

Oxiperm[®] Pro

OCD-162

ⒼⒺ Installation and operating instructions



Declaration of Conformity

We **Grundfos Alldos** declare under our sole responsibility that the products **Oxiperm[®] Pro**, to which this declaration relates, are in conformity with the Council Directives on the approximation of the laws of the EC Member States relating to

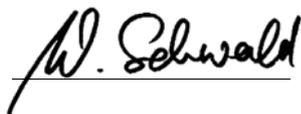
- Machinery (98/37/EC).
- Electrical equipment designed for use within certain voltage limits (73/23/EC).
- Electromagnetic compatibility (89/336/EC).

The following harmonised standards have been applied:

EN 292-1: 1991 EN 292-2: 1991 + A1: 1995	Safety of machines, parts 1 and 2
EN 61010-1: 2002	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
EN 954-1: 1996	Safety-related parts of machinery control systems
EN 1050: 1996	Principles for risk assessment
EN 61326-1: 2006 class B EN 61000-3-2: 2006 EN 61000-3-3: 2006	Interference emission
EN 61326-1: 2006 industrial locations	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
EN 809: 1998	Pumps and pump units for fluids/liquids – Safety specifications.

The complete technical documentation, including operating instructions, is available.

Pfinzthal, 9th October 2007



W. Schwald
Managing Director



Ulrich Stemick
Technical Director

Any modification made to the Oxiperm Pro disinfection system without our approval will invalidate this declaration.

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Warning

These operating instructions are also available on www.Grundfosalldos.com.

Before operating the Oxiperm Pro system, read these operating instructions.

1. General safety instructions

1.1 Purpose of these operating instructions

The Grundfos Alldos **Oxiperm Pro** disinfection system is a state-of-the-art solution, which complies with recognised safety regulations.

Conformity with applicable standards, directives and laws has been verified.

For a list of applicable standards and directives, see section [7. Applicable standards and directives](#).

Nevertheless, certain risks which cannot be prevented by the manufacturer are associated with the use of the system.

Purpose of this manual:

- Inform users of optimum use of the system.
- Warn users of possible residual risks when using the system correctly, and identify measures that should be taken to avoid damage.
- Caution users against obvious misuse or inappropriate use of the system and inform them of the necessary care that must be taken when operating the system.

For installation, maintenance, servicing and dismantling information, please see the separate service instructions.

1.2 Symbols used in this document



Warning

If these safety instructions are not observed, it may result in personal injury!

Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment!

Note

Notes or instructions that make the job easier and ensure safe operation.

Information about possible residual risks can be found:

- on warning signs located at the installation site
- at the beginning of each section in this manual
- immediately before steps associated with a residual risk.

1.3 Users/target groups

Users are persons who are responsible for operating and monitoring the **Oxiperm Pro** disinfection system at the installation location. The system may only be operated by trained and qualified personnel. Personnel must have appropriate technical knowledge and be familiar with the basic principles of measuring and control technology.

1.3.1 Obligations of the users

The users' obligations:

- Read this manual before operating the **Oxiperm Pro** disinfection system.
- Be trained by qualified personnel from Grundfos Alldos in the operation of the system.
- Observe the recognised regulations governing safety in the workplace and accident prevention.
- Wear appropriate protective clothing in accordance with national regulations for the prevention of accidents when operating the system and handling chemicals (German GUV-V D05).
- Keep secret the user code for the operating software.

1.3.2 User workstation

The **Oxiperm Pro** disinfection system is electronically controlled. Users and service personnel operate the system via a display with control and display elements. See section [2.8 Control and display elements](#).

1.4 Obligations of the operator

The owner of the building or the operator of the **Oxiperm Pro** disinfection system is responsible for the following:

- Consider this manual to be part of the product and ensure that it is kept clearly accessible in the immediate vicinity of the system for the entire service life of the system.
- Meet the installation requirements specified by the manufacturer (required water connections and fittings, environmental conditions, electrical connection, protective tube for dosing line (if necessary), audible or optical warning device for alarm messages (if necessary)). See section [4.1 Planning installation](#).
- Ensure that water lines and fixings are regularly checked, serviced and maintained.
- Obtain official approval for storing chemicals, if necessary.
- Instruct users in the operation of the system.
- Ensure that the labels supplied by the manufacturer with the system are clearly displayed in the installation location. For illustration, see section [10. Photos](#).
- Provide the user code for the operating software only to users who have received appropriate technical training.
- Ensure that the regulations for the prevention of accidents are observed in the installation location (German GUV-V D05 regulation for the prevention of accidents, "Chlorination of Water" dated January 1997).
- Provide all users and service personnel with protective clothing in accordance with GUV-V D05 (face mask, gloves, protective apron).
- If the system has been ordered without a dosing pump, the operator must provide an external dosing pump prior to installation. This may only be connected to the **Oxiperm Pro** disinfection system by authorised and qualified personnel from Grundfos Alldos.

1.5 Maintenance and service personnel

The system may only be maintained and serviced by authorised service personnel from Grundfos Alldos.

1.6 Correct usage

The **Oxiperm Pro** disinfection system is used to mix a diluted chlorine dioxide solution from 7.5 % sodium chlorite and 9 % hydrochloric acid. In accordance with the conditions described in this manual, it is used to dose the chlorine dioxide solution produced continuously or non-continuously into the (drinking) water line of a building or to introduce it into a swimming pool, process water, wastewater or other industrial system for water disinfection.

1.7 Inappropriate usage

Applications other than those listed in section [1.6 Correct usage](#) are not in accordance with the intended use and are not permitted. The manufacturer, Grundfos Alldos, accepts no liability for any damage resulting from incorrect use.

The system comprises state-of-the-art components and has undergone safety-related testing.



Warning

Unauthorised structural modifications to the system may result in serious damage to equipment and personal injury.

It is forbidden to dismantle, modify, change the structure of, bridge, remove, bypass or disable components, including safety equipment.

1.8 Safety and monitoring equipment

The **Oxiperm Pro** disinfection system is fitted with the following safety and monitoring equipment:

- cover on the system frame
- two collecting trays for the two chemical containers (accessories)
- safety/multi-function valve at the dosing pump
- solenoid valve at the dilution water inlet
- volumetric accumulator and activated carbon filter for ClO₂ gas that escapes from the reaction tank
- alarm functions in the control system.

1.9 Chemicals

1.9.1 Chlorine dioxide concentration

In the reaction tank of the **Oxiperm Pro** disinfection system, diluted sodium chlorite and diluted hydrochloric acid are mixed to create a chlorine dioxide concentration of approximately 2 g per litre of water. The system doses the diluted chlorine dioxide solution according to the disinfection requirement into the main line to be disinfected. According to the German drinking water ordinance (TrinkwV 2001), the chlorine dioxide concentration in drinking water must not exceed a maximum of 0.4 mg per litre of water.

The following safety instructions must be observed:

Warning

Risk of explosion when using chemicals in too high a concentration.

Only use sodium chlorite in a diluted concentration of 7.5 % by weight in accordance with DIN EN 938.

Only use hydrochloric acid in a diluted concentration of 9.0 % by weight in accordance with DIN EN 939.

The safety data sheets from the supplier must be observed.



Warning

Risk of explosion and serious damage to equipment and personal injury as a result of operating faults due to confusing the chemical containers or suction lances.

Do not confuse the containers.

Observe the red and blue markings on chemical pumps, suction lances and chemical containers: Red = HCl, blue = NaClO₂.



Warning

Risk of burns when skin and clothing come into contact with sodium chlorite and hydrochloric acid.

Affected skin and clothing must be washed immediately in water.



Warning

Risk of irritation to eyes, respiratory system and skin if chlorine dioxide is inhaled.

When changing the chemical containers, wear protective clothing in accordance with regulations for the prevention of accidents (German GUV-V D05, "Chlorination of Water" dated January 1997).



1.9.2 Storing chemicals

- Chemicals must be stored in the appropriately marked original plastic containers (20 to 33 litres).
- Do not store chemicals near grease, flammable substances, oils, oxidising substances, acids or salts.
- Empty and full containers must be kept closed, especially in areas where national regulations for the prevention of accidents apply to storage (German GUV-V D05).

1.9.3 Procedure in case of an emergency

The general safety regulations and regulations for the procedure in case of an emergency as specified in EN 12671: 2007 (D) apply.

Actions in case of an emergency:

- Ventilate the installation location immediately.
- Wear protective clothing (safety goggles, gloves, respirator and/or self-contained breathing apparatus, protective apron).
- Implement initial help measures:
 - In case of contact with the eyes, rinse immediately with plenty of water for at least 15 minutes. Consult a doctor.
 - In case of contact with the skin, wash immediately with plenty of water. Remove all contaminated clothing.
 - In case gas is inhaled, move the casualty to a source of fresh air. Avoid taking deep breaths. Consult a doctor (look out for a racing pulse, as vasodilating treatment may be required).
- Spillages:
 - In case of contact with clothing, remove the clothing immediately and wash with plenty of water. Chemical spillages in buildings must be washed away with water.
- Firefighting:
 - Aqueous solutions of chlorine dioxide are not directly flammable. Extinguish the surrounding fire with water, preferably using a fire sprinkler system to dilute the ambient gas. Inform the fire brigade of the installed production capacity and any harmful starting substances that are being stored (precursor substances) so that precautions can be taken regarding possible risks.

For emergency phone numbers, see the acceptance report.

2. Product description

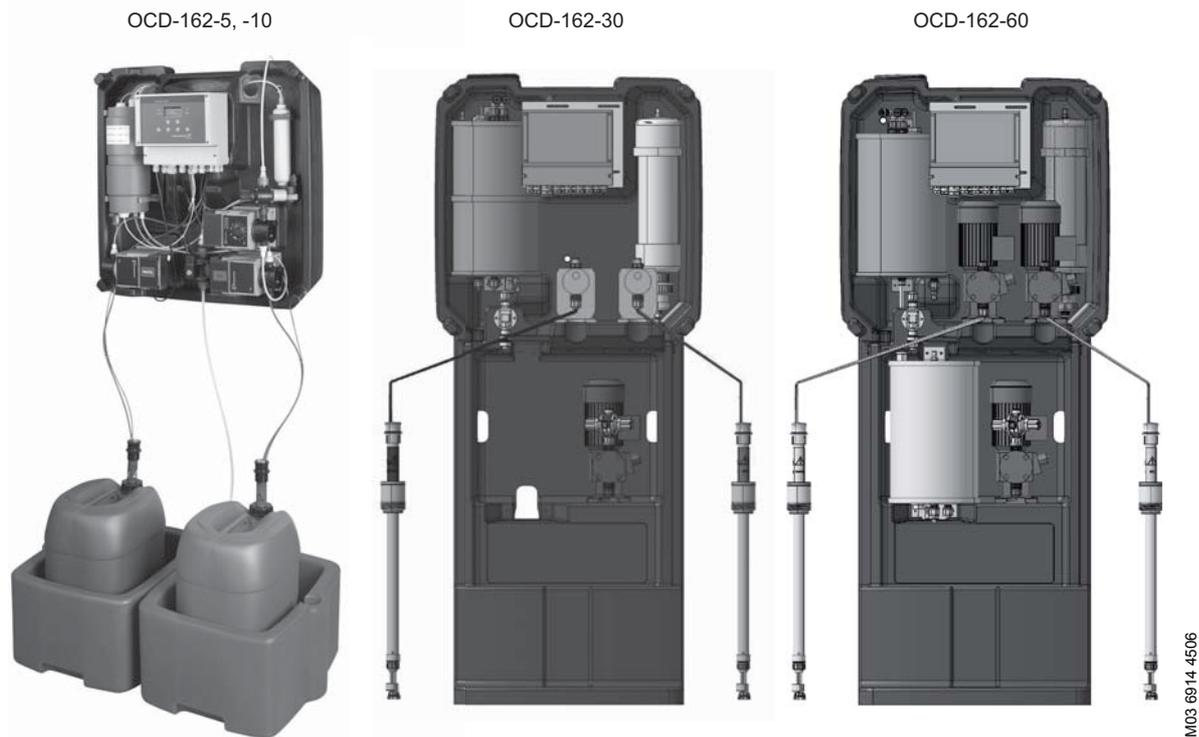


Fig. 1 The Oxiperm Pro – without cover and peripheral devices

The Grundfos Alldos **Oxiperm Pro** disinfection system is used to produce and dose chlorine dioxide for the disinfection of drinking water, process water, cooling water and wastewater.

The device itself consists of a plastic system frame, on which the internal components are mounted. It is wall-mounted or installed on the floor and covered by a plastic cover.

The chemicals are supplied from two original chemical containers, which are located in two collecting trays directly under the system (Oxiperm Pro systems up to 10 g/h) or in a separate tray for each container next to the unit (Oxiperm Pro systems with more than 10 g/h). A suction lance is inserted in each container and is permanently connected to the corresponding chemical pump in the device. The suction lance cables are used to send "pre-empty" and "empty" signals to the control system.

The device is connected to two water lines:

- The drinking water line for supplying dilution water and flushing water.
- The main water line to be disinfected, into which the final ClO_2 solution is dosed.

2.1 Application examples

The **Oxiperm Pro** disinfection system can be used for two different types of application:

Group 1: Disinfection of drinking water lines

- The flow rate of the water in the lines can fluctuate greatly (peak times when water is used for bathing and cooking).
- The type and level of contamination in the water (disturbance variables) are not known or are very varied.
- Examples: Drinking water lines in:
 - hotels, multi-storey buildings
 - schools, hospitals, nursing homes
 - food and beverage plants
 - small waterworks
 - showers in gymnasiums and at swimming pools.

Group 2: Disinfection of industrial systems

- The water quantity in these systems is relatively constant.
- The type and level of contamination in the water (disturbance

variables) are measured and hardly ever change.

- Examples:
 - bottle cleaning plants in breweries
 - industrial process water or wastewater systems
 - cooling water systems.

Group 3: Shock disinfection

- Applications requiring large quantities of disinfectant in a short time
- Example:
 - cleaning of whirlpool baths

2.2 Functional principle

2.2.1 Production of chlorine dioxide

Chlorine dioxide is prepared in the reaction tank as follows:

Water, hydrochloric acid and then sodium chlorite are added until a specific level is reached. During the reaction time, a diluted ClO_2 solution is produced. The reaction vessel is then filled with water. With a concentration of approximately 2 g of ClO_2 per litre of water, the final solution flows (as a result of its own hydraulic effect) through a pipe (overflow) located in the middle of the reaction vessel into the reservoir tank below.

From the reservoir tank, the dosing pump doses the final ClO_2 solution through to the injection unit, where it is dosed into the main water line to be disinfected. See section 2.2.2 *Flow-rate-proportional dosing* and 2.2.3 *Setpoint-controlled dosing*.

In "once" operation, the ClO_2 production stops.

In "continuous" or "ext. batch" operation, the chlorine dioxide production starts from the beginning in the reaction tank after a pause.

2.2.2 Flow-rate-proportional dosing

Suitable for group 1 applications – drinking water:

1. The control system is set to proportional controller.
2. A contact water meter or flow meter measures the water flow rate in the main water line and continuously sends measured values to the **Oxiperm Pro** control system.
3. The proportional controller calculates the required ClO_2 dosing volume in proportion to the water flow rate in the main line.
4. The proportional controller sends the corresponding output

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signals to the dosing pump.

5. The dosing pump doses the corresponding quantity of the ClO₂ solution from the reservoir tank into the main water line.
6. An optional measuring cell monitors the ClO₂ concentration in the main line.

2.2.3 Setpoint-controlled dosing

Suitable for group 2 applications – industrial water:

1. The control system is set to setpoint controller. A setpoint for the desired ClO₂ concentration in the main line is specified for the setpoint controller.
2. A measuring cell monitors the ClO₂ concentration in the main line.
3. The measuring cell continuously sends actual values for the ClO₂ concentration to the control system of the disinfection system.
4. The setpoint controller compares the incoming actual values with the setpoint and based on the deviation calculates the quantity of the ClO₂ solution (actuating variable) that is required to achieve the desired concentration.
5. The setpoint controller sends output signals to the dosing pump.
6. The dosing pump doses the corresponding quantity of the ClO₂ solution from the reservoir tank into the main water line.

A combined controller is also available for applications with setpoint controller and flow meter (see separate service instructions).

2.3 Components of the standard device

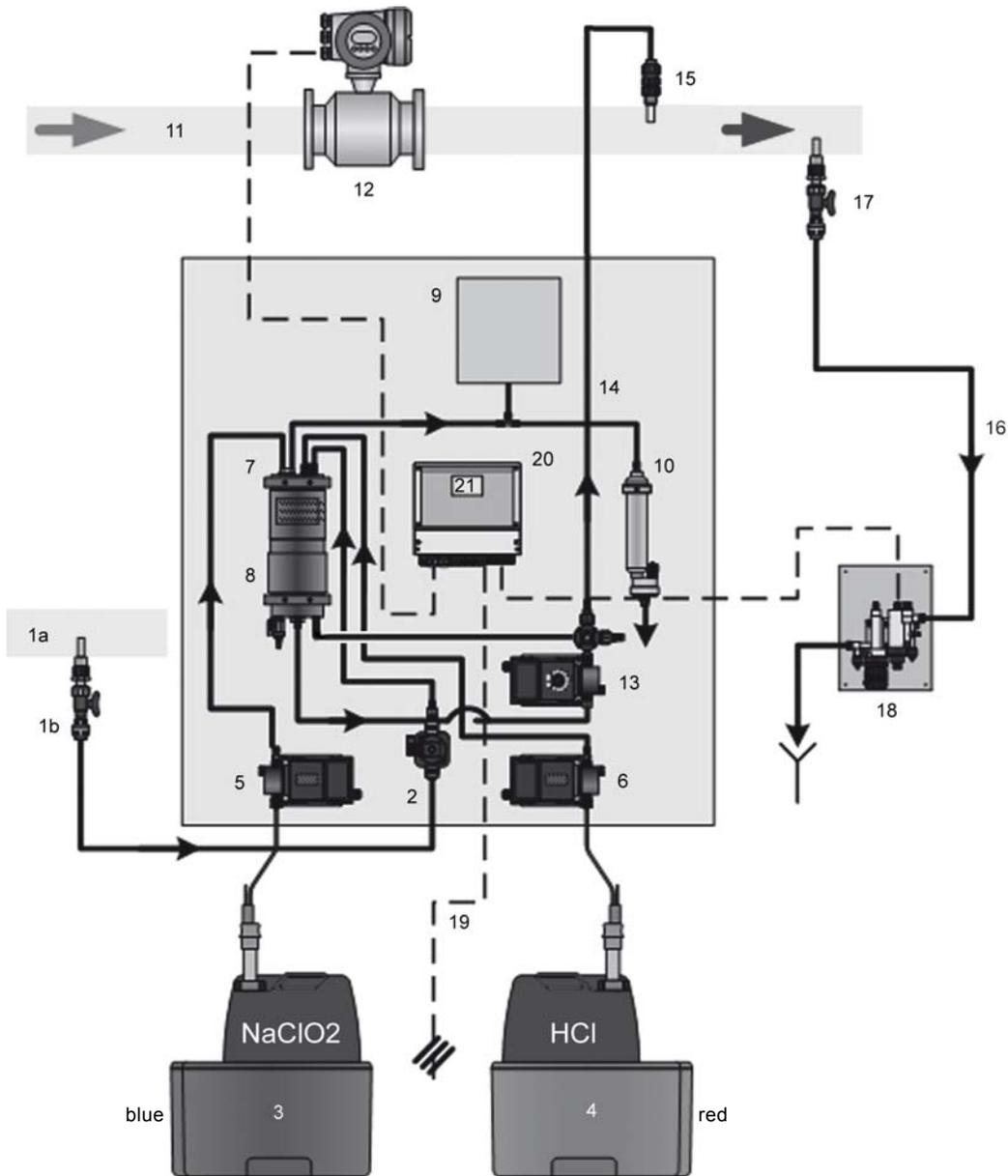


Fig. 2 Components of the Oxiperme Pro standard device (here: OCD-162-5, -10)

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2.3.1 External parts

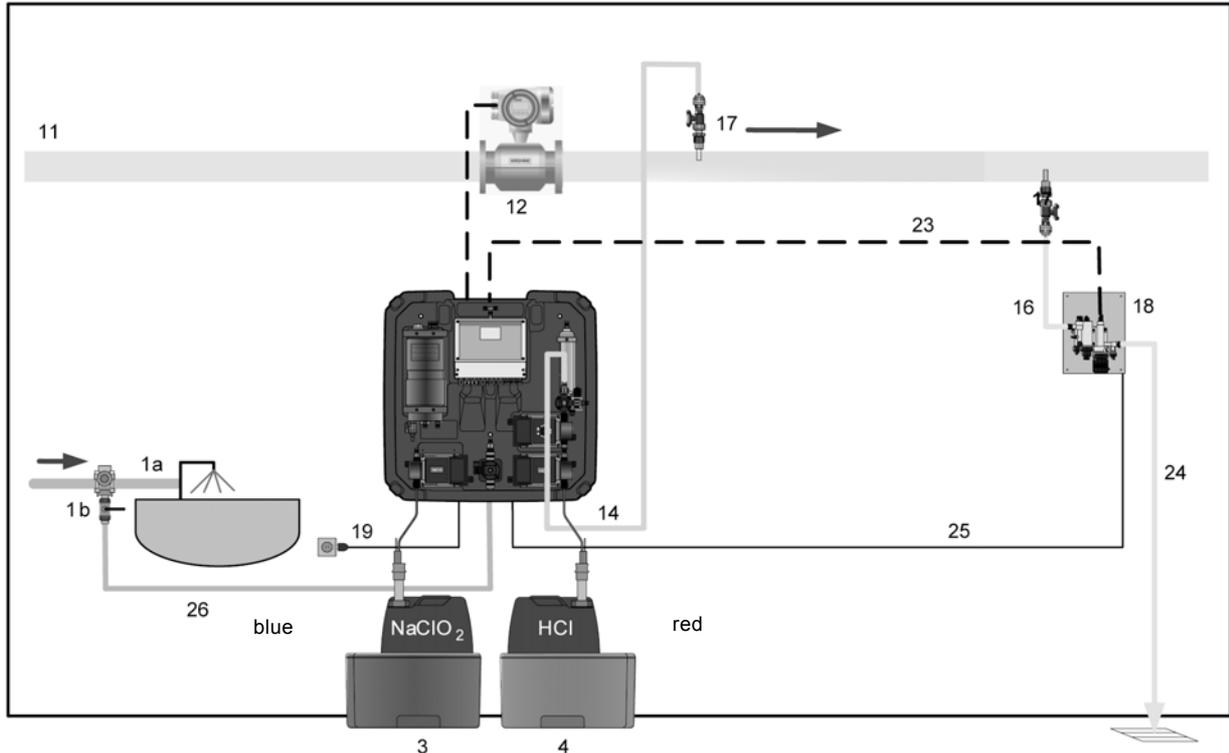
Pos.	Components
1a	Water line for supplying dilution water and flushing water (via solenoid valve in the device)
1b	Bleeding point for dilution water with stopcock
3	Chemical container for NaClO ₂ (diluted concentration of 7.5 % by volume) with suction lance and collecting tray
4	Chemical container for HCl (diluted concentration of 9 % by volume) with suction lance and collecting tray
11	Main water line to be disinfected
12	Flow meter (or contact water meter)
14	Dosing line
15	Injection unit for dosing the ClO ₂
18	Measuring cell for checking the chlorine dioxide concentration in the main line (optional)
19	Power supply connection

2.3.2 Internal components

Pos.	Components
2	Solenoid valve for supplying dilution water and flushing water
5	Chemical pump for sodium chlorite (pump 2)
6	Chemical pump for hydrochloric acid (pump 1)
7	Reaction tank with float switch
8	Chlorine dioxide reservoir tank with float switch and drain cock (bottom left)
9	Volumetric accumulator for ClO ₂ gas
10	Activated carbon filter for ClO ₂ gas
13	Dosing pump with multi-function valve
16	Measuring water pipe
17	Measuring water extraction point
20	Electronic control system with measured-value sensor for check measurements
21	Display with control and display elements

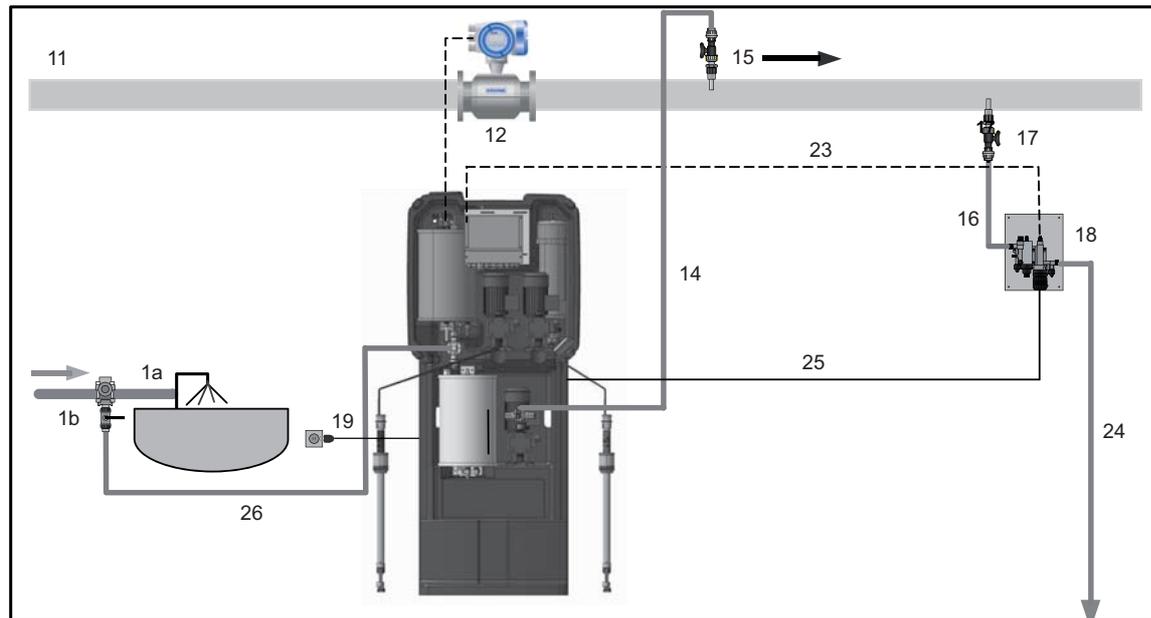
See the photos in section 10. Photos.

2.4 System peripheral devices and accessories



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Fig. 3 Complete Oxiper Pro OCD-162-5, -10 system with measuring cell and without extension module



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Fig. 4 Complete Oxiper Pro OCD-162-30, -60 system with measuring cell and without extension module

Pos.	Components
1a	Water line for supplying dilution water and flushing water (via solenoid valve in the device)
1b	Bleeding point for dilution water with stopcock
3	Chemical container for NaClO ₂ (diluted concentration of 7.5 % by volume) with suction lance and collecting tray
4	Chemical container for HCl (diluted concentration of 9 % by volume) with suction lance and collecting tray
11	Main water line to be disinfected
12	Flow meter (or contact water meter)
14	Dosing line

Pos.	Components
15	Injection unit for dosing the ClO ₂
16	Hose for sample-water bleeding
17	Sample-water bleeding point
18	Measuring cell
19	Power supply connection/main switch
23	Connection cable for measuring cell
24	Sample-water drain
25	Connection cable for cleaning motor
26	Hose for dilution water

2.4.1 Accessories for the dilution water line (not included)

- Stopcock (ball valve)
- Tapping sleeve for dilution water bleeding (optional) (if necessary, with double nipple and connection piece for hose)
- Hose with connection to solenoid valve.

Stopcock and tapping sleeve are not required if the bypass mixing module with dilution water connection has been selected.

2.4.2 Accessories for the main water line (not included)

- Contact water meter or fitted flow meter (in case of a new water line, water flow meter that provides signals or ultrasound flow meter).
- Tapping sleeve for the injection unit (optional).
- Protective tube for the dosing line, installed from the dosing pump to the injection unit (optional).
- Grundfos Alldos DIT photometer (measures ClO_2 concentration after dosing) (optional).
- Sample-water filter (in case of insufficient water quality).

2.4.3 Measuring cell (optional)

- Measuring cell
- Tapping sleeve for sample-water bleeding at the main line (not included)
- Hose from the sample-water bleeding point to the measuring cell
- Hose from the measuring cell to the sample-water drain.

2.4.4 Extension modules (optional)

The standard system can be extended using modules:

- measuring cell for cold and hot water (main water up to $50\text{ }^\circ\text{C}$, pressure 4 bar) for connection to the Oxiperm Pro.
- measuring module for cold and hot water (main water up to $70\text{ }^\circ\text{C}$, pressure 8 bar) for connection to the Oxiperm Pro.
- bypass mixing module for cold and hot water for connection to the Oxiperm Pro (separate instructions).

Note

In case of fluctuating flow rates in the main water flow, the use of a bypass mixing module is recommended in order to optimise mixing and reduce the risk of corrosion.

2.5 Hydraulic connections

2.5.1 Hydraulic connections Oxiperm Pro (OCD-162-5, -10)

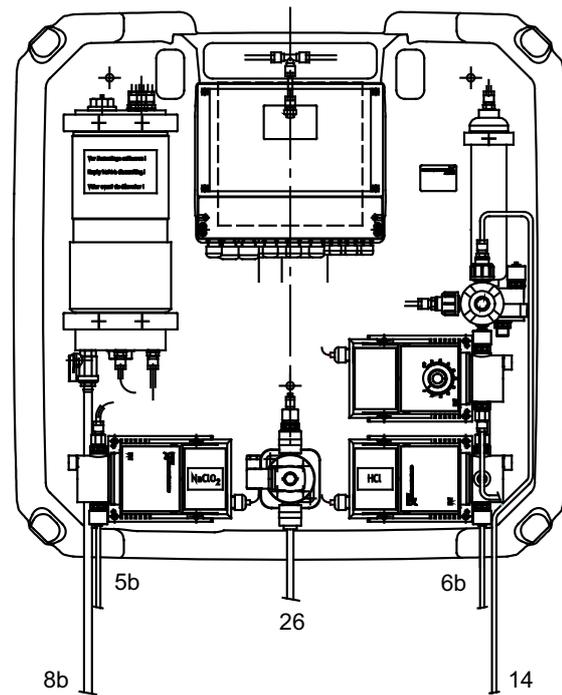


Fig. 5 Oxiperm Pro (OCD-162-5, -10) hydraulic connections

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2.5.2 Hydraulic connections Oxiperm Pro (OCD-162-30, -60)

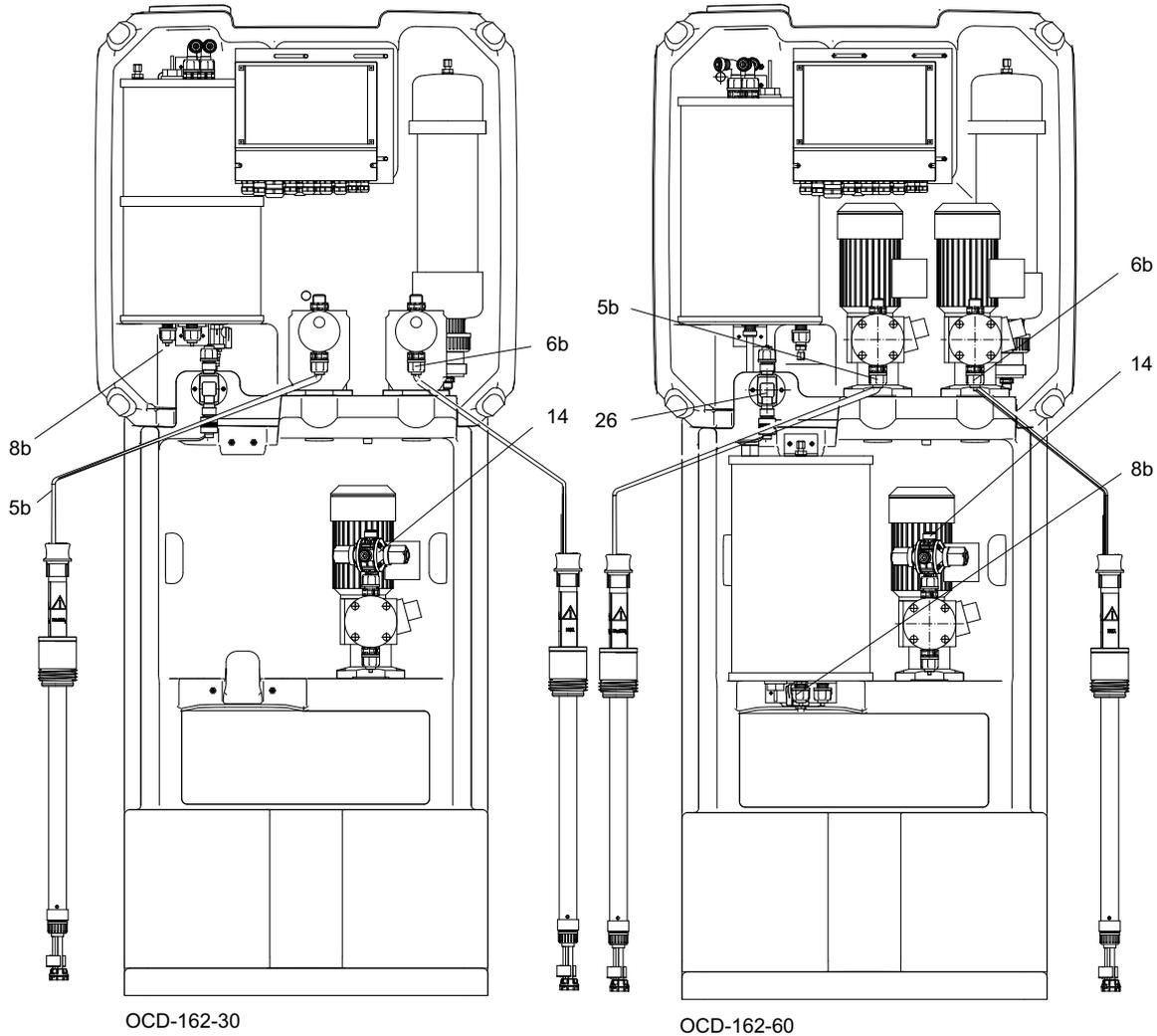


Fig. 6 Oxiperm Pro (OCD-162-30, -60) hydraulic connections

For nominal width of hose connections, see section 6. [Technical data](#).

2.5.3 Device connections

The **Oxiperm Pro** has connections for the following:

- dilution water hose at the solenoid valve (fig. 5 and fig. 6, pos. 26)
- hoses for both suction lances on the suction side of the chemical pumps (fig. 5, pos. 5b and 6b)
- dosing line from the dosing pump to the injection unit at the main line or to the flow control instrument in the mixing module or to the external batch tank. (fig. 5 and fig. 6, pos. 14)
- hose at the drain cock of the reservoir tank (only installed for flushing and ventilation) (fig. 5, pos. 8b).

2.5.4 External dosing pump connection

If the system has been supplied without a dosing pump, the dosing line of an external dosing pump is connected to the reservoir tank.

2.5.5 Measuring cell connections

The measuring cell is hydraulically connected to the main line. After dosing, the ClO_2 concentration, temperature and pH/ORP value of the sample water are measured in the measuring cell.

The measuring cell has connections for the following:

- hose from the sample-water bleeding point to the measuring cell
- hose from the measuring cell to the drain.

See the installation and operating instructions for the measuring cell.

2.5.6 Measuring module connections

The measuring module is hydraulically connected to the main line.

The measuring module has connections for the following:

- hose from tapping sleeve 1 to the measuring module and hose from the measuring module to tapping sleeve 2 at the main line.

See the installation and operating instructions for the measuring module.

2.5.7 Mixing module connections

The mixing module is hydraulically connected to the main line and the **Oxiperm Pro**.

The mixing module has connections for the following:

- dosing line from the **Oxiperm Pro** dosing pump to the injection unit in the mixing module.
- hose from tapping sleeve 1 to the mixing module and hose from the mixing module to tapping sleeve 2 at the main line.

See the installation and operating instructions for the mixing module.

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2.6 Power supply connections and electronic connections

The **Oxiperm Pro** disinfection system is equipped with an electronic control system from Grundfos Alldos. See section [2.8 Control and display elements](#), fig. 8.

The control system has connections for the following:

- power supply cable to the main switch
- cable from the water flow meter or flow meter
- cable from external batch tank to level control, if necessary
- cables for measuring cell AQC-D1 or AQC-D6, if necessary:
 - measuring electrode, from the counter-electrode
 - sample-water deficiency sensor
 - Pt100 sensor
 - pH electrode, if necessary (for pH or ORP) (AQC-D1 only)
 - cleaning motor (AQC-D1 only)
- or the cables from the measuring module, if necessary:
 - measuring electrode and counter-electrode
 - water deficiency sensor
 - Pt100 sensor
- or the cable from the mixing module, if necessary:
 - flow controller.

For additional connections, see the separate service instructions, sections 4. Installation and 4.6 Connecting the electronic components.

2.7 Operating modes

During commissioning, the disinfection system is set up according to the application. When switched on and the ClO₂ production is started, system operation is fully automatic using menu commands.

For ClO₂ production, two operating modes can be set:

- continuous operation ("continuous" mode)
- dosing once ("once" mode).
- external batch tank (operation mode "ext. batch").

Dosing is controlled automatically by the controller. In manual operation, the controller can be switched off. See section [5.14 Emergency stop](#).

Other functions in manual operation can only be used with the service code.

2.8 Control and display elements



Fig. 7 The display and control panel

2.8.1 Using the control panel

Buttons and LEDs	Functions
[Esc] button	Cancels command, exits menu
[Up] button	Selects the previous menu item or sets a higher numerical value
[Down] button	Selects the next menu item or sets a lower numerical value
[OK] button	Confirms the menu selection
[Cal] button	Calibration
[Man] button	Manual operation
"Alarm" LED	Alarm (red)
"Caution" LED	Warning (yellow)
"Cal" LED	Calibration (yellow)
"Man" LED	Manual operation (yellow)

2.8.2 Using the display

Once the system is started, the following display level appears in the display:

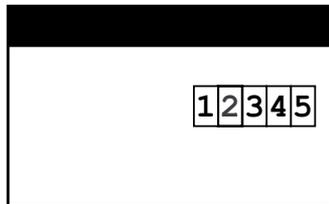
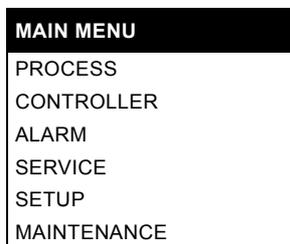


Fig. 8 Display level after starting the system

The header indicates the status (here: no process started). For symbols and numbers for relays, see the table below. Press [OK] to access the MAIN MENU:



During operation, press [Esc] to access the display level.

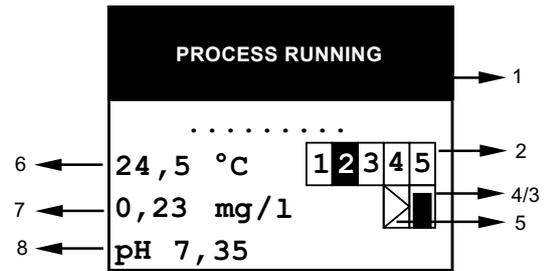


Fig. 9 PROCESS RUNNING display level

Fig. 9: 1-5, see table below:

- 6 = water temperature
- 7 = ClO₂ concentration
- 8 = pH value in the sample water.

Message in the display level	Meaning of the message	
PROCESS RUNNING	ClO ₂ production is active.	
PROCESS STOP	ClO ₂ production has been stopped by an alarm.	1
PROCESS ABORTION	ClO ₂ production has been aborted by a menu command or alarm.	Headers
FLUSHING	Flushing is started automatically or manually.	
	Relay for solenoid valve. Display:	
1	White number on a black background: relay active. Black number on a white background: relay not active.	
2	Relay for HCl pump: display as for 1.	2
3	Relay for NaClO ₂ pump: display as for 1.	Relays
4	Alarm relay: display as for 1.	
5	Warning relay: display as for 1.	
6	Symbol for relay for the pulse pause controller.	
6	Symbol for relay stop for the pulse pause controller.	3 Symbol

Message in the display level	Meaning of the message
	<p>Symbol for continuous controller. Box with plotted line. The height of the line is proportional to the actuating variable (ClO₂ dosing volume):</p> <p>Line not visible: Actuating variable = 0 %.</p> <p>Line fills the entire box: Actuating variable = 100 %.</p>
	<p>Symbol for continuous controller stop and external controller stop due to an alarm. White box with a diagonal line through it.</p>
	<p>Symbol for external disturbance value input (input value of the disturbance variable, for water flow meter: pulses, for flow meter: mA). Box with plotted triangle. The black fill is proportional to the flow (the greater the fill, the greater the flow, 0-100 %). (Only visible if proportional or combined controller is configured.)</p>

2.9 Access codes

When the system is ready for operation, the MAIN MENU cannot be accessed without a code request.

Two different access authorisations/security levels are assigned for all submenus. Each code automatically enables the levels below it too.

- User code:** By default, all user menus can initially be accessed without a code request.
(When the menu selection has been confirmed using [OK], a code request is not displayed.)
Once the user has entered his/her own user code (MAIN MENU - SETUP - CHANGE CODE), the code request appears before any user submenu can be accessed. The modified user code must only allow access for trained users with appropriate technical training and experience. Access is enabled for 60 minutes after entry.
- Service code:** This code is reserved for trained Grundfos Alldos service engineers. Access is enabled for 30 minutes after entry. The service code is necessary for commissioning.

See section [5.8.2 Changing the user code](#).

2.10 User menu structure

Users can view certain submenus in the display and can also modify certain values.

2.10.1 Finding user menus

In the following tables, the first column indicates whether users can access a submenu:

- without a code (0)
- with the user code (A).

User menu

All software menus can be selected from the MAIN MENU using the [Up] and [Down] buttons and accessed using [OK].

Note

Press [Esc] to return to the previous menu level. For operating instructions for each menu, see section 5. Operation.

Users can access the following submenus from the MAIN MENU (without a code or with the user code):

Code	Main menu	Submenu 1	Submenu 2	Submenu 3	Submenu 4	Submenu 5	
A	Main menu	Process	Start	Start	Start ClO ₂ production?		
A				Back			
A			Abortion	Abortion	Abort ClO ₂ production?		
A				Back			
A			Operation	continuous			
A				once			
A				ext. batch			
0			Service	Process	Status	Display: Process status	
0					List of events		
0		ClO ₂ production			Cycles		
0					Chemicals HCl/NaClO ₂ since 14.09.06	HCl (l) NaClO ₂ (l) reset	
0					Age of ClO ₂ (mm:ss)		
0					Maintenance		
A		Flushing			Start		
A					Abortion		
0		Measurement			ClO ₂	Measured value	
0				CalData/logbook			
0				Temperature	°C or °F Measured value		
0				pH or ORP	Measured value CalData/logbook		
0		ClO ₂ controller		Display: Controller setting			
0		Water flow meter 1.00 - 100.00 pulses/sec. (Note 5*)		50 pulses/sec., 50 %* (or: 5 mA, 25 %)			
0		Test display					
0		Program version					
A		Setup		Language	Deutsch		
A					English		
A					(all listed)		
A				Date/time	Date		
A					Time		
A			Daylight sav. t.		Begin, end, time shift (± x hours), off		
A			Code function	Change			
A	Delete						
A	Display		Contrast 50 %				
0							

Code	Main menu	Submenu 1	Submenu 2	Submenu 3	Submenu 4	Submenu 5
A	Main menu	Alarm (Note 4*)	ClO ₂ alarm values	Alarm off		
A				Alarm value1 0.15 mg/l	Upward violation or downward viol.	
A				Alarm value 2 0.70 mg/l	Upward violation or downward viol.	
A				Hysteresis 0.01		
A				Alarm delay 0 sec.		
A				Dos. time monit.	Off/On	
A	Calibration	Chlorine dioxide	Cal. meas. value			
A			Cal. result	Slope µA, mg/l		
A			Cal. cycle	On/Off		
A		pH	Cal. meas. value	Grundfos, DIN/Nist, other		
A			Cal. result	Slope µA, mg/l asym. mV		
A			Cal. cycle	On/Off		
A		ORP	Cal. meas. value			
A			Cal. result	Asym. mV		
A			Cal. cycle	On/Off		
HB			Manual operation	ClO ₂ controller	On/Off	

Notes to table:

Note 4*:

- The ALARM settings are only available when MEASUREMENT has been enabled (using the service code).
- The alarm relay is activated in case previously set alarm values for chlorine dioxide are exceeded or not reached, the maximum dosing time is exceeded, and in case of a fault.

Note 5*:

- The WATER FLOW METER submenu only appears if a WATER FLOW METER is enabled (using the service code).
- When connecting a contact water meter, the pulse rate and the maximum flow are entered during commissioning. The control system thus calculates the number of pulses per

second. This value corresponds 100 % to the disturbance variable as a control parameter.

- When connecting a flow meter, the measuring range of the incoming current signal is entered during commissioning. This is used as the basis for a control parameter.

Users can view the current input value of the water flow meter or flow meter as well as the pulses/second or value in mA and the calculation in percent. See section [5.9.3 Displaying the current input value for the water flow meter \(not applicable for Group 3 applications\)](#).

The value is also displayed if the defined input values are exceeded or not reached (a water flow meter malfunction is visible here).

3. Transport and packaging

Warning

Increased risk of damage to equipment and personal injury as a result of operating faults due to transport damage.



Do not shake, crush or drop the box. Open the packaging carefully.

Do not use a sharp or pointed blade.

Carefully remove the device from the box.

Do not bend the hoses and cables.

3.1 Unpacking the device(s)

Number of packing units: 1 box.

Box	Dimensions		Contents	Weight gross / net
	L x W x H [mm]			
1	900 x 900 x 518		Device with	OCD-162-5: 30 kg / 26 kg OCD-162-10: 32 kg / 28 kg
1	766 x 558 x 1813		cover, hoses, screws, accessories	OCD-162-30-D: 80 kg / 70 kg OCD-162-30-P: 79 kg / 69 kg
1	766 x 558 x 1813			OCD-162-60-D: 100 kg / 85 kg OCD-162-60-P: 99 kg / 84 kg

Procedure:

1. Unpack the device.
2. Unpack the cover.

3. Unpack the measuring cell, if supplied.

4. Unpack the extension modules, supplied.

5. Retain the original packaging in order to return the device for servicing.

6. Check the device(s) for transport damage (especially hoses and lines).

3.2 Measures in case of transport damage

In case of transport damage:

1. Pack the device in its original packaging.
2. Inform the forwarder of the transport damage.
3. Return the device to the supplier.

4. Installation

Installation is described in detail in the separate service instructions.

This subsection can be used by operators to plan installation.

4.1 Planning installation

4.1.1 Preparing the installation location (customer)



Warning

Risk of fire and corrosion due to incorrect storage of chemicals. Do not store hydrochloric acid and sodium chlorite near grease, flammable or oxidising substances, oils, acids or salts. Obtain approval for storing chemicals.

The operator must ensure that all the conditions listed below for structurally and technically safe and optimum operation of the system are met prior to commencing installation.

An installation location must be provided that fulfils the following:

- It is protected from the sun, frost-proof, well-ventilated and has sufficient lighting (the system must not be installed outdoors).
- It meets the conditions specified in section 6. *Technical data* regarding air temperature, humidity, permissible component operating temperature and dilution water quality.
- It has concrete walls and floors, which enable the OCD-162-5, -10 system to be wall-mounted (minimum wall thickness of 10 cm for the mounting screws) or the OCD-162-30, -60 system to be floor-mounted.
- It has a power supply connection. See section 6. *Technical data*.
- It has access to the main water line.
- It has a connection for dilution water of drinking water quality in accordance with TrinkwV 2001.
- It has a floor drain for washing away chemicals and a drain (tank) for sample water.
- It has a separate storage room for empty and full chemical containers.
- It is isolated from other areas with regard to fire protection.
- It is secured against unauthorised access and meets the regulations for the prevention of accidents.
- It is not in permanent use by personnel (maximum stay: two hours).

Operator's checklist – preparing for installation

Done

See section 6. *Technical data*

1. Read the installation and operating instructions for Oxiperm Pro and for the dosing pumps DMI 208, DDI 209, DMX 221 or DDI 222, if applicable, as well as for the multi-function valve, the measuring cell and the extension module, if used. Store the manuals in a dry place in the installation location.
 2. Measure the pressure and temperature in the dilution water line and in the main water line.
 3. Measure the room temperature and humidity.
 4. Obtain official approval for storing chemicals, if necessary.
 5. Purchase accessories. See section 8. *Operator's accessory list*.
 6. Fit a tapping sleeve for the dilution water supply in the drinking water line.
 7. Fit a tapping clamp for the injection unit in the main line.
 8. Install a protective pipe for the dosing line, if necessary.
- At the main line:
9. Fit a tapping sleeve for sample water extraction, if necessary.
 10. Fit tapping sleeves for the measuring or mixing module, if used.
 11. Provide protective clothing in the room in accordance with the regulations for the prevention of accidents (German GUV-V D05).
 12. Display a "No fires, naked flames or smoking" warning sign. Display all warning signs provided.

5. Operation

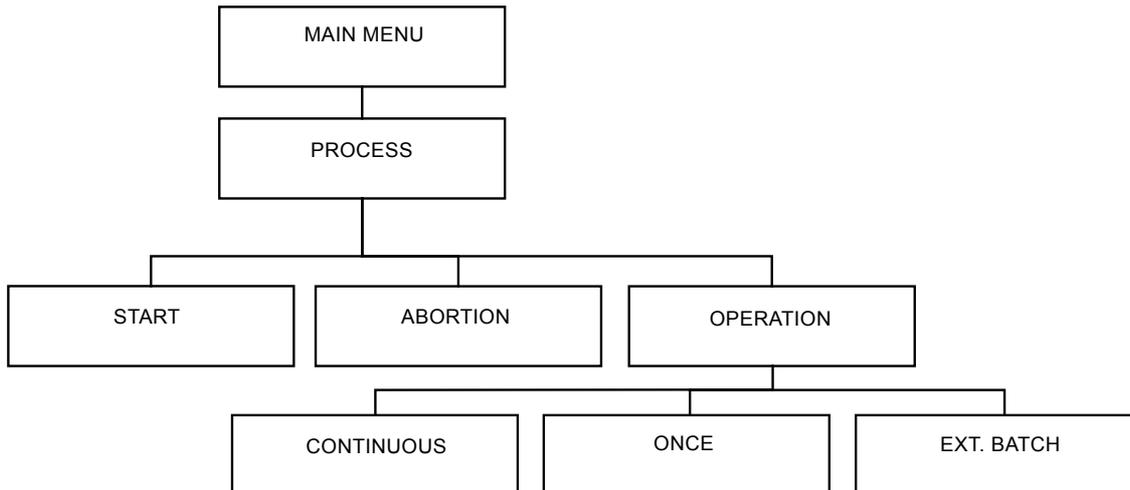


Fig. 10 PROCESS menu structure



Warning

The Oxiperm Pro disinfection system uses chemicals. The system must only be operated by authorised and qualified personnel.

This menu can be found:

- in the overview table in section 2.10.1 *Finding user menus*
- in the menu structure at the start of the section.

Use the display as follows:

The display menus are represented by tables in this manual. The black header represents the menu and the lines below the submenus.

Access a menu as follows:

Access the MAIN MENU by pressing [OK] in the display level. In the MAIN MENU, use the [Up] or [Down] button to select the menu, and access it by pressing [OK].

Exit a menu as follows:

Press [Esc] to return to the menu level above (this is automatic for most menus).

Menu commands are specified as follows:

In this manual, for example:

1. MAIN MENU > PROCESS > [OK].

In the table that follows:

The black header contains PROCESS.

The text lines contain START, ABORTION and OPERATION.

2. LANGUAGE > [OK].

This means:

In the MAIN MENU, use the [Down] button to select the PROCESS submenu, and access it by pressing [OK].

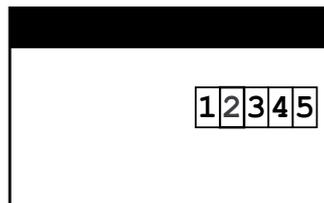
The PROCESS submenu appears in the display.

Use the [Down] button to select the LANGUAGE submenu, and access it by pressing [OK].

The LANGUAGE submenu appears in the display.

5.1 Switching on the system

1. Open the stopcock for the dilution water (1b).
 2. Switch on the main switch for the power supply.
- The system starts. The following display level appears in the display.



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Fig. 11 Display level after switching on the system

The system is ready for operation.

3. Press [OK].

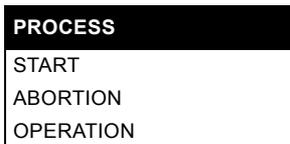
MAIN MENU appears in the display:

MAIN MENU
PROCESS
CONTROLLER ClO ₂
ALARM
SERVICE
SETUP
MAINTENANCE

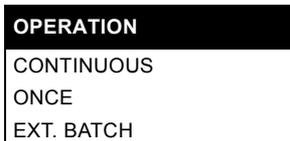
5.2 Changing operating mode

To specify whether just one batch of ClO₂ is to be prepared or whether the production process should run continuously, proceed as follows:

1. MAIN MENU > PROCESS > [OK].



2. OPERATION > [OK].



3. CONTINUOUS (or ONCE or EXT. BATCH) > [OK].

CONTINUOUS = continuous operation.

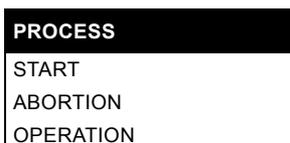
In the operation mode "continuous" or "ext. batch" a new production process is started when the reaction tank is empty.

In the operation mode "once" the ClO₂ production stops, when the reaction tank is empty.

5.3 Starting operation

5.3.1 Starting ClO₂ production

1. MAIN MENU > PROCESS > [OK].



2. START > [OK].



Cancel command:

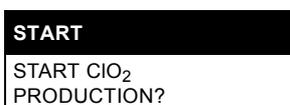
3. BACK > [OK].

The display returns to the PROCESS submenu.

ClO₂ production is not started.

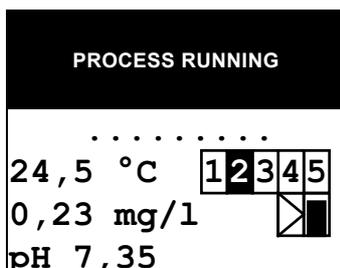
Execute command:

4. START > [OK].



5. Press [OK].

ClO₂ production starts. The display level appears.



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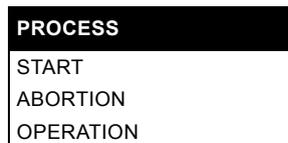
Fig. 12 Display level during operation

Dosing does not have to be started. This is done automatically as soon as the reservoir tank is filled.

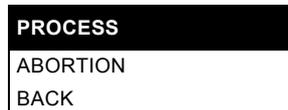
5.4 Interrupting operation

5.4.1 Aborting ClO₂ production

1. Access the MAIN MENU by pressing [OK] in the display level.
2. MAIN MENU > PROCESS > [OK].



3. ABORTION > [OK].



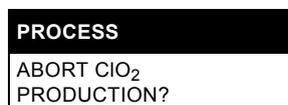
Cancel command:

4. BACK > [OK].

The display returns to the PROCESS submenu.

Abort ClO₂ production:

5. ABORTION > [OK].



6. Press [OK].

The chemical pumps are stopped. To dilute the undefined contents of the reaction tank, it is filled with water up to level 4 afterwards.

5.4.2 Aborting the dosing process

In order to stop the dosing pump, the controller must be switched off in manual operation.

Switching off the controller in manual operation

1. Press [Man] (manual operation).
2. ClO₂ CONTROLLER > [OK].
3. (Controller) OFF > [OK].

See section [5.14 Emergency stop](#).

5.5 Continuing operation after an interruption

There are four ways in which operation can be interrupted:

- ABORT ClO₂ PRODUCTION menu command (and after the CONTROLLER OFF command)
- fault with an alarm message
- an empty chemical container
- power failure with power supply interruption.

5.5.1 Continuing operation after aborting ClO₂ production

If the controller has been switched off in manual operation, switch the controller on again in manual operation:

1. Press [Man] (manual operation).
2. ClO₂ CONTROLLER > [OK].
3. (Controller) ON > [OK].

See section [5.3.1 Starting ClO₂ production](#).

The system automatically carries out a flushing process.

The process and dosing then run in normal mode.

5.5.2 Continuing operation after removing a fault

Confirm the alarm message, if necessary.

The system automatically continues operating.

5.5.3 Continuing operation after changing a chemical container

The system automatically continues operating.

5.5.4 Continuing operation after a power supply interruption

As soon as the power is restored, the system is switched on again automatically.

If the reaction tank is full, the liquid is now in an undefined state.

It can contain too much hydrochloric acid or too little ClO₂. The control system uses the float switch in the reaction tank to determine whether the reaction tank is empty or full and continues operation accordingly:

1. Reaction tank part-filled or full, reservoir tank empty:
 - If the reaction tank is full, it is filled up with water. The undefined liquid is drained into the reservoir tank, and the following alarm message is displayed: CHECK ClO₂ BATCH.
 - Drain the reservoir tank manually. See section 5.6.2 *Manually draining the reservoir tank*. (If it is not emptied manually, the undefined liquid will be dosed.)
 - The dosing pump is switched off when the reservoir tank is empty.
2. Reaction tank empty, reservoir tank empty:
 - In "continuous" mode, a new production process is started.
3. Reaction tank empty, reservoir tank part-filled or full:
 - The finished batch is dosed (continues being dosed).
 - In "continuous" or "ext. batch" mode, a new production process is started.
4. Reaction tank part-filled or full, reservoir tank part-filled or full:
 - The remaining batch is dosed into the reservoir tank.
 - The reaction tank is filled up with water. The undefined liquid remains in the reaction tank until the reservoir tank is empty. Water is supplied to make the reaction tank overflow, and the alarm message CHECK ClO₂ BATCH is displayed.
 - Drain the reservoir tank manually. (If it is not drained manually, the undefined solution will be dosed.)
 - In "continuous" mode, a new production cycle is started after the reaction tank is empty.

5.6 Flushing

Warning

Risk of poisoning from ClO₂ gas.

Never mix NaClO₂ and HCl.

Never put suction lances in the same bucket.

Never insert suction lances in the wrong container.

Observe the labels for HCl (red) and NaClO₂ (blue) on chemical containers, pumps and suction lances.



Warning

Risk of serious damage to equipment and personal injury due to incorrect handling of chemicals.

Before commencing work, put on protective clothing (gloves, face mask, protective apron) (German GUV-V D05).



Warning

Risk of burns from stray droplets when removing the suction lance from the chemical container.

Take care that no stray droplets fall on skin, clothing, shoes or the floor. Any stray droplets on the container or in the collecting tray must be immediately rinsed away with water.



For automatic flushing, see section 5.5 [Continuing operation after an interruption](#).

Flushing using the FLUSHING menu command is useful for long system downtimes.

During flushing, the system is flushed with water to remove any chemical residue in the suction lines, pumps and reaction tanks. Dilution water is used for flushing. However, the suction lances must be removed from the chemical containers prior to flushing and are placed in separate 10-litre buckets filled with drinking water so that they can draw water in by suction.

Empty the reservoir tank manually at the drain cock prior to flushing. If the reservoir tank is empty, the dosing pump is switched off.

The reaction tank must be empty prior to flushing.

- Only start flushing if the ClO₂ production is not active (the FLUSHING menu is also only visible in the display).

The flushing process can be stopped anytime using [Esc].

5.6.1 Preparing for flushing

1. Before using the FLUSHING menu command, have the following to hand:
 - empty 10-litre plastic bucket (1 bucket for OCD-162-005, -010, -030 or 2 buckets for OCD-162-060)
 - 11 x 8 mm PE hose for reservoir tank drain cock
 - 20g (OCD-162-5), 40g (OCD-162-10), 120g (OCD-162-30), 240g (OCD-162-60) of ClO₂ breakdown substance sodium thiosulfate Na₂S₂O₃ x 5 H₂O
 - two 10-litre buckets filled with water
 - original screw plugs for the chemical containers.
2. Take the cover off the unit.

5.6.2 Manually draining the reservoir tank

- Place the two 10-litre buckets filled with water to the right and left of the chemical containers.
- Untwist the cover on the suction lance for the NaClO₂ container, remove the suction lance and place it in one of the buckets of water.
- Screw the original screw cover onto the chemical container.
- Untwist the cover on the suction lance for the HCl container, remove the suction lance, and place it in the other bucket of water.
- Screw the original screw cover onto the chemical container.
- Fill the empty bucket with 1 litre of water and 20 g (OCD-162-5), 40 g (OCD-162-10) or 120 g (OCD-162-30) of ClO₂ breakdown substance and place it to the left of the system. For OCD-162-60: fill two empty buckets with 1 litre of water each and 120 g of ClO₂ breakdown substance and place them next to the system.
- Remove the cover from the device.
- Connect the hose (PE or PVC) to the reservoir tank drain cock, and place the other end in the bucket. Open the outlet valve.
- Empty the contents of the reservoir tank (OCD-162-5: around 1 litre, OCD-162-10: around 1.8 litres, OCD-162-30: around 6.5 litres or OCD-162-60: around 13.0 litres) into the bucket(s).
- When the reservoir tank is empty, close the outlet valve. When the reservoir tank is empty, the dosing pump is switched off. When the reservoir tank is filled with a new batch, the dosing pump is switched on again.

5.6.3 Starting flushing

- MAIN MENU > SERVICE > [OK].
 - PROCESS > [OK].
 - FLUSHING > [OK].
- Start flushing:
- START > [OK].

```

FLUSHING
START SYSTEM
FLUSHING?
    
```

- Press [OK].

```

FLUSHING
PUT SUCTION LANCE IN
WATER
    
```

- Press [OK] if the lances are already in the water.

```

FLUSHING
DRAIN RESERVOIR TANK
    
```

- Press [OK], if the reservoir tank is already empty. See section 5.6.2 *Manually draining the reservoir tank*.

```

FLUSHING
CLOSE DRAIN COCK
    
```

- Press [OK], if the drain cock is already closed.
- Flushing starts. The flushing process automatically runs twice.

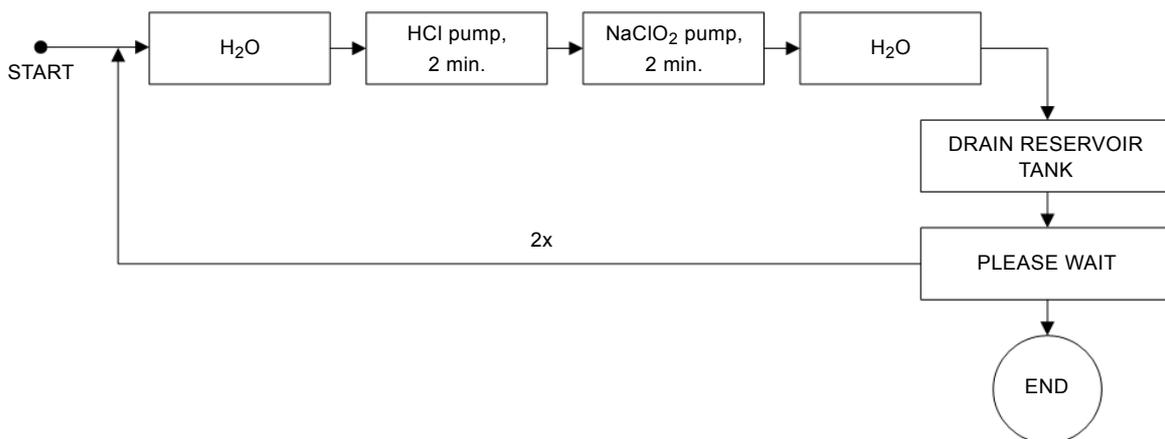


Fig. 13 Flushing process

- Dilution water is filled up in the reaction tank until the level reaches K1.
- The HCl pump runs for two minutes.
- The NaClO₂ pump runs for two minutes.
- Dilution water is filled up until the reaction tank's highest level K4 is reached and it overflows into the reservoir tank.

The following message is displayed:

```

FLUSHING
FLUSHING IS RUNNING
    
```

At the end of flushing, the following message is displayed:

```

FLUSHING
PLEASE WAIT!
    
```

This message disappears after one minute.

- If the reaction tank is empty, the process starts again with step 8.

After two flushing processes, the following message is displayed:

```

FLUSHING
SYSTEM FLUSHING IS
FINISHED
    
```

- Confirm using [OK].

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5.6.4 Working with the system after flushing

1. Remove the hose from the drain cock, and place it in the bucket.
2. Pour the contents of the bucket down the drain.
3. Clean the hose, bucket and drain thoroughly with water.
4. Unscrew the original screw cover of the NaClO₂ container.
5. Remove the NaClO₂ suction lance from the bucket of water, and insert it in the NaClO₂ container. Screw the suction lance cover on the container. Retain the original cover.
6. Unscrew the original screw cover of the HCl container.
7. Remove the HCl suction lance from the bucket of water, and insert it in the HCl container. Screw the suction lance cover on the container. Retain the original cover.
8. Fit the cover back on the device.

5.6.5 Aborting flushing

The flushing process can be aborted at any time:

1. MAIN MENU > SERVICE > PROCESS > FLUSHING > [OK].



2. ABORTION > [OK].



Abort flushing:

3. ABORTION > [OK].

Restart flushing:

4. START AGAIN > [OK].

5.6.6 Responding to flushing faults

It can take five minutes to rinse the pumps. If, after five minutes, the following error message appears, proceed as follows:



1. Call Service.
(The cause may be a problem with the pumps.)
2. Once the fault has been removed, press [Esc] or [OK] to confirm.
3. Restart flushing.

5.7 Manually ventilating the dosing pump



Warning

Risk of serious damage to equipment and personal injury due to incorrect handling of chemicals.

Before commencing work, put on protective clothing (German GUV-V D05).

Conditions for ventilation:

- The reservoir tank must contain chlorine dioxide solution.
 - The dosing pump must be operated in "manual" mode.
1. Hold the black and green knobs of the multi-function valve, slightly turn the green knob clockwise as far as it will go (turning can hardly be felt).
See the installation and operating instructions for the multi-function valve.
 2. Turn the knob again, if necessary.

The dosing pump is ventilated.

Air is flowing from the reservoir tank and the reaction tank through the gas hose to the volumetric accumulator and activated carbon filter and then escapes to the atmosphere.

5.8 Modifying setup

Setup can be selected as follows:

1. MAIN MENU > SETUP > [OK].

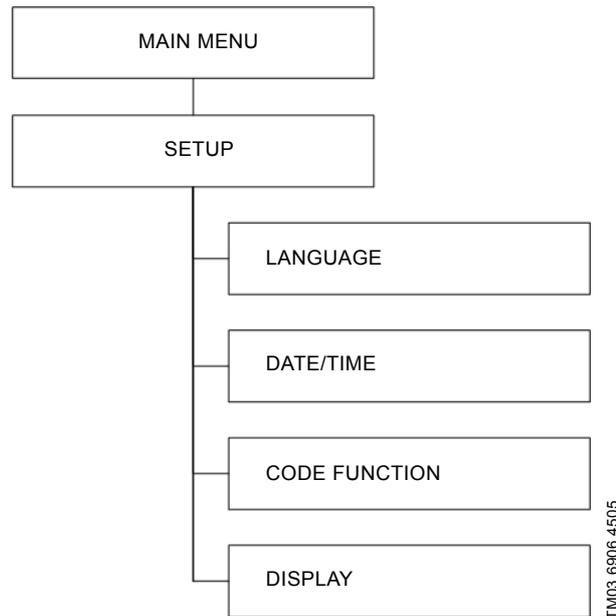


Fig. 14 SETUP user menu structure

Note

Other menus can only be accessed using the service code.

5.8.1 Changing the language

1. SETUP > LANGUAGE > [OK].



Fig. 15 Language menu

2. Use the [Down] button to select the desired language > [OK] > [Esc].

5.8.2 Changing the user code

1. SETUP > CODE FUNCTION > [OK].



Change code:

2. CHANGE CODE > [OK].

A code request for the old code appears:



3. Use the [Up] button to set the old code > [OK].



4. Use the [Up] button to set the new code (hold down the [Up] button to scroll faster through numbers). > [OK].

The maximum number is 9999.

The new code is set. The code request now appears before all submenus that can be accessed by users.

Delete code:

5. DELETE CODE > [OK].

The code setting is deleted. Access is now only possible using the factory-set user code 0000.

5.8.3 Changing the date/time/daylight sav. t.

Change date:

1. SETUP > DATE/TIME > [OK].

DATE/TIME
DATE
TIME
DAYLIGHT SAV. T.

Change date:

2. DATE > [OK].
3. Use the [Up] or [Down] button to change the date (YYYY.MM.DD) > [OK] > [Esc].

Change time:

4. TIME > [OK].
5. Use the [Up] or [Down] button to change the time > [OK] > [Esc].

Set daylight sav. t.:

6. DAYLIGHT SAV. T. > [OK].

DAYLIGHT SAV. T.
BEGIN
END
TIME SHIFT
OFF

Switch daylight sav. t. off/on:

7. OFF > [OK] > [Esc].

Daylight sav. t. is switched off.

8. DAYLIGHT SAV. T. > [OK].

9. BEGIN > [OK].

BEGIN DAY. SAV. T.
TIME
DATE

10. TIME > [OK].

Use the [Up] or [Down] button to set the time daylight sav. t. begins > [OK] > [Esc].

11. DATE > [OK].

Use the [Up] or [Down] button to set the date daylight sav. t. begins [OK] > [Esc] > [Esc].

12. END > [OK].

13. TIME > [OK].

Use the [Up] or [Down] button to set the time daylight sav. t. ends > [OK] > [Esc].

14. DATE > [OK].

Use the [Up] or [Down] button to set the date daylight sav. t. ends > [OK] > [Esc] > [Esc].

15. TIME SHIFT > [OK].

Use the [Up] or [Down] button to set the number of hours > [OK] > [Esc].

5.8.4 Adjusting the display contrast

1. SETUP > DISPLAY > [OK].

2. Use the [Up] or [Down] button to change the percentage > [OK] > [Esc].

5.8.5 Displaying the program version

1. MAIN MENU > SERVICE > PROGRAM VERSION > [OK].

View program version > [Esc]

PROGRAM VERSION
Oxiperm Pro 162
5g/h
V 0.20.020090426

5.9 Monitoring the production and dosing process

The coloured fields in the service menu structure can only be accessed by service engineers.

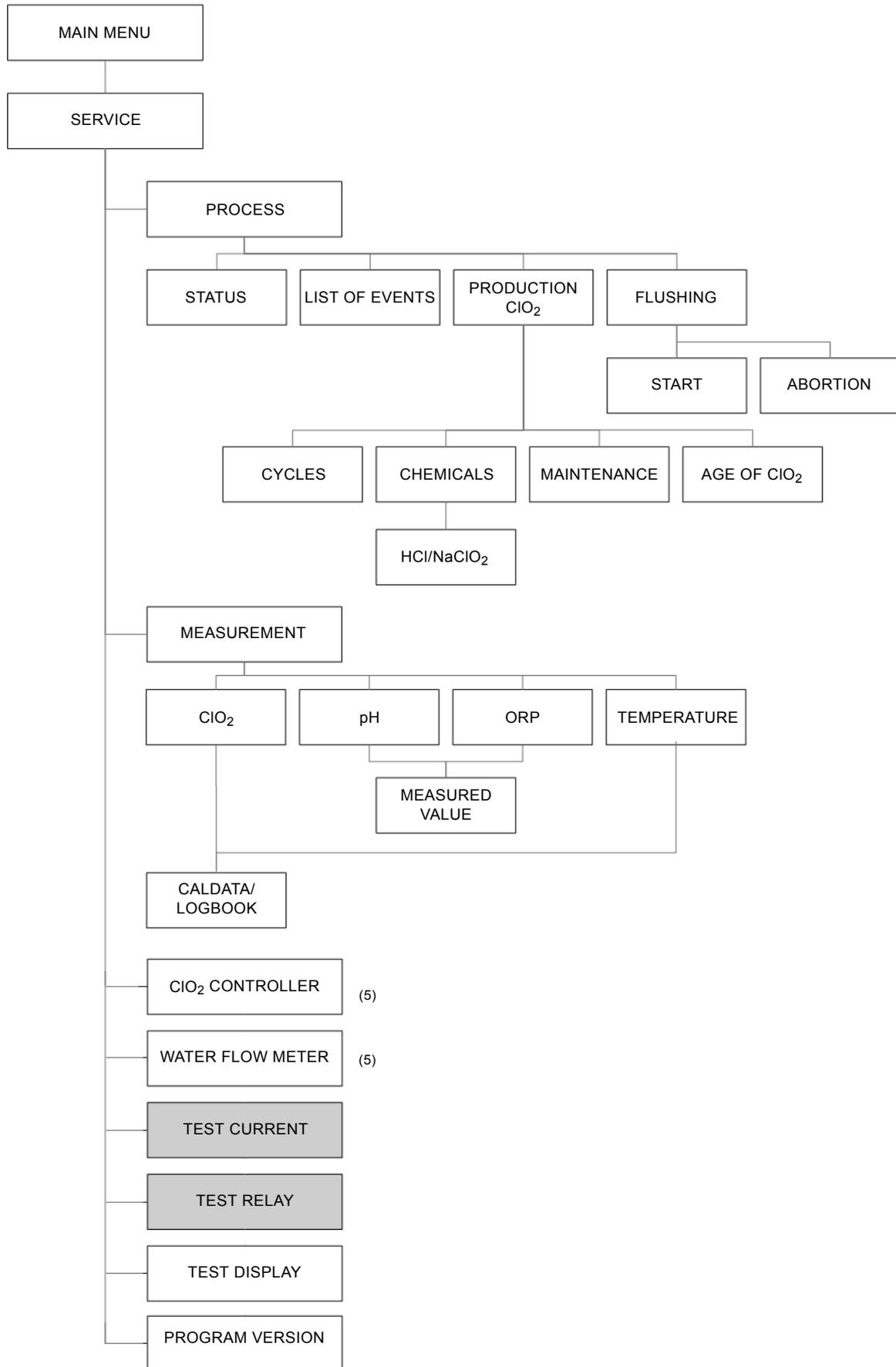


Fig. 16 Service menu structure

(5) Not visible for Group 3 applications

5.9.1 Displaying current measured values for ClO₂, water temperature and pH/ORP

The measured values in this menu as well as the menus TEST CURRENT and TEST RELAY are only displayed if MEASUREMENT has been enabled (with the service code).

Note

If the measuring cell AQC-D6 is selected, only the ClO₂ measured value is displayed.

If the measuring AQC-D1 is selected, the ClO₂ and the pH/ORP measured values are displayed.

The controller parameters in this menu are only displayed if the following has been enabled (with the service code):

Note

- CONTROLLER
- WATER FLOW METER (for proportional controller)
- MEASUREMENT (for setpoint controller)
- WATER FLOW METER and MEASUREMENT (for combined controller).

1. MAIN MENU > SERVICE > [OK].
2. MEASUREMENT > [OK].

MEASUREMENT
ClO ₂
TEMPERATURE
pH/ORP

Displaying the ClO₂ measured value

1. ClO₂ > [OK].

ClO ₂ MEASUREMENT
CALDATA/LOGBOOK
MEASURED VALUE

2. Use the [Down] button to select MEASURED VALUE > [OK].

ClO ₂ MEASUREMENT
0.00 mg/l
0.000 µA
0.0 - 1.0 mg/l

The current ClO₂ measured value is displayed:

- ClO₂ concentration (in mg/l)
- current (in µA)
- set measuring range (in mg/l).

Displaying the calibration logbook for ClO₂

1. Use the [Up] button to select CALDATA/LOGBOOK > [OK].

MEASUREMENT
ClO ₂
TEMPERATURE
pH

2. ClO₂ > [OK].

CALDATA/LOGBOOK
NO.
DATE/TIME
SLOPE

The last 10 calibration data records are listed in chronological order in CALDATA/LOGBOOK. Data record 1 is the one that was last saved.

- Press [OK] to display the previous data record. Use the [Up] or [Down] button to scroll more than five lines.

See section 5.13.1 Perform ClO₂ calibration.

Displaying the pH value

1. MAIN MENU > SERVICE > [OK].
2. MEASUREMENT > [OK].

MEASUREMENT
ClO ₂
TEMPERATURE
pH

3. pH > [OK].

pH MEASUREMENT
CALDATA/LOGBOOK
MEASURED VALUE

4. Use the [Down] button to select MEASURED VALUE > [OK].

pH MEASUREMENT
7.20 pH
-30 mV
0.00 - 14.00 pH

The current pH measured value is displayed:

- pH measured value
- voltage (in mV)
- set measuring range (in pH).

Displaying the calibration logbook for pH

1. Use the [Up] button to select CALDATA/LOGBOOK > [OK].

MEASUREMENT
ClO ₂
pH

2. pH > [OK].

CALDATA/LOGBOOK
NO.
DATE/TIME
SLOPE
ASYM.
CAL. TEMPERATURE

The last 10 calibration data records are listed in chronological order in the CALDATA/LOGBOOK. Data record 1 is the one that was last saved. Data record 2 is the one that was saved before it, etc.

- Press [OK] to display the previous data record. Use the [Up] or [Down] button to scroll more than five lines.

See section 5.13.2 Performing (two-point) pH calibration.

Displaying the ORP value

1. MAIN MENU > SERVICE > [OK].
2. MEASUREMENT > [OK].

```
MEASUREMENT
ClO2
ORP
```

3. ORP > [OK].

```
ORP MEASUREMENT
CALDATA/LOGBOOK
MEASURED VALUE
```

4. Use the [Down] button to select MEASURED VALUE > [OK].

```
ORP MEASUREMENT
-1600 mV
-1500 - 1500 mV
```

The current ORP measured value is displayed:

- ORP measured value: voltage (in mV)
 - set measuring range (in mV).
5. Press [Esc].

Displaying the calibration logbook for ORP

1. Use the [Up] button to select CALDATA/LOGBOOK > [OK].

```
MEASUREMENT
ClO2
ORP
```

2. ORP > [OK].

```
CALDATA/LOGBOOK
NO.
DATE/TIME
ORP OFFSET
```

The last 10 calibration data records are listed in chronological order in the CALDATA/LOGBOOK. Data record 1 is the one that was last saved.

- Press [OK] to display the previous data record.
Use the [Up] or [Down] button to scroll more than five lines.

See section [5.13.3 Performing ORP calibration](#).

Displaying the temperature of the sample water

1. MAIN MENU > SERVICE > [OK].
2. MEASUREMENT > [OK].
3. TEMPERATURE > [OK].
4. MEASURED VALUE > [OK].

```
TEMPERATURE
23 °C
0.0 - 50.0 °C
```

The current measured value is displayed:

- temperature (in °C)
- set measuring range.

If the measuring range is exceeded or not reached, a fault has occurred (for example temperature sensor cable breakage).

5.9.2 Displaying the current dosing flow, controller type, setpoint and other control parameters (not applicable for Group 3 applications)

1. MAIN MENU > SERVICE > [OK].
2. ClO₂ CONTROLLER > [OK].

Displaying the current proportional controller data

If the system is controlled with a proportional controller:

```
ClO2 CONTROLLER
Y OUT: 75 %
PROPORT. CONTRL
DOS CAP: 100 %
INTPU: 10 sec.
MIN ON: 1.0 sec.
DOS. FACT.: 1.0
```

Menu text	Explanation
Y OUT	Controller output signal to the dosing pump, specifies the dosing flow in % (0-100 %, 100 % corresponds to the maximum dosing capacity (Technical Data see enclosure) with stroke length adjustment knob set to 100 %)
PROPORT. CONTRL	Controller type
DOS CAP	Maximum dosing flow (0-100 %) (the value entered in the CONTROLLER menu under DOSING FLOW)
INTPU	Pulse pause time
MIN ON	Minimum on-time
DOS. FACT.	Dosing factor (value calculated by the Oxiperm Pro)

Displaying the current setpoint controller data

If the system is controlled with a setpoint controller:

CIO2 CONTROLLER	
Y OUT:	75 %
SETPT:	0.40 mg/l
SETPOINT CONTRL	
XP:	30 %
TN:	60 sec.
(TV)	
DOS CAP:	100 %
INTPU:	10 sec.
MIN ON:	1.0 sec.

Menu text	Explanation
Y OUT	Controller output signal to the dosing pump, specifies the dosing flow in % (0-100 %, 100 % corresponds to the maximum dosing capacity (Technical Data see enclosure) with stroke-length adjustment knob set to 100 %)
SETPT	Setpoint in mg/l
SETPOINT CONTRL	Controller type
XP	Proportional band: When selecting the P controller range, the actuating variable (dosing volume) is proportional to the system deviation (difference between actual value and setpoint)
TN	Reset time
(TV)	Derivative action time
DOS CAP	Maximum dosing flow (0-100 %) (the value entered in the CONTROLLER menu under DOSING FLOW)
INTPU	Pulse pause time
MIN ON	Minimum on-time

Displaying the current combined controller data

If the system is controlled with a combined controller:

CIO2 CONTROLLER	
Y OUT:	75 %
SETPT:	0.40 mg/l
COMBINED CONTRL	
XP:	83 %
TN:	300 sec.
(TV)	
DOS CAP:	100 %
INTPU:	10 sec.
MIN ON:	1.0 sec.
DOS. FACT.:	1.0

Menu text	Explanation
Y OUT	Controller output signal to the dosing pump, specifies the dosing flow in % (0-100 %, 100 % corresponds to the maximum dosing capacity (Technical Data see enclosure) with stroke-length adjustment knob set to 100 %)
SETPT	Setpoint in mg/l
COMBINED CONTRL	Controller type
XP	Proportional band: When selecting the P controller range, the actuating variable (dosing volume) is proportional to the system deviation (difference between actual value and setpoint)
TN	Reset time
(TV)	Derivative action time
DOS CAP	Maximum dosing flow (0-100 %) (the value entered in the CONTROLLER menu under DOSING FLOW)
INTPU	Pulse pause time
MIN ON	Minimum on-time
DOS. FACT.	Dosing factor (value calculated by the Oxiperm Pro)

5.9.3 Displaying the current input value for the water flow meter (not applicable for Group 3 applications)

1. MAIN MENU > SERVICE > [OK].
2. WATER FLOW METER > [OK].

Displaying the current input value for the contact water meter

WATER FLOW METER
0.00 pulses/sec.
0 %

- "Pulses per second", which correspond to the pulse rate (xxx litres per pulse), and the flow.
- Disturbance variable in percent.

Calculation example with 5 l/pulse, $Q_{max} = 2000$ l/h:
 $2000/5 = 400$ pulses/h = 0.11 pulses/sec.
 This corresponds to a disturbance variable of 100 %.

In case the defined input values are exceeded or not reached, a fault has occurred, for example at the water flow meter.

Displaying the current input value for the flow meter

WATER FLOW METER
0 mA
0 %

- Corresponding current for the flow (in mA).
- Disturbance variable (in percent).

5.9.4 Displaying the process status

Examples:

1. MAIN MENU > SERVICE > [OK].
2. PROCESS > [OK].
3. STATUS > [OK].

PROCESS STATUS
HCl SUPPLY RUNNING

5.9.5 Displaying the list of events

1. MAIN MENU > SERVICE > PROCESS > [OK].
2. LIST OF EVENTS > [OK].

LIST OF EVENTS
NUMBER..... 1/99
PROCESS ABORTION
2008-07-22 11:45

5.9.6 Displaying the number of ClO₂ cycles

1. MAIN MENU > SERVICE > [OK].
2. ClO₂ PRODUCTION > [OK].
3. CYCLES > [OK].

ClO ₂ PRODUCTION
25
CYCLES

After 9999 cycles, the display is reset to 0.

5.9.7 Displaying the maintenance date

1. MAIN MENU > SERVICE > [OK].
2. ClO₂ PRODUCTION > [OK].
3. MAINTENANCE > [OK].

MAINTENANCE
LAST
2008-07-25
NEXT
2009-07-25

5.9.8 Displaying or resetting the chemical consumption after changing containers

The control system calculates the chemical consumption and displays this in litres. It starts automatically at 0.000 l.

Displaying the chemical consumption

1. MAIN MENU > SERVICE > [OK].
2. PROCESS > [OK].
3. ClO₂ PRODUCTION > [OK].
4. CHEMICALS > [OK].

CHEMICALS
HCl
NaClO ₂
RESET

5. HCl > [OK].

HCl
0.000 L
Since 2008-07-31

6. Press [Esc].
 7. NaClO₂ > [OK].
- See the example for HCl.
8. Press [Esc].

Resetting the chemical consumption

1. ClO₂ PRODUCTION > [OK].
2. CHEMICALS > [OK].
3. RESET > [OK].

RESET
HCl
NaClO ₂

4. HCl > [OK].
- The consumption meter is reset to 0.
5. NaClO₂ > [OK].
- The consumption meter is reset to 0.

5.9.9 Indicating age of ClO₂ in the reaction and in reservoir tank

1. MAIN MENU > SERVICE > [OK].
2. ClO₂ PRODUCTION > [OK].

PRODUCTION ClO ₂
CYCLES
CHEMICALS
MAINTENANCE
AGE OF ClO ₂

3. AGE OF ClO₂ > [OK].

AGE OF ClO ₂
REACTION TANK
03:16
STOCK
00:00

The factory setting for both is 00:00 (minutes and seconds).

4. Press [Esc].

5.9.10 Testing the display

1. MAIN MENU > SERVICE > [OK].
2. TEST DISPLAY > [OK].

The test function is started. The display goes completely dark so that each pixel can be checked. In addition, all LEDs are switched on. They light up orange, and the red alarm LED flashes. After about 5 seconds, the display returns to the SERVICE - TEST DISPLAY submenu.

5.10 Changing alarm settings

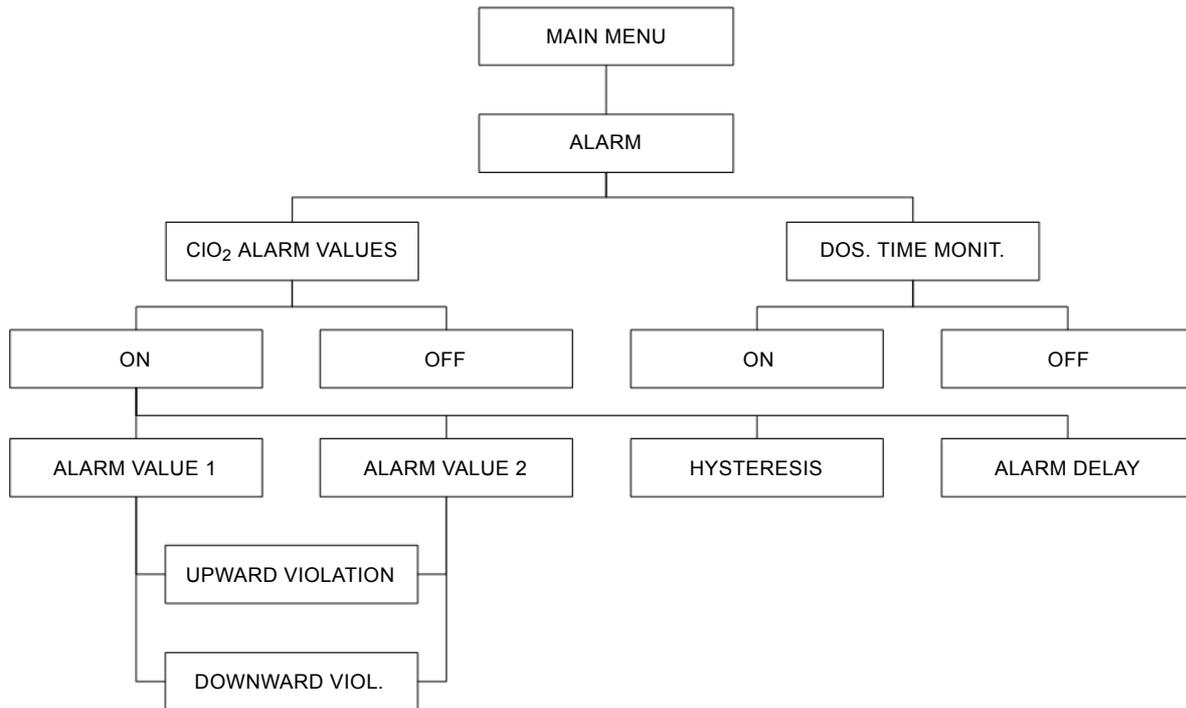


Fig. 17 User alarm settings

To maintain the factory settings, proceed as follows:

Load the value or range to be checked using [OK], and exit the menu using [OK] or [Esc].

To set a different value/range, proceed as follows:

If several values or ranges are available, use the [Up] or [Down] button to select the desired value or range, open it using [OK] and confirm using [OK].

If only one value or range is available, open it using [OK], use the [Up] or [Down] button to modify, and confirm using [OK].

Press [Esc] to exit the menu.

5.10.1 Changing ClO₂ alarm values

1. MAIN MENU > ALARM > [OK].

ALARM
CIO ₂ ALARM VALUES
DOS. TIME MONIT.
EMPTY SIG. RESER.

2. CIO₂ ALARM VALUES > [OK].

CIO ₂ ALARM VALUES
ALARM ON
ALARM OFF

Factory setting: ALARM OFF.

3. Use the [Up] button to select ALARM ON > [OK].

The settings are saved.

CIO ₂ ALARM VALUES
ALARM VALUE 1
ALARM VALUE 2
HYSTERESIS
ALARM DELAY

To set the lower and upper switching points for the alarm, proceed as follows:

Changing alarm value 1

1. ALARM VALUE 1 > [OK].

ALARM VALUE 1
0.15 mg/l

The factory setting for the lower switching point is 0.15 mg/l.

(From start to end, the range is in the unit and resolution of the measured value).

2. Factory setting > [Esc] or another value > [OK].

EFFECTIVE DIRECTION
UPWARD VIOLATION
DOWNWARD VIOL.

The factory setting is DOWNWARD VIOL.

An alarm is triggered in case of a downward violation:

3. DOWNWARD VIOL. > [OK].

In case the set value is not reached, an alarm is triggered, and the following message appears in the 3rd and 4th lines: CIO₂ ALARM VALUE 1 DOWNWARD VIOL.

- Remove the cause of the downward violation.
- Confirm the alarm message.

An alarm is triggered in case of an upward violation:

4. UPWARD VIOLATION > [OK].

In case the set value is exceeded, an alarm is triggered, and the following message appears in the 3rd and 4th lines: CIO₂ ALARM VALUE 1 UPWARD VIOLATION.

- Remove the cause of the upward violation.
- Confirm the alarm message.

Changing alarm value 2

1. MAIN MENU > ALARM > [OK].
2. CIO₂ ALARM VALUES > [OK].
3. ALARM VALUE 2 > [OK].

ALARM VALUE 2
0.70 mg/l

The factory setting for the upper switching point is 0.70 mg/l.

(From start to end, the range is in the unit and resolution of the measured value).

4. Factory setting > [Esc] or another value > [OK].

EFFECTIVE DIRECTION

UPWARD VIOLATION
DOWNWARD VIOL.

The factory setting is UPWARD VIOLATION.

An alarm is triggered in case of an upward violation:

- UPWARD VIOLATION > [OK].

In case the set value is exceeded, an alarm is triggered, and the following message appears in the 3rd and 4th lines: ClO₂ ALARM VALUE 2 UPWARD VIOLATION.

- Remove the cause of the upward violation.
- Confirm the alarm message.

An alarm is to be triggered in case of a downward violation:

- DOWNWARD VIOL. > [OK].

In case the set value is not reached, an alarm is triggered, and the following message appears in the 3rd and 4th lines: ClO₂ ALARM VALUE 2 DOWNWARD VIOL.

- Remove the cause of the downward violation.
- Confirm the alarm message.

5.10.2 Setting the hysteresis

- MAIN MENU > ALARM > [OK].
- ClO₂ ALARM VALUES > [OK].

CIO2 ALARM VALUES

ALARM VALUE 1
ALARM VALUE 2
HYSTERESIS
ALARM DELAY

- HYSTERESIS > [OK].

The factory setting is 0.01 mg/l.

(From 0 to halfway through the measuring range, the range is in the unit and resolution of the measured value).

- Factory setting > [Esc] or another value > [OK] > [Esc].

The HYSTERESIS function can be applied to both set alarm values. The hysteresis indicates the tolerance of the alarm value (alarm value ± hysteresis/2).

5.10.3 Setting the alarm delay

- MAIN MENU > ALARM > [OK].
- ClO₂ ALARM VALUES > [OK].
- ALARM DELAY > [OK].

Factory setting: 0 sec. (setting range from 0 to 999 seconds).

- Factory setting > [Esc] or another value > [OK] > [Esc].

The alarm relay is switched on after the set time has elapsed.

- Press [Esc] > [Esc].

5.10.4 Enabling dosing time monitoring

- MAIN MENU > ALARM > [OK].
- DOS. TIME MONIT. > [OK].

Disable dosing time monitoring:

- OFF > [OK] > [Esc].

Enable dosing time monitoring:

- ON > [OK].

MAX. DOSING TIME

600 minutes

The factory setting is 600 minutes (range 0 to 600 minutes).

- Factory setting > [Esc] or another value > [OK] > [Esc].

An alarm is triggered when the controller specifies the set maximum dosing flow for longer than the set time for the dosing pump (Y OUT = X %).

5.11 Changing chemical containers**Warning**

Risk of serious damage to equipment and personal injury due to confusing the chemical containers or suction lances.

Observe the red and blue labels on chemical containers, suction lances and pumps.

Warning

Risk of burns from stray droplets when removing the lance from the chemical container.

Risk of poisoning from ClO₂ gas.



Before commencing work, put on protective clothing in accordance with GUV-V D05.

Never mix sodium chlorite and hydrochloric acid.

Take care that no stray droplets fall on skin, clothing, shoes or the floor.

Any stray droplets on the container or in the collecting tray must be immediately rinsed away with water.

When must a chemical container be changed?

- As soon as possible if the "pre-empty" signal appears in the display.
 - Immediately if the "empty" signal appears in the display. The system shuts down automatically.
- Unscrew the cover on the chemical container.
 - Carefully remove the suction lance from the container and place it immediately in the drain pipe at the collection container or in the collecting tray.
 - Immediately dilute any stray droplets on the container or floor with water.
 - Remove the empty chemical container and reseal it with the cover for storage until it can be disposed of safely.
 - Have a full chemical container ready.
 - Unscrew the cover and retain it for storage until it can be disposed of safely.
 - Insert the suction lance in the new container, and screw the cover back on.

As soon as the suction lance is fully inserted in the container, the system switches back on. The alarm message is confirmed automatically.

- Reset the chemical consumption display to 0. See section [5.9.8 Displaying or resetting the chemical consumption after changing containers.](#)

5.12 Fault finding

Activated relays can be deactivated using the [Esc] key. An exception is the warning relay, which is activated using the signal "reservoir tank empty". This relay is only deactivated, if the fault is removed.

For trouble-free operation of the system, eliminate the cause of the faults.

5.12.1 Faults with error message

Error message if applicable system reaction	Cause	Remedy
1. Pre-empty signal HCl/NaClO ₂ : – ClO ₂ production proceeds. – Warning relay activated.	a) Chemical container almost empty.	Change the chemical container.
	b) Floater on suction lance has wrong orientation.	Call Service. Turn the floater upside down.
2. Empty signal HCl/NaClO ₂ : – ClO ₂ production stops, continues after fault elimination. – Alarm relay activated.	Chemical container empty.	Change the chemical container.
3. Check ClO ₂ batch: – ClO ₂ production proceeds. – Warning relay activated.	Warning message, undefined contents in the reservoir tank after power supply failure.	Drain the reservoir tank manually, and dispose of the content.
4. Level reservoir tank: – ClO ₂ production is aborted. – Alarm relay activated.	Too much water is flowing into the reservoir tank. The ClO ₂ solution in the reservoir tank is too diluted.	Stop the system.
	a) Solenoid valve leaking.	Check the solenoid valve. Call Service to clean or replace the filter in the solenoid valve.
	b) Faulty float switch in the reaction tank or too much HCl and/or too much NaClO ₂ flowing into the reservoir tank.	Call Service to replace the float switch in the reaction tank.
5. Max.-Max. level ext. batch: – Alarm relay activated.	Faulty float switch in the external batch tank or external batch tank is overfull.	Call Service to replace the float switch in the external batch tank.
6. Timeout H ₂ O supply 1: – ClO ₂ production is aborted. – Alarm relay activated.	Level in the reaction tank increased too slowly during the first water addition (after process start). K1 not reached in time.	Call Service. Check the solenoid valve in the TEST RELAY menu.
	a) Filter in solenoid valve clogged or faulty solenoid valve.	Check the solenoid valve. Replace the filter, if necessary, or replace the solenoid valve.
	b) Dilution water tap not sufficiently open.	If necessary, open the dilution water tap further.
	c) Float switch in the reaction tank damaged.	Call Service to replace the float switch in the reaction tank.
7. Timeout HCl pump: – ClO ₂ production is aborted. – Alarm relay activated.	Level in the reaction tank increased too slowly during HCl supply between contacts K1 and K2. K2 was not reached in time.	Check assembly faults of the hose from pump to reaction tank. Service: In TEST RELAY, check the HCl pump.
	a) Insufficient performance from the HCl pump – Air in suction line and/or dosing head. – Pump not dosing. – Leaking, clogged, porous or bent discharge line.	Check the discharge line. Call Service to replace.
	b) HCl pump not sucking in – Leaking, clogged, porous or bent suction line. – Deposits at the foot valve. – Valve not installed correctly or clogged. – Crystalline deposits in the valves. – Diaphragm broken (leaking). – Valve tappet torn out. – Chemical container empty.	<ul style="list-style-type: none"> • Check the suction line and the suction lance. • Call Service to clean or replace the foot valve. • Call Service to clean the valves. • Call Service to replace the diaphragm. • Check the fill level of the chemical container. • If "HCl empty" signal is indicated, replace the chemical container.
	c) Flow in the pump not OK.	Ventilate the system.
	d) Pump not running at all.	Call Service.
	e) Cable breakage at the control system.	Check the cable from pump to control system. Call Service.
	f) Faulty control system.	Check the control system. Call Service to replace.
	g) Float switch in the reaction tank damaged.	Call Service to replace the float switch in the reaction tank.

Error message if applicable system reaction	Cause	Remedy
8. Timeout pump NaClO ₂ : – ClO ₂ production is aborted. – Alarm relay activated.	Level in the reaction tank increased too slowly during NaClO ₂ supply between contacts K2 and K3. K3 was not reached in time.	Check correct assembly of the hose from pump to reaction tank. Call Service. In TEST RELAY, check the NaClO ₂ pump.
	a) Insufficient performance from the NaClO ₂ pump. For other reasons, see alarm message 7. <i>Timeout HCl pump</i> .	See alarm message 7. <i>Timeout HCl pump</i> .
9. H ₂ O supply 2 timeout: – ClO ₂ production is aborted. – Alarm relay activated.	Level in the reaction tank increased too slowly during the second water addition between contacts K3 and K4. K4 was not reached in time.	
	a) See alarm message 6. <i>Timeout H2O supply 1</i> .	Call Service. In TEST RELAY, check the solenoid valve. Check the water supply. See alarm message 6. <i>Timeout H2O supply 1</i> .
10. Timeout process: – ClO ₂ production is aborted. – Alarm relay activated.	After overflow, it took too long for the reaction tank level to drop back down to K1.	
	a) Air bubbles in the overflow pipe.	Ventilate the system.
	b) Insufficient water supply. See alarm message 6. <i>Timeout H2O supply 1</i> .	See 6. <i>Timeout H2O supply 1</i> .
11. Timeout overflow: – ClO ₂ production is aborted. – Alarm relay activated.	During the third water addition, no overflow from the reaction tank into the reservoir tank could be determined.	
	a) Water supply and solenoid valve.	Call Service. In TEST RELAY, check the water supply and the solenoid valve.
	b) Air bubbles in the overflow pipe.	Ventilate the system.
12. Temperature error: – ClO ₂ production proceeds.	Temperature at the measuring cell has exceeded the set measuring range.	
	a) Problem with the temperature sensor.	Check the temperature sensor. Call Service to replace (see the installation and operating instructions for the measuring cell).
	b) Temperature sensor cable.	Check the temperature sensor cable. Call Service to replace.
	c) Water temperature higher/lower than measuring range.	Check the water temperature.
	d) Temperature measuring range set incorrectly.	Call Service to correct the measuring range.
13. Slope error: – ClO ₂ production proceeds.	Plausibility check for calibration data. Calibration error at calibration level.	Repeat the calibration. Call Service. Clean the cell, or replace the electrodes.
14. Electrode/buffer fault: – ClO ₂ production proceeds.	Auto reading of buffer data. Calibration error at calibration level.	Repeat the calibration. Call Service. Clean the cell, or replace the pH probe.
15. Symmetry error: – ClO ₂ production proceeds.	Plausibility check for asymmetry potential pH calibration data. Calibration error at calibration level.	Repeat the calibration. Call Service. Clean the cell, or replace the pH probe.
16. pH buffer difference error: – ClO ₂ production proceeds.	Alarm was activated by selecting two buffers (with "other" buffer selection), which have a pH difference less than 1 pH. Calibration error at calibration level.	Check the buffer solutions. Repeat calibration, and replace the probe.
17. Calibration time exceeded: – ClO ₂ production proceeds.	Buffer timeout. A fault occurred during pH and ORP calibration. An alarm is activated if the calibration process still does not have a stable measured value once the time has elapsed. Calibration error at calibration level.	Call Service. Check the pH electrode and replace, if necessary.
18. Offset error: – ClO ₂ production proceeds.	Calibration error at calibration level. Only during ORP calibration.	Repeat the ORP calibration, or call Service. Replace the sensor.
19. Calibrate sensor NaClO ₂ /ORP: – ClO ₂ production proceeds.	Triggered when the set monitoring time is reached for the next calibration process (calibration interval).	Calibrate or replace the sensor.

Error message if applicable system reaction	Cause	Remedy
20. Water sensor fault: – ClO ₂ production proceeds. – Combined and setpoint controller stop and start running after fault elimination.		Stop the controller.
	a) Measuring cell float body above the water sensor – flow too high.	Reduce the flow with the measuring cell adjustment spindle.
	b) Measuring cell float body below the water sensor – flow too low.	Increase the flow with the measuring cell adjustment spindle.
	c) Sample-water bleeding point or hose to the measuring cell clogged or leaking.	Check the sample-water bleeding point and the hose to the measuring cell.
	d) No sample-water flow in the measuring cell. Filter clogged.	Call Service. Clean the measuring cell filter.
	e) Insufficient water at the sample-water bleeding point.	Check the flow in the main line at the sample-water bleeding point.
	f) Water sensor.	Call Service to replace the water sensor.
	g) One of the cables from the measuring cell to the control system.	Call Service to replace the cable.
	h) Control system.	Call Service.
	i) Setting in the MAINTENANCE > WATER SENSOR > NC CONTACT/NO CONTACT menu does not correspond with terminal connections.	Setting can only be corrected using super-user-code!
21. Cleaning motor fault: – ClO ₂ production proceeds. – Alarm relay activated. – Combined and setpoint controller stop and start running after fault elimination.	Cleaning motor monitoring in the measuring cell indicates a fault.	Stop the system.
	a) Faulty cleaning motor.	Check the power supply to the cleaning motor. Call Service to replace the cleaning motor.
	b) No power supply to the cleaning motor. Cable breakage.	Check the cable. Call Service to replace.
	c) Gas bubbles in the measuring cell.	Vent the measuring cell.
22. Dosing time ClO ₂ exceeded: – ClO ₂ production proceeds. – Alarm relay activated. – Controller stops ClO ₂ dosing pump until fault is eliminated.	Controller attempts to operate at maximum dosing flow for a period longer than the set time.	
	a) Solution in the reservoir tank has been diluted too much after flushing (after a power supply failure) (for setpoint and combined controllers only).	Continue operation after flushing.
	b) Poor water quality (for setpoint and combined controllers only).	Measure the water quality and the ClO ₂ concentration in the main line.
	c) Water flow meter defective or wrong setting of water flow meter (proportional and combined controllers only).	Check the water flow meter and replace, if necessary.
	d) Measuring cell cable or measuring cell.	Check the measuring cell cable. Call Service to replace.
	e) Chemical container contains only water.	Replace the chemical container.
	f) Controller set incorrectly.	Call Service to check the controller settings.
23. Wire breakage current output 2: – ClO ₂ production proceeds. – Alarm relay activated. – Combined and setpoint controller stop and start running after fault elimination.	Chlorine dioxide measured value can no longer be transmitted.	
	a) Cable breakage at current output.	Service: Check current output measurement with TEST CURRENT menu. Replace the cable, if necessary.
	b) Control system.	Service: Replace the control system, if necessary.
24. Wire breakage current output 1: – ClO ₂ production proceeds. – Alarm relay activated.	Cable breakage at controller output used to control the external dosing pump.	
	a) Cable breakage.	Service: Check current output control with TEST CURRENT menu. Check the cable and replace, if necessary.
	b) Control system.	Service: Replace the control system, if necessary.

Error message if applicable system reaction	Cause	Remedy
25. External error: – ClO ₂ production is aborted. – Alarm relay activated. – Controller stops ClO ₂ dosing pump until fault is eliminated.	An external device that may be connected to a "fault input" (terminal 51/52) indicates a fault.	
	a) External device.	Check the external device.
	b) Cable to the external device.	Check the cable to the external device. Replace, if necessary.
	c) Control system.	Call Service to replace the control system.
26. Annual maintenance due: – ClO ₂ production proceeds.	Maintenance overdue 0-30 days	Call Service.
		The alarm message disappears if maintenance has been enabled.
27. Maintenance date exceeded – stop system: – ClO ₂ production proceeds.	Maintenance overdue for more than 30 days	Stop the system.
		Call Service.
28. Empty signal reservoir tank: – ClO ₂ production proceeds. – Warning relay activated. – Controller stops ClO ₂ dosing pump after 20 seconds until fault is eliminated.	This message is displayed in the following situations:	
	a) During "once" operation, if no other process is running (no fault).	Check the operating mode. In "once" operating mode, this is not a fault.
	b) If the dosing pump pumps the reservoir tank empty before the final chlorine dioxide is available in the reaction tank.	Call Service. If the message appears in every cycle, the controller must be reset. In the monitoring menu, check the measured value under SERVICE > MEASUREMENT. In the SERVICE > CONTROLLER menu, check the displayed parameter. In the SERVICE > WATER FLOW METER menu, check the displayed values.
	c) Faulty water sensor.	Check the water flow meter. Replace, if necessary.
	d) Drain cock at the reservoir tank open.	Close the drain cock.
	e) Measuring cell (for setpoint and combined controllers only).	Check the measuring cell. Call Service to replace the measuring cell.
29. Reaction tank control fault: – ClO ₂ production is aborted. – Alarm relay activated.	Plausibility check float switch in the reaction tank.	
	a) Float switch.	Call Service. Check the float switch in the reaction tank in the TEST LEVEL menu. Replace, if necessary.
	b) Control system.	Call Service. Replace the control system, if necessary.
30. Reservoir control fault: – ClO ₂ production is aborted. – Alarm relay activated.	Plausibility check float switch in the reservoir tank.	
	a) Float switch.	Call Service. Check the float switch in the reservoir tank in the TEST LEVEL menu. Replace, if necessary.
	b) Control system.	Call Service. Replace the control system, if necessary.

Error message if applicable system reaction	Cause	Remedy
31. Current input fault: – ClO ₂ production proceeds. – Alarm relay activated. – Combined and setpoint controller stop.	Wire breakage, current input 1. Occurs in the following situations: <ul style="list-style-type: none"> • If a water flow meter is connected, and the signal exceeds the full-scale value of 20 mA. • If a water flow meter with 4-20 mA is selected, and the signal falls below 3.8 mA. In case of this fault, the controller is also stopped (proportional and combined controllers only).	
	a) Water flow meter.	Check the water flow meter.
	b) Current input/control.	Call Service. Check the current input and control. Supply with a defined current between 0 and 20 mA, and compare with display of SERVICE > WATER METER menu. In case of damaged control, call Service.
	c) Cable breakage between water flow meter and controller.	Call Service to replace the cable.
	d) Water flow meter is connected with 0-20 mA, but set value is 4-20 mA.	Call Service to correct the software setting.
32. ClO ₂ alarm value 1 or 2 exceeded or not reached: – ClO ₂ production proceeds. – Alarm relay activated.	Appears when the set upper switching point for the alarm is exceeded or not reached.	Call Service.

5.12.2 Faults without error message at the OCD-162

The dosing pump stops. The DDI pump display shows the message "ERROR". The DMI or DMX pumps do not display an error message.	The isolating valve of the dosing line is closed.	Open the isolating valve. If the Oxiperm Pro operates in 60 Hz mode, check if the multifunction valve is set to 6 bars at the overflow side. See also the installation and operating instructions for the multifunction valve.
Overdosing of chlorine dioxide dilution due to a "free discharge".	The chlorine-dioxide dosing pump has a "free discharge" into a container. Even if the pump stops, the chlorine dioxide solution continues running into the container due to a siphon effect. The consequence is overdosing. The conditions are: <ul style="list-style-type: none"> • injection unit disconnected. • dosing pump without multi-function valve. 	Connect the multifunction valve at the pump. This will prevent undesired siphoning, i.e. uncontrolled flow of the dosing liquid through the dosing lines.

5.13 Calibration

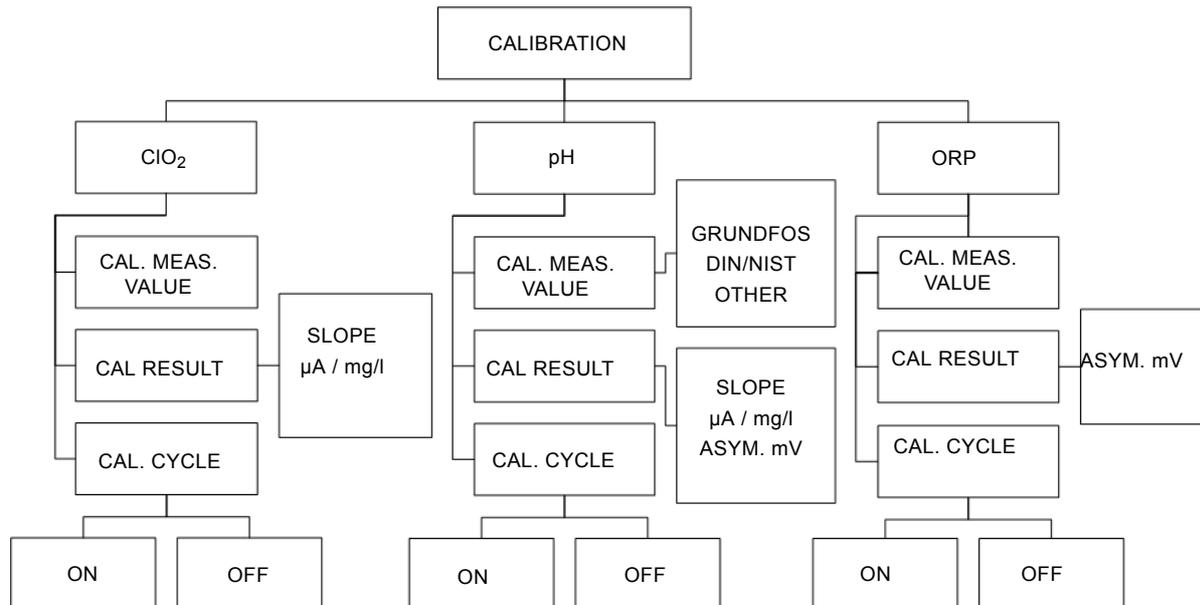


Fig. 18 CALIBRATION menu structure

For information about calibration, please also refer to the installation and operating instructions for the **Oxiperm Pro** measuring cell (AquaCell AQC-D1).

Only perform calibration with constant measured values from the measuring cell.

Note

Prior to calibration, check the electrode measured value of the measuring cell (MAIN MENU > SERVICE > MEASUREMENT > ClO₂ > MEASURED VALUE).

5.13.1 Perform ClO₂ calibration

To calibrate the ClO₂ measured value, a reference measurement must be taken first, for example photometrically (with Grundfos Alldos DIT photometer and the usual ClO₂ reagents).

The reference value that was determined is then entered in the operating software by correcting the current measured value in the measured value display.

The control system reads in the new measured value and assigns the incoming current signal (μA) from calibration at the measuring cell current input to the new measured value.

Check whether the electrode measured value is constant:

1. SERVICE > MEASUREMENT > ClO₂ > MEASURED VALUE.

ClO₂ MEASUREMENT

0.21 mg/l
5.800 μA
0.0 - 0.5 mg/l

- Current ClO₂ concentration at the measuring cell
- Current signal of the measuring cell
- Measuring range.

If the measured value remains constant, proceed as follows:

2. Determine and note down the ClO₂ value by means of a reference measurement.
3. Press [Cal].

CALIBRATION

CHLORINE DIOXIDE
pH/ORP

4. CHLORINE DIOXIDE > [OK].

CHLORINE DIOXIDE

CAL. MEAS. VALUE
CAL. RESULT
CAL. CYCLE

5. CAL. MEAS. VALUE > [OK].

CAL. MEAS. VALUE

0.05 mg/l
I CELL 5.2 μA

6. Use the [Up] or [Down] button to set the mg/l value to the reference value that was determined > [OK].

The control system assigns the reference value to the current signal.

The result is represented geometrically:

When the current (in μA) is entered on the y axis and the ClO₂ concentration (in mg/l) on the x axis, the result is a point. The second point is the 0 point, as no current flows from the electrode when there is no ClO₂ in the water. Joining the two points results in a straight line.

7. CAL. RESULT > [OK].

CAL. RESULT

SLOPE
22.0 μA/ppm

The result is displayed as a slope of the straight line in μA per ppm (ppm = parts per million = mg/l in water).

From now on the control system uses this value as the basis for calculations.

The ClO₂ calibration has been completed.

Reading the slope in the calibration logbook

- SERVICE > MEASUREMENT > [OK].
- ClO₂ > [OK].
- CALDATA/LOGBOOK > [OK].

CALDATA/LOGBOOK	
NO.	1
DATE	31.07.2007
TIME	12:34
SLOPE	22.0 µA

Entry no. 1 is the latest entry, entry no. 2 is the previous one, etc.

Enabling/disabling the display of the ClO₂ calibration interval

- CALIBRATION > ClO₂ > CAL. CYCLE > [OK].
- (Interval) OFF > [OK] or
- (Interval) ON > [OK].

5.13.2 Performing (two-point) pH calibration

The electrode sends the voltage (in mV), that corresponds to the pH value, to the control system.

Two different buffer solutions can be used to calibrate the pH measured value.

- Prepare two glass jars with the buffer solutions.
- Have an empty 10-litre plastic bucket ready.
- Measure the temperature of the buffer solution (using a thermometer).
- Press [Cal].

CALIBRATION	
CHLORINE DIOXIDE	
pH/ORP	

- pH > [OK].

pH	
CAL. MEAS. VALUE	
CAL. RESULT	
CAL. CYCLE	

- CAL. MEAS. VALUE > [OK].

CAL. MEAS. VALUE	
GRUNDFOS	
DIN/NIST	
OTHER	

- Use the [Up] or [Down] button to select one of the three buffer types.

Buffer type	Buffer values
GRUNDFOS	4.01, 7.00, 9.18
DIN/NIST	4.01, 6.86, 9.18
OTHER	The lower and upper buffer values can be freely adjusted (difference of at least 1 pH) within the set pH measuring range.

- GRUNDFOS > [OK].

BUFFER TEMPERATURE	
25 °C	

- Set the measured temperature of the buffer solution in the display > [OK].
- Shut off the measuring cell water supply.
- Unscrew the pH electrode from the measuring cell. Use the bucket to catch any water that runs out. See the end of the section *Alternative method using the calibration lute*.

- Immerse the pH electrode in one of the glass jars containing the buffer solution, for example 4.01 pH.

BUFFER VALUE	
4.01 pH	
7.00 pH	
9.18 pH	

- In the display, select the buffer value of the buffer solution in which the electrode is immersed, for example 4.01 pH > [OK].

CAL	
Please wait	

The voltage in mV at the electrode in the buffer solution (for example 4.01 pH) is measured and assigned to the pH value.

- Remove the pH electrode from the buffer solution, and rinse with water.

- Immerse the pH electrode in the glass jar containing the second buffer solution, for example 7.00 pH.

BUFFER VALUE	
4.01 pH	
7.00 pH	
9.18 pH	

- Select the buffer value of the buffer solution in which the electrode is immersed, for example 7.00 pH.

CAL	
Please wait	

The voltage in mV at the electrode in the second buffer solution (for example 7.00 pH) is measured and assigned to the pH value.

The result is represented geometrically:

When the voltage (mV) is represented on the y axis and the pH value on the x axis, the result is two points. Joining the two points results in a straight line.

- CAL. RESULT > [OK].

CAL. RESULT	
SLOPE	
-57.88 mV/pH	
ASYM.	
-0.6 mV	

The result is displayed as the slope of the straight line, and the asymmetry (the asymmetry is the deviation from the zero point at pH 7). In this example, one pH unit corresponds to -57.88 mV.

PROCESS RUNNING	
21 °C	
0.24 mg/l	
7.00 pH	

- Remove the pH electrode from the buffer solution, and rinse with water.

- Screw the pH electrode back into the measuring cell.

The current pH value of the water in the main water line is updated in the display level.

- Turn the measuring cell water supply back on.

- Dispose of the buffer solution. Do not pour it back into the bottle.

- Pour the contents of the bucket down the drain.

pH calibration has been completed.

Alternative method using the calibration lute

Instead of unscrewing the electrode from the measuring cell, the electrode can be left in the measuring cell, and the "calibration lute" below the electrode at the measuring cell can be used.

1. Unscrew the calibration lute, fill with buffer solution 1, screw back in and calibrate.
2. Unscrew the calibration lute again, rinse with water, fill with buffer solution 2, screw back in and calibrate.
3. Unscrew the calibration lute again, rinse with water and screw back in.

Enabling/disabling the display of the pH calibration interval

1. CALIBRATION > pH > CAL. CYCLE > [OK].
2. (Interval) OFF > [OK] or
3. (Interval) ON > [OK].

5.13.3 Performing ORP calibration

The electrode sends the voltage (in mV), that corresponds to the ORP value, to the control system. It indicates the voltage of all ions in the water (summation parameter).

1. Prepare a glass jar with the ORP buffer solution with a known mV value.
2. Press [Cal].

CALIBRATION
CHLORINE DIOXIDE ORP

3. ORP > [OK].

ORP
CAL. MEAS. VALUE CAL. RESULT CAL. CYCLE

4. MEASURED VALUE > [OK].

CAL. MEAS. VALUE
225 mV

5. Turn off the measuring cell water supply and have a bucket to hand.
6. Unscrew the ORP electrode from the measuring cell. Use the bucket to catch any water that runs out. See the end of the section *Alternative method using the calibration lute*.
7. Immerse the ORP electrode in the glass jar containing the ORP buffer solution.
8. In the display, set the mV value of the ORP buffer solution > [OK].

CAL
Please wait

The mV value of the ORP buffer solution is measured.

9. CAL. RESULT > [OK].

CAL. RESULT
ORP OFFSET -2 mV

The ORP OFFSET value is displayed as the result (for example – 2 mV). This is the deviation between the entered mV value and the measured mV value of the buffer solution.

The control system corrects the measured value of the ORP value in the water of the main line by the offset value.

10. Remove the ORP electrode from the buffer solution, and rinse with water.
11. Screw the ORP electrode back into the measuring cell.
12. Turn on the measuring cell water supply.
13. Dispose of the buffer solution. Do not pour it back into the bottle.

14. Pour the contents of the bucket down the drain.

ORP calibration has been completed.

Alternative method using the calibration lute

Instead of unscrewing the electrode from the measuring cell, the electrode can be left in the measuring cell, and the "calibration lute" that is below the electrode at the measuring cell can be used.

1. Unscrew the calibration lute, fill with buffer solution, screw back in and calibrate.
2. Unscrew the calibration lute again, rinse with water, and screw back in.

Enabling/disabling the display of the ORP calibration interval

1. CALIBRATION > ORP > CAL. CYCLE > [OK].
2. (Interval) OFF > [OK] or
3. (Interval) ON > [OK].

5.13.4 Responding to calibration errors

1. If, for example, 4.0 pH is selected in the display, but the electrode is immersed in a 7.00 buffer solution, the following error message is displayed: BUFFER ERROR.
 - Press [Esc] to abort calibration, and repeat the process correctly.
2. If the slope or asymmetry is outside the norm, the following error message is displayed: SLOPE ERROR, ERROR ASYM. POT.
(This is caused by using an old electrode or buffer solution. Check the expiry date.)
 - Press [Esc] to abort calibration, replace the electrode, and repeat calibration.
3. If the electrode does not send a stable measuring signal to the control system within 120 seconds, the following error message is displayed: CALIBRATION TIME EXCEEDED.
(This is caused by using an old electrode.)
 - Press [Esc] to abort calibration, replace the electrode, and repeat calibration.

5.14 Emergency stop

Aborting ClO₂ production

1. MAIN MENU > PROCESS > [OK].
2. ABORTION > [OK].
3. ABORTION > [OK].

The chemical pumps are stopped. See section [5.4.1 Aborting ClO₂ production](#).

Aborting the dosing process

Switch off the controller in manual operation:

1. Press [Man].
2. ClO₂ CONTROLLER > [OK].

When the controller is switched off (using the service code), the following message is displayed: CHECK SETTINGS. The display returns to the display level. You do not enter manual operation.

When the controller is switched on (using the service code), the following is displayed:

MANUAL OPERATION
ClO ₂ CONTROLLER
DOSING FLOW

3. ClO₂ CONTROLLER > [OK].

CONTROLLER
ON
OFF

The factory setting is ON.

Switch off the controller in manual operation:

4. OFF > [OK] > [Esc].

The controller is switched off. The dosing pump stops.

An emergency stop may also be performed via the higher-level control system.

The service code is required to continue in manual operation (set the dosing flow for dosing once).

Switching off the main switch

- Switch off the system using the main switch.

The production and dosing process are aborted.

To restart, see section [5.5.4 Continuing operation after a power supply interruption](#).

5.15 Switching off the system

1. See section [5.4.1 Aborting ClO₂ production](#).
2. See section [5.6 Flushing](#).
(The dosing pump is switched off automatically as soon as the reservoir tank is empty.)
3. Switch off the main switch.
4. Shut off the stopcock for the dilution water (1b).

To restart, see section [5.5.4 Continuing operation after a power supply interruption](#).

6. Technical data

Identification

Product type: Oxiperm Pro.
 Product number: 162-005 (in this example).
 Series: Disinfection systems.

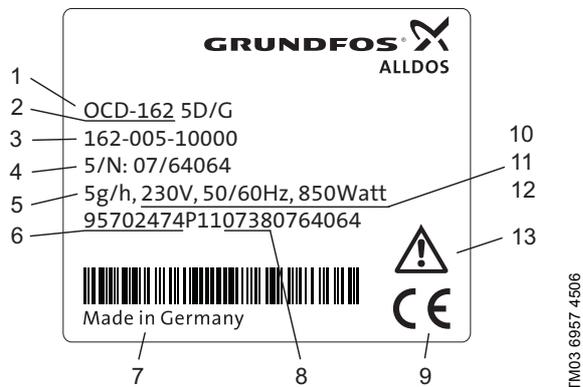


Fig. 19 Nameplate e.g. for OCD-162-5-D/G

Pos.	Description
1	Type designation
2	Product name
3	Model
4	Serial number
5	ClO ₂ production capacity
6	Product number
7	Country of origin
8	Year and week of production
9	Marks of approval, CE mark, etc.
10	Voltage (V)
11	Frequency (Hz)
12	Power consumption
13	Safety instruction: Please read this manual

6.1 Technical data

Performance and consumption data

OCD-162-5: ClO ₂ production capacity	5 g/h
OCD-162-10: ClO ₂ production capacity	10 g/h
OCD-162-30 ClO ₂ production capacity	30 g/h
OCD-162-60 ClO ₂ production capacity	60 g/h
Concentration of the chlorine dioxide solution	Approximately 2 g/l (2000 ppm)
OCD-162-5: HCl component consumption	Approximately 0.17 l/h
OCD-162-10: HCl component consumption	Approximately 0.37 l/h
OCD-162-30 HCl component consumption	Approximately 0.88 l/h
OCD-162-60 HCl component consumption	Approximately 1.71 l/h
OCD-162-5: NaClO ₂ component consumption	Approximately 0.14 l/h
OCD-162-10: NaClO ₂ component consumption	Approximately 0.30 l/h
OCD-162-30 HCl component consumption	Approximately 0.86 l/h
OCD-162-60 HCl component consumption	Approximately 1.63 l/h

Dilution water at 3-6 bar
 OCD-162-5: Approximately 2.3 l/h
 OCD-162-10: Approximately 4.8 l/h
 OCD-162-30: Approximately 14.8 l/h
 OCD-162-60: Approximately 32.5 l/h
 Quality in accordance with EU drinking water ordinance TrinkwV 2001

Maximum back pressure for ClO ₂ dosing pump (5 g/h)		
DMI 50Hz: OCD-162-5-D/G		9 bar
DMI 60Hz: OCD-162-5-D/H		6 bar
DDI 50Hz: OCD-162-5-P/G(H)		10 bar
DDI 60Hz: OCD-162-5-P/G(H)		10 bar

Maximum back pressure for ClO ₂ dosing pump (10 g/h)		
DMI 50Hz: OCD-162-10-D/G		7 bar
DMI 60Hz: OCD-162-10-D/H		5 bar
DDI 50Hz: OCD-162-10-P/G(H)		10 bar
DDI 60Hz: OCD-162-10-P/G(H)		10 bar

Maximum back pressure for ClO ₂ dosing pump (30 g/h)		
DMX 50 Hz: OCD-162-30-D/G		9 bar
DMX 60 Hz: OCD-162-30-D/H		9 bar
DDI 50 Hz: OCD-162-30-P/G(H)		9 bar
DDI 60 Hz: OCD-162-30-P/G(H)		9 bar

Maximum back pressure for ClO ₂ dosing pump (60 g/h)		
DMX 50 Hz: OCD-162-60-D/G		9 bar
DMX 60 Hz: OCD-162-60-D/H		9 bar
DDI 50 Hz: OCD-162-60-P/G(H)		9 bar
DDI 60 Hz: OCD-162-60-P/G(H)		9 bar

Temperatures and humidity

Permissible relative air humidity (no condensation)	Maximum 80 %
Permissible ambient temperature	+5 °C to +35 °C
Permissible dilution water operating temperature	+10 °C to +30 °C
Permissible component operating temperature (chemicals)	+10 °C to +35 °C
Storage temperature of the system (not connected)	-5 °C to +50 °C
Storage temperature of chemicals (not connected)	+5 °C to +40 °C

Dimensions and weight

Permissible height above sea level, where the system is allowed to be operated		5000 m
Total height	OCD-162-30, -60	181 mm
Gross weight (without collecting trays)	OCD-162-5	30 kg
	OCD-162-10	32 kg
	OCD-162-30-D	80 kg
	OCD-162-30-P	79 kg
	OCD-162-60-D	100 kg
Net weight (without collecting trays)	OCD-162-60-P	99 kg
	OCD-162-5	26 kg
	OCD-162-10	28 kg
	OCD-162-30-D	70 kg
Volume compensation bag	OCD-162-30-P	69 kg
	OCD-162-60-D	85 kg
	OCD-162-60-P	84 kg
	OCD-162-5	2 l (1 unit)
OCD-162-10	4 l (2 units)	
OCD-162-30	12 l (1 unit)	
OCD-162-60	24 l (2 units)	

Total volume of reaction tank	OCD-162-5	1.00 l
	OCD-162-10	1.80 l
	OCD-162-30	6.10 l
	OCD-162-60	13.40 l
Total volume of reservoir tank	OCD-162-5	1.00 l
	OCD-162-10	1.80 l
	OCD-162-30	7.00 l
	OCD-162-60	13.90 l
Filling volume of reaction tank	OCD-162-5	0.87 l
	OCD-162-10	1.67 l
	OCD-162-30	5.52 l
	OCD-162-60	11.96 l
Filling volume of reservoir tank	OCD-162-5	0.87 l
	OCD-162-10	1.67 l
	OCD-162-30	6.50 l
	OCD-162-60	13.00 l
Distance between bottom edge of frame and floor	OCD-162-5, -10	Approximately 1 m
Measurements of collecting trays		W x H x D 485 x 270 x 550 mm
Weight of collecting trays		2 x 5.5 kg
External batch tank (50l)	Accessories	L x W x H 840 x 530 x 1640 mm diameter: 315 mm
External batch tank (100l)		L x W x H 840 x 530 x 2000 mm diameter: 315 mm

Permissible chemicals

Permissible concentration of the NaClO ₂ solution	7.5 % *) by weight
Permissible concentration of the HCl solution	9.0 % *) by weight
Total length of suction line including suction lance	(OCD-162-5, -10) 1.3 m (OCD-162-30, -60) 3.0 m or 6.0 m

*) All technical data refer to the nominal concentrations. In operation, deviations up to ± 10 % of the chemicals concentrations are permissible. They can, however, change the performance data of the system specified here.

Materials

System frame	PE
Cover	EPP
Reaction tank/reservoir tank	PVC
Hoses	PTFE/PE
Seals	FPM/PTFE/FKM
Dosing head on pumps	PVC

Grundfos Alldos pumps

HCl

For performance data, see the installation and operating instructions for the pump

OCD-162-5, -10:	DMI 6.0-8
OCD-162-30:	DMI 18-4
OCD-162 -60:	DMX 35-10

Connection on suction side	PE hose 4/6
----------------------------	-------------

Connection on discharge side	PTFE hose 4/6
------------------------------	---------------

NaClO₂

For performance data, see the installation and operating instructions for the pump

OCD-162-5, -10:	DMI 6.0-8
OCD-162-30:	DMI 18-4
OCD-162 -60:	DMX 35-10

Connection on suction side	PE hose 4/6
----------------------------	-------------

Connection on discharge side	PTFE hose 4/6
------------------------------	---------------

ClO₂: OCD-162-5-D/G:

For performance data, see the installation and operating instructions for the pump

	DMI 3.0-10
Connection on suction side	PTFE hose 4/6
Connection on discharge side	PTFE hose 4/6

ClO₂: OCD-162-10-D/G

For performance data, see the installation and operating instructions for the pump

	DMI 6.0-8
Connection on suction side	PTFE hose 4/6
Connection on discharge side	PTFE hose 4/6

ClO₂: OCD-162-5-P/G, -P/H : OCD-162-10-P/G, -PH

For performance data, see the installation and operating instructions for the pump

	DDI 5.5-10
Connection on suction side	PTFE hose 4/6
Connection on discharge side	PTFE hose 4/6

ClO₂: OCD-162-30-D/G

For performance data, see the installation and operating instructions for the pump

	DMX 16-10
Connection on suction side	PTFE hose 9/12
Connection on discharge side	PTFE hose 9/12

ClO₂: OCD-162-30-P/G

For performance data, see the installation and operating instructions for the pump

	DDI 60-10
Connection on suction side	PTFE hose 9/12
Connection on discharge side	PTFE hose 9/12

ClO₂: OCD-162-60-D/G

For performance data, see the installation and operating instructions for the pump

	DMX 35-10
Connection on suction side	PTFE hose 9/12
Connection on discharge side	PTFE hose 9/12

ClO₂: OCD-162-60-P/G

For performance data, see the installation and operating instructions for the pump

	DDI 60-10
Connection on suction side	PTFE hose 9/12
Connection on discharge side	PTFE hose 9/12
Internal diameter of protective pipe	at least 9 mm

Dilution water

Stopcock – ball valve connection	For types, see the Grundfos Alldos data booklet* PE 6/9 mm
Tapping sleeve for dilution water bleeding	For types, see the Grundfos Alldos data booklet*
Hose connection for dilution water at the solenoid valve	Hose PE 6/9 mm or pipe PVC 10/12, pipe G 1/4

* The data booklet is available on www.Grundfosalldos.com.

Main water line

Flow meter and cable (instead of water flow meter)	For types, see Grundfos Alldos data booklet*
Tapping sleeve for injection unit	

* The data booklet is available on www.Grundfosalldos.com.

Permissible measuring cell type

Measures ClO ₂ + pH or ORP	AQC-D1
Measures ClO ₂ only	AQC-D6
Connection for hose Sample-water bleeding and drain	See Grundfos Alldos data booklet*

* The data booklet is available on www.Grundfosalldos.com.

Product number OCD 162-005, -010

Grundfos	Grundfos Alldos	Voltage/frequency	Equipment
95702474	162-005-10000	230 V, 50/60 Hz	With dosing pump DMI 3.0-10
95702475	162-005-10001	115 V, 50/60 Hz	With dosing pump DMI 3.0-10
95702476	162-005-10002	230 V, 50/60 Hz	Without dosing pump
95702477	162-005-10003	115 V, 50/60 Hz	Without dosing pump
95702478	162-010-10000	230 V, 50/60 Hz	With dosing pump DMI 6.0-8
95702479	162-010-10001	115 V, 50/60 Hz	With dosing pump DMI 6.0-8
95702480	162-010-10002	230 V, 50/60 Hz	Without dosing pump
95702481	162-010-10003	115 V, 50/60 Hz	Without dosing pump
95707848	162-005-10004	230 V, 50/60 Hz	With dosing pump DDI 5.5-10
95707849	162-005-10005	115 V, 50/60 Hz	With dosing pump DDI 5.5-10
95707850	162-010-10004	230 V, 50/60 Hz	With dosing pump DDI 5.5-10
95707851	162-010-10005	115 V, 50/60 Hz	With dosing pump DDI 5.5-10

Product number OCD 162-030, -060

Grundfos	Grundfos Alldos	Voltage / frequency	Equipment
95718444	162-030-10000	230 V, 50/60 Hz	Dosing pump DMX 15-10 Suction line 3.0 m
95718445	162-030-10001	115 V, 50/60 Hz	Dosing pump DMX 15-10 Suction line 3.0 m
95718446	162-030-10002	230 V, 50/60 Hz	Dosing pump DDI 60-10 Suction line 3.0 m
95718447	162-030-10003	115 V, 50/60 Hz	Dosing pump DDI 60-10 Suction line 3.0 m
95718452	162-060-10000	230 V, 50/60 Hz	Dosing pump DMX 35-10 Suction line 3.0 m
95718453	162-060-10001	115 V, 50/60 Hz	Dosing pump DMX 35-10 Suction line 3.0 m
95718454	162-060-10002	230 V, 50/60 Hz	Dosing pump DDI 60-10 Suction line 3.0 m
95718455	162-060-10003	115 V, 50/60 Hz	Dosing pump DDI 60-10 Suction line 3.0 m
95718448	162-030-10004	230 V, 50/60 Hz	Dosing pump DMX 15-10 Suction line 6.0 m
95718449	162-030-10005	115 V, 50/60 Hz	Dosing pump DMX 15-10 Suction line 6.0 m
95718450	162-030-10006	230 V, 50/60 Hz	Dosing pump DDI 60-10 Suction line 6.0 m
95718451	162-030-10007	115 V, 50/60 Hz	Dosing pump DDI 60-10 Suction line 6.0 m
95718456	162-060-10004	230 V, 50/60 Hz	Dosing pump DMX 35-10 Suction line 6.0 m
95718457	162-060-10005	115 V, 50/60 Hz	Dosing pump DMX 35-10 Suction line 6.0 m
95718458	162-060-10006	230 V, 50/60 Hz	Dosing pump DDI 60-10 Suction line 6.0 m
95718459	162-060-10007	115 V, 50/60 Hz	Dosing pump DDI 60-10 Suction line 6.0 m

Electrical data

Power supply connection	115 V, 50/60 Hz or 230 V, 50/60 Hz
Power consumption of the basic system without external consumer load	OCD-162-5, -10 Max. 100 VA OCD-162-30 Max. 180 VA OCD-162-60 Max. 320 VA
Maximum permissible power consumption of the whole system	Max. 850 VA
Maximum permissible load on the potential-free output contacts	Max. 550 VA (250V x 2A)
Electronic protection level	IP65
Enclosure class, dosing pump	IP65
Enclosure class, solenoid valve	IP65

Connections for the control system – inputs

Analog input for flow meter	Current input 0(4)-20 mA Load: 50 Ω
Analog input	Chlorine dioxide concentration Measuring cell (optional) Pt100 water temperature sensor in the measuring cell
Contact input (compound-loop control)	Contact water meter Maximum 50 pulses/second Maximum voltage: 13 V
External input stop	For process enabling and for external error
mV input	pH or ORP
53, 54, H ₂ O	Sample-water deficiency sensor measuring cell Maximum voltage: 13 V
Switching input K1	Reaction tank water supply to level K1
Switching input K2	Reaction tank HCl supply level
Switching input K3	Reaction tank NaClO ₂ supply level
Switching input K4	Reaction tank water supply to level K4
Switching input K5	Min. level in reservoir tank → empty signal
Switching input K6	Max. level in reservoir tank → error signal
Switching input K7	HCl container level Contact open → pre-empty signal HCl
Switching input K8	Container level HCL Contact open → empty signal HCl
Switching input K9	NaClO ₂ container level Contact open → pre-empty signal NAClO ₂
Switching input K10	NaClO ₂ container level Contact open → empty signal NAClO ₂
Switching input K11	ext. batch tank → min. level
Switching input K12	ext. batch tank → max. level
Switching input K13	ext. batch tank → max.-max. level

Connections for the control system – outputs

Analog output mA out, 0(4)-20 mA	Current output Control
Analog output for external device (proportional to ClO ₂ concentration)	Current output Measured value for check measurements 0(4)-20 mA Load: 500 Ω
Solenoid valve for water supply	Relay 1
HCl pump	Relay 2
NaClO ₂ pump	Relay 3
Alarm relay (changeover contact) Potential-free output	Relay 4
Warning relay Potential-free output	Relay 5
ClO ₂ dosing pump	Relay 6

7. Applicable standards and directives

DIN EN	Applicable standards and directives
EN 809: 1998	Pumps and pump units for liquids - Common safety requirements; German version EN 809: 1998
EN 61000-3-2: 2006	Emitted interference
EN 61000-3-3	Emitted interference
EN 61326-1: 2006	Immunity to interference for the industrial sector
EN 61326-1: 2006	Emitted interference Class B
DIN EN ISO 12100-1 and -2 (2004 - 04)	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology (ISO 12100-1: 2003); German version EN ISO 12100-1: 2003; Part 2: Technical principles (ISO 12100-2: 2003); German version ISO 12100-2: 2003 (Replaces EN 292-1, -2)
DIN EN 938	Chemicals used for treatment of water intended for human consumption - Sodium chlorite
DIN EN 939	Chemicals used for treatment of water intended for human consumption - Hydrochloric acid
DIN EN 12671: 2007	Chemicals used for treatment of water intended for human consumption <ul style="list-style-type: none"> Chlorine dioxide generated in situ; German version EN 12671: 2007, <ul style="list-style-type: none"> Chlorine dioxide; German version EN 12671: 2000
98/37/EC	Machinery directive
2006/95/EC	Low voltage directive
DVGW worksheet W224 W624	Dosing of a chlorine dioxide solution generated in situ for the purpose of disinfection
GUV-V D05	Regulation for the prevention of accidents "Chlorination of Water" of the Rheinischer Gemeindeunfallversicherungsverband Heyestraße 99 40625 Düsseldorf, Germany dated April 1979 in the version dated January 1997, valid since 1st January 1997
TrinkwV 2001	Drinking water ordinance, valid since January 2003

8. Operator's accessory list

Prior to installation, the operator must purchase the following accessories according to the product numbers in the Grundfos Alldos data booklet and the technical data. The data booklet is available on www.Grundfosalldos.com.

Accessories to be purchased	Available from Grundfos Alldos
1. Container with diluted HCl (diluted concentration of 9.0 % by weight in accordance with DIN EN 939)	No
2. Container with diluted NaClO ₂ (diluted concentration of 7.5 % by weight in accordance with DIN EN 938)	No
3. Two collecting trays for chemical containers	Yes
4. Inductive or ultrasound flow meter, if necessary	Yes
5. Connection cable, if necessary	Yes
For dilution water line (if no mixing module with dilution water connection has been ordered):	
6. Tapping sleeve	Yes
7. Double nipple	No
8. Ball valve	No
9. Hose connection for dilution water hose	No
For main water line:	
10. Tapping sleeve for injection unit	Yes
11. Two tapping sleeves for extension module, if necessary	Yes
12. Tapping sleeve for sample-water bleeding	Yes
13. Sample-water filter (in case of insufficient water quality)	Yes
Oxiperm Pro hoses:	
14. Hose between dilution water and solenoid valve	Yes
15. Dosing line between dosing pump and injection unit	Yes
Measuring cell hoses:	
16. Hose between measuring cell and sample-water bleeding point	Yes
17. Hose between measuring cell and drain	Yes
For mixing module, if installed:	
18. Hose between mixing module and main water line and hose back to mixing module	Yes
19. Dosing line between dosing pump and injection unit in mixing module	Yes
Or for measuring module, if installed:	
20. Hose between measuring module and main water line and hose back to measuring module	Yes
21. Protective tube for dosing hose	No
22. Main switch	No
Cables:	
23. Oxiperm Pro power supply cable	No
24. Cable for measuring module or mixing module, if necessary	No
25. Protective clothing (in accordance with German GUV-V D05)	Yes
26. Two 10-litre plastic buckets	No
27. 100 g sodium thiosulphate (20 g per flushing process)	No

9. Dimensional sketch OCD-162-5, -10

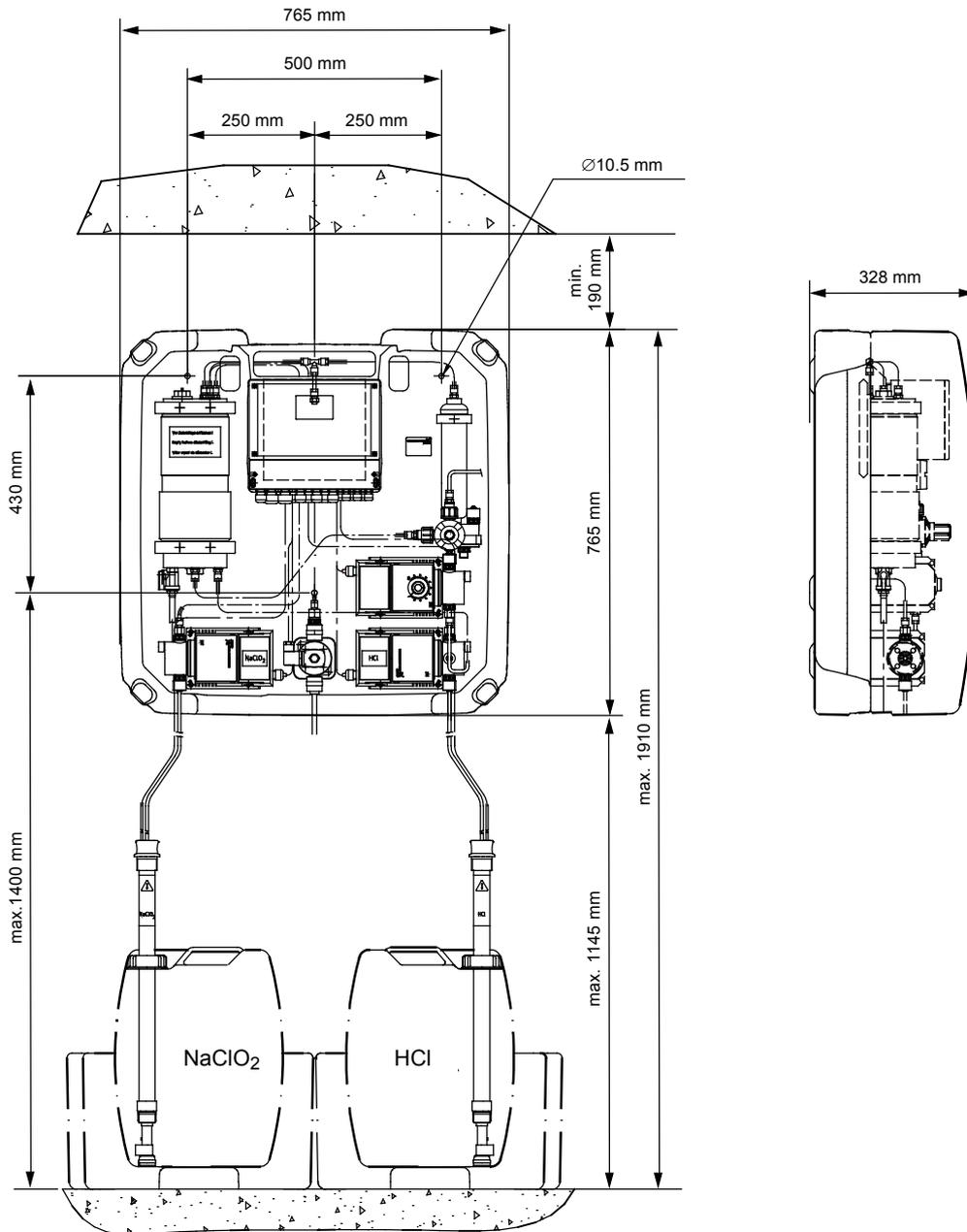


Fig. 20 Oxiperm Pro with drill holes (OCD-162-5, -10)

TM03 6924-4506

Dimensional sketch OCD-162-30, -60

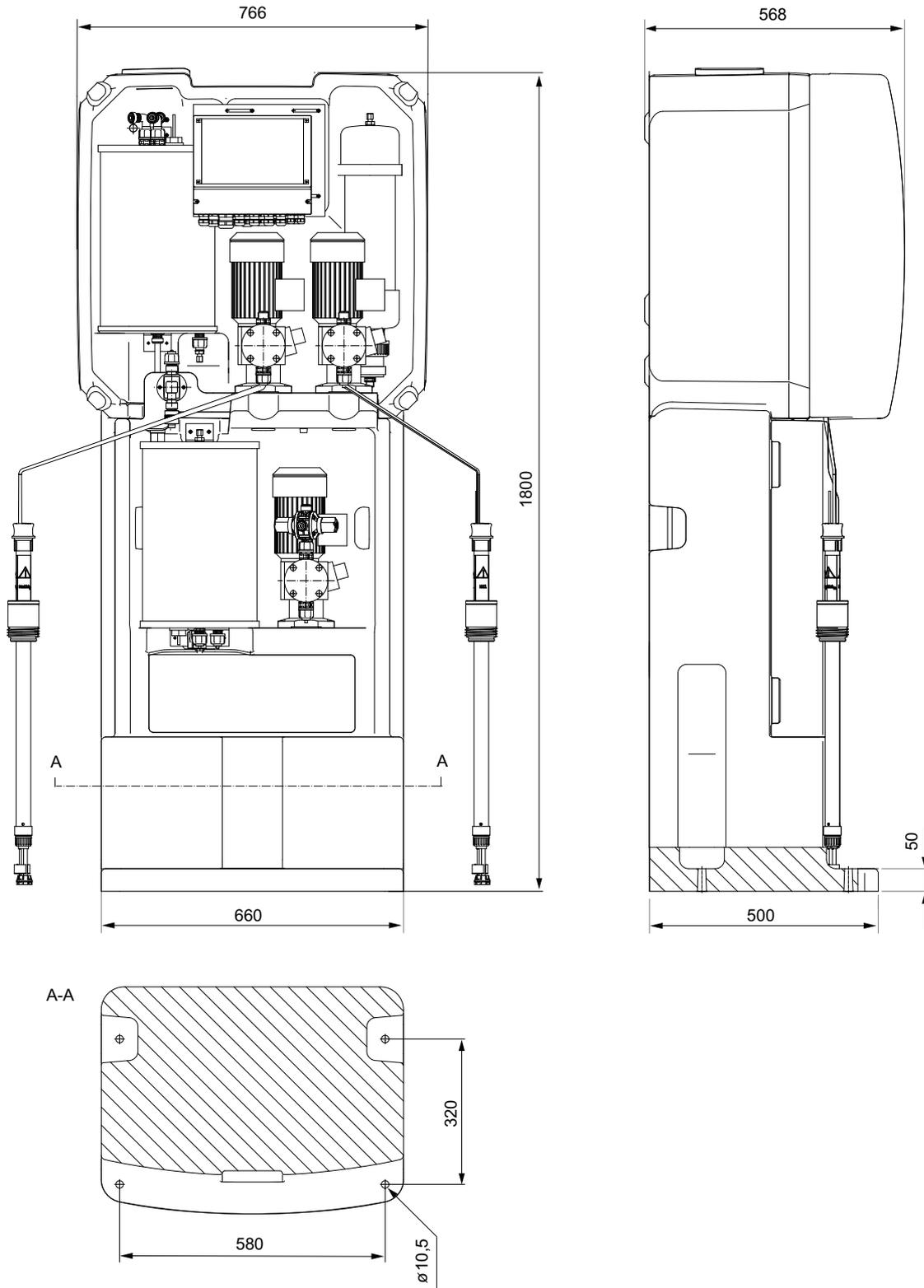


Fig. 21 Oxiperm Pro with drill holes (OCD-162-30, -60)

Length of the suction lines: max. 6.0 m.

Room height: min. 2.2 m.

Distance of both sides: min. 0.2 m.

TIM04 0852 1709

10. Photos

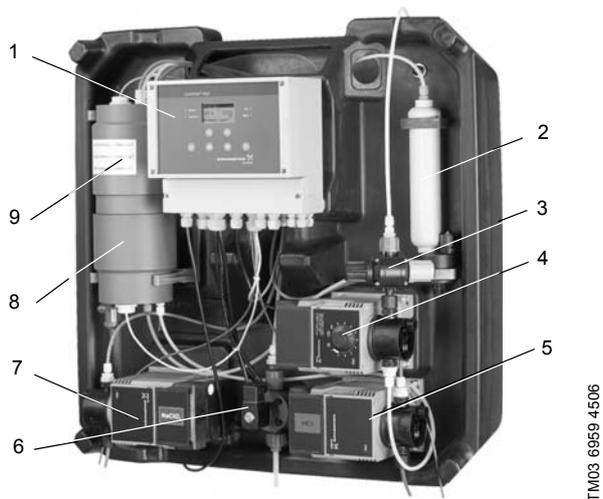
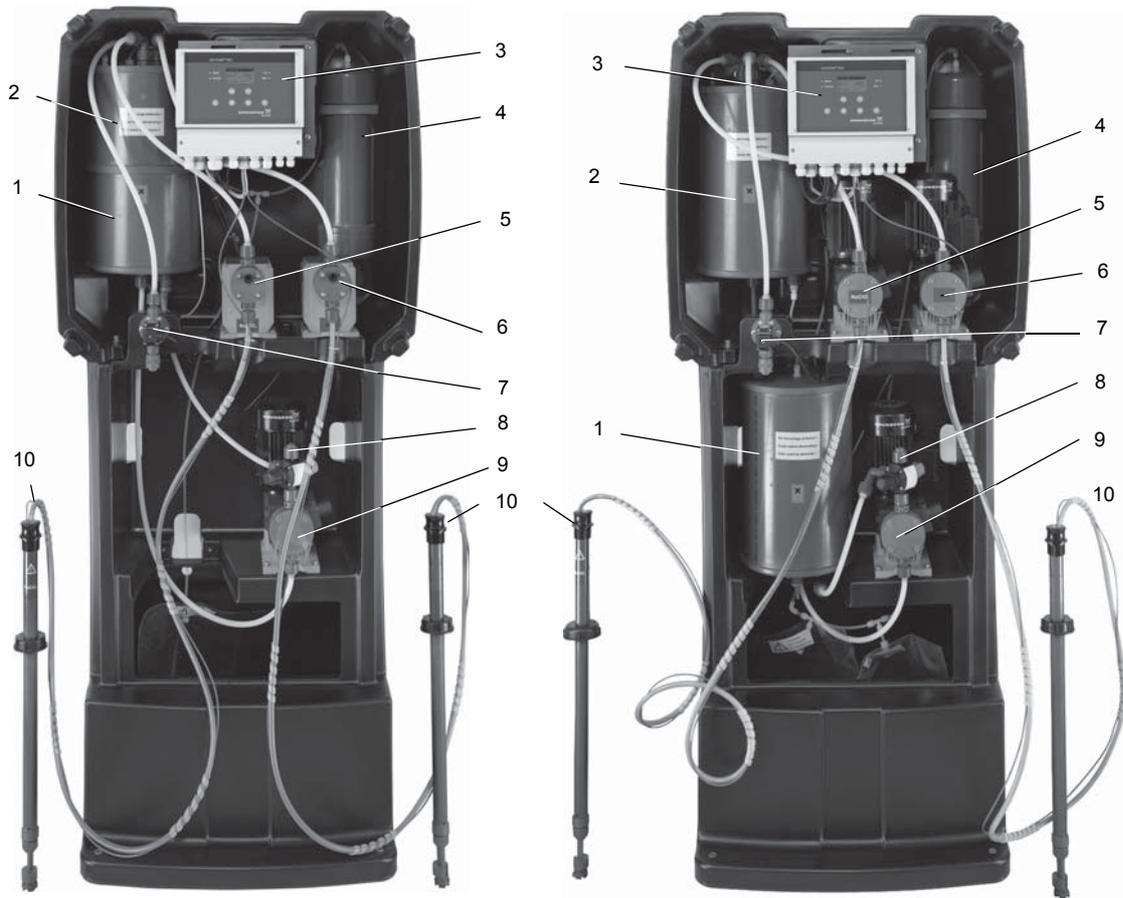


Fig. 22 The Oxiperm Pro OCD-162-5, -10 with components according to fig. 3

Pos.	Components
1	Controller with display and control panel
2	Activated carbon filter
3	Multi-function valve
4	Dosing pump for chlorine dioxide (ClO_2)
5	Dosing pump for hydrochloric acid (HCl)
6	Solenoid valve
7	Dosing pump for sodium chlorite (NaClO_2)
8	Reservoir tank with drain cock
9	Reaction tank with connections on top



TM03 6959 4506

Fig. 23 Oxiperm Pro OCD-162-30, -60 with components according to fig. 4

Pos.	Components
1	Reservoir tank with drain cock
2	Reaction tank with connections on top
3	Controller with display and control panel
4	Absorption filter
5	Dosing pump for sodium chlorite (NaClO_2)
6	Dosing pump for hydrochloric acid (HCl)
7	Solenoid valve for dilution water
8	Multi-function valve
9	Dosing pump for chlorine dioxide (ClO_2)
10	Suction set

11. Disposal

The Oxiperm Pro disinfection system and its associated parts must be disposed of in an environmentally friendly way.

Note

The system may only be dismantled by authorised and qualified personnel.

The operator is responsible for ensuring an environmentally friendly disposal.

Before dismantling, the system must be completely rinsed with water in order to remove the chemicals from the reaction tank, the hoses and the pumps. The dosing line must be placed outdoors to let residual chlorine dioxide escape.

For environmentally friendly disposal, the operator should hand over the **Oxiperm Pro** disinfection system or its parts to a private disposal system. If there is none in your region, send the **Oxiperm Pro** to the nearest Grundfos Alldos company.

Argentina

Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Lote 34A
1619 - Garin
Pcia. de Buenos Aires
Phone: +54-3327 414 444
Telefax: +54-3327 411 111

Australia

Grundfos Alldos
Dosing & Disinfection
ALLDOS Oceania Pty. Ltd.
Unit 3 / 74 Murdoch Circuit
Acacia Ridge QLD 4100
Phone: +61 (0)7 3712 6888
Telefax: +61 (0)7 3272 5188
E-mail: alldos.au@alldos.com

Australia

GRUNDFOS Pumps Pty. Ltd.
P.O. Box 2040
Regency Park
South Australia 5942
Phone: +61-8-8461-4611
Telefax: +61-8-8340 0155

Austria

GRUNDFOS Pumpen Vertrieb Ges.m.b.H.
Grundfosstraße 2
A-5082 Grödig/Salzburg
Tel.: +43-6246-883-0
Telefax: +43-6246-883-30

Belgium

N.V. GRUNDFOS Bellux S.A.
Boomssesteenweg 81-83
B-2630 Aartselaar
Tél.: +32-3-870 7300
Télécopie: +32-3-870 7301

Belorussia

Представительство ГРУНДФОС в
Минске
220123, Минск,
ул. В. Хоружей, 22, оф. 1105
Тел.: +(37517) 233 97 65
Факс: (37517) 233 9769
E-mail: grundfos_minsk@mail.ru

Bosnia/Herzegovina

GRUNDFOS Sarajevo
Trg Heroja 16,
BiH-71000 Sarajevo
Phone: +387 33 713 290
Telefax: +387 33 659 079
e-mail: grundfos@bih.net.ba

Brazil

Mark GRUNDFOS Ltda.
Av. Humberto de Alencar Castelo Branco,
630
CEP 09850 - 300
São Bernardo do Campo - SP
Phone: +55-11 4393 5533
Telefax: +55-11 4343 5015

Bulgaria

GRUNDFOS Pumpen Vertrieb
Representative Office - Bulgaria
Bulgaria, 1421 Sofia
Lozenetz District
105-107 Arsenalski Blvd.
Phone: +359 2963 3820, 2963 5653
Telefax: +359 2963 1305

Canada

GRUNDFOS Canada Inc.
2941 Brighton Road
Oakville, Ontario
L6H 6C9
Phone: +1-905 829 9533
Telefax: +1-905 829 9512

China

Grundfos Alldos
Dosing & Disinfection
ALLDOS (Shanghai) Water Technology
Co. Ltd.
West Unit, 1 Floor, No. 2 Building (T 4-2)
278 Jinhu Road, Jin Qiao Export Process-
ing Zone
Pudong New Area
Shanghai, 201206
Phone: +86 21 5055 1012
Telefax: +86 21 5032 0596
E-mail: alldos.cn@alldos.com

China

GRUNDFOS Pumps (Shanghai) Co. Ltd.
22 Floor, Xin Hua Lian Building
755-775 Huai Hai Rd, (M)
Shanghai 200020
PRC
Phone: +86-512-67 61 11 80
Telefax: +86-512-67 61 81 67

Croatia

GRUNDFOS CROATIA d.o.o.
Cebini 37, Buzin
HR-10010 Zagreb
Phone: +385 1 6595 400
Telefax: +385 1 6595 499
www.grundfos.hr
Czech Republic
GRUNDFOS s.r.o.
Čapkovského 21
779 00 Olomouc
Phone: +420-585-716 111
Telefax: +420-585-716 299

Denmark

GRUNDFOS DK A/S
Martin Bachs Vej 3
DK-8850 Bjerringbro
Tlf.: +45-87 50 50 50
Telefax: +45-87 50 51 51
E-mail: info_GDK@grundfos.com
www.grundfos.com/DK

Estonia

GRUNDFOS Pumps Eesti OÜ
Peterburi tee 92G
11415 Tallinn
Tel: + 372 606 1690
Fax: + 372 606 1691

Finland

OY GRUNDFOS Pumput AB
Mestariintie 11
FIN-01730 Vantaa
Phone: +358-3066 5650
Telefax: +358-3066 56550

France

Grundfos Alldos
Dosing & Disinfection
ALLDOS S.A.R.L.
7, rue Gutenberg
F-67610 La Wantzenau
Tél.: +33-3 88 59 26 26
Télécopie: +33-3 88 59 26 00
E-mail: alldos.fr@alldos.com

France

Pompes GRUNDFOS Distribution S.A.
Parc d'Activités de Chesnes
57, rue de Malacombe
F-38290 St. Quentin Fallavier (Lyon)
Tél.: +33-4 74 82 15 15
Télécopie: +33-4 74 94 10 51

Germany

Grundfos Alldos
Dosing & Disinfection
ALLDOS Eichler GmbH
Reetzstraße 85
D-76327 Pfinztal (Söllingen)
Tel.: +49 7240 61-0
Telefax: +49 7240 61-177
E-mail: alldos.de@alldos.com

Germany

GRUNDFOS GMBH
Schlüterstr. 33
D-40699 Erkrath
Tel.: +49-(0) 211 929 69-0
Telefax: +49-(0) 211 929 69-3799
E-mail: infoservice@grundfos.de
Service in Deutschland:
E-mail: kundendienst@grundfos.de

Greece

GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Phone: +0030-210-66 83 400
Telefax: +0030-210-66 46 273

Hong Kong

GRUNDFOS Pumps (Hong Kong) Ltd.
Unit 1, Ground floor
Siu Wai Industrial Centre
29-33 Wing Hong Street &
68 King Lam Street, Cheung Sha Wan
Kowloon
Phone: +852-27861706 / 27861741
Telefax: +852-27858664

Hungary

GRUNDFOS Hungária Kft.
Park u. 8
H-2045 Törökbálint,
Phone: +36-23 511 110
Telefax: +36-23 511 111

India

GRUNDFOS Pumps India Private Limited
118 Old Mahabalipuram Road
Thoraipakkam
Chennai 600 096
Phone: +91-44 2496 6800
Indonesia
PT GRUNDFOS Pompa
Jl. Rawa Sumur III, Blok III / CC-1
Kawasan Industri, Pulogadung
Jakarta 13930
Phone: +62-21-460 6909
Telefax: +62-21-460 6910 / 460 6901

Ireland

GRUNDFOS (Ireland) Ltd.
Unit A, Merrywell Business Park
Ballymount Road Lower
Dublin 12
Phone: +353-1-4089 800
Telefax: +353-1-4089 830

Italy

GRUNDFOS Pompe Italia S.r.l.
Via Gran Sasso 4
I-20060 Truccazzano (Milano)
Tel.: +39-02-95838112
Telefax: +39-02-95309290 / 95838461

Japan

GRUNDFOS Pumps K.K.
Gotanda Metalion Bldg. 5F,
5-21-15, Higashi-gotanda
Shiagawa-ku, Tokyo,
141-0022 Japan
Phone: +81 35 448 1391
Telefax: +81 35 448 9619

Korea

GRUNDFOS Pumps Korea Ltd.
6th Floor, Aju Building 679-5
Yeoksam-dong, Kangnam-ku, 135-916
Seoul, Korea
Phone: +82-2-5317 600
Telefax: +82-2-5633 725

Latvia

SIA GRUNDFOS Pumps Latvija
Deglava biznesa centrs
Augusta Deglava ielā 60, LV-1035, Rīga,
Tālr.: + 371 714 9640, 7 149 641
Fakss: + 371 914 9646

Lithuania

GRUNDFOS Pumps UAB
Smolensko g. 6
LT-03201 Vilnius
Tel: + 370 52 395 430
Fax: + 370 52 395 431

Malaysia

GRUNDFOS Pumps Sdn. Bhd.
7 Jalan Peguam U1/25
Glenmarie Industrial Park
40150 Shah Alam
Selangor
Phone: +60-3-5569 2922
Telefax: +60-3-5569 2866

México

Bombas GRUNDFOS de México S.A. de
C.V.
Boulevard TLC No. 15
Parque Industrial Stiva Aeropuerto
Apodaca, N.L. 66600
Phone: +52-81-8144 4000
Telefax: +52-81-8144 4010

Netherlands

Grundfos Alldos
Dosing & Disinfection
ALLDOS BV
Leerlooiersstraat 6
NL-8601 WK Sneek
Tel.: +31-51 54 25 789
Telefax: +31-51 54 30 550
E-mail: alldos.nl@alldos.com

Netherlands

GRUNDFOS Netherlands
Veluwezoom 35
1326 AE Almere
Postbus 22015
1302 CA ALMERE
Tel.: +31-88-478 6336
Telefax: +31-88-478 6332
e-mail: info_gnl@grundfos.com

New Zealand

GRUNDFOS Pumps NZ Ltd.
17 Beatrice Tinsley Crescent
North Harbour Industrial Estate
Albany, Auckland
Phone: +64-9-415 3240
Telefax: +64-9-415 3250

Norway

GRUNDFOS Pumper A/S
Strømsveien 344
Postboks 235, Leirdal
N-1011 Oslo
Tlf.: +47-22 90 47 00
Telefax: +47-22 32 21 50

Poland

GRUNDFOS Pompy Sp. z o.o.
ul. Klonowa 23
Baranowo k. Poznań
PL-62-081 Przeźmierowo
Tel: (+48-61) 650 13 00
Fax: (+48-61) 650 13 50

Portugal

Bombas GRUNDFOS Portugal, S.A.
Rua Calvet de Magalhães, 241
Apartado 1079
P-2770-153 Paço de Arcos
Tel.: +351-21-440 76 00
Telefax: +351-21-440 76 90

Romania

GRUNDFOS Pompe România SRL
Bd. Biruintei, nr 103
Pantelimon county Ifov
Phone: +40 21 200 4100
Telefax: +40 21 200 4101
E-mail: romania@grundfos.ro

Russia

ООО Грундфос
Россия, 109544 Москва, ул. Школьная
39
Тел. (+7) 495 737 30 00, 564 88 00
Факс (+7) 495 737 75 36, 564 88 11
E-mail grundfos.moscow@grundfos.com

Serbia

GRUNDFOS Predstavništvo Beograd
Dr. Milutina Ivkovića 2a/29
YU-11000 Beograd
Phone: +381 11 26 47 877 / 11 26 47 966
Telefax: +381 11 26 48 340

Singapore

GRUNDFOS (Singapore) Pte. Ltd.
24 Tuas West Road
Jurong Town
Singapore 638381
Phone: +65-6865 1222
Telefax: +65-6861 8402

Slovenia

GRUNDFOS PUMPEM VERTRIEB
Ges.m.b.H.,
Podružnica Ljubljana
Šlandrova 8b, SI-1231 Ljubljana-Črnuče
Phone: +386 1 568 0610
Telefax: +386 1 568 0619
E-mail: slovenia@grundfos.si

South Africa

Grundfos Alldos
Dosing & Disinfection
ALLDOS (Pty) LTD
98 Matroosberg Road, Waterkloof Park
P.O. Box 36505, Menlo Park 0102
0181 ZA Pretoria
E-mail: alldos.za@alldos.com

Spain

Bombas GRUNDFOS España S.A.
Camino de la Fuentevilla, s/n
E-28110 Algete (Madrid)
Tel.: +34-91-848 8800
Telefax: +34-91-628 0465

Sweden

GRUNDFOS AB
(Box 333) Lunnegårdsgatan 6
431 24 Mölndal
Tel.: +46(0)771-32 23 00
Telefax: +46(0)31-331 94 60

Switzerland

Grundfos Alldos
Dosing & Disinfection
ALLDOS International AG
Schönmatzstraße 4
CH-4153 Reinach
Tel.: +41-61-717 5555
Telefax: +41-61-717 5500
E-mail: alldos.ch@alldos.com

Switzerland

GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fallanden/ZH
Tel.: +41-1-806 8111
Telefax: +41-1-806 8115

Taiwan

GRUNDFOS Pumps (Taiwan) Ltd.
7 Floor, 219 Min-Chuan Road
Taichung, Taiwan, R.O.C.
Phone: +886-4-2305 0868
Telefax: +886-4-2305 0878

Thailand

GRUNDFOS (Thailand) Ltd.
92 Chaloem Phrakiat Rama 9 Road,
Dokmai, Pravej, Bangkok 10250
Phone: +66-2-725 8999
Telefax: +66-2-725 8998

Turkey

GRUNDFOS POMPA San. ve Tic. Ltd. Sti.
Gebze Organize Sanayi Bolgesi
Ihsan dede Caddesi,
2. yol 200. Sokak No. 204
41490 Gebze/ Kocaeli
Phone: +90 - 262-679 7979
Telefax: +90 - 262-679 7905
E-mail: satis@grundfos.com

Ukraine

ТОВ ГРУНДФОС УКРАЇНА
01010 Київ, Вул. Московська 86,
Тел.: (+38 044) 390 40 50
Факс: (+38 044) 390 40 59
E-mail: ukraine@grundfos.com

United Arab Emirates

GRUNDFOS Gulf Distribution
P.O. Box 16768
Jebel Ali Free Zone
Dubai
Phone: +971-4- 8815 166
Telefax: +971-4-8815 136

United Kingdom

Grundfos Alldos
Dosing & Disinfection
ALLDOS Ltd.
39 Gravely Industrial Park, Tyburn Road
Birmingham B24 8TG
Phone: +44-121-3283336
Telefax: +44-121-3284332
E-mail: alldos.uk@alldos.com

United Kingdom

GRUNDFOS Pumps Ltd.
Grovebury Road
Leighton Buzzard/Beds. LU7 8TL
Phone: +44-1525-850000
Telefax: +44-1525-850011

U.S.A.

GRUNDFOS Pumps Corporation
17100 West 118th Terrace
Olathe, Kansas 66061
Phone: +1-913-227-3400
Telefax: +1-913-227-3500

Uzbekistan

Представительство ГРУНДФОС в
Ташкенте
700000 Ташкент ул.Усмана Носира 1-й
тулик 5
Телефон: (3712) 55-68-15
Факс: (3712) 53-36-35

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