30 V DC, 10 mA	5 to 15 V DC, 10 mA
Electronics	Output signal: analog signal 0 to 200 µA Non-isolated electronics. Analog internal processing of measured values.	
Connection	4-pin connection socket	
Dimensions	Diameter: approx. 25 mm (1"), length: approx. 175 mm (6.9")	
Material	Microporous hydrophilic membrane, PVC-U, stainless steel 1.4571	
Transport	41 to 122 °F (+5 to + 50 °C) (membrane sensor, electrolyte, membrane cap)	
CE	DIN EN 61326-1, 61326-2-3 and RoHS conform	

	Membrane sensor CD7 (chlorine dioxide)	Membrane sensor OZ7 (ozone)
Measured value	Chlorine dioxide, selective toward Cl ₂ , Br ₂ , H ₂ O ₂ , cross-sensitivity to O ₃ , peracetic acid	Ozone, selective toward Cl ₂ , Br ₂ , H ₂ O ₂ , cross-sensitivity to ClO ₂ , peracetic acid
Power supply	unipolar +12 – 15 VDC, 11 mA	
Typical output signal	approx. 10 µA pre 1 mg/l (ppm) ClO ₂	approx. 10 µA pre 1 mg/l (ppm) O ₃
Measuring system	Membrane-covered 2-electrode system	
Reference electrode	Silver / silver halide / potassium halide solution	
Working electrode	Gold	
Further materials	PVC, silicone rubber, stainless steel	
External dimensions	Ø 25 mm (1"), length 175 mm (6.9")	
Connector-cable combination	Cable length 1.2 m	
Electrolyte	Diluted potassium halide solution, 100 ml bottle, store in a dark place at 59 to 77°F (15°C to 25°C), can be used for a max. of 2 years if still evenly clear	Diluted potassium halide solution, 100 ml bottle, store in a dark place at 59 to 77°F (15°C to 25°C), can be used for a max. of 1 year if still evenly clear
Range	0,05 to 20 mg/l (ppm) ClO ₂	0,02 to 10 mg/l (ppm) O ₃
Analysis	DPD 1 + DPD 3	
Zero point calibration	Not necessary (zero point signal at 0 mg/l ClO ₂ = 0 µA)	Not necessary (zero point signal at 0 mg/l O ₃ = 0 µA)
Response time	T ₉₀ < 20 sec.	T ₉₀ < 50 sec.
Influence of the pH value	No signal influence up to stability limit ClO ₂	No signal influence up to stability limit Ozon
Temperature compensation	Internal temperature compensation 41 to 113°F (5 – 45°C)	
Storage temperature	14 to 113°F (-10 – +45 °C) (without electrolyte)	
Max. pressure	1.5 bar (21.76 PSI) with suitable flow cell, no pressure surges and/or vibrations. Observe the back pressure of the flow cell!	
Water quality	All types of water, swimming pool, drinking, service and process water (limescale deposits can block the membrane).	All types of water, swimming pool, drinking, service and process water (also containing surfactants), (limescale deposits can block the membrane).
Conductivity	> 1 µS/cm to max. 40 mS/cm	
Flow	1.6 to 9.2 gal/hr (6 – 35 l/h), as constant as possible	
Service life	Service life of the electrolyte in operation approx. 6 months, service life of the membrane cap typically 1 year (less with poor water quality, e.g. sand, dirt)	
Cross-sensitivity	Ozone, peracetic acid	Chlorine dioxide, peracetic acid
Selectivity	Toward chlorine, bromine, hydrogen peroxide	

4. Interfaces

DANGER

Risk of injury or death!

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

4.1 USB interface

The electronics module is equipped internally with a USB interface. It is used to update the firmware via USB stick (chapter 6.5) or for use as a data logger via USB stick.

If a memory stick (W2T866279) is permanently installed in the USB port, monthly archive files are saved in CSV format. All measurements, controller outputs and states of the digital inputs are saved every two minutes. Proceed as follows to create data backup:

- 1 De-energize the electronics module.
- 2 Remove the housing cover.
- 3 Remove the USB stick.
- 4 Copy the archive files.
- 5 Reinsert the USB stick.
- 6 Fit the housing cover again.
- 7 Switch the electronics module on again.



Fig. 1 Detail of PCB - 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 us or download it from our homepage.

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.

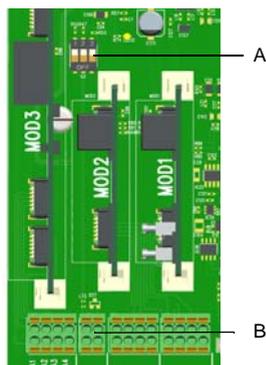


Fig. 2 Detail of PCB - RS485 interface

- A DIP switches for activating the resistors:
 DIP switch 1 (left): Balancing resistor R_u
 DIP switch 2 (center): Terminating resistor R_t
 DIP switch 3 (right): Balancing resistor R_d
 B Terminals, RS485 interface

4.3 Ethernet interface

The electronics module has two integrated Ethernet interfaces (ETH 1 and ETH 2). They are connected internally via an Ethernet switch. The device has a MAC address. The MAC address is displayed in the menu “Information”. The installed LAN interface allows data visualization via an Internet-capable device and HTTP protocol or standard browser. The LAN interface also supports data communication via the Modbus TCP protocol, (chapter 4.4).

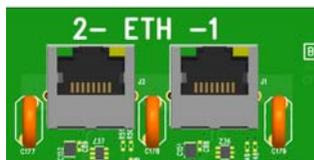


Fig. 3 Detail of PCB - Ethernet interface

Visualization and operation are effected via the web pages integrated in the electronics module. 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 electronics module. 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. To avoid long process times, we recommend that you do not daisy-chain more than three devices via the internal switch. An additional external switch assembly must be provided if several devices are used.

Connection is via a standard Ethernet connection cable. Two special M25 cable glands 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.

NOTICE

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

NOTICE

- 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 electronics module only supports the unencrypted communication protocol "http" and is designed for operation within an Intranet (closed network), chapter 2.2 "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 cross-over cable (crossed network cable). The LEDs are fitted in the 8P8C socket. They display the interface statuses.

Meaning of the LED:

- **green lights up:** Ethernet connection established
- **green flashes:** Data being transferred
- **yellow off:** 10 Base-T
- **yellow lights up:** 100 Base-T

LED (green) LED (yellow)

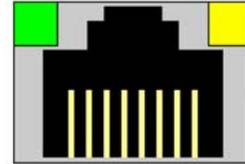


Fig. 4 Ethernet connection

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 Configuring the Ethernet connection for installation in a network

The electronics module is delivered with a fixed IP address. Alternatively, the electronics module can be configured with DHCP. The Ethernet settings of the electronics module can be configured via the menu "Settings" – "Network". The MAC address is displayed in the "Information" menu.

A network connection is set up between a PC or laptop computer with Ethernet interface (10/100 MB/sec) and the electronics module. In order to operate the electronics module in a network, the network configuration must be adapted to the existing network. If required, you can obtain the necessary information (IP address, subnet mask) from your local network administrator. You can configure the IP address and subnet mask assigned to you in the menu "Settings" - "Network".

NOTICE

A network connection or connection via WLAN router is required in order to access the web views of the DEPOLOX® 400 M.

DEPOLOX® 400 M factory settings

IP address	192.168.200.11
Network mask	255.255.255.0
Gateway	0.0.0.0

Web view in the browser:

- 1 Start the browser, e.g. Firefox or Internet Explorer.
- 2 Enter the IP address of the electronics module, e.g. "http://192.168.200.11/" (in the factory setting). After successful connection, the start screen of the electronics module appears. Depending on the resolution of the operating DEPOLOX® 400 M, 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.

4.3.2 Configuring direct network connection

If the DEPOLOX® 400 M is not integrated in a network, a direct network connection can be established between a PC or laptop computer with Ethernet interface (10/100 MB/sec) and the electronics module using a network cable.

- 1 Using a network cable, connect the electronics module to a PC or laptop computer.
- 2 Assign a fixed IP address and network mask to the PC or laptop (chapter 4.3.3) vergeben.
- 3 Start the browser, e. g. Firefox or Internet Explorer.
- 4 Enter the IP address of the electronics module "http://192.168.200.11" (factory setting) in the address input field. After successful connection, the start screen of the DEPOLOX® 400 M appears.

NOTICE

The electronics module and the PC or laptop computer must always have the same network mask and an IP address in the same IP address range. The IP address must not be identical.

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 network 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.

NOTICE

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

NOTICE

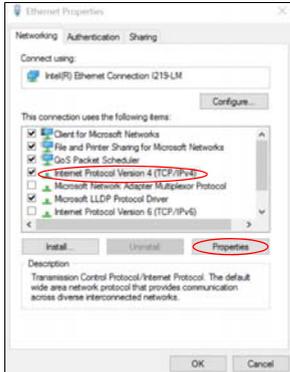
With the setting, a fixed IP address is always assigned to the PC or laptop computer.

- 1 Under "Connections," click "Ethernet". A further menu, "Ethernet status," opens.



- 2 Click the "Properties" button.

- 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 electronics module.



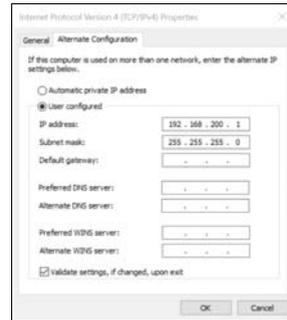
- Click the “Properties” button to configure the element “Internet protocol Version 4 (TCP/Pv4).”
- Activate the selection “Use following IP address.”



- Assign a fixed IP address and network mask. Do not change any other settings.
- 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
With Windows 10, it is also possible to set an alternative configuration.

- Carry out steps 1 to 4 as described under “Windows 10 with static (fixed) IP address”.
- Click the “Alternative configuration” button.
- Activate the selection “User-defined”.



- Assign a fixed IP address and network mask. Do not change any other settings.
- Tap the “OK” button twice to confirm and save the entry. In some Windows configurations, it may be necessary to reboot Windows.

4.4 Modbus TCP interface

The Ethernet interface used on more than one network, enter the alternate IP settings below.

The Ethernet interface is used on more than one network, enter the alternate IP settings below.

The electronics module supports data communication via Modbus TCP protocol. Various data points are available for data exchange (chapter 4.4.1).

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 electronics module 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 port used for the communication protocol Modbus TCP is 502.

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	Value range min.	Value range max.
INT8	8	yes	-128	127
UINT8	8	no	0	255
INT16	16	yes	-32.768	32.767
UINT16	16	no	0	65.535
INT32	32	yes	-2.147.483.648	2.147.483.647
UINT32	32	no	0	4.294.967.295
FLOAT	32 (8/23)*1	yes	$3.4 \cdot 10^{-38}$ ($-3.4 \cdot 10^{-38}$)	$3.4 \cdot 10^{38}$ ($-3.4 \cdot 10^{38}$)
ASCII	n * 8	no	--	--

*1 Exponent / mantissa

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

Data type INT8 / UINT8

Example using the figure 50 (32 hex):

Register X	
Byte 1	Byte 2
00 _H	32 _H
0 0 0 0 0 0 0 0	0 0 0 1 1 0 0 1 0
15	0

Data type INT16 / UINT16

Using the figure 12589 (312D hex):

Register X	
Byte 1	Byte 2
31 _H	2D _H
0 0 1 1 0 0 0 1	0 0 1 0 1 1 0 1
15	0

Data type INT32 / UINT32

Using the figure 1212117675 (483F72AB hex):

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 0 1 1	1 0 1 0 0 1 0 0 0 0	0 0 1 1 1 1 1 1 1
15	0	31	16

Data type FLOAT

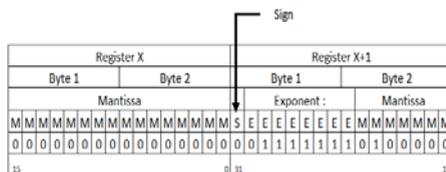
The Float or Real values are transferred in accordance with the IEEE754 Standard Format for 32-bit values. Example using the figure 1.25:

Hexadecimal: 3F A0 00 00 (0: +; 1: -)

Signed (S): 0

Exponent (E): 0111 1111

Mantissa (M): 010 0000 0000 0000 0000



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
67 _H	6D _H	6C _H	2F _H
'g'	'm'	'l'	'/'
15	0	31	16

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.

NOTICE

It must be noted that write commands should not be set to variables or the Modbus register cyclically or repeatedly set to the same values. Permanent writing of values can cause damage to the device (memory).

Modbus Register DEPOLOX® 400 M**IP address of the device, e.g. 192.168.200.11 Port: 502**

Modbus Register	Bit	Type	No. Byte	Access	Designation	Description
System information						
400001		ASCII	20	R	System name	e.g. "DEPOLOX 400 M"
400011		ASCII	10	R	Software Version	e.g. "V:1.00"
400016		ASCII	10	R	act. date	e.g. "21.02.17"
400021		ASCII	6	R	act. time	e.g. "13:16"
400024		ASCII	16	R	Serial number	
(Ch.1) Desinfection - Measurement (DES sensor)						
400100		FLOAT	4	R	Measured value	
400102		ASCII	10	R	Measured unit	"mg/l"
400107		FLOAT	4	R	Lower range	
400109		FLOAT	4	R	Upper range	
400111		FLOAT	4	R	Current setpoint	in the measuring range
400113		FLOAT	4	R	Current measuring range/ control value Yout	0.0 - 100.0%
(Ch.2) pH/Fluoride - Measurement						
400115		FLOAT	4	R	Measured value	
400117		ASCII	10	R	Measured unit	"pH / mg/l"
400122		FLOAT	4	R	Lower range	
400124		FLOAT	4	R	Upper range	
400126		FLOAT	4	R	Current setpoint	in the measuring range
400128		FLOAT	4	R	Current measuring range/ control value Yout	0.0 - 100.0%
(Ch.3) ORP (Redox) - Measurement						
400130		FLOAT	4	R	Measured value	
400132		ASCII	10	R	Measured unit	"mV"
400137		FLOAT	4	R	Lower range	
400139		FLOAT	4	R	Upper range	
400141			4	R	-	
400143			4	R	-	
(Ch.4) Reserved						
400145						
400147						
400152						
400154						
400156						
400158						

Modbus Register	Bit	Type	No. Byte	Access	Designation	Description
(Ch.5) Temperature - Measurement						
400160		FLOAT	4	R	Measured value	
400162		ASCII	10	R	Measured unit	"°C"; "°F"
400167		FLOAT	4	R	Lower range	0,0°C; 32,0°F
400169		FLOAT	4	R	Upper range	50,0°C; 122,0°F
400171			4	R	--	
400173			4	R	--	
Status messages						
400300		UINT16	2	R	Alarm stats	
	0				Alarm 1	1 = Alarm pending
	1				Alarm 2	1 = Alarm pending
	2				Alarm 3	1 = Alarm pending
	3				Alarm 4	1 = Alarm pending
	4				Alarm 5	1 = Alarm pending
	5				Alarm 6	1 = Alarm pending
	6				Alarm 7	1 = Alarm pending
400301	7				Alarm 8	1 = Alarm pending
		UINT16	2	R	Digital inputs	
	0				Sample water STOP - DI1	1 = DI active (open)
	1				DI 2	1 = DI active (open)
	2				DI 3	1 = DI active (open)
400302	3				DI 4	1 = DI active (open)
	4				DI 5	1 = DI active (open)
		UINT16	2	R	Relay outputs	
	0				Relay K1	1 = Relais aktiv
	1				Relay K2	2 = Relais aktiv
	2				Relay K3	3 = Relais aktiv
400303	3				Relay K4	4 = Relais aktiv
	4				Relay K5	5 = Relais aktiv
	5				Relay K6	6 = Relais aktiv
400303		UINT16	2	R	---	

Modbus Register	Bit	Type	No. Byte	Access	Designation	Description
400304		UINT16	2	R	Operation mode controller 1 (chlorine)	
	0				MAN.	
	1				Auto	
	2				Controller Aus	
	3				Adaption running	
	4				--	
	5				Controller stop (Yout=0%)	
	6				Controller freeze (Yout=Yout)	
	7				Controller Yout=100%	
	8				--	
	9				--	
	10				--	
	11				Eco Mode switching	
12				Controller standby		
400305						
400306						
400307						
400308						
400310		UINT32	4	R	Error code chlorine (Ch.1)	
	0				Zero point calibration	1 = error aktive
	1				DPD calibration	1 = error aktive
	2				pH7 calibration	1 = error aktive
	3				pHX calibration	1 = error aktive
	4				Error calibration e.g. ORP (Redox)	1 = error aktive
	5				Offset calibration	1 = error aktive
	6				--	
	7				Cell error	1 = error aktive
	8				Factory calibration error	1 = error aktive
	9				--	
	10				--	
	11				Setpoint error	1 = error aktive
	12				Limit error	1 = error aktive
	13				HOCL error (Cl2++)	1 = error aktive
	14				--	
	15				Overfeed (max. dosing time)	1 = error aktive
16				Auto tune error	1 = error aktive	

Modbus Register	Bit	Type	No. Byte	Access	Designation	Description
400314		UINT32	4	R	Error code pH/Fluoride (Ch.2)	Coding see Reg. 400310
400318		UINT32	4	R	Error code ORP (Redox) (Ch.3)	Coding see Reg. 400310
400326		UINT32	4	R	Error code temperature (Ch.5)	Coding see Reg. 400310
(Ch.1) Desinfection - Controller parameter (DES sensor)						
401000		FLOAT	4	RW	Setpoint (W)	in the measuring range
401002		FLOAT	4	RW	P-element(Xp)	0 - 1000%
401004						
(Ch.2) pH/Fluoride - Controller parameter						
401006		FLOAT	4	RW	Setpoint (W)	in the measuring range
401008		FLOAT	4	RW	P-element (Xp)	0 - 1000%
401010			4		--	
(Ch.3) Reserved						
401012						
401014						
401018						
(Ch.4) Reserved						
401018						
401020						
401022						
(Ch.1) Desinfection - Limits (DES sensor)						
401050		FLOAT	4	RW	Min. value 1	Lower range - Max 1
401052		FLOAT	4	RW	Max. value 1	Min 1 - Upper range
401054		FLOAT	4	RW	Hysteresis valve 1	1 - 25 Digit
401056		FLOAT	4	RW	Min. value 2	Lower range - Max 2
401058		FLOAT	4	RW	Max. value 2	Min 2 - Upper range
401060		FLOAT	4	RW	Hysteresis value 2	1 - 25 Digit
(Ch.2) pH/Fluoride - Limits						
401062		FLOAT	4	RW	Min. value 1	Lower range - Max 1
401064		FLOAT	4	RW	Max. value 1	Min 1 - Upper range
401066		FLOAT	4	RW	Hysteresis value 1	1 - 25 Digit
401068		FLOAT	4	RW	Min. value 2	Lower range - Max 2
401070		FLOAT	4	RW	Max. value 2	Min 2 - Upper range
401072		FLOAT	4	RW	Hysteresis value 2	1 - 25 Digit

Modbus Register	Bit	Type	No. Byte	Access	Designation	Description
(Ch.3) Redox - Limits						
401074		FLOAT	4	RW	Min. value 1	Lower range - Max 1
401076		FLOAT	4	RW	Max. value 1	Min 1 - Upper range
401078		FLOAT	4	RW	Hysteresis value 1	1 - 25 Digit
401080		FLOAT	4	RW	Min. value 2	Lower range - Max 2
401082		FLOAT	4	RW	Max. value 2	Min 2 - Upper range
401084		FLOAT	4	RW	Hysteresis value 2	1 - 25 Digit
(Ch.4) Reserved						
401086						
401088						
401090						
401092						
401094						
401096						
(Ch.5) Temperature - Limits						
401098		FLOAT	4	RW	Min. value 1	Lower range - Max 1
401100		FLOAT	4	RW	Max. value 1	Min 1 - Upper range
401102		FLOAT	4	RW	Hysteresis value 1	1 - 25 Digit
401104		FLOAT	4	RW	Min. value 2	Lower range - Max 2
401106		FLOAT	4	RW	Max. value 2	Min 2 - Upper range
401108		FLOAT	4	RW	Hysteresis value 2	1 - 25 Digit

5. Installation

5.1 Scope of delivery

The scope of delivery includes the following, depending on the version selected:

- 400 M electronics module (module name E02)
- Flow cell (module name D02) or Y-style flow-through
 - DEPOLOX® 5 C
 - non-pressurized or pressurized version
 - VariaSens C
 - non-pressurized or pressurized version
 - Y-style flow-through assembly
 - non-pressurized version
- Sensor measuring module:
 - TC3 (total chlorine)
 - FC2 (free chlorine)
 - CD7 (Chlorine dioxide)
 - OZ7 (Ozone)
 - pH
 - ORP (Redox)
 - Fluoride
- LED glow stick (pre-wired)
- Multi-sensor (pre-wired)
- DIN rail
- Assembly accessories
- Instruction manual

5.2 Transport and storage

Transport

The DEPOLOX® 400 M disinfection analyzer is shipped in standard packaging. During transport, the packaged DEPOLOX® 400 M 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

Electronics module, flow cell, Y-style flow-through and sensors must be stored in dry condition without any residual water in a dry place that is not exposed to the elements.

Shut-down

The DEPOLOX® 400 M may only be taken out of operation by trained and authorized personnel.

5.3 Required ambient conditions

NOTICE

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!

- The DEPOLOX® 400 M must be protected against moisture, rain, frost, heat and direct sunlight and may therefore not be installed outdoors.
- Do not use the DEPOLOX® 400 M in environments where there are flammable gases, fumes or dust or conductive dust.
- Do not subject the DEPOLOX® 400 M to strong shocks or vibrations.
- The air in the room must be non-condensing.

5.4 Mechanical Installation

WARNING

Risk of injury or damage to the installation!

- Only authorized and qualified electricians are permitted to install the DEPOLOX® 400 M.
- All electrical work on the DEPOLOX® 400 M must be carried out by authorized and qualified electricians.
- Modifications to the device other than those described in this instruction manual are not permissible.

NOTICE

- 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.
- Screws and dowels for fixing to a solid wall are included in the scope of delivery.
- Tallow-drop screws and dowels for fixing to a solid wall are included in the scope of delivery.

NOTICE

- If the device is to be installed on a suitable lightweight wall, use the appropriate mounting fixtures. Not included in the scope of delivery!
 - 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.
 - If the electronics module and flow cell are mounted in separate locations, the use of optional sensor extension cables is required. A length of 164 feet (50 m) must not be exceeded. For the pH or fluoride sensor, an optional impedance converter is required when longer cables are utilized.
 - In cases where the sensor cable is not long enough and an extension is required, an impedance converter must be screwed onto the pH and fluoride 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. After this time, the impedance converter should be sent to our company to have the battery replaced.
 - Dimension drawing chapter 5.5.3: Measurement are shown in millimeters. To convert to inch measurement, divide by 25.4 (1 inch = 25.4 mm).
- 1 Installation of the module (chapter 5.5)
 - Install the electronics module and flow cell with or without DIN rail
 - Install the Y-style flow-through assembly
 - 2 Remove the housing cover of the flow cell (chapter 5.6).
 - 3 Install the optional strainer (chapter 5.7).
 - 4 Connect the sample water inlet (chapter 5.8)
 - with tubing connection
 - with rigid pipework
 - 5 Connect the sample water outlet (chapter 5.9).
 - 6 Prepare VariaSens C (chapter 5.11)
 - Install the fine filter
 - 7 Prepare DEPOLOX® 5 C (chapter 5.10)
 - Remove the felt ring
 - Remove and replace the transport plug
 - Add electrode cleaning sand
 - 8 Install sensors, LED glow stick and Multi-sensor (chapter 5.12).
 - 9 Fit calibration aids (chapter 5.12.2).
 - 10 Install the sensors (chapter 5.13)
 - 11 Refit the housing cover (chapter 5.6).

5.5 Installation of the module

Install the electronics module and flow cell with or without DIN rail. Dimension drawing chapter 5.5.3.

5.5.1 With DIN rail

- 1 Secure the DIN rail to a solid wall using the dowels and screws supplied.
- 2 Hook the electronics module onto the DIN rail so that it is flush at the right.
- 3 Fasten the electronics module to the solid wall at the bottom by the holders using dowels and screws.
- 4 Hook the flow cell on the DIN rail to the left of the electronics module.
- 5 Fasten the flow cell to the solid wall at the bottom by the holders using dowels and screws.

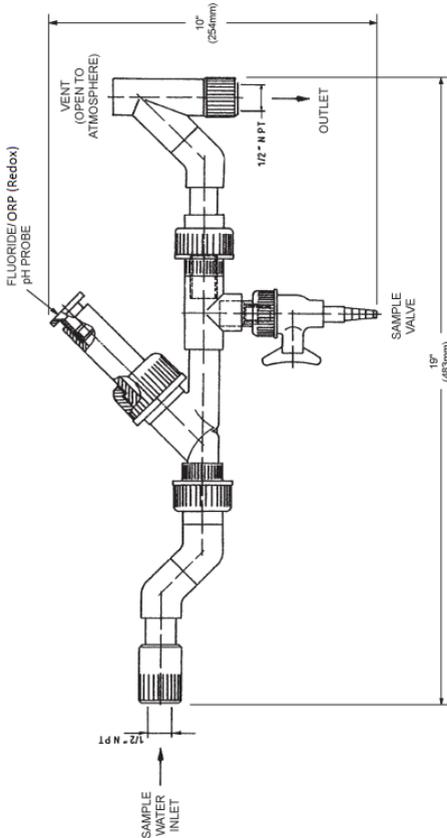
5.5.2 Without DIN rail

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

- 1 Attach the tallow-drop screws and dowels provided to the solid wall (included in the scope of delivery).
- 2 Hook the electronics module onto the screws.
- 3 Fasten the electronics module to the solid wall at the bottom by the holders using dowels and screws.
- 4 Hook the flow cell onto the screws.
- 5 Fasten the flow cell to the solid wall at the bottom by the holders using dowels and screws.

5.5.4 Y-style flow-through assembly

- Using mounting clamps (not included in the scope of delivery), screw the Y-style flow-through assembly to the solid wall below the electronics module.



5.6 Removing and fitting the housing cover

5.6.1 Flow cell

Removing

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

Fitting

- 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.

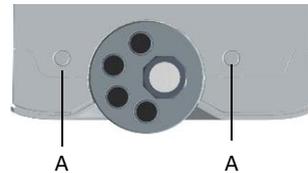


Fig. 1 View of top of housing cover

A *Unlocking buttons*

5.6.2 Electronics module

Removing

- Release the four screws on the housing cover.
- Remove the housing cover carefully.
- Hook the housing cover into the holders (A) on the basic housing.

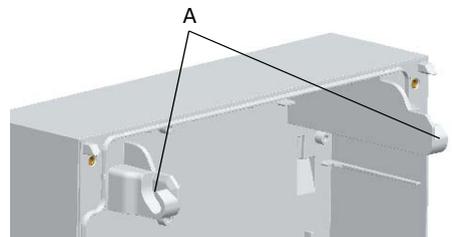


Fig. 2 Section, housing cover

A *Holders*

Fitting

- Place the housing cover carefully on the basic housing.
- Tighten the housing screws by hand (to a maximum torque of 0.5 ft-lb \pm 0.11 ft-lb (0.7 Nm \pm 0.15 Nm)).

5.7 Installing the optional strainer

- 1 Release the screw joint on the sample water inlet with ball valve (A).
- 2 Connect strainer with pipe clamp (B).
- 3 Connect sample water inlet (C).

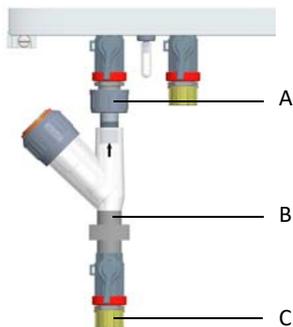


Fig. 3 Section, installation of strainer

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

5.8 Connecting the sample water inlet

NOTICE

No water pipes made of copper may be fitted in the installation. They would falsify the measurement.

When connecting the sample water inlet, note the following:

- 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 tubing connection and a sample water inlet with rigid pipework.
- 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. Long measuring dead times mean poorer control quality!

- The pressure in the sample water inlet must always be within a range of min. 4 to max. 45 psig (min. 0.25 to max. 3.0 bar). The pressure in the sample water inlet must always be 4 psig (0.25 bar) higher than in the sample water outlet.
- If the inlet pressure is below 4 psig (0.25 bar), a booster pump must be used.
- If the inlet pressure exceeds 45 psig (3.0 bar), an optional pressure reducing valve must be used.
- To protect the flow cell against contamination, an optional strainer with a mesh width of 0.02" (0.5 mm) should be provided on the sample water inlet (chapter 5.7).

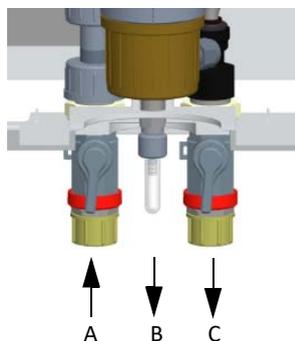


Fig. 4 Section, DEPOLOX® 5 C flow cell, pressurized version

- A Sample water inlet with ball valve
 B Flow cell drain valve (drain at the drain screw)
 C Sample water outlet with ball valve

5.8.1 With tubing connection

NOTICE

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

- 1 Release union nut (C) on the hose screw connection.
- 2 Insert the tubing (D) until it meets the hose bushing (A).
- 3 Push the locking ring (B) out until the union nut (C) engages the connecting threads.

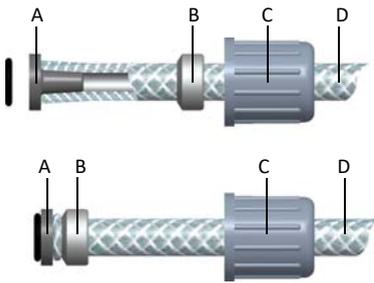


Fig. 5 Detail of hose screw connection

- A *Hose bushing*
 B *Locking ring*
 C *Union nut*
 D *Tuning*

5.8.2 With rigid pipes

NOTICE

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

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

5.9 Connecting the sample water outlet

NOTICE

No water pipes made of copper may be fitted in the installation. They would falsify the measurement.

5.9.1 Non-pressurized version

- 1 On the non-pressurized version, no back-pressure is permitted in the cell body.
- 2 The sample water outlet must be open. We recommend using a funnel above the outlet.
- 3 The sample water outlet must be routed in such a way that no siphon effect can arise.

5.9.2 Pressurized version

- 1 On the pressurized version, a maximum back-pressure of 22 psig (1.5 bar) is permitted on the sample water outlet.
- 2 Ensure that the drain screw (flow cell drain valve) is always closed, see chapter 3.7.2. and 3.8.2.

5.10 Prepare the DEPOLOX® 5 C flow cell

5.10.1 Removing the felt ring

In order to keep the diaphragm in the DEPOLOX® 5 C flow cell moist and prevent crystallization of the electrolyte solution during storage, a moist felt ring is inserted in the space between the electrolyte storage tank and electrode.

⚠ ATTENTION

This felt ring for moistening the diaphragms must be removed before commissioning the DEPOLOX® 5 C flow cell.

- 1 Unscrew the knurled nut (A) on the lid of the electrolyte storage tank.
- 2 Press the entire electrode unit downward out of the cell body.
- 3 Remove the felt ring (B) between electrolyte storage tank and electrode.
- 4 Reinstall the entire electrode unit in the cell body. Position it precisely within the cell body with the help of the positioning pin.
- 5 Press the entire electrode unit upward.
- 6 Screw the knurled nut back onto the electrolyte storage tank.

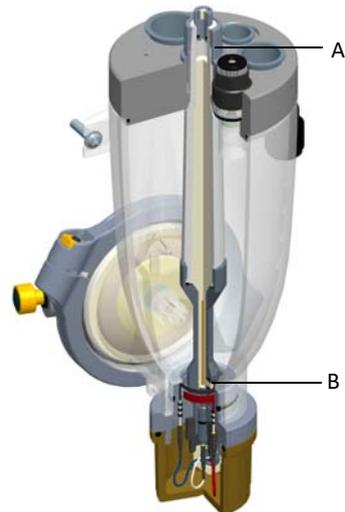


Fig. 6 Cross-section, cell body

- A *Knurled nut*
 B *Felt ring*

5.10.2 Removing and replacing the transport plug

NOTICE

Before commissioning the DEPOLOX® 5 C flow cell, the transport plug must be removed from the electrolyte storage tank and replaced with the stopper provided.

DEPOLOX® 5 C non-pressurized version

- 1 Remove the yellow protection plug from the electrolyte storage tank.
- 2 Replace the transport plug with the stopper provided.

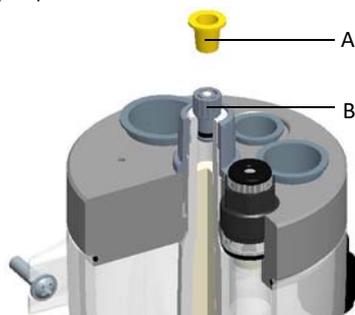


Fig. 7 Section, cell body cover

- A Protection plug (yellow)
B Stopper (with white venting rod)

DEPOLOX® 5 C pressurized version

⚠ ATTENTION

During operation, always use the protection plug.

- 1 Unscrew the knurled nut.
- 2 Remove the long transport plug (A) from the electrolyte storage tank
- 3 Replace it with the short stopper (B) provided.
- 4 Screw on the knurled nut.

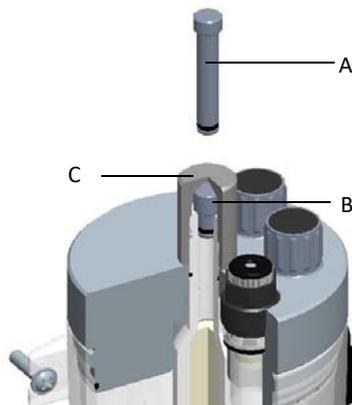


Fig. 8 Section, cell body cover

- A Transport plug (long)
B Stopper (short)
C Knurled nut

5.10.3 Add electrode cleaning sand

The electrode cleaning sand (W3T158743) is supplied in a plastic bottle. The cap serves as a measure.

- 1 Close the ball valve on the sample water inlet.
- 2 Close the ball valve on the sample water outlet on the pressurized version.
- 3 On the non-pressurized version, remove a sealing plug or sensor from the cell body cover.
- 4 On the pressurized version, remove the protection plug or sensor from the cell body cover.
- 5 Fill the cleaning sand cap (plastic bottle) up to one-third and pour the cleaning sand into the cell body via the location hole of a sensor (approx. 0.01 fluid ounce (approx. 1/3 cm³) of cleaning sand).

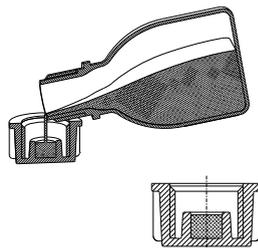


Fig. 9 Cutaway model, plastic bottle

- 6 Make sure that the opening and the thread are clean; if necessary, rinse with distilled water.
- 7 Insert sealing plug or sensor into the cell body cover.
- 8 Open the ball valve on the sample water inlet.
- 9 On the pressurized version, open the ball valve on the sample water outlet.

5.11 Prepare the VariaSens C flow cell

NOTICE

A fine filter must only be installed when membrane sensors are employed.

- 1 Release both knurled nuts (B).
- 2 Remove the entire filter unit (A).
- 3 Push the fine filter (D) into the filter unit. Ensure that the O-ring (C) is fitted correctly.
- 4 Fit the entire filter unit (A). Observe the correct installation position (top/bottom).
- 5 Tighten the knurled nuts (B).

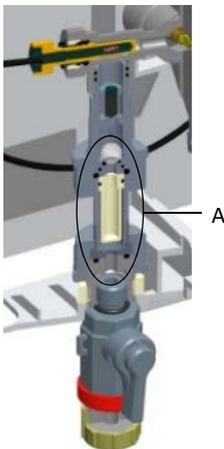


Fig. 10 Section, VariaSens C flow cell

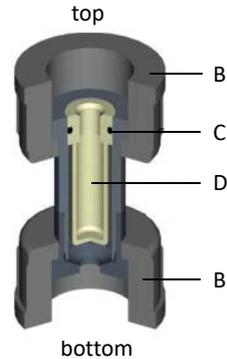


Fig. 11 Cross-section, filter unit

- A Entire filter unit
 B Knurled nuts
 C O-ring
 D Fine filter

5.12 Installing sensors

5.12.1 Installing sensors in the flow cell

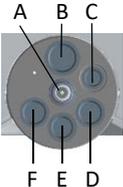
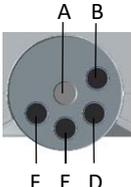
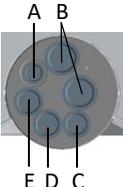
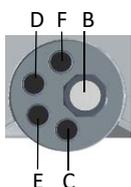
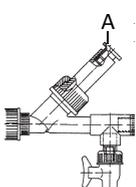
The sensors are inserted or screwed into the location hole in the cell body cover.

NOTICE

- With the pressurized version, the sensors must be screwed in or secured to prevent them from being pushed out.
- The sensors must be prepared accordingly.
- Keep the KCl tank with stand in a safe place for later use or storage.
- Please follow the relevant operating instructions for the sensors!

- 1 On the non-pressurized version, remove the sealing plug from the location hole on the cell body cover.
- 2 On the pressurized version, unscrew the protection plug.
- 3 Remove the pH sensor or the ORP (Redox) sensor from the KCl tank with stand.
- 4 Insert or screw the prepared sensors into the corresponding location hole in the cell body cover.

Sensor configuration

DEPOLOX® 5 C non-pressurized version	DEPOLOX® 5 C pressurized version	VariaSens C non-pressurized version	VariaSens C pressurized version	Y-style flow-through assembly non-pressurized version
				
<p><i>E</i> 3-Electrode cell (free chlorine)</p> <p><i>F</i> Blind plug</p> <p><i>G</i> Fluoride sensor (only on non-pressurized version)</p> <p><i>H</i> pH sensor</p> <p><i>I</i> LED glow stick</p> <p><i>J</i> ORP sensor (Redox)</p>		<p><i>A</i> Fluoride sensor (only on non-pressurized version)</p> <p><i>B</i> Membrane sensors TC3, FC2, CD7, OZ7</p> <p><i>C</i> LED glow stick</p> <p><i>D</i> ORP sensor (Redox)</p> <p><i>E</i> pH sensor</p> <p><i>F</i> Blind plug</p>		<p><i>A</i> pH-, ORP (Redox) or fluoride sensor</p>

5.12.2 Fitting calibration aids

The DEPOLOX® 5 C and VariaSens C flow cells have two calibration clips 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 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).

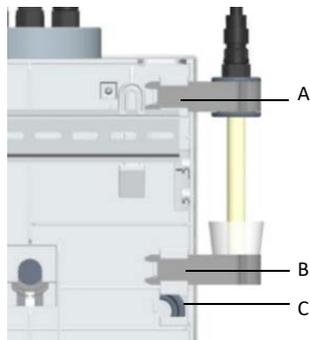


Fig. 12 Rear side of the DEPOLOX® 5 C flow cell, pressurized version

- A* Top holding clip
- B* Position of holding clip for bag
- C* Position of holding clip for beaker

5.12.3 Installing a sensor in the Y-style flow-through assembly

- 1 Fit the pH, ORP (Redox) or fluoride sensor into the sensor holder.
- 2 Tighten the clamping nut to hold the electrode shaft.

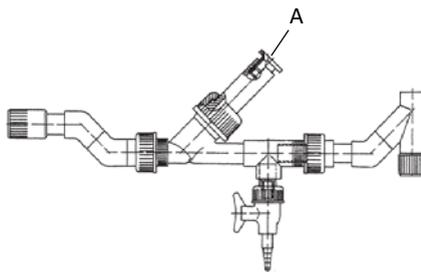


Fig. 13 Section, Y-style flow-through assembly

A Sensor holder

5.13 Connecting sensors

NOTICE

- The sensor cable glands on the electronics module are special cable glands and are already fitted with special sealing inserts at the factory.
- Threaded locking bolts are fitted in the cable glands at the factory. These must be removed during installation in order to install the corresponding sensor cables.

The Ethernet cable(s) are connected via the cable glands with connectors (A, larger opening). A maximum of two cables can be connected with the enclosed double sealing insert. The other cable glands can be used as required. Multiple sealing inserts (metric 4x5 mm, 2x6 mm) are included with the accessories.

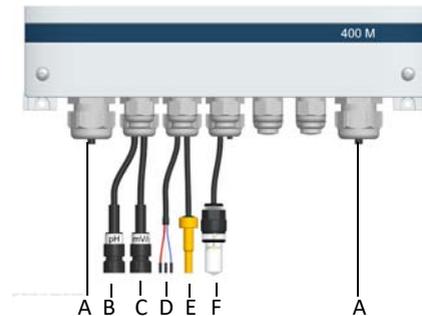


Fig. 14 Section, electronics module - cable glands

- A Cable gland for Ethernet cable
 B pH or fluoride sensor
 C ORP (Redox) sensor
 D DEPOLOX® 5 C, VariaSens C or membrane sensors
 E Multi-sensor
 F LED glow stick

5.13.1 Connect the sensor to the flow cell

- 1 Remove the red sealing plug (position A).
- 2 Plug multi-sensor into the flow control valve (position A).

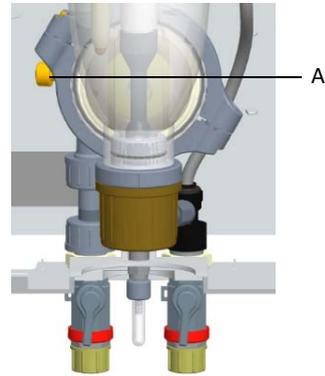


Fig. 15 Section, DEPOLOX® 5 C flow cell, pressurized version

- 3 Route the sensor cable of the 3-electrode cell or the membrane sensor into the electronics module through the corresponding cable gland.
- 4 Connect the sensor cable of the 3-electrode cell or the membrane sensor to the electronics module as shown in the wiring diagram (chapter 9.)

NOTICE

The sensor cable of the 3-electrode cell (DEPOLOX® 5 C) is already pre-wired.

WRK	working electrode	red dot	red cable
CNT	counter electrode	blue dot	blue cable
Ref	reference electrode	-	white cable

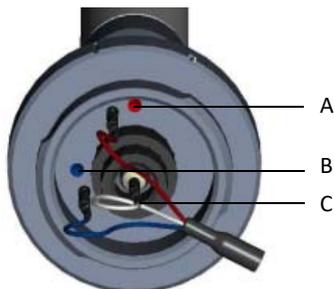


Fig. 16 Section, 3-electrode cell - color-coding of the electrode connections on the DEPOLOX® 5 C

- A Working electrode (red cable)
 B Counter electrode (blue cable)
 C Reference electrode (white cable)

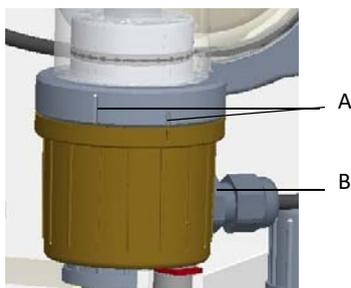


Fig. 17 Section, cap, DEPOLOX® 5 C flow cell

- A Markings for opening and closing the cap
 B M12 threaded connection

- 5 Plug or screw the LED glow stick into the location hole of the cell body cover.
- 6 Route the pH, ORP (Redox) or fluoride sensor cable into the electronics module through the corresponding cable gland.
- 7 Connect the sensor cable of the pH or fluoride sensor to the electronics module as shown in the wiring diagram (chapter 9.).

5.13.2 Connect the sensor to the Y-style flow-through assembly

- 8 Route the pH, ORP (Redox) or fluoride sensor cable into the electronics module through the corresponding cable gland.
- 9 Connect the sensor cable of the pH, ORP (Redox) or fluoride sensor to the electronics module as shown in the wiring diagram (chapter 9.)

5.14 Electrical installation

⚠ DANGER

Risk of injury or death!

External voltages may still be connected even if the operating voltage is switched off. The electronics module must be de-energized before opening it.

⚠ WARNING

Risk of injury or damage to the device!

- Only authorized and qualified electricians are permitted to install the DEPOLOX® 400 M and open the housing.
- The electronics module may only be wired in de-energized state.
- Connect the electronics module in accordance with the wiring diagram (chapter 9.) and applicable local and national regulations.
- 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.
- 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.
Ambient temperature <30°C (<86°F):
 cable temperature resistant up to at least 60°C
Ambient temperature <40°C (<104°F):
 cable temperature resistant up to at least 70°C
Ambient temperature >40°C (>104°F):
 cable temperature resistant up to at least 80°C

NOTICE

- 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.

NOTICE

- 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 (chapter 3.11.1).

**WARNING****Risk of injury or damage to the device!**

- The DEPOLOX® 400 M 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.
- If devices are connected to the internal voltage supply (e.g. dosing devices) or via fixed connection cables (e.g. connectors), the total power consumption must not exceed 6 A.

- Open the housing cover of the electronics module.
- Connect the power supply in accordance with the wiring diagram (chapter 9.).

NOTICE

Note the correct polarity of the voltage connections and the correct dimensioning of the wire cross-sections (chapter “3.11.1 - Power consumption”).

- Install ORP (Redox) sensor measuring modul (chapter 5.14.1).
- Connect CPU board in accordance with wiring diagram (chapter 9.).

NOTICE

Make sure that all cable glands are installed correctly.

- Fit the housing cover.
- Then put the DEPOLOX® 400 M operation (chapter 5.15).

5.14.1 ORP sensor measuring module

- Disconnect the electronics module from the power supply.
- Remove the housing cover of the electronics module.
- Feed the ORP (Redox) sensor cable through the cable gland together with the pH sensor cable with double sealing insert.
- Connect sensor cable to the ORP (Redox) sensor card (A).
- 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.
- Remove the cover of the flow cell.
- Install ORP (Redox) sensor in the flow cell. Please remove the blind plug first (note position!).
- Feed the sensor cable through the hole at the bottom into the housing of the flow cell and route upward to the sensor.
- Connect sensor cable to the ORP (Redox) sensor.
- Fit the housing cover.
- Switch the device on.

NOTICE

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

- Calibrate the ORP sensor.
- Set the limit values and perform ORP settings.

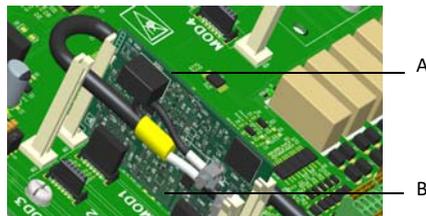


Fig. 18 Section ORP sensor module with sensor cable in slot

- A ORP (Redox) sensor card
B Mod1 slot

5.15 Initial commissioning

DANGER

Risk of injury or death!

The DEPOLOX® 400 M 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® 400 M 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® 400 M to the power supply, a 6A back-up fuse must be used in the mains supply line.

Following complete mechanical and electrical installation, initial commissioning can be carried out. Please check that the following conditions are met:

- Electronics module, flow cell or Y-style flow-through assembly are installed.
- Housing covers are fitted.
- Optional strainer is installed.
- Sample water inlet and outlet are connected.
- Sensors are installed in the flow cell or Y-style flow-through assembly.
- The sensors are connected to the electronics module.
- The electronics module is wired in accordance with the wiring diagram (circuit diagram) and local regulations.
- Ensure that all transport protection was removed.
- Check all connections for leakage.
- Sample water monitoring is active (chapter 3.6.6).

- 1 Switch on power supply.
- 2 Perform initial configuration:
 - Select the language
 - Set the date and time
 - Enter the system name
- 3 **Chlorine, chlorine dioxide, ozone or potassium permanganate measurement (DES sensors)**
 - Check the limit values 1 and 2 ("Min" and "Max"), adjust if necessary.
 - Check the measurement range, adjust if necessary.
- 4 **pH, OPR (Redox) and fluoride measurement**
 - Check the limit values 1 and 2 for pH/ORP (Redox)/fluoride (Min and Max), adjust if necessary.
 - Check the measurement range for pH/ORP (Redox)/fluoride, adjust if necessary.
- 5 Configure mA outputs.
- 6 Carry out initial calibration of the sensors used.

5.16 Replace 4-way mA output card

⚠ DANGER

Risk of injury or death!

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

- 1 Disconnect the electronics module from the power supply.
- 2 Remove the housing cover of the electronics module.
- 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 (chapter 9.).
- 6 Fit the housing cover.
- 7 Connect 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.
- 10 Check all menu settings and configure if necessary.

NOTICE

After changes the electronics module resets all parameter to factory settings.



Fig. 19 View, installation of the 4-way mA output card

5.17 Shut-down

⚠ DANGER

Risk of injury or death!

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

- 1 Disconnect the DEPOLOX® 400 M 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 flow cell drain valve.
- 5 Flush out the cleaning sand.
- 6 Dismantle the filter unit and the check valve housing (chapter 7.7).
- 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 location hole in the cover of the cell body and disconnect from the electronics module.
- 9 Shut down the sensors. See the relevant operating instructions for the sensors.
 - Plug in the pH or OPR (Redox) sensor in the transport container with diluted electrolytes (KCl tank with stand and 5 ml KCl solution).
 - Store the sensor in a frost-protected location.
- 10 Replace and engage the housing cover.

5.18 Start-up

See chapter 5.15.

6. Operation

6.1 Display and control elements

The colored graphic display with capacitive touchscreen is the display and control element.

⚠ ATTENTION

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 with a pen designed for that purpose (PDA pen).

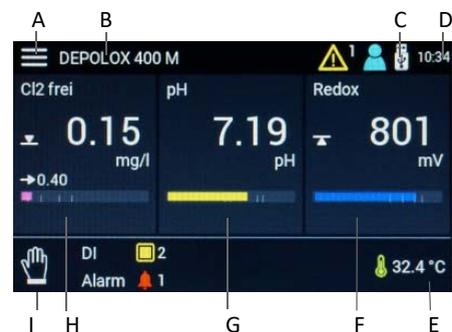


Fig. 1 Home screen (example)

- A System menu
- B Device name
- C Data logger symbol USB memory stick
- D Current time
- E Current temperature
- F Menu field Measurement with current measured value for ORP (Redox), setpoint display and bar graph
- G Menu field Measurement with current measured value for pH, setpoint display and bar graph
- H Menu field Measurement with current measured value for chlorine, setpoint display and bar graph
- I Operation mode

Main scrture

From the main menu, you can call up the system settings, the measured values menus and the controller menus. To access the corresponding menus, tap the Measurement menu fields or tap the  "System menu" symbol.

Menu field

The menu fields are used to carry out functions and to switch between the menu fields, menus and screens. The Home screen view depends on the sensors that are fitted.

Symbols

The symbols display function. There are also symbols with underlying functions. This means that functions can be carried out or changed by tapping certain symbols.

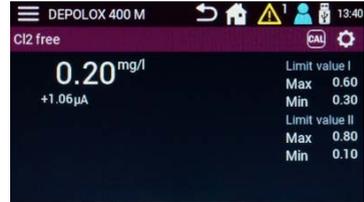
Symbols	Meaning
	Numeric keypad
	Enter key - save entry
	Upper-case character keypad
	Delete previous keypad entry
	Limit value Min. 1/2 not reached
	Limit value Max. 1/2 exceeded
	Menu Information
	Temperature display
	Setpoint controller
	Dosing on
	Increase value
	Reduce value
	Switch to Home menu
	Switch to the previous screen
	Logout and Login levels screen Level 1 = white symbol Level 2 = yellow symbol Level 3 = blue symbol

Symbols	Meaning
	<p>Message/error active Tap the symbol to open the message window.</p> <ul style="list-style-type: none"> Yellow symbol = alarm that cannot be acknowledged is active Red symbol = alarm that can be acknowledged is active or error message is active Orange symbol = maintenance or calibration interval expired
	Data logger symbol USB memory stick
	Menu Alarms
	Digital input active
	Sample water Stop
	Alarm active (1 to 8)
	Calibration menu
	Settings menu
	Acknowledge 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 “Measurement” menu

This menu shows the current measured value and the sensor signal. All settings relating to measurements, such as range, limit values, controller settings and calibration must be made via this menu.

- 1 Call up the Home menu.
- 2 Tap the desired measurement (e.g. Cl₂ free).



- 3 Tap symbol.



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.

The settings menus are subdivided into various areas such as Measurement, Controller and Dosing. To change values, press the corresponding parameter.

NOTICE

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 (chapter 6.3.8).

Chlorine measurement parameters

Measurement
Range
Range end: 1.00 / 2.00 / 5.00 / 10.00 / 20.00 mg/l or ppm 200 / 500 µg/l or ppd
Unit: µg/l / mg/l / ppd / ppm
Sensor type: O3sel(M) / ClO2sel(M) / Cl-tot(M) / Cl2 free(M) / KMnO4 / O3 / ClO2 / Cl2 free, Cl2++
Measurement filter: off/low/middle/strong
Upot: -1000 to 1000 (factory setting 250 mV)
µA-Range: 10 µA / 100 µA / 1000 µA (factory setting 100 µA)
Notice: Depending on the sensor and the size of the measurement, the µA-Range may need to be adjusted. If the µA-Range is not sufficient, select the next higher µA-Range.
Limits
Limits value I
Max: within range
Min: within range
Hysteresis: 0.01 to 0.25
Limits value II
Max: within range
Min: within range
Hysteresis: 0.01 to 0.25
Maintenance intervals
Calibration
Message: On/Off
Interval: 2 to 90
Next maintenance on: Date
Reset maintenance: Execute
Cell
Message: On/Off
Interval: 10 to 365
Next maintenance on: Date
Reset maintenance: Execute

pH measurement parameters

Measurement
Range
Range end: pH 0.00 to pH 14.00
Range start: pH 0.00 to pH 14.00
Measurement filter: off/low/middle/strong
Limits
Limits value I
Max: within range
Min: within range
Hysteresis: 1 to 25
Limits value II
Max: within range
Min: within range
Hysteresis: 1 to 25
Maintenance intervals
Calibration
Message: On/Off
Interval: 2 to 90
Next maintenance on: Date
Reset maintenance: Execute
Cell
Message: On/Off
Interval: 10 to 365
Next maintenance on: Date
Reset maintenance: Execute

ORP (Redox) measurement parameters

Measurement
Range
Range end: 600/700/800/900/1000
Range start: 0/100/200/300/400
Measurement filter: off/low/middle/strong
Limits
Limits value
Max: within range
Min: within range
Hysteresis: 1 to 25
Limits value II
Max: within range
Min: within range
Hysteresis: 1 bis 25
Maintenance intervals
Calibration
Message: On/Off
Interval: 2 to 90
Next maintenance on: Date
Reset maintenance: Execute
Cell
Message: On/Off
Interval: 10 to 365
Next maintenance on: Date
Reset maintenance: Execute

Fluoride measurement parameters

Measurement
Range
Range end: 2.00 / 5.00 / 20.00 mg/l
Measurement filter: off/low/middle/strong
Limits
Limits value I
Max: within range
Min: within range
Hysteresis: 1 to 25
Limits value II
Max: within range
Min: within range
Hysteresis: 1 to 25

Maintenance intervals
Calibration
Message: On/Off
Interval: 2 to 90
Next maintenance on: Date
Reset maintenance: Execute
Cell
Message: On/Off
Interval: 10 to 365
Next maintenance on: Date
Reset maintenance: Execute

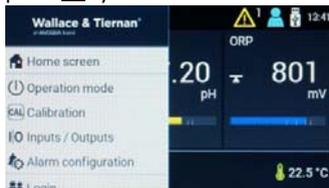
Temperature measurement parameters

Measurement
Range
Range end: 0 to 50°C / 32 to 122° C
Sensor type: Pt1000 / Pt100 / Off
Limits
Limits value I
Max: 0 to 50 °C
Min: 0 to 50 °C
Hysteresis: 0.1 to 2.5 °C
Limits value II
Max: 0 to 50 °C
Min: 0 to 50 °C
Hysteresis: 0.1 to 2.5 °C
Maintenance intervals
Calibration
Message: On/Off
Interval: 2 to 90
Next maintenance on: Date
Reset maintenance: Execute
Cell
Message: On/Off
Interval: 10 to 365
Next maintenance on: Date
Reset maintenance: Execute

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 this menu.

- 1 Call up the Home menu.
- 2 Tap the  symbol.



- 3 Tap the desired menu.

Symbol/Menu	Meaning
 Home menu	Home screen
 Operation mode	“Operation mode” menu
 Calibration	“Calibration” menu
 Inputs/Outputs	Configuration of inputs and outputs
 Alarm configuration	Configuration alarms
 Login	Login screen for entry of the password or unlock code
 Settings	Settings menu
 Information	Info display

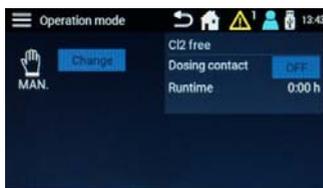
6.3.1 “Operation mode” menu

NOTICE

This function is only available if the parameter “Disinfection controller = On” is set in the menu “Settings – Setup.”

Select in this menu the operation mode.

- 1 Call up the Home menu.
- 2 Tap  or  symbol or tap the  symbol and then  Operation mode menu.



- 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 switch the dosing contact on and off manually via the “ON/OFF” button.

NOTICE

In “Manual mode”, the dosing contact only switches off if the dosing contact is switched off manually.

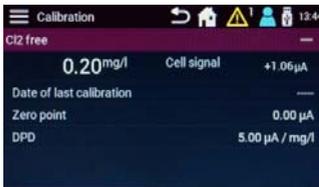
- 5 In “Automatic mode” it is possible to switch to the settings level by pressing the  symbol.

6.3.2 “Calibration” menu

In this menu, the measurements are compared in compliance with the prescribed maintenance intervals using calibration solution or buffer solution or via comparative measurements (chapter 6.6). 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 menu can be opened in via the  System menu or via the Measurement menu field.

Calibration - System menu

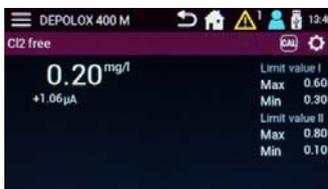
- 1 Call up the Home menu.
 - 2 Tap the symbol.
- 
- 3 Press Calibration menu.
 - 4 Tap the desired measurement (e.g. Cl₂ free).



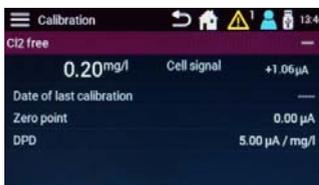
- 5 Press calibration selection, see “Calibration selection” on page 57.
- 6 To display extended calibration options, tap the “+” symbol. To return to the standard calibration menu, tap the “-” symbol.
- 7 Carry out sensor calibration as described in chapter 6.6. See “Example ”Cl₂ free calibration” on page 58.

Calibration - Measurement menu field

- 1 Call up the Home menu.
- 2 Tap the desired measurement (e.g. Cl₂ free).



- 3 Tap the symbol.



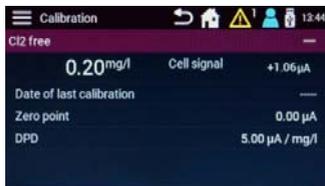
- 4 Press calibration selection, see “Calibration selection” on page 57.
- 5 Carry out sensor calibration as described in chapter 6.6. See “Example ”Cl₂ free calibration” on page 58.
- 6 To display extended calibration options, tap the “+” symbol. To return to the standard calibration menu, tap the “-” symbol.

Calibration selection

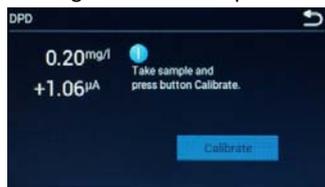
Chlorine
Zero point: Calibration of the zero point current of the chlorine measuring cell (only with extended calibration view)
DPD: DPD calibration of the chlorine measurement cell
pH
pH7: Span calibration of the pH sensor with buffer solution (only with extended calibration view)
pHX: Span calibration of the pH sensor with buffer solution (only with extended calibration view)
Offset: Offset calibration of the pH sensor
ORP (Redox)
Kal.Wert: ORP (Redox) calibration with calibration solution
Fluoride
Calibre lower value: Calibration of lower value for entry in accordance with calibration solution
Calibre upper value: Calibration of upper value for entry in accordance with calibration solution
Offset: Offset calibration of the fluoride sensor
Temperature
Cal. value: Temperature calibration for entry in accordance with comparative measurement

Example “Cl₂ free calibration”

- 1 Tap up the Home menu.
- 2 Tap the  Calibration menu in the System menu or the  symbol in the Measurement menu.



- 3 To display extended calibration options, tap the “+” symbol. A zero point calibration is also possible in this view. To return to the standard calibration menu, tap the “-” symbol.
- 4 Press the desired calibration selection. A further screen opens with information describing the calibration process.



- 5 Press the “Calibrate” button to open the input menu.
- 6 Enter the desired values in the input field and save with the Enter key.

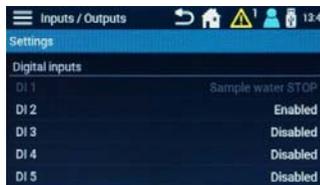


- 7 Make any further entries (e.g. DPD).

6.3.3 “Inputs and Outputs” menu

The digital inputs and the mA outputs are configured in this menu.

- 1 Call up the Home menu.
- 2 Tap the  symbol.
- 3 Tap the  Inputs/Outputs menu.



- 4 Press the desired “Digital inputs” or “mA outputs” menu.

Digital inputs
DI 1: Measurement Stop (cannot be changed)
DI 2 / DI 3 / DI 4 / DI 5: Disabled, Enabled, Controller Stop, Standby
mA outputs 1/2/3/4
mA outputs: off, 0 to 20 mA, 4 to 20 mA
Measurement: Disinfection, pH, ORP (Redox), Temperature, Fluoride
Signal: Measured value

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:** Controller is switched off and measured value display are not displayed when the digital input is opened. Standby is used, when the circulation is deactivated and no sample water flows through the module.

Example

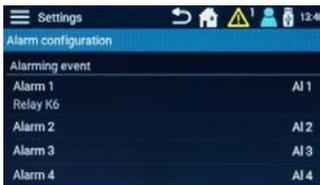
To transfer a measurement signal, e.g. Cl₂, via the mA output, the following setting is required:

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

6.3.4 "Alarm configuration" menu

Alarms 1 to 8 are configured in the "Alarm Configuration" menu. The DEPOLOX® 400 M offers the option of setting 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 dosing contact is used as dosing output for chlorine, relay K2 cannot be used as an alarm relay. 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.

- 1 Call up the HOME menu.
- 2 Tap the  symbol.
- 3 Tap the  Alarm configuration menu.



- 4 Enter the desired setting.

Alarm 1/2/3/4

Designation:

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

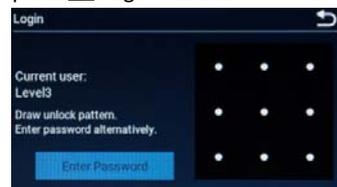
Relay function:

Normally Open / N.O
Normally Closed / N.C

6.3.5 "Login" menu

Log in on the desired user level in this menu. Depending on the user administration configuration (chapter 6.3.8), 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.

- 1 Call up the HOME menu.
- 2 Tap the  symbol.
- 3 Tap the  Login menu.



- 4 Enter locking code or password.

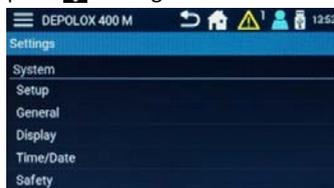
6.3.6 "Settings" menu

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

NOTICE

The control function for the DEPOLOX® 400 M is only to be used for constant flow applications and is only an on/off type of controller. Under no circumstances should this control function be used in applications where the process water flow changes for any reason.

- 1 Call up the HOME menu.
- 2 Tap the  symbol.
- 3 Tap the  Settings Menu.



- 4 Enter desired settings.

System
Setup
Setup - Controller
Disinfection controller: On/Off Enables or disables the disinfection controller (only to be used for constant flow application)
Setup - Measurement
Disinfection: On/Off Enables or disables pH measurement and controller
pH/OPR/Fluoride: On/Off Enables or disables pH, ORP (Redox) or fluoride measurement
General information
System name: Freely definable
Language: German/English/French/Italian/Croatian/Dutch/Japanese

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 to 100 %

Screensaver:

Off, 30 s, 1/5/15/30 min, 1 h

Color scheme: Design 1 to 5

Calibrate LED:

This setting can be used for white balance of the LED glow stick color if color deviations occur.

Red, yellow, blue: 50 to 100 %

Time/Date - Date

Time: 00:00 to 24:00 / 00:00 to 12:00

24 h Format: On/Off

Safety

Sample water delay time:

00:00 to 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 to 120:00 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. The rundown of the selected time can be interrupted by selecting the "Start now!" button.

<p>Max. dosing time: 00:00 to 10:00 h</p> <p>This parameter defines a monitoring time which specifies the maximum time the controllers may require before the measured value reaches the setpoint minus monitoring hysteresis. If one of the controllers does not reach the setpoint within the defined maximum dosing time, the corresponding controller is switched off and a message is displayed. When the setting is “00:00:00,” this function is switched off.</p> <p>Notice: It is not possible in manual mode!</p>	<p>Level 2:</p> <p>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.</p>
<p>Monitoring hysteresis: 2 to 50 %</p> <p>This parameter defines a range around the setpoint within which the setpoint is recognized as reached when dosing time monitoring is enabled.</p>	<p>Unlock pattern:</p> <p>Menu for entry of a Level 2 unlock pattern. The entry must be repeated as confirmation.</p>
<p>Safety MAN. mode:</p> <p>Stops dosing with sample water stop or external stop.</p>	<p>Password:</p> <p>Menu for entry of a Level 2 password. The entry must be repeated as confirmation.</p>
<p>User administration (chapter 6.3.8)</p>	<p>Level 1:</p> <p>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.</p>
<p>Access control:</p> <p>This parameter is used to switch the user administration on and off.</p> <ul style="list-style-type: none"> • deactivated = no user administration; all parameters can be changed without entering a password • activated = user administration enabled, password protection or Level 1, 2 and 3 can be configured 	<p>Unlock pattern:</p> <p>Menu for entry/definition of a Level 1 unlock pattern. The entry must be repeated as confirmation.</p>
<p>Level 3:</p> <p>If access control is enabled, at least Level 3 must be used or configured. Level 3 comprises read and write access to all setting parameters of the device.</p>	<p>Password:</p> <p>Menu for entry/definition of a Level 1 password. The entry must be repeated as confirmation.</p>
<p>Unlock pattern:</p> <p>Menu for entry/definition of a Level 3 unlock pattern. The entry must be repeated as confirmation.</p>	<p>Connection - Network</p>
<p>Password:</p> <p>Menu for entry/definition of a Level 3 password. The entry must be repeated as confirmation.</p>	<p>IP Address:</p> <p>Enter a fixed IP address (contact network administrator)</p>
	<p>Subnet mask:</p> <p>Enter the subnet mask (contact network administrator)</p>
	<p>Gateway:</p> <p>Gateway settings</p>
	<p>DHCP: On/Off</p> <p>In the setting “DHCP = On,” the network configuration is automatically defined by the DHCP server and cannot be configured manually. The network settings are displayed.</p> <p>In the setting “DHCP = Off,” the network settings must be configured manually.</p>
	<p>Status:</p> <p><input type="checkbox"/> Http <input type="checkbox"/> Modbus</p>

Connection - RS485 interface
Function: Off or RS485 WT 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. RS485-WT protocol (new address reference list)
Busaddress: Bus address setting at the RS485 Interface (RS485 WT) 00 to31
Status: <input type="checkbox"/> RxD <input type="checkbox"/> TxD <input type="checkbox"/> Aktiv <input type="checkbox"/> Fehler
Backup and Reset
Reset to factory setting: Under Factory setting, 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: <input checked="" type="checkbox"/> <input type="checkbox"/>
Reset system settings: <input checked="" type="checkbox"/> <input type="checkbox"/>
Reset user administration: <input checked="" type="checkbox"/> <input type="checkbox"/>
Reset dosing average: <input checked="" type="checkbox"/> <input type="checkbox"/>

NOTICE

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

6.3.7 "Information" menu

Various system information, e.g. the installed software version, is described in this menu.

6.3.8 "User administration" menu

The electronics module offers the option of using up to three user levels. Different rights are assigned to each user level. The colored user symbol in the Home screen shows on what level the user is logged in.



Fig. 2 Home menu

A Actual user administration level

NOTICE

The user administration of the web visualization via Internet browser differs from the user administration on the display of the electronics module (chapter 6.3.9).

No symbol

- User logged out.
- Read rights for all settings and change of operation mode.

NOTICE

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 yellow = 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

NOTICE
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

- 1 Call up the Home menu.
- 2 Press the symbol.
- 3 Tap the Login menu.
- 4 Enter locking code or password (chapter 6.3.5).

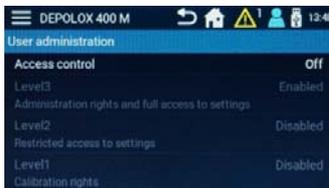
Logout

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

Create users

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

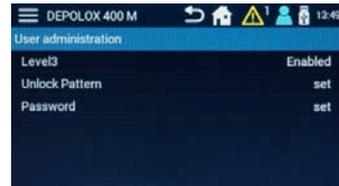
- 1 Call up the Home menu.
- 2 Press the symbol.
- 3 Tap the Settings menu.
- 4 Press the "User administration" parameter.



- 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.

NOTICE
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 display changes to the settings menu for the corresponding level (Example: Level 3).



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 patterns

- 1 Press the "Unlock pattern" parameter.
- 2 Define unlock pattern with 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

- 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 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.

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

- 1 Press the red padlock symbol. Login window for password entry opens.
- 2 Enter password.
- 3 Confirm with the “Save” button.

Logout

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

Enable user levels

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

NOTICE

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® 400 M allow you to visualize the measurements and setting parameters via a standard browser and Internet-capable devices.



Fig. 3 Example, web view DEPOLOX® 400 M

NOTICE

If alarms or errors are active, a yellow or red message symbol is displayed in the menu bar. Pressing the message symbol displays the active alarms or errors.

The menu bar is divided into two main menus:

- Language
- Settings

6.4.1 Language

Selection of language.

6.4.2 Settings

Parameter

- Cl2 free
- pH
- ORP (Redox)
- Fluoride
- Temperature

Setpoint: within range

Xp: 1 to 1000

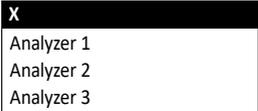
Tn: 0 to 100.0 min

Limit value Max 1: within range

Limit value Min 1: within range

Limit value Max 2: within range

Limit value Min 2: within range

System
System name: Customizable, customer-specific device name
Date: Date setting
Time: 00:00 to 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 (contact the network administrator)
Network mask: Enter the subnet mask (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 links) via Name of 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.
Menu IP link  

NOTICE

If several DEPOLOX® 400 M devices are connected via the IP link, when entering the IP link, the text "/main.shtml" must be entered after the IP address.
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 must 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.

NOTICE

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

 DANGER**Risk of injury or death!**

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

 WARNING**Risk of injury or damage to the device!**

Only authorized and qualified electricians are permitted to connect the DEPOLOX® 400 M electrically and to open the housing.

- 1 De-energize the electronics module.
- 2 Remove the housing cover of the electronics module.
- 3 Insert the USB stick into the USB port (A).
- 4 Switch on mains voltage.
- 5 Using an insulated screwdriver, briefly press the Update button (B) on the motherboard.

NOTICE

The update takes approximately 1 to 2 minutes. The LED flashes green while the update is in progress. The update is complete when the green LED no longer flashes.

- 6 The USB stick must now be removed.
- 7 Close the housing cover.
- 8 Switch the device on.
- 9 All settings must now be entered again (chapter 5.15).
- 10 Calibrate the sensors.

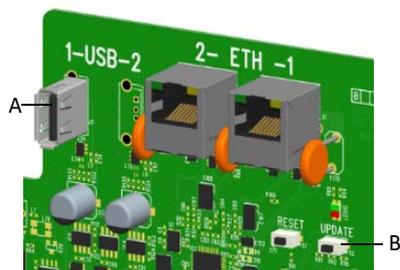


Fig. 4 Section, circuit board

A USB socket

B Update button

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 (chapter 6.3.6).

LED white

- All OK.
- The device is working trouble-free.
- No active errors or currently no message in the message system.

LED 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 enabled tank monitoring and if the Min message from the Cl2 or pH tank is present.)

LED 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.

⚠ 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.

NOTICE

- 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 (chapter 7.1).
- Always start with the pH 7 calibration!
- Before calibration of the pH value with calibration solution, 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.

6.6.1 Calibration interval

The electronics module offers the option of using automatic maintenance and calibration intervals for disinfection, pH, ORP (Redox) and fluoride measurement. In as-delivered status, the maintenance and calibration intervals are disabled. Activated calibration interval:

- 1 Call up the Home menu
- 2 Select the desired measurement (e.g. Chlorine free). The “Measurement” menu opens.
- 3 Tap the  Settings menu. The settings menu for the selected measurement opens.
- 4 The “Maintenance interval” menu opens.

- 5 To enable the calibration check interval, set the parameter “Message” to “On” under the heading Calibration and, under “Interval,” enter the number of days after which you wish to receive a reminder to carry out sensor calibration. When the set interval expires, the disinfection analyzer generates an orange message reminding you to carry out sensor calibration. The message can be acknowledged via the message system. To reset the calibration check interval, carry out sensor calibration or, in the case of premature calibration, tap the “Execute” button under the heading “Calibration” to reset the calibration interval. The date for the next calibration is recalculated and displayed under “next maintenance on.”

6.6.2 Calibration Disinfection (DES sensors)

During calibration on the 3-electrode cell (flow cell), a zero point calibration and a measured value calibration (DPD1) must be carried out.

NOTICE

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

NOTICE

If there are deviations in the zero point, a zero point calibration must be carried out.

- 1 Press the  symbol.
- 2 Press the  Calibration menu.
- 3 Tap the measured value “Disinfection.”
- 4 Tap “+” for zero point calibration, and the display for the extended calibration menu opens.
- 5 Press the “Zero point” parameter.
- 6 Close the ball valve on the sample water inlet.

NOTICE

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.

- 7 Wait until the displayed value no longer changes.
- 8 Press the “Calibration” button. An input field opens.
- 9 Press "Enter" to save the zero point.
- 10 Open the ball valve on the sample water inlet.

Measuring value calibration (DPD)

- 11 After zero point calibration, wait at least 2 minutes.
 - 12 Open the flow cell drain valve by approximately 1 turn and extract a specimen of the sample water.
 - 13 Determine the disinfectant content in the sample using a photometer.
 - 14 Press the parameter “DPD.”
 - 15 Press the “Calibration” button. An input field opens.
 - 16 Use the input keys to enter the determined value.
 - 17 Press "Enter" to save the entry.
- This concludes the calibration for DPD.

6.6.3 pH calibration

NOTICE

During pH calibration with pH buffer solution, the buffer solution and the sample water must have the same temperature. If there is a temperature difference of $> 9\text{ }^{\circ}\text{F}$ ($> 5\text{ }^{\circ}\text{C}$), first bring the buffer solution to the same temperature as the sample water. Also observe the calibration values of the buffer solution at different temperatures.

- 1 Press the  symbol.
- 2 Press the  Calibration menu.
- 3 Tap the measurement “pH.”
- 4 Tap “+” for calibration with pH buffer solution, and the display for the extended calibration menu opens. Otherwise, continue under “Offset alignment.”

pH 7 alignment

- 5 Press the "pH 7" parameter.
- 6 Close the sample water inlet and sample water outlet and briefly open the flow cell drain valve to release the pressure. Close the flow cell drain valve again.
- 7 Place the beaker in the bottom clip and fill with buffer solution "pH 7.00" or clamp the bag with buffer solution "pH 7.00" in the bottom clip.
- 8 Unscrew and remove the pH sensor from the cell body cover.
- 9 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.
- 10 Press the "Calibration" button. An input field opens.
- 11 Use the input field to enter the value to be calibrated for the buffer solution.
- 12 Press "Enter" to save the entry.

pH X-span alignment

- 13 Remove the buffer solution "pH 7.00" from the bottom clip.
- 14 Wash the pH sensor in distilled water to prevent carryover of buffer solution.
- 15 Press the "pH X" parameter.
- 16 Place the beaker in the bottom clip and fill it with buffer solution "pH 4.65" or clamp a bag with buffer solution "pH 4.65" in the bottom clip.

NOTICE

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.

- 17 Dip the pH sensor at least 2 cm deep into the buffer solution and move gently until the indicated pH value remains constant.
- 18 Press the "Calibration" button. An input field opens.
- 19 Use the keypad to enter the value to be calibrated.
- 20 Press "Enter" to save the entry.
- 21 Remove the pH sensor from the top clip.
- 22 Screw the pH sensor into the cell body cover.
- 23 Open the sample water inlet and outlet again.

The pH measurement has now been calibrated.

Offset alignment

If there is a difference between the displayed pH value and a pH value measured manually, this difference can be compensated for and the comparative value entered in the Offset menu.

- 1 Press the  symbol.
- 2 Press the  Calibration menu.
- 3 Tap the "pH" measurement.
- 4 Press the "Offset" parameter
- 5 Use the keypad to enter the value from the comparative measurement.
- 6 Press "Enter" to save the entry.

This concludes the pH offset.

NOTICE

The offset calibration is deleted each time a new pH-7 alignment or span alignment is performed with the pH buffer solution.

6.6.4 ORP calibration (Redox)**NOTICE**

ORP (Redox) 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..

- 1 Press the  symbol.
- 2 Press the  Calibration menu.
- 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 Unscrew the ORP sensor into the cell body cover.
- 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 cell body cover.
- 14 Open the sample water inlet and outlet again.

This concludes the ORP (Redox) calibration.

6.6.5 Fluoride calibration

NOTICE

- During fluoride calibration, the calibration solution and the sample water must have the same temperature. If there is a temperature difference of $> 9\text{ °F}$ ($> 5\text{ °C}$), first bring the calibration solution to the same temperature as the sample water.
- The first time you use the fluoride sensor, place the fluoride sensor into a 100 mg/l calibration solution overnight and then into the sample water. After one hour the fluoride sensor has stabilized and the first calibration can be started.

- 1 Press the  symbol.
- 2 Press the  Calibration menu.
- 3 Tap the measured value "Fluoride."
- 4 Tap "+" for calibration with calibration solutions, and the display for the extended calibration menu opens. In the case of single-point calibration, continue under "Offset compensation."
- 5 Tap the "Calibrate lower value" parameter.
- 6 Place the beaker in the bottom clip and fill it with calibration solution 0.20 mg/l.
- 7 Close the sample water inlet and sample water outlet and briefly open the flow cell drain valve to release the pressure. Close the flow cell drain valve again.
- 8 Remove the fluoride sensor from the cell body cover.
- 9 Dip the fluoride sensor at least 1" (2 cm) into the calibration solution through the top clip and move it slightly until the indicated value remains constant.
- 10 Press the "Calibration" button. An input field opens.
- 11 Use the input field to enter the value to be calibrated for the calibration solution.
- 12 Press "Enter" to save the entry.
- 13 Remove the calibration solution from the bottom clip.
- 14 Wash the sensor in distilled water to prevent carryover of calibration solution.

- 15 Tap the "Calibrate upper value" parameter.
 - 16 Place the beaker in the bottom clip and fill it with calibration solution 2.00 mg/l.
 - 17 Dip the fluoride sensor at least 1" (2 cm) deep into the calibration solution and move gently until the indicated value remains constant.
 - 18 Press the "Calibration" button. An input field opens.
 - 19 Use the keypad to enter the value to be calibrated.
 - 20 Press "Enter" to save the entry.
 - 21 Remove the fluoride sensor from the top clip.
 - 22 Insert the fluoride sensor into the cell body cover.
 - 23 Open the sample water inlet again.
- The fluoride measurement has now been calibrated.

Offset alignment

If there is a constant difference between the displayed fluoride value and a fluoride value measured manually, this difference can be compensated for and the comparative value entered in the Offset menu.

- 1 Press the  symbol.
- 2 Press the  Calibration menu.
- 3 Tap the measured value "Fluoride."
- 4 Press the "Offset" parameter.
- 5 Use the keypad to enter the value from the comparative measurement.
- 6 Press "Enter" to save the entry.

This concludes the fluoride calibration.

NOTICE

The offset calibration is deleted each time a new fluoride alignment with calibration solution is performed

6.6.6 Temperature calibration multi-sensor

- 1 Press the  symbol.
- 2 Press the  Calibration menu.
- 3 Tap the measurement "Temperature."
- 4 Press the "Cal. value" parameter.
- 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 Messages, alarms and errors

Messages, alarms and errors are displayed on the electronics module with the colored  message symbol (chapter 3.6.4). 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.

6.7.1 Acknowledgeable messages

NOTICE	
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.	Identify the cause, e.g. chemicals tank empty. Check the dosing pump.

6.7.2 Non-acknowledgeable messages and errors

NOTICE	
Error messages 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 DI 4 DI 5	Digital input 2 active Digital input 3 active Digital input 4 active Digital input 5 active	Check cause depending on use of the digital input, chemicals tank empty, change tank.
Zero point calibration ?	Disinfection sensor (DES sensor): Zero current of sensor > +5 µA or < -5 µA	Upot potential voltage set incorrectly; change if necessary. Electrodes of disinfection sensor are dirty, if necessary clean / service. Sample water is not turned off or check valve leaks; turn off sample water if necessary.
Modul Communication ?	ORP (Redox) ensor card defective	Check sensor card. Check that the card is installed correctly.

Error message	Cause	Remedy
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 DES 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.
	Disinfection sensor (DES sensor): Slope error - the sensor current based on 1 mg/l has fallen below the required minimum.	Carry out DES sensor maintenance, replenish cleaning sand.
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	Check the electrode. Check buffer solutions, replace if necessary.
	mV per pH increment, the calibration point distance is smaller than 1 pH increment.	
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.
Cell ?	Disinfection sensor (DES sensor): Chlorine sensor not screwed in. No sand cleaning. Sensor, sensor cable or sensor measuring module defective. Sensor measuring module μ A measuring range exceeded.	Screw in DES sensor correctly. Check sand cleaning. Check the sensor, sensor cable or sensor measuring module, replace if necessary. Select higher μ A measurement range.
	pH and fluoride sensor: Sensor, sensor cable or sensor measuring module defective.	Check the sensor, sensor cable and sensor measuring module, replace if necessary.

Error message	Cause	Remedy
Cl ₂ ++	pH measurement is outside < 6,00 and >8,75	Measurement/Dosiering check pH
Maximum dosing time has been exceeded	The maximum dosing time set for a control output has been exceeded	Check measuring water, calibration, dosing pump, chemical storage sensor, sensor cable, measurement.

6.7.3 Messages

Error message	Cause	Remedy
Cl ₂ free Maintenance! Sensor calibration	Calibration check interval Time expired	Calibrate the measurement, reset maintenance interval after calibration and acknowledge message.
Fluoride Maintenance! Sensor calibration		
pH Maintenance! Sensor calibration		
ORP (Redox) Maintenance! Sensor calibration		
Cl ₂ free Maintenance! Cell	Sensor maintenance interval expired	Carry out sensor maintenance, reset maintenance interval and acknowledge message.
Fluoride Maintenance! Cell		
pH Maintenance! Cell		
ORP (Redox) Maintenance! Cell		
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

6.8 Faults and remedies

NOTICE

If it is not possible to remedy the fault or error yourself, please contact your affiliate.

Error message	Cause	Remedy
No indication on device	No power supply.	Turn external switch or fuse on.
	Device fuse defective.	Check power supply, replace fuse (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
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), replace fuse.
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).

7. Maintenance

DANGER

Risk of injury or death!

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

NOTICE

- Liability for defects can only be accepted if maintenance work is performed as specified.
- Adhere to the applicable standards and national and regional regulations.
- Observe maintenance intervals of the sensors. See instruction manual of sensors!

7.1 Automatic maintenance and calibration check intervals

The electronics module offers the option of using automatic maintenance and calibration check intervals for disinfection, and pH, ORP (Redox) and fluoride measurement. In as-delivered status, the maintenance and calibration intervals are disabled. To enable the maintenance intervals for disinfection, pH and fluoride measurement:

- 1 Call up the Home menu.
- 2 Select the desired measurement (e.g. Chlorine free). The "Measurement" menu opens.
- 3 Tap the  Settings menu. The settings menu for the selected measurement opens.
- 4 "Maintenance interval" menu opens.
- 5 To enable the maintenance interval, set the parameter "Message" to "On" under the heading Cells and, under the parameter "Interval," enter the number of days after which you wish to receive a reminder to carry out sensor calibration.

When the set interval expires, an orange message appears on the electronics module reminding you to carry out sensor calibration. The message can be acknowledged via the message system.

To reset the maintenance interval, tap the "Execute" button under the heading "Cell." The date on which the next maintenance is due is recalculated and displayed under "next maintenance on."

7.2 Maintenance intervals

regularly

- Sample water monitoring (chapter 3.6.6)
- DEPOLOX® 5 C: Check electrolyte level

daily

- Check the flow cell, including all screw connections, for leakage

weekly

- DEPOLOX® 5 C: Check the electrode cleaning sand

every six months

- DEPOLOX® 5 C: Replace electrolyte level
- DEPOLOX® 5 C: Replace the electrode cleaning sand

annually

- DEPOLOX® 5 C: Check diaphragms

2 years

- DEPOLOX® 5 C: Replacing reference electrode

5 years

- Replace battery of the electronics module
- Replace battery of the Impedance converter

as required

- VariaSens C: Cleaning or replacing the fine filter
- DEPOLOX® 5 C: Check diaphragms (depending on sample water quality)
- DEPOLOX® 5 C: Replacing reference electrode
- Clean or replace optional strainer

in accordance with standard or local regulations

- Comparative measurement of chlorine, pH, ORP (Redox) and fluoride. Carry out calibration.

7.3 Maintenance parts set for flow cell

7.3.1 DEPOLOX® 5 C flow cell

non-pressurized version

Part No.	Designation
W3T170065	Maintenance parts kit, annually
W3T170071	Maintenance parts kit, 4 years
W3T158882	Spare parts set for flow control valve

pressurized version

Part No.	Designation
W3T158875	Maintenance parts kit, annually
W3T170072	Maintenance parts kit, 4 years
W3T158882	Spare parts set for flow control valve

7.3.2 VariaSens C flow cell

non-pressurized version

Part No.	Designation
W3T158876	Maintenance parts kit, annually
W3T158750	Maintenance parts kit, 4 years
W3T158882	Spare parts set for flow control valve

pressurized version

Part No.	Designation
W3T158877	Maintenance parts kit, annually
W3T158879	Maintenance parts kit, 4 years
W3T158882	Spare parts set for flow control valve

7.4 Checking for leaks

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

NOTICE

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

7.5 Servicing the DEPOLOX® 5 C flow cell

7.5.1 Checking and replacing the electrode cleaning sand

The electrode cleaning sand is necessary for cleaning the 3-electrode cell and must be replenished or replaced if necessary. The electrode cleaning sand must be checked and replaced regularly (chapter 5.10.3 and 7.5.4). Grinds itself down with time. Check the DEPOLOX® 5 C flow cell at weekly intervals to make sure that there is enough electrode cleaning sand in the cell body. The electrode cleaning sand must be swirled around in the bottom part of the cell body.

NOTICE

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 (chapter 6.6).

7.5.2 Checking electrolyte solution level

Check whether the electrolyte solution is filled approx. 3 cm above water level (narrowing of the KCL container) and replenish if necessary.

- 1 Remove the plug in the upper part of the electrolyte tank.
- 2 Inject the electrolyte. Use the syringe in the accessory kit.

7.5.3 Checking diaphragms

The two diaphragms (A) in the electrolyte tank form the connection between the reference electrolytes and the sample water. They cannot be cleaned. The diaphragms should be white in color. Any discoloration is an indication that they are clogging and should be replaced. If the sample water quality is poor (e.g. high iron content), the diaphragms become soiled. This influences the measuring accuracy. The two diaphragms in the electrode case must therefore be replaced regularly.

If sample water quality is very good, the diaphragms can remain installed for up to a year, after which they must be replaced (chapter 7.5.4).

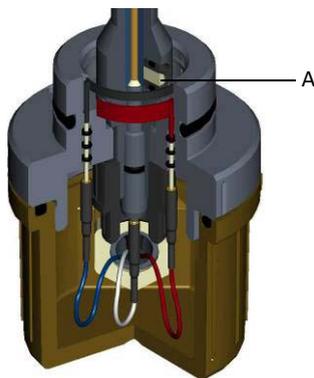


Fig. 1 Cross-section through electrolyte tank

A Diaphragms

7.5.4 Replacing or cleaning electrode cleaning sand, electrolyte solution, reference electrode and diaphragms

Replace or clean if necessary:

- electrode cleaning sand
- electrolyte solution
- reference electrode
- diaphragms
- fine filter
- flow switch
- check valve

NOTICE

Steps 1 to 14, 22, and 25 to 34 apply only to replacement and cleaning of the electrode cleaning sand.

- 1 Switch off the power supply.
- 2 Close the shut-off ball valve at the sample water inlet.
- 3 On the pressurized version, close the shut-off ball valve at the sample water outlet.
- 4 Open the drain screw on the sample taking unit and empty the cell body. To do so, hold a collection vessel under it and temporarily loosen a plug or sensor to allow air to flow in.
- 5 When the cell body is empty, close the drain screw once more.
- 6 Remove the housing cover.
- 7 Remove the sensors from the mounting hole in cell body cover and keep them in a safe place. See appropriate sensor operating instructions.
- 8 Separate the cable gland from electronics module. Hold the cable while doing this as it must not be allowed to twist.
- 9 Unscrew cap to the 3-electrode measuring cell counterclockwise up to the mark and take it off (chapter 5.13.1).
- 10 Remove the signal cables (red, blue, white).

Replacing electrolyte solution

- 11 Unscrew the upper knurled nut from the electrolyte tank.
- 12 Take off or unscrew the cell body cover.
- 13 Remove the electrolyte tank complete with electrode support from the cell body.

Rinsing out cleaning sand

- 14 Rinse the cleaning sand out of the electrode mount with distilled water.
- 15 Unscrew the knurled nut from the electrode mount and pull the electrolyte tank out of the electrode mount.
- 16 Pull the electrolyte tank upwards off the electrode support.
- 17 Pull the plug out of the electrolyte tank.

Emptying electrolyte

- 18 Turn the electrolyte container upside down and drain the KCl electrolytes by lightly shaking it.

Replacing reference electrode

- 19 Replace the reference electrode. To do this, screw the reference electrode out of the electrolyte tank. Lightly moisten the O-ring and screw a new reference electrode into the electrolyte tank.

Replacing diaphragms

- 20 Remove both diaphragms from the electrolyte tank using a suitable tool (e.g. tweezers).
- 21 Push new diaphragms into the electrolyte tank. Lightly moisten the O-ring before fitting.
- 22 Reinsert the electrolyte tank into the electrode support.

Filling electrolyte

- 23 Fill the tank with fresh electrolyte solution (approx. 3 cm above the water level or up to the narrow section of the KCl tank). Observe the use-by date of the electrolyte solution!
- 24 Insert the plug into the electrolyte tank.
- 25 Reinsert the electrode mount complete with electrolyte tank into the cell body. The cell body's locating pin must engage in the corresponding hole in the electrode mount.
- 26 Screw the upper knurled nut back onto the electrolyte tank.
- 27 Reconnect the signal cable, observing the correct colors (chapter 5.13.1).
- 28 Fit the cap.
- 29 Fill in electrode cleaning sand (chapter 5.10.3).
- 30 Insert or screw on the sensor and connect with electronics module.
- 31 Refit and engage the housing cover.
- 32 Open the shut-off ball valve at the sample water inlet.
- 33 On the pressurized version, open the shut-off ball valve on the sample water outlet.
- 34 The cell body refills with sample water.
- 35 Re-establish the power supply.

NOTICE

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

7.6 Cleaning or replacing the fine filter of Varia Sens C

The fine filter must be cleaned or replaced to protect the membrane sensor's delicate membrane against soiling or damage and to prevent clogging.

- 1 Switch off the power supply.
- 2 Drain the sample water inlet and outlet.
- 3 Remove the housing cover.
- 4 Release both knurled nuts (A).
- 5 Remove the complete filter unit.
- 6 Remove the fine filter (C). To do this, screw the M6 screw into the fine filter and pull the fine filter out of the filter unit.
- 7 Rinse the fine filter with water, replace if necessary.
- 8 Push the fine filter into the filter unit. Ensure that the O-ring (B) is fitted correctly.
- 9 Fit the complete filter unit. Ensure that it is in the correct position (top/bottom).
- 10 Tighten the knurled nuts (A).
- 11 Refit and engage the housing cover.
- 12 Reconnect the sample water inlet and outlet.
- 13 Re-establish the power supply.

NOTICE

After topping up or replacing cleaning sand, the electrode current may increase slightly for about three hours. Do not calibrate during this time. Recalibrate after each cell sand replacement. The calibration must be checked after one day.

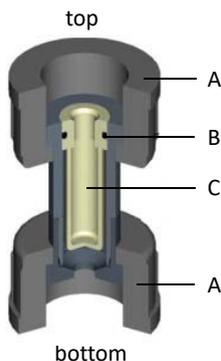


Fig. 2 Filter unit cross-section

- A Knurled nut
- B O-ring
- C Fine filter

7.7 Cleaning the flow rate monitor and non-return ball valve

- 1 Switch off the power supply.
- 2 Drain the sample water inlet and outlet.
- 3 Remove the housing cover of the flow cell.
- 4 Release both knurled nuts. Take out the filter unit toward the front.
- 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 Use a suitable blunt tool to push out the ball seat (C) and glass ball (D) against the direction of flow.
- 8 Clean the empty check valve housing, flow ball, ball seat and glass ball with clear water.

NOTICE

During reassembly make sure that the ball seat and ball are correctly positioned (Fig. 4).

- 9 To help push the assembled check valve housing back into the control valve, we recommend slightly lubricating the gaskets with the Unisilikon grease provided.
- 10 Check that the check valve housing is correctly positioned by the guide lugs on the housing.

- 11 Fit the filter unit again. To do this, tighten the knurled nuts.
- 12 Fit and engage the housing cover of the flow cell.
- 13 Open the ball valves on the sample water supply and drainage line again.
- 14 Switch on the power supply.

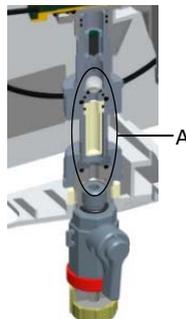


Fig. 3 Section, installation position check valve housing - DEPOLOX® 5 C flow cell

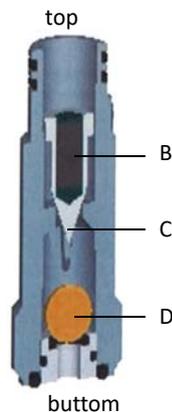


Fig. 4 Cross-section model, filter unit

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

7.8 Cleaning or replacing the optional strainer

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.

- 1 Close the ball valve on the sample water supply line in front of the strainer.
- 2 Unscrew the strainer and rinse it with water. Catch escaping water in a container.
- 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 Replacing the fuses on the CPU board

WARNING

Risk of injury or damage to the device!

Only authorized and qualified electricians are permitted to install the DEPOLOX® 400 M and open the housing.

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.

- 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.
- 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.
- 5 Switch on mains voltage.

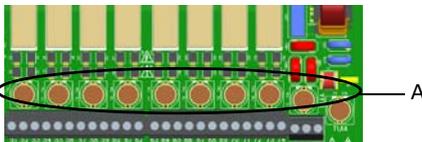


Fig. 5 Section, electronics module - fuses

A Fuses

7.10 Replacing the battery

WARNING

Risk of injury or damage to the device!

Only authorized and qualified electricians are permitted to install the DEPOLOX® 400 M and open the housing.

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.
- 3 Remove the battery from the holder.

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.
- 6 Switch on mains voltage.
- 7 Set date and time.

NOTICE

No further adjustments 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

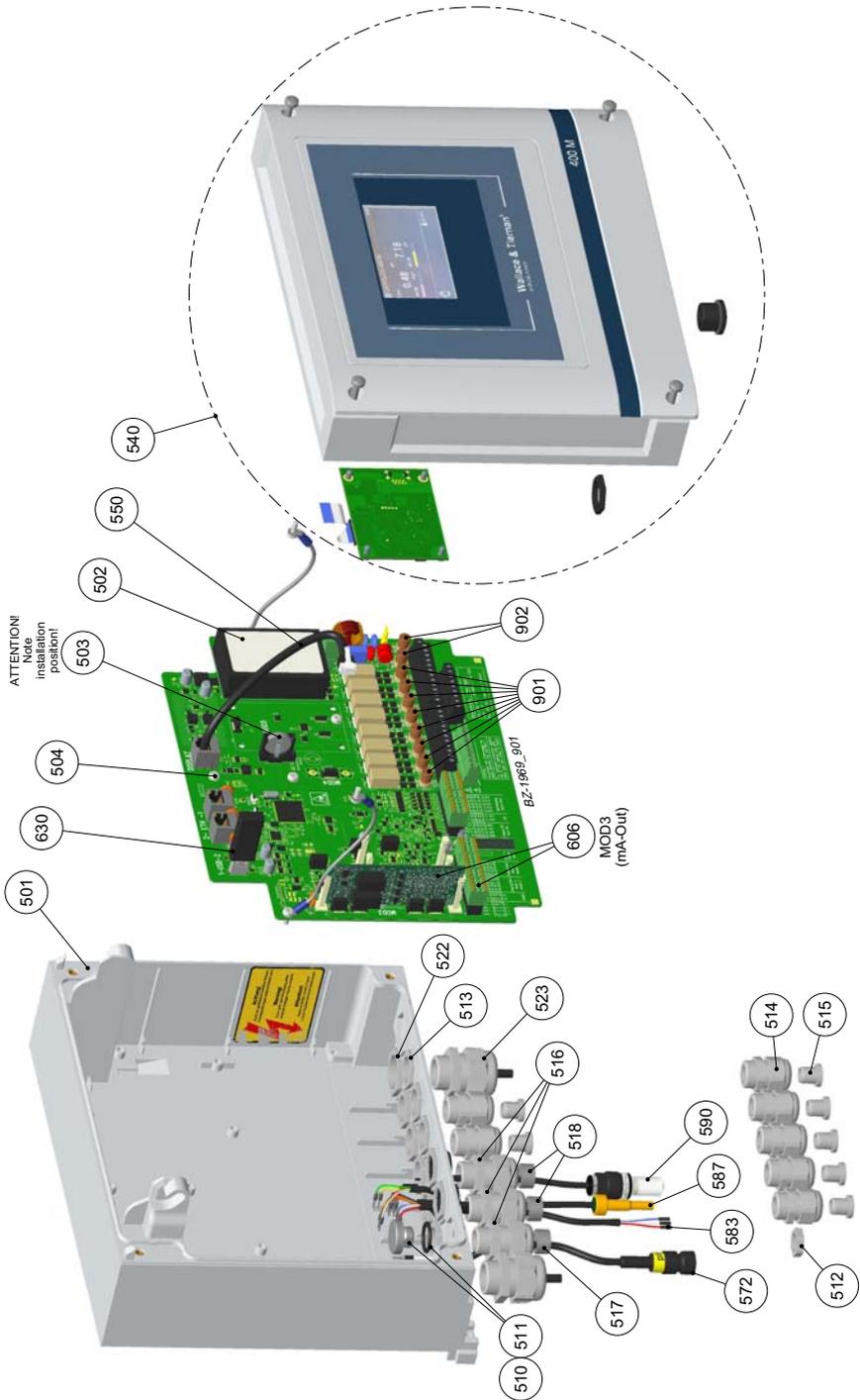
NOTICE

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

8.1 400 M electronics module

400 M electronics module (module name E02) - W3T441932

Item	Part.No.	Designation
	W3T391851	Electronics module for Cl ₂ /pH, spare part
501	W3T247667	Basic housing electronic module
502	W3T391862	CPU Board (motherboard spare part)
503	W3T172625	Lithium coin cell battery CR2032
504	W2T504397	Plastic self-tapping screw
510	W3T364164	Drain plug
511	W3T169088	O-ring
512	W3T165349	Counter nut
513	W3T160551	M20x1.5 hex nut
514	W2T504179	M20x1.5 cable gland
515	W2T504212	M20 blind plug
516	W2T833447	Cable gland M20 for sensor cable
517	W3T375710	Multi-cable sealing insert
518	W3T375709	Multi-cable sealing insert
522	W3T160552	M25x1.5 hex nut
523	W2T542498	KM25x1.5 cable gland for assembly of cables with pre-assembled connectors
540	W3T441933	Control panel with cover and display
550	W2T821593	RJ45 connection cable CPU Board/HMI
572	W3T173161	Snesor cable for pH- and fluorid sensor
583	W3T441081	Sensor cable for chlorine sensor DEPOLOX® 5 C
587	W3T364409	Multi-sensor
590	W3T391866	LED glow stick
606	W3T391865	4-way mA output module
630	W2T866279	USB memory stick
901	W2T839300	Fuse TR5 3,15A T
902	W2T839299	Fuse TR5 1,6A T
	W2T505559	RS485 data cable (1 m)



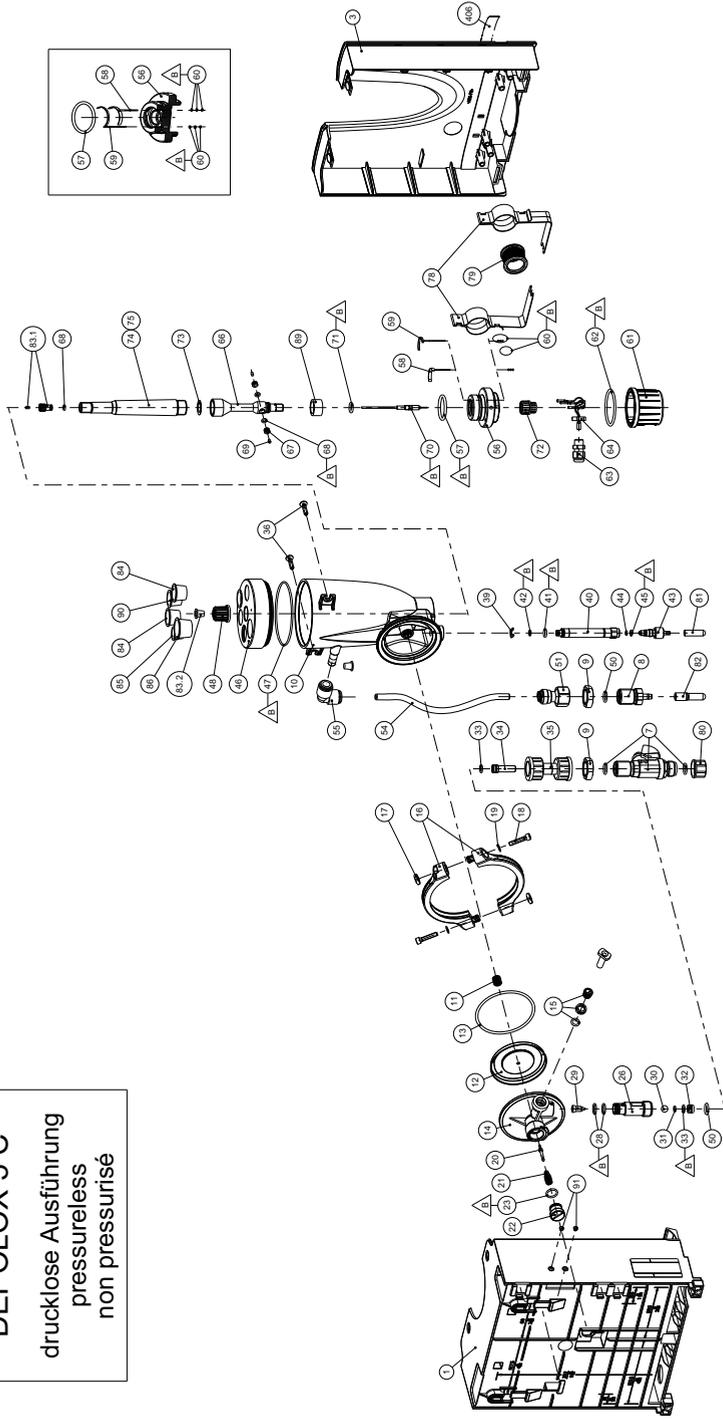
8.2 DEPOLOX® 5 C flow cell

DEPOLOX® 5 C Flow cell module (module name D02) non-pressurized version - W3T389205

Item	Part No.	Designation
1	W3T247776	Basic housing
3	W3T247777	Housing cover
7	W3T166170	Shut-off valve
8	W3T158593	Discharge nozzle
9	W2T507615	Flat nut
10	W3T158561	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
26	W3T160648	Check valve housing
28	W3T161396	O-ring
29	W3T169827	Float with magnet
30	W3T172946	Ball
31	W3T172949	O-ring
32	W3T159707	Ball seat
33	W3T172975	O-ring
35	W3T158602	Filter housing
36	W2T505463	Pan head screw
39	W3T172041	Securing ring
40	W3T158576	Outlet drain pipe
41	W3T172997	O-ring
42	W3T164597	O-ring
43	W3T158575	Drain screw
44	W3T166160	EPDM flat gasket
45	W3T172556	O-ring
46	W3T320060	Cell body cover
47	W3T160657	O-ring

Item	Part No.	Designation
48	W3T165266	Knurled nut
50	W3T172861	O-ring
51	W2T863568	Adapter
54	W3T435413	Hose
55	W2T505093	Angle-reducing connector
56	W3T166209	Electrode mount
57	W3T168875	O-ring
58	W3T163795	Working electrode
59	W3T167461	Counter electrode
60	W3T168904	O-ring
61	W3T158562	Sealing cap
62	W3T168868	O-ring
63	W2T504177	Cable gland
64	W3T160549	Hexagon nut
66	W3T159653	Electrode housing
67	W3T167242	Diaphragm holder
68	W3T168947	O-ring
69	W2T504994	Round rod
70	W3T169295	Reference electrode
71	W3T161424	O-ring
72	W3T165267	Knurled nut
73	W3T161464	Flat gasket
74	W3T168807	Potassium chloride gel
75	W3T172885	Electrolysis tank
78	W3T166169	Retaining clip, coated
79	W3T172045	Electrode mount
80	W3T161561	Screw cap
81	W3T168162	Protective cap
82	W3T164588	Protective cap
83	W3T161537	Protection plug
84	W3T169029	Protection plug
85	W3T169044	Protection plug
86	W3T164574	Protection plug
89	W3T161452	Felt ring, transport protection
90	W3T161453	Protection plug

DEPOLOX 5 C
drucklose Ausführung
pressureless
non pressurisé



O-Ring leicht gefettet mit Spezialfett UNISILIKON L250L (W2T504248 / W2T504249)
Grease the o-rings slightly with special grease UNISILIKON L250L (W2T504248 / W2T504249)
Graisser les joint toriques légèrement avec UNISILIKON L250L (W2T504248 / W2T504249)



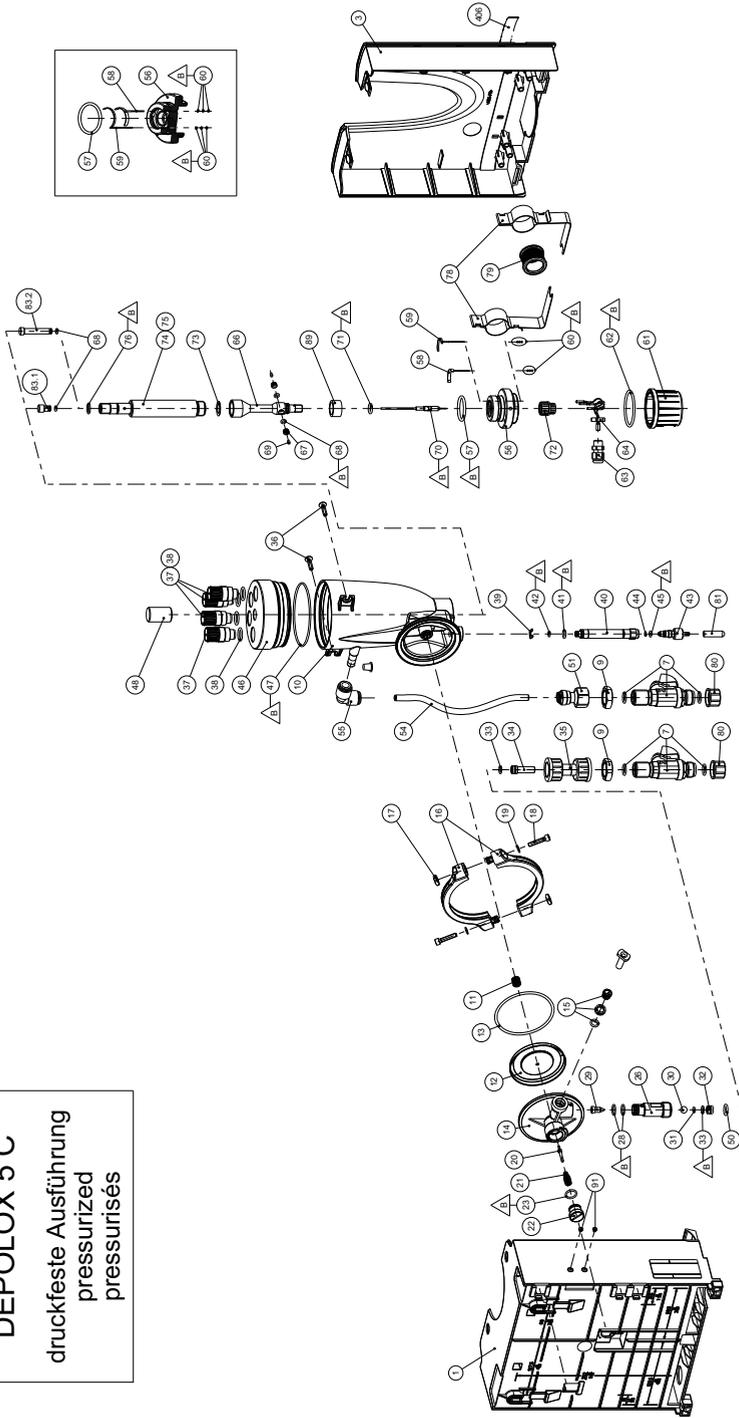
8.3 DEPOLOX® 5 C flow cell

DEPOLOX® 5 C flow cell (module name D02) pressurized version - W3T389210

Item	Part No.	Designation
1	W3T247776	Basic housing
3	W3T247777	Housing cover
7	W3T166170	Shut-off valve
9	W2T507615	Flat nut
10	W3T158560	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
26	W3T160648	Check valve housing
28	W3T161396	O-ring
29	W3T169827	Float with magnet
30	W3T172946	Ball
31	W3T172949	O-ring
32	W3T159707	Ball seat
33	W3T172975	O-ring
35	W3T158602	Filter housing
36	W2T505463	Plastic tapping screw
37	W3T161450	Plug
38	W3T168859	O-ring
39	W3T172041	Securing ring
40	W3T158576	Outlet drain pipe
41	W3T172997	O-ring
42	W3T164597	O-ring
43	W3T158575	Drain screw
44	W3T166160	EPDM flat gasket

Item	Part No.	Designation
45	W3T172556	O-ring
46	W3T320102	Cell body cover
47	W3T160657	O-ring
48	W3T171088	Knurled nut
50	W3T172861	O-ring
51	W2T863568	Adapter
54	W3T438413	Hose
55	W2T505093	Angle-reducing connector
56	W3T166209	Electrode mount
57	W3T168875	O-ring
58	W3T163795	Working electrode
59	W3T167461	Counter electrode
60	W3T168904	O-ring
61	W3T158562	Sealing cap
62	W3T168868	O-ring
63	W2T504177	Cable gland
64	W3T160549	Hexagon nut
66	W3T159653	Electrode housing
67	W3T167242	Diaphragm holder
68	W3T168947	O-ring
69	W2T504994	Round rod
70	W3T169295	Reference electrode
71	W3T161424	O-ring
72	W3T165267	Knurled nut
73	W3T161464	Flat gasket
74	W3T168807	Potassium chloride gel
75	W3T171171	Electrolysis tank
76	W3T161396	O-ring
78	W3T166169	Retaining clip, coated
79	W3T172045	Electrode mount
80	W3T161561	Screw cap
81	W3T168162	Protective cap
83	W3T159757	Plug
89	W3T161452	Felt ring, transport plug

DEPOLOX 5 C
druckfeste Ausführung
pressurized
pressurisés



O-Ring geliefert mit Spezialfett UNISILIKON L250L (W2T1504248 / W2T1504249)
Grease the o-rings slightly with special grease UNISILIKON L250L (W2T1504248 / W2T1504249)
Graisser les joint toriques légèrement avec UNISILIKON L250L (W2T1504248 / W2T1504249)

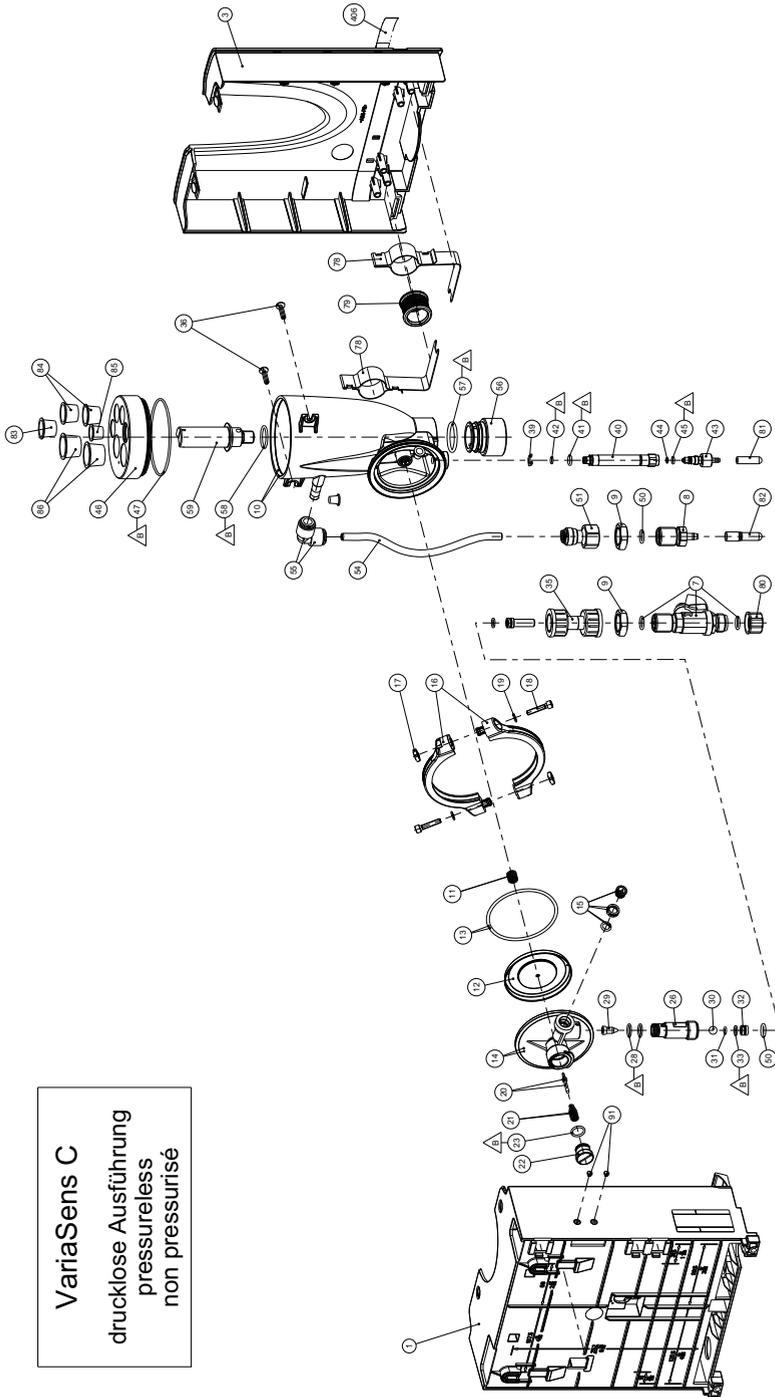


8.4 VariaSens C flow cell

VariaSens C flow cell (module name D02) non-pressurized version - W3T440600

Item	Part No.	Designation
1	W3T247776	Basic housing
3	W3T247777	Housing cover
7	W3T166170	Shut-off valve
8	W3T158593	Discharge nozzle
9	W2T507615	Flat nut
10	W3T158561	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
26	W3T160648	Check valve housing
28	W3T161396	O-ring
29	W3T169827	Float with magnet
30	W3T172946	Ball
31	W3T172949	O-ring
32	W3T159707	Ball seat
33	W3T172975	O-ring
35	W3T158602	Filter housing
36	W2T505463	Pan head screw
39	W3T172041	Securing ring

Item	Part No.	Designation
40	W3T158576	Outlet drain pipe
41	W3T172997	O-ring
42	W3T164597	O-ring
43	W3T158575	Drain screw
44	W3T166160	EPDM flat gasket
45	W3T172556	O-ring
46	W3T320103	Cell body cover
47	W3T160657	O-ring
50	W3T172861	O-ring
51	W2T863568	Adapter
54	W3T438413	Hose
55	W2T505093	Angle-reducing connector
56	W3T158740	Sealing plug
57	W3T168875	O-ring
58	W3T167941	O-ring
59	W3T158739	Flow body
78	W3T166169	Retaining clip, coated
79	W3T172045	Electrode mount
80	W3T161561	Screw cap
81	W3T168162	Protective cap
82	W3T164588	Protective cap
83	W3T161453	Protection plug
84	W3T169029	Protection plug
85	W3T169044	Protection plug
86	W3T164574	Protection plug



VariaSens C
drucklose Ausführung
pressureless
non pressurisé

O-Ring leicht gefettet mit Spezialfett UNISILIKON L250L (W2T504248 / W2T504249)
Grease the o-rings slightly with special grease UNISILIKON L250L (W2T504248 / W2T504249)
Graisser les joint toriques légèrement avec UNISILIKON L250L (W2T504248 / W2T504249)

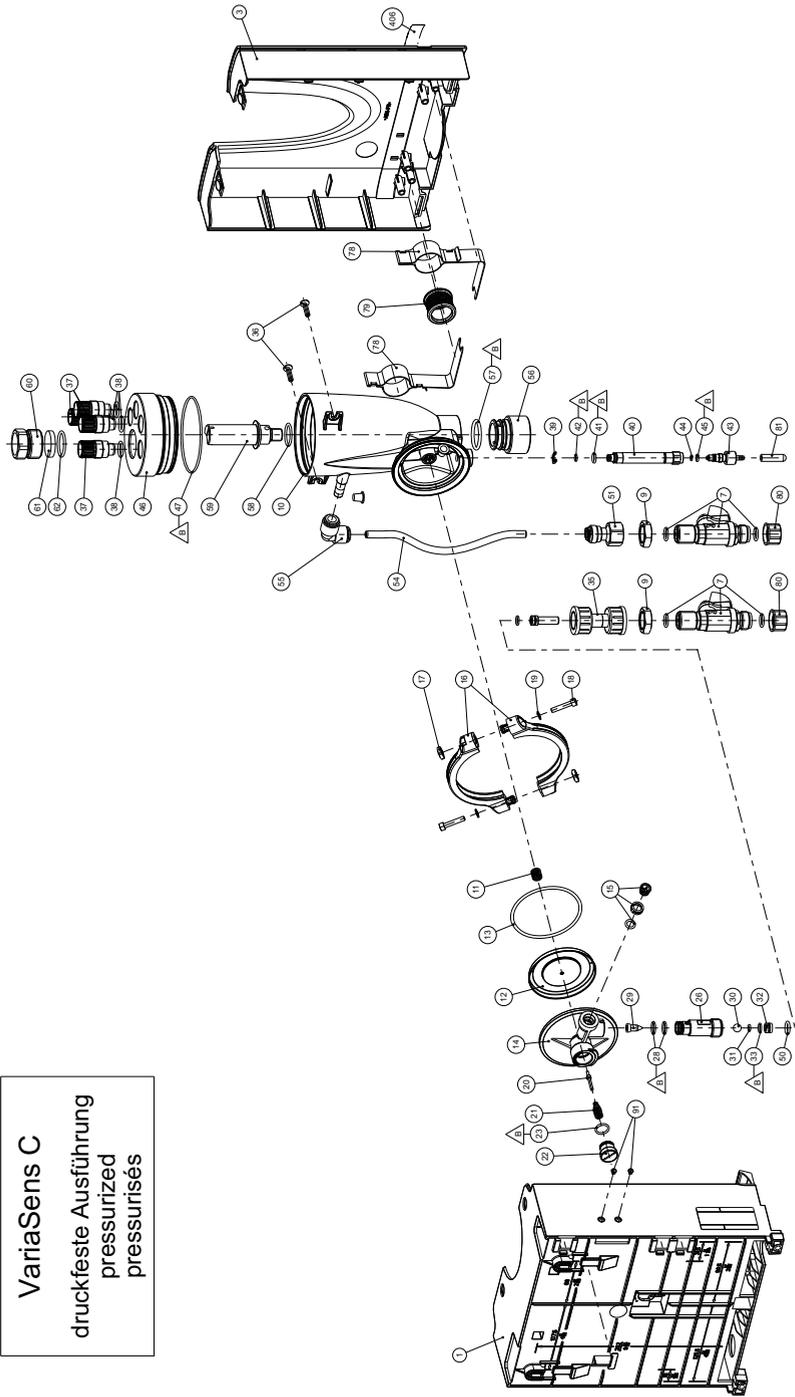


8.5 VariaSens C flow cell

VariaSens C flow cell (module name D02) pressurized version - W3T440611

Item	Part No.	Designation
1	W3T247776	Basic housing
3	W3T247777	Housing cover
7	W3T166170	Shut-off valve
9	W2T507615	Discharge nozzle
10	W3T158560	Flat nut
11	W3T164226	Cell body
12	W3T158569	Compression spring
13	W3T160654	Membrane unit
14	W3T158595	O-ring
15	W2T504209	Control valve body
16	W3T160649	Plastic cartridge
17	W3T158567	V profile clamp
18	W2T504659	Square nut
19	W2T506019	Cheese-head screw
20	W3T158572	Washer
21	W3T172795	Valve pin
22	W3T158573	Compression spring
23	W3T160357	Adjusting screw
26	W3T160648	O-ring
28	W3T161396	Check valve housing
29	W3T169827	O-ring
30	W3T172946	Float with magnet
31	W3T172949	Ball
32	W3T159707	O-ring
33	W3T172975	Ball seat
35	W3T158602	O-ring
36	W2T505463	Filter housing
39	W3T172041	Pan head screw
40	W3T158576	Securing ring

Item	Part No.	Designation
41	W3T172997	O-ring
42	W3T164597	O-ring
43	W3T158575	Drain screw
44	W3T166160	EPDM flat gasket
45	W3T172556	O-ring
46	W3T320104	Cell body cover
47	W3T160657	O-ring
48	W3T161450	Plug
49	W3T168859	O-ring
50	W3T172861	O-ring
51	W2T863568	Adapter
54	W3T438413	Hose
55	W2T505093	Angle-reducing connector
56	W3T158740	Sealing plug
57	W3T168875	O-ring
58	W3T167941	O-ring
59	W3T158739	Flow body
60	W3T171788	Union bush
61	W3T163376	Dummy disk
62	W3T168861	O-ring
78	W3T166169	Retaining clip, coated
79	W3T172045	Electrode mount
80	W3T161561	Screw cap
81	W3T168162	Protective cap
82	W3T164588	Protective cap
83	W3T161453	Protection plug

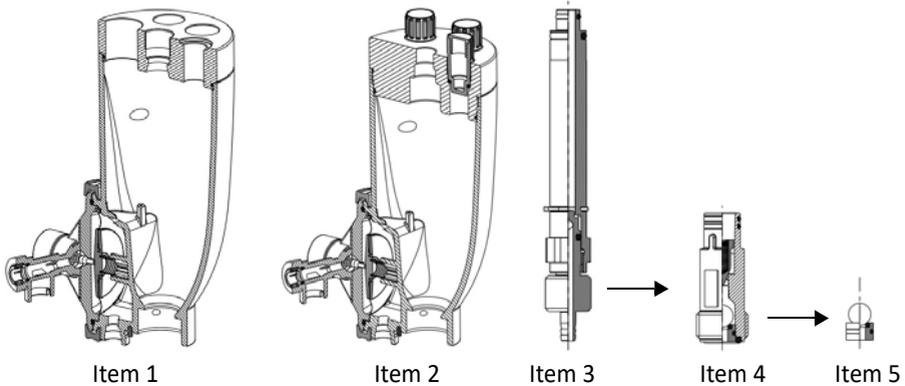


VariaSens C
druckfeste Ausführung
pressurized
pressurisés

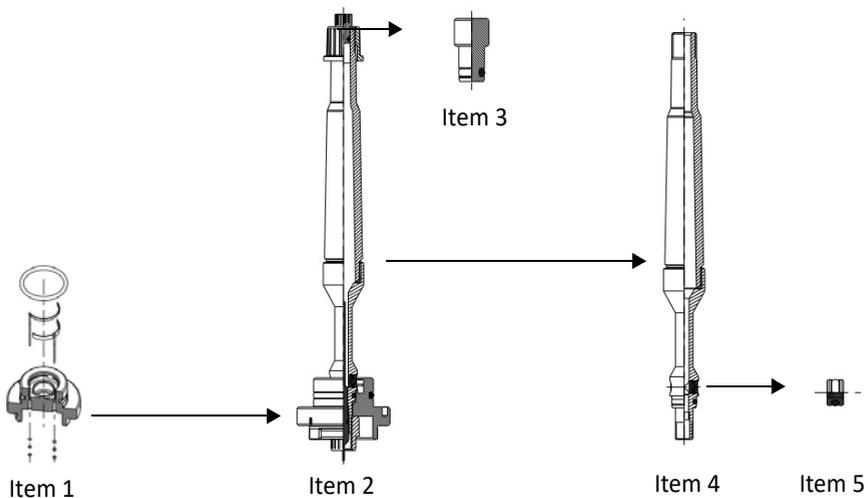
O-Ring leicht geölt mit Spezialfett UNSILKON L250L (WZT504248 / WZT504249)
Grease the O-rings slightly with special grease UNSILKON L250L (WZT504248 / WZT504249)
Graisser les joints toriques légèrement avec UNSILKON L250L (WZT504248 / WZT504249)



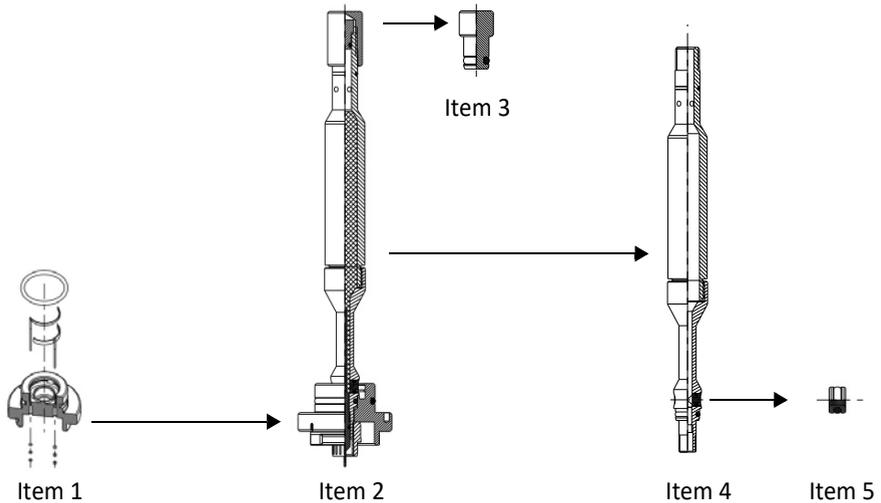
8.6 Cell body cover, DEPOLOX® 5 C flow cell



Item	Part No.	Designation
1	W3T322432	Cell body, complete, non-pressurized version
2	W3T322435	Cell body, complete, pressurized version
3	W3T166171	Drain valve unit
4	W3T158603	Non-return unit with float
5	W3T163739	Spherical seat, complete, PVC/EPDM



Item	Part No.	Designation
1	W3T166210	Electrode mount, complete, with electrodes
2	W3T162579	Electrode unit, complete, non-pressurized version
3	W3T159961	Plug, complete, non-pressurized version
4	W3T159824	Electrode housing, non-pressurized version
5	W3T159870	Diaphragm, complete (2 pieces required)



Item	Part No.	Designation
1	W3T166210	Electrode mount, complete, with electrodes
2	W3T162580	Electrode unit, complete, pressurized version
3	W3T163746	Plug, complete, pressurized version
4	W3T159825	Electrode housing, pressurized version
5	W3T159870	Diaphragm, complete (2 pieces required)

Pre-installed assembly groups

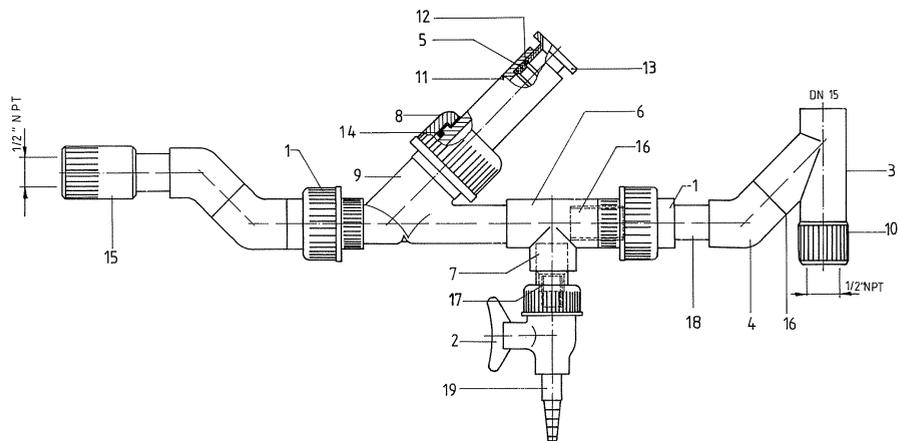
Part No.	Designation
W3T322432	Cell body, fully, non-pressurized version
W3T322435	Cell body, fully, pressurized version
W3T166171	Flow cell drain valve
W3T158603	Back pressure unit with float
W3T163739	Spherical seat, complete

8.7 Cell body, VariaSens C flow cell

Pre-installed assembly groups

Part No.	Designation
W3T322438	Cell body, fully, non-pressurized version
W3T322439	Cell body, fully, pressurized version
W3T166171	Flow cell drain valve
W3T158603	Back pressure unit with float
W3T163739	Spherical seat, complete
W3T166194	Fine filter with O-Ring

8.8 Y-style flow-through assembly non-pressurized version - W3T167442



Item	Part No.	Designation
1	W2T505181	Union
2	W2T507048	Laboratory ball cock
3	W2T507158	Tee
4	W2T507134	Elbow
5	W3T168889	Gasket rubber
6	W2T507524	Tee
7	W2T505438	Bush red
8	W3T170971	Union nut
9	W3T172856	Transparent housing
10	W3T167194	Adapter nipple

Item	Part No.	Designation
11	W3T170970	Electrode support
12	W3T167237	Washer
13	W3T163413	Clamping nut
14	W3T168861	O-ring
15	W3T163387	Adapter socket
16	W2T506051	Pipe
17	W2T506626	Pipe
18	W2T506051	Pipe
19	W2T506240	Hose connector, tape-red

8.9 Sensors, connector-cable combination and extension cable

Designation	3-electrode cell (DEPOLOX® 5 C)	pH sensor	ORP (Redox) sensor	Fluoride sensor
Sensor	-	W3T169297	W3T169298	W2T840142 (Hersteller VanLondon)
KCl electrolyte set, comprising: KCl gel electrolyte 3 mol/l KCl (bottle 100 ml), syringe and PVC hose	W3T165565	-	-	-
KCl tank with stand and 5 ml KCl solution	-	W3T164482		-
*Electrolyte solution 3 mol/l KCl, bottle 250 ml	-	*W3T160410		-
Electrode cleaning sand QK	W3T158743	-	-	-
Buffer solution pH 7.00				
Bottle 250 ml	-	W3T165076	-	-
Bag 12 ml	-	W3T161181	-	-
Buffer solution pH 4.65				
Bottle 250 ml	-	W3T165084	-	-
Bag 12 ml	-	W3T161189	-	-
Buffer solution 478 mV				
Bottle 250 ml	-	-	W3T165048	-
Bag 12 m	-	-	W3T161182	-
Calibration solution, Fluoride				
0,2 mg/l Bottle 500 ml	-	-	-	W3T161789
2 mg/l Bottle 500 ml	-	-	-	W3T161845
100 mg/l Bottle 500 ml	-	-	-	W3T161884
Measuring beaker (5 pieces)	-	W3T158600		-

ATTENTION

Damage to the device!

*The electrolyte solution (W3T160410) can be used only for the KCl tank with stand. Do not pour into the 3-electrode cell (DEPOLOX® 5 C)!

Connector-cable combination/extension cable	3-electrode cell (DEPOLOX® 5 C)	pH sensor	ORP (Redox) sensor	Fluoride sensor
0,9 m	W3T441081	-	-	-
1,5 m	-	W3T173161		
5 m	W3T160703	W3T164517 (with 2 connectors)		
10 m	W3T160704	W3T164518 (with 2 connectors)		
15 m	W3T160705	W3T164544 (with 2 connectors)		
25 m	W3T160706	W3T164545 (with 2 connectors)		
50 m	W3T160707	W3T164546 (with 2 connectors)		

8.10 Membrane sensors and extension cable

Designation	TC3 (total chlorine)	FC2 (free chlorine)	CD7 (chlordioxide)	OZ7 (ozone)
Membrane sensor TC3	W3T391561	W3T365498	W3T164493	W3T164494
Sensor cable	W3T172017			
Membrane cap, incl. lapping paper	W3T365500		W3T168103	W3T168106
Plastic membrane cap, incl. lapping paper NOTICE: For optional use with increased salt concentration!	W3T391564	-	-	-
Elektrolyte E-TC, 100 ml bottle	W3T171793	-	-	-
Elektrolyte ECS2/Gel, 100 ml bottle	-	W3T168101	-	-
Elektrolyte CD7, 100 ml bottle	-	-	W3T168102	-
Elektrolyte OZ7, 100 ml bottle	-	-	-	W3T168105
Maintenance parts kit, comprising: membrane cap, lapping paper, electrolyte, O-ring and elastomer seal	W3T391565	W3T365601	W3T168242	W3T168243
Spare parts kit, comprising: lapping paper, O-ring and elastomer seal	W3T164339		-	-

Extension cable	TC3 (total chlorine)	FC2 (free chlorine)	CD7 (chlordioxide)	OZ7 (ozone)
5 m	W3T164519 (with 1 connector)			
10 m	W3T164520 (with 1 connector)			
15 m	W3T164538 (with 1 connector)			
25 m	W3T164539 (with 1 connector)			
50 m	W3T164540 (with 1 connector)			

8.11 Accessories

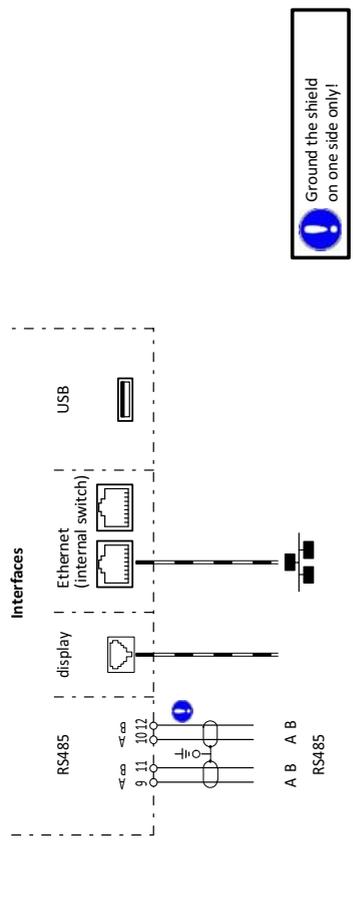
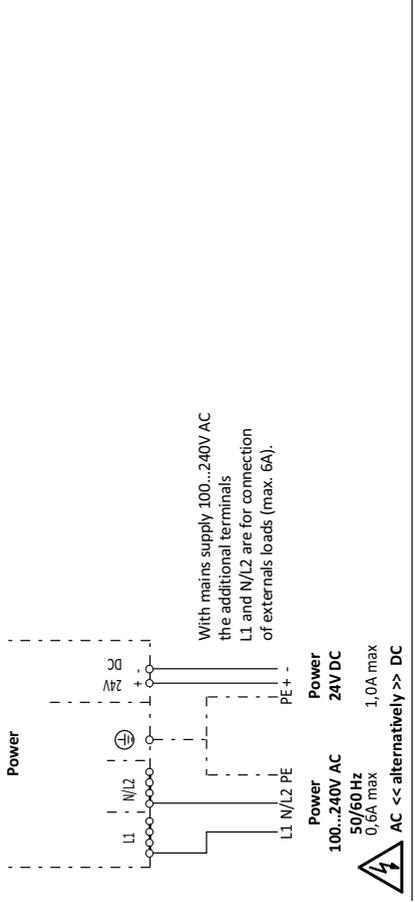
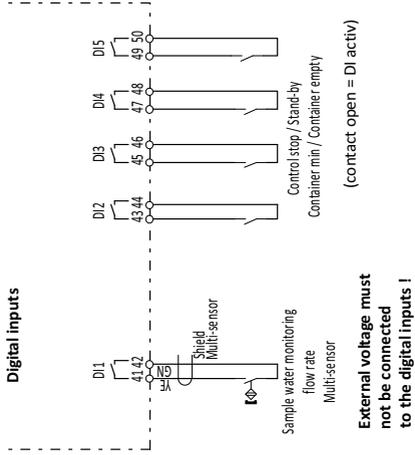
Part No.	Designation
W3T395161	Mounting plate with accessories for simple mounting of the DEPOLOX® 400 M, strainer and up to four peristaltic dosing pumps
W3T165563	Impedance converter for pH sensor, ORP (Redox) sensor and Fluoride sensor
W3T158721	Strainer with ball valve, straight
W3T389201	Attachment set for strainer
W2T866279	USB memory stick for data storage with MLC technology

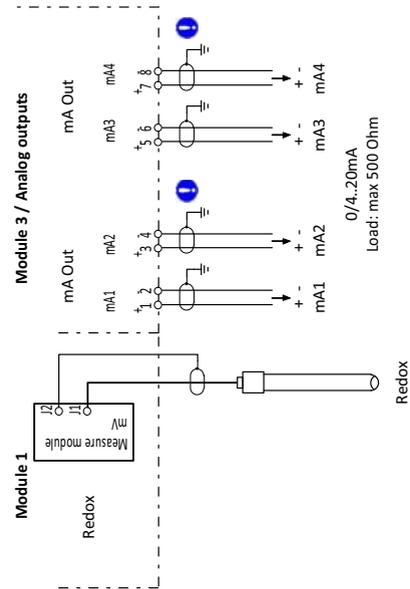
Metric PVC tubing, fabric-reinforced (internal diameter x wall thickness)	ø 4 x 3	ø 6 x 3	ø 10 x 3
Tubing	W2T505524	W2T505525	W2T505334
PVC hose connecting parts comprising:	W3T167626	W3T167518	W3T167590
O-ring	W3T172861	W3T172861	W3T169068
Locking ring	W3T163417	W3T161436	W3T159622
Union nut	W3T161502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

Metric PE tubing (internal diameter x wall thickness)	ø 4 x 1	ø 6 x 1	ø 6 x 2	ø 10 x 2
Tubing	W2T507155	W2T505784	W2T505676	W2T505734
PVC hose connecting parts 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

9. Wiring diagram

WBE1288 - Issue 02-1119

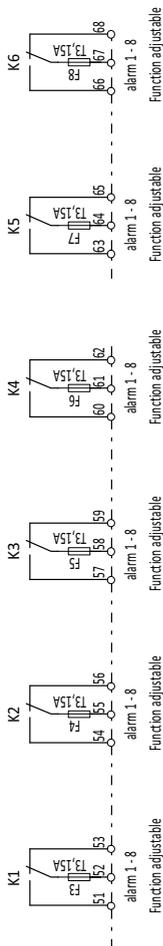




0/4...20mA
Load: max. 500 Ohm

Redox

Relay-Outputs: alarm contacts



Note

Observe permissible contact load!
See chapter Relay outputs and technical data.

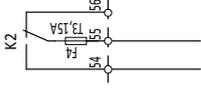
Relay K2 is only available as alarm contacts if it is not used as control or dosing output!

External voltage may still be connected even when the main switch is set to OFF!



Observe Note !

Relay-Outputs: Dosing Chlorine



Dosing contact
e.g. for chlorine electrolyser

Note

Observe permissible contact load!
See chapter Relay outputs and technical data.

External voltage may still be connected even when the main switch is set to OFF!

Observe Note!

10. EC Declaration of Conformity and Certificate



EG-Konformitätserklärung EC Declaration of Conformity Déclaration CE de conformité

No. MAE1906

Ausgabe/issue/édition 01

Hersteller/Manufacturer/Constructeur: Evoqua Water Technologies GmbH

Anschrift/Address/Adresse: Auf der Weide 10, D-89312 Günzburg

Produktbezeichnung: Messsystem DEPOLOX® 400 M bestehend aus:
Elektronik-Modul 400 M (E02)
Durchfluss-Modul DEPOLOX® 5 C (D02)
Durchfluss-Modul VariaSens C (D02)
Schrägsitz-Durchflussarmatur

Product description: *Measuring system DEPOLOX® 400 M comprising:
Electronics module 400 M (E02)
Flow cell DEPOLOX® 5 C (D02)
Flow cell VariaSens C (D02)
Y flow-through assembly*

Description du produit: **Dispositifs de mesure DEPOLOX® 400 M comprenant :**
Module électronique 400 M (E02)
Module de la cellule de mesure DEPOLOX® 5 C (D02)
Module de la cellule de mesure VariaSens C (D02)
Conduite de circulation à tête inclinée

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: 2019

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 technique 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 2019-02-14

Evoqua Water Technologies GmbH

Klaus Andre
Technischer Leiter / Director Engineering

Unterschrift
signature / signature

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.

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