



**evoqua**  
WATER TECHNOLOGIES



# WALLACE & TIERNAN<sup>®</sup> CHLORINE DIOXIDE GENERATOR DIOX-A 5000

INSTRUCTION MANUAL



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*Please note*

Original manual!

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## Contents

|       |   |    |
|-------|---|----|
| 1.    | Introduction                                | 9  |
| 1.1   | Documentation                               | 9  |
| 1.1.1 | Target groups                               | 9  |
| 1.2   | Conventions                                 | 10 |
| 2.    | Safety                                      | 11 |
| 2.1   | Intended use                                | 11 |
| 2.2   | General safety instructions                 | 12 |
| 2.3   | Specific safety instructions for DIOX-A     | 13 |
| 2.4   | Standards and legal regulations in Germany  | 16 |
| 2.5   | Data sheets                                 | 17 |
| 2.6   | Liability for defects                       | 17 |
| 3.    | Description                                 | 19 |
| 3.1   | Chemical procedure                          | 19 |
| 3.2   | Description of the system                   | 19 |
| 3.2.1 | Front view                                  | 22 |
| 3.2.2 | Back view                                   | 23 |
| 3.2.3 | Flow chart                                  | 24 |
| 3.2.4 | Control panel with control and display unit | 26 |
| 3.3   | PLC controller                              | 27 |
| 3.4   | Functions, password                         | 28 |
| 3.5   | Technical data                              | 29 |
| 3.6   | System variants                             | 30 |
| 3.7   | Operating water                             | 31 |
| 3.7.1 | Process water consumption                   | 31 |
| 3.7.2 | Motive water for aspiration injector        | 32 |
| 3.8   | Chemical consumption                        | 32 |
| 3.9   | Connections                                 | 33 |
| 4.    | Installation and start up                   | 35 |
| 4.1   | Scope of supply, transport                  | 35 |

---

|       |  |    |
|-------|--|----|
| 4.1.1 | Scope of supply  | 35 |
| 4.1.2 | Transport  | 35 |
| 4.1.3 | Unpacking  | 36 |
| 4.2   | Conditions for installation                                    | 36 |
| 4.2.1 | Set up location of the DIOX-A                                  | 36 |
| 4.2.2 | Operating water  | 38 |
| 4.2.3 | Storage tank for the initial chemicals                         | 39 |
| 4.2.4 | ClO <sub>2</sub> storage tank                                  | 40 |
| 4.2.5 | ClO <sub>2</sub> solution dosing                               | 44 |
| 4.3   | Installation   | 45 |
| 4.3.1 | Setting up DIOX-A  | 45 |
| 4.3.2 | Installing the operating water supply                          | 46 |
| 4.3.3 | Connect chemical tanks   | 47 |
| 4.3.4 | Connect the rectangular ClO <sub>2</sub> storage tank (500 l)  | 47 |
| 4.3.5 | Connect the round ClO <sub>2</sub> storage tank                | 49 |
| 4.3.6 | Installing vent gas aspiration pipe                            | 51 |
| 4.3.7 | Vent gas discharge pipe  | 51 |
| 4.4   | Installing the DIOX-A electrically                             | 53 |
| 4.4.1 | Connect inputs   | 54 |
| 4.4.2 | Connect outputs  | 55 |
| 4.5   | Connect interface (optional)                                   | 55 |
| 4.6   | Start the plant  | 56 |
| 4.6.1 | Preparation  | 56 |
| 4.6.2 | Fill absorber  | 56 |
| 4.6.3 | Adjusting ball valves and a valves                             | 57 |
| 4.6.4 | Switch on the system   | 58 |
| 4.6.5 | Checking the functionality of the fill level sensors           | 64 |
| 4.6.6 | Check optional PLC controller inputs                           | 65 |
| 4.6.7 | Set output contacts  | 66 |
| 4.6.8 | PROFIBUS DP  | 68 |
| 4.6.9 | Set the fill level sensor at the ClO <sub>2</sub> storage tank | 69 |
| 4.7   | Training and instructing operators                             | 70 |
| 4.8   | Completing the acceptance certificate                          | 70 |
| 5.    | PROFIBUS DP  | 71 |
| 5.1   | Connecting the PROFIBUS DP                                     | 71 |
| 5.1.1 | Technical data   | 71 |
| 5.1.2 | Connect the PROFIBUS DP  | 72 |
| 5.1.3 | Configuring the PROFIBUS DP master                             | 74 |
| 5.2   | Data formats   | 75 |
| 5.3   | Reference list   | 77 |
| 6.    | Operation  | 85 |

|        |  |            |
|--------|--|------------|
| 6.1    | Control and display unit                             | 85         |
| 6.1.1  | General  | 85         |
| 6.1.2  | Main screen  | 86         |
| 6.2    | Password protection                                  | 88         |
| 6.2.1  | General  | 88         |
| 6.2.2  | Log in   | 89         |
| 6.3    | Switching on the main switch                         | 90         |
| 6.4    | Automatic mode                                       | 91         |
| 6.4.1  | Switch on automatic mode                             | 93         |
| 6.4.2  | Switch off automatic mode                            | 95         |
| 6.5    | Semi-Automatic mode                                  | 96         |
| 6.6    | Manual mode  | 97         |
| 6.7    | Operating messages                                   | 98         |
| 6.7.1  | General  | 98         |
| 6.7.2  | Preparation off                                      | 99         |
| 6.7.3  | Preparation standby                                  | 99         |
| 6.7.4  | Preparation active!                                  | 100        |
| 6.7.5  | Preparation ext. locked!                             | 102        |
| 6.7.6  | EMERGENCY STOP                                       | 102        |
| 6.8    | Change HCl storage tank                              | 103        |
| 6.9    | Change the NaClO <sub>2</sub> storage tank.          | 104        |
| 6.10   | Warning messages                                     | 105        |
| 6.10.1 | General  | 105        |
| 6.10.2 | Perform monthly maintenance!                         | 112        |
| 6.10.3 | Perform annual maintenance! Service required         | 112        |
| 6.11   | Error messages                                       | 113        |
| 6.11.1 | Faults that do not end the automatic operation       | 115        |
| 6.11.2 | Faults that cause automatic operation to end         | 122        |
| 6.12   | Menus  | 124        |
| 6.12.1 | Menu selection                                       | 124        |
| 6.12.2 | "Outputs" menu                                       | 125        |
| 6.12.3 | "Diagnostics" menu                                   | 127        |
| 6.12.4 | „Service“ menu                                       | 132        |
| 6.12.5 | "System" menu  | 137        |
| 6.12.6 | "Manual functions" menu                              | 140        |
| 6.13   | Maintenance by the operator                          | 141        |
| 6.13.1 | Maintenance overview                                 | 142        |
| 6.13.2 | <b>Dilution/motive water for the mixing injector</b> | <b>144</b> |
| 6.13.3 | Adjust aspiration injector motive water              | 145        |
| 6.13.4 | Adjust position of the positioner                    | 146        |
| 6.13.5 | Inspect sight glass                                  | 146        |
| 6.13.6 | Replace absorber solution                            | 147        |

---

|        |   |     |
|--------|---|-----|
| 6.13.7 | Clean strainer  | 147 |
| 6.14   | Power failure   | 148 |
| 7.     | Maintenance by service personnel                      | 149 |
| 7.1    | Perform system maintenance                            | 150 |
| 7.2    | Flush system  | 152 |
| 7.2.1  | Flush HCl lines                                       | 154 |
| 7.2.2  | Flush NaClO <sub>2</sub> lines                        | 156 |
| 7.2.3  | Flush reaction tank                                   | 157 |
| 7.2.4  | Special error message during flushing                 | 160 |
| 7.3    | Calibrating   | 161 |
| 7.3.1  | Calibrate water flow rate sensors                     | 161 |
| 7.4    | Calibrate sensors for HCl and NaClO <sub>2</sub>      | 163 |
| 7.4.1  | Calibrating HCl                                       | 163 |
| 7.4.2  | NaClO <sub>2</sub> calibration                        | 167 |
| 7.4.3  | Special error messages during calibration             | 170 |
| 7.5    | Maintenance part sets                                 | 171 |
| 7.5.1  | Spare parts for maintenance for 1 year                | 172 |
| 7.5.2  | Spare parts for maintenance for 5 years               | 174 |
| 7.5.3  | Using maintenance part sets                           | 177 |
| 7.6    | Notes for maintenance work                            | 178 |
| 7.6.1  | Service expansion chamber                             | 178 |
| 7.6.2  | Servicing absorber                                    | 178 |
| 7.6.3  | Replacing wear parts                                  | 179 |
| 7.7    | Wear parts to be replaced                             | 180 |
| 7.8    | Replacing the stand pipe of the ClO <sub>2</sub> tank | 183 |
| 7.9    | Service booster pump                                  | 184 |
| 7.10   | Shutting down   | 184 |
| 7.11   | Renewed start up                                      | 184 |
| 7.12   | Dismantling   | 184 |
| 8.     | Operating journal                                     | 187 |
| 9.     | Wiring diagrams                                       | 189 |
| 9.1    | Wiring diagrams DIOX-A 1000/2500/5000/10000           | 190 |
| 9.2    | Terminal box on the ClO <sub>2</sub> storage tank     | 224 |
| 10.    | Drawings  | 225 |



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|                               |     |
|-------------------------------|-----|
| 11. Declaration of conformity | 227 |
| 12. Index                     | 229 |





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## 1. Introduction

### 1.1 Documentation

#### 1.1.1 Target groups

This operating manual provides installation, operating and maintenance personnel with the information necessary for the operation and maintenance of the chlorine dioxide generator.

This operating manual is intended for operators of the chlorine dioxide generator. It contains important information for safe, trouble-free and efficient operation of the chlorine dioxide generator. Carefully observing these instructions will help to prevent danger, reduce repair costs and downtimes, and increases the reliability and service life of the chlorine dioxide generator.

The chapters on installation and maintenance are solely provided for trained service personnel. These sections contain important information on assembling, configuring, and start up of the chlorine dioxide generator as well as information for maintenance and repair work.

Anyone working with the chlorine dioxide generator must have read and understood the operating manual, and, in particular, the safety instructions.






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

## 1.2 Conventions



### *Hinweis*

This operating manual contains a number of notes with different priorities marked with symbols.

| Pictogram   | Note              | Meaning   |
|---|-------------------|---|
|    | <i>Warning!</i>   | Danger to life and limb! If the situation is not handled properly, death or serious injury may be the result. |
|    | <i>Attention!</i> | If this note is not observed, medium or slight injury or damage to the equipment may be the result.           |
|  | <i>Warning!</i>   | Risk involving electric current. Switch the system off with the emergency OFF main switch.                    |
|  | <i>Warning!</i>   | Risk of injury!<br>Explosive substances!  |
|  | <i>Note</i>       | This note facilitates working with the system.  |

## 2. Safety

### 2.1 Intended use

The chlorine dioxide generator DIOX-A 5000 is equipped for the stationary preparation of a chlorine dioxide solution with a max. concentration of 3 g/l ClO<sub>2</sub>.

The action time of the system is 100%.

The operational safety of the system can only be guaranteed if it is used strictly as intended. The system may only be used for the purpose defined in the order and under the operating conditions indicated in the technical specifications.

Compliance with the intended use also includes reading this and the other operating manual within the scope of supply and adhering to all the instructions they contain. The system may only be installed and maintenance may only be performed by manufacturer personnel or by personnel trained by the manufacturer especially for the system.

Furthermore, all inspection and maintenance work must be performed at the prescribed intervals.

#### *Non-intended use*

The operator bears full and sole responsibility if this unit is put to any use which does not comply strictly and exclusively with this intended use.

Non-compliant and therefore not permitted would be in particular

- preparation or use of other media
- pressurization of the ClO<sub>2</sub> storage tank
- transport with filled storage tanks
- mobile use

#### *Gas monitoring system*

Recommended safety accessories include a gas monitoring system for chlorine dioxide with a flashing alarm light/horn.

For the operation of the gas monitoring system, a separate voltage supply (country-specific grid voltage) is required.

One flashing alarm light/horn per system

## 2.2 General safety instructions

The manufacturer places great value upon safety when working with its system. This was already taken into account in the design of the system, by the integration of safety features.

### *Safety regulations*

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

### *Safety instructions at the system*

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

### *State-of-the-art technology*

The system has been constructed in accordance with state-of-the-art technology and the recognized safety regulations. However, danger to the life and limbs of users or third parties or damage to the system or other property cannot be ruled out if the system is used by personnel who have not received suitable training and instruction. Installation and maintenance as well as any work not described in this operating manual may only be performed by trained and authorized technical personnel.

### *Personnel*

The operator of the system must ensure that only authorized and qualified specialized personnel are permitted to work with and on the system within their specified area of responsibility.

"Authorized and qualified technical personnel" are:

### *Operation*

- Operators who have been trained and instructed by the manufacturer or if applicable, by the service partner

### *Installation, Start up and maintenance, level 2*

- Manufacturer service personnel or personnel who have been trained and authorized by the manufacturer. Level 2 installation, start up, and maintenance may only be carried out exclusively by this personnel

### *Electrical work*

- Authorized and qualified electrical technicians. All electrical work may only exclusively be carried out by qualified electrical technicians.

All remaining persons that may come into contact with the system must receive safety instructions indicating all of the dangers associated with it.

### *Spare parts / components*

Trouble-free operation of the system is only guaranteed if original spare parts and components are used in precisely the combination described in this operating manual. Failure to observe this instruction may incur the risk of malfunction or damage to the system.

### *Extensions and conversions*

Never attempt to rebuild, modify or extend the system without written approval from the manufacturer.

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|                         |  |
|-------------------------|--|
| <i>Electrical power</i> | <p>During normal operation, the control panel must remain closed.</p> <p>Before starting any assembly, inspection, maintenance, or repair work, the system must be switched off using the emergency OFF main switch and the switch must be secured against reactivation.</p> <p>Connect all lines in accordance to the wiring diagram.</p> |
| <i>Disposal</i>         | <p>Ensure safe and environmentally-friendly disposal of agents and replaced parts.</p>   |

### 2.3 Specific safety instructions for DIOX-A

The operator is obligated to issue an operating instructions of the safe operation of the DIOX-A. The operating instructions must contain the following information.

#### *Indication of hazardous material*

Chlorine Dioxide,  $\text{ClO}_2$ , aqueous solution, 2 - 4 g/l for the disinfection of water.  
 $\text{ClO}_2$  solution is a yellowish to orange in color.

Sodium chlorite  $\text{NaClO}_2$ , aqueous solution, 300 g/l for producing chlorine dioxide.

For information on hydrochloric acid, please see corresponding safety data sheet.

#### *Description of dangers*

- Hydrochloric acid and sodium chlorite solution must not at all come into contact with each other (except in the injector). Risk of explosion, escape of dangerous chlorine dioxide.
- Danger of chlorine dioxide use:
  - Toxic if swallowed.
  - Causes chemical burns.
  - Very poisonous for water organisms
- Sodium chlorite solution in its dry state is oxidizing. Do not allow to dry into flammable substances.  
Danger of spontaneous combustion!

#### *General protective measures*

- Access to the system restricted to trained and instructed personnel
- Ensure against entry of unauthorized person to the system and storage room.
- Smoking and open flames are forbidden in the system room and in the sodium chlorite storage space.
- Do not inhale hydrochloric acid or chlorine dioxide fumes. Keep respirator on standby.
- Provide sufficient ventilation.

*Special protective measures*

- Wear suitable protective clothing, gloves and eye/face protection while working.
- Avoid the release of chemicals into the environment. Get special instructions / consult safety data sheet.
- In Germany, please see also DGUV 203-086.
- The chlorine dioxide generator DIOX-A must only be operated with the following media:
  - Hydrochloric acid 30-38% according to DIN EN 939 type 1
  - Sodium chlorite with 300 g/l or 24.5% according to DIN EN 938
  - Operating water with drinking-water quality (according to DIN 1988 T4)
- Chemical container, suction lance and collecting basins must be clearly labeled to prevent confusion.
- Display notices in the workplace and the immediate vicinity corresponding to the accident prevention regulation "chlorination of water".
- Chlorine dioxide is produced as a dilute aqueous solution (max. 3 g/l) for immediate use.
- It may only be stored in sealed containers. Displaced volumes of gas must be extracted by means of suction; during a halt of ClO<sub>2</sub> preparation, the resulting ClO<sub>2</sub> gas must be led over an absorber.
- Do not drain concentrated reactor contents, it is imperative to flush the reactor before discharging. For this reason, the drain valve is shut off and sealed with a dummy disc.
- Store hydrochloric acid and sodium chlorite solution only in sealed, upright storage tanks. Place these storage tanks into separate amply-dimensioned collecting basins  
No decanting, no dilution.  
Protect from heat and direct sunlight.  
The chemicals must in no way come into contact with each other or with other chemicals.  
Risk of explosion!

*Personal safety measures and rules of conduct*

- Eye protection: Tight-fitting safety glasses, face mask, eye wash bottle or eye-wash shower unit
- Protective gloves: Chemical resistant protective gloves
- Body protection: Tight protective clothing or rubber apron, rubber boots
- Respiratory protection: Should vapors result, use the respirator with filter B grey.
- Hygiene: Do not eat, drink, smoke. Do not store any food or similar materials in the system or storage room. After working and before breaks, wash hands thoroughly.
- Pay attention to cleanliness at the workplace
- Do not dismantle any system parts or empty any fluid as long as ClO<sub>2</sub>, HCl or NaClO<sub>2</sub> are still in the system!

*In the event of faults and in the event of danger*

- Use water spray to disperse gas released from solution.
- Neutralize spilt hydrochloric acid or chlorine dioxide with sodium thiosulfate solution, then dilute with plenty of water and wash into the drain, observing any local regulations concerning release of chemical waste into the sewage system.
- Do not neutralize sodium chlorite solution with sodium thiosulfate solution, but dilute with plenty of water and wash into the drain, observing any local regulations concerning release of chemical waste into the sewage system.
- Remove clothing splattered with sodium chlorite solution and wash with thoroughly wash with water. Do not allow the solution to dry due to risk of spontaneous combustion.
- Do not hold the chemicals together with flammable or oxidizable materials (e.g. cleaning rags, saw dust), risk of spontaneous combustion.

*In the event of fire*

- Aqueous solutions of chlorine dioxide are not flammable.
- Sodium chlorite in its dry state is oxidizing.
- In the event of fire, danger of the accumulation of dangerous gases.
- The chemicals must in no way come into contact with each other or with other chemicals.  
Risk of explosion!
- Extinguish any fire in the vicinity with water, preferably using a sprinkler system to dilute the gas.
- In the event of an electrical fire use conventional fire extinguishing methods

*Code of conduct in the case of accidents with chlorine dioxide - First aid*

- In case of accident or if you feel unwell, seek medical attention immediately  
(If possible, present the ClO<sub>2</sub> safety data sheet W3T277212).
- If splashed in the eyes, flush with flowing water for several minutes while holding lids wide open (remove contact lenses beforehand). Seek medical attention.
- In the event of skin contact: Flush with plenty of water.
- Remove contaminated clothing and wash skin again.
- Seek medical attention.
- If swallowed, rinse mouth, let drink plenty of water (as long as the afflicted is still conscious), induce vomiting, seek medical assistance.
- In the event of inhalation: The victim should leave, or be removed from, the contaminated area to fresh air as rapidly as possible and should rest.
- Keep victim in an upright position. If breathing has stopped, trained personnel should administer artificial respiration (AR).
- Seek medical attention.

In reference to hydrochloric acid and sodium chlorite, please observe the corresponding safety data sheets

*Proper disposal*

Neutralize hydrochloric acid or  $\text{ClO}_2$  solution with sodium thiosulfate solution, then dilute with plenty of water and wash into the drain, observing any local regulations concerning release of chemical waste into the sewage system.

$\text{ClO}_2$  solution is a greenish in color, which is colorless following neutralization.

For Neutralization of 100 g  $\text{ClO}_2$ , 234 g of sodium thiosulfate are required free from water. That means approx. 5 g sodium thiosulfate per liter  $\text{ClO}_2$  solution (2 g/l).

Waste code:

- 513 Other oxides
- 521 Inorganic acids
- 593 Chemical residues

In reference to hydrochloric acid and sodium chlorite, please observe the corresponding safety data sheets

## 2.4 Standards and legal regulations in Germany

- "Chlorination of drinking water", DGUV 203-086
- „Dosing Systems for Chlorine Dioxide“ DVGW W 624
- "Chlorine Dioxide for Water Treatment“ DVGW W 224
- Drinking Water Ordinance TrinkwV 2001
- Federal Water Act WHG §19
- Hazardous Materials Ordinance GefStoffV
- DIN EN 12671

This list makes no claim to completeness, up-to-dateness or validity for the respective installation site or the usage.



## 2.5 Data sheets

Safety data sheets hydrochloric acid and sodium chlorite:  
to receive from supplier

Chlorine Dioxide:

The safety data sheet for chlorine dioxide can be downloaded from  
[www.sds-id.com/1000102-8](http://www.sds-id.com/1000102-8) under the number W3T277212.

## 2.6 Liability for defects

Liability for defects is regulated by general terms and conditions of supply ("Green Terms of Delivery" - GL - Grüne Lieferbedingungen by the "German Electrical and Electronics Manufacturers Association" (ZVEI)) and by special contractual agreements.



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### *Note*

In order for the liability for defects to remain valid, it is required that the operating and environmental conditions and the operating and maintenance regulations described in this operating manual must be observed. Failure to do so will result in loss of your right to claim for liability for defects

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## 3. Description

### 3.1 Chemical procedure

Chlorine dioxide is produced in the Wallace & Tiernan Chlorine Dioxide Generator DIOX-A 5000 as an aqueous solution avoiding the gas phase with a variable concentration of 1.5 to 3 g/l (2.0 to 3 g/l for DIOX-A10000).

As basic chemicals for the production of chlorine dioxide, commercially available hydrochloric acid (30-38%) and NaClO<sub>2</sub> solution (300 g/l and 245 g/kg) are used.

The chemical reaction takes place according to the following equation:



In order for the reaction to proceed from left to right in order to yield a high level of ClO<sub>2</sub>, hydrochloric acid has to be dosed with triple the excess amount.

### 3.2 Description of the system

The system components are in the process diagram and portrayed in views within chapters 3.2.1 to 3.2.3.

Both initial chemicals sodium chlorite (NaClO<sub>2</sub>) solution and hydrochloric acid (HCl) are stored in external storage tanks.

Over the mixing injector (W) the sodium chlorite solution and the hydrochloric acid are aspirated from the external storage tanks (AN and AM) and diluted by the mixing injector motive water, the ClO<sub>2</sub> solution flows in den reaction tank (AI) to the complete the reaction.

For this purpose, the mixing injector requires and corresponding amount of motive water under sufficient admission pressure depending on the system type (see technical data). The motive water level is adjusted using the dosing ball valve (S), displayed on the flow meter (L) and monitored with aid of the impeller meter (P).

The dilution water level is adjusted using the dosing ball valve (T),

displayed on the flow meter (K) and monitored with aid of the impeller meter (P).

The flows of the basic chemicals are regulated by both of the automatic flow control valves (U and V) and the corresponding inductive flow rate sensors (R and O).

Vacuum control valves are built onto the mixing injector (W) which open up after having overcome the spring resistance by the injector vacuum. This ensures that both initial chemicals are only brought forth if enough motive water for the mixing injector is available.

The diluted HCl and NaClO<sub>2</sub> mixed together flow into the reaction tank (AI) and react there, thus accumulating ClO<sub>2</sub>. This ClO<sub>2</sub> solution is diluted and flows further into the external ClO<sub>2</sub> storage tank (AO).

From the ClO<sub>2</sub> storage tank, the prepared chlorine dioxide solution can be added to water for treatment in various ways:

- Adding by means of injectors
- Dosing with dosing pumps

The chlorine dioxide generator works discontinuously and is regulated by the fill levels MIN and MAX in the ClO<sub>2</sub> storage tank (AO). When the fill level MAX has been reached, the chlorine dioxide generator shuts down automatically. In this process, the solenoidvalves stop the motive water mixing injector and the dilution water.

During the preparation phase, the gas/air mixture which occurs in the ClO<sub>2</sub> storage tank as a result of the ClO<sub>2</sub> solution must be aspirated in order to prevent the increase of ClO<sub>2</sub> gas concentration to a critical level. The amount of motive water for the aspiration injector (AB) is dependent upon the gas and liquid flows (see technical data). The motive water level is adjusted on the pressure reducing valve for vent gas aspiration (E). Appropriate admission pressure must be available. The functionality of the aspiration injector (AB) is monitored with a vacuum switch, just as the temperature in the gas compartment of the ClO<sub>2</sub> storage tank.

In addition, an absorber unit (AP) is built into the ventilation and venting line of the ClO<sub>2</sub> storage tank which absorbs any eventual escape of ClO<sub>2</sub> gas. The absorber solution must be replaced as required (see maintenance).

#### *Safety deactivation*

In the event of failure of a system component or exceeding limit values, the chlorine dioxide generator shuts down automatically and indicates an error message. The safety shut-off valve (G) closes. The shutdown also takes place if an empty message of one of the chemical tanks is displayed or in the event of vent gas aspiration failure in the ClO<sub>2</sub> storage tank.

For an addition manual possibility of manual shutdown, an electri-

cal main switch and a shutoff valve for the system operating water should be installed outside of the system room, which are both properly labeled and can be switched OFF in the case of failure.

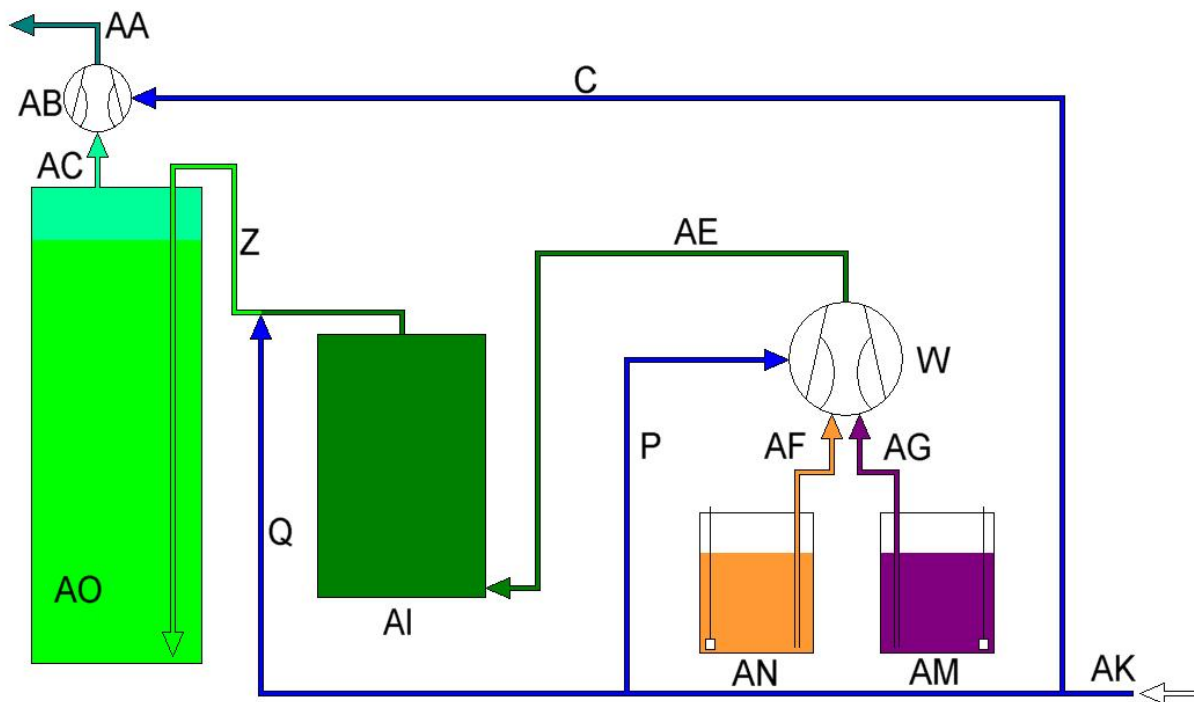
In the PLC controller, several functions of the chlorine dioxide generator are monitored and shown on the display.



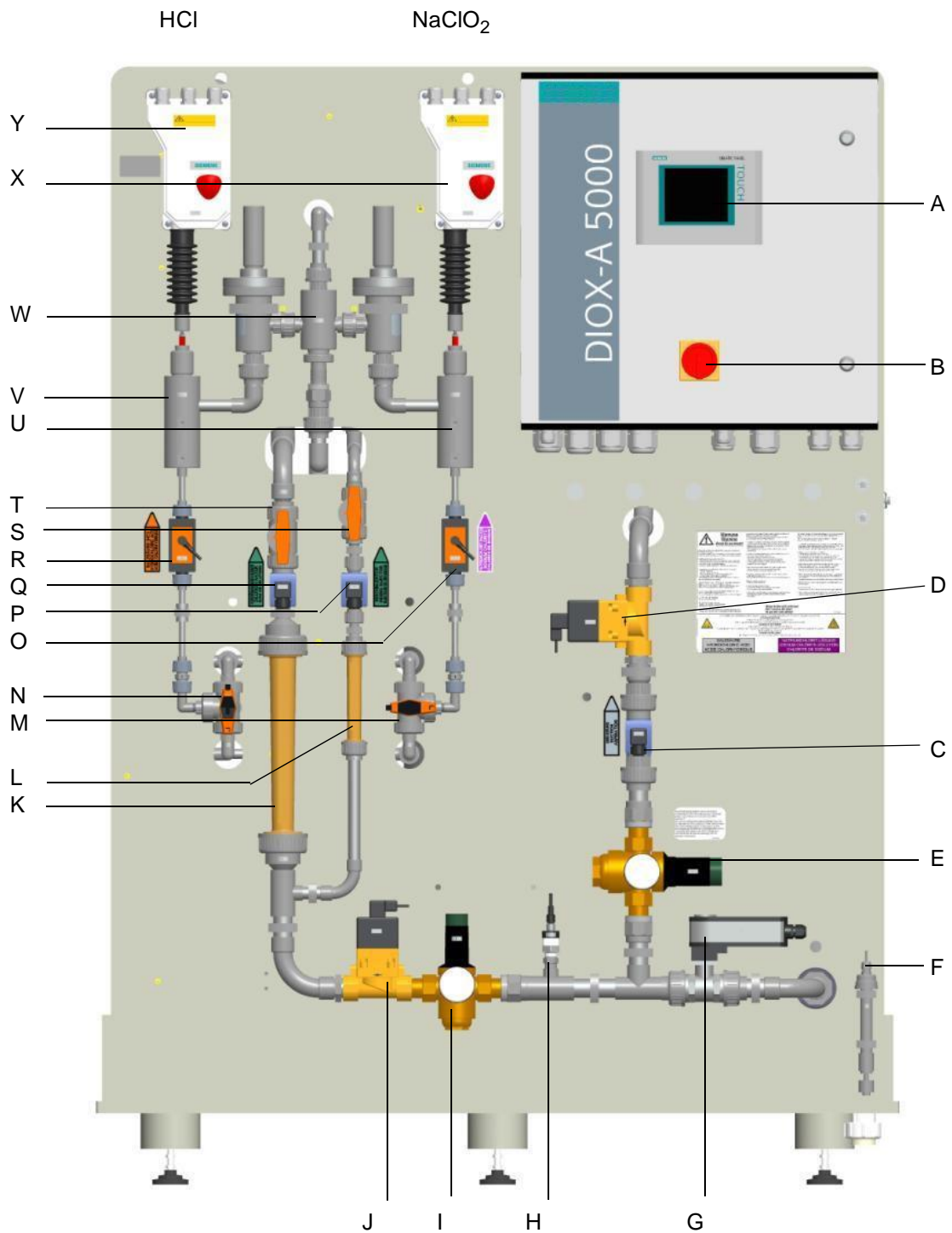
#### Hinweis

Components and hose connections that are mechanically or electrically operated are labeled on the system with abbreviations (e.g. M). These abbreviations can also be found at the appropriate places in the operating manual and on the flow chart and views to assist identification.

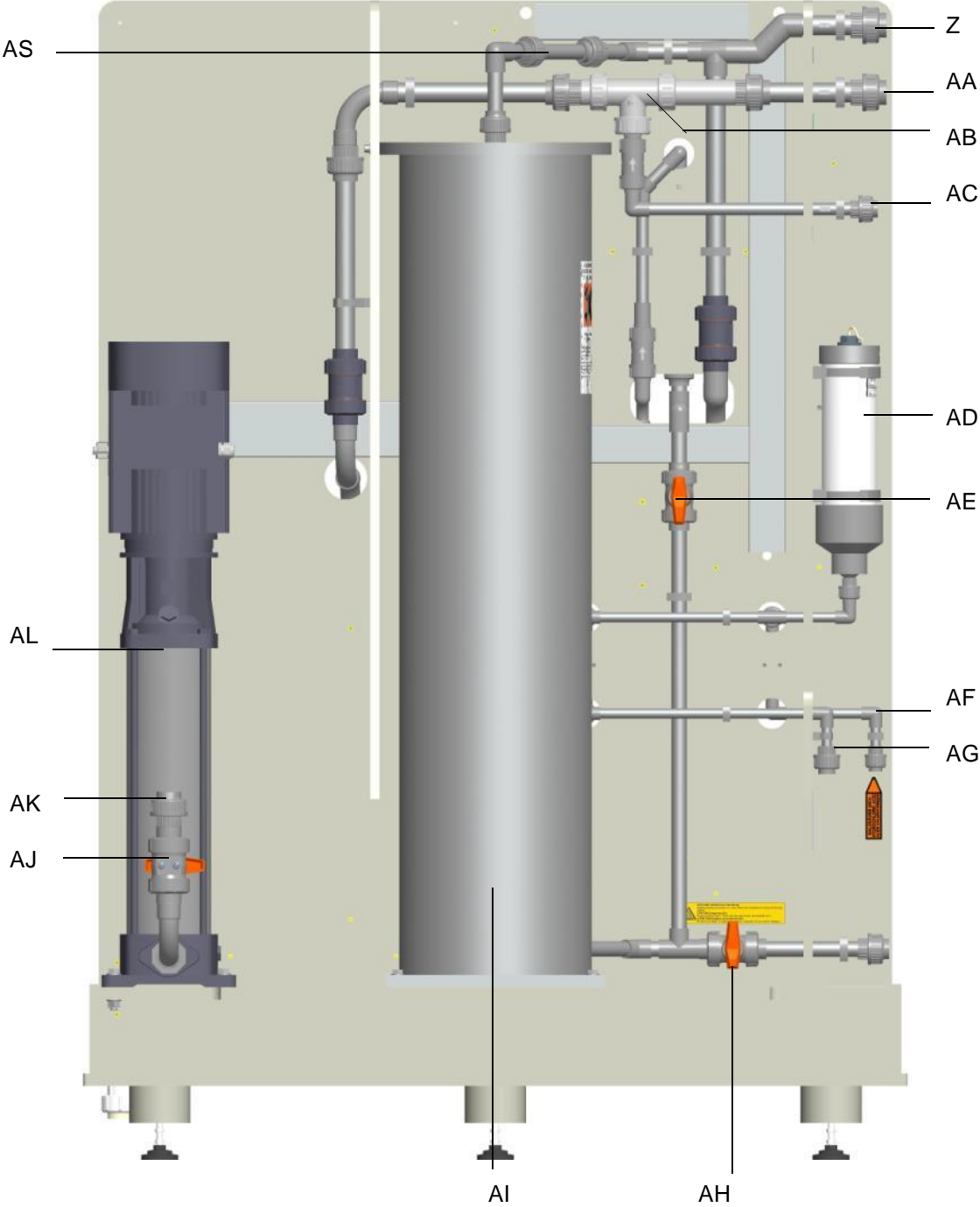
#### Process diagram



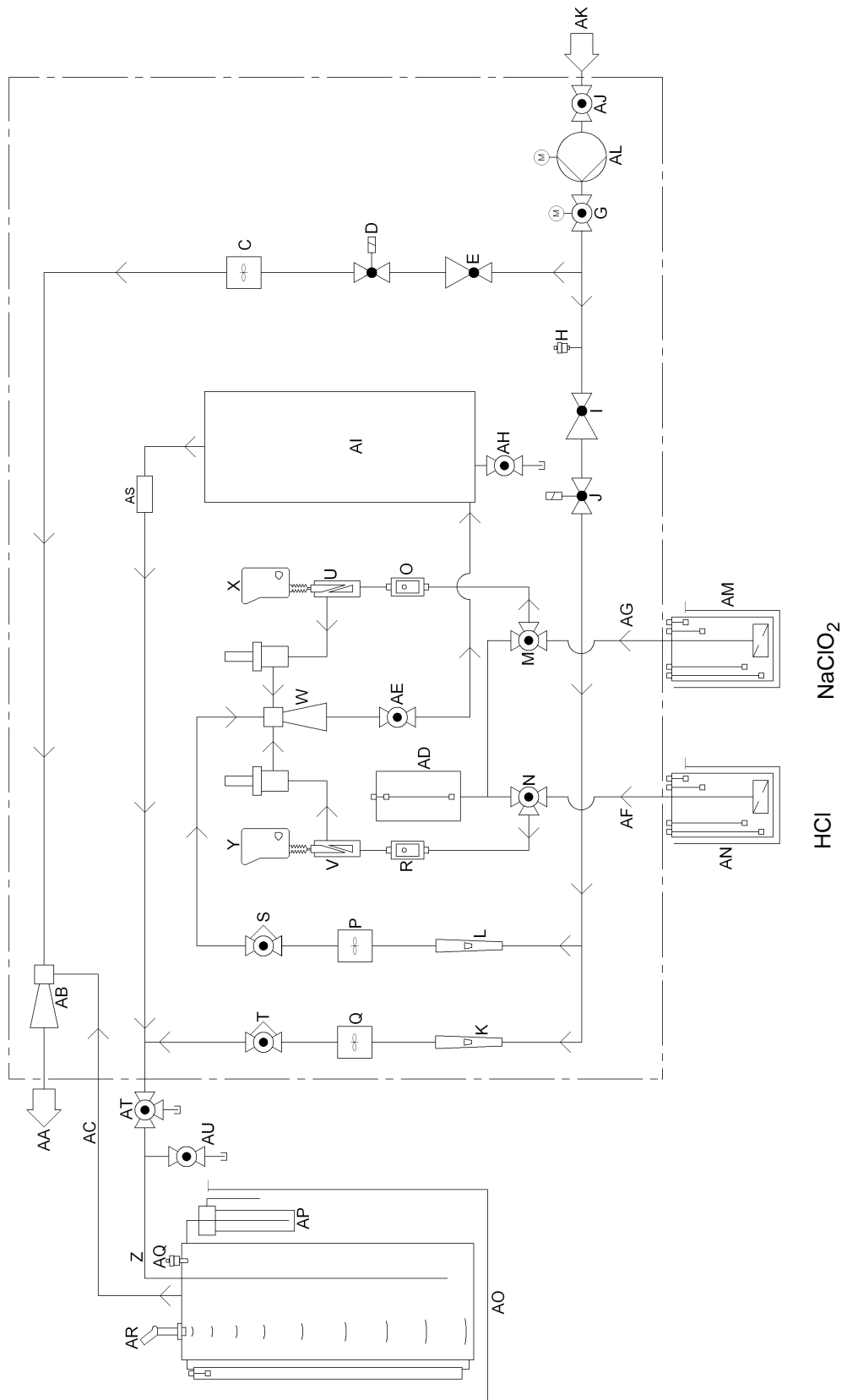
3.2.1 Front view



3.2.2 Back view



3.2.3 Flow chart





- A Control panel with system control unit
- B Emergency OFF main switch
- C Aspiration injector motive water flow rate sensor
- D Aspiration injector motive water solenoid valve
- E Pressure reducing valve motive water for aspiration injector with strainer
- F System leak detection sensor
- G Safety shut-off valve operating water (motor ball valve)
- H Operating water pressure sensor
- I Process water pressure reducing valve with strainer
- J Process water solenoid valve
- K Dilution water float flow meter
- L Motive water mixing injector float flow meter
- M NaClO<sub>2</sub> 3-way valve (to calibrate)
- N HCl 3-way valve (to calibrate)
- O NaClO<sub>2</sub> flow rate sensor
- P Mixing injector motive water flow rate sensor
- Q Dilution water flow rate sensor
- R HCl flow rate sensor
- S Motive water dosing ball valve for mixing injector
- T Dilution water dosing ball valve
- U Flow rate control valve for NaClO<sub>2</sub>
- V HCl flow control valve
- W Mixing injector with vacuum control valves
- X Positioner for NaClO<sub>2</sub>
- Y HCl positioner
- Z ClO<sub>2</sub> line to the ClO<sub>2</sub> storage tank
- AA Vent gas discharge pipe
- AB Aspiration injector
- AC Vent gas aspiration from ClO<sub>2</sub> storage tank
- AD Calibration tank
- AE ClO<sub>2</sub> supply ball valve to the reaction tank
- AF Aspiration pipe from the HCl storage tank
- AG Aspiration pipe from the NaClO<sub>2</sub> storage tank
- AH Ball valve for draining reaction tank  
(sealed, flush the system before draining!)
- AI Reaction tank
- AJ Operating water supply ball valve
- AK Operating water supply
- AL Booster pump (optional)
- AM NaClO<sub>2</sub> storage tank with fill level sensors
- AN HCl storage tank with fill level sensors
- AO ClO<sub>2</sub> storage tank with collecting basin
- AP Absorber ClO<sub>2</sub> storage tank with safety overflow and vacuum switch
- AQ Temperature sensor ClO<sub>2</sub> storage tank
- AR Fill level sensor ClO<sub>2</sub> storage tank and overfilled sensor
- AS Sight glass for reaction tank drain pipe
- AT 3-way valve ClO<sub>2</sub> drain outlet
- AU ClO<sub>2</sub> sampling valve (optional)

### 3.2.4 Control panel with control and display unit

*Housing* The PLC controller of the chlorine dioxide generator is accommodated in a housing on the right side of the system (for details, see chapter 3.3 PLC controller). The main switch and the control and display unit are arranged on the front side of the control panel.

*Main switch* The main switch turns the power off for the entire chlorine dioxide generator.

**Risk of injury or death!**

The system may still be live, even if the main switch is off!  
Working on the electrical system parts may only be carried out by an electrical technician.

---

*Control and display unit* On the control and display unit, important system data settings are shown and adjusted as well as indicating operating, warning and error messages.

### 3.3 PLC controller

The PLC controller is used to record, display, and process the measured data as well as for process control.

A touch panel is used as the control and display unit. The system is controlled using the buttons. All of the settings and operating parameters can be read by all users, in any user group, without requiring the user to enter a password. Some of the functions are password protected and are only accessible to certain users. See chapter 3.4. for details.

|                         |  |
|-------------------------|--|
| <i>Measurements</i>     | <p>The following measurements are recorded and processed:</p> <ul style="list-style-type: none"><li>• Operating water pressure</li><li>• Flow rates</li><li>• Temperature in the ClO<sub>2</sub> storage tank</li><li>• Fill level in the ClO<sub>2</sub> storage tank</li><li>• Switching state of the connected sensor system (e.g. overfilled sensor, leak sensor)</li></ul>                        |
| <i>Displays</i>         | <ul style="list-style-type: none"><li>• Operating states and operating messages</li><li>• Warning and error messages</li><li>• Settings and operating parameters</li></ul>   |
| <i>Functions</i>        | <p>The following functions are integrated into the PLC controller:</p> <ul style="list-style-type: none"><li>• Evaluation and processing of the fill level sensors</li><li>• PLC controller positioners</li><li>• PLC controller booster pump (optional)</li><li>• PLC controller solenoid valves and safety shut-off valve</li></ul>  |
| <i>Safety functions</i> | <ul style="list-style-type: none"><li>• Monitoring of operating water pressure</li><li>• Monitoring flow rates</li><li>• Monitoring aspiration function</li><li>• Control of safety shut-off valve in the event of leakage,</li><li>• Overfilled and chlorine gas alarm</li><li>• Controlling flashing light/alarm horn</li><li>• Digital input EMERGENCY-STOP</li><li>• Password protection</li></ul> |
| <i>Interface</i>        | <ul style="list-style-type: none"><li>• PROFIBUS DP interface</li></ul> <p>The PROFIBUS DP interface is a standardized interface (EN50170) for data transfer. The PROFIBUS DP interface can be used to connect the chlorine dioxide generator to an existing PROFIBUS DP network (see chapter 5.).</p>   |

### 3.4 Functions, password

All operating parameters and settings can be read by all user groups without needing a log in. Certain functions are user/password protected and are only available to certain user groups.

There are three password levels:

#### *Password level 1*

Entering password and user is not required. All of the functions of this password level may be used by the operators.

The functions include:

- Displaying all settings and operating parameters as well as the operating messages, warning messages, and error messages
- Clean the display
- Change the display language

#### *Password level 2*

Entering password and user is required. All of the functions of this password level may be used by the operators. The user name is WT and the password is 9040.

The functions include:

- all functions of password level 1
- Selecting the mode (automatic, semi-auto or manual)
- Starting and stopping preparation manually
- Resetting the system
- Outputs:
  - Setting or changing the alarm relay assignment
  - Setting or changing the alarm relay switching function NO or NC
  - Setting or changing the alarm relay switching function delay time
- Diagnostics
  - Resetting the preparation hours (day uptime counter)

#### *Password level 3*

- Entering password and user is required. All functions of this password level may only be used by service personnel.

### 3.5 Technical data

#### DIOX-A 5000

| Capacity in g/h ClO <sub>2</sub>  | 2500<br>1000                       | 5000 | 2500<br>1000                 | 5000 | 10000                       |
|---|------------------------------------|------|------------------------------|------|-----------------------------|
|   | without booster pump               |      | with booster pump            |      | w/o bp.                     |
| Concentration of ClO <sub>2</sub> solution in the ClO <sub>2</sub> storage tank                                       | 1.5 g/l ... 3.0 g/l                |      |                              |      | 2.0 ... 3.0 g/l             |
| Operating water requirement<br>admission pressure<br>max. vent gas aspiration back pressure                           | see tables in chapters 3.6 and 3.7 |      |                              |      |                             |
| Mains connection  | 1/N/PE AC 230 V<br>50 Hz           |      | 3/N/PE AC 400/230 V<br>50 Hz |      | 1/N/PE<br>AC 230 V<br>50 Hz |
| Connection power  | 0.3 kVA                            |      | 4.1 kVA                      |      | 0.3 kVA                     |
| Nominal current (I <sub>nom</sub> )   | 1.54 A                             |      | 6.9 A                        |      | 1.54 A                      |
| Max. cable cross section<br>solid/stranded  | 16 mm <sup>2</sup>                 |      |                              |      |                             |
| Max. cable cross section<br>with end sleeves  | 10 mm <sup>2</sup>                 |      |                              |      |                             |
| Back-up fuse max.   | 1x 20 A                            |      | 3x 20 A                      |      | 1x 20 A                     |
| Type of protection control panel,<br>positioners, safety shut-off valve,<br>solenoid valves, sensors, booster<br>pump | IP 54                              |      |                              |      |                             |
| Dimensions (W x H x D)  | 1350 x 1880 x 790 mm               |      |                              |      |                             |
| Tare weight approx...   | 190 kg                             |      | 240 kg                       |      | 200 kg                      |

| Operating / ambient temperature                  |                                    |
|--|------------------------------------|
| Ambient temperature during operation             | +10 ... +35°C (no direct sunlight) |
| relative humidity                                | 5 ... 95%, without condensation    |
| Ambient temperature during storage and transport | 5 ... 55°C                         |
| Operating water temperature                      | 10 ... 30°C                        |

### 3.6 System variants

| Nominal performance        | Booster pump | max. Back pressure<br>Vent gas discharge | allowed admission pressure | Partnumber | Description |
|----------------------------|--------------|--|----------------------------|------------|-------------|
| 1000 g/h ClO <sub>2</sub>  | no           | 1,0 bar                                  | 5 - 16 bar                 | W3T320339  | 1000-N10    |
|                            |              | 2,0 bar                                  | 10,5 - 16 bar              | W3T320340  | 1000-N20    |
|                            |              | 3,0 bar                                  | 10,5 - 16 bar              | W3T320341  | 1000-N30    |
|                            |              | 4,0 bar                                  | 10,5 - 16 bar              | W3T320342  | 1000-N40    |
|                            | yes          | 1,0 bar                                  | 0 - 4 bar                  | W3T320344  | 1000-D10    |
|                            |              | 2,0 bar                                  | 0 - 4 bar                  | W3T320345  | 1000-D20    |
|                            |              | 3,0 bar                                  | 1 - 4 bar                  | W3T320346  | 1000-D30    |
|                            |              | 4,0 bar                                  | 2,5 - 4 bar                | W3T320347  | 1000-D40    |
| 2500 g/h ClO <sub>2</sub>  | no           | 1.0 bar                                  | 5 - 16 bar                 | W3T265939  | 2500-N10    |
|                            |              | 2.0 bar                                  | 10.5 - 16 bar              | W3T265940  | 2500-N20    |
|                            |              | 3.0 bar                                  | 10.5 - 16 bar              | W3T265951  | 2500-N30    |
|                            |              | 4.0 bar                                  | 10.5 - 16 bar              | W3T265952  | 2500-N40    |
|                            | yes          | 1.0 bar                                  | 0 - 4 bar                  | W3T265954  | 2500-D10    |
|                            |              | 2.0 bar                                  | 0 - 4 bar                  | W3T265955  | 2500-D20    |
|                            |              | 3.0 bar                                  | 1 - 4 bar                  | W3T265956  | 2500-D30    |
|                            |              | 4.0 bar                                  | 2.5 - 4 bar                | W3T265957  | 2500-D40    |
| 5000 g/h ClO <sub>2</sub>  | no           | 1.0 bar                                  | 6.5 - 16 bar               | W3T265933  | 5000-N10    |
|                            |              | 1.5 bar                                  | 10.5 - 16 bar              | W3T265934  | 5000-N15    |
|                            |              | 2.0 bar                                  | 10.5 - 16 bar              | W3T265935  | 5000-N20    |
|                            | yes          | 1.0 bar                                  | 0 - 4 bar                  | W3T265936  | 5000-D10    |
|                            |              | 1.5 bar                                  | 2.5 - 4 bar                | W3T265937  | 5000-D15    |
|                            |              | 2.0 bar                                  | 3 - 4 bar                  | W3T265938  | 5000-D20    |
| 10000 g/h ClO <sub>2</sub> | no           | 1.0 bar                                  | 10.5 - 16 bar              | W3T379561  | 10000-N10   |
|                            |              | 1.5 bar                                  | 10.5 - 16 bar              | W3T379562  | 10000-N15   |
|                            |              | 2.0 bar                                  | 10.5 - 16 bar              | W3T379563  | 10000-N20   |

### 3.7 Operating water

The operating water requirement includes a mixture of:

Process water + motive water for the aspiration injector

#### 3.7.1 Process water consumption

The process water consumption is dependent upon the size of the system and the settings of the ClO<sub>2</sub> concentration:

| ClO <sub>2</sub> -<br>Concentration | Process water                               |   |   |  |
|-------------------------------------|---|---|---|--|
|                                     | for<br>1000 g/h ClO <sub>2</sub><br>version | for<br>2500 g/h ClO <sub>2</sub><br>version | for<br>5000 g/h ClO <sub>2</sub><br>version | for<br>10000 g/h<br>ClO <sub>2</sub> version |
| 3.0 g/l                             | 320 l/h                                     | 800 l/h                                     | 1600 l/h                                    | 3200 l/h                                     |
| 2.9 g/l                             | 332 l/h                                     | 830 l/h                                     | 1660 l/h                                    | 3320 l/h                                     |
| 2.8 g/l                             | 344 l/h                                     | 860 l/h                                     | 1720 l/h                                    | 3440 l/h                                     |
| 2.7 g/l                             | 356 l/h                                     | 890 l/h                                     | 1790 l/h                                    | 3570 l/h                                     |
| 2.6 g/l                             | 372 l/h                                     | 930 l/h                                     | 1860 l/h                                    | 3850 l/h                                     |
| 2.5 g/l                             | 388 l/h                                     | 970 l/h                                     | 1930 l/h                                    | 3870 l/h                                     |
| 2.4 g/l                             | 404 l/h                                     | 1010 l/h                                    | 2020 l/h                                    | 4030 l/h                                     |
| 2.3 g/l                             | 420 l/h                                     | 1050 l/h                                    | 2110 l/h                                    | 4220 l/h                                     |
| 2.2 g/l                             | 440 l/h                                     | 1100 l/h                                    | 2210 l/h                                    | 4410 l/h                                     |
| 2.1 g/l                             | 464 l/h                                     | 1160 l/h                                    | 2320 l/h                                    | 4630 l/h                                     |
| 2.0 g/l                             | 488 l/h                                     | 1220 l/h                                    | 2430 l/h                                    | 4870 l/h                                     |
| 1.9 g/l                             | 512 l/h                                     | 1280 l/h                                    | 2570 l/h                                    | n.a.   |
| 1.8 g/l                             | 544 l/h                                     | 1360 l/h                                    | 2710 l/h                                    | n.a.   |
| 1.7 g/l                             | 576 l/h                                     | 1440 l/h                                    | 2880 l/h                                    | n.a.   |
| 1.6 g/l                             | 612 l/h                                     | 1530 l/h                                    | 3060 l/h                                    | n.a.   |
| 1.5 g/l                             | 652 l/h                                     | 1630 l/h                                    | 3270 l/h                                    | n.a.   |

The process water pressure is adjusted on the pressure reducing valve (I) to 4.5 bar.

### 3.7.2 Motive water for aspiration injector

The motive water for the aspiration injector is dependent upon the system variants:

| System variant      | Motive water for the aspiration injector |
|---------------------|--|
| 1000-N10 / 1000-D10 | 1160 l/h                                 |
| 1000-N20 / 1000-D20 | 840 l/h                                  |
| 1000-N30 / 1000-D30 | 1240 l/h                                 |
| 1000-N40 / 1000-D40 | 1600 l/h                                 |
| 2500-N10 / 2500-D10 | 2900 l/h                                 |
| 2500-N20 / 2500-D20 | 2100 l/h                                 |
| 2500-N30 / 2500-D30 | 3100 l/h                                 |
| 2500-N40 / 2500-D40 | 4000 l/h                                 |
| 5000-N10 / 5000-D10 | 4000 l/h                                 |
| 5000-N15 / 5000-D15 | 2900 l/h                                 |
| 5000-N20 / 5000-D20 | 3700 l/h                                 |
| 10000-N10           | 3000 l/h                                 |
| 10000-N15           | 4200 l/h                                 |
| 10000-N20           | 5400 l/h                                 |

-N: without booster pump

-D: with booster pump

### 3.8 Chemical consumption

The consumption indicated contains calculated values and refers to 100 % of the preparation duration.

| for<br>1000 g/h ClO <sub>2</sub><br>version |                    | for<br>2500 g/h ClO <sub>2</sub><br>version |                    | for<br>5000 g/h ClO <sub>2</sub><br>version |                    | for<br>10000 g/h ClO <sub>2</sub><br>version |                    |
|---|--------------------|---|--------------------|---|--------------------|--|--------------------|
| HCl   | NaClO <sub>2</sub> | HCl   | NaClO <sub>2</sub> | HCl   | NaClO <sub>2</sub> | HCl  | NaClO <sub>2</sub> |
| 6,6 l/h                                     | 6,6 l/h            | 16.5 l/h                                    | 16.5 l/h           | 33 l/h                                      | 33 l/h             | 66 l/h                                       | 66 l/h             |



### 3.9 Connections

| Connections   | 1000/2500/5000<br>g/h | 10000<br>g/h |
|---|-----------------------|--------------|
| Operating water supply  | PVC DN25              | PVC DN40     |
| Aspiration pipe from the hydrochloric acid storage tank                       | PVC DN10              | PVC DN10     |
| Aspiration pipe from the NaClO <sub>2</sub> storage tank                      | PVC DN15              | PVC DN15     |
| Connection of the ClO <sub>2</sub> line to the ClO <sub>2</sub> storage tank  | PVC DN25              | PVC DN25     |
| Vent gas discharge pipe   | PVC DN25              | PVC DN25     |
| Vent gas aspiration pipe from the ClO <sub>2</sub> storage tank               | PVC DN15              | PVC DN15     |
| Vent gas discharge pipe back pressure   | see 3.6               | see 3.6      |
| Absorber with safety overflow mechanism at ClO <sub>2</sub> storage tank (AP) | PVC DN25              | PVC DN25     |



## 4. Installation and start up

The system components are labeled with (A) ..., see illustrations in chapter 3.2, technical data see 3.5.

### 4.1 Scope of supply, transport

#### 4.1.1 Scope of supply

The DIOX-A is installed wired ready for connection.

The following parts are separately packed:

- Absorber with ceramic carrier material and initial filling of sodium thiosulfate, vacuum switch.
- Ultrasonic fill level sensor, overfilled sensor and temperature sensor for the ClO<sub>2</sub> tank
- Levelling bases
- Decal kit for sign posting the system room according to the local regulations.

*Option*

- Gas monitoring system GMS

#### 4.1.2 Transport



---

##### *Warning!*

During transport or storage, danger of crushing, impact hazard! Secure the system against rolling, falling or sliding. Wear protective clothing and safety gloves. Only to be carried out by trained personnel.

---

The system is delivered ready assembled in a wooden crate for standing transport. Four transport rollers are mounted on for pushing.

- During transport, the system must be secured against falling and rolling.

- Lift the system with proper equipment, e.g. fork lift or lift truck, in the middle of the system.



#### 4.1.3 Unpacking

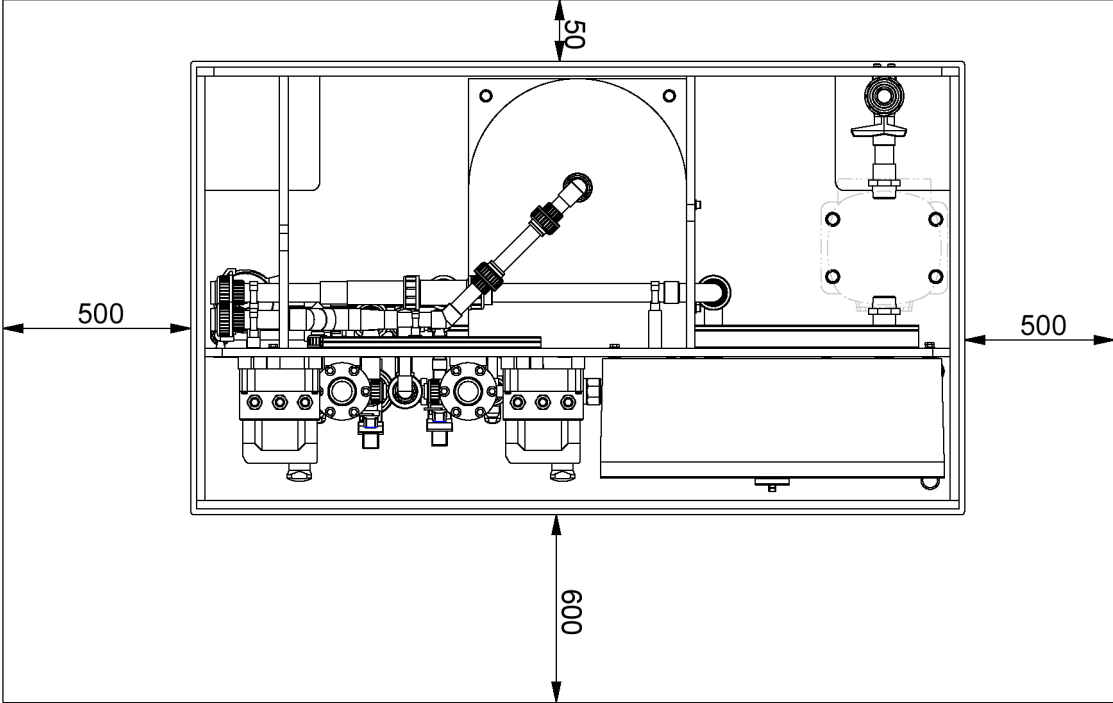
- While unpacking, pay attention that all the required parts in the parts list are present.
- Dispose of the packaging after successful start up.

### 4.2 Conditions for installation

#### 4.2.1 Set up location of the DIOX-A

- The chlorine dioxide generator and the chemicals have to be in a closed room not intended for the permanent presence of persons.
- The rooms must comply with the corresponding requirements set forth by the accident prevention regulation "Chlorination of water", (in Germany) and corresponding local regulations e.g. regarding fire prevention.
- Lockable, protected against unauthorized access.
- Furnish with mandatory sign posting
- Frost-resistant, no direct sunlight, easily ventilated  
Exchange of fresh air from outside must be possible.
- Working temperature in the system room: +10...35 °C  
if needed, an active temperature control of the installation site may be necessary, e.g. using a fan or air conditioning unit.
- Relative humidity 5-95%
- Floor drain with fluid receiver and water connection for maintenance and cleaning work.
- In the rooms in which sodium chlorite is handled, smoking or open flames are prohibited.
- There must be ample room for the installation and maintenance available (see the following page and technical data).  
The control panel door must be fully able to open.

- Space requirements:



- see also the dimension drawing in chapter 10.

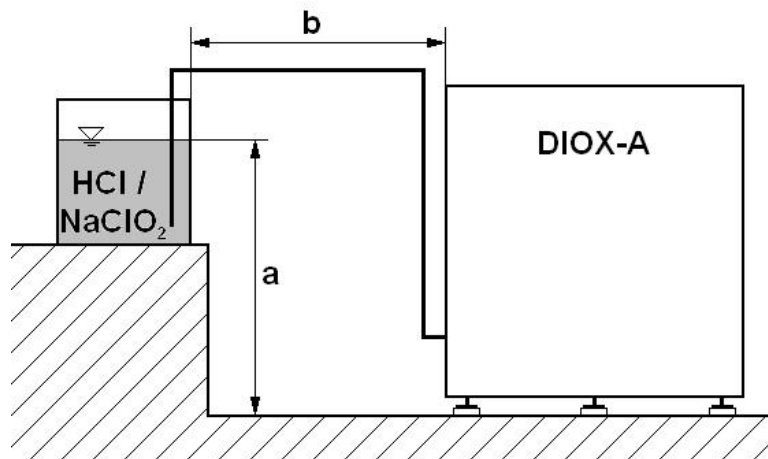
#### 4.2.2 Operating water

- The operating water must always be available in sufficient quantity and sufficient pressure (see table in chapter 3.7)
- The operating water must not contain any sediments (drinking water quality in accordance with WHO Guidelines for Drinking water quality, third edition).
- For systems without pressure increase, a constant admission pressure is urgently required (see table in chapter 3.7)
- If there is a low operating water admission pressure, a booster pump is necessary.
- Operating water temperature 10 ... 30°C
- Connection according to DIN 1988 T4 and DIN EN 1717, Backflow preventer and protection filter in front of the system

### 4.2.3 Storage tank for the initial chemicals

General requirements:

- Appropriate for the provisioning of hydrochloric acid and sodium chlorite in the corresponding concentrations.
- For filling and draining, a corresponding venting and ventilation must be ensured.
- Reaching the minimum fill level is detected by a correlative sensor and the system must be locked over the contact configured for this purpose.
- The temperature in the installation room of the tank may not be higher than the temperature in the installation room of the DIOX-A.
- Mixing both chemicals must in no manner take place, even in the case of leakage (risk of explosion).
- For setting up the tank, the following dimensions are permitted:



a: -1 m ... +1.7 m

(in reference to the possible fluid fill level in the tank)

b: max. 7m line length

#### 4.2.4 ClO<sub>2</sub> storage tank

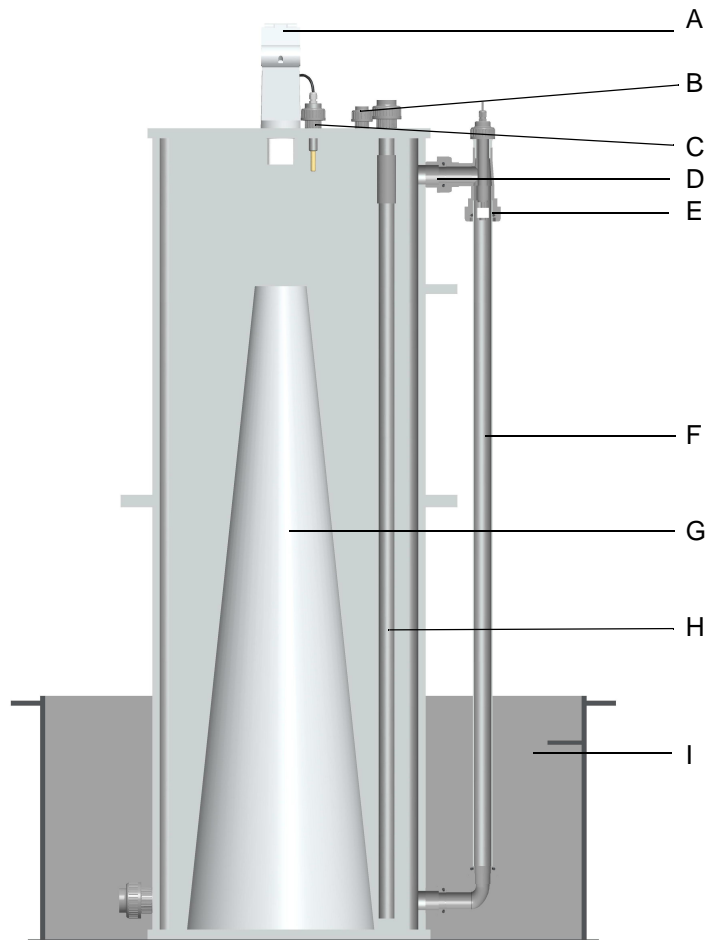
General requirements:

- Material suitable for provisioning of chlorine dioxide solution (3.0 g/l chlorine dioxide to 35°C)
- Installation surface level and sustainable, Installation according to DIN EN 13121 - 4
- Installation of the ClO<sub>2</sub> storage tank in a impermeable collecting basin. The volume of the collecting basin is to be chosen according to the country-specific regulations.
- Filling line of the DIOX-A to the ClO<sub>2</sub> storage tank DN 25 or larger; line length < 15 m
- Line material resistant to chlorine dioxide solution as described above
- The tank must be gas tight. Ventilation may only take place over the absorber (see below) with the fluid receiver and the gas vent aspiration device.
- During the chlorine dioxide preparation, the ventilation must be ensured solely by the gas vent aspiration device. A push through of gas through the absorber is not permitted.
- Aspiration line DN 15 or larger; line length < 15 m, Line material resistant to chlorine dioxide solution
- Due to the process, the minimum tank sizes are (usable tank volumes):  
DIOX-A 1000 g/h ClO<sub>2</sub>: 450 l  
DIOX-A 2500 g/h ClO<sub>2</sub>: 900 l  
DIOX-A 5000 g/h ClO<sub>2</sub>: 2700 l  
DIOX-A 10000 g/h ClO<sub>2</sub>: 4600 l
- For the round tank supplied by Evoqua (made by Weber):  
The tank must not be exposed to frost.  
Before mounting the tank check the temperature check label. If the label indicates frost, inform Evoqua and Weber immediately.  
Place the drainage underlayer between ClO<sub>2</sub> tank and collecting basin.
- The operator must ensure that the ClO<sub>2</sub> storage tank is subject to a annual test through a certified inspection agency.

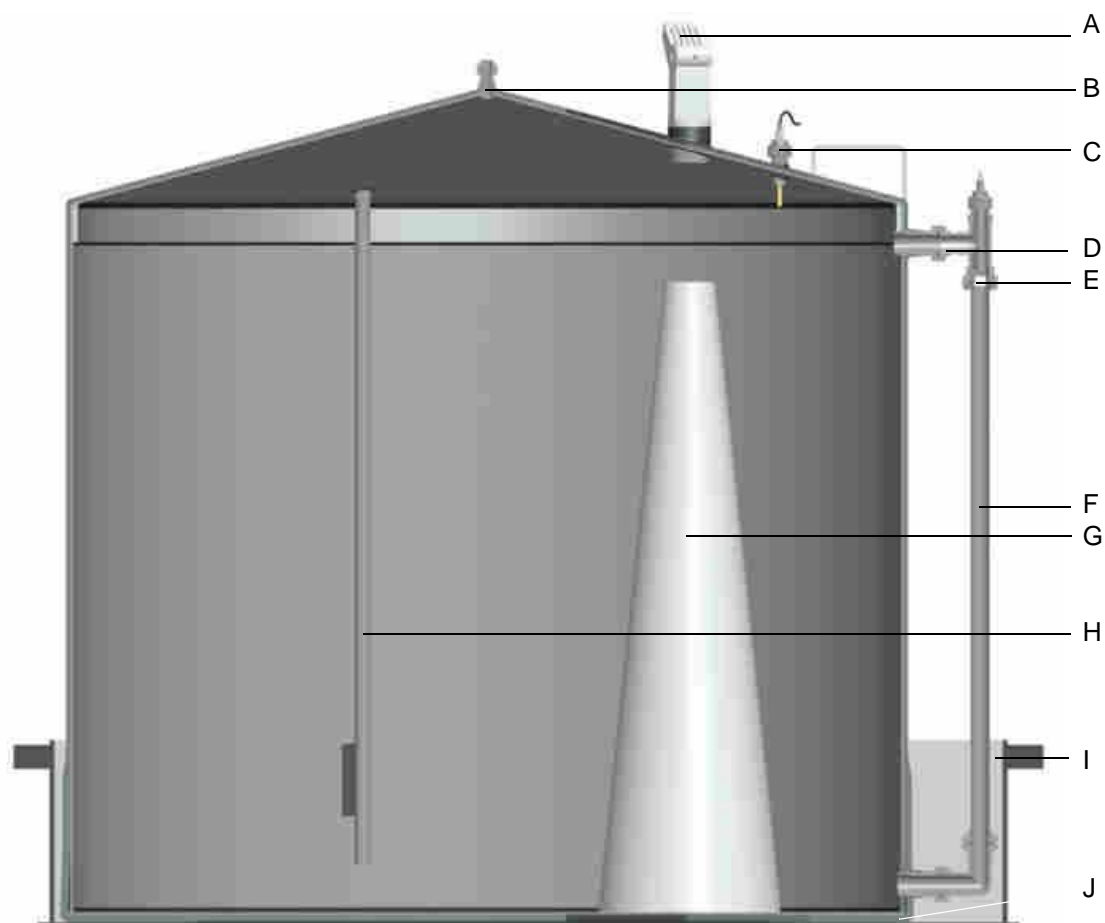


- For safety and technical reasons the following accessories kit must be used.  
(Layout and installation see following dimension drawings).

| Function   | Part   | Part No.  |
|--|--|-----------|
| Temperature monitoring ClO <sub>2</sub> storage tank   | Temperature sensor<br>Connection G 1¼"<br>(Insert with unionnut)   | W3T242724 |
| Safety overflow mechanism ClO <sub>2</sub> storage tank<br>Ventilation ClO <sub>2</sub> storage tank<br>Monitoring vent gas aspiration | Absorption device (Absorber with ventilations and vacuum switch)<br>Connection G2"<br>(Insert with unionnut) | W3T251942 |
| Fill level ClO <sub>2</sub> storage tank   | Fill level sensor<br>(G2" internal thread)   | W3T240930 |
| Monitoring overfilled ClO <sub>2</sub> storage tank  | Overfilled sensor (float switch)<br>Connection G 1¼"<br>(Insert with unionnut)                               | W3T163928 |

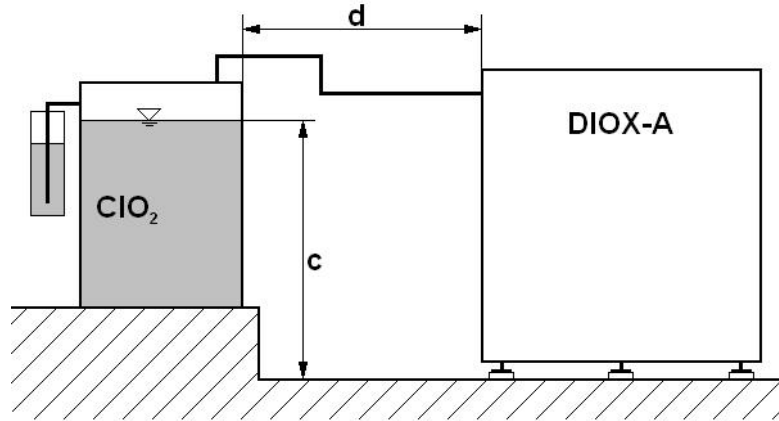
**Rectangular storage tank 500 l**

- A *Fill level sensor (ultrasonic)*
- B *Ventilation for the vent gas aspiration*
- C *Temperature sensor gas compartment*
- D *Connection standpipe (above fluid level)*
- E *Float switch overfilled*
- F *Standpipe*
- G *Intended sound beam (ultrasonic)*
- H *Filling pipe*
- I *Collecting basin*

**Round storage tank 900 I / 2750 I / 4600 I**

- A *Fill level sensor (ultrasonic)*
- B *Ventilation for the vent gas aspiration*
- C *Temperature sensor gas compartment*
- D *Connection standpipe (above fluid level)*
- E *Float switch overfilled*
- F *Standpipe*
- G *Intended sound beam (ultrasonic)*
- H *Filling pipe*
- I *Collecting basin*
- J *Drainage underlayer*

For setting up the tank, the following dimensions are permitted:



- c: -2 ... +3 m  
(in reference to the possible fluid fill level in the ClO<sub>2</sub> storage tank)
- d: max. 10 m distance, max. 15 m line length

#### Standard ClO<sub>2</sub> storage tank

| Storage tank size         | for DIOX-A<br>1000 g/h<br>ClO <sub>2</sub> | for DIOX-A<br>2500 g/h<br>ClO <sub>2</sub> | for DIOX-A<br>5000 g/h<br>ClO <sub>2</sub> | for DIOX-A<br>10000 g/h<br>ClO <sub>2</sub> | Tank<br>dimensions<br>WxHxD    |
|---------------------------|--|--|--|---|--------------------------------|
| 500 l<br>rectangular tank | W3T334426                                  | n.a.                                       | n.a.                                       | n.a.  | 900 x 1850 x 750               |
| 900 l<br>round tank       | W3T232812                                  | W3T232812                                  | n.a.                                       | n.a.  | 1200 x 1800 x 1250<br>(Ø 1035) |
| 2750 l<br>round tank      | W3T232813                                  | W3T232813                                  | W3T232813                                  | n.a.  | 1800 x 1900 x 2000<br>(Ø 1775) |
| 4600 l<br>round tank      | W3T232814                                  | W3T232814                                  | W3T232814                                  | W3T232814                                   | 2300 x 2000 x 2500<br>(Ø 2280) |

#### 4.2.5 ClO<sub>2</sub> solution dosing

- Dosing of the ClO<sub>2</sub> solution from the ClO<sub>2</sub> storage tank by dosing pumps or injectors
- Liquid level in the dosing line not over the MAX contact of the ClO<sub>2</sub> storage tank

### 4.3 Installation

For sequence, see separate checklist VD317-1.



*Warning!*

Danger of crushing, impact hazard!  
Secure the system against rolling, falling or sliding.  
Wear protective clothing and safety gloves.  
Only to be carried out by trained personnel.

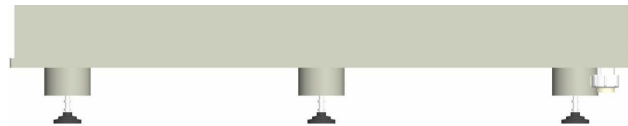


*Warning!*

Chemical hazard!  
Wear suitable protective clothing, gloves and eye/face protection while working.  
Keep respirator on standby.  
Only to be carried out by trained personnel.

#### 4.3.1 Setting up DIOX-A

- 1 Lift the system and remove the transport rollers.
- 2 Attached the leveling bases included in the scope of supply.
- 3 Adjust the leveling bases in such a way that the system stands on all five feet.  
Make sure you stand it up exactly horizontally.  
Tighten the nuts of the leveling base to secure



- 4 For DIOX-A with booster pump:  
Remove transport locking device from booster pump.

### 4.3.2 Installing the operating water supply

General requirements:

- The operating water must have drinking water quality.
- Temperature 10 -30°C
- Connections to DIN 1988 T4 resp. DIN EN 1717
- The tube diameters must be suitable for the following maximum water flow:

Maximum water flow =

Maximum process water flow + Motive water flow for aspiration injector

| ClO <sub>2</sub> concentration | Maximum process water flow                                       |                                     |   |
|--------------------------------|--|-------------------------------------|---|
|                                | DIOX-A<br>1000 g/h ClO <sub>2</sub><br>2500 g/h ClO <sub>2</sub> | DIOX-A<br>5000 g/h ClO <sub>2</sub> | DIOX-A<br>10000 g/h<br>ClO <sub>2</sub> |
| 3,0 g/l                        | 800 l/h  | 1600 l/h                            | 3200 l/h                                |
| 2,9 g/l                        | 830 l/h  | 1660 l/h                            | 3320 l/h                                |
| 2,8 g/l                        | 860 l/h  | 1720 l/h                            | 3440 l/h                                |
| 2,7 g/l                        | 890 l/h  | 1790 l/h                            | 3570 l/h                                |
| 2,6 g/l                        | 930 l/h  | 1860 l/h                            | 3710 l/h                                |
| 2,5 g/l                        | 970 l/h  | 1930 l/h                            | 3870 l/h                                |
| 2,4 g/l                        | 1010 l/h   | 2020 l/h                            | 4030 l/h                                |
| 2,3 g/l                        | 1050 l/h   | 2110 l/h                            | 4220 l/h                                |
| 2,2 g/l                        | 1100 l/h   | 2210 l/h                            | 4410 l/h                                |
| 2,1 g/l                        | 1160 l/h   | 2320 l/h                            | 4630 l/h                                |
| 2,0 g/l                        | 1220 l/h   | 2430 l/h                            | 4870 l/h                                |
| 1,9 g/l                        | 1280 l/h   | 2570 l/h                            | n.a.                                    |
| 1,8 g/l                        | 1360 l/h   | 2710 l/h                            | n.a.                                    |
| 1,7 g/l                        | 1440 l/h   | 2880 l/h                            | n.a.                                    |
| 1,6 g/l                        | 1530 l/h   | 3060 l/h                            | n.a.                                    |
| 1,5 g/l                        | 1630 l/h   | 3270 l/h                            | n.a.                                    |

For the aspiration motive water flow refer to table 3.7.2

### 4.3.3 Connect chemical tanks

- 1 Remove drain plug from the connections.
- 2 Lay the HCl or NaClO<sub>2</sub> aspiration pipe as short as possible.  
Maximum length: 15 m  
Material: PVC pipe or hose  
(for gluing of HCl lines, use a glue that is suitable for use with concentrated acids, e.g. Dytex ®)
- 3 Pay attention that both chemicals in no way can come into contact with one another (e.g. in case of damage, leak, etc.)
- 4 Check the lines for leaks.

### 4.3.4 Connect the rectangular ClO<sub>2</sub> storage tank (500 l)



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*Please note*

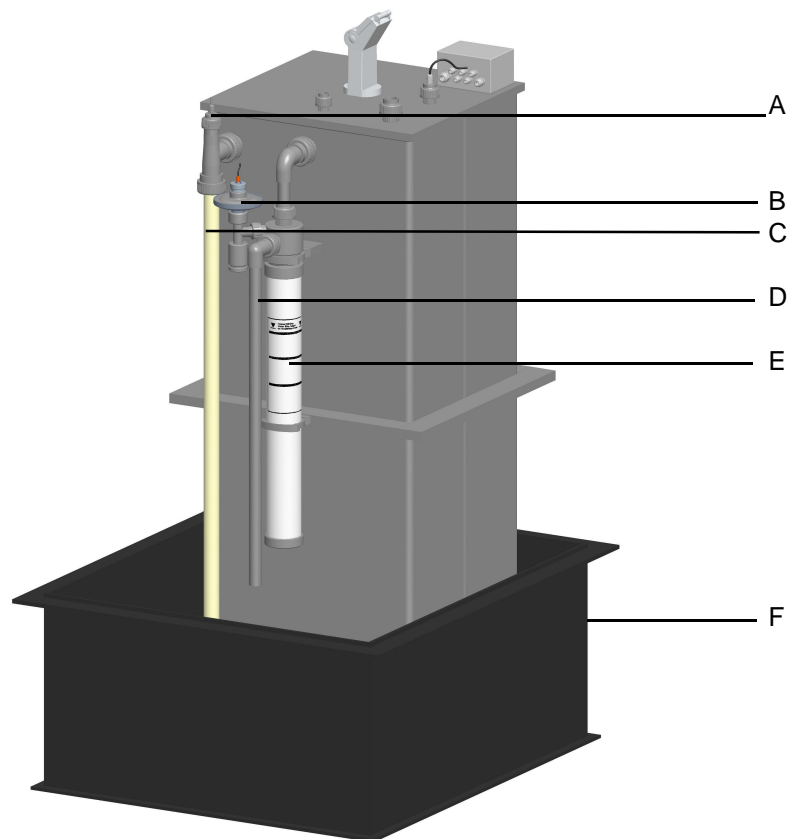
Only operate the ClO<sub>2</sub> storage tank non-pressurized.

---

- 1 Remove drain plug from the connections.
- 2 Lay the ClO<sub>2</sub> line as short as possible.  
Maximum length: 15 m  
Material: PVC-U, DN25 or larger
- 3 Install the 3-way valve ClO<sub>2</sub> drain outlet (AT) in the ClO<sub>2</sub> line (see chapter 3.2.3).  
Set the ball valve to straight in the positioning range and seal.
- 4 Optional:  
Mount the T-part with the ClO<sub>2</sub> sampling valve (AU) into a horizontal portion of the ClO<sub>2</sub> line.  
This sampling valve is needed for the ClO<sub>2</sub> correction (see chapter 6.12.5).  
Lock the ClO<sub>2</sub> sampling valve in the closed position (e.g. with a padlock) and close it with a union nut and a dummy disc.
- 5 Check the line for leaks.
- 6 Install the transparent standpipe.
- 7 Install the absorber device (W3T251942) (refer to the mounting drawing on the next page).  
The fixing parts are supplied together with the tank.  
The safety overflow has to end inside the collecting basin.
- 8 Mount the fill level sensor (ultrasonic transmitter, W3T240930) onto the ClO<sub>2</sub> tank.  
In the process, pay attention to:
  - no objects obstructing the sound beam
  - Distance to the max. fill level > 250 mm

- 9 Mount the overfilled level sensor (W3T163928) onto the standpipe of the ClO<sub>2</sub> tank.
- 10 Mount the temperature sensor (W3T242724) on to the ClO<sub>2</sub> tank (measurement of the temperature in the gas compartment above the ClO<sub>2</sub> solution).

### Installing the absorber



- A Overfilled sensor
- B Vacuum switch
- C Transparent standpipe, maximum fill level
- D Overflow
- E Absorber tank
- F Collecting basin



### 4.3.5 Connect the round ClO<sub>2</sub> storage tank



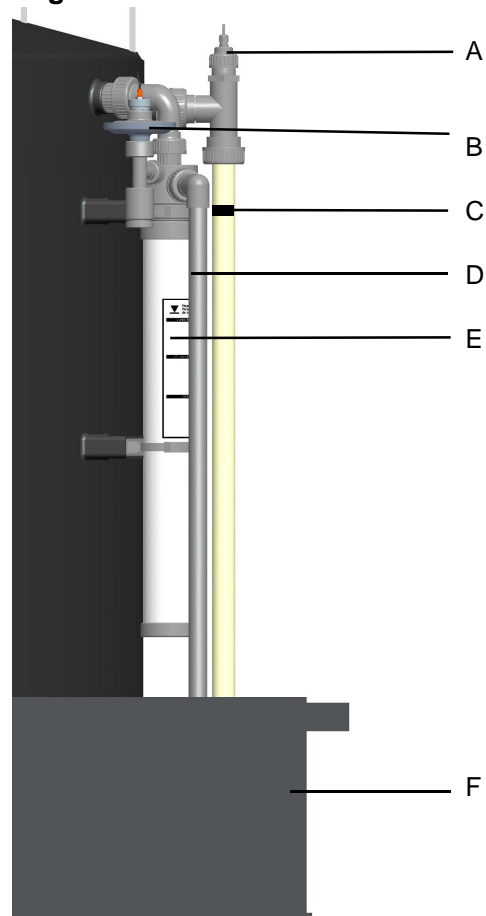
---

*Please note*

Only operate the ClO<sub>2</sub> storage tank non-pressurized.

---

- 1 Remove drain plug from the connections.
- 2 Lay the ClO<sub>2</sub> line as short as possible.  
Maximum length: 15 m  
Material: PVC-U, DN25 or larger
- 3 Install the 3-way valve ClO<sub>2</sub> drain outlet (AT) in the ClO<sub>2</sub> line (see chapter 3.2.3).  
Set the ball valve to straight in the positioning range and seal.
- 4 Optional:  
Mount the T-part with the ClO<sub>2</sub> sampling valve (AU) into a horizontal portion of the ClO<sub>2</sub> line.  
This sampling valve is needed for the ClO<sub>2</sub> correction (see chapter 6.12.5).  
Lock the ClO<sub>2</sub> sampling valve in the closed position (e.g. with a padlock) and close it with a union nut and a dummy disc.
- 5 Check the line for leaks.
- 6 Install the transparent standpipe.
- 7 Mount the wiring box.
- 8 Install the absorber device (W3T251942) (refer to the mounting drawing WAE7773, pos. 4-8, the drawing is supplied with the accessories).  
The safety overflow has to end inside the collecting basin.
- 9 Mount the fill level sensor (ultrasonic transmitter, W3T240930) onto the ClO<sub>2</sub> tank.  
In the process, pay attention to:
  - no objects obstructing the sound beam
  - Distance to the max. fill level > 250 mm
- 10 Mount the overfilled level sensor (W3T163928) onto the standpipe of the ClO<sub>2</sub> tank.
- 11 Mount the temperature sensor (W3T242724) on to the ClO<sub>2</sub> tank (measurement of the temperature in the gas compartment above the ClO<sub>2</sub> solution).

**Installing the absorber**

- A *Overfilled sensor*
- B *Vacuum switch*
- C *Transparent standpipe, maximum fill level*
- D *Overflow*
- E *Absorber tank*
- F *Collecting basin*

#### 4.3.6 Installing vent gas aspiration pipe

from the ClO<sub>2</sub> storage tank to the aspiration injector

- 1 Lay the vent gas aspiration pipe.  
Maximum length between DIOX-A and ClO<sub>2</sub> tank: 15 m  
Material: PVC-U, DN15 or larger.
- The use of flow regulating control valves or shut-off devices is not permitted.
  - Each DIOX-A requires a separate vent gas aspiration pipe.

#### 4.3.7 Vent gas discharge pipe

after the aspiration injector

- Material: PVC-U, DN25 or larger
- The use of flow regulating control valves or shut-off devices is not permitted.  
A stop valve or a drain valve is recommended for maintenance purposes.
- Each DIOX-A requires a separate vent gas discharge.
- The water in the vent gas discharge is showing a low concentration of chlorine dioxide. It should be led to the water flow to be treated
- Pay attention to the maximum back pressure in the gas phase discharge (see chapter 3.8).

**Attach labels and information signs**

- 1 Put up the signs included in the scope of supply for operating water, chlorine dioxide, sodium chlorite. ventilation and venting in clear and plain view. (Sign kit W3T166586).
- 2 Fit safety warning signs at the entrance to the system room.

See also national regulations.

#### 4.4 Installing the DIOX-A electrically



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##### *Warning!*

To prevent harm to health or damage to the system:  
Electrical hazards must be ruled out. The system may only be connect, started up, maintained or repaired by an electrical technician.

---

For any work on the electrical system, please pay attention to the following:

- this operating manual and any of the related wiring diagrams
- applicable electrical regulations such as VDE0100, VDE0113, BGV-A2 as well as the regulations of the responsible power utilities company.
- Inspections at the installation site of the machine or at site of construction must be carried out depending on the current state of implementation of the machine. (see also DIN EN 60204-1, Table 9)  
Testing methods in TN Systems
  - Test 1 required >>Test 1 "Examination of the consistency of the conductor system"
  - Test 2 required >>Test 2 "Examination of the impedance of the of the fault loop and the adequacy of the overcurrent protective device"
- Safety requirements on site:  
Please get detailed information from the operator!  
Coordinate your work with the environment around you!
- Only used approved and functioning tools, measuring devices, and personal safety equipment.
- The system must be properly grounded. No freely accessible part of the system may be located at mains potential or any other dangerous voltage potential.
- As soon as the system is connected, work at the system may only be performed when the back-up fuse has been removed or the local main switch is secured in the OFF position. (e.g. with a padlock).
- If work on a running device is necessary, do not touch electrical contacts in any way.

- 1 Connect the system according to the wiring diagram (see chapter 9.)

The system is configured for connection to a TN-network.  
For inspection and confirmation see "Installation acceptance certificate".

#### 4.4.1 Connect inputs

There are inputs that must be connected and inputs whose connection is optional:

| Input   | Contact | Voltage        | State   | Switching function          | Need      |
|---|---------|----------------|---------|-----------------------------|-----------|
| Gas alarm from the gas monitoring system              | Closer  | potential-free | closed  | Opens in event of gas alarm | optional  |
| Leakage monitoring DIOX-A                             | Opener  | potential-free | closed  | Opens if leakage            | mandatory |
| ClO <sub>2</sub> storage tank (AO) leakage monitoring | Opener  | potential-free | closed  | Opens if leakage            | optional  |
| ClO <sub>2</sub> storage tank overfilled              | Opener  | potential-free | closed  | Opens if overfilled         | mandatory |
| ClO <sub>2</sub> storage tank fill level              | -       | mA signal      | 4-20 mA | 4 mA: empty<br>20 mA, full  | mandatory |
| HCl storage tank empty (AN)                           | Opener  | potential-free | closed  | Opens at empty              | mandatory |
| HCl storage tank MIN                                  | Opener  | potential-free | closed  | Opens if under MIN          | optional  |
| HCl storage tank MAX                                  | Opener  | potential-free | closed  | Opens if over MAX           | optional  |
| NaClO <sub>2</sub> storage tank empty (AM)            | Opener  | potential-free | closed  | Opens at empty              | mandatory |
| NaClO <sub>2</sub> storage tank MIN                   | Opener  | potential-free | closed  | Opens if under MIN          | optional  |
| NaClO <sub>2</sub> storage tank MAX                   | Opener  | potential-free | closed  | Opens if over MAX           | optional  |
| Release preparation / preparation off                 | Closer  | potential-free | closed  | Opens to end preparation    | optional  |
| Release system / EMERGENCY-STOP                       | Closer  | potential-free | closed  | Opens for EMERGENCY-STOP    | optional  |



*Please note*

If they are not already bridged as a default, bridge all inputs which are not needed.



*Please note*

The manufacturer always recommends the use of a gas monitoring system.

#### 4.4.2 Connect outputs

Arrange the outputs of the relevant design type in accordance with the specifications in the electrical diagram in chapter 9.

| Output                    | Contact            | Voltage        | State                        | Switching function                                    | Need     |
|---------------------------|--------------------|----------------|------------------------------|---|----------|
| Flashing alarm light/horn | Transistor output  | DC 24 V        | inactive                     | active when fault occurs<br>(Time limit of 3 minutes) | optional |
| Alarm relay 1             | Changeover contact | potential-free | adjustable<br>NC/NO,<br>time | adjustable<br>see chapter 4.6.7                       | optional |
| Alarm relay 2             | Changeover contact | potential-free |                              |   | optional |
| Alarm relay 3             | Changeover contact | potential-free |                              |   | optional |
| Alarm relay 4             | Changeover contact | potential-free |                              |   | optional |
| Alarm relay 5             | Changeover contact | potential-free |                              |   | optional |

#### 4.5 Connect interface (optional)

Connect interfaces for the PROFIBUS DP according to the wiring diagram (see chapter 9. ).

The connection to a PROFIBUS DP network is described in chapter 5.

## 4.6 Start the plant

For sequence, see separate checklist VD317-2.



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### *Warning!*

Wear suitable protective clothing, gloves and eye/face protection while working.

Keep respirator on standby.

Hydrochloric acid is caustic!

Chlorine dioxide is caustic, poisonous and flammable.

Sodium chlorite solution in its dry-state is oxidizing. Do not allow to dry into flammable substances.

Danger of spontaneous combustion!

The chemicals must in no way come into contact with each other or with other chemicals. Risk of explosion!

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### *Warning!*

In the reactor, air pockets must not form.

Otherwise, there is risk of explosion.

It is therefore important upon starting the system to first fill the reactor with water.

---

### 4.6.1 Preparation

- 1 Check all screw joints
- 2 Check the fill level in the HCl- and NaClO<sub>2</sub> storage tanks.

### 4.6.2 Fill absorber

see also the directions on the absorber housing (AP)

- 1 Take off the holding clip of the absorber housing (AP).
- 2 Pull lower part of the absorber housing by turning while holding the upper part of the absorber housing (e.g. with a band wrench).
- 3 Apply filler (order No. W3T162291) to the absorber housing.
- 4 Fill the absorber housing with water to the marking.
- 5 Pour 300 g sodium thiosulfate (order no. W3T163644) into the water and mix well
- 6 Check for leaks, assemble the absorber housing again.
- 7 Attach lower holding clip again.



### 4.6.3 Adjusting ball valves and a valves

The ball valve and the valves must be in the following positions before start up:

| Initials | Description   | Position  |
|----------|---|---|
| M        | 3-way valve NaClO <sub>2</sub>                          | Preparation   |
| N        | 3-way valve HCl   | Preparation   |
| S        | Dosing ball valve<br>Motive water mixing injector       | approx. half open                                       |
| T        | Dosing ball valve<br>Dilution water:                    | approx. half open                                       |
| X        | Positioner for NaClO <sub>2</sub>                       | 0%,<br>Engage the button                                |
| Y        | HCl positioner  | 0%,<br>Engage the button                                |
| AA       | Vent gas discharge pipe                                 | open  |
| AE       | ClO <sub>2</sub> supply ball valve to the reaction tank | open  |
| AH       | Reaction tank ball valve discharge                      | closed<br>sealed  |
| AJ       | Operating water supply ball valve                       | open  |
| AK       | Operating water supply                                  | open  |
| AT       | 3-way valve ClO <sub>2</sub> drain outlet               | Run<br>Reaction tank - ClO <sub>2</sub><br>storage tank |
| AU       | ClO <sub>2</sub> sampling valve                         | closed<br>locked, e.g. with a pad-<br>lock              |

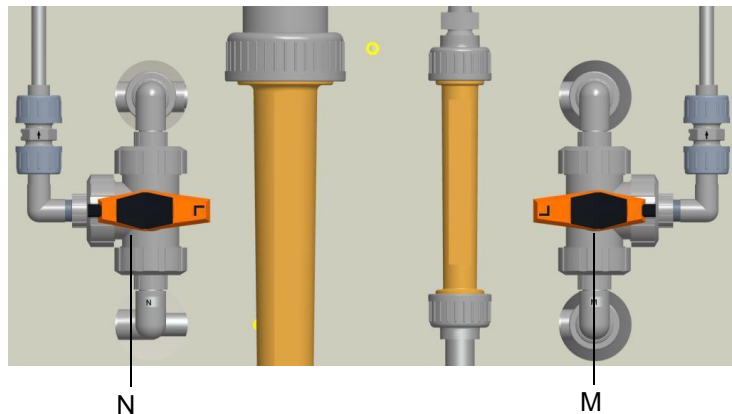
#### 4.6.4 Switch on the system



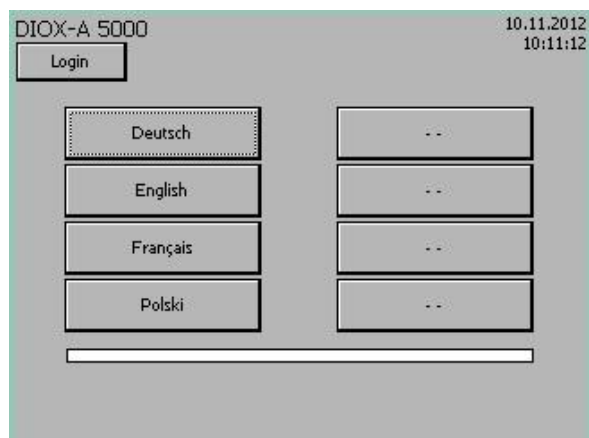
##### *Please note*

The ball valve reactor drain (AH) must be closed and sealed. The reactor drain ball valve may only be authorized specialized personnel, and only after the reactor tank has been flushed (see chapter 7.2).

- 1 3-way valve for HCl (N) and NaClO<sub>2</sub> (M) have to be in the "flush" position.

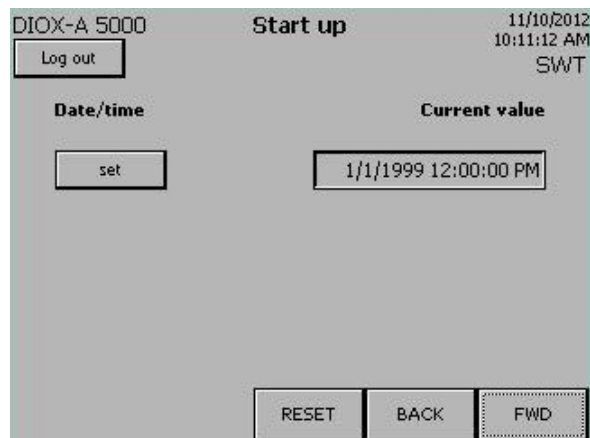


- 2 Remove the seal at the emergency OFF main switch. Switch on emergency OFF main switch. Every time the system is switched on, the display language will be requested. If no language is chosen within 10 seconds, the language settings will be kept.

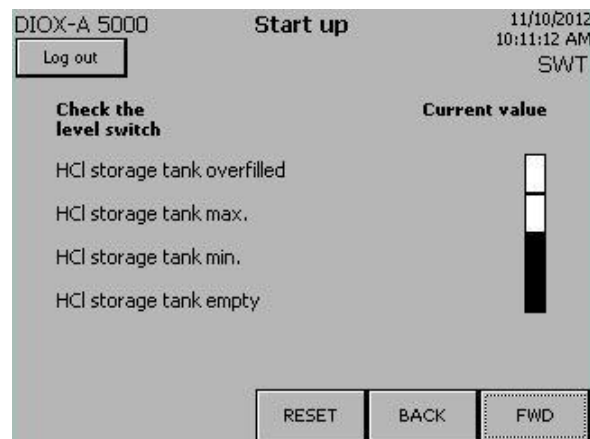


- 3 In necessary, press on the desired display language. „Start up" is displayed.
- 4 When the system is switched on for the first time, the date and time will be requested.

## Check the date and time

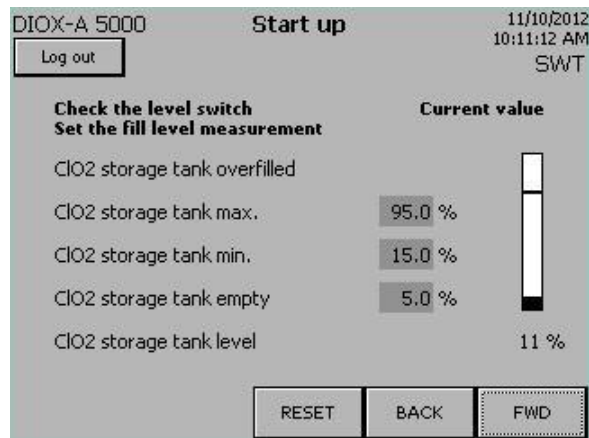


- 5 If the date and time are correct:  
Press "FWD"  
If the date and time need to be corrected:  
press the Date-Time button and set the date and time. Next,  
press "Set" and "FWD".
- 6 Log in with service password.
- 7 Press "FWD"
- 8 Check the function of the level switch in the HCL storage tank  
see chapter 4.6.5).  
The position of the level switch is shown in the bar on the right:  
white: Level not reached.  
black: Level reached.

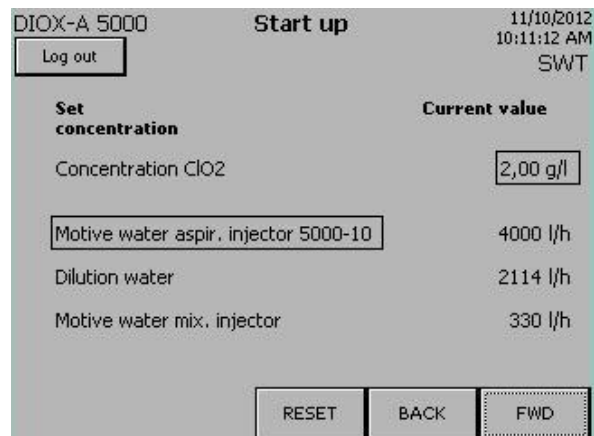


- 9 Press "FWD"  
In the same way, check the function of the level switch in the  
NaClO<sub>2</sub> storage tank.

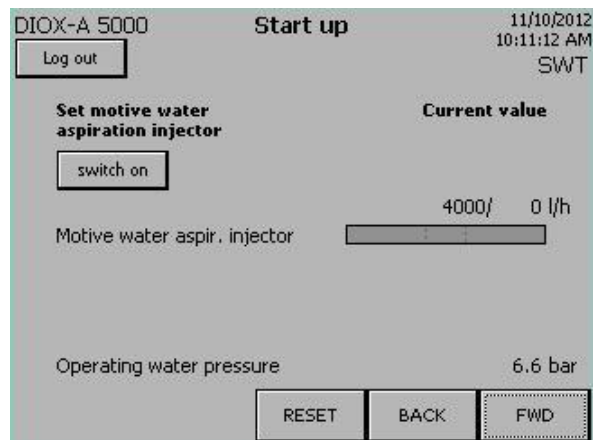
- 10** Set the fill level sensor (AR) in the ClO<sub>2</sub> storage tank (AO).  
(see chapter 4.6.9)



- 11** Set the desired ClO<sub>2</sub> concentration  
Standard default setting: 2.0 g/l  
Press the value to set.



- 12** The aspiration injector is indicated for the "aspiration injector motive water" (e.g. 5000-10).  
This indication must coincide with the type label on the aspiration injector installed  
Correct if necessary
- 13** Press "FWD"

**14 Set motive water for gas phase aspiration injector.**

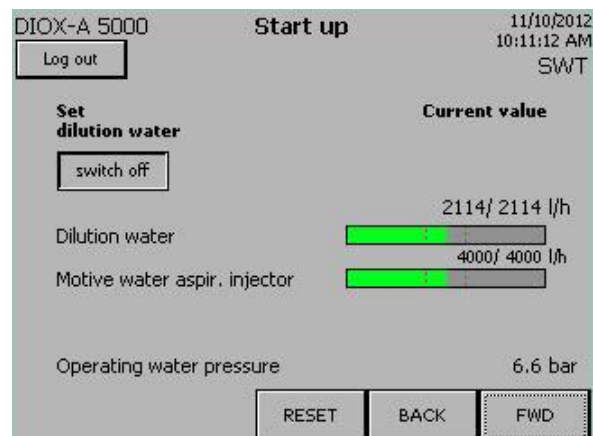
Press "switch on".

Set the Motive water flow rate with the pressure reducing valve (E) in such a way that the setpoint is reached, then the bar will be shown in green.

Flow rate value left: Setpoint

Right flow rate value: current value

If the error message "STOP positioners..." is displayed, at least one positioner (X,Y) is set to "Manual". Then, press in the adjustment knob on both positioners and engage.

**15 Check operating water admission pressure (is shown below):**  
See chapter 3.8**16 Press "FWD"****17 Set dilution water.**

Press "switch on"

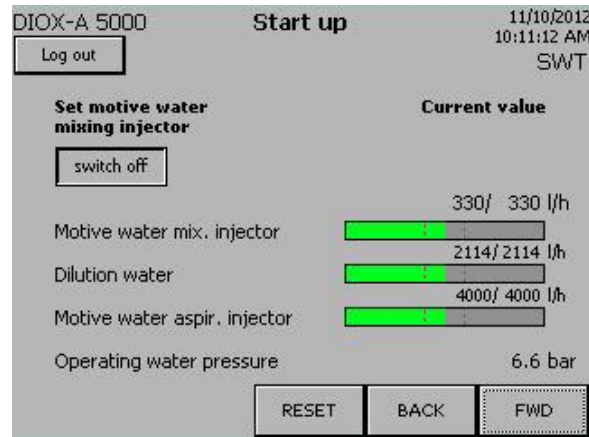
**18 Adjust the process water pressure on the pressure reducing valve (I) to 4.5 bar.****19 Set the motive water flow rate with the dosing ball valve (T) in such a way that setpoint on the float flow meter (K) has been reached, then the bar will be shown in green.**

Flow rate value left: Setpoint

Right flow rate value: current value

If the setpoint cannot be reached, the operating water admission pressure is possibly too low.

**20** Set the motive water for the mixing injector:



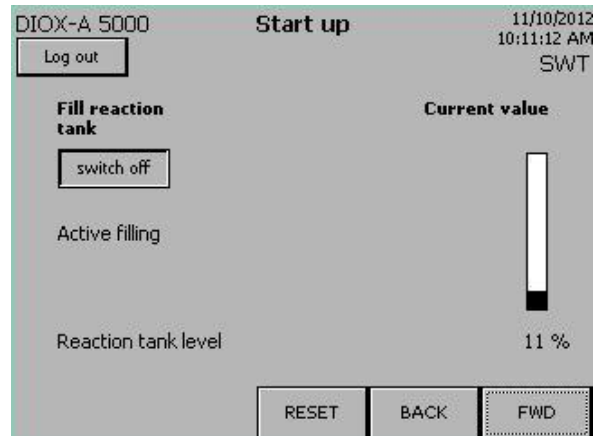
Set the motive water flow rate with the dosing ball valve (S) in such a way that the setpoint on the float flow meter has been reached, then the bar will be shown in green.

Flow rate value left: Setpoint

Right flow rate value: current value

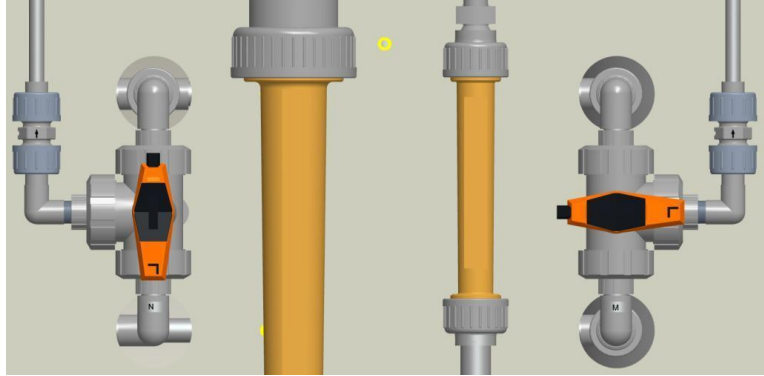
**21** If all flow rates have reached the setpoints, press "FWD".

**22** Let the water continue running until the reactor storage tank has been filled to 90%. Then the bar will be shown in green.



**23** Only then, press "switch off". Close both solenoid valves (D and J). Otherwise, the water flows until the MAX level in the ClO<sub>2</sub> storage tank has been reached.

- 24** Turn the 3-way valves for HCl (N) and NaClO<sub>2</sub> (M) to the "Preparation" position.



- 25** Press "FWD"
- 26** Start up is now complete.  
Press END  
To end start up, confirm the query with Yes.
- 27** Switch to AUTOMATIC and check the preparation for functionality.

#### 4.6.5 Checking the functionality of the fill level sensors

Die safety shut-off valve (G) opens automatically when the system is switched on.


*Empty sensor  
HCl storage tank (AN)*

- 1 Select the empty sensor in the HCl storage tank (AN); the corresponding message must be displayed.
- 2 Release the empty sensor again.  
The message disappears.


*Empty sensor  
NaClO<sub>2</sub> storage tank (AM)*

- 1 Select the empty sensor in the NaClO<sub>2</sub> storage tank (AN); the corresponding message must be displayed.
- 2 Release the empty sensor again.  
The message disappears.


*Leakage sensor  
System*

- 1 Select leakage sensor in the collecting basin of the system; the corresponding message must be displayed.  
The safety shut-off valve (G) closes.
- 2 Release the leakage sensor again.
- 3 Acknowledge the fault with  and RESET.

*Leakage sensor  
ClO<sub>2</sub> storage tank (AO)*

- 1 Select leakage sensor in the ClO<sub>2</sub> storage tank (AO); the corresponding message must be displayed.  
The safety shut-off valve (G) closes.
- 2 Release the leakage sensor again.
- 3 Acknowledge the fault with  and RESET.

*Overfilled sensor  
ClO<sub>2</sub> storage tank (AO)*

- 1 Select the overfilled sensor of the ClO<sub>2</sub> storage tank (AO).  
The safety shut-off valve (G) closes.  
the messages "ClO<sub>2</sub> storage tank overflow" and "ClO<sub>2</sub> storage tank level switch not plausible" are displayed.
- 2 Release the overfilled sensor again.
- 3 Acknowledge the fault with  and RESET.



#### 4.6.6 Check optional PLC controller inputs

- 1 Check shut off functionality of the system by triggering the gas alarm on the gas monitoring system (see separate GMS operating manual).
- 2 Check the "Release preparation/preparation off" contact for functionality.
- 3 Check the "Emergency off signal" for correct functionality.



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*Please note*

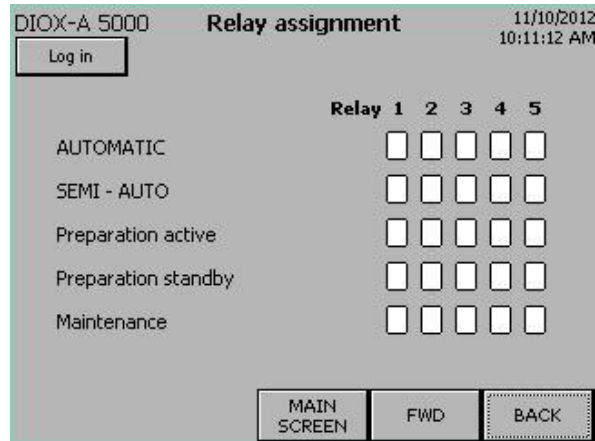
The "EMERGENCY STOP" function causes the Chlorine dioxide generator to stop immediately in the event of an external hazardous situation.

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### 4.6.7 Set output contacts

The assignment of the output contacts can be specifically customized.

- 1 Press "Menu"
- 2 Press "Outputs"
- 3 Press "Alarm relay assignment".

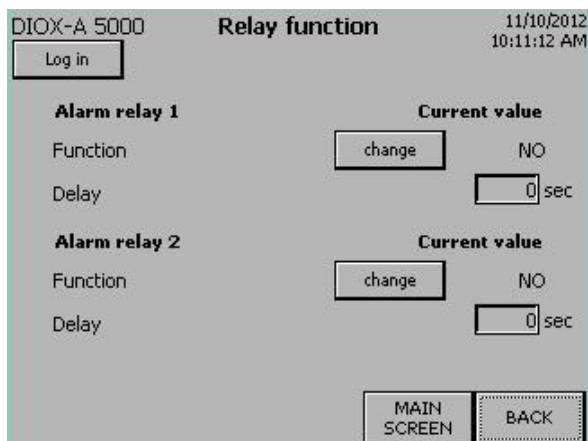


Press FWD and further settings will be shown.  
The following settings are possible:

| Message                               |
|---------------------------------------|
| AUTOMATIC                             |
| SEMI-AUTO                             |
| Preparation active                    |
| Preparation standby                   |
| Maintenance                           |
| Release dose                          |
| HCl storage tank empty                |
| NaClO <sub>2</sub> storage tank empty |
| ClO <sub>2</sub> storage tank empty   |
| HCl storage tank min                  |
| NaClO <sub>2</sub> storage tank min   |
| Warning                               |
| Fault                                 |

- 4 Choose the desired setting in addition to pressing the respective button. The chosen settings will be shown in black. For each alarm relay, numerous messages may be chosen.

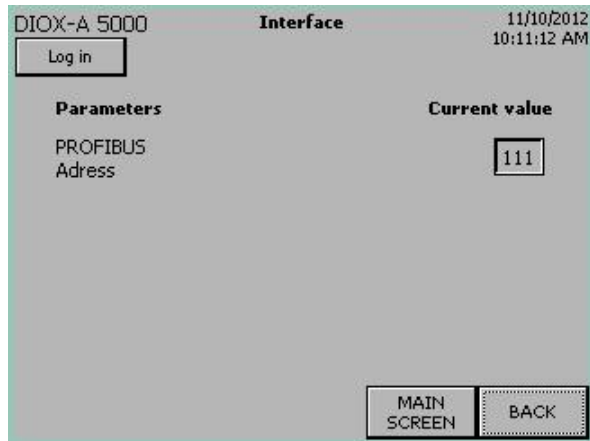
- 5 Press "FWD"
- 6 Press "Alarm relay 1/2 function"...



- 7 With the button "Change", the switching function NO and NC may be chosen.  
To change the delay, press the button under it.
- 8 Set the functions of alarm relay 2 in the same way.
- 9 To the alarm relay 3-5: Press "BACK" and then „alarm relay 3/4 and 5 function“.

#### 4.6.8 PROFIBUS DP

- 1 Press "Menu"
- 2 Press "Outputs"
- 3 Press "Interface" in the outputs menu.



- 4 The address is set to "111" as a default.  
It can be modified in the range of 3...125.

Connect PROFIBUS DP see chapter 5.



*Please note*

Both status LEDs "ERROR" and "DIAG" illuminate on the SIMATIC S7-1200 if the chlorine dioxide generator is not connected to a superordinate PROFIBUS DP network. The lacking of a communication partner (master) is signaled. The operation of the chlorine dioxide generator is not affected or interrupted as a result.

#### 4.6.9 Set the fill level sensor at the ClO<sub>2</sub> storage tank

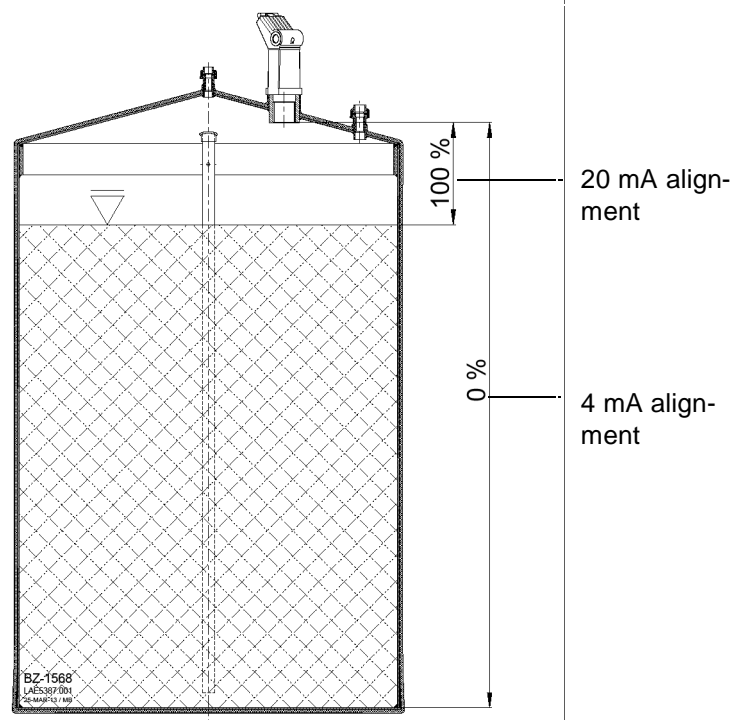
The indications in this chapter refer to the Wallace & Tiernan ClO<sub>2</sub> standard storage tank with 500 l, 900 l, 2750 l and 4600 l net capacity (rectangular or round tanks).

For installation and start up, please consult the Evoqua operating manual for the Fill level sensor (Ultrasonic Transmitter THE PROBE). For the following fill level sensor setting, the indications in the "Calibration, quick run (Scroll)" chapter shall apply.

- 1 Perform 4 mA alignment.  
In addition, record the value from the table as a calibration value in meters (distance from the lower edge of the sensor - bottom of the tank).
- 2 Perform 20 mA alignment  
In addition, record the value from the table as a calibration value in meters (distance from the lower edge of the sensor - maximum fill level).
- 3 Set close range fade-out to 0.25 meters.
- 4 Set the failsafe to FLS = 1

|                 | Calibration value |            |             |             | Fill level |
|-----------------|-------------------|------------|-------------|-------------|------------|
|                 | 500 l tank        | 900 l tank | 2750 l tank | 4600 l tank |            |
| 4 mA alignment  | 1.65 m            | 1.46 m     | 1.49 m      | 1.51 m      | 0%         |
| 20 mA alignment | 0.27 m            | 0.29 m     | 0.32 m      | 0.33 m      | 100%       |

For the setting with these values it is irrelevant if the tank at the time of these setting is filled or empty.



## 4.7 Training and instructing operators

- Train and instruct the operators with the help of the operating manual, and in particular the chapters on Safety, Operation, and Faults.  
Training and instruction must be checked with the protocol for training and instruction VD317-4. The protocol must be filled out correctly, signed and sent to the manufacturer (requirement for the claim of liability for defects).



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*Please note*

Risk of damage to the system!  
Before commencing training, log out of the service password level and log in using the level 2 with user name and password (WT, 9040)

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*Please note*

The operator of the overall system must ensure that only authorized and qualified personnel working with their specific area of responsibility can work on or with the chlorine dioxide generator.

Anyone working with the chlorine dioxide generator must have read and understood the operating manual, and, in particular, the safety instructions.

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## 4.8 Completing the acceptance certificate

The installation work must be checked with the acceptance certificate for the VD317-1 by manufacturer service personnel or personnel who have been trained and authorized by the manufacturer.

The protocol must be filled out correctly, signed, and sent to the manufacturer (requirement for the claim of liability for defects).

The chlorine dioxide generator may only be put into operation if it has a correctly completed, signed acceptance certificate that is free of complaints or objections.

## 5. PROFIBUS DP

### 5.1 Connecting the PROFIBUS DP

The PLC controller of the chlorine dioxide generator, the Siemens SIMATIC S7-1200, is geared for data exchange over PROFIBUS DP on a superordinate PROFIBUS DP network. In this process, the chlorine dioxide generator operates as a PROFIBUS DP slave and provides output data. (See chapter 5.3 reference list). The superordinate automation system works as a PROFIBUS DP master.

Data transfer over PROFIBUS DP offers a standardized interface (EN 50170) for the transfer of process data. The process data is available on the PROFIBUS DP page as output data.

This chapter provides software developers and assembly personnel with information on programming and installation for connection to a PROFIBUS DP system.

#### 5.1.1 Technical data

|                         |  |
|-------------------------|--|
| Hardware                | PLC controller SIMATIC S7-1200<br>CPU1242-5 PROFIBUS DP slave V1.0 |
| Siemens Order No.       | 6GK7242-5DX30-0XE0   |
| Transmission technology | RS-485 according to PROFIBUS specification                         |
| Baud rate               | up to 12 Mbit/s, automatic detection                               |
| Bus address             | pre-set 111  |
| Bus assignment          | 9-pole D-Sub-plug<br>on-site, 9 pole PROFIBUS DP connector plug    |
| Communication           | cyclical I/O data exchange<br>between DP-master and DP slave(s)    |
| Configuration           | 6 x 32 byte,<br>Data consistency entire length                     |

### 5.1.2 Connect the PROFIBUS DP



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#### *Please note*

Please note that the installation guidelines for PROFIBUS networks such as network topology, bus lines characteristics, line termination, max. segment lengths, max. number of participants, transfer speed, use/number of repeaters, etc..! Information on this can be provided by the PROFIBUS user organization, Siemens AG as well as from the manufacturer of your implemented automation system.

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#### *Warning!*

#### **Risk of injury or damage to the system!**

All electrical work on the chlorine dioxide generator may only be performed by qualified electrical technicians.

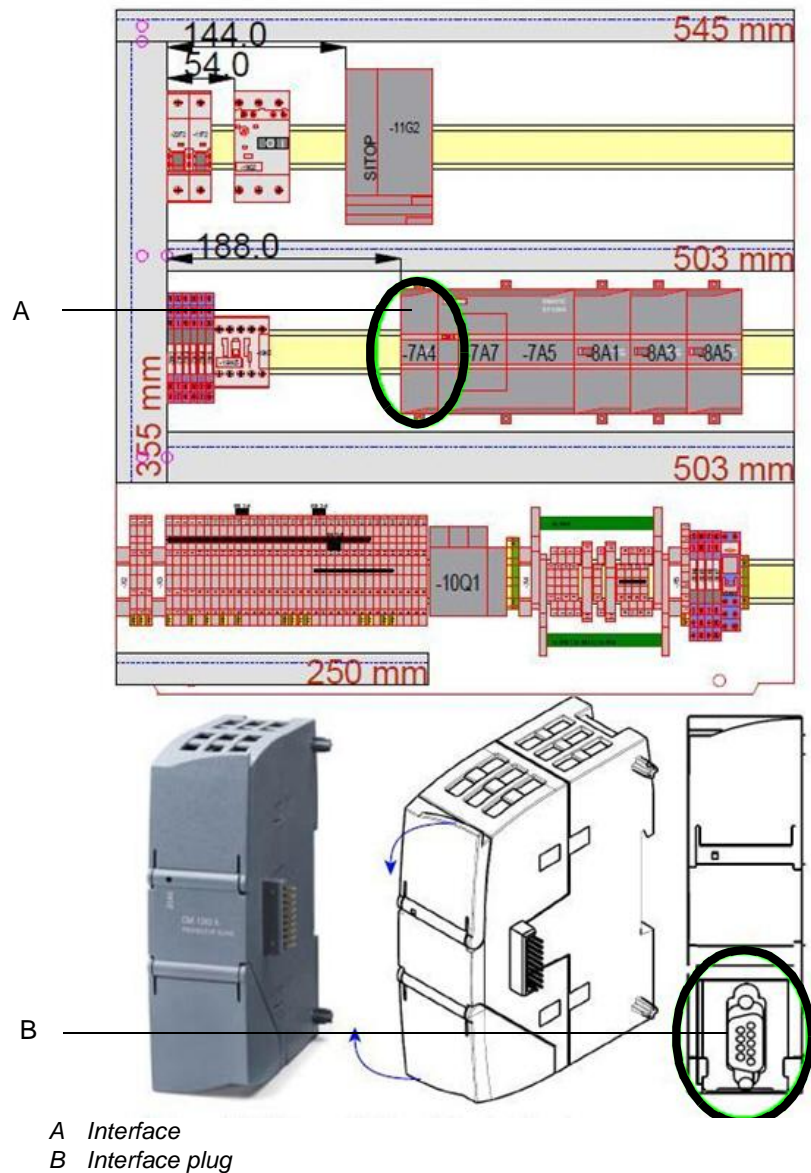
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Proceed as follows:

- 1 Switching off the chlorine dioxide generator at the main switch.
- 2 Open control panel
- 3 PROFIBUS DP bus line over a 9-pole PROFIBUS DP connector plug at interface X1: Connect the PB DP to the CM 1242-5.

The inner view of the PLC controller of the ClO<sub>2</sub> preparation system (mounting plate) shows the position of the PROFIBUS DP unit.






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*Please note*

Both status LEDs "ERROR" and „DIAG" on the SIMATIC S7 illuminate if the DIOX-A is not connected to a master Profibus DP network. In such case, the communication partner (master) is not available. This does not affect or interrupt the operation of the system.

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4 Switch on chlorine dioxide generator at the main switch again.

### 5.1.3 Configuring the PROFIBUS DP master

In order for the data on a automation system to be read, it must know the configuration for the data transfer.

Data exchange configuration:

The PROFIBUS DP master is configured with the aid of the device master data (GSD-file) of the SIMATIC CM1242-5 PROFIBUS DP slave V1.0.

To development in foreign systems, a GD file is available for the CM 1242-5 (6GK7242-5DX30-0XE0, Version 1.0).

192 bytes of user data is transferred over the PROFIBUS DP to the master. (6 x 32 byte with data consistency across the entire length).

| Transferbereiche |     |                   |     |                |   |     |         |               |
|------------------|-----|-------------------|-----|----------------|---|-----|---------|---------------|
|                  | ... | Transferbereich   | Typ | Master-Adresse | ↔ | ... | Länge   | Konsistenz    |
| 1                |     | Transferbereich_1 | MS  |                | ← | ... | 32 Byte | Gesamte Länge |
| 2                |     | Transferbereich_2 | MS  |                | ← | ... | 32 Byte | Gesamte Länge |
| 3                |     | Transferbereich_3 | MS  |                | ← | ... | 32 Byte | Gesamte Länge |
| 4                |     | Transferbereich_4 | MS  |                | ← | ... | 32 Byte | Gesamte Länge |
| 5                |     | Transferbereich_5 | MS  |                | ← | ... | 32 Byte | Gesamte Länge |
| 6                |     | Transferbereich_6 | MS  |                | ← | ... | 32 Byte | Gesamte Länge |
| 7                |     | <Neu hinzufügen>  |     |                |   |     |         |               |

## 5.2 Data formats

The following table contains data formats used during the transfer of process data:

| Data type     | Size (bit) | Typical names                   | Initials | Value range       |                     |
|---------------|------------|---------------------------------|----------|-------------------|---------------------|
|               |            |                                 |          | min               | max                 |
| <b>BOOL</b>   | 1          | bit, bool                       | no       | 0                 | 1                   |
| <b>BYTE</b>   | 8          | unsigned char, byte             | no       | 00 <sub>HEX</sub> | FF <sub>HEX</sub>   |
| <b>WORD</b>   | 16         | unsigned integer, word          | no       | 00 <sub>HEX</sub> | FFFF <sub>HEX</sub> |
| <b>REAL</b>   | 32         | Float, real, floating point     | yes      | 1.175 495E-38     | 3.402 823E+38       |
| <b>STRING</b> | (n*8) + 16 | ASCII, string, Character string | no       | ---               | ---                 |

n = number of characters

The byte sequence, in which the various data are saved into the memory or transmitted can be taken from the following chapters.

**BYTE**Example:  $7B_{\text{hex}} = 123_{\text{dec}}$ 

| BYTE 0            |     |   |   |   |   |   |   |
|-------------------|-----|---|---|---|---|---|---|
| $7B_{\text{hex}}$ |     |   |   |   |   |   |   |
| 7                 | bit |   |   |   |   |   | 0 |
| 0                 | 1   | 1 | 1 | 1 | 0 | 1 | 1 |

**WORD**Example:  $3039_{\text{hex}} = 12345_{\text{dec}}$ 

| BYTE 0              |     |   |   |   |   |   |   | BYTE 1 |   |     |   |   |   |   |   |   |   |
|---------------------|-----|---|---|---|---|---|---|--------|---|-----|---|---|---|---|---|---|---|
| $3039_{\text{hex}}$ |     |   |   |   |   |   |   |        |   |     |   |   |   |   |   |   |   |
| 15                  | bit |   |   |   |   |   |   | 8      | 7 | bit |   |   |   |   |   |   | 0 |
| 0                   | 0   | 1 | 1 | 0 | 0 | 0 | 0 | 0      | 0 | 0   | 1 | 1 | 1 | 0 | 0 | 1 |   |

**REAL, IEEE 754**

Example: 3.141593

| BYTE 0   |     |          |   |   |   |   |   | BYTE 1 |    |          |   |   |   |   |   | BYTE 2 |    |    |     |   |   |   |   | BYTE 3 |   |   |     |   |   |   |   |   |   |   |
|----------|-----|----------|---|---|---|---|---|--------|----|----------|---|---|---|---|---|--------|----|----|-----|---|---|---|---|--------|---|---|-----|---|---|---|---|---|---|---|
| 3.141593 |     |          |   |   |   |   |   |        |    |          |   |   |   |   |   |        |    |    |     |   |   |   |   |        |   |   |     |   |   |   |   |   |   |   |
| Sign     |     | Exponent |   |   |   |   |   |        |    | Mantissa |   |   |   |   |   |        |    |    |     |   |   |   |   |        |   |   |     |   |   |   |   |   |   |   |
| 31       | bit |          |   |   |   |   |   | 24     | 23 | bit      |   |   |   |   |   |        | 16 | 15 | bit |   |   |   |   |        | 8 | 7 | bit |   |   |   |   |   |   | 0 |
| V        | e   | e        | e | e | e | e | e | e      | m  | m        | m | m | m | m | m | m      | m  | m  | m   | m | m | m | m | m      | m | m | m   | m | m | m | m | m | m | m |
| 0        | 1   | 0        | 0 | 0 | 0 | 0 | 0 | 0      | 1  | 0        | 0 | 1 | 0 | 0 | 1 | 0      | 0  | 0  | 0   | 1 | 1 | 1 | 1 | 1      | 1 | 1 | 1   | 0 | 1 | 1 | 1 | 0 | 0 | 0 |

**STRING**

Example: ‚FROM‘ STRING [2]

| BYTE 0             |     |   |   |   |   |   |   | BYTE 1               |    |     |   |   |   |   |   | BYTE 2        |    |    |     |   |   |   |   | BYTE 3        |   |   |     |   |   |   |   |   |   |   |
|--------------------|-----|---|---|---|---|---|---|----------------------|----|-----|---|---|---|---|---|---------------|----|----|-----|---|---|---|---|---------------|---|---|-----|---|---|---|---|---|---|---|
| From               |     |   |   |   |   |   |   |                      |    |     |   |   |   |   |   |               |    |    |     |   |   |   |   |               |   |   |     |   |   |   |   |   |   |   |
| max. length string |     |   |   |   |   |   |   | actual length string |    |     |   |   |   |   |   | ASCII value A |    |    |     |   |   |   |   | ASCII value b |   |   |     |   |   |   |   |   |   |   |
| 31                 | bit |   |   |   |   |   |   | 24                   | 23 | bit |   |   |   |   |   |               | 16 | 15 | bit |   |   |   |   |               | 8 | 7 | bit |   |   |   |   |   |   | 0 |
| 0                  | 0   | 0 | 0 | 0 | 0 | 0 | 1 | 0                    | 0  | 0   | 0 | 0 | 0 | 1 | 0 | 0             | 1  | 0  | 0   | 0 | 0 | 0 | 0 | 0             | 1 | 0 | 1   | 1 | 0 | 0 | 0 | 1 | 0 |   |

### 5.3 Reference list

The following reference list contains the data that were made available by the chlorine dioxide generator.

"n" starting address of the master input area.

"R" read access right

| Byte addr. | bit addr. | Length (byte) | Format     | Access | Description  | Value Value range  |
|------------|-----------|---------------|------------|--------|--|--|
| n          |           | 8             | STRING[6]  | R      | Product type description Mode  | DIOX-A   |
| n+8        |           | 8             | STRING[6]  | R      | Product type dimensions  | 1000/2500/5000/10000   |
| n+16       |           | 10            | STRING[8]  | R      | Serial number  |  |
| n+26       |           | 8             | STRING[6]  | R      | Order number   |  |
| n+34       |           | 18            | STRING[16] | R      | System name  |  |
| n+52       |           | 18            | STRING[16] | R      | System location  |  |
| n+70       |           | 10            | STRING[8]  | R      | Software article number  | EAE****  |
| n+80       |           | 8             | STRING[6]  | R      | Software version   | V**. **  |
| n+88       |           | 12            | STRING[10] | R      | Software date  | DDMMM.YYYY   |
| n+100      |           | 2             | WORD       | R      | Mode   | 0=MANUAL<br>1=AUTOMATIC<br>2=SEMI-AUTO   |
| n+102      |           | 2             | WORD       | R      | Operating state  | 0 = preparation off<br>1 = Preparation standby<br>3 = Preparation active!<br>5 = Preparation ext. Locked!<br>6 = manual mode active! |
| n+104      |           | 6             | BYTE       | R      | **reserved, n.c**  |  |
| n+110      | 0         | 1             | BOOL       | R      | WARNING message "HCI positioner in the "MANUAL" position"            | 1=Message is on  |
| n+110      | 1         |               | BOOL       | R      | WARNING message "Mixing injector motive water flow rate too low"     | 1=Message is on  |
| n+110      | 2         |               | BOOL       | R      | WARNING message "Mixing injector motive water flow rate too high"    | 1=Message is on  |
| n+110      | 3         |               | BOOL       | R      | WARNING message "Aspiration injector motive water flow rate too low" | 1=Message is on  |

| Byte addr. | bit addr. | Length (byte) | Format | Access | Description   | Value Value range |
|------------|-----------|---------------|--------|--------|---|-------------------|
| n+110      | 4         |               | BOOL   | R      | WARNING message "Aspiration injector motive water flow rate too high"   | 1=Message is on   |
| n+110      | 5         |               | BOOL   | R      | WARNING message "Perform annual Maintenance! Customer service required" | 1=Message is on   |
| n+110      | 6         |               | BOOL   | R      | WARNING message "Perform monthly Maintenance!"                          | 1=Message is on   |
| n+110      | 7         |               | BOOL   | R      | WARNING message "NaClO <sub>2</sub> flow rate too low"                  | 1=Message is on   |
| n+111      | 0         | 1             | BOOL   | R      | WARNING message "Operating water pressure too low"                      | 1=Message is on   |
| n+111      | 1         |               | BOOL   | R      | WARNING message "Operating water pressure too high"                     | 1=Message is on   |
| n+111      | 2         |               | BOOL   | R      | WARNING message "ClO <sub>2</sub> storage tank empty"                   | 1=Message is on   |
| n+111      | 3         |               | BOOL   | R      | WARNING message "reserved, n.c"   |                   |
| n+111      | 4         |               | BOOL   | R      | WARNING message "reserved, n.c"   |                   |
| n+111      | 5         |               | BOOL   | R      | WARNING message "HCl flow rate too low"                                 | 1=Message is on   |
| n+111      | 6         |               | BOOL   | R      | WARNING message "HCl flow rate too high"                                | 1=Message is on   |
| n+111      | 7         |               | BOOL   | R      | WARNING message "HCl storage tank empty"                                | 1=Message is on   |
| n+112      | 0         | 1             | BOOL   | R      | WARNING message "reserved, n.c"   |                   |
| n+112      | 1         |               | BOOL   | R      | WARNING message "Gas phase temperature too low. DANGER OF FREEZING! "   | 1=Message is on   |
| n+112      | 2         |               | BOOL   | R      | WARNING message "Gas phase temperature too high"                        | 1=Message is on   |
| n+112      | 3         |               | BOOL   | R      | WARNING message "Vacuum for vent gas aspiration too low"                | 1=Message is on   |
| n+112      | 4         |               | BOOL   | R      | WARNING message "reserved, n.c"   |                   |
| n+112      | 5         |               | BOOL   | R      | WARNING message "reserved, n.c"   |                   |
| n+112      | 6         |               | BOOL   | R      | WARNING message "reserved, n.c"   |                   |

| Byte addr. | bit addr. | Length (byte) | Format | Access | Description  | Value Value range |
|------------|-----------|---------------|--------|--------|--|-------------------|
| n+112      | 7         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+113      | 0         | 1             | BOOL   | R      | WARNING message "NaClO <sub>2</sub> flow rate too high"              | 1=Message is on   |
| n+113      | 1         |               | BOOL   | R      | WARNING message "NaClO <sub>2</sub> storage tank empty"              | 1=Message is on   |
| n+113      | 2         |               | BOOL   | R      | WARNING message "NaClO <sub>2</sub> -positioner in position "Manual" | 1=Message is on   |
| n+113      | 3         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+113      | 4         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+113      | 5         |               | BOOL   | R      | WARNING message "Dilution water flow rate too low"                   | 1=Message is on   |
| n+113      | 6         |               | BOOL   | R      | WARNING message "Dilution water flow rate too high"                  | 1=Message is on   |
| n+113      | 7         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+114      | 0         | 1             | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+114      | 1         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+114      | 2         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+114      | 3         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+114      | 4         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+114      | 5         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+114      | 6         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+114      | 7         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+115      | 0         | 1             | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+115      | 1         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |
| n+115      | 2         |               | BOOL   | R      | WARNING message "reserved, n.c"                                      |                   |

| Byte addr. | bit addr. | Length (byte) | Format | Access | Description  | Value Value range |
|------------|-----------|---------------|--------|--------|--|-------------------|
| n+115      | 3         |               | BOOL   | R      | WARNING message "reserved, n.c"  |                   |
| n+115      | 4         |               | BOOL   | R      | WARNING message "reserved, n.c"  |                   |
| n+115      | 5         |               | BOOL   | R      | WARNING message "reserved, n.c"  |                   |
| n+115      | 6         |               | BOOL   | R      | WARNING message "reserved, n.c"  |                   |
| n+115      | 7         |               | BOOL   | R      | WARNING message "reserved, n.c"  |                   |
| n+116      | 0         | 1             | BOOL   | R      | ERROR message "Leakage ClO <sub>2</sub> storage tank"  | 1=Message is on   |
| n+116      | 1         |               | BOOL   | R      | ERROR message "Fill level measurement / overfilled sensor ClO <sub>2</sub> storage tank. Plausibility? " | 1=Message is on   |
| n+116      | 2         |               | BOOL   | R      | ERROR message "ClO <sub>2</sub> storage tank overfilled"   | 1=Message is on   |
| n+116      | 3         |               | BOOL   | R      | ERROR message "Booster pump failure"   | 1=Message is on   |
| n+116      | 4         |               | BOOL   | R      | ERROR message "Gas alarm"  | 1=Message is on   |
| n+116      | 5         |               | BOOL   | R      | ERROR message "Gas phase temperature measurement. Signal? "  | 1=Message is on   |
| n+116      | 6         |               | BOOL   | R      | ERROR message "Gas phase temperature too high"   | 1=Message is on   |
| n+116      | 7         |               | BOOL   | R      | ERROR message "HCl flow rate too low"  | 1=Message is on   |
| n+117      | 0         | 1             | BOOL   | R      | ERROR message "Plant leak "  | 1=Message is on   |
| n+117      | 1         |               | BOOL   | R      | ERROR message "Operating water pressure measurement. mA signal"  |                   |
| n+117      | 2         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+117      | 3         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+117      | 4         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+117      | 5         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+117      | 6         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+117      | 7         |               | BOOL   | R      | ERROR message "Fill level measurement ClO <sub>2</sub> storage tank. mA Signal? "                        | 1=Message is on   |



| Byte addr. | bit addr. | Length (byte) | Format | Access | Description  | Value Value range |
|------------|-----------|---------------|--------|--------|--|-------------------|
| n+118      | 0         | 1             | BOOL   | R      | ERROR message "Mixing injector motive water flow rate too high"                          | 1=Message is on   |
| n+118      | 1         |               | BOOL   | R      | ERROR message "Mixing injector motive water flow rate measurement. Plausibility? "       | 1=Message is on   |
| n+118      | 2         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+118      | 3         |               | BOOL   | R      | ERROR message "Aspiration injector motive water flow rate too low"                       | 1=Message is on   |
| n+118      | 4         |               | BOOL   | R      | ERROR message "Aspiration injector motive water flow rate too low. Pressure + warning! " | 1=Message is on   |
| n+118      | 5         |               | BOOL   | R      | ERROR message "Aspiration injector motive water flow rate too high"                      | 1=Message is on   |
| n+118      | 6         |               | BOOL   | R      | ERROR message "Aspiration injector motive water flow rate measurement. Plausibility? "   | 1=Message is on   |
| n+118      | 7         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+119      | 0         | 1             | BOOL   | R      | ERROR message "HCl flow rate too high"   | 1=Message is on   |
| n+119      | 1         |               | BOOL   | R      | ERROR message "HCl flow rate measurement. Plausibility? "                                | 1=Message is on   |
| n+119      | 2         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+119      | 3         |               | BOOL   | R      | ERROR message "Level sensors HCl storage tank. Plausibility? "                           | 1=Message is on   |
| n+119      | 4         |               | BOOL   | R      | ERROR message "HCl storage tank overfilled"  | 1=Message is on   |
| n+119      | 5         |               | BOOL   | R      | ERROR message "HCl positioner in "Manual" position                                       | 1=Message is on   |
| n+119      | 6         |               | BOOL   | R      | ERROR message "Mixing injector motive water flow rate too low"                           | 1=Message is on   |
| n+119      | 7         |               | BOOL   | R      | ERROR message "Mixing injector motive water flow rate too low. Pressure + warning! "     | 1=Message is on   |
| n+120      | 0         | 1             | BOOL   | R      | ERROR message "EMERGENCY-STOP"   | 1=Message is on   |
| n+120      | 1         |               | BOOL   | R      | ERROR message "Safety shut-off valve does not open"                                      | 1=Message is on   |
| n+120      | 2         |               | BOOL   | R      | ERROR message "Safety shut-off valve does not close"                                     | 1=Message is on   |

| Byte addr. | bit addr. | Length (byte) | Format | Access | Description  | Value Value range |
|------------|-----------|---------------|--------|--------|--|-------------------|
| n+120      | 3         |               | BOOL   | R      | ERROR message "reserved, n.c"  | 1=Message is on   |
| n+120      | 4         |               | BOOL   | R      | ERROR message "Dilution water flow rate too low"                               | 1=Message is on   |
| n+120      | 5         |               | BOOL   | R      | ERROR message "Dilution water flow rate too low" Pressure + warning! "         | 1=Message is on   |
| n+120      | 6         |               | BOOL   | R      | ERROR message "Dilution water flow rate too high"                              | 1=Message is on   |
| n+120      | 7         |               | BOOL   | R      | ERROR message "Dilution water flow rate measurement" Plausibility?             | 1=Message is on   |
| n+121      | 0         | 1             | BOOL   | R      | ERROR message "Level sensors calibration tank. Plausibility? "                 | 1=Message is on   |
| n+121      | 1         |               | BOOL   | R      | ERROR message "NaClO <sub>2</sub> flow rate too low"                           | 1=Message is on   |
| n+121      | 2         |               | BOOL   | R      | ERROR message "NaClO <sub>2</sub> flow rate too high"                          | 1=Message is on   |
| n+121      | 3         |               | BOOL   | R      | ERROR message " NaClO <sub>2</sub> flow rate measurement. Plausibility? "      | 1=Message is on   |
| n+121      | 4         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+121      | 5         |               | BOOL   | R      | ERROR message " NaClO <sub>2</sub> storage tank level sensors. Plausibility? " | 1=Message is on   |
| n+121      | 6         |               | BOOL   | R      | ERROR message "NaClO <sub>2</sub> storage tank overfilled"                     | 1=Message is on   |
| n+121      | 7         |               | BOOL   | R      | ERROR message "NaClO <sub>2</sub> positioner in Position "manual"              | 1=Message is on   |
| n+122      | 0         | 1             | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+122      | 1         |               | BOOL   | R      | ERROR message "Vacuum for vent gas aspiration too low"                         | 1=Message is on   |
| n+122      | 2         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+122      | 3         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+122      | 4         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+122      | 5         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+122      | 6         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+122      | 7         |               | BOOL   | R      | ERROR message "reserved, n.c"  |                   |
| n+123      | 0         | 1             | BOOL   | R      | ERROR message "reserved, n.c"  |                   |

| Byte addr. | bit addr. | Length (byte) | Format | Access                        | Description  | Value Value range |
|------------|-----------|---------------|--------|-------------------------------|--|-------------------|
| n+123      | 1         |               | BOOL   | R                             | ERROR message "Operating water pressure too low"                     | 1=Message is on   |
| n+123      | 2         |               | BOOL   | R                             | ERROR message "Operating water pressure too high"                    | 1=Message is on   |
| n+123      | 3         |               | BOOL   | R                             | ERROR message "Operating water pressure measurement. Plausibility? " | 1=Message is on   |
| n+123      | 4         |               | BOOL   | R                             | ERROR message "Gas phase temperature measurement. Plausibility? "    | 1=Message is on   |
| n+123      | 5         |               | BOOL   | R                             | ERROR message "Gas phase temperature too low. DANGER OF FREEZING! "  | 1=Message is on   |
| n+123      | 6         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+123      | 7         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+124      | 0         | 1             | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+124      | 1         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+124      | 2         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+124      | 3         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+124      | 4         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+124      | 5         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+124      | 6         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+124      | 7         | BOOL          | R      | ERROR message "reserved, n.c" |  |                   |
| n+125      | 0         | 1             | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+125      | 1         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+125      | 2         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+125      | 3         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+125      | 4         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+125      | 5         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+125      | 6         |               | BOOL   | R                             | ERROR message "reserved, n.c"  |                   |
| n+125      | 7         | BOOL          | R      | ERROR message "reserved, n.c" |  |                   |
| n+126      |           | 4             | REAL   | R                             | Preparation total [h]  | 0.0...876000.0    |
| n+130      |           | 4             | REAL   | R                             | Preparation average [h]  | 0.0...876000.0    |
| n+134      |           | 4             | REAL   | R                             | Preparation cycles   | 0.0...+3e+38      |
| n+138      |           | 4             | REAL   | R                             | Operating hours total [h]  | 0.0...876000.0    |
| n+142      |           | 4             | REAL   | R                             | Operating water pressure [bar]                                       | 0.0...40.0        |

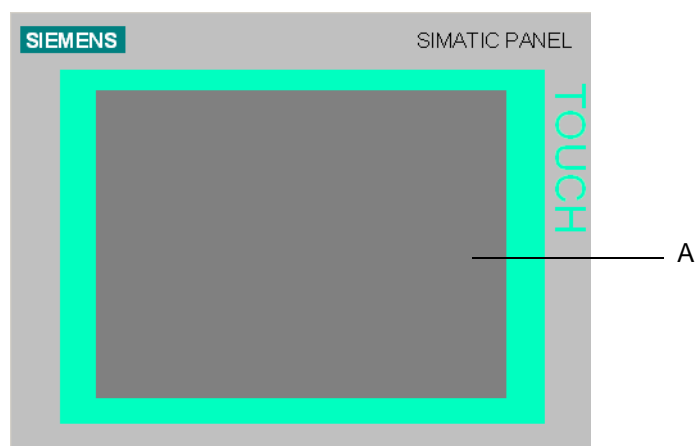
| Byte addr. | bit addr. | Length (byte) | Format | Access | Description                                      | Value Value range |
|------------|-----------|---------------|--------|--------|--|-------------------|
| n+146      |           | 4             | REAL   | R      | ClO <sub>2</sub> storage tank fill level [%]     | 0.0...100.0       |
| n+150      |           | 4             | REAL   | R      | Gas phase temperature [°C]                       | -10.0...100.0     |
| n+154      |           | 4             | REAL   | R      | HCl flow rate [l/h]                              | 0.0...66.0        |
| n+158      |           | 4             | REAL   | R      | NaClO <sub>2</sub> flow rate [l/h]               | 0.0...66.0        |
| n+162      |           | 4             | REAL   | R      | Motive water aspiration injector flow rate [l/h] | 0.0...8000.0      |
| n+166      |           | 4             | REAL   | R      | Dilution water flow rate[l/h]                    | 0.0...6000.0      |
| n+170      |           | 4             | REAL   | R      | Mixing injector motive water flow rate [l/h]     | 0.0...1000.0      |
| n+174      |           | 4             | REAL   | R      | **reserved, n.c**                                |                   |
| n+178      |           | 4             | REAL   | R      | **reserved, n.c**                                |                   |
| n+182      |           | 4             | REAL   | R      | **reserved, n.c**                                |                   |
| n+186      |           | 4             | REAL   | R      | **reserved, n.c**                                |                   |
| n+190      |           | 2             | BYTE   | R      | **reserved, n.c**                                |                   |

Σ: 192 Bytes

## 6. Operation

### 6.1 Control and display unit

#### 6.1.1 General



Siemens SIMATIC Touch Panel

The default input unit on the controller is the touch screen (A). All control objects required for controlling are displayed on the touch screen after starting the controller.

The buttons under the touch screen have no function.



*Attention!*

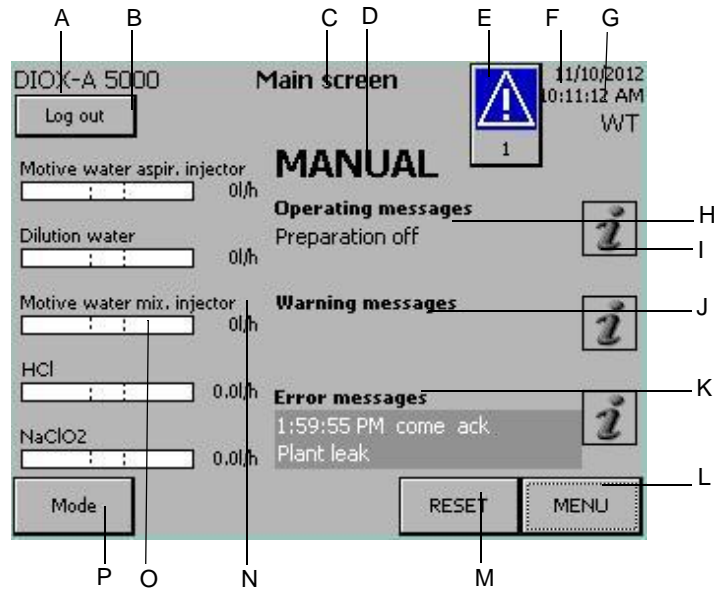
#### **Risk of damage to the system!**

Only touch the touch screen with your finger or a touch screen stylus. Never use pointed or sharp instruments to operate the touch screen or press it abruptly with hard objects, as this can severely shorten its operational life or cause it to stop working completely.

Only touch one control object at a time. Never touch more than one control object at a time, as doing so may trigger unwanted operations.

### 6.1.2 Main screen

When the chlorine dioxide generator is on, the main screen is displayed on the touch screen.



Main screen when fault is detected

- A Model
- B Log in/Log out button (see chapter 6.2.2)
- C Display menu
- D Display mode (see chapter 6.4)
- E Error display showing the number of pending faults (see chapter 6.11)
- F Display the current date
- G Display current time
- H Two-line operating messages display (see chapter 6.7)
- I Information button "i", provides information on current messages
- J Two-line warning messages display (see chapter 6.10)
- K Two-line error messages display (see chapter 6.11)
- L Menu selection button
- M Reset error messages button (see chapter 6.11)
- N Display flow rate actual value
- O Bar display of flow rates (see chapter 6.4)
- P Mode button (AUTOMATIC or SEMI-AUTO) (see chapter 6.4)

**Buttons** Use the buttons to carry out a variety of functions and to jump between menus and displays.




---

*Please note*

The rest of the displays are shown and described in the appropriate chapters.

The descriptions of the system components (A)... refer to the illustrations in chapter 3.2.

---

Each image shown on the displays indicates by what means the respective display can be reached as well as the name of the display.

Example: .

```

Main screen¶ _____ A
  "i" (info) operating messages¶ _____ B
                    OPERATING MESSAGES — C
                    "PREPARATION RUNNING" — D
  
```

- A starting from the main screen*
- B Press the "Mode" button*
- C Change mode: Press yes or NO*
- D Name of the display*

## 6.2 Password protection

### 6.2.1 General

All operating parameters and settings can be read by all user groups without needing a log in. Certain functions are user/password protected and are only available to certain user groups.

There are three password levels. Only the functions of password levels 1 and 2 are accessible to the operator (= user).

- Password level 1: no log in required. For operators and service personnel.
- Password level 2: Log in required. For operators and service personnel
- Password level 3: Log in required. Service personnel only

For details on the functions of each of the password levels, refer to the chapter Description, 3.4 Functions.



*Please note*

The user name for password level 2 is **WT** and the password is **9040**.

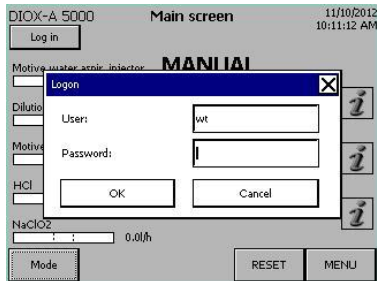
---



### 6.2.2 Log in



Main screen  
Log in

#### MAIN SCREEN



In any operating state, you can log in.

Proceed as follows:

- 1 Press the "Log in" button. The login window opens.
- 2 Press the "User" button. Enter the user name for the password level you wish to log in by using the keyboard displayed on the screen and then press  RETURN.  
To erase single characters: Use BSP (backspace)
- 3 Press the "Password" button  
Enter the user name for the password level you wish to log in by using the keyboard displayed on the screen and then press  RETURN.
- 4 Press OK to confirm. The display jumps back to the previous menu. The "Log in" button becomes "Log out".  
The required functions are now accessible.



*Please note*

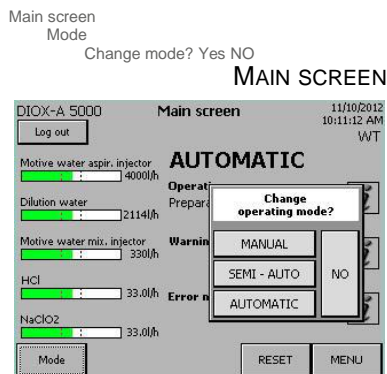
Once you have logged in, all other functions available at the respective password level are accessible.  
In password level 2 (operator level), you are automatically logged out after 60 minutes, and in password level 3 (service) after only five minutes.  
If a password is required to login, a dialog box is displayed automatically.

### 6.3 Switching on the main switch

After switching on the main switch (or after a powerfailure), the main screen will display after approx. 1 minute. Subsequently, the system is in the same operating state as before switching off.

| Operating state before switching off / before power failure  | Operating state after switching on / after the power failure  |
|--|---|
| SEMI-AUTO<br>Preparation off                                 | SEMI-AUTO<br>Preparation off  |
| SEMI-AUTO<br>Preparation active                              | SEMI-AUTO<br>Preparation off  |
| AUTOMATIC<br>Preparation standby<br>or<br>Preparation active | AUTOMATIC<br><br>If the fill level of the ClO <sub>2</sub> storage tank (AO) is under MIN:<br>ClO <sub>2</sub> preparation starts (preparation active).<br><br>If the fill level of the ClO <sub>2</sub> storage tank (AO) is over MIN:<br>Preparation standby. |
| MANUAL   | MANUAL<br>Preparation off   |

### 6.4 Automatic mode



The chlorine dioxide generator is running in automatic mode. Automatic preparation is turned on and off by pressing the button "Mode".

If automatic mode is turned on, the display will indicate: "AUTOMATIC"

The chlorine dioxide generator has two operating states in automatic mode.

- Preparation standby
- Preparation active!

Other than the automatic mode, there is also the operating state:

- Preparation off

The current operating state is shown on the display under "Operating messages". If additional information is available, it can be displayed by pressing the "i" (info) button.

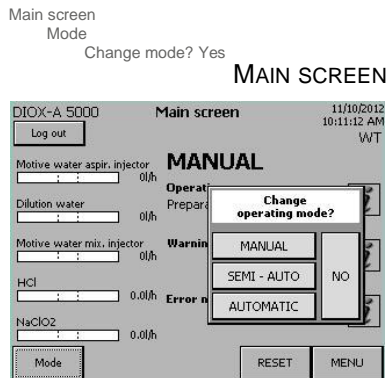
The fill levels MIN, MAX and EMPTY of the ClO<sub>2</sub> storage tank are detected by a filllevel sensor (AR) on the storage tank:

| Fill level | Function | Description according to DVGW | Description  |
|------------|----------|-------------------------------|--|
| MAX        | MAX      | max                           | Up to this fill level, the ClO <sub>2</sub> storage tank (AO) is filled; the ClO <sub>2</sub> preparation turns off.   |
| MIN        | MIN      | min                           | From this fill level, the ClO <sub>2</sub> storage tank (AO) is filled; the ClO <sub>2</sub> preparation turns on.   |
| EMPTY      | MIN-MIN  | too low                       | Der ClO <sub>2</sub> storage tank (AO) is almost empty.  |
| OVERFILLED | MAX-MAX  | too high                      | Measured by a separate overfilled sensor. The ClO <sub>2</sub> storage tank (AO) is almost overflowing. ClO <sub>2</sub> preparation has stopped. The safety shut-off valve (G) closes. Error message is displayed |

Speciality for the DIOX-A 1000:

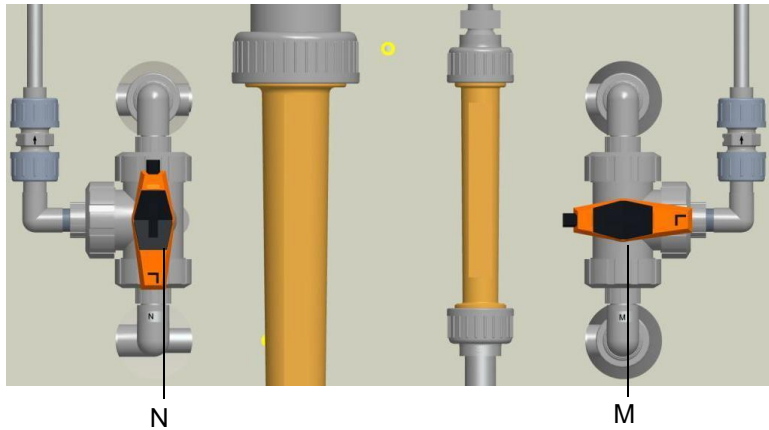
- Display: Preparation active! Filling the reaction tank.  
Both chemicals are transferred into the reaction tank. Process water is flowing, vent gas aspiration is working.
- Display: Preparation active! Reaction time.  
Transfer of the chemicals, process water and vent gas aspiration are stopped.

### 6.4.1 Switch on automatic mode

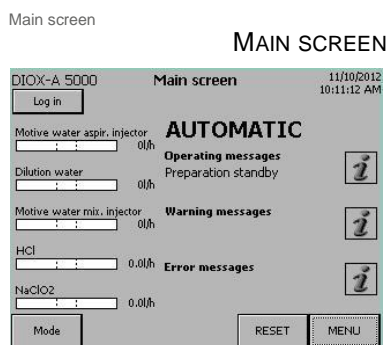


To switch on AUTOMATIC mode, proceed as follows:

- 1 Enter the user name and password if required. For details see chapter 6.2.2 Log in.
- 2 Both 3-way valves (N) and (M) must be in the “preparation” position and engaged.



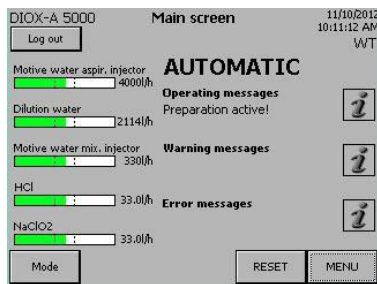
- 3 Press the "Mode" button.  
At „change mode?” press “AUTOMATIC”.  
The mode „AUTOMATIC” is displayed.  
The first preparation occurs, the safety shut-off valve (G) opens and remains open.



First, the system is in the operating state "Preparation standby". If the fill level of the ClO<sub>2</sub> storage tank (AO) falls below "MIN", the chlorine dioxide preparation will start. "Preparation active!" is displayed.

Main screen

## MAIN SCREEN



The chlorine dioxide generator changes to the "Preparation active!" operating state.

The solenoid valves open, water, HCl and NaClO<sub>2</sub> flow with their set flows rates.

The flow rates are displayed as a bar chart; and in the process, the setpoint is located in the middle of the bar.



If the limit values are adhered to, the bar will be shown in green.

If the limit values are not adhered to, the bar will be shown in red. A slightly delayed warning message will be displayed (see chapter 6.10 Warning messages).

If intense and lengthy deviations occur, an error message will be displayed and the preparation will be stopped. (see chapter 6.11 Error messages).

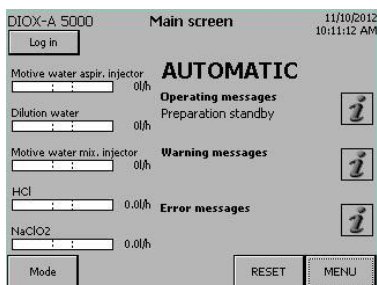
Speciality for the DIOX-A 1000:

The status „Preparation active” is separated into two phases:

- Display: Preparation active! Filling the reaction tank.  
Both chemicals are transferred into the reaction tank. Process water is flowing, vent gas aspiration is working.
- Display: Preparation active! Reaction time.  
Transfer of the chemicals, process water and vent gas aspiration are stopped.

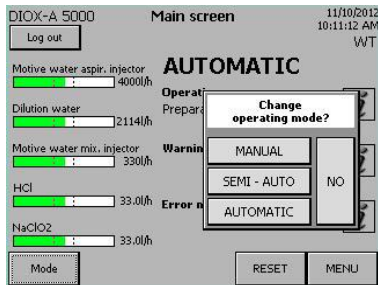
Upon reaching the fill level "MAX", the chlorine dioxide preparation will be stopped, "Preparation standby" will be displayed.

If the fill level of the ClO<sub>2</sub> storage tank (AO) falls again below "MIN", the chlorine dioxide preparation will start again, etc.



**6.4.2 Switch off automatic mode**

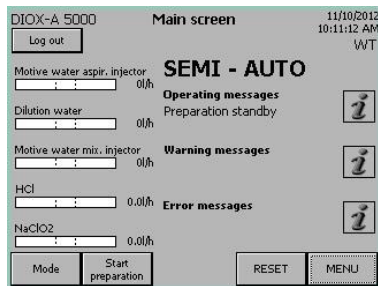
Main screen  
Mode  
Change mode? Yes



The automatic mode must be switched off during maintenance work and when the system is temporarily shut down.

Proceed as follows:

- 1 „AUTOMATIC” is displayed.  
Press the "Mode" button.  
Change mode: Press “SEMI-AUTO”.

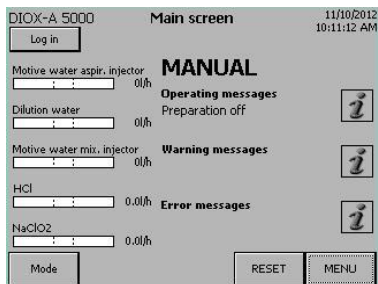


The system switches to the "Preparation standby" operating state. The mode “SEMI-AUTO” is displayed as a text message on the display. The preparation is stopped.

In order to start the automatic mode again:

- Press the "Mode" button.  
Change mode: Press “AUTOMATIC”

or for longer down time:



- 2 Press the "Mode" button.  
Change mode: Press “MANUAL”.

The system switches to the "Preparation off" operating state. The mode "MANUAL" is displayed as a text message on the display.

The safety shut-off valve (G) closes.

## 6.5 Semi-Automatic mode

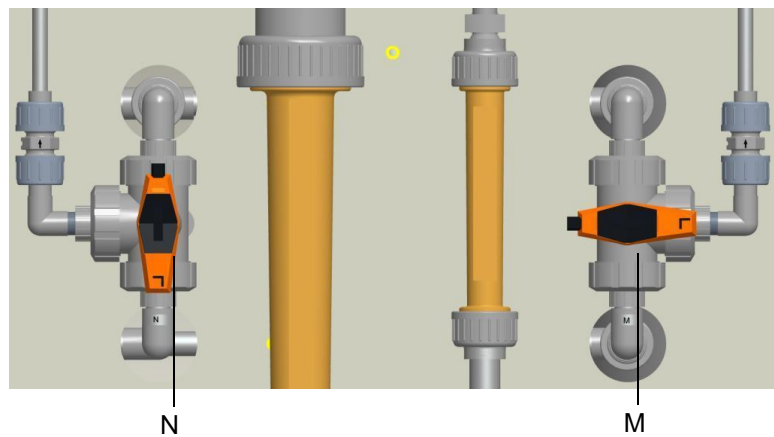
During semi-automatic mode, the chlorine dioxide preparation can be manually started and stopped. The preparation only works so long until the fill level MAX of the ClO<sub>2</sub> storage tank has been reached.

Principally, the preparation does not start automatically.

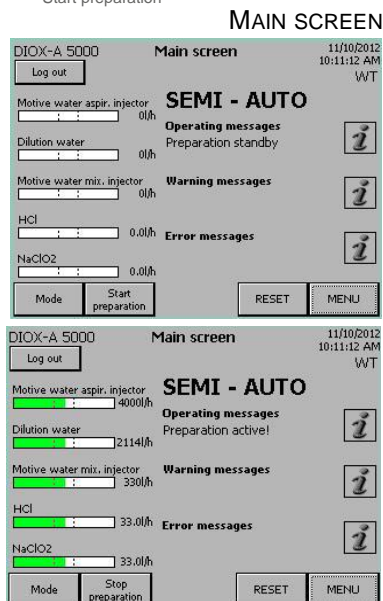
You can change to automatic mode at any time (mode button).

The preparation can be started under the following conditions:

- The fill level in the ClO<sub>2</sub> storage tank is under the "ClO<sub>2</sub> storage tank MAX"
- Both 3-way valves (N) and (M) must be in the "preparation" position:



Main screen  
Start preparation



If both of these conditions are met, the "Start preparation" button is also displayed on the main screen.

Proceed as follows:

- 1 Press the "Start preparation" button. You will be asked to enter a user name and password.  
The system switches to the "Preparation active!" operating state  
To stop the preparation, press „Stop preparation“.

The chlorine dioxide generator prepares chlorine dioxide up until the fill level „ClO<sub>2</sub> storage tank MAX“ has been reached.

Upon reaching the fill level „ClO<sub>2</sub> storage tank MAX“, the ClO<sub>2</sub> preparation stops; the chlorine dioxide generator changes to the operating state „Preparation standby“.

If the fill level of the ClO<sub>2</sub> storage tank falls below "MIN", the chlorine dioxide preparation will not start again.



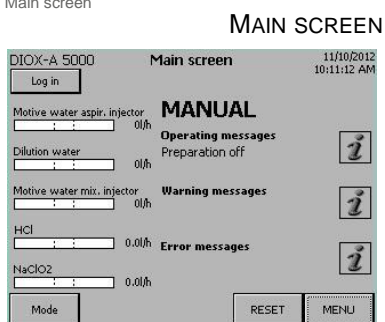
Speciality for the DIOX-A 1000:

The status „Preparation active” is separated into two phases:

- Display: Preparation active! Filling the reaction tank.  
Both chemicals are transferred into the reaction tank. Process water is flowing, vent gas aspiration is working.
- Display: Preparation active! Reaction time.  
Transfer of the chemicals, process water and vent gas aspiration are stopped.

## 6.6 Manual mode

Main screen



In manual mode, all functions are switched off.

The safety shut-off valve (G) is closed.

Manual functions in the menu System” (see chapter 6.12.6)

## 6.7 Operating messages

### 6.7.1 General

The chlorine dioxide generator shows the following operating messages on the display.

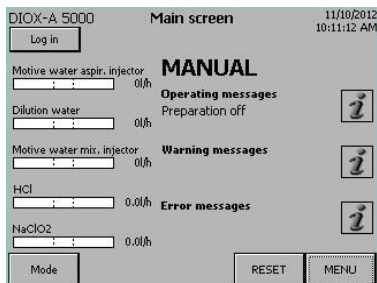
Operating states:

- In AUTOMATIC mode:*
- Preparation standby
  - Preparation active!
  - Preparation ext. Locked!
- In SEMI-AUTO mode:*
- Preparation standby
  - Preparation active!
  - Preparation ext. Locked!
- In MANUAL mode*
- Preparation off

### 6.7.2 Preparation off

Main screen

MAIN SCREEN



The Chlorine dioxide generator is in the "Preparation off" operating state.

- Automatic mode is switched off.
- The chlorine dioxide preparation does not start automatically.

Main screen

MAIN SCREEN



- If there is a fault, an error message is displayed. Acknowledge the fault and rectify it see chapter 6.11 Faults

### 6.7.3 Preparation standby

Main screen

MAIN SCREEN



The Chlorine dioxide generator is in the "Preparation standby" operating state.

- Automatic mode or semi-automatic mode is active.
- The system is not preparing anything.
- All the control systems control functions are reactive.

In AUTOMATIC mode:

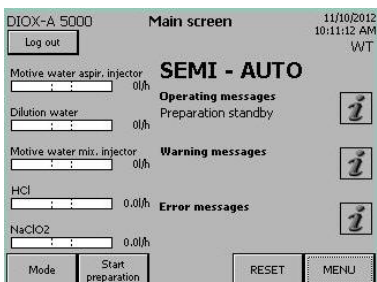
Upon reaching the fill level „ClO<sub>2</sub> storage tank MIN“ in the ClO<sub>2</sub> storage tank, the chlorine dioxide preparation starts again automatically.

In semi-automatic mode:

The chlorine dioxide preparation does not start automatically.

Main screen

SEMI - AUTO



### 6.7.4 Preparation active!

Main screen

MAIN SCREEN

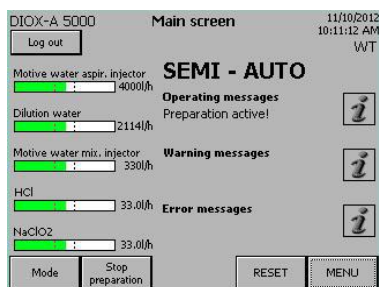


During the  $\text{ClO}_2$  preparation „Preparation active!“ is displayed.

In AUTOMATIC mode:

Upon reaching the fill level „ $\text{ClO}_2$  storage tank MIN“ in the  $\text{ClO}_2$  storage tank (AO), the chlorine dioxide preparation starts. The system switches to the “Preparation active!” operating state.

- The solenoid valve process water (dilution water and motive water mixing injector) (J) opens.
- The solenoid valve motive water for aspiration injector (D) opens.
- The flow rates HCl and  $\text{NaClO}_2$  are automatically adjusted.
- The flow rates dilution water, motive water for mixing injector and motive water for aspiration injector are measured and monitored with the aid of the flow rate sensors (Q, P, C).
- The chlorine dioxide generator prepares chlorine dioxide up until the fill level “ $\text{ClO}_2$  storage tank MAX” in the  $\text{ClO}_2$  storage tank has been reached. Then, the chlorine dioxide preparation is stopped.
- The solenoid valves process water (J) and motive water for the aspiration injector (D) close.
- The system switches to the "Preparation standby" operating state.
- Upon reaching the fill level „ $\text{ClO}_2$  storage tank MIN“ in the  $\text{ClO}_2$  storage tank (AO), the chlorine dioxide preparation starts again. The system switches to the “Preparation active!” operating state.



In semi-automatic mode:

After pressing the button "start preparation", the system switches to the “Preparation active!” operating state.

- The solenoid valve process water (dilution water and motive water for mixing injector) (J) opens.
- The solenoid valve motive water for aspiration injector (D) opens.
- The flow rates HCl and  $\text{NaClO}_2$  are automatically adjusted.
- The flow rates dilution water, motive water for mixing injector and motive water for aspiration injector are measured and monitored with the aid of the flow rate sensors (Q, P, C).
- The chlorine dioxide generator prepares chlorine dioxide up until the fill level “ $\text{ClO}_2$  storage tank MAX” in the  $\text{ClO}_2$  storage tank has been reached. Then, the chlorine dioxide preparation is stopped.
- The solenoid valves process water (J) and motive water for the aspiration injector (D) close.
- The system switches to the "Preparation standby" operating state.

Speciality for the DIOX-A 1000:

The status „Preparation active” is separated into two phases:

- Display: Preparation active! Filling the reaction tank.  
Both chemicals are transferred into the reaction tank. Process water is flowing, vent gas aspiration is working.
- Display: Preparation active! Reaction time.  
Transfer of the chemicals, process water and vent gas aspiration are stopped.

### 6.7.5 Preparation ext. locked!

The PLC controller of the Chlorine dioxide generator also provides a digital input for external release or block of chlorine dioxide preparation. This allows the operator to turn off the chlorine dioxide preparation from a control room. This is possible in every operating state and is shown on the display.

If the chlorine dioxide generator is carrying out the preparation process, this will be interrupted. The system is still in automatic operation or in semi-automatic mode. The chlorine dioxide preparation, however, cannot be started.

In automatic mode:

If the signal "ext. locked" is not showing, the chlorine dioxide preparation starts, as soon as the fill level „ClO<sub>2</sub> storage tank MIN“ in the ClO<sub>2</sub> storage tank (AO) has been reached.

In semi-automatic mode:

If the signal "ext. locked" is not showing, the chlorine dioxide preparation will not start automatically.

### 6.7.6 EMERGENCY STOP

The PLC controller of the Chlorine dioxide generator also provides a digital input for EMERGENCY STOP. The EMERGENCY-STOP signal turns the automatic mode off in an emergency. This is possible in every operating state and is shown on the display as a fault.

The automatic mode is stopped and switched to the MANUAL mode. The chlorine dioxide preparation does not start automatically.

## 6.8 Change HCl storage tank

for systems with HCl containers, e.g. IBC.



---

### *Warning!*

Hydrochloric acid causes serious burns, and is irritating to eyes and respiratory system.

The hydrochloric acid must in no way come into contact with the sodium chlorite solution or with other chemicals.

Risk of explosion!

Wear suitable protective clothing, gloves and eye/face protection while working.

Keep respirator on standby.

---

At the latest when the preparation stops due to an empty HCl storage tank (AN), the HCl storage tank must be changed.

- 1 Switch off automatic mode
  - 2 Pull the suction lance out of the empty HCl storage tank and place it into a in container with water.
  - 3 Close the empty HCl storage tank and remove.
  - 4 Place a full HCl storage tank in the HCl collecting basin and install the suction lance into the HCl storage tank.
  - 5 Pour away the water from the container.
  - 6 Switch on the automatic mode again.
- 



### *Please note*

Do not allow the suction lance to come into contact with dirt.  
Do not place or lay the suction lance on the floor

---



### *Please note*

In order to reduce the danger of confusing them, it is advisable not to change both chemical tanks at the same time but consecutively instead.

---

### 6.9 Change the NaClO<sub>2</sub> storage tank.

for systems with NaClO<sub>2</sub> equipment containers, e.g. IBC.



---

*Warning!*

Sodium chlorite solution in its dry state is oxidizing. Do not allow to dry into flammable substances.

Danger of spontaneous combustion!

The sodium chlorite solution must in no way come into contact with the hydrochloric acid or with other chemicals.

Risk of explosion!

Wear suitable protective clothing, gloves and eye/face protection while working.

Keep respirator on standby.

---

At the latest when the preparation stops due to an empty NaClO<sub>2</sub> storage tank (AM), the NaClO<sub>2</sub> storage tank must be changed.

- 1 Switch off automatic mode
  - 2 Pull the suction lance out of the empty NaClO<sub>2</sub> storage tank and place it into a container with water.
  - 3 Close the empty NaClO<sub>2</sub> storage tank and remove.
  - 4 Place a full NaClO<sub>2</sub> storage tank in the NaClO<sub>2</sub> collecting basin and install the suction lance into the NaClO<sub>2</sub> storage tank.
  - 5 Pour away the water from the container.
  - 6 Switch on the automatic mode again.
- 



*Please note*

Do not allow the suction lance to come into contact with dirt.

Do not place or lay the suction lance on the floor

Dirt in the NaClO<sub>2</sub> line can result in faults.

---



*Please note*

In order to reduce the danger of confusing them, it is advisable not to change both chemical tanks at the same time but consecutively instead.

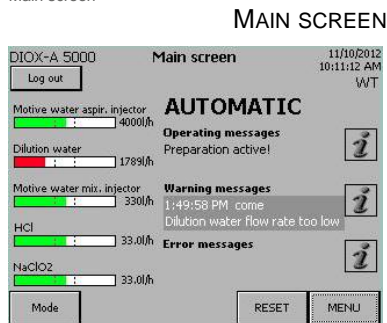
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## 6.10 Warning messages

### 6.10.1 General

Main screen



The Chlorine dioxide generator displays warning messages. The last warning message reported by the system is displayed as a text message on the main screen, together with the time stamp and the status details. The "i" (Info) button flashes:

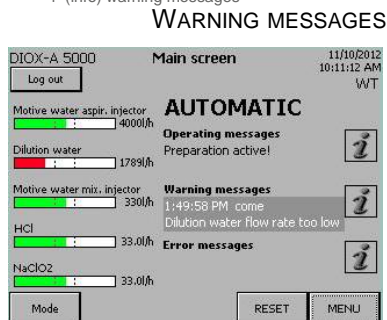
Examples:

- Perform monthly maintenance!
- Perform annual maintenance Service required
- ClO<sub>2</sub> storage tank empty
- Operating water pressure too low
- Operating water pressure too high
- Check injector motive water flow rate
- Temperature in the ClO<sub>2</sub> storage tank too high

The Chlorine dioxide generator stays in the current operating state (except when the chemical storage tanks are empty). The current automatic process is not interrupted. The warning message and the flashing "i" (Info) button disappear once the cause of the fault has been corrected.

Main screen

"i" (info) warning messages

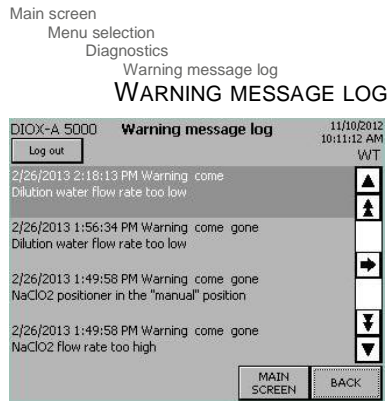


The "i" (Info) button allows you to view the current warning messages that have been displayed by the system including the date, time and status details (e.g. "come"), at any time.

State:

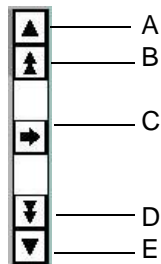
- come: Time at which the warning message occurred.
- gone: Time at which the warning message has ended.
- ack (acknowledged): Time at which the warning message was acknowledged.

Using the "Warning message log" button in the diagnostics menu, the warning message log may be accessed.



All warnings are stored in the "Warning message log" together with the date, time and status details ("come" and "gone") and can be viewed there at any time. For details, see chapter 6.12.3 Diagnostics, warning message log.

The arrow keys are used to navigate around the display:



- A one message up  
B one screen display page up  
C Message text  
D one screen display page down  
E one message down

**Warning!**

Wear suitable protective clothing, gloves and eye/face protection while working.

Keep respirator on standby.

Sodium chlorite solution in its dry-state is oxidizing. Do not allow to dry into flammable substances.

Danger of spontaneous combustion!

The chemicals must in no way come into contact with each other or with other chemicals. Risk of explosion!

Working on the electrical system parts may only be carried out by an electrical technician.

| Warning message                     | Cause   | Remedy  |
|-------------------------------------|---|---|
| ClO <sub>2</sub> storage tank empty | <ul style="list-style-type: none"> <li>Due to another fault, the preparation will not run at fill level MIN.</li> </ul>   | <ul style="list-style-type: none"> <li>Correct other faults.</li> </ul>   |
|                                     | <ul style="list-style-type: none"> <li>Plant leak</li> </ul>  | <ul style="list-style-type: none"> <li>Perform a visual inspection of the entire Chlorine dioxide generator including the ClO<sub>2</sub> storage tank (AO) to check for leaks and damage.</li> </ul> |
|                                     | <ul style="list-style-type: none"> <li>The system is not in AUTOMATIC mode. But chlorine dioxide is being drawn by the system nevertheless.</li> </ul>              | <ul style="list-style-type: none"> <li>Check the display to see whether AUTOMATIC mode is on. If required, switch on.</li> </ul>  |
|                                     | <ul style="list-style-type: none"> <li>The system is in AUTOMATIC mode. However, more chlorine dioxide is being drawn, than what the system can produce.</li> </ul> | <ul style="list-style-type: none"> <li>Check chlorine dioxide consumption.</li> </ul>   |
| Operating water pressure too low    | <ul style="list-style-type: none"> <li>Local admission pressure too low.</li> </ul>   | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>   |
|                                     | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>  | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>   |
| Operating water pressure too high   | <ul style="list-style-type: none"> <li>Local admission pressure too high.</li> </ul>  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary, e.g. on the local pressure reducing valve</li> </ul>   |

| Warning message  | Cause   | Remedy  |
|--|---|---|
| HCl flow rate too low                                  | • 3-way valve (N) not in position "preparation"               | • Turn 3-way valve (N) in position "preparation"  |
|  | • Leaks in HCl aspiration pipe                                | • Tighten the union nuts manually.  |
|  | • Pressure process water too low                              | • Check pressure (e.g. in the diagnostics menu), adjust.                                    |
|  | • Flow rate motive water for mixing injector too low          | • Check flow rate (see bar diagram on the main screen), adjust at the dosing ball valve (S) |
|  | • EMPTY sensor in the HCl suction lance faulty                | • check, repair   |
| HCl flow rate too high                                 | • Error in HCl regulation                                     | • Inform customer service   |
| HCl storage tank empty                                 | • HCl storage tank leak                                       | • Change HCl storage tank   |
|  | • HCl decanting not in operation or faulty                    | • Check HCl decanting   |
|  | • MIN- or EMPTY sensor faulty                                 | • check   |
| NaClO <sub>2</sub> flow rate too low                   | • 3-way valve (N) not in position "preparation"               | • Turn 3-way valve (N) in position "preparation"  |
|  | • Leakage in NaClO <sub>2</sub> aspiration pipe               | • Tighten the union nuts manually.  |
|  | • Pressure process water too low                              | • Check pressure (e.g. in the diagnostics menu), adjust.                                    |
|  | • Flow rate motive water for mixing injector too low          | • Check flow rate (main display), adjust (S)  |
|  | • EMPTY sensor in the NaClO <sub>2</sub> suction lance faulty | • check, repair   |
| NaClO <sub>2</sub> flow rate too high                  | • Error in NaClO <sub>2</sub> regulation                      | • Inform customer service   |
| NaClO <sub>2</sub> storage tank empty                  | • NaClO <sub>2</sub> storage tank leak                        | • Change HCl storage tank   |
|  | • MIN- or EMPTY sensor faulty                                 | • check   |
| NaClO <sub>2</sub> positioner in the "manual" position | • Adjustment knob on positioner pulled out                    | • Push in adjustment knob on the positioner until it engages                                |

| Warning message                                 | Cause   | Remedy   |
|---|---|--|
| Mixing injector motive water flow rate too high | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>                      | <ul style="list-style-type: none"> <li>Check flow rate motive water for mixing injector, adjust at the ball valve (S) (see bar diagram on the main screen).</li> </ul> |
|   | <ul style="list-style-type: none"> <li>Admission pressure setting (I) not correct</li> </ul>          | <ul style="list-style-type: none"> <li>Adjust the admission pressure on the pressure reducing valve (I) to 4.5 bar</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>                | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>  |
| Mixing injector motive water flow rate too low  | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>                      | <ul style="list-style-type: none"> <li>Check flow rate motive water for mixing injector, adjust at the ball valve (S) (see bar diagram on the main screen).</li> </ul> |
|   | <ul style="list-style-type: none"> <li>Admission pressure setting (I) not correct</li> </ul>          | <ul style="list-style-type: none"> <li>Adjust the admission pressure on the pressure reducing valve (I) to 4.5 bar</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>                | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Dirt in the strainer (I)</li> </ul>                            | <ul style="list-style-type: none"> <li>Clean the strainer (I) For details see chapter 6.13.7</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>                      | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>  |
| Flow rate Dilution water too low                | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>                      | <ul style="list-style-type: none"> <li>Check flow rate motive water for mixing injector, adjust at the ball valve (S) (see bar diagram on the main screen).</li> </ul> |
|   | <ul style="list-style-type: none"> <li>Admission pressure setting (I) not correct</li> </ul>          | <ul style="list-style-type: none"> <li>Adjust the admission pressure on the pressure reducing valve (I) to 4.5 bar.</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>                | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Aspiration injector motive water flow rate too high</li> </ul> | <ul style="list-style-type: none"> <li>Check flow rate motive water aspiration injector, adjust if necessary</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Dirt in the strainer (I)</li> </ul>                            | <ul style="list-style-type: none"> <li>Clean the strainer (I) For details see chapter 6.13.7.</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>                      | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>  |

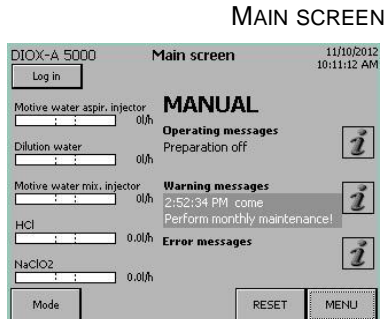
| Warning message                                    | Cause   | Remedy  |
|--|---|---|
| Flow rate<br>Dilution water too high               | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>                        | <ul style="list-style-type: none"> <li>Check flow rate dilution water and adjust at the ball valve (T) (see bar diagram on the main screen).</li> </ul>               |
|  | <ul style="list-style-type: none"> <li>Admission pressure setting (I) not correct</li> </ul>            | <ul style="list-style-type: none"> <li>Adjust the admission pressure on the pressure reducing valve (I) to 4.5 bar.</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>                  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>   |
| Aspiration injector motive water flow rate too low | <ul style="list-style-type: none"> <li>Admission pressure setting (E) not correct</li> </ul>            | <ul style="list-style-type: none"> <li>Check motive water aspiration injector and adjust pressure reducing valve (E) (see bar diagram on the main screen).</li> </ul> |
|  | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>                  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Back pressure on aspiration injector too high</li> </ul>         | <ul style="list-style-type: none"> <li>Check back pressure (see chapter 3.6.)</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Dirt in the strainer (E)</li> </ul>                              | <ul style="list-style-type: none"> <li>Clean the strainer (E) For details see chapter 6.13.7</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>                        | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Back pressure in the vent gas discharge (AA) too high</li> </ul> | <ul style="list-style-type: none"> <li>Check vent gas discharge (AA) : Shut-off devices open, back pressure see 3.6</li> </ul>  |
| Vacuum for vent gas aspiration too low             | <ul style="list-style-type: none"> <li>Injector aspiration performance too low</li> </ul>               | <ul style="list-style-type: none"> <li>Check motive water aspiration injector and adjust pressure reducing valve (E) (see bar diagram on the main screen).</li> </ul> |
|  | <ul style="list-style-type: none"> <li>Dirt in the strainer (E)</li> </ul>                              | <ul style="list-style-type: none"> <li>Clean the strainer (E) For details see 6.13.7.</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>                        | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>                  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary, see 3.6.</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Back pressure in the vent gas discharge too high</li> </ul>      | <ul style="list-style-type: none"> <li>Check vent gas discharge (AA) : Shut-off devices open, back pressure see 3.6</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Aspiration injector (AB) faulty</li> </ul>                       | <ul style="list-style-type: none"> <li>Check aspiration injector (AB)</li> </ul>  |

| Warning message  | Cause  | Remedy   |
|--|--|--|
| Gas phase temperature too low. DANGER OF FREEZING!     | <ul style="list-style-type: none"> <li>Ambient temperature too low</li> </ul>  | <ul style="list-style-type: none"> <li>Heat ambient air</li> </ul>   |
| Temperature in the ClO <sub>2</sub> storage tank <5°C) | <ul style="list-style-type: none"> <li>Operating water temperature too low</li> </ul>  | <ul style="list-style-type: none"> <li>Measure operating water temperature Also heat, if necessary.</li> </ul> |
| Gas phase temperature too high                         | <ul style="list-style-type: none"> <li>Temperature in the ClO<sub>2</sub> storage tank &gt;40°C</li> </ul>                               | The vent gas aspiration continues to run after preparation intermittently (2 min. ON, 5 min. OFF).             |
|  | <ul style="list-style-type: none"> <li>Ambient temperature too high</li> </ul>   | <ul style="list-style-type: none"> <li>Cool ambient air</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Operating water temperature too high</li> </ul>   | <ul style="list-style-type: none"> <li>Measure operating water temperature Cool if necessary</li> </ul>        |
|  | <ul style="list-style-type: none"> <li>External heating of the ClO<sub>2</sub> storage tank, e.g. by means of direct sunlight</li> </ul> | <ul style="list-style-type: none"> <li>Prevent external heating of the ClO<sub>2</sub> storage tank</li> </ul> |
| Perform monthly maintenance!                           | <ul style="list-style-type: none"> <li>Monthly maintenance required!</li> </ul>  | <ul style="list-style-type: none"> <li>see 6.10.2</li> </ul>   |
| Perform annual maintenance!<br>Service required        | <ul style="list-style-type: none"> <li>Annual maintenance required</li> </ul>  | <ul style="list-style-type: none"> <li>see 6.10.3</li> </ul>   |

Error messages during flushing or calibration are described in chapter 7.3.

### 6.10.2 Perform monthly maintenance!

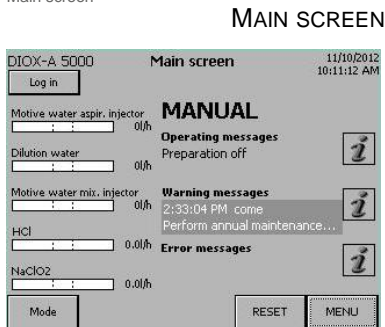
Main screen



The warning message "Perform monthly maintenance!" is displayed once a month. This warning message can be displayed in every operating state. The chlorine dioxide generator remains operational. The warning message disappears as soon as monthly maintenance has been performed and the "Maintenance" button on the main "Service" menu is pressed. See chapter 6.12.4 Menu Service. For details on carrying out monthly maintenance see chapter 6.13 Maintenance by the operator.

### 6.10.3 Perform annual maintenance! Service required

Main screen



Once a year, manufacturer service personnel or personnel who have been trained and authorized by the manufacturer must perform maintenance. The requirement to do so is indicated on the display. This warning message will be displayed for the first time after twelve months after start up, and then every twelve months thereafter. This warning message can be displayed in any operating state. The chlorine dioxide generator remains operational. The message disappears as soon as annual maintenance has been performed and the "Maintenance" button on the main "Service" menu is pressed .



### 6.11 Error messages


There are basically two different types of faults:

- Faults that only stop preparation. The chlorine dioxide generator changes to the "Preparation standby" operating state. The automatic mode remains active. As soon as the fault has been corrected and the "RESET" button has been pressed, preparation can be started again.
- Faults that cause automatic mode to switch off. The mode changes from AUTOMATIC to MANUAL. The chlorine dioxide generator changes to the "Preparation off" operating state.



If the system develops a fault, a window with "Error messages" is shown in the display, irrespective of the current operating state or what display is currently being shown by the chlorine dioxide generator.

The symbol  is displayed.

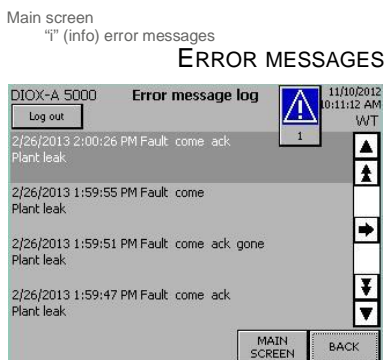
Every error message has to be acknowledged individually  by pressing the button. If the last error message has been acknowledged, the display goes back to the previous menu.



The last error message reported by the system is displayed as a text message on the main screen, together with the time stamp and the status details. The "i" (Info) button flashes.


The text message, the symbol and the flashing "i" (Info) button all cease to be displayed once the fault has been cleared and the "RESET" button has been pressed.

If it is not possible to remedy the fault yourself, please contact the manufacturer customer service directly.



The "i" (Info) button allows you to view the error messages that have been displayed by the system, including the date, time and status details ("come", "ack" and "gone"), at any time.

Use the arrow keys to move around the display.

As long as at least one fault is active, the symbol  is displayed.

All faults are also stored in the error message log and can be viewed there at any time.

For details see chapter 6.12.3, section Error message log



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*Warning!*

**Chemical hazard!**

In the Chlorine dioxide generator chemicals settle and accrue in unsubstantial quantities. When remedying faults, be sure to follow the safety instructions and warnings indicated on the system and in this operating manual.

The chemicals may not come into contact with each other or with other chemicals.

Do not drain the reactor contents, it is absolutely necessary to flush.

Risk of explosion!

When working at the system, wear personal protection gear, keep respirator on standby.

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*Warning!*

**Risk of injury or damage to the system!**

If you find any leaks or damage to the Chlorine dioxide generator, switch off automatic preparation immediately by pressing the "Mode" button and contact customer service.

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*Warning!*

**Danger of electric current.**

Only qualified electrical technicians may perform work on the system's electrical components.

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### 6.11.1 Faults that do not end the automatic operation

For the faults in this table, the automatic mode is not turned off. The preparation is switched off in the case of most faults. Every error message has to be acknowledged individually  by pressing the button. When the last error message has been acknowledged, the last display is shown again.

In order to activate automatic mode after remedying a fault: Press "RESET".

In order to start the preparation again immediately Press "Preparation start".

If the fault cannot be removed with the remedies indicated: Inform customer service.

| Error message  | Cause  | Remedy  |
|--|--|---|
| Pressure measurement<br>Operating water. mA signal?                                      | <ul style="list-style-type: none"> <li>• mA signal disrupted.</li> <li>• Pressure sensor (H) faulty</li> <li>• Cabling faulty</li> </ul>                           | <ul style="list-style-type: none"> <li>• Check pressure sensor (diagnostics menu: Analogue inputs)</li> <li>• Check cabling</li> </ul>  |
| Fill level measurement<br>Overfilled sensor<br>ClO <sub>2</sub> storage tank. mA signal? | <ul style="list-style-type: none"> <li>• mA signal from fill level sensor (AR) disrupted.</li> <li>• Overfilled sensor faulty</li> <li>• Cabling faulty</li> </ul> | <ul style="list-style-type: none"> <li>• Check fill level sensor (AR) (diagnostics menu: analogue inputs)</li> <li>• Check the switching functions of the overfilled sensor in the ClO<sub>2</sub> storage tank.</li> </ul>   |
| Booster pump<br>failure  | <ul style="list-style-type: none"> <li>• Fault signal from the motor protection switch</li> </ul>  | <ul style="list-style-type: none"> <li>• Check motor protection switch and pump motor</li> </ul>  |
| Temperature measurement<br>Gas phase. Signal?  | <ul style="list-style-type: none"> <li>• Signal from temperature sensor ClO<sub>2</sub> storage tank faulty</li> </ul>   | <ul style="list-style-type: none"> <li>• Check pressure sensor and cabling (diagnostics menu: Analogue inputs)</li> </ul>   |
| Gas phase temperature too high   | <ul style="list-style-type: none"> <li>• Temperature in the ClO<sub>2</sub> storage tank &gt;45°C</li> </ul>   | <p>The vent gas aspiration continues to intermittently run after preparation . The preparation stops.<br/>In AUTOMATIC: The preparation starts again automatically when the fault has ended and the fill level in the ClO<sub>2</sub> storage tank sinks under MIN.</p> |
|  | <ul style="list-style-type: none"> <li>• Ambient temperature too high</li> </ul>   | <ul style="list-style-type: none"> <li>• Cool ambient air</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>• Operating water temperature too high</li> </ul>   | <ul style="list-style-type: none"> <li>• Measure operating water temperature. Cool if necessary</li> </ul>  |

| Error message   | Cause   | Remedy  |
|---|---|---|
|   | <ul style="list-style-type: none"> <li>External heating of the ClO<sub>2</sub> storage tank, e.g.. by means of direct sunlight</li> </ul> | <ul style="list-style-type: none"> <li>Prevent external heating of the ClO<sub>2</sub> storage tank</li> </ul>                              |
| HCl flow rate too high  | <ul style="list-style-type: none"> <li>Error in HCl regulation</li> </ul>   | <ul style="list-style-type: none"> <li>Inform customer service</li> </ul>   |
| HCl flow rate too low   | <ul style="list-style-type: none"> <li>3-way valve (N) not in position "preparation"</li> </ul>   | <ul style="list-style-type: none"> <li>Turn 3-way valve (N) to position "preparation", see 6.4.1</li> </ul>                                 |
|   | <ul style="list-style-type: none"> <li>Leaks in HCl aspiration pipe</li> </ul>  | <ul style="list-style-type: none"> <li>Tighten the union nuts manually</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Pressure process water too low</li> </ul>  | <ul style="list-style-type: none"> <li>Check pressure (e.g. in the diagnostics menu)</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Mixing injector motive water flow rate too low</li> </ul>  | <ul style="list-style-type: none"> <li>Check flow rate (see bar diagram on the main screen), adjust at the dosing ball valve (S)</li> </ul> |
|   | <ul style="list-style-type: none"> <li>EMPTY sensor in the HCl suction lance faulty</li> </ul>  | <ul style="list-style-type: none"> <li>check, repair</li> </ul>   |
| Level sensors HCl storage tank. Plausibility?   | <ul style="list-style-type: none"> <li>simultaneous indication of different fill levels</li> </ul>  | <ul style="list-style-type: none"> <li>Check the switching functions of the level switches in the HCl storage tank</li> </ul>               |
| HCl storage tank overfilled   | <ul style="list-style-type: none"> <li>MAX or overfilled sensor faulty</li> </ul>   | <ul style="list-style-type: none"> <li>Check MAX and overfilled sensor in the HCl storage tank</li> </ul>                                   |
|   | <ul style="list-style-type: none"> <li>External decanting unit does not shut down</li> </ul>  | <ul style="list-style-type: none"> <li>Check decanting unit</li> </ul>  |
| HCl positioner in the "manual" position<br><br>STOP positioner?<br>Adjustment knob AUTO | <ul style="list-style-type: none"> <li>Adjustment knob on positioner pulled out</li> </ul>  | <ul style="list-style-type: none"> <li>Push in adjustment knob on the positioner until it engages</li> </ul>                                |

| Error message   | Cause   | Remedy  |
|---|---|---|
| Mixing injector motive water flow rate too low  | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>  | <ul style="list-style-type: none"> <li>Check flow rate motive water mixing injector, adjust at the ball valve (S) (see bar diagram on the main screen).</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Admission pressure setting (I) not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Adjust the admission pressure on the pressure reducing valve (I) to 4.5 bar.</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Dirt in the strainer (I)</li> </ul>  | <ul style="list-style-type: none"> <li>Clean the strainer (I) For details see chapter 6.13.7</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>  | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>   |
| Mixing injector motive water flow rate too low.<br>Operating water pressure x bar! Warning for y h! | <ul style="list-style-type: none"> <li>The water pressure has been low for (y) hours already; the lowest pressure (x) during this time is indicated.</li> </ul> | <ul style="list-style-type: none"> <li>Check operating water pressure during on-going operation</li> <li>Adjust the admission pressure on the pressure reducing valve (I) to 4.5 bar.</li> <li>Check flow rate motive water mixing injector, adjust at the ball valve (S) (see bar diagram on the main screen).</li> <li>Clean the strainer (I) For details see chapter 6.13.7</li> <li>If pump faulty: Inform customer service</li> <li>Check the warning message log</li> </ul> |
| Mixing injector motive water flow rate too high   | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>  | <ul style="list-style-type: none"> <li>Check flow rate motive water for mixing injector, adjust at the ball valve (S) (see bar diagram on the main screen).</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Admission pressure setting (I) not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Adjust the admission pressure on the pressure reducing valve (I) to 4.5 bar.</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>   |

| Error message  | Cause   | Remedy   |
|--|---|--|
| Aspiration injector motive water flow rate too low   | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Pressure reducing valve setting (E) not correct</li> </ul>   | <ul style="list-style-type: none"> <li>Adjust the flow rate on the pressure reducing valve (E) (see bar diagram on the main screen).</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>  | <ul style="list-style-type: none"> <li>check local admission pressure (see chapter 3.6)</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Dirt in the strainer (E)</li> </ul>  | <ul style="list-style-type: none"> <li>Clean the strainer (E) For details see chapter 6.13.7</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>  | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>  |
| Aspiration injector motive water flow rate too low. Operating water pressure x bar! Warning for y h! | <ul style="list-style-type: none"> <li>The water pressure has been low for (y) hours already; the lowest pressure (x) during this time is indicated.</li> </ul> | <ul style="list-style-type: none"> <li>Check operating water pressure during on-going operation</li> <li>Adjust the flow rate on the pressure reducing valve (E) (see bar diagram on the main screen).</li> <li>Clean the strainer (E) For details see chapter 6.13.7</li> <li>If pump faulty: Inform customer service</li> <li>Check the warning message log</li> </ul> |
| Level sensors Calibration tank. Plausibility?  | <ul style="list-style-type: none"> <li>simultaneous indication of different fill levels</li> </ul>  | <ul style="list-style-type: none"> <li>Check the switching functions of the level switches in calibration tank (AD). Due to this fault, the preparation will not be switched off.</li> </ul>   |
| NaClO <sub>2</sub> flow rate too low   | <ul style="list-style-type: none"> <li>3-way valve (M) not in position "preparation"</li> </ul>   | <ul style="list-style-type: none"> <li>Turn 3-way valve (M) to in position "preparation"</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Leakage in NaClO<sub>2</sub> aspiration pipe</li> </ul>  | <ul style="list-style-type: none"> <li>Tighten the union nuts manually.</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Pressure process water too low</li> </ul>  | <ul style="list-style-type: none"> <li>Check pressure (e.g. in the diagnostics menu), adjust.</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Mixing injector motive water flow rate too low</li> </ul>  | <ul style="list-style-type: none"> <li>Check flow rate (see bar diagram on the main screen), adjust (S)</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>EMPTY sensor in the NaClO<sub>2</sub> suction lance faulty</li> </ul>  | <ul style="list-style-type: none"> <li>check, repair</li> </ul>  |
| NaClO <sub>2</sub> flow rate too high  | <ul style="list-style-type: none"> <li>Error in NaClO<sub>2</sub> regulation</li> </ul>   | <ul style="list-style-type: none"> <li>Inform customer service</li> </ul>  |

| Error message  | Cause   | Remedy   |
|--|---|--|
| Level sensors<br>NaClO <sub>2</sub> storage tank.<br>Plausibility? | <ul style="list-style-type: none"> <li>simultaneous indication of different fill levels</li> </ul>                                    | <ul style="list-style-type: none"> <li>Check the switching functions of the level switches in the NaClO<sub>2</sub> storage tank (AM)</li> </ul>                       |
| NaClO <sub>2</sub> storage tank overfilled                         | <ul style="list-style-type: none"> <li>MAX or overfilled sensor faulty</li> <li>External decanting unit does not shut down</li> </ul> | <ul style="list-style-type: none"> <li>Check MAX- and overfilled sensor, repair</li> <li>Check decanting unit (option)</li> </ul>                                      |
| NaClO <sub>2</sub> positioner in "MANUAL" position                 | <ul style="list-style-type: none"> <li>Adjustment knob on the positioner (X) pulled out</li> </ul>                                    | <ul style="list-style-type: none"> <li>Push in the adjustment knob on the positioner (X) until it engages</li> </ul>   |
| Safety shut-off valve does not open                                | <ul style="list-style-type: none"> <li>no confirmation if the safety shut-off valve is completely open</li> </ul>                     | <ul style="list-style-type: none"> <li>Inform customer service</li> </ul>  |
| Safety shut-off valve does not close                               | <ul style="list-style-type: none"> <li>no confirmation if the safety shut-off valve is completely closed</li> </ul>                   | <ul style="list-style-type: none"> <li>Inform customer service</li> </ul>  |
| Flow rate<br>Dilution water too low                                | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>  | <ul style="list-style-type: none"> <li>Adjust flow rate on dosing ball valve (T)</li> <li>Check the local admission pressure and adjust if necessary.</li> </ul>       |
|  | <ul style="list-style-type: none"> <li>Admission pressure setting (I) not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Adjust the pressure on the pressure reducing valve (I) to 4.5 bar</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Check flow rate motive water for mixing injector, adjust at the ball valve (S) (see bar diagram on the main screen).</li> </ul> |
|  | <ul style="list-style-type: none"> <li>Aspiration injector motive water flow rate too high</li> </ul>                                 | <ul style="list-style-type: none"> <li>Check flow rate motive water aspiration injector, adjust if necessary</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Dirt in the strainer (I)</li> </ul>  | <ul style="list-style-type: none"> <li>Clean the strainer (I) For details see chapter 6.13.7.</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>  | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>  |


| Error message   | Cause   | Remedy   |
|---|---|--|
| Flow rate<br>Dilution water too low.<br>Operating water pressure x<br>bar! Warning for y h! | <ul style="list-style-type: none"> <li>The water pressure has been low for (y) hours already; the lowest pressure (x) during this time is indicated.</li> </ul> | <ul style="list-style-type: none"> <li>Check operating water pressure during on-going operation</li> <li>Check flow rate dilution water and adjust at the ball valve (T) (see bar diagram on the main screen).</li> <li>Clean the strainer (I) For details see chapter 6.13.7</li> <li>If pump faulty: Inform customer service</li> <li>Check the warning message log</li> </ul> |
| Flow rate<br>Dilution water too high  | <ul style="list-style-type: none"> <li>Flow rate setting not correct.</li> </ul>  | <ul style="list-style-type: none"> <li>Check flow rate dilution water and adjust at the ball valve (T) (see bar portrayal on the main screen).</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Admission pressure setting (I) not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Adjust the pressure on the pressure reducing valve (I) to 4.5 bar</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>  |
| Operating water pressure<br>too low   | <ul style="list-style-type: none"> <li>Local admission pressure too low.</li> </ul>   | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>  | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>  |
| Operating water pressure<br>too high  | <ul style="list-style-type: none"> <li>Local admission pressure too high.</li> </ul>  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary, see 3.6)</li> </ul>   |
| Vacuum for vent gas aspiration<br>too low   | <ul style="list-style-type: none"> <li>Injector aspiration performance too low</li> </ul>   | <ul style="list-style-type: none"> <li>Check motive water aspiration injector and adjust pressure reducing valve (E) (see bar diagram on the main screen).</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Back pressure in the vent gas discharge to high</li> </ul>   | <ul style="list-style-type: none"> <li>Check vent gas discharge (AA) : Shut-off devices open, back pressure see chapter 3.6</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>local admission pressure not correct</li> </ul>  | <ul style="list-style-type: none"> <li>Check the local admission pressure and adjust if necessary.</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Dirt in the strainer (E)</li> </ul>  | <ul style="list-style-type: none"> <li>Clean the strainer (E) For details see chapter 6.13.7.</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Booster pump faulty (optional)</li> </ul>  | <ul style="list-style-type: none"> <li>If pump faulty: Inform customer service</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Aspiration injector (AB) faulty</li> </ul>   | <ul style="list-style-type: none"> <li>Check aspiration injector (AB)</li> </ul>   |



| Error message                                   | Cause  | Remedy   |
|---|--|--|
| Flushing fail<br>Q signal at NaClO <sub>2</sub> | <ul style="list-style-type: none"><li>wrong ball valve setting during flush of the HCl line or the reaction tank</li></ul>               | <ul style="list-style-type: none"><li>Set NaClO<sub>2</sub> ball valve (M) correctly (see chapter 7.2)</li></ul> |
| Flushing fail<br>Q signal for HCl               | <ul style="list-style-type: none"><li>wrong ball valve setting during flush of the NaClO<sub>2</sub> line or the reaction tank</li></ul> | <ul style="list-style-type: none"><li>Set HCl ball valve (N) correctly (see chapter 7.2)</li></ul>               |

### 6.11.2 Faults that cause automatic operation to end

For the faults in this table, the preparation and automatic mode is switched off. The safety shut-off valve closes.

Every error message has to be acknowledged individually  by pressing the button.

If the last error message has been acknowledged, the display goes back to the previous menu.

After remedying a fault, press RESET.

Switch on automatic mode (see chapter 6.4.1)

If the fault cannot be removed with the remedies indicated: Inform customer service.

| Error message   | triggered by  | Remedy  |
|---|---|---|
| Plant leak  | <ul style="list-style-type: none"> <li>Liquid in the collecting basin (e.g. due to leak)</li> </ul>   | <ul style="list-style-type: none"> <li>Fix leaks</li> <li>Dispose of fluid properly. Rinse the collecting basin with water.</li> </ul>  |
| Fill level measurement Overfilled sensor ClO <sub>2</sub> storage tank. Plausibility? | <ul style="list-style-type: none"> <li>simultaneous indication of different fill levels</li> <li>Switching point overfilled under adjusted switching point MAX</li> </ul> | <ul style="list-style-type: none"> <li>Check the switching functions of the fill level sensor and overfilled sensor in the ClO<sub>2</sub> storage tank. See chapter 4.6.9</li> </ul> |
| Leakage ClO <sub>2</sub> storage tank   | <ul style="list-style-type: none"> <li>Liquid in the collecting basin (e.g. due to leak)</li> </ul>   | <ul style="list-style-type: none"> <li>Fix leaks</li> <li>Dispose of fluid properly. Rinse the collecting basin with water.</li> </ul>  |
| ClO <sub>2</sub> storage tank overfilled  | <ul style="list-style-type: none"> <li>Filllevel sensor (AR) set wrong or faulty</li> <li>Overfilledsensor in the ClO<sub>2</sub> storage tank (AO) faulty</li> </ul>     | <ul style="list-style-type: none"> <li>Check overfilled sensor (AR) and overfilled sensor in the ClO<sub>2</sub> storage tank (AO)</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Solenoid valve (J) leak</li> </ul>   | <ul style="list-style-type: none"> <li>Check the tightness of the solenoid valve (J)</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Back-pressure valve in the aspirationinjector (AB) leaky</li> </ul>  | <ul style="list-style-type: none"> <li>Check back-pressure valve in the aspirationinjector (AB) for leaks</li> </ul>  |
| Gas phase temperature too low. DANGER OF FREEZING!                                    | <ul style="list-style-type: none"> <li>Temperature in the ClO<sub>2</sub> storage tank &lt;3°C</li> </ul>   | <ul style="list-style-type: none"> <li>Heat ambient air</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Ambient temperature too low</li> </ul>   | <ul style="list-style-type: none"> <li>Heat ambient air</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Operating water temperature too low</li> </ul>   | <ul style="list-style-type: none"> <li>Measure operating water temperature Also heat, if necessary.</li> </ul>  |

| Error message  | triggered by   | Remedy  |
|--|--|---|
| Gas alarm  | <ul style="list-style-type: none"> <li>Gas monitoring system HCl or ClO<sub>2</sub> fluid has escaped</li> </ul>                                 | <ul style="list-style-type: none"> <li>Follow alarm plan. Put on personal protective equipment Acknowledge alarm at gas monitoring system.</li> <li>Remove cause of alarm.</li> <li>Dispose of fluid properly.</li> </ul> |
|  | <ul style="list-style-type: none"> <li>Absorber solution used up</li> </ul>  | <ul style="list-style-type: none"> <li>Replace absorber solution (see chapter 6.13.6)</li> </ul>  |
| Flow rate measurement HCl Plausibility?                              | <ul style="list-style-type: none"> <li>HCl flow rate &gt;0 is measured although the solenoid valve (J) is not actuated.</li> </ul>               | <ul style="list-style-type: none"> <li>Check the tightness of the solenoid valve (J)</li> <li>Check flow rate sensor (Bars on the main screen). Inform customer service</li> </ul>  |
| Flow rate measurement Motive water mixing injector Plausibility?     | <ul style="list-style-type: none"> <li>Motive water-flow rate &gt;0 is measured, although the solenoid valve (J) is not actuated.</li> </ul>     | <ul style="list-style-type: none"> <li>Check the tightness of the solenoid valve (J)</li> <li>Check flow rate sensor (bars on the main screen). Inform customer service</li> </ul>  |
| Flow rate measurement Motive water aspiration injector Plausibility? | <ul style="list-style-type: none"> <li>Motive water-flow rate &gt;0 is measured, although the solenoid valve (D) is not actuated.</li> </ul>     | <ul style="list-style-type: none"> <li>Check the tightness of the solenoid valve (D)</li> <li>Check flow rate sensor (Bars on the main screen). Inform customer service</li> </ul>  |
| Flow rate measurement NaClO <sub>2</sub> . Plausibility?             | <ul style="list-style-type: none"> <li>NaClO<sub>2</sub> flow rate &gt;0 is measured although the solenoid valve (J) is not actuated.</li> </ul> | <ul style="list-style-type: none"> <li>Check the tightness of the solenoid valve (J)</li> <li>Check flow rate sensor (Bars on the main screen). Inform customer service</li> </ul>  |
| Flow rate measurement Dilution water: Plausibility?                  | <ul style="list-style-type: none"> <li>Dilution water flow rate &gt;0 is measured although the solenoid valve (J) is not actuated.</li> </ul>    | <ul style="list-style-type: none"> <li>Check the tightness of the solenoid valve (J)</li> <li>Check flow rate sensor (Bars on the main screen). Inform customer service</li> </ul>  |
| EMERGENCY-STOP   | <ul style="list-style-type: none"> <li>Missing "Release system" signal</li> </ul>  | <ul style="list-style-type: none"> <li>check if external release has been withdrawn by an external switch function</li> </ul>   |



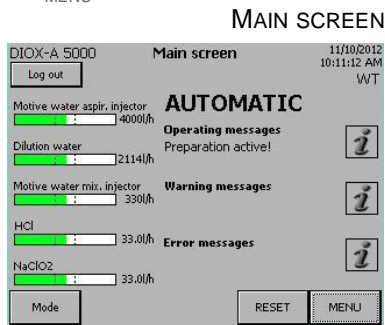
*Please note*

All faults must be recorded in the operating journal! (chapter 8.)!

## 6.12 Menus

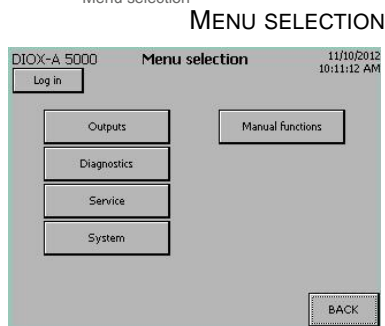
### 6.12.1 Menu selection

Main screen  
MENU



Pressing the "MENU" button on the main screen opens the "Menu selection" screen.

Main screen  
MENU  
Menu selection



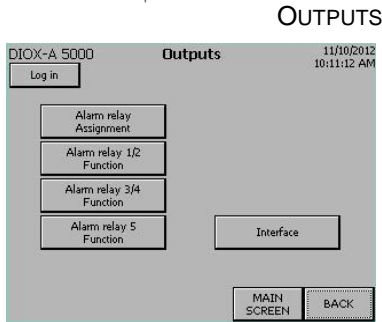
Altogether, the following menus may be chosen from:

- Outputs
- Diagnostics
- Service
- System
- Manual functions

All menus are accessible to all user groups to display the operating parameters and settings and do not require a user name or password, irrespective of the current operating state of the chlorine dioxide generator.

### 6.12.2 "Outputs" menu

Main screen  
MENU  
Menu selection  
Outputs



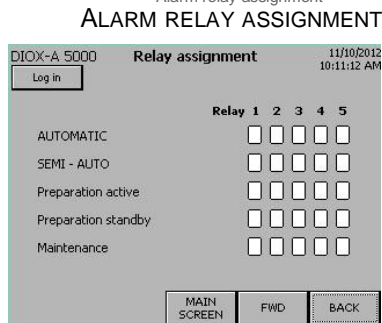
The PLC controller has five potential-free alarm relays for operating, warning and error messages as well as acting as interfaces for the PROFIBUS DP bus system.

In the "Outputs" menu, the alarm relay messages and the interface addresses can be assigned.

The menu "Outputs" contains the following sub-menus:

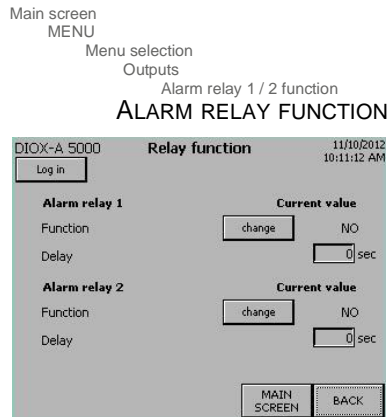
- Alarm relay assignment
- Alarm relay 1/2 function
- Alarm relay 3/4 function
- Alarm relay 5 function
- Interface

Main screen  
MENU  
Menu selection  
Outputs  
Alarm relay assignment

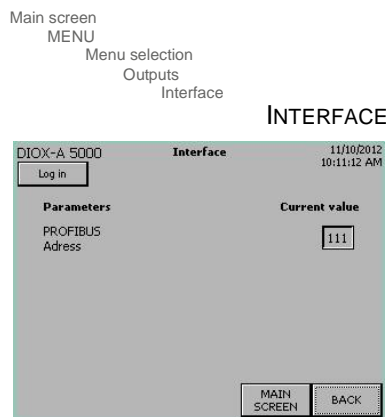


Proceed as follows:

- 1 Change to the Display „Alarm relay assignment“.
- 2 If you wish to assign a different message, select the required message from the sources mentioned.  
You will be asked to enter a user name and password. Choose the desired setting and press the corresponding button. The chosen settings will be shown in black. For each alarm relay, numerous messages may be chosen. Press FWD and further settings will be shown.



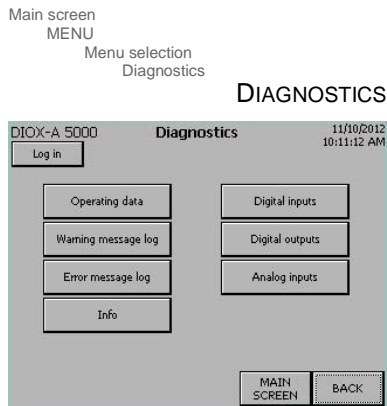
The alarm relays must be assigned to an NC (normally closed) or NO (normally open) switching function. If the switching function should be triggered with a delay, you can also specify a delay of between 0 and 3600 seconds.



#### PROFIBUS DP interface

- 1 In the display change „Interface“. The bus address “111” has been assigned.  
See chapter 5.

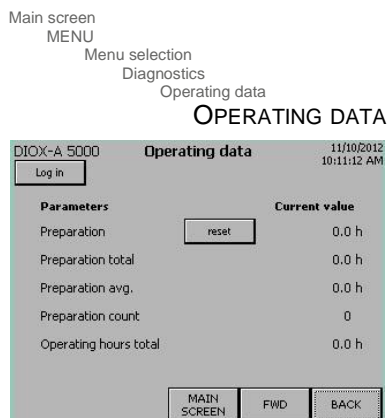
### 6.12.3 "Diagnostics" menu



In the menu "diagnostics" all of the operating parameters and settings can be viewed without needing to enter a user name or password.

The menu "Diagnostics" contains the following sub-menus:

- Operating data
- Warning message log
- Error message log
- Info
- Digital inputs
- Digital outputs
- Analog inputs



#### Operating data

The "Operating data" menu consists of several screens. Press the "FWD" button to move to the next screen, and "BACK" to go back to the previous screen.

The first screen shows the current number of hours the system has been operating and preparing:

- Preparation  
so-called "Day uptime counter" Gives the number of hours the system has actually been preparing the product since it was last reset.  
To perform a reset, you will be asked to enter a user name and password.
- Preparation total  
Gives the number of hours the system has actually been preparing since the chlorine dioxide generator was last switched on.
- Preparation average  
gives the average length of a preparation count (in the "Preparation active!" operating state).
- Preparation cycles  
Gives the number of preparation cycles (in the "Preparation active!" operating state) since the system was last switched on.
- Operating hours total  
Gives the total number of system operating hours since the system was last switched on.



*Please note*

The preparation and total operating hours should be entered in the operating journal (chapter 8.)!

Main screen  
MENU

Diagnostics  
Operating data  
"FWD"

OPERATING DATA

| Parameters                     |          | Current value |
|--------------------------------|----------|---------------|
| Concentration ClO <sub>2</sub> |          | 2.0 g/l       |
| Motive water aspir. injector   | 4000 l/h | 0 l/h         |
| Dilution water                 | 2114 l/h | 0 l/h         |
| Motive water mix. injector     | 330 l/h  | 0 l/h         |
| HCl                            | 33.0 l/h | 0.0 l/h       |
| NaClO <sub>2</sub>             | 33.0 l/h | 0.0 l/h       |

Buttons: MAIN SCREEN, FWD, BACK

In the next window, you will see details for the parameters (left column: Setpoints, right column: current measurement values)

- chosen ClO<sub>2</sub> concentration and the setpoints calculated from it
- Flow rate motive water for aspiration injector
- Flow rate dilution water
- Flow rate motive water for mixing injector
- Flow rate HCl
- NaClO<sub>2</sub> flow rate

| Parameters                          | Current value |
|-------------------------------------|---------------|
| Operating water pressure            | 6.1 bar       |
| ClO <sub>2</sub> storage tank level | 33 %          |
| Gas phase temperature               | 13 °C         |

Buttons: MAIN SCREEN, FWD, BACK

In the next window, you will see details on the current values

- Operating water pressure
- Fill level ClO<sub>2</sub> storage tank
- Temperature in the ClO<sub>2</sub> storage tank

| Parameters                              | Current value |
|---|---------------|
| <b>Calibration factors / correction</b> |               |
| Concentration ClO <sub>2</sub>          | 1.0           |
| Dilution water                          | 1.0           |
| Motive water mixing injector            | 1.0           |
| HCl                                     | 1.0           |
| NaClO <sub>2</sub>                      | 1.0           |

Buttons: MAIN SCREEN, FWD, BACK

In the next window, you will see details on the calibration and correction factors:

- ClO<sub>2</sub> concentration
- Dilution water
- Motive water for mixing injector
- HCl
- NaClO<sub>2</sub>

In order to set the correction factor for the ClO<sub>2</sub> concentration to "1" and pick the ClO<sub>2</sub> correction again: Press "Reset" (see chapter 6.12.4)

| Parameters               | Current value        |
|--------------------------|----------------------|
| Last monthly maintenance | 1/1/1999 12:00:00 PM |
| Last annual maintenance  | 1/1/1999 12:00:00 PM |

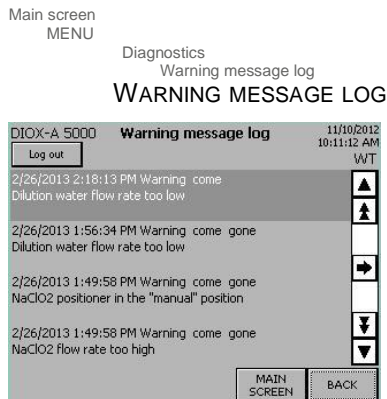
Buttons: MAIN SCREEN, BACK

In the next window, you will see details on

- Date of last monthly maintenance
- Date of last annual maintenance



## Warning message log



All warnings are kept shown in the menu „Warning message log“.

The display is laid out as follows:

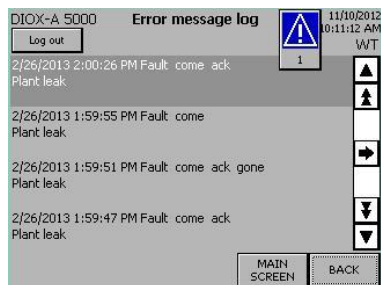
- Date of the warning message
- Time of the warning message
- Status of the warning message
  - come
  - gone
- Warning message text

You can use the arrow keys to move around the display. Press "BACK" or "MAIN SCREEN" buttons to exit the warning message log again.

## Error message log

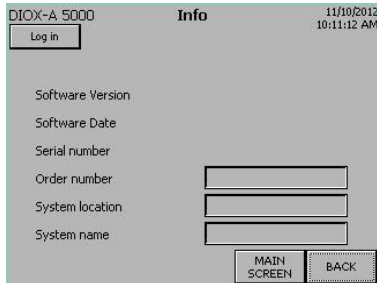
All the faults are kept in the menu „Error message log“.

The display is laid out as follows:



- Date of error message
- Time of error message
- Status of the error message
  - come
  - acknowledge
  - gone
- Error message text

You can use the arrow keys to move around the display. Press "BACK" or "MAIN SCREEN" to exit the error message log again.



### System information

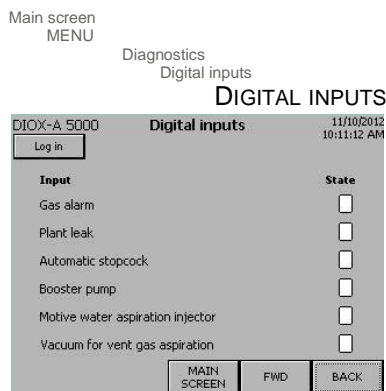
In the menu "System information", you can view the software version, its date and the chlorine dioxide generator system's serial number.'

The operator can also enter other information about the chlorine dioxide generator here. You will be asked to enter a user name and password.

Proceed as follows:

- 1 Tap the desired input field. The keyboard is displayed.
- 2 Enter the number or name and confirm by pressing Enter.

### Digital inputs

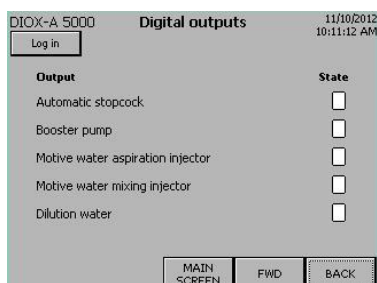


In the menu „Digital inputs“, the current messaging status of the digital inputs can be read for diagnostics purposes.

- a white signal status box means: at the digital input, there is no voltage,
- a dark signal status box means: at the digital input, there is voltage.

The "Digital inputs" menu consists of several screens. Press the "FWD" button to move to the next screen, and "BACK" to go back to the previous screen.

### Digital outputs



In the menu „Digital Outputs“, the current messaging status of the digital inputs can be read for diagnostics purposes.

That means:

- a white signal status box means: The digital output is not actuated,
- a dark signal status box means: The digital output is actuated,

The "Digital outputs" consists of several screens. Press the "FWD" button to move to the next screen, and "BACK" to go back to the previous screen.

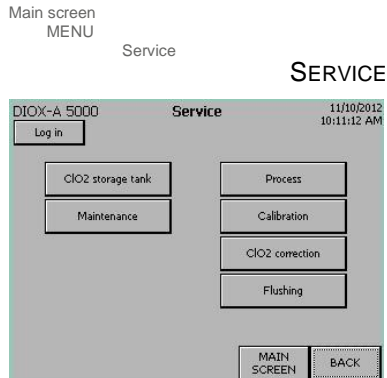
## Analog inputs

In the menu “Analog inputs” the service personnel can read, for diagnostic purposes, the current value and state of the analog input for the operating water pressure, the position of the positioner and the fill level and temperature in the ClO<sub>2</sub> storage tank.

| Input                               | State | Current value |
|-------------------------------------|-------|---------------|
| Operating water pressure            | 0     | 0.0 mA        |
| HCl positioner                      | 0     | 0.0 V         |
| NaClO <sub>2</sub> positioner       | 0     | 0.0 V         |
| ClO <sub>2</sub> storage tank level | 0     | 0.0 mA        |
| Gas phase temperature               | 0     | 0.0 Ω         |

| Input                                       | digital state | current value (area) |
|---|---------------|----------------------|
| Operating water pressure                    | 0...27648     | 4...20 mA            |
| HCl dosing unit (Positioner)                | 0...27648     | 0...10 V             |
| NaClO <sub>2</sub> dosing unit (Positioner) | 0...27648     | 0...10 V             |
| Fill level ClO <sub>2</sub> storage tank    | 0...27648     | 4...20 mA            |
| Gas phase temperature                       | -328...1562   | 96...131 ohm         |

### 6.12.4 „Service“ menu



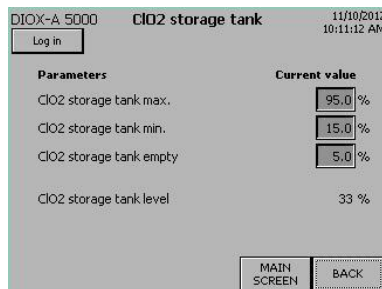
The menu “Service” is primarily intended for use by service personnel. All settings and operating parameters can, however, be read by all user groups, without requiring log in.

The menu “Service” contains the following sub-menus

- ClO<sub>2</sub> storage tank
- Maintenance
- Process
- Calibration
- ClO<sub>2</sub>-correction
- Flushing:

#### ClO<sub>2</sub> storage tank

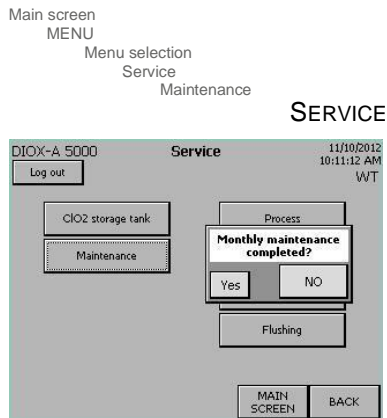
In the menu „ClO<sub>2</sub> storage tank“ the switching points for the ClO<sub>2</sub> storage tank can be set (Entering a user name and password is required):



| Fill level | Factorysetting | Setting-range | Description  |
|------------|----------------|---------------|--|
| MAX        | 95%            | 50-99%        | Up to this fill level, the ClO <sub>2</sub> storage tank is filled, the preparation switches off |
| MIN        | 15%            | 10-49%        | From this fill level, the ClO <sub>2</sub> storage tank is filled, the preparation switches on.  |
| EMPTY      | 5%             | 1-9%          | ClO <sub>2</sub> storage tank is empty.  |

The fill level OVERFILLED will be detected by a factory-set overflow sensor.

## Maintenance



Regular service of the chlorine dioxide generator is required for the liability for defects. There are certain tasks that the operator is required to perform on a daily, weekly or monthly basis. Once a year, manufacturer service personnel or personnel who have been trained and authorized by the manufacturer must perform maintenance. When monthly or annual maintenance is due, a warning message is displayed on the main screen.

To confirm that the required maintenance has been carried out, press the "Maintenance" button. You will be asked to enter a user name and password.

Depending on the password level entered, you confirm completion of monthly maintenance (by the operator) or annual maintenance (by the service personnel).

Proceed as follows:

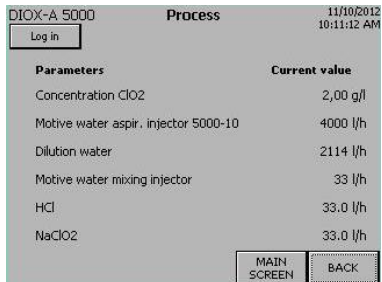
- 1 Press the "Maintenance" button. Depending on the password level, the window "Monthly maintenance completed?" or "Yearly maintenance completed?" opens.
- 2 If maintenance has been completed, press "Yes". The warning message in the main screen will then disappear. The time stamp is reset (see also diagnostics menu "Maintenance" ).



*Attention!*

### **Risk of injury and damage to the system!**

Changes may only be made by manufacturer service personnel or personnel who have been trained and authorized by the manufacturer, after consulting the works.



The screenshot shows the 'Process' menu of the DIOX-A 5000. At the top left, it says 'DIOX-A 5000' and 'Process'. At the top right, it shows the date '11/10/2012' and time '10:11:12 AM'. Below this is a 'Log in' button. The main content is a table with two columns: 'Parameters' and 'Current value'. The table lists several parameters and their current values. At the bottom right, there are two buttons: 'MAIN SCREEN' and 'BACK'.

| Parameters                           | Current value |
|--------------------------------------|---------------|
| Concentration ClO <sub>2</sub>       | 2,00 g/l      |
| Motive water aspir. injector 5000-10 | 4000 l/h      |
| Dilution water                       | 2114 l/h      |
| Motive water mixing injector         | 33 l/h        |
| HCl                                  | 33.0 l/h      |
| NaClO <sub>2</sub>                   | 33.0 l/h      |

## Process

The the menu Process, current process values are displayed.

The following values are displayed:

- ClO<sub>2</sub>
- Flow rate motive water for aspiration injector
- Flow rate dilution water
- Flow rate motive water for mixing injector
- Flow rate HCl
- Flow rate NaClO<sub>2</sub>

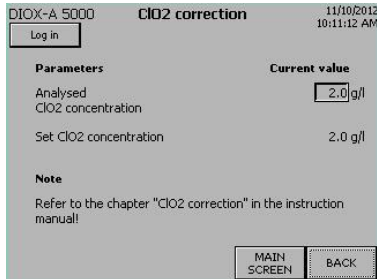
After entering the service password, it is possible to change the ClO<sub>2</sub> concentration and the motive water aspiration injector. In addition, press on the current value.

## Calibration

Carrying out calibration is described in chapter 7.3.

## ClO<sub>2</sub> correction

For ClO<sub>2</sub> correction, the measured value of the ClO<sub>2</sub> concentration produced is entered in g/l, the PLC controller corrects the flow of chemicals as a result.



Condition for it:

All system parameters correspond to the design.

In particular:

- Is dilution water correctly adjusted?
- Motive water for mixing injector adjusted correctly?
- Calibration of the flow meter for dilution water OK?
- Calibration of the flow meter for motive water for the mixing injector OK?
- Is system maintenance going to be performed by the operating personnel according to the maintenance plan?
- Once a year, is the system maintenance going to be performed by manufacturer service personnel or personnel who have been trained and authorized by the manufacturer and in the process, is the calibration going to be performed on the flow meter HCl and NaClO<sub>2</sub>?
- Is the HCl used according to specification?
- Is the NaClO<sub>2</sub> used according to specification?
- Was the product sample "fresh" which was from the supply to the ClO<sub>2</sub> storage tank?  
Do not take any old solution from the product tank, take the sample from the ClO<sub>2</sub> sampling valve (AU) in the ClO<sub>2</sub> line.
- How plausible is the result of the analytical result? Which provider is responsible?

Only after answering these questions may a ClO<sub>2</sub> correction be carried out.

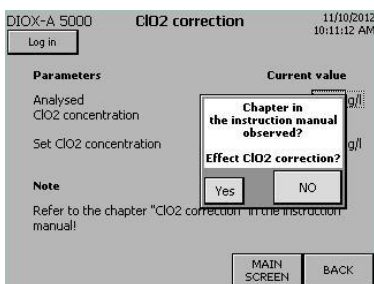
*Drawing of samples**Warning!*

To avoid health hazards caused by dangerously high ClO<sub>2</sub> concentrations:  
Wear suitable protective clothing, gloves and eye/face protection while working.  
Keep respirator on standby.

*Please note*

When taking samples, pay attention to the recommendations may by the analysis service provider!

- 1 The preparation must be in operation for at least 30 minutes.
- 2 Switch off preparation
- 3 At the ClO<sub>2</sub> sampling valve (AU) take out the union nut with the dummy disc. Collect any ClO<sub>2</sub> solution which may escape, dilute and dispose of.
- 4 Open the lock on the ClO<sub>2</sub> sampling valve
- 5 Hold the sampling receptacle under the sampling valve and fill.
- 6 Close the ClO<sub>2</sub> sampling valve (AU) again, lock and seal with the union nut with the dummy disc.
- 7 Have a sample analyzed.

*Enter analysis value*

- 1 Press the button "current value".
- 2 Answer the security question.
- 3 Enter the ClO<sub>2</sub> concentration determined from the analysis.  
The settings of the ClO<sub>2</sub> preparation are corrected so that the ClO<sub>2</sub> solution which is produced corresponds with the desired concentration.

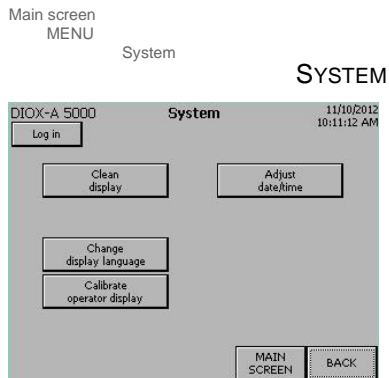
In order to undo the ClO<sub>2</sub> correction if needed, meaning to set the correction factor back to "1":  
See chapter 6.12.3, Operating data, Factors ...

**Flushing:**

Flushing of the system is described in chapter 7.2.



### 6.12.5 "System" menu



In the menu "System", the control and display unit are adjusted.

The menu "System" contains the following sub-menus.

- Clean the display
- Change the display language
- Calibrate the display control
- Date / Time set

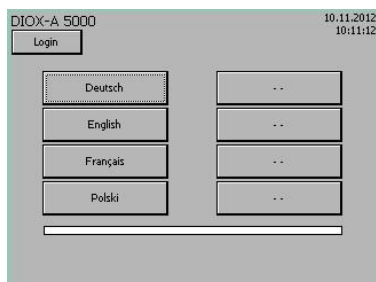
#### Clean the display

- 1 Press the "Clean display" button.  
A protective screen is displayed. During the following 30 seconds, you can clean the touch screen with a slightly moistened light cloth. No other operation can be performed on the machine during this time.

#### Change display language

The factory default language setting is German. The language can be changed if required. These languages are available for selection:

- German
- English
- French
- Polish



Proceed as follows:

- 1 Press the "Change display language" button.
- 2 Press the language you wish to select.

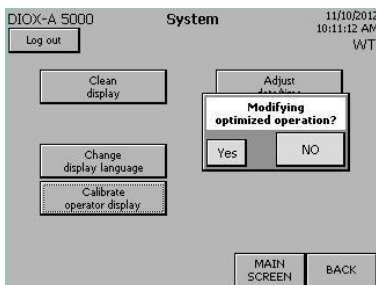
## Calibrate the display



### Please note

The controls on the display are adjusted to average eye level. This setting should only be changed if there is a significant difference, for example, if the Chlorine dioxide generator is installed at an unusual height.

A wrongly performed calibration can lead to the display not being able to be operated (in the this event, inform customer service).



Proceed as follows:

- 1 Press the "Calibrate operator display" button. The "Modifying optimized operation?" dialog box opens.
- 2 To confirm that you wish to change the settings, press "Yes".

A text „Carefully press and briefly hold...“ is displayed

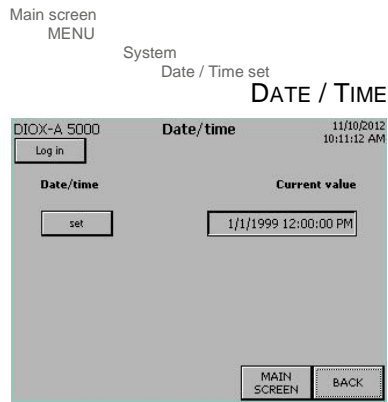
- 3 Press as close to the middle of the displayed cross as possible.
- 4 The cross springs into the four corners of the display. Press as close to the middle of the displayed cross as possible respectively.

A text „New calibration settings ...“ is displayed.

- 5 If you have carefully pressed the displayed crosses, you save the calibration as you press any point on the display again.

If the calibration shall not be saved, wait 30 seconds. Then, the display is automatically closed.

## Set the date and time

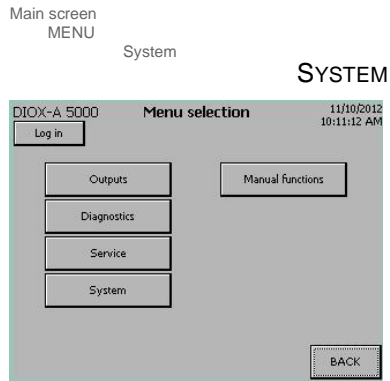


Proceed as follows:

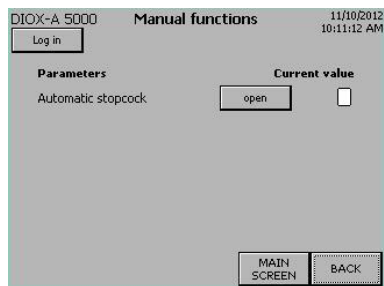
- 1 Press the "Adjust date/time" button.
- 2 In the Menu „Date/Time“, press the Date/Time button. Enter the date and time with the left-right cursor and the number keys.  
To delete positions Press BSP (Backspace)  
To save press RETURN.
- 3 Press the "Set" button to confirm. The time displayed on screen is updated after several seconds.

### 6.12.6 "Manual functions" menu

The "Manual functions" menu is only accessible in MANUAL mode.



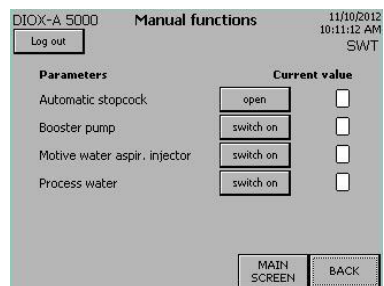
In the "Manual functions" menu, individual valves as well as the booster pump can be activated.



The menu "Manual functions" menu contains the following sub-menus.

accessible with the operator password:

- Open / Close the safety shut-off valve (G)  
Press on "open" to open and press "close" to close.



accessible with the service password:

- Open / Close the safety shut-off valve (G)  
Press on "open" to open and press "close" to close.
- Switch on booster pump (AL)  
To switch on, press "switch on" after letting loose, the pump will stop again.
- Open the solenoid valve motive water for the aspiration injector (D)  
Press "switch on" to switch on, after letting loose, the solenoid valve with close again.
- Open solenoid valve for process water (J)  
Press "switch on" to switch on, after letting loose, the solenoid valve with close again.

The positioners (X and Y) cannot be actuated over in the manual function.

### 6.13 Maintenance by the operator



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*Warning!*

#### **Risk of injury!**

If you find any leaks or damage to the Chlorine dioxide generator, switch off automatic preparation immediately by pressing the "Mode" button and contact customer service.

---



---

*Please note*

Components and hose connections that are mechanically or electrically operated are labeled on the system with abbreviations (e.g. M). These abbreviations can also be found at the appropriate places in the operating manual and on the drawings to assist identification. (see chapter 3.2).

---

Maintenance is divided into two levels:

- Maintenance level 1  
To be performed by trained operators who have received appropriate training and instruction.
- Maintenance level 2  
To be carried out by manufacturer service personnel or personnel who have been trained and authorized by the manufacturer.

The liability for defects is only valid if maintenance work is performed as specified.



---

*Please note*

Check only during on-going operation

---

### 6.13.1 Maintenance overview

The information in parenthesis designate the corresponding display or control element (see chapter 3.2)

*daily*

| Required work  | see Chapter  |
|--|--|
| <ul style="list-style-type: none"> <li>Perform a visual inspection of the entire chlorine dioxide generator including the HCl storage tank, the NaClO<sub>2</sub> storage tank, ClO<sub>2</sub> storage tank and the connecting lines to check for leaks and damage.</li> <li>Are there any warning messages or error messages?<br/>See the warning and error message logs.</li> <li>Check the pressure of the process water pressure reducing valve (I).<br/>Adjust to 4.5 bar</li> <li>Check the mixing injector dilution water and motive water flow rates (see chapter 3.7).<br/>If required adjust at the dosing ball valves (T and S).</li> <li>Check the aspiration injector motive water flow rate [l/h]<br/>If required adjust at pressure reducing valve for aspiration injector motive water (E) (see chapter 3.7)</li> </ul> | <br><br><br><br><br><br>6.13.2<br><br><br><br><br><br>6.13.3 |

*weekly*

| Required work   | see Chapter                                |
|---|--|
| <ul style="list-style-type: none"> <li>Check the preparation and total operating hours and enter in the operating journal.</li> </ul>   | Diag-<br>nostics<br>Menu and<br>Chapter 8. |
| <ul style="list-style-type: none"> <li>Fill the water feed in the floor drain (Odor trap).</li> </ul>   |  |
| <ul style="list-style-type: none"> <li>Adjust absorber at the ClO<sub>2</sub> storage tank.<br/>If the absorber solution becomes cloudy:<br/>Replace absorber solution</li> </ul> | 6.13.6                                     |

*monthly*

| <b>Required work</b>  | <b>see Chapter</b> |
|---|--------------------|
| <ul style="list-style-type: none"><li>• Adjust the positioner and record in the operating journal (in volt)</li></ul>   | 6.13.4             |
| <ul style="list-style-type: none"><li>• Inspect state of sight glass (AS)</li></ul>   | 6.13.5             |
| <ul style="list-style-type: none"><li>• Check the tubular of the suction lance (s) for debris and sediments and clean if necessary, rinse and then fill aging with water to the half-point.</li></ul> |                    |
| <ul style="list-style-type: none"><li>• Reset "Perform monthly maintenance!" warning message</li></ul>  | 6.12.4             |

*annually*

| <b>Required work</b>   | <b>see Chapter</b> |
|--|--------------------|
| <ul style="list-style-type: none"><li>• Send request to customer service (Maintenance level 2)</li></ul> |                    |

### 6.13.2 Dilution/motive water for the mixing injector

Both individual dilution water lines and the motive water for the mixing injector are located in the process water line. Both lines have a flow rate sensor (Q and P) and a dosing ball valve (T and S) over a float flow meter (K and L) respectively.

The flow rates in both lines are adjusted at the dosing ball valve. The float flow meters are meant to adjust the flow rates.

At the control and display unit the actual values measured for the flow rates are indicated.

In addition, both values measured are portrayed in the bar graph. The respective flow-rate limit values are shown in the bar graph by dotted lines. If the displayed bar moves between these lines, the measured value is within the tolerance range and the respective bar will be shown in green.

If a slight deviation from the setpoint occurs, the color of the bar turns from green to red and indicates a warning message, e.g. "Dilution waterflow ratetoo low" is displayed (see chapter Warning messages).

Should the large deviation exceeding or falling short of the setpoint occur, the preparation is stopped and a fault is displayed.

Limit values warning message - error message

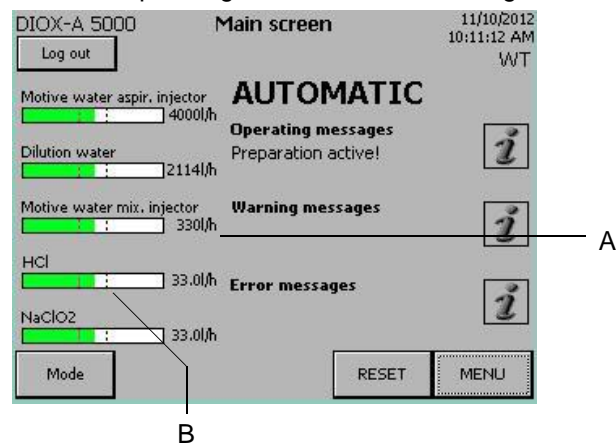
| Limit values                        | Motive water aspiration injector | Dilution water | Motive water mixing injector | HCl  | NaClO <sub>2</sub> |
|-------------------------------------|----------------------------------|----------------|------------------------------|------|--------------------|
| Warning,<br>Shift from green to red | ±5%                              | ±10%           | ±10%                         | ±10% | ±10%               |
| Fault                               | ±10%                             | ±20%           | ±20%                         | ±20% | ±20%               |

To adjust both flow rates, proceed as follows:

- 1 The preparation must be active.
- 2 Adjust the admission pressure at the pressure reducing valve for process water (I) and set to 4.5 bar if needed.
- 3 In the "Diagnostics, operating data" menu, read the setpoints.
- 4 At the respective dosing ball valve (T or S), set the flow rate so that the flow rate setpoint is displayed on the float flow meter.



The corresponding bar must be shown in green.



A current actual value

B Limit line

### 6.13.3 Adjust aspiration injector motive water

The line from aspiration injector motive water has a flow rate sensor and a pressure reducing valve.

The flow rate is set over the pressure reducing valve (E) .

On the control and display unit, the real value measure for the flow rate will be shown.

In addition, the measured value will be shown by means of a bar.

The flow-rate limit values are shown in the bar graph by dotted lines. If the bar moves between these lines, the measured value is within the tolerance range and the respective bar will be shown in green.

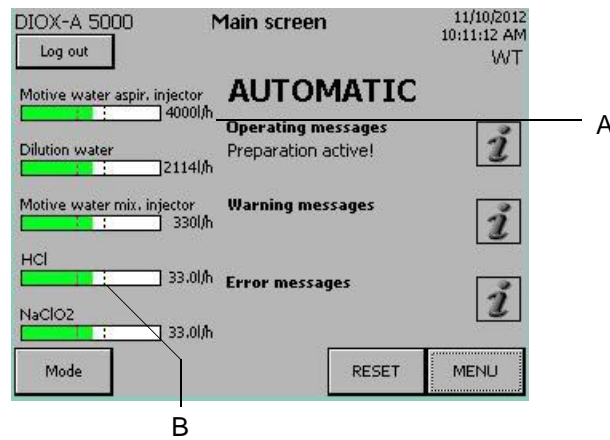
If a lower deviation to the minimum value occurs, the color of the bar turns from green to red and the warning message "Aspiration injector motive water flow rate too low" is shown (see chapter 6.13.2).

If the lower deviation to the minimum values intensifies, the preparation will be stopped and the Fault displayed.

To adjust the flow rate, proceed as follows:

- 1 The preparation must be active.
- 2 In the "Diagnostics, operating data" menu, read the setpoint.
- 3 By turning on the pressure reducing valve (E), adjust the flow rate so that the bar „Motive water aspiration injector" lies in the

middle of the display between the dotted lines.



A Present value

B Limit line

#### 6.13.4 Adjust position of the positioner

In the sub-menu "Analog inputs" of the menu "Diagnostics", the positions of both positioners is displayed in volt (HCl dosing unit and NaClO<sub>2</sub> dosing unit).

During monthly maintenance these values should be recorded in the operating journal (Chapter 8.).

#### 6.13.5 Inspect sight glass

The sight glass (AS) at the drain outlet of the reactor gradually becomes cloudy due to contact with the chlorine dioxide solution.

During monthly maintenance, check the state of the glass plate (cloudy or clear) and record it into the operating journal (Chapter 8.).

### 6.13.6 Replace absorber solution



---

#### *Warning!*

Chemical hazard!

Wear suitable protective clothing, gloves and eye/face protection while working.

Wear a respirator.

Ventilate the system room well.

---

The absorber device (AP) ensures that during out-gassing of the ClO<sub>2</sub> storage tank, no ClO<sub>2</sub> gases escape, but are bound with the sodium thiosulfate solution. During ClO<sub>2</sub> preparation, the ClO<sub>2</sub> gases are aspirated by the vent gas injector.

The sodium thiosulfate solution is clear as long as it can still bind ClO<sub>2</sub> gas. It gets cloudy when it is used up. Then ClO<sub>2</sub> gas odor occurs and the sodium thiosulfate solution must be changed, otherwise the sodium thiosulfate solution should be changed every six months. (see also notice on the absorber tank).

- 1 Switch off the system at the main switch.
- 2 Take off the holding clip of the absorber housing (AP).
- 3 Pull lower part of the absorber housing by turning while holding the upper part of the absorber housing (e.g. with a band wrench).
- 4 Dilute used absorber solution with approx. 10 l of water and pour into the sewer.
- 5 Clean absorber tank and immersion pipe (e.g. with a bottle brush).
- 6 Fill the absorber housing with water to the marking.
- 7 Pour 2x300 g sodium thiosulfate (Order no. W3T163644) into the water and mix well.
- 8 Inspect seal, replace if required.
- 9 Assemble the absorber housing again
- 10 Attach lower holding clip again.

### 6.13.7 Clean strainer

Within the scope of monthly maintenance, check the strainer and clean if necessary:

- Strainer in the pressure reducing valve Motive water for aspiration injector (E)
- Strainer in the pressure reducing valve process water (I)

Proceed as follows:

- 1 Switch system to MANUAL.
- 2 Close the operating water supply ball valve (AJ)



---

*Please note*

When dismantling the strainers, take note of the sequence of parts and observe this when reassembling!

---

- 3 Hold the pressure reducing valve underneath the side connections with a band wrench and loosen up the strainer cup (SW41 and SW50), let the water pressure subside, then tighten it up.
- 4 Clean strainer.
- 5 Make sure that the thread and the O-ring are lightly greased (grease appropriate for drinking water).
- 6 Screw the strainer cup back in and tighten it by hand.
- 7 Open the operating water supply ball valve (AJ)

#### 6.14 Power failure

After power recovery the Chlorine dioxide generator works in the same mode as before power failure (see chapter 6.3).

## 7. Maintenance by service personnel



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*Warning!*

To avoid health hazards, personal injury, or damage to the system caused by caustic and toxic substances or a dangerously high  $\text{ClO}_2$  concentration:

Put on protective clothing and face mask, keep respirator on stand-by.

Before draining liquid or disassembly of system components:  
Flush system and shut down (see 7.2).

---



---

*Warning!*

Pay attention to hazardousness of chemicals!

$\text{NaClO}_2$  and  $\text{HCl}$  must not come into contact with each other: Risk of explosion!

If necessary, neutralize  $\text{ClO}_2$  and  $\text{HCl}$  with sodium thiosulfate.  
Don't neutralize  $\text{NaClO}_2$  solution with sodium thiosulfate!

Hydrochloric acid is caustic!

Chlorine dioxide is caustic, poisonous and flammable.

Sodium chlorite solution in its dry-state is oxidizing. Do not allow to dry into flammable substances.

Danger of spontaneous combustion!

The chemicals must in no way come into contact with each other or with other chemicals. Risk of explosion!

---



---

*Warning!*

In the reactor, air pockets must not form.

Otherwise, there is risk of explosion.

It is therefore important upon starting the system again to first fill the reaction tank with water.

---



---

*Warning!*

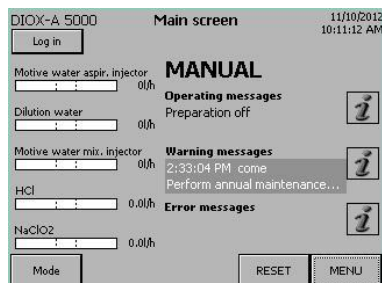
Danger of electric current.

Pay attention to instructions and safety instructions!

Working on the electrical system parts may only be carried out by an electrical technician.

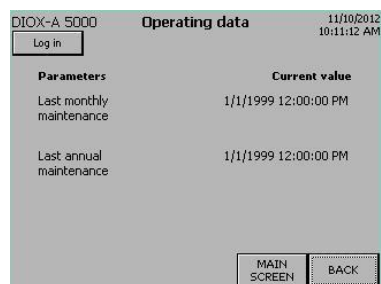
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## 7.1 Perform system maintenance



Regular maintenance of chlorine dioxide generator is the qualification for claim to your liability for defects. Once a year, for the first time after a period of twelve months, the manufacturer service personnel or personnel who have been trained and authorized by the manufacturer must perform maintenance corresponding to maintenance level 2.

This is shown on the display. This warning message is displayed on the screen for the first time after twelve months, and once every twelve months thereafter. The chlorine dioxide generator remains operational. The warning message disappears as soon as the "Maintenance" button on the main "Service" menu is pressed when annual maintenance has been performed. See chapter 6.12.4 Menu Service.



You can check when the last monthly or annual maintenance were performed at any time by selecting "operating data, parameters" in the "Diagnostics" menu.

### *Maintenance part sets*

The parts required for the annual service are included in the maintenance part kits. In the process, we distinguish maintenance part kits for wear parts for 1 year and for 5 years. For details see chapter 7.5 Maintenance part sets.

### *Additional tools and materials*

The following additional tools and materials are required for annual maintenance:

- Personal Protection with respiratory protection
- Temperature measurement device for water and room temperature
- Multimeter
- Bucket for 5 liters of water
- 1 neutralization container, made of a 10 liter tank or larger
- Sodium thiosulfate 3.5 kg
- 1 flushing tube HCl with screw joint DN10, length >2 m
- 1 flushing tube NaClO<sub>2</sub> with screw joint DN15, length >2 m
- 1 hose drain reaction tank with screw joint DN20, length reaction tank to the gully
- 1 flushing tube 3-way valve with screw joint DN25, 3-way valve (AT) length to drain

*Maintenance checklist*

The procedure and the scope of yearly maintenance is carried out corresponding to the checklist for maintenance VD317-3. The individual steps must be adhered to in the correct sequence. Notes to individual maintenance work see chapter 7.6.

The check list of maintenance must be correctly filled out, signed, and sent back to the manufacturer (requirement for claims of liability for defects).

*Renewed start up*

After finishing maintenance work, start up the chlorine dioxide generator as described in chapter 7.11 Renewed start up. Reset the warning message in the main menu "Service" using the button "Maintenance".



---

*Warning!***Chemical hazard!**

A substantial quantity of chemicals is produced in the chlorine dioxide generator. To ensure safe operation and avoid the risk of injury, always follow the safety instructions and heed the warnings on the system and in this operating manual.

---



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*Please note*

Document all modifications or other work in the check list and the operating log!

---

## 7.2 Flush system

Flushing the system is controlled by the program and carried out in three steps:

- Flush HCl lines
- Flush NaClO<sub>2</sub> lines
- Flush reaction tank

Individual steps may be skipped, press "FWD" to do this.

Error messages during flushing are described in chapter 7.2.4



---

### *Please note*

Flushing the reaction tank can also be carried out by the operator, although the operator may not drain the contents of the reaction tank. Therefore, the drain valve (AH) is closed and sealed. All other activities may only be carried out by trained and authorized personnel.

---



---

### *Warning!*

Wear suitable protective clothing, gloves and eye/face protection while working.

Keep respirator on standby.

Provide good ventilation for the system room when working.

Hydrochloric acid is caustic!

Chlorine dioxide is caustic, poisonous and flammable.

Sodium chlorite solution in its dry-state is oxidizing. Do not allow to dry into flammable substances.

Danger of spontaneous combustion!

The chemicals must in no way come into contact with each other or with other chemicals. Risk of explosion!

---



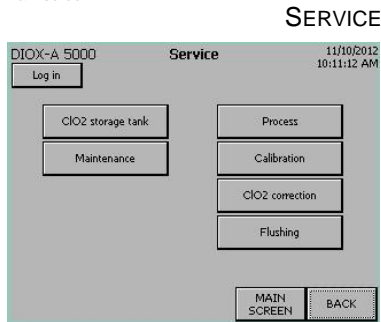
Before flushing, it must be ensured that there is enough free volume in the ClO<sub>2</sub> storage tank:

| ClO <sub>2</sub><br>concentration in<br>g/l | Free volume in the ClO <sub>2</sub> storage tank in liters<br>for operation with |                                     |                                     |                                      |
|---|--|-------------------------------------|-------------------------------------|--------------------------------------|
|   | DIOX-A<br>1000 g/h ClO <sub>2</sub>  | DIOX-A<br>2500 g/h ClO <sub>2</sub> | DIOX-A<br>5000 g/h ClO <sub>2</sub> | DIOX-A<br>10000 g/h ClO <sub>2</sub> |
| 3.0   | 140  | 240                                 | 480                                 | 960                                  |
| 2.9   | 145  | 250                                 | 490                                 | 990                                  |
| 2.8   | 150  | 260                                 | 510                                 | 1030                                 |
| 2.7   | 155  | 270                                 | 530                                 | 1070                                 |
| 2.6   | 160  | 280                                 | 550                                 | 1110                                 |
| 2.5   | 170  | 290                                 | 570                                 | 1150                                 |
| 2.4   | 175  | 300                                 | 590                                 | 1200                                 |
| 2.3   | 185  | 310                                 | 620                                 | 1250                                 |
| 2.2   | 190  | 330                                 | 650                                 | 1310                                 |
| 2.1   | 200  | 340                                 | 680                                 | 1370                                 |
| 2.0   | 210  | 360                                 | 710                                 | 1440                                 |
| 1.9   | 220  | 380                                 | 750                                 | n.a.                                 |
| 1.8   | 235  | 400                                 | 790                                 | n.a.                                 |
| 1.7   | 245  | 420                                 | 840                                 | n.a.                                 |
| 1.6   | 260  | 450                                 | 890                                 | n.a.                                 |
| 1.5   | 280  | 480                                 | 950                                 | n.a.                                 |

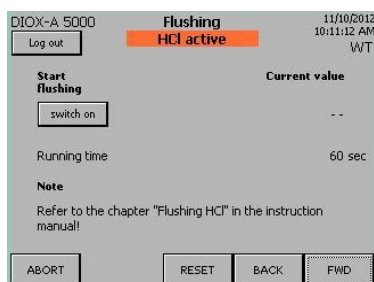
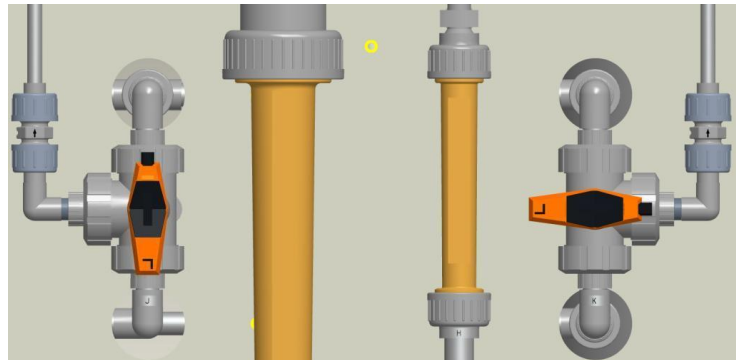
### 7.2.1 Flush HCl lines

- 1 Switch off preparation
- 2 Interrupt HCL supply and close tight.
- 3 Connect water supply to the HCl supply (AF).  
Place the HCl flushing tube in a bucket with 5 l water.
- 4 Press „Flush” in the service menu.

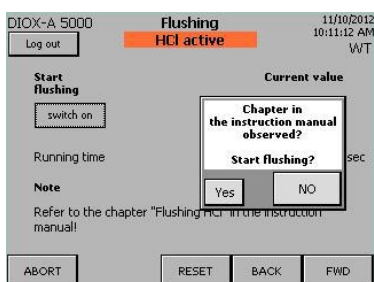
Main screen



- 5 Turn both ball valves (N and M) in the position “Flush HCl” (see image).



- 6 Press “FWD”



- 7 Press “switch on” to start flushing the HCl lines.
- 8 If the water supply and the position of both ball valves (N and M) are correct, the security question should be confirmed with “Yes”. To cancel press “NO”.
- 9 Press “switch on” again.  
Open both solenoid valves (J and D). The booster pump (optional) starts; the HCl lines are flushed for 60 seconds.  
If necessary, the flush can be interrupted and started again (press “switch off”)

The flush is automatically ended after 60 seconds.

**10** Carefully remove HCl residuals.

**11** Press "FWD"

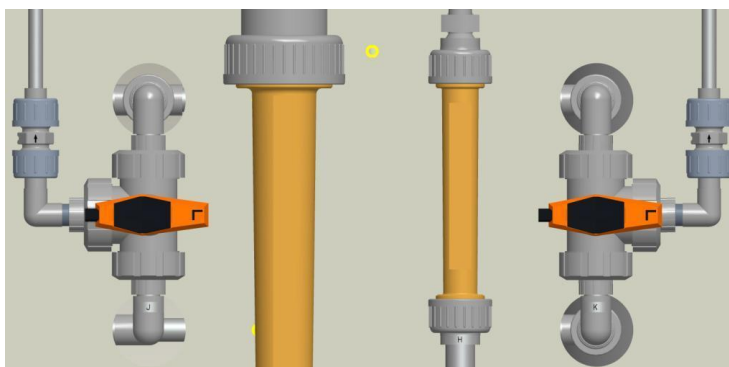
### 7.2.2 Flush NaClO<sub>2</sub> lines



#### *Please note*

Flushing the NaClO<sub>2</sub> lines may only be carried out if a flush of the HCl lines had previously taken place and therefore enough hydrochloric acid in the reaction tank is available to chemically convert the NaClO<sub>2</sub>.

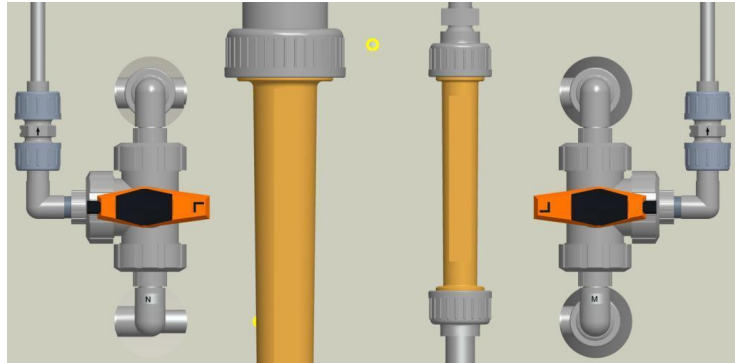
- 1 Interrupt NaClO<sub>2</sub> supply and close tight.
- 2 Connect water supply to the NaClO<sub>2</sub> supply (AF)  
Place the NaClO<sub>2</sub> flushing tube in a bucket with 5 l water.  
Turn both ball valves (N and M) in the position "Flush NaClO<sub>2</sub>" (see image).



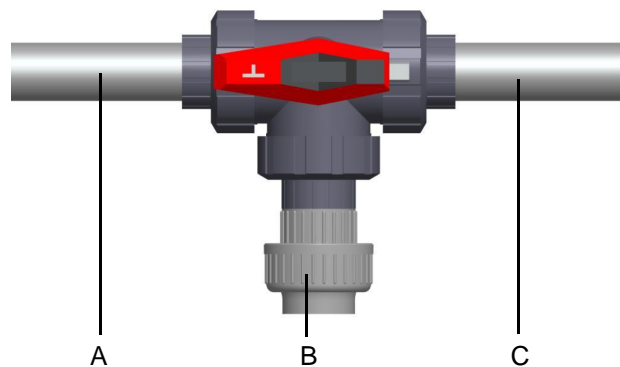
- 3 Press "FWD"
  - 4 Press "switch on" to start flushing the NaClO<sub>2</sub> lines.
  - 5 If the water supply and the position of both ball valves (N and M) are correct, the security question should be confirmed with "Yes". To cancel press "NO".
  - 6 Press "switch on" again.  
Open both solenoid valves (J and D). The booster pumps (optional) starts; the NaClO<sub>2</sub> lines are flushed for 60 seconds.  
If necessary, the flush can be interrupted and started again (press "switch off")
- The flush is automatically ended after 60 seconds.
- 7 Carefully remove NaClO<sub>2</sub> residuals.  
Sodium chlorite solution in its dry-state is oxidizing. Do not allow to dry into flammable substances!
  - 8 Press "FWD"

### 7.2.3 Flush reaction tank

- 1 Turn both ball valves (N and M) in the position “flush reaction tank” (see image).



- 2 3-way valve ClO<sub>2</sub> drain outlet (AT) must be in the position “run”



- A ClO<sub>2</sub> line to the ClO<sub>2</sub> storage tank  
 B Drain hose connection  
 C ClO<sub>2</sub> line from the reaction tank

- 3 Press “FWD”
- 4 Press “switch on” to start flushing the reaction tank.
- 5 Only if the position of the three ball valves (N,M and AT) are correct, should the security question be confirmed with “Yes”. To cancel press “NO”.
- 6 Press “switch on” again.  
 Open both solenoid valves (J and D). The booster pump (optional) starts; the reaction tank is flushed for 900 seconds (DIOX-A 1000: 480 seconds). The ClO<sub>2</sub> solution from the reaction tank is pressed into the ClO<sub>2</sub> storage tank.  
 If necessary, the flush can be interrupted and started again (press “switch off”)

The flush is automatically ended after 900 seconds.



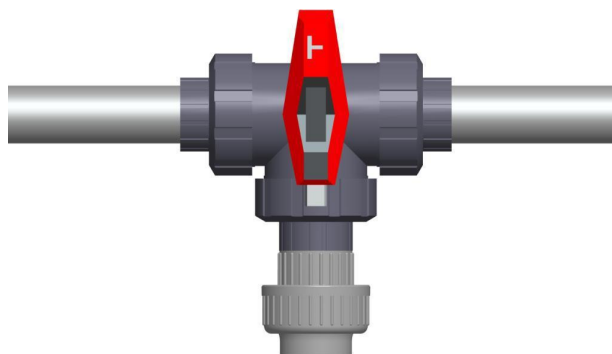
---

*Please note*

The following flushing steps may only be carried out by trained service personnel. Only then, you may open the seal on the ClO<sub>2</sub> drain outlet 3-way valve (AT) and drain the reaction tank.

---

- 7** Remove the seal on the ClO<sub>2</sub> drain outlet 3-way valve (AT), take off the dummy disc, and connect the flushing tube 3-way valve. The hose should be long enough that it reaches the nearest floor drain (gully).  
Lead the flushing tube to the floor drain
- 8** Prepare neutralization tank for the reactor contents:
  - Fill a container which holds at least 10 liters with approx. 2 liters of water.
  - Fill approx. 350 g of sodium thiosulfate.
- 9** Remove the dummy disc from the drain ball valve (AH) and connect a drain hose. In the process, a small amount of ClO<sub>2</sub> solution can escape.
- 10** Place the flushing tube into the neutralization tank so that it is under the water surface.
- 11** Open the drain ball valve (AH) half way.
- 12** Turn the ClO<sub>2</sub> drain outlet (AT) 3-way valve to the “flush” position



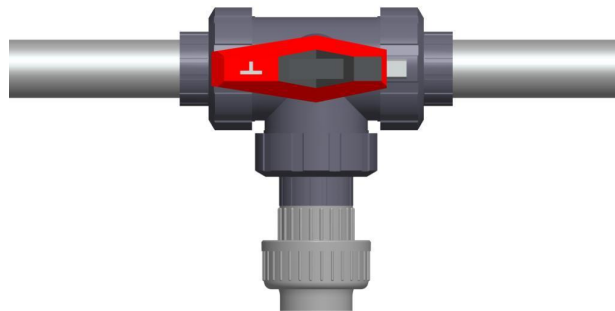
- 13** Keep the drain ball valve (AH) open until the neutralization tank is full. Close the drain ball valve (AH) again.
- 14** Drain the neutralization tank into the floor drain. In the process, the dissolved sodium thiosulfate should not remain in the storage tank.
- 15** Fill the storage tank with 2 liters of water again and approx. 350 g of sodiumthiosulfate.
- 16** Repeat the same draining process, until the reaction tank is empty.
- 17** Close the drain ball valve (AH).

- 18** Lead the rinsing tube to the reaction tank drain outlet (AT) to the floor drain.
- 19** Press “switch on” again to fill the reaction tank with water again.  
In the process, water can escape from the flushing tube, that is on the ClO<sub>2</sub> drain outlet 3-way valve (AT).
- 20** Empty the contents of the reaction tank into the floor drain.

*Connection*

After the maintenance work, at the latest, before starting up of the system again:

- 1** Close and seal the drain ball valve (AH) on the reaction tank again.  
Attach the dummy disc again.
- 2** Turn the ClO<sub>2</sub> drain outlet (AT) 3-way valve to the “run” position and seal it.



- 3** Remove the flushing tube on the ClO<sub>2</sub> drain outlet 3-way valve again and flush. Attach the dummy disc again.
- 4** Connect the HCl and NaClO<sub>2</sub> supply and check for leaks.
- 5** After system maintenance, start up the system again as described in chapter 4.6.

**7.2.4 Special error message during flushing**

| <b>Error message</b>                            | <b>Cause</b>   | <b>Remedy</b>  |
|---|--|--|
| Flushing fail<br>Q signal at NaClO <sub>2</sub> | <ul style="list-style-type: none"><li>wrong ball valve setting during flush of the HCl line or the reaction tank</li></ul>               | <ul style="list-style-type: none"><li>Set NaClO<sub>2</sub> ball valve (M) correctly (see chapter 7.2)</li></ul> |
| Flushing fail<br>Q signal for HCl               | <ul style="list-style-type: none"><li>wrong ball valve setting during flush of the NaClO<sub>2</sub> line or the reaction tank</li></ul> | <ul style="list-style-type: none"><li>Set HCl ball valve (N) correctly (see chapter 7.2)</li></ul>               |



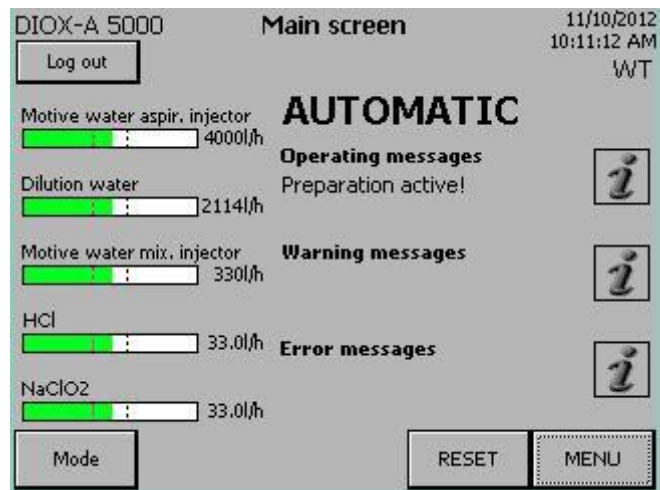
## 7.3 Calibrating

### 7.3.1 Calibrate water flow rate sensors

The calibration of the sensors for dilution water and mixing injector motive water can only take place in AUTOMATIC or SEMI-AUTO mode during ClO<sub>2</sub> preparation.

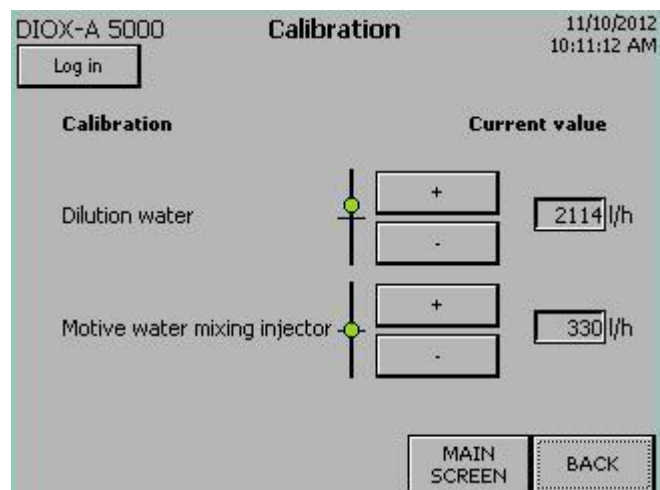
Service password required.

- 1 Check in the main screen if all the flow rates are OK (bars are displayed in green)  
If required, adjust the flow rates.



- 2 Press "Menu".
- 3 Press "Service".
- 4 Press "Calibrate".
- 5 Press „Calibrate dilution water”

*Calibrate dilution water*



*Motive water mixing injector  
calibrating*

- 6** Set the dilution water flow rate value displayed on the left float flow rate meter (K) with the buttons „+” or „-” .  
The green point shows, how far was corrected
- 7** Set the motive water flow rate value displayed on the left float flow rate meter (L) with the buttons „+” or „-” .

The following deviations can be tolerated:

- Dilution water: to approx.  $\pm 40$  l/h
- Motive water mixing injector: to approx.  $\pm 10$  l/h

## 7.4 Calibrate sensors for HCl and NaClO<sub>2</sub>

The calibration of the sensors HCl and NaClO<sub>2</sub> can only take place in the MANUAL mode. All MANUAL functions must be switched off.

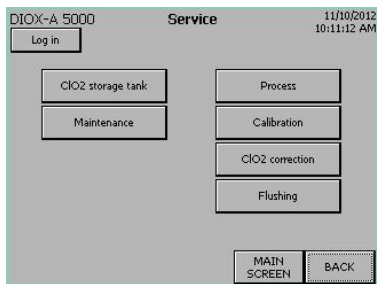
Service password required.

Error messages during flushing are described in chapter 7.4.3 .

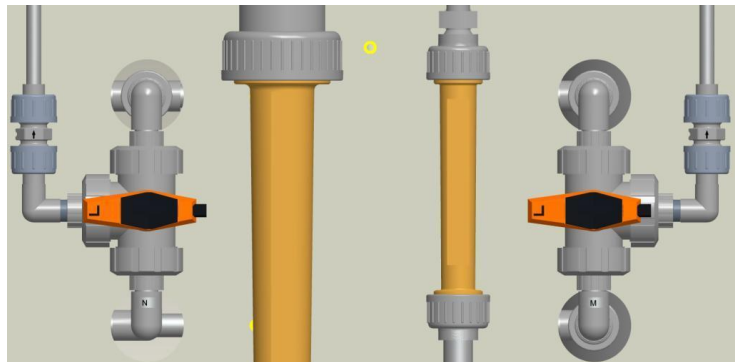
### 7.4.1 Calibrating HCl

Main screen

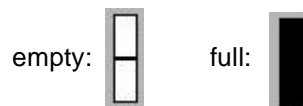
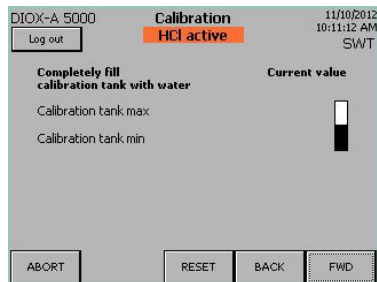
SERVICE



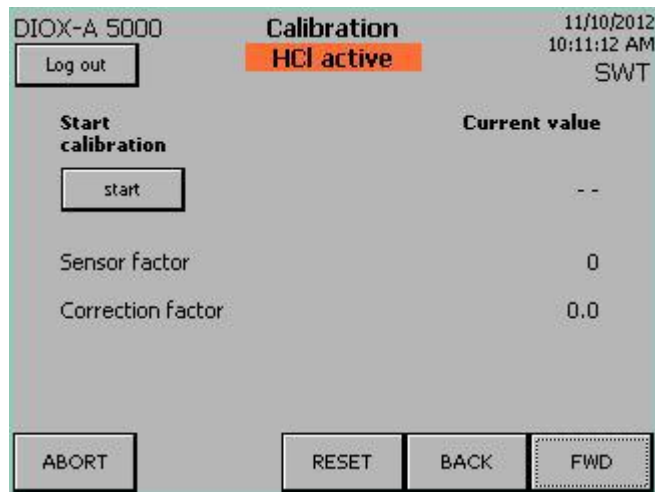
- 1 Press "Menu".
- 2 Press "Service".
- 3 Press "Calibrate".
- 4 Press "Calibrate HCl".
- 5 Set both ball valves (N and M) to the position "HCl calibration":



- 6 Press "FWD".
- 7 Fill the calibration tank (AD) with water to the marking. Do not replace the plug.  
Filling water is indicated:



## 8 Press "FWD".




*Run 1  
(flush)*

## 9 Press "Start".

Open the process water solenoid valve (J) and water will be aspirated from the calibration tank (AD).

The first run ends after about 2-4 minutes and the process water solenoid valve (J) closes.

Press "BACK" on the "HCl calibration OK" display. If there is

an error message, press on the exclamation mark  to acknowledge the fault.

Press "FWD".

10 Dismount the HCl flow rate sensor (R) and remount it in the opposite direction. Pay attention to the O-rings. The flow rate arrow on the housing now points downward.



*Run 2  
(flush)*

## 11 Fill the calibration tank (AD) with water to the marking again.

Do not replace the plug.

Press "Start".

Open the process water solenoid valve (J) and water will be aspirated from the calibration tank (AD).

The second run ends after about 2-4 minutes and the process water solenoid valve (J) closes.

If there is an error message, press on the exclamation mark



to acknowledge the fault.

Press "FWD".

- 12** Dismount the HCl flow rate sensor (R) again and remount it in the original direction again. Pay attention to O-ring in the process. The flow rate arrow on the housing now points upward.



*Run 3  
(flush)*


- 13** Fill the calibration tank (AD) with water to the marking again. Do not replace the plug.

Press "Start".

Open the process water solenoid valve (J) and water will be aspirated from the calibration tank (AD).

The third run ends after about 2-4 minutes and the process water solenoid valve (J) closes.

Press "BACK" on the "HCl calibration OK" display. If there is

an error message, press on the exclamation mark  to acknowledge the fault.

Press "FWD".

*Run 4  
(Calibrating)*


- 14** Fill the calibration tank (AD) with water to the marking again. Do not replace the plug.

Press "Start".

Open the process water solenoid valve (J) and water will be aspirated from the calibration tank (AD).

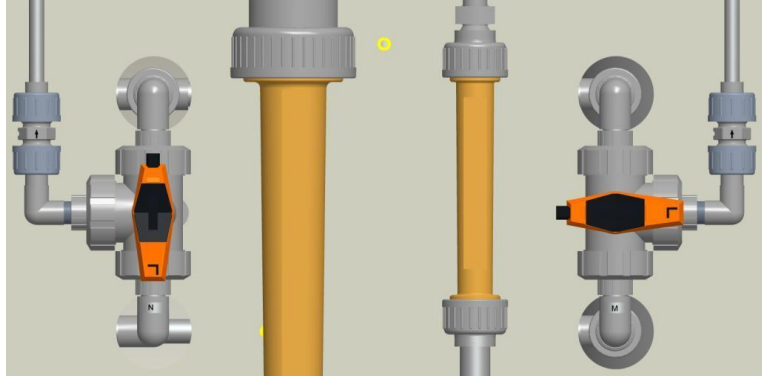
The fourth run ends after about 2-4 minutes and the process water solenoid valve (J) closes.

Press "BACK" on the "HCl calibration OK" display. If there is

an error message, press on the exclamation mark  to acknowledge the fault, then repeat run 4.

- 15** Press "FWD".

**16** Set both ball valves (N and M) to the position “Preparation”:

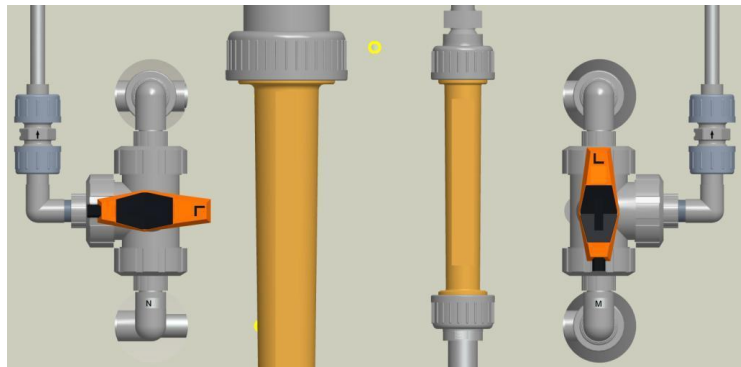


**17** Put the plug back into the calibration tank (AD) opening again.

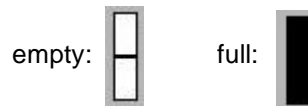
**18** The calibration of HCl has now ended.  
Press the “END” button.

### 7.4.2 NaClO<sub>2</sub> calibration


- 1 Press "Menu".
- 2 Press "Service".
- 3 Press "Calibrate".
- 4 Press "Calibrate NaClO<sub>2</sub>".
- 5 Set both ball valves (N and M) to the position "NaClO<sub>2</sub> calibration"

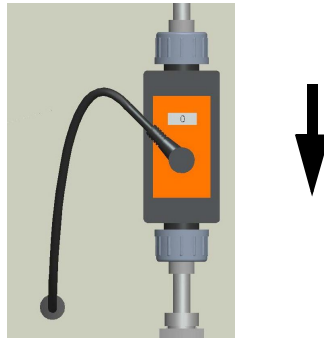


- 6 Press "FWD".
- 7 Fill the calibration tank (AD) with water to the marking. Do not replace the plug.  
Filling water is indicated:




*Run 1  
(flush)*

- 8 Press "FWD".
- 9 Press "Start".  
Open the process water solenoid valve (J) and water will be aspirated from the calibration tank (AD).  
The first run ends after about 2-4 minutes and the process water solenoid valve (J) closes.  
Press "BACK" on the "NaClO<sub>2</sub> calibration OK" display. If there is an error message, press on the exclamation mark  to acknowledge the fault.  
Press "FWD".
- 10 Dismount the NaClO<sub>2</sub> flow rate sensor (O) and remount it in the opposite direction. Pay attention to O-ring in the process.  
The flow rate arrow on the housing now points downward.




*Run 2  
(flush)*

- 11** Fill the calibration tank (AD) with water to the marking again. Do not replace the plug. Press "Start".  
Open the process water solenoid valve (J) and water will be aspirated from the calibration tank (AD).  
The second run ends after about 2-4 minutes and the process water solenoid valve (J) closes.  
If there is an error message, press on the exclamation mark  to acknowledge the fault.  
Press "FWD".

- 12** Dismount the NaClO<sub>2</sub> flow rate sensor (O) again and remount it in the original direction again. Pay attention to O-ring in the process. The flow rate arrow on the housing now points upward. .




*Run 3  
(flush)*

- 13** Fill the calibration tank (AD) with water to the marking again. Do not replace the plug. Press "Start".  
Open the process water solenoid valve (J) and water will be aspirated from the calibration tank (AD).  
The third run ends after about 2-4 minutes and the process water solenoid valve (J) closes.  
Press "BACK" on the "NaClO<sub>2</sub> calibration OK" display. If there is an error message, press on the exclamation mark  to acknowledge the fault.  
Press "FWD".



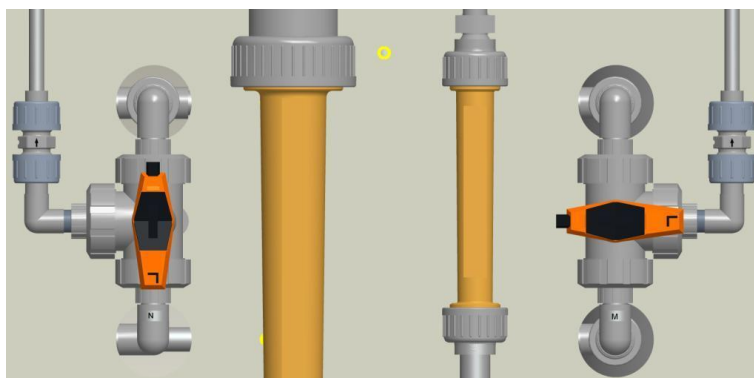
*Run 4  
(calibrating)*

- 14** Fill the calibration tank (AD) with water to the marking again.  
Do not replace the plug.  
Press "Start".  
Open the process water solenoid valve (J) and water will be aspirated from the calibration tank (AD).  
The forth run ends after about 2-4 minutes and the process water solenoid valve (J) closes.  
Press "BACK" on the "NaClO<sub>2</sub> calibration OK" display. If there is

an error message, press on the exclamation mark  to acknowledge the fault, then repeat run 4.

- 15** Press "FWD".

- 16** Set both ball valves (N and M) to the position "Preparation":



- 17** Put the plug back into the calibration tank (AD) opening again.
- 18** The calibration of NaClO<sub>2</sub> has now ended.  
Press the "END" button.

### 7.4.3 Special error messages during calibration

| Error message  | Cause   | Remedy  |
|--|---|---|
| Calibration fail<br>Running time until MAX switch?                           | <ul style="list-style-type: none"> <li>Water is not being aspirated quickly enough</li> </ul>   | <ul style="list-style-type: none"> <li>Set motive water mixing injector</li> </ul>  |
| Calibration fail<br>Running time until MIN switch?                           | <ul style="list-style-type: none"> <li>Plug in the lid of the calibration tank; there is not ventilation.</li> </ul>                  | <ul style="list-style-type: none"> <li>Remove plugs</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>MAX or MIN switch is either stuck or faulty</li> </ul>   | <ul style="list-style-type: none"> <li>Check MAX and MIN switch</li> </ul>  |
| Calibration fail<br>Q signal for HCl!  | <ul style="list-style-type: none"> <li>During the NaClO<sub>2</sub> calibration, the HCl flow rate is determined.</li> </ul>          | <ul style="list-style-type: none"> <li>Set HCl ball valve correctly (see chapter 7.4)</li> </ul>  |
| Calibration fail<br>Q signal at NaClO <sub>2</sub> !                         | <ul style="list-style-type: none"> <li>During the HCl calibration, the NaClO<sub>2</sub> flow rate is determined</li> </ul>           | <ul style="list-style-type: none"> <li>Set NaClO<sub>2</sub> ball valve correctly ((see chapter 7.4)</li> </ul>   |
| Calibration fail<br>HCl / NaClO <sub>2</sub> positioner in "MANUAL" position | <ul style="list-style-type: none"> <li>Positioner not engaged</li> </ul>  | <ul style="list-style-type: none"> <li>Engage button on the positioner</li> </ul>   |
| Calibration fail<br>Injector flow rate!                                      | <ul style="list-style-type: none"> <li>Flow rate too low or too high<br/>Mixing injector motive water adjusted incorrectly</li> </ul> | <ul style="list-style-type: none"> <li>Set motive water mixing injector</li> </ul>  |
| Calibration fail<br>Deviation to high!                                       | <ul style="list-style-type: none"> <li>Flow rate sensor fitted incorrectly</li> </ul>   | <ul style="list-style-type: none"> <li>This warning may only occur after the calibration runs 1-3. If it occurs after calibration run 4: Repeat calibrating run 4: See chapter 7.4.1 and 7.4.2</li> </ul> |
|  | <ul style="list-style-type: none"> <li>Flow rate sensor faulty</li> </ul>   | <ul style="list-style-type: none"> <li>Inform customer service</li> </ul>   |

## 7.5 Maintenance part sets

The parts required for annual maintenance are provided in maintenance part sets. The following maintenance part sets are available:

| DIOX-A<br>1000 g/h<br>2500 g/h<br>ClO <sub>2</sub> | DIOX-A<br>5000 g/h<br>ClO <sub>2</sub> | DIOX-A<br>10000 g/h<br>ClO <sub>2</sub> | Description   |
|--|--|---|---|
| W3T231599  | W3T228904                              | W3T379493                               | Spare parts for maintenance,<br>1 year<br>(or for the first time 12<br>months after start up) |
| W3T231600  | W3T228964                              | W3T379494                               | Spare parts for maintenance,<br>5 years   |

Which maintenance part kit to use is explained exactly in the table in chapter 7.5.3 Using maintenance parts

The parts contained in the maintenance part kits have to be completely replaced and processed.

### 7.5.1 Spare parts for maintenance for 1 year



*Please note*

The position numbers in the table refer to the dimension drawing in chapter 7.6.3 Replacing wear parts .

| <b>W3T231599 spare parts for maintenance for DIOX-A 1000 and 2500 g/h ClO<sub>2</sub>, 1 year</b><br><b>W3T228904 spare parts for maintenance for DIOX-A 5000 g/h ClO<sub>2</sub>, 1 year</b><br><b>W3T379493 spare parts for maintenance for DIOX-A 10000 g/h ClO<sub>2</sub>, 1 year</b> |          |   |                                  |   |
|--|----------|---|----------------------------------|---|
| Item   | Quantity | Part No.                                      | Description                      | Application   |
| 1  | 6        | W2T506488                                     | O-ring, d 17.12 x 2.62 FPM       | 3-way valves  |
| 2  | 2        | W3T170132                                     | Back-pressure valve G1/2A        | Back pressure in chemical lines   |
| 3  | 9*)      | W3T173010                                     | O-ring 28.17 x 3.53 FPM          | Screw joints d25 (touched by chemicals)<br>*) one O-ring is located at the over-full switch of the storage tank |
| 4  | 5        | W3T172724                                     | O-ring 20.22 x 3.53 FPM          | Screw joints d 20 (touched by chemicals)  |
| 5  | 1        | W2T504821                                     | Sealing set ; FPM; type 546 d32  | 3-way valve ClO <sub>2</sub> drain outlet   |
| 6  | 2        | W3T161292                                     | Nozzle PTFE                      | Fluid control valve   |
| 7  | 2        | W3T168909                                     | O-ring 23.39x3.53 CSM            | Fluid control valve   |
| 8  | 2        | W3T170894                                     | Gasket PTFE                      | Fluid control valve   |
| 9  | 2        | W3T169197                                     | O-ring 9.25x1.78 CSM             | Fluid control valve   |
| 10   | 1        | 1000/2500 g/h ClO <sub>2</sub> :<br>W3T159864 | Nozzle with connecting adaptor   | Mixing injector   |
|  | 1        | 5000 g/h ClO <sub>2</sub> :<br>W3T241541      | Nozzle with connecting adaptor   | Mixing injector   |
|  | 1        | 10000 g/h ClO <sub>2</sub> :<br>W3T163685     | Nozzle with connecting adaptor   | Mixing injector   |
| 11   | 1        | W3T167439                                     | O-ring set FPM                   | Mixing injector   |
| 12   | 2        | W3T423640                                     | O-ring 30,2 x 3 FPM              | Aspiration injector   |
| 13   | 2        | W2T552531                                     | Ball check valve sealing kit d20 | Back-pressure valve d 20  |

| <b>W3T231599 spare parts for maintenance for DIOX-A 1000 and 2500 g/h ClO<sub>2</sub>, 1 year</b><br><b>W3T228904 spare parts for maintenance for DIOX-A 5000 g/h ClO<sub>2</sub>, 1 year</b><br><b>W3T379493 spare parts for maintenance for DIOX-A 10000 g/h ClO<sub>2</sub>, 1 year</b> |          |           |   |   |
|--|----------|-----------|---|---|
| Item   | Quantity | Part No.  | Description   | Application   |
| 14   | 2        | W2T552533 | Sealing kit - back pressure<br>Type 561 d32   | Dilution / aspiration back-pressure valve                 |
| 15   | 4        | W3T169073 | O-ring, 21.89 x 2.62  | Ball valves d 25  |
| 16   | 1        | W3T241589 | Sight glass   | Reactor discharge pipe                                    |
| 17   | 8        | W3T172725 | O-ring, 32.92 x 3.53 FPM  | Screw joints d 32 (touched by chemicals)                  |
| 18   | 3        | W3T169014 | O-ring 37.69x3.53 FPM   | Aspiration injector                                       |
| 19   | 2        | W3T172822 | O-ring 15.54 x 2.62 FPM   | Screw joints d16 (touched by chemicals)                   |
| 22   | 1/2/4 *) | W3T163716 | Sodium thiosulfate 3 kg<br>*) 1x for DIOX-A1000 and 2500<br>2x for DIOX-A5000<br>4x for DIOX-A10000 | Neutralization of reactor contents                        |
| 23   | 4        | W3T163644 | Sodium thiosulfate 300 g  | ClO <sub>2</sub> storage tank absorber                    |
| 24   | 1        | W2T503995 | PTFE - Barrierta grease   | sealing points to be greased                              |
| 25   | 1        | W3T161334 | Flat gasket CSM; D32x25.4x3   | Vacuum switch   |
| 26   | 1        | W2T507221 | O-ring 5.28x1.78 CSM  | Vacuum switch   |
| 27   | 1        | W3T172724 | O-ring 20.22 x 3.53   | Vacuum switch   |
| 28   | 1        | W3T172880 | Flat gaskets D80x65x2 FPM   | ClO <sub>2</sub> storage tank absorber                    |
| 29   | 1        | W3T168651 | O-ring d7x1.5/75 FPM-B V37  | Temperature sensor<br>ClO <sub>2</sub> storage tank empty |
| 50   | 2        | W2T517439 | Seal  | Drain valve reactor /<br>3-way valve ClO <sub>2</sub>     |
| 51   | 2        | W2T517438 | Sealing wire  | Drain valve reactor /<br>3-way valve ClO <sub>2</sub>     |

### 7.5.2 Spare parts for maintenance for 5 years



*Please note*

The position numbers in the table refer to the dimension drawing in chapter 7.6.3 Replacing wear parts.

| <b>W3T231600 spare parts for maintenance for DIOX-A 1000 and 2500 g/h ClO<sub>2</sub>, 5 years</b><br><b>W3T228964 spare parts for maintenance for DIOX-A 5000 g/h ClO<sub>2</sub>, 5 years</b><br><b>W3T379494 spare parts for maintenance for DIOX-A 10000 g/h ClO<sub>2</sub>, 5 years</b> |          |   |                                |   |
|---|----------|---|--------------------------------|---|
| Item  | Quantity | Part No.                                      | Description                    | Application   |
| 2   | 2        | W3T170132                                     | Back-pressure valve G1/2A      | Back pressure in chemical lines   |
| 3   | 9*)      | W3T173010                                     | O-ring 28.17 x 3.53 FPM        | Screw joints d25 (touched by chemicals)<br>*) one O-ring is located at the over-full switch of the storage tank |
| 4   | 5        | W3T172724                                     | O-ring 20.22 x 3.53 FPM        | Screw joints d20 (touched by chemicals)   |
| 6   | 2        | W3T161292                                     | Nozzle PTFE                    | Fluid control valve   |
| 7   | 2        | W3T168909                                     | O-ring 23.39x3.53 CSM          | Fluid control valve   |
| 8   | 2        | W3T170894                                     | Gasket PTFE                    | Fluid control valve   |
| 9   | 2        | W3T169197                                     | O-ring 9.25x1.78 CSM           | Fluid control valve   |
| 10  | 1        | 1000/2500 g/h ClO <sub>2</sub> :<br>W3T159864 | Nozzle with connecting adaptor | Mixing injector   |
|   | 1        | 5000 g/h ClO <sub>2</sub> :<br>W3T241541      | Nozzle with connecting adaptor | Mixing injector   |
|   | 1        | 100000 g/h ClO <sub>2</sub> :<br>W3T163685    | Nozzle with connecting adaptor | Mixing injector   |
| 11  | 1        | W3T167439                                     | O-ring set FPM                 | Mixing injector   |
| 12  | 2        | W3T423640                                     | O-ring 30,2 x 3 FPM            | Aspiration injector   |
| 16  | 1        | W3T241589                                     | Sight glass                    | Reactor discharge   |
| 17  | 8        | W3T172725                                     | O-ring, 32.92 x 3.53 FPM       | Screw joints d 32 (touched by chemicals)  |
| 18  | 3        | W3T169014                                     | O-ring 37.69x3.53 FPM          | Aspiration injector   |

| <b>W3T231600 spare parts for maintenance for DIOX-A 1000 and 2500 g/h ClO<sub>2</sub>, 5 years</b> |                 |                 |   |  |
|--|-----------------|-----------------|---|--|
| <b>W3T228964 spare parts for maintenance for DIOX-A 5000 g/h ClO<sub>2</sub>, 5 years</b>          |                 |                 |   |  |
| <b>W3T379494 spare parts for maintenance for DIOX-A 10000 g/h ClO<sub>2</sub>, 5 years</b>         |                 |                 |   |  |
| <b>Item</b>  | <b>Quantity</b> | <b>Part No.</b> | <b>Description</b>  | <b>Application</b>                               |
| 19   | 2               | W3T172822       | O-ring 15.54 x 2.62 FPM   | Screw joints d16 (touched by chemicals)          |
| 22   | 1/2/4*)         | W3T163716       | Sodium thiosulfate 3 kg<br>*) 1x for DIOX-A1000 and 2500<br>2x for DIOX-A5000<br>4x for DIOX-A10000 | Neutralization of reactor contents               |
| 23   | 4               | W3T163644       | Sodium thiosulfate 300 g  | ClO <sub>2</sub> storage tank absorber           |
| 24   | 1               | W2T503995       | PTFE - Barrierta grease   | Sealing points to be greased                     |
| 25   | 1               | W3T161334       | Flat gasket CSM; D32x25.4x3   | Vacuum switch                                    |
| 26   | 1               | W2T507221       | O-ring 5.28x1.78 CSM  | Vacuum switch                                    |
| 27   | 1               | W3T172724       | O-ring 20.22 x 3.53   | Vacuum switch                                    |
| 28   | 1               | W3T172880       | Flat gaskets D80x65x2 FPM   | ClO <sub>2</sub> storage tank absorber           |
| 29   | 1               | W3T168651       | O-ring d7x1.5/75 FPM-B V37  | Temperature sensor ClO <sub>2</sub> storage tank |
| 30   | 3*              | W3T172725       | O-ring, 32.92 x 3.53 FPM<br>(* only 2 with DIOX-A10000)   | Screw joints d32                                 |
| 31   | 1               | W2T504821       | Sealing set; FPM; type 546 d32<br>(for DIOX-A1000/2500/5000)  | Operating water ball valve                       |
|  |                 | W2T504823       | Sealing set; FPM; type 546 d50<br>(for DIOX-A10000)   | Operating water ball valve                       |
| 32   | 2               | W3T169026       | O-ring 35 x 3 mm FPM  | Safety shut-off valve                            |
| 33   | 2               | W3T169194       | O-ring 46.99x5.33 FPM<br>(for DIOX-A1000/2500/5000)   | Dilution water flow rate meter                   |
|  |                 | W3T169199       | O-Ring d59,69x5,33/FPM<br>(for DIOX-A10000)   | Dilution water flow rate meter                   |
| 34   | 2               | W3T172724       | O-ring 20.22x3.53 FPM<br>(for DIOX-A1000/2500/5000)   | Mixing injector motive water flow rate meter     |
|  |                 | W3T172725       | O-Ring d32,92x3,53/FPM<br>(for DIOX-A10000)   | Mixing injector motive water flow rate meter     |
| 35   | 2               | W3T172723       | O-ring, 12.37 x 2.62 FPM  | Mixing injector motive water vane wheel meter    |
| 36   | 2               | W3T241613       | 3-way valve type 543 D16<br>PVC-U FPM   | 3-way valve                                      |

**W3T231600 spare parts for maintenance for DIOX-A 1000 and 2500 g/h ClO<sub>2</sub>, 5 years**  
**W3T228964 spare parts for maintenance for DIOX-A 5000 g/h ClO<sub>2</sub>, 5 years**  
**W3T379494 spare parts for maintenance for DIOX-A 10000 g/h ClO<sub>2</sub>, 5 years**

| Item | Quantity | Part No.  | Description  | Application   |
|------|----------|-----------|--|---|
| 37   | 2*       | W3T173010 | O-ring, 28.17 x 3.53 FPM<br>(*: for DIOX-A1000/2500/5000 only)     | Screw joints d25                                      |
| 38   | 2        | W2T552202 | Ball check valve type 561, d20                                     | Ball check valve d20                                  |
| 39   | 2        | W3T220250 | Ball check valve Type 561 d32                                      | Ball check valve d 32                                 |
| 40   | 2        | W3T172372 | Flow solenoid valve DN25   | Solenoid valves                                       |
| 41   | 3        | W3T172822 | O-ring 15.54 x 2.62 FPM  | Screw joints D16                                      |
| 42   | 2*       | W3T172724 | O-ring 20.22 x 3.53 FPM<br>(*: for DIOX-A1000/2500/5000 only)      | Screw joints d20                                      |
| 43   | 1        | W3T165515 | Valve body   | Vacuum switch   |
| 44   | 2        | W3T171231 | V-notch linear 20-400 g/h Cl <sub>2</sub><br>(for DIOX-A1000/2500) | Flow control valves                                   |
|      |          | W3T171242 | V-notch linear 30-600 g/h Cl <sub>2</sub><br>(for DIOX-A5000)      | Flow control valves                                   |
|      |          | W3T171251 | V-notch linear 50-1000 g/h Cl <sub>2</sub><br>(for DIOX-A10000)    | Flow control valves                                   |
| 45   | 2        | W3T168899 | Washer d=12.7x4.9; PTFE  | Flow control valves                                   |
| 46   | 2        | W3T163273 | Shaft  | Flow control valves                                   |
| 47   | 2        | W3T163275 | Set screw silver   | Flow control valves                                   |
| 48   | 1        | W3T264238 | 3-way valve type 543/d32/PVC-U                                     | 3-way valve ClO <sub>2</sub> drain outlet             |
| 49   | 1*       | W3T169194 | O-Ring d46,99x5,33/FPM<br>(*: for DIOX-A10000 only)                | Operating water inlet                                 |
| 50   | 2        | W2T517439 | Seal   | Drain valve reactor /<br>3-way valve ClO <sub>2</sub> |
| 51   | 2        | W2T517438 | Sealing wire   | Drain valve reactor /<br>3-way valve ClO <sub>2</sub> |
| 52   | 4        | W2T606488 | O-Ring d17,13x2,62/FPM   | Dosing ball valve                                     |



### 7.5.3 Using maintenance part sets

Seeing that the various wear parts are worn to a different degree, the following maintenance part kits must be used according to the maintenance schedule:

| Maintenance intervals | Maintenance part sets DIOX-A 1000 g/h ClO <sub>2</sub> | Maintenance part sets DIOX-A 2500 g/h ClO <sub>2</sub> | Maintenance part sets DIOX-A 5000 g/h ClO <sub>2</sub> | Maintenance part sets DIOX-A 10000 g/h ClO <sub>2</sub> |
|-----------------------|--|--|--|---|
| 1st year              | W3T231599  | W3T231599  | W3T228904  | W3T379493   |
| 2nd year              | W3T231599  | W3T231599  | W3T228904  | W3T379493   |
| 3rd year              | W3T231599  | W3T231599  | W3T228904  | W3T379493   |
| 4th year              | W3T231599  | W3T231599  | W3T228904  | W3T379493   |
| 5th year              | W3T231600  | W3T231600  | W3T228964  | W3T379494   |
| 6th year              | W3T231599  | W3T231599  | W3T228904  | W3T379493   |
| 7th year              | W3T231599  | W3T231599  | W3T228904  | W3T379493   |
| 8th year              | W3T231599  | W3T231599  | W3T228904  | W3T379493   |
| 9th year              | W3T231599  | W3T231599  | W3T228904  | W3T379493   |
| 10th year             | W3T231600<br>+<br>W3T320348<br>(Reaction tank)         | W3T231600<br>+<br>W3T228902<br>(Reaction tank)         | W3T228964<br>+<br>W3T220012<br>(Reaction tank)         | W3T379494<br>+<br>W3T379305<br>(Reaction tank)          |



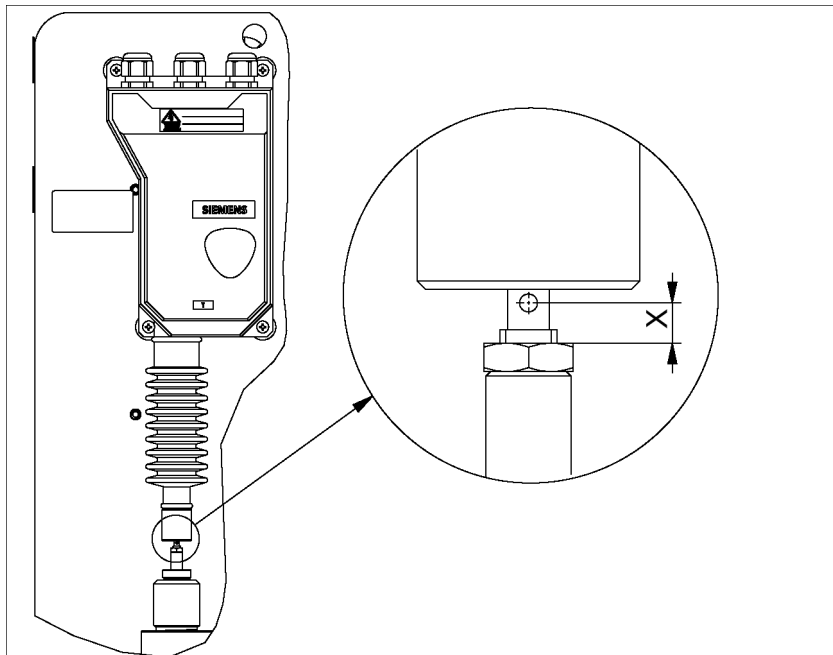
*Please note*

The parts contained in the maintenance part kits have to be completely replaced and processed (exceptions: pos. 37, 42 and 52).

## 7.6 Notes for maintenance work

### 7.6.1 Service expansion chamber

- 1 Before dismantling, measure "x" and make a note of it.
- 2 After replacing the wear parts, lubricate the shaft (pos. 46) lightly with the silicon grease (pos. 24)
- 3 After installation, set measurement "x" again



### 7.6.2 Servicing absorber



#### *Warning!*

Chemical hazard!  
Wear suitable protective clothing, gloves and eye/face protection while working.  
Wear a respirator.  
Ventilate the system room well.

- 1 While dismantling the absorber tank, wear a respirator and ventilate the system room (see chapter 6.13.6).  
Do not close the connection to the ClO<sub>2</sub> storage tank!

### 7.6.3 Replacing wear parts

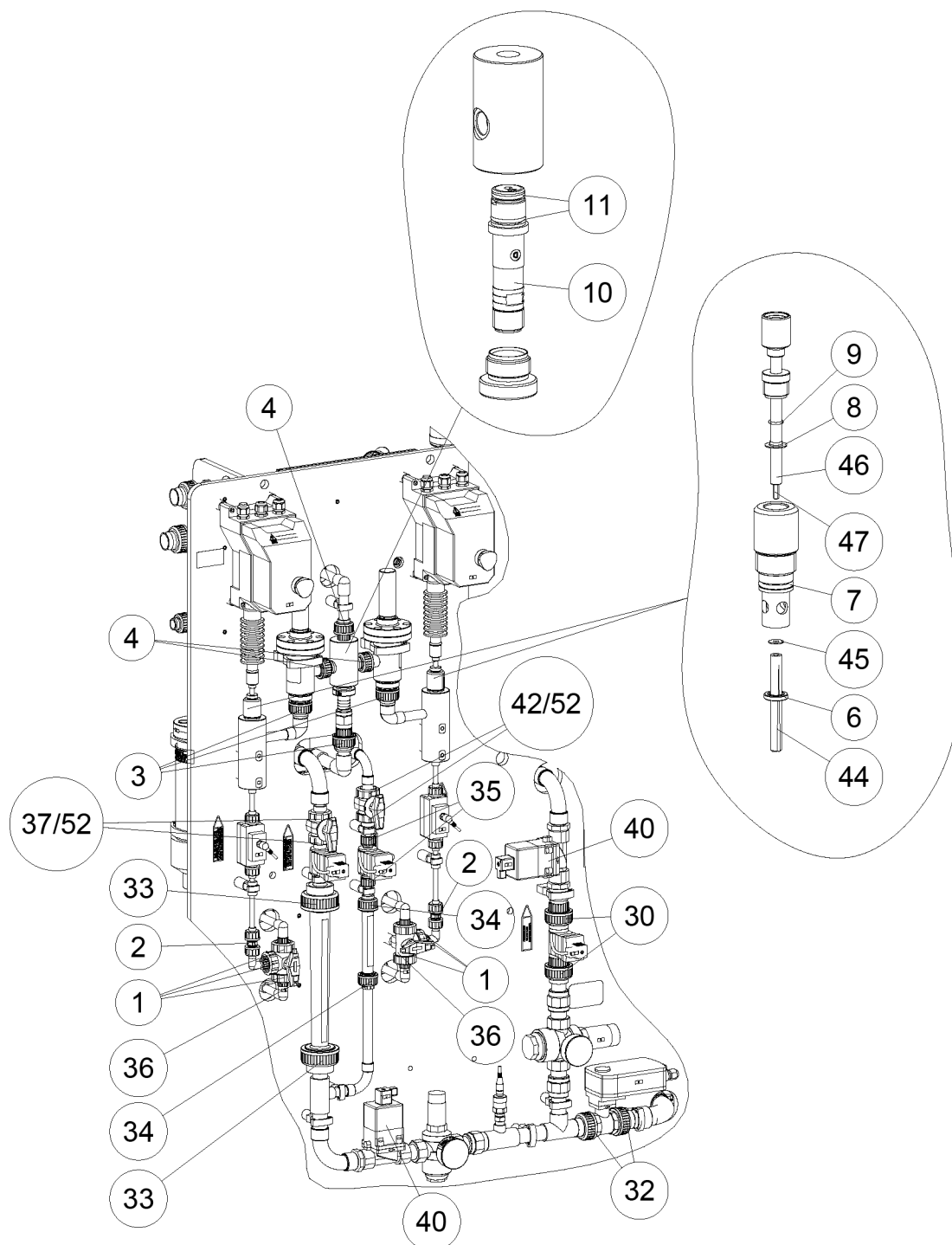
The wear parts included in the respective maintenance part kits must be replaced according to the following dimension drawings.

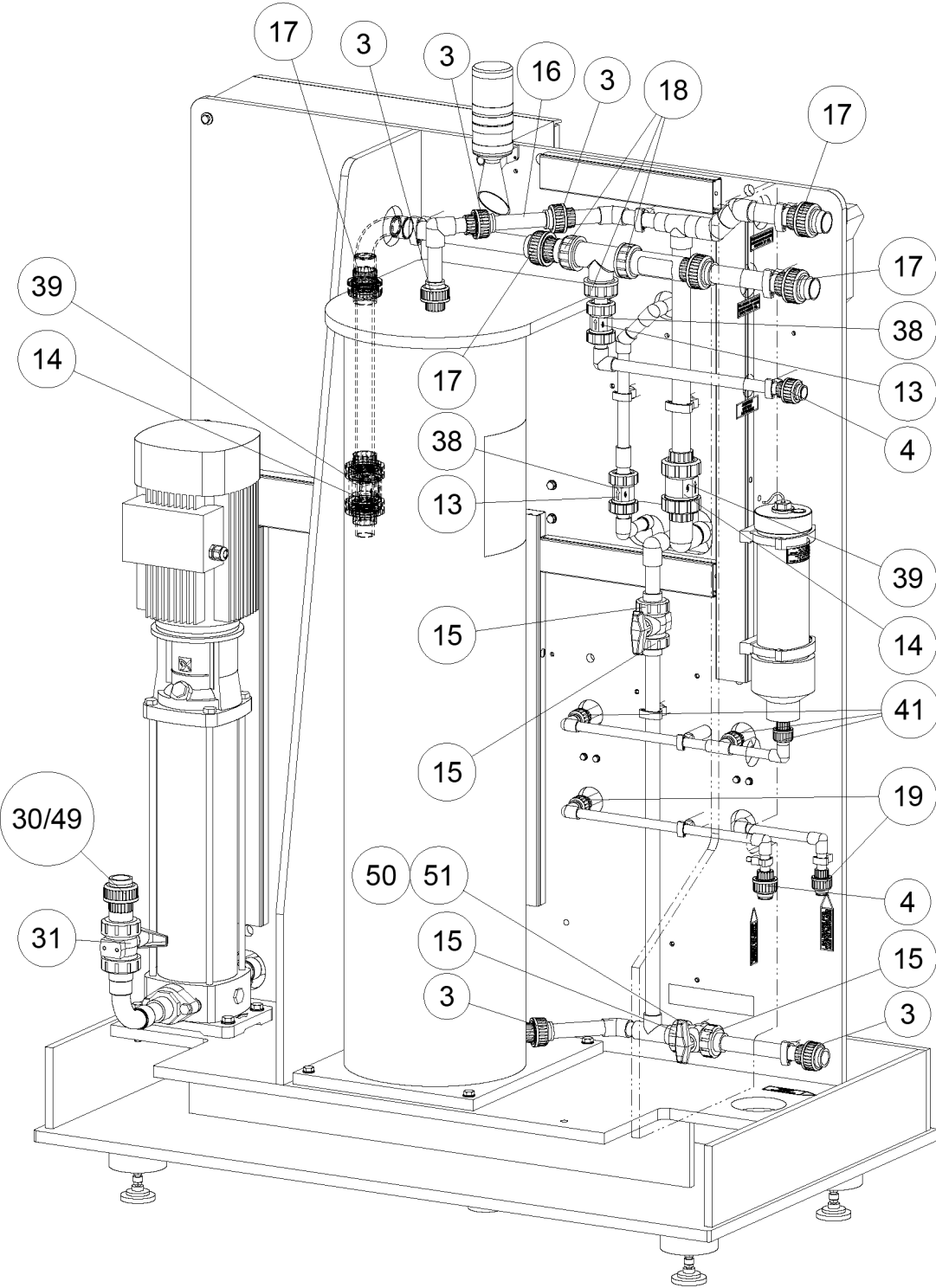
Proceed as follows:

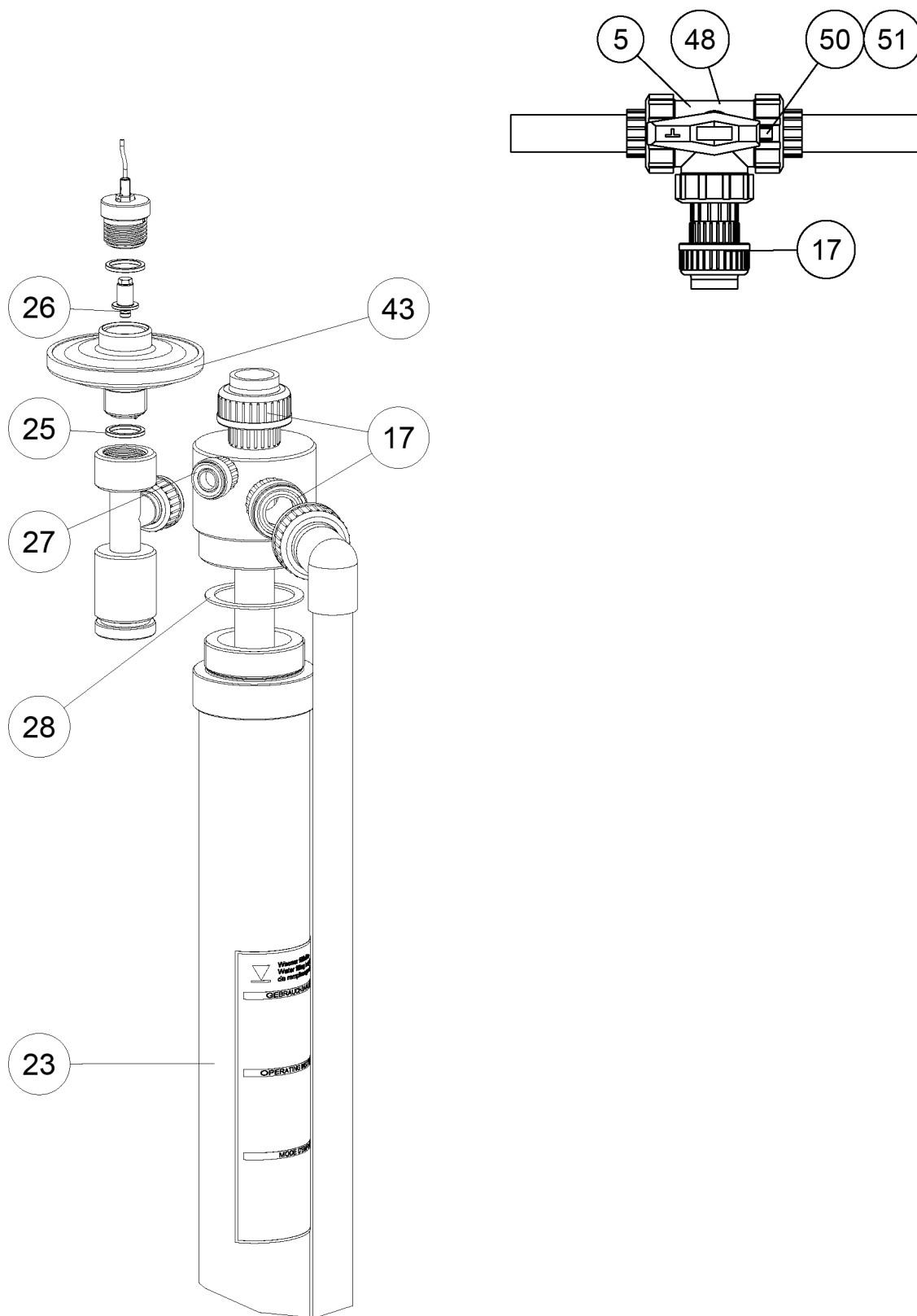
Requirements:

- 1 Flush the chlorine dioxide generator and switch off it off at the main switch.
- 1 Shut off local water supply.
- 2 Shut off the vent gas discharge or if possible, empty it to avoid backflow.
- 3 Loosen both union nuts in front of and after the safety shut-off valve (G) and release the pressure.
- 4 Replace the wear parts with regard to the maintenance part kits (see chapter 7.5).
- 5 Before start up, check all screw joints for leaks, and tighten by hand if necessary.

## 7.7 Wear parts to be replaced



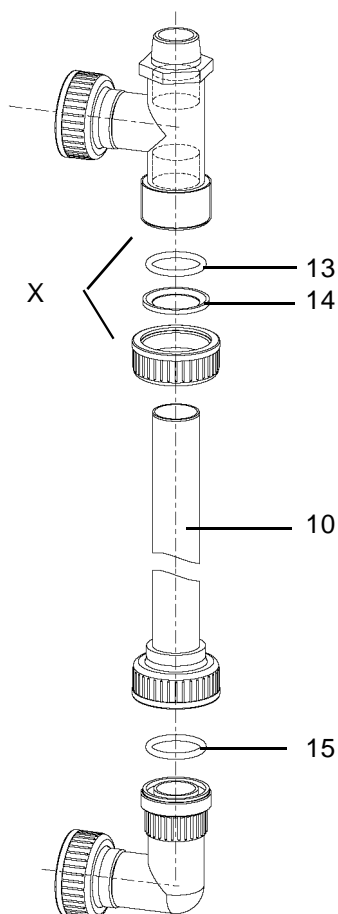




## 7.8 Replacing the stand pipe of the ClO<sub>2</sub> tank

### Stand pipe sets

| Part no.  | Description              | Used in  | Contents  |
|-----------|--------------------------|--|---|
| W3T269808 | Stand pipe set<br>L=1190 | ClO <sub>2</sub> tank<br>W3T232812 (900 l)<br>W3T232813 (2750 l)<br>W3T232814 (4600 l) | one piece each<br>Pos. 13: O-ring d38x5/FPM<br>Pos. 14: Clamping ring d40,PVC<br>Pos. 10: Stand pipe d40; PMMA<br>Pos. 15: O-ring d40,64x5,33/FPM |
| W3T347958 | Stand pipe set<br>L=1435 | ClO <sub>2</sub> tank<br>W3T334426 (500 l)   |   |

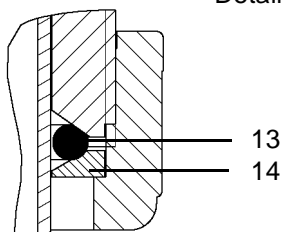


The stand pipe needs to be replaced as necessary.

- 1 Put on protective clothing and face mask, keep respirator on stand-by.
- 2 Empty the ClO<sub>2</sub> tank down to the level of the outlet pipe.
- 3 Remove the old stand pipe (10).  
Do not remove the elbow at the lower end and the tee at the upper end.
- 4 Clean the union nuts for reuse.
- 5 Pay attention when assembling:  
Position of O-ring and clamping ring see Detail X.  
Do not interchange the O-rings!  
Push the upper O-ring onto the tube.
- 6 Tighten the lower and then the upper union nut by hand.
- 7 When refilling the ClO<sub>2</sub> tank check for leaks.

The connections of the elbow and the tee to the ClO<sub>2</sub> tank include one O-Ring d40,64x5,33/FPM each (pos. 15, part no. W3T173047).

Detail X



## 7.9 Service booster pump

The booster pump is maintenance-free.

## 7.10 Shutting down

- 1 Flush system (see chapter 7.2)
- 2 In the service menu, press the “Shut down” (Service password required).
- 3 Switch off main switch

## 7.11 Renewed start up

- 1 Ensure the system requirements given in the chapter 4.6 Start up are met.
- 2 Switch the system on at the main switch, see chapter 4.6.4

## 7.12 Dismantling



### *Warning!*

To avoid health hazards, personal injury, or damage to the system caused by caustic and / or toxic substances or dangerously high ClO<sub>2</sub> concentration:

Put on protective clothing and face mask, keep respirator on stand-by.

Before draining liquid or disassembly of system components:  
Flush system and shut down (see 7.2).

---



### *Warning!*

Pay attention to hazardousness of chemicals!

NaClO<sub>2</sub> and HCl must not come into contact with each other:

Risk of explosion!

If necessary, neutralize ClO<sub>2</sub> and HCl with sodium thiosulfate.

Don't neutralize NaClO<sub>2</sub> solution with sodium thiosulfate!

Hydrochloric acid is caustic!

Chlorine dioxide is caustic, poisonous and flammable.



Sodium chlorite solution in its dry-state is oxidizing. Do not allow to dry into flammable substances.

Danger of spontaneous combustion!

The chemicals must in no way come into contact with each other or with other chemicals. Risk of explosion!

---



*Warning!*

In the reactor, air pockets must not form.

Otherwise, there is risk of explosion.

Therefore, flush the reaction tank with water first before dismantling (see 7.2).

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*Warning!*

Danger of electric current.

Pay attention to instructions and safety instructions!

Working on the electrical system parts may only be carried out by an electrical technician.

---

- 1 Flush system (see chapter 7.2)
- 2 Ensure blockage of chemical supply.
- 3 Dispose of all chemicals properly
- 4 Switch off all electrical lines externally and ensure against switching them back on.
- 5 Dispose of all system components properly  
Lines and storage tanks: mainly made of PVC.  
Mount: PP



## 8. Operating journal

| Operating journal for DIOX-A 5000 (1000, 2500, 5000 and 10000 g/h ClO <sub>2</sub> ) |                   |                         |                           |                      |   |  |   |          |  |        |          |
|--|-------------------|-------------------------|---------------------------|----------------------|---|--|---|----------|--|--------|----------|
| Date   | personal Initials | weekly                  |                           |                      | monthly                                 |  |   | annually |  | Faults | Measures |
|  |                   | Opera-<br>ting<br>hours | Prepara-<br>tion<br>hours | State<br>Sight glass | Position<br>HCl<br>positioner<br>(volt) | Position<br>NaClO <sub>2</sub><br>positioner<br>(volt) | Date<br>Maintenance<br>by customer<br>service |          |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |
|  |                   |                         |                           |                      |   |  | V   | V        |  |        |          |



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## 9. Wiring diagrams




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*Warning!*

To prevent harm to health or damage to the system:  
Electrical hazards must be ruled out. The system may only be  
connect, started up, maintained or repaired by an electrical  
technician.

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9.1 Wiring diagrams DIOX-A 1000/2500/5000/10000

|   |             |  |      |   |              |               |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
|---|-------------|--|------|---|--------------|---------------|---------|----------|----|------|------------|---------------|-----|---|-------------|----------|----|-------|--|---------------|--|---|-------------|----------|----|------|--|---------|--|-------|----------|------|------|---------------|--|--|--|
| <h1 style="margin: 0;">Project: DIOX-A 5000</h1>  |             | <h1 style="margin: 0;">Cover page</h1>   |      | Project<br><b>DIOX-A 5000</b><br>order number | =A1<br>+S1   |               |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
| <p><b>order number:</b></p> <p><b>Customer:</b></p> <p><b>Drawing number:</b></p> <p><b>Date:</b></p> <p><b>Plant:</b></p> <p><b>Place:</b></p> |             | <p>WAE7601</p> <p>23.11.2011</p> <p>=A1</p> <p>+S1</p>   |      | Drawing number<br><b>WAE7601</b>              |              |               |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
| <p><b>Remark:</b></p> <p>Language Drawing number</p> <p>DE WAE7600</p> <p>EN WAE7601</p> <p>FR WAE7602</p>                                      |             | <div style="border: 1px solid black; padding: 5px;"> <p><b>Note:</b></p> <p>The bill of material contains all parts. It is a complete list and not dependent on the type and size of plant!</p> </div>   |      |   |              |               |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
| <p><b>Description:</b></p> <p>DIOX-A 1000</p> <p>DIOX-A 2500</p> <p>DIOX-A 5000</p> <p>DIOX-A 10000</p>   |             | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">3</td> <td style="width: 15%;">LAE5028</td> <td style="width: 15%;">01.11.14</td> <td style="width: 15%;">tb</td> <td style="width: 15%;">Date</td> <td style="width: 15%;">23.11.2011</td> <td style="width: 15%;">Design Center</td> <td style="width: 15%;">GER</td> </tr> <tr> <td>4</td> <td>LAE5402.088</td> <td>01.08.16</td> <td>tb</td> <td>Drawn</td> <td></td> <td>Prod. / Sales</td> <td></td> </tr> <tr> <td>5</td> <td>LAE5579.002</td> <td>11.10.16</td> <td>tb</td> <td>Date</td> <td></td> <td>release</td> <td></td> </tr> <tr> <td>Issue</td> <td>Revision</td> <td>Date</td> <td>Name</td> <td>Checked/ Norm</td> <td></td> <td></td> <td></td> </tr> </table> |      |   |              | 3             | LAE5028 | 01.11.14 | tb | Date | 23.11.2011 | Design Center | GER | 4 | LAE5402.088 | 01.08.16 | tb | Drawn |  | Prod. / Sales |  | 5 | LAE5579.002 | 11.10.16 | tb | Date |  | release |  | Issue | Revision | Date | Name | Checked/ Norm |  |  |  |
| 3   | LAE5028     | 01.11.14   | tb   | Date  | 23.11.2011   | Design Center | GER     |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
| 4   | LAE5402.088 | 01.08.16   | tb   | Drawn   |              | Prod. / Sales |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
| 5   | LAE5579.002 | 11.10.16   | tb   | Date  |              | release       |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
| Issue   | Revision    | Date   | Name | Checked/ Norm                                 |              |               |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
|   |             |  evoqua<br><small>Water Technologies GmbH</small>   |      | Original                                      | Rep. I       |               |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
|   |             | Evoqua<br>Water Technologies GmbH  |      | Rep. I  | Rep. By      |               |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |
|   |             |  |      | Sheet <b>1</b>                                | of <b>34</b> |               |         |          |    |      |            |               |     |   |             |          |    |       |  |               |  |   |             |          |    |      |  |         |  |       |          |      |      |               |  |  |  |

| Sheet | Description  | Issue | Date     | Document type        |
|-------|--|-------|----------|----------------------|
| 1     | Cover page   | 5     | 11.10.16 | Cover page           |
| 4     | Design control panel                                   | 5     | 11.10.16 | Design control panel |
| 5     | Design control panel free sheet                        | 5     | 11.10.16 | Design control panel |
| 6     | Operator Panel   | 5     | 11.10.16 | wiring diagram       |
| 7     | PLC  | 5     | 11.10.16 | wiring diagram       |
| 8     | PLC  | 5     | 11.10.16 | wiring diagram       |
| 9     | PLC free sheet   | 5     | 11.10.16 | wiring diagram       |
| 10    | Main power supply                                      | 5     | 11.10.16 | wiring diagram       |
| 11    | DC24V  | 5     | 11.10.16 | wiring diagram       |
| 12    | PLC  | 5     | 11.10.16 | wiring diagram       |
| 13    | PLC  | 5     | 11.10.16 | wiring diagram       |
| 14    | Gas leak detector, Leakage monitoring                  | 5     | 11.10.16 | wiring diagram       |
| 15    | temperature sensor                                     | 5     | 11.10.16 | wiring diagram       |
| 16    | HCl Tank   | 5     | 11.10.16 | wiring diagram       |
| 17    | NaClO2 Tank  | 5     | 11.10.16 | wiring diagram       |
| 18    | Operating water Automatic stopcock Pressure sensor     | 5     | 11.10.16 | wiring diagram       |
| 19    | Operating water Booster pump                           | 5     | 11.10.16 | wiring diagram       |
| 20    | Injector water aspiration injector vent gas aspiration | 5     | 11.10.16 | wiring diagram       |
| 21    | Injector water mixing injector, Dilution water         | 5     | 11.10.16 | wiring diagram       |
| 22    | HCl Positioner   | 5     | 11.10.16 | wiring diagram       |
| 23    | NaClO2 Positioner                                      | 5     | 11.10.16 | wiring diagram       |
| 24    | HCl & NaClO2 Flow meter                                | 5     | 11.10.16 | wiring diagram       |
| 25    | calibration vessel                                     | 5     | 11.10.16 | wiring diagram       |
| 26    | free sheet   | 5     | 11.10.16 | wiring diagram       |
| 27    | ClO2 storage tank                                      | 5     | 11.10.16 | wiring diagram       |
| 28    | ClO2 quality   | 5     | 11.10.16 | wiring diagram       |

| Revision | Date     | Name | Drawn | Checked | Issue |
|----------|----------|------|-------|---------|-------|
| 1        | 01.11.14 | ib   |       |         |       |
| 2        | 01.08.16 | ib   |       |         |       |
| 3        | 11.10.16 | ib   |       |         |       |

| Issue | Date       | Name | Design Center | GER |
|-------|------------|------|---------------|-----|
| 1     | 23.11.2011 | ib   |               |     |
| 2     |            |      |               |     |
| 3     |            |      |               |     |

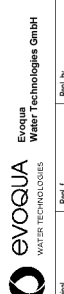
| Revision | Date | Name | Original | Repl. / | Repl. by |
|----------|------|------|----------|---------|----------|
| 1        |      |      |          |         |          |
| 2        |      |      |          |         |          |
| 3        |      |      |          |         |          |

| Project     | Order number | Drawing number |
|-------------|--------------|----------------|
| DIOX-A 5000 |              | WAE7601        |

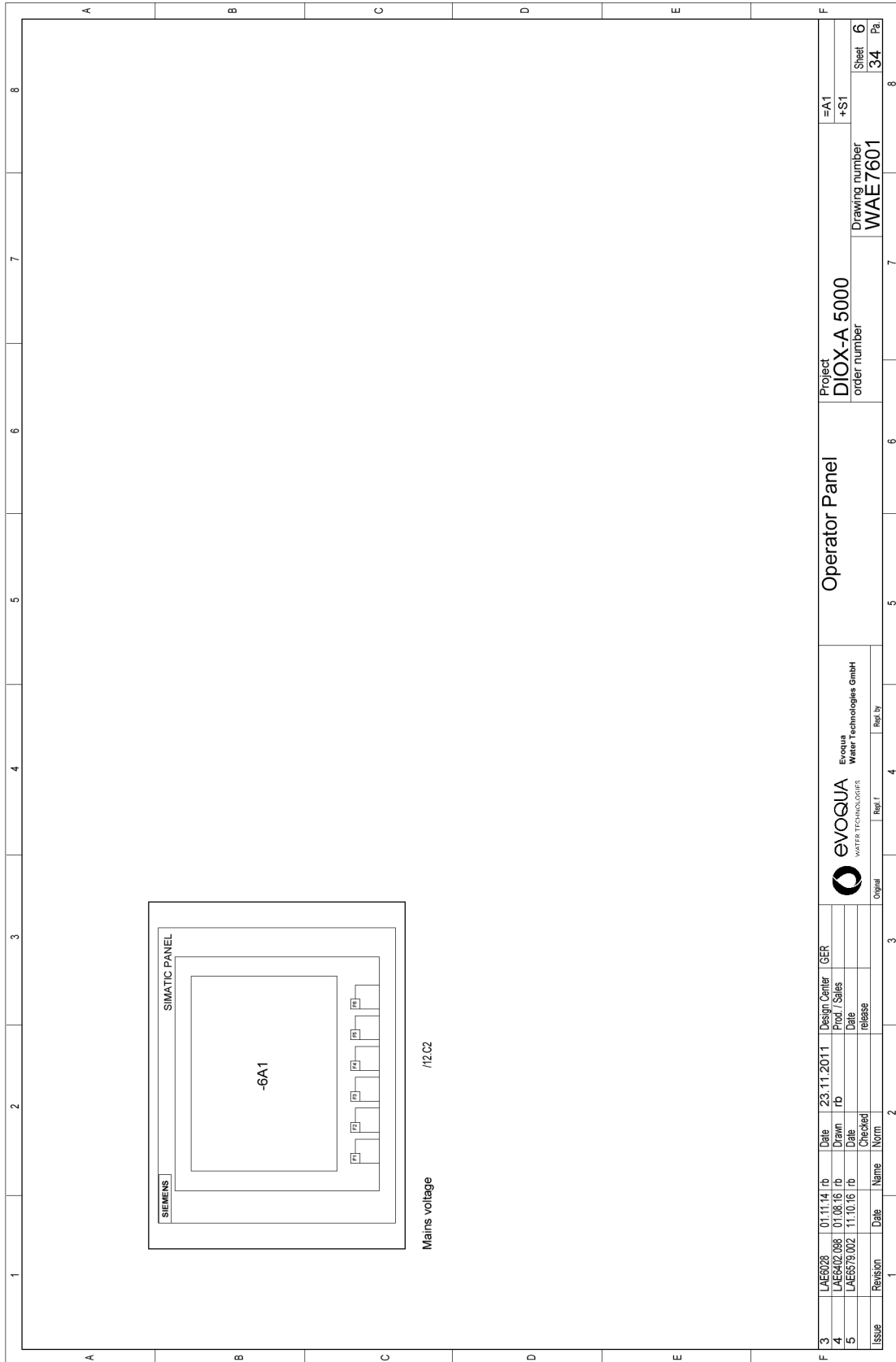
| Contents | Sheet | Pa. |
|----------|-------|-----|
| =A1      |       |     |
| +S1      |       |     |
|          | 2     | 34  |

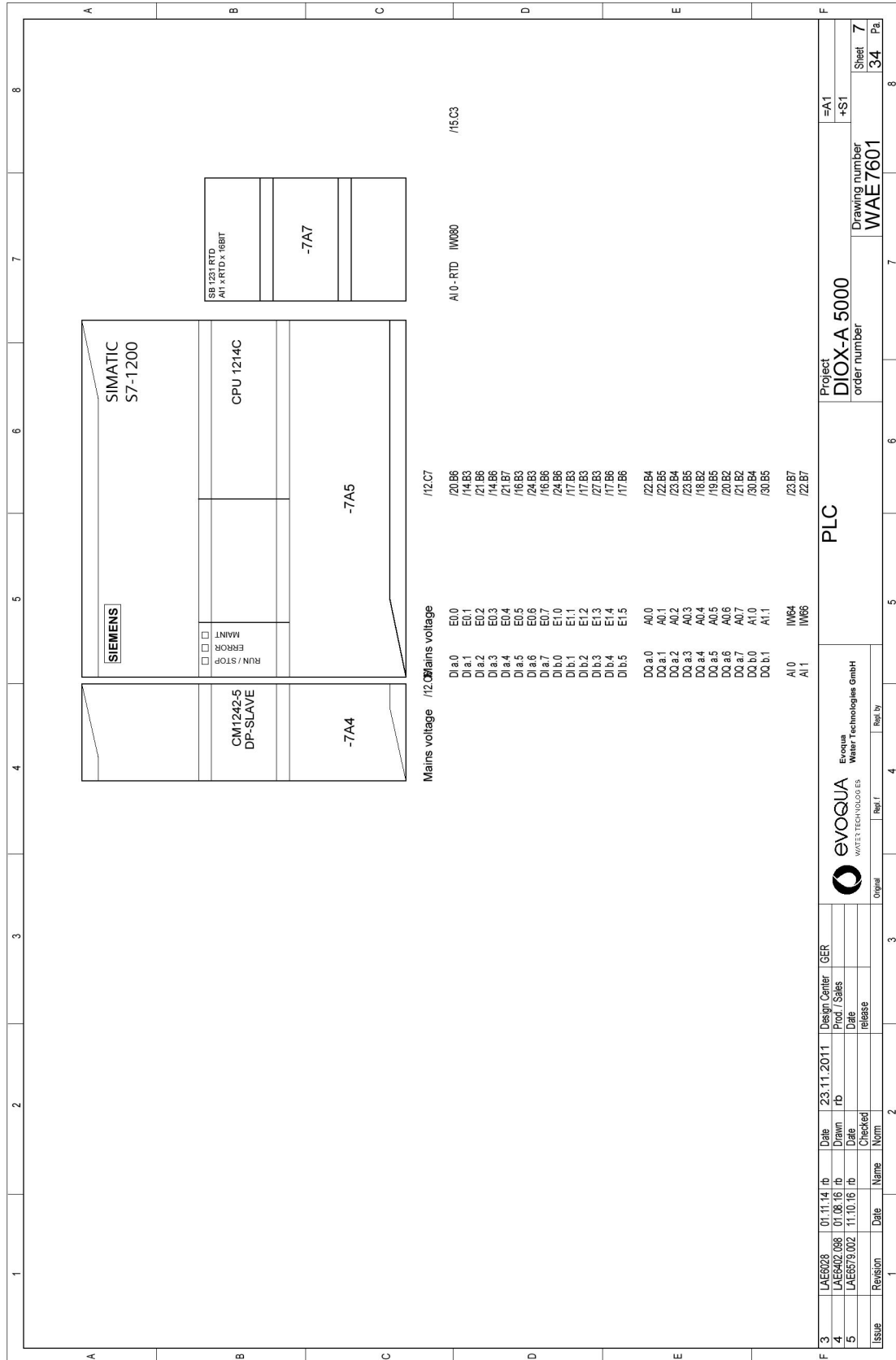
| 1   |  | 2                                  |       | 3        |                   | 4       |            | 5             |     | 6   |  | 7 |  | 8 |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
|---|--|------------------------------------|-------|----------|-------------------|---------|------------|---------------|-----|---|--|---|--|---|--|---------|--|-------------|--|----------|----|------|------------|---------------|-----|--|--|--|--|-----|--|----------------|--|-------------|--|----------|----|---------|----|-------------|--|--|--|--|--|----|--|---|--|-------------|--|----------|----|------|--|---------|--|--|--|--|--|--|--|-------|--|----------|------|------|--------|---------|--|--|--|--|--|--|--|--|--|
| Plant: =A1<br>Place: +S1  |  |                                    |       |          |                   |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| <h2 style="text-align: center;">Contents</h2>   |  |                                    |       |          |                   |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| A   | Sheet  | Description                        | Issue | Date     | Document type     |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
|   | 29   | release Preparation, release Plant | 5     | 11.10.16 | wiring diagram    |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
|   | 30   | message interface                  | 5     | 11.10.16 | wiring diagram    |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
|   | 31   | message interface                  | 5     | 11.10.16 | wiring diagram    |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
|   | 32   | free sheet                         | 5     | 11.10.16 | wiring diagram    |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| B   | 33   | name plate, wiring, Accessories    | 5     | 11.10.16 | wiring diagram    |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
|   | 34   | bill of materials                  | 5     | 11.10.16 | bill of materials |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| C   |  |                                    |       |          |                   |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| D   |  |                                    |       |          |                   |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| E   |  |                                    |       |          |                   |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| F   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">3</td> <td colspan="2">LAES003</td> <td>01.11.14</td> <td>1b</td> <td>Date</td> <td>23.11.2011</td> <td>Design Center</td> <td>GER</td> <td colspan="6"></td> </tr> <tr> <td colspan="2">4</td> <td colspan="2">LAES002.098</td> <td>01.08.16</td> <td>1b</td> <td>Drawn</td> <td>ID</td> <td>Prod. Sales</td> <td></td> <td colspan="6"></td> </tr> <tr> <td colspan="2">5</td> <td colspan="2">LAES002.002</td> <td>11.10.16</td> <td>1b</td> <td>Date</td> <td></td> <td>Release</td> <td></td> <td colspan="6"></td> </tr> <tr> <td colspan="2">Issue</td> <td>Revision</td> <td>Date</td> <td>Name</td> <td>In/Out</td> <td>Checked</td> <td></td> <td></td> <td></td> <td colspan="6"></td> </tr> </table> |                                    |       |          |                   |         |            |               |     |   |  |   |  |   |  | 3       |  | LAES003     |  | 01.11.14 | 1b | Date | 23.11.2011 | Design Center | GER |  |  |  |  |     |  | 4              |  | LAES002.098 |  | 01.08.16 | 1b | Drawn   | ID | Prod. Sales |  |  |  |  |  |    |  | 5 |  | LAES002.002 |  | 11.10.16 | 1b | Date |  | Release |  |  |  |  |  |  |  | Issue |  | Revision | Date | Name | In/Out | Checked |  |  |  |  |  |  |  |  |  |
| 3   |  | LAES003                            |       | 01.11.14 | 1b                | Date    | 23.11.2011 | Design Center | GER |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| 4   |  | LAES002.098                        |       | 01.08.16 | 1b                | Drawn   | ID         | Prod. Sales   |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| 5   |  | LAES002.002                        |       | 11.10.16 | 1b                | Date    |            | Release       |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| Issue   |  | Revision                           | Date  | Name     | In/Out            | Checked |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
|   |  |                                    |       |          |                   |         |            |               |     | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Project</td> <td colspan="4">DIOX-A 5000</td> <td colspan="2">=A1</td> </tr> <tr> <td colspan="2">order number</td> <td colspan="4"></td> <td colspan="2">+S1</td> </tr> <tr> <td colspan="2">Drawing number</td> <td colspan="4">WAE7601</td> <td colspan="2">Sheet 3</td> </tr> <tr> <td colspan="2">Pa</td> <td colspan="4"></td> <td colspan="2">34</td> </tr> </table> |  |   |  |   |  | Project |  | DIOX-A 5000 |  |          |    | =A1  |            | order number  |     |  |  |  |  | +S1 |  | Drawing number |  | WAE7601     |  |          |    | Sheet 3 |    | Pa          |  |  |  |  |  | 34 |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| Project   |  | DIOX-A 5000                        |       |          |                   | =A1     |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| order number  |  |                                    |       |          |                   | +S1     |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
| Drawing number  |  | WAE7601                            |       |          |                   | Sheet 3 |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
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| <h3>Contents</h3>   |  |                                    |       |          |                   |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |
|  |  |                                    |       |          |                   |         |            |               |     |   |  |   |  |   |  |         |  |             |  |          |    |      |            |               |     |  |  |  |  |     |  |                |  |             |  |          |    |         |    |             |  |  |  |  |  |    |  |   |  |             |  |          |    |      |  |         |  |  |  |  |  |  |  |       |  |          |      |      |        |         |  |  |  |  |  |  |  |  |  |

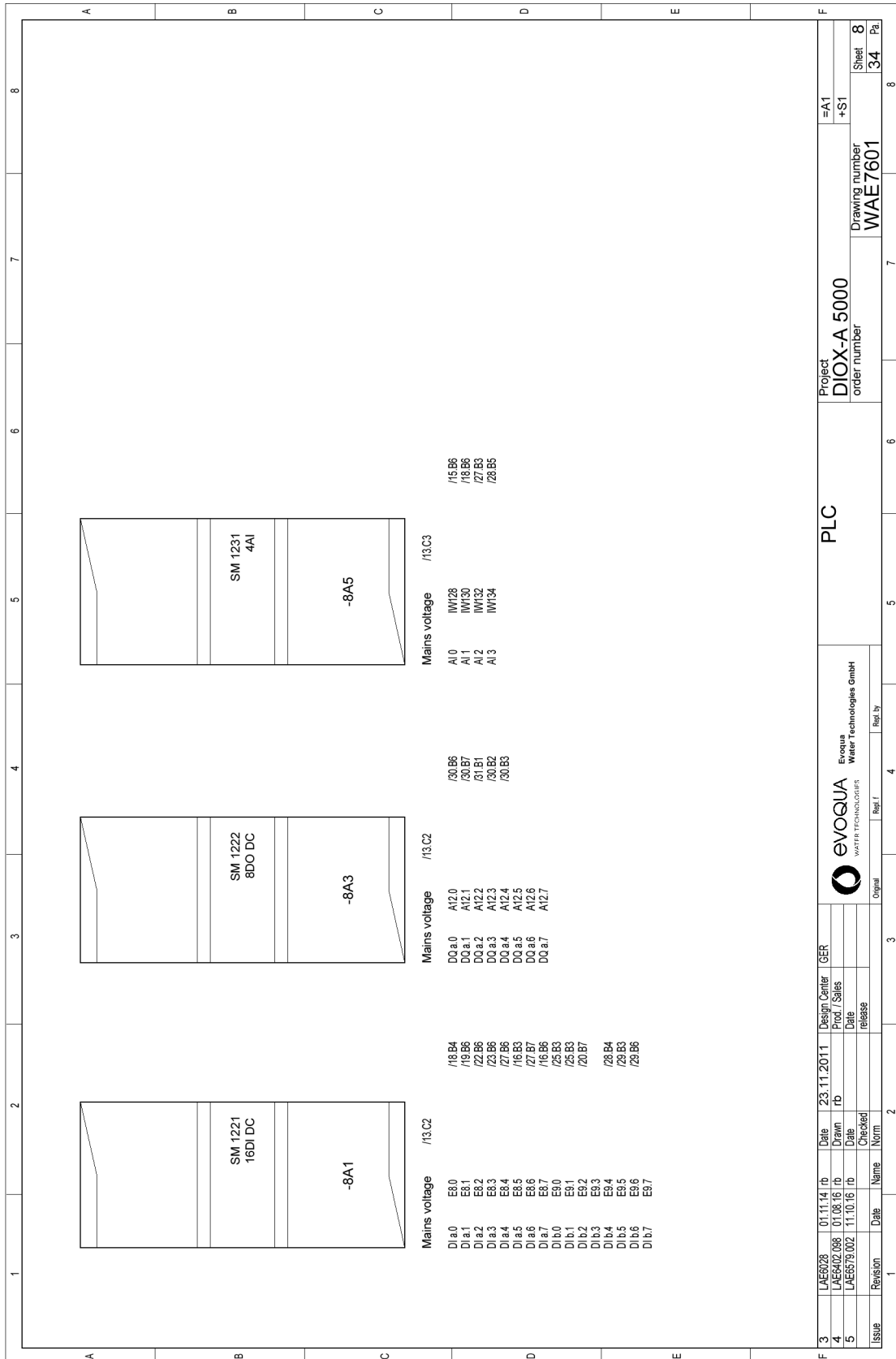










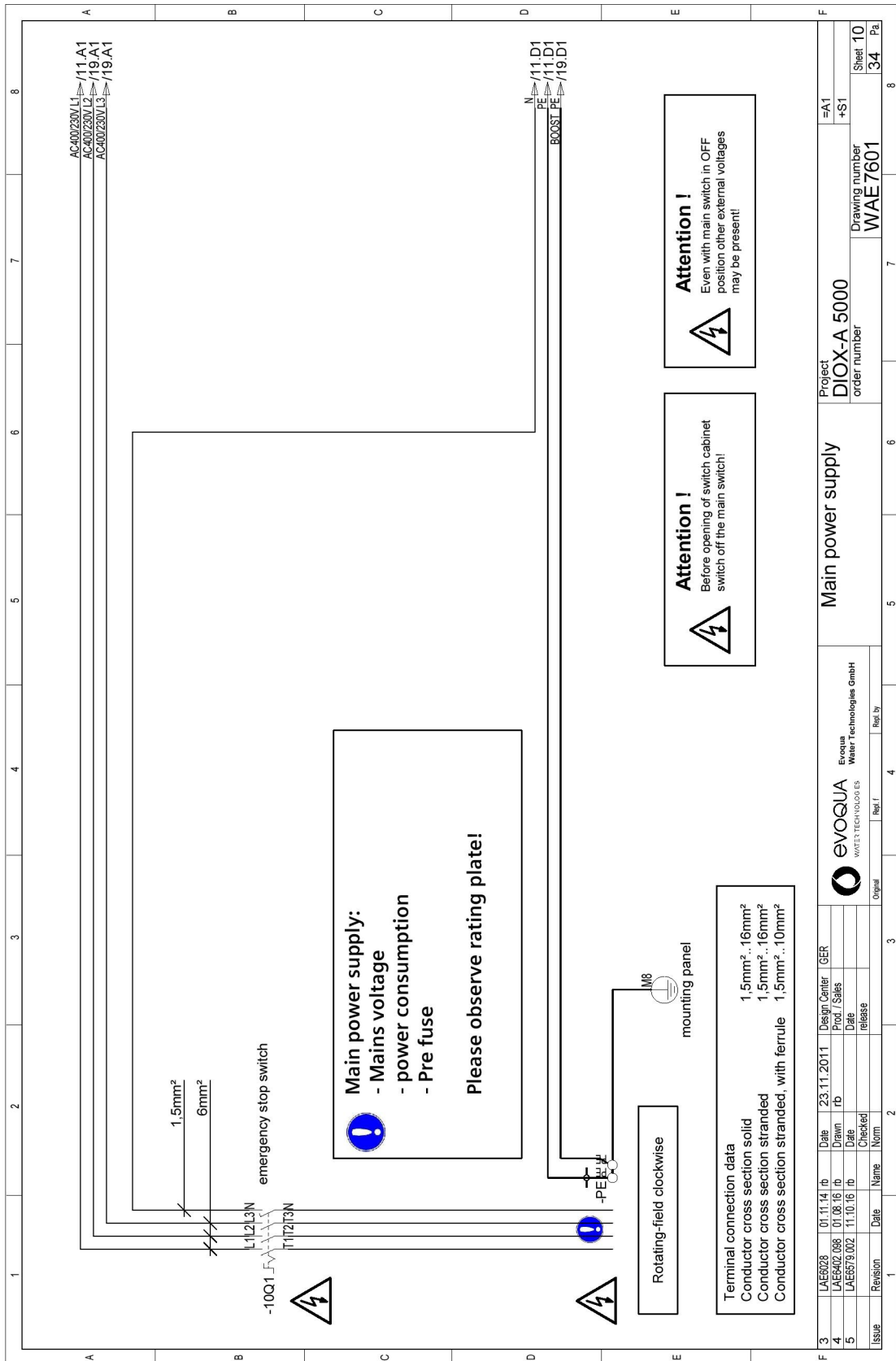


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| 3     | LA65028  | 01.11.14 | ib   | 23.11.2011 | Design Center | GER     |
| 4     | LA65028  | 01.08.16 | ib   |            | Proj. Sales   |         |
| 5     | LA65028  | 11.10.16 | ib   |            | Date          |         |
| Issue | Revision | Date     | Name | Norm       | Checked       | Release |

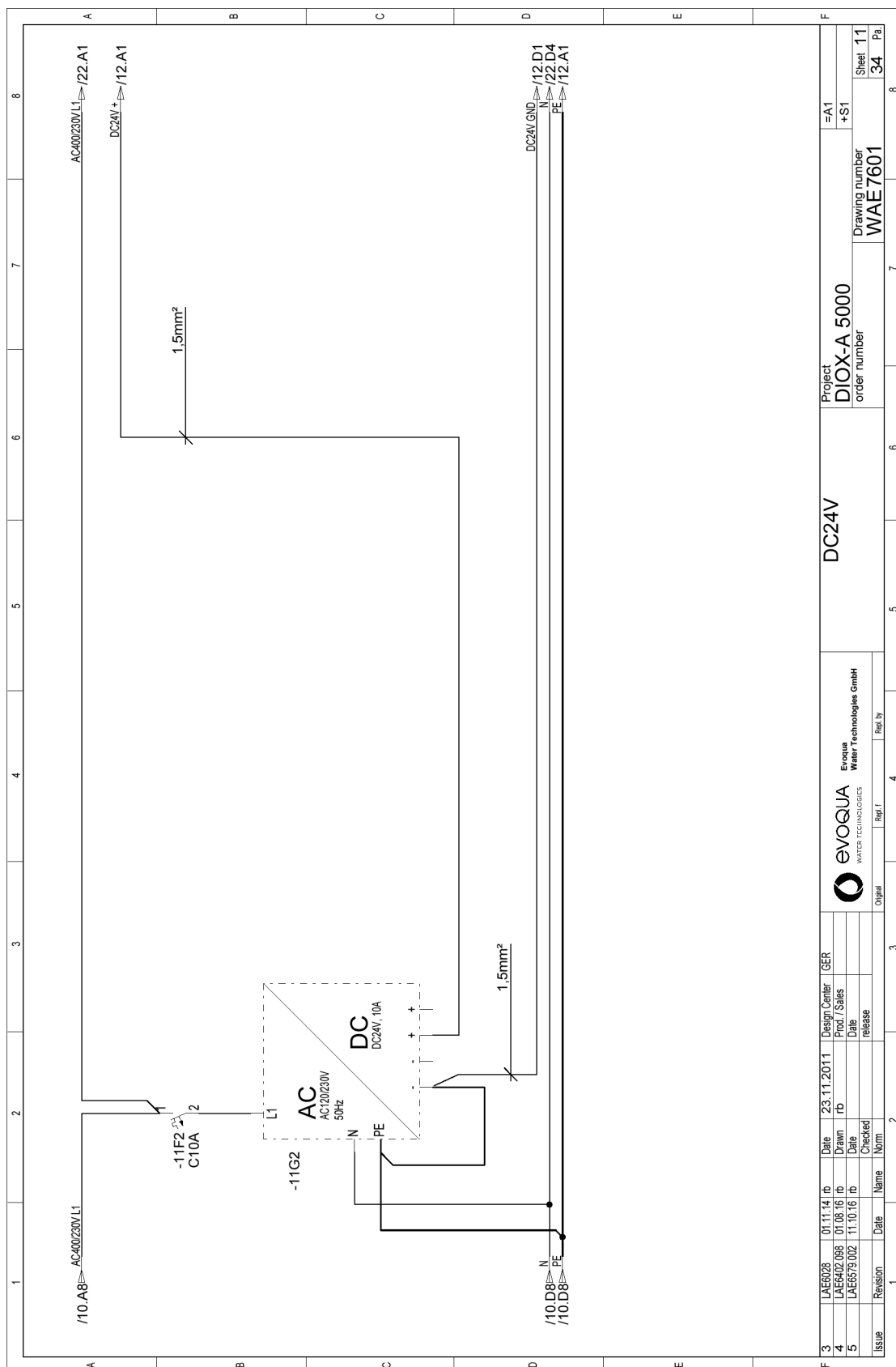
  

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| Project        | DIOX-A 5000 |
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| Project        | PLC         |
| Drawing number | WAE7601     |
| Sheet          | 8           |
| 34             | Pa.         |



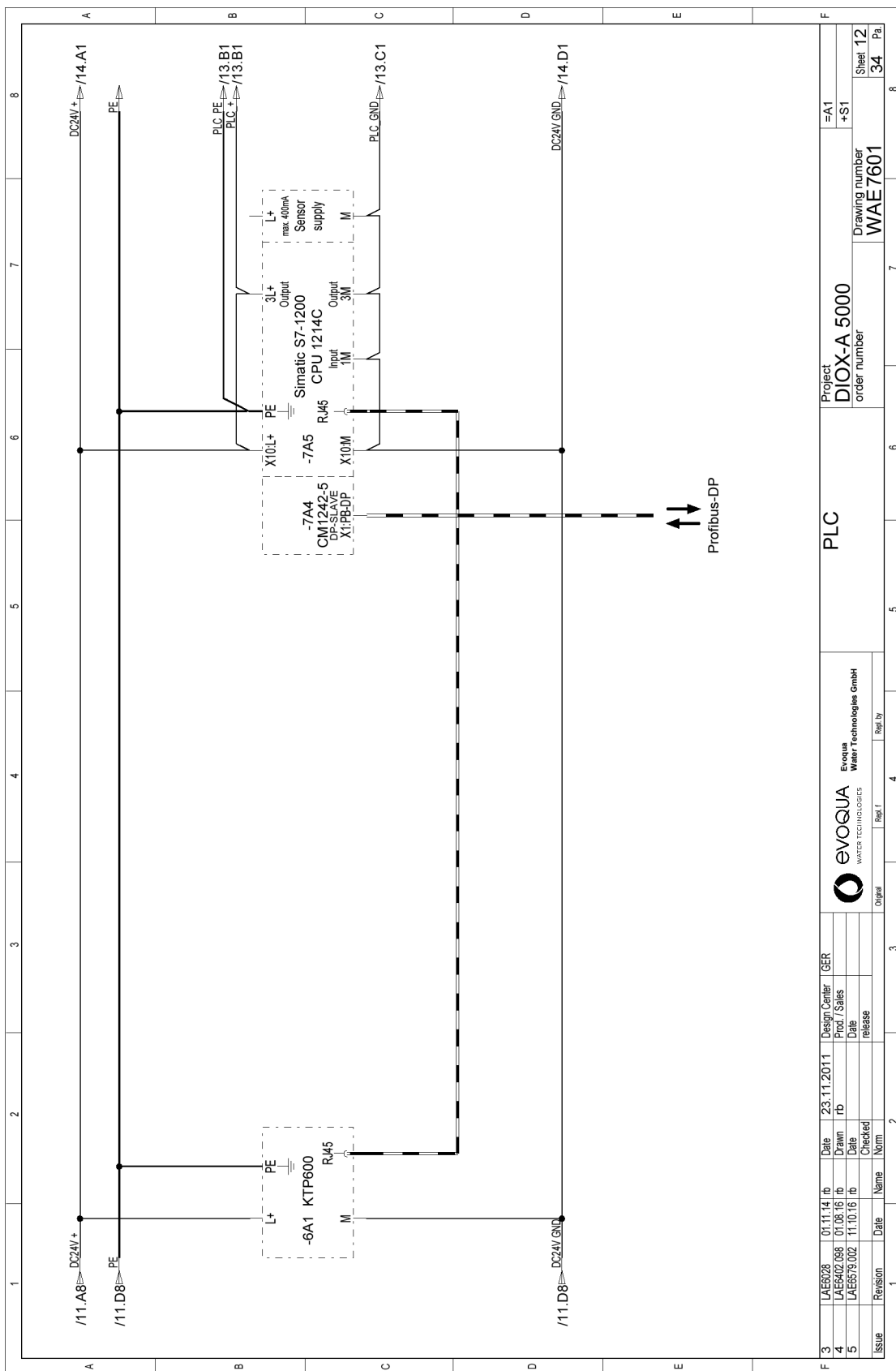


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| 4     | LAE502   | 08       | ib   | Drawn  | TD         | Prod./Sales   |         |
| 5     | LAE57    | 9.02     | ib   | Date   | release    |               |         |
| Issue | Revision | Date     | Name | Checked  | Norm       | Rep. I        | Rep. by |
|       |          |          |      |  |            | Original      |         |
|       |          |          |      |  |            |               |         |
|       |          |          |      | Project<br><b>DIOX-A 5000</b><br>order number<br><b>WAE 7601</b>     |            |               |         |
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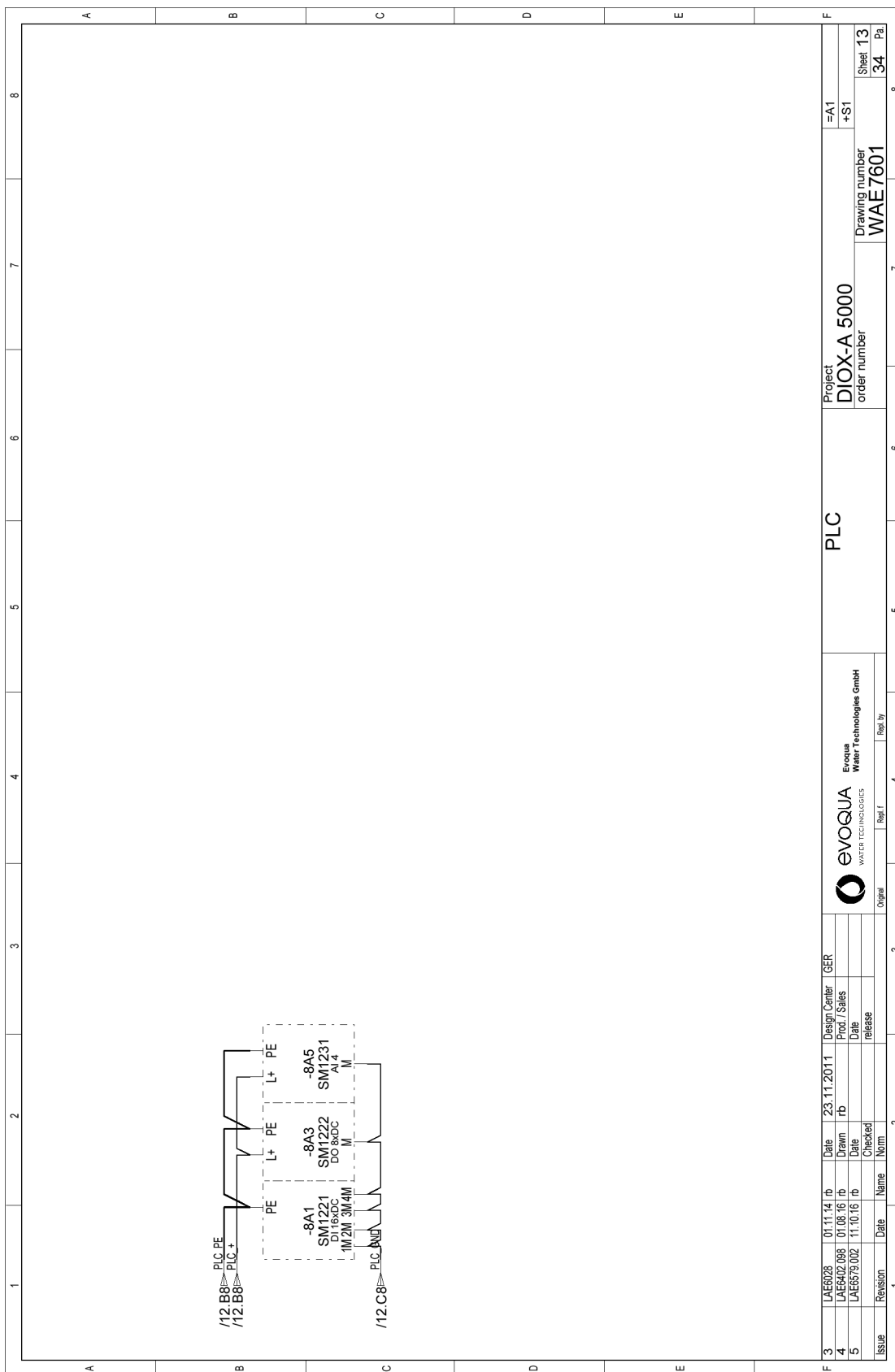


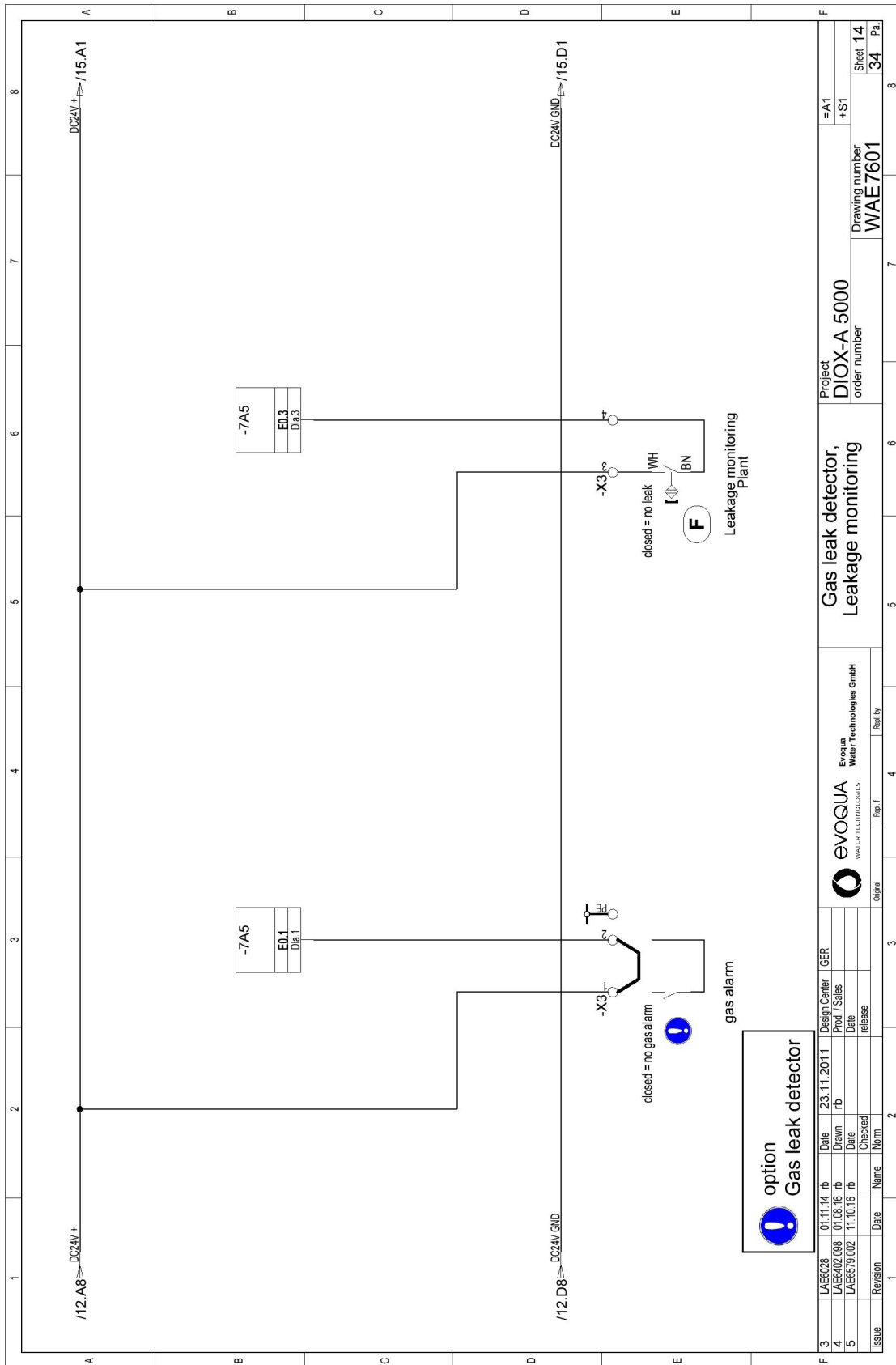
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| 4     | LAES02888 | 01.08.16 | 10   | Drawn          | FD         | Prod./Sales   |         |
| 5     | LAES59.02 | 11.10.16 | 10   | Checked        |            | release       |         |
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|       |           |          |      | Project        |            | DIOX-A 5000   |         |
|       |           |          |      | Drawing number |            | WAE7601       |         |
|       |           |          |      | order number   |            | 34            |         |
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|       |           |          |      | Page           |            | 34            |         |

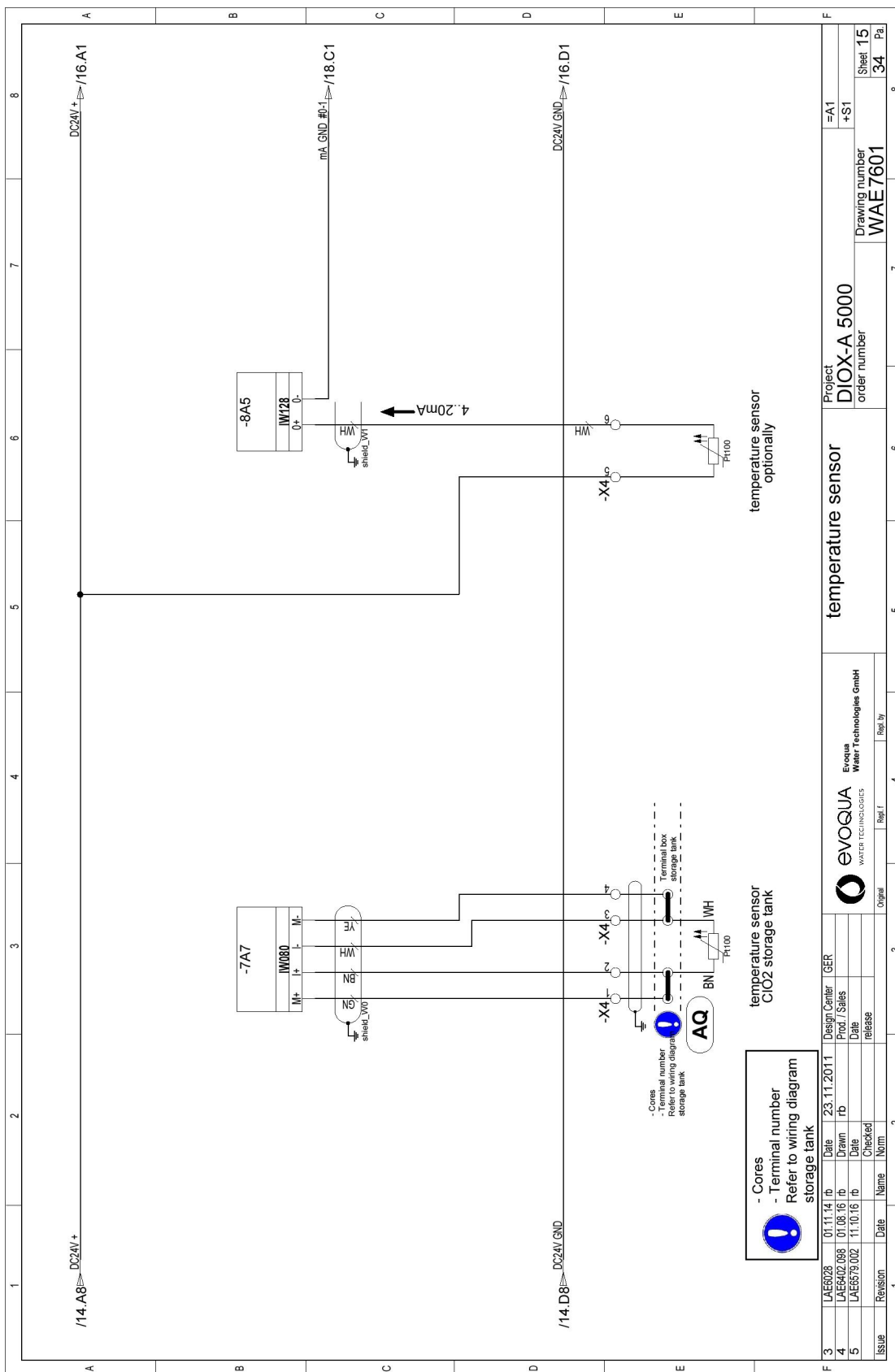




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| 4              | LA6402868 | 01.08.16 | ib   | Drawn       | fd         | Prod./Sales   |          |
| 5              | LA657302  | 11.10.16 | ib   | Date        |            | release       |          |
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| Order number   |           |          |      | WAE7601     |            | 34 Pa.        |          |







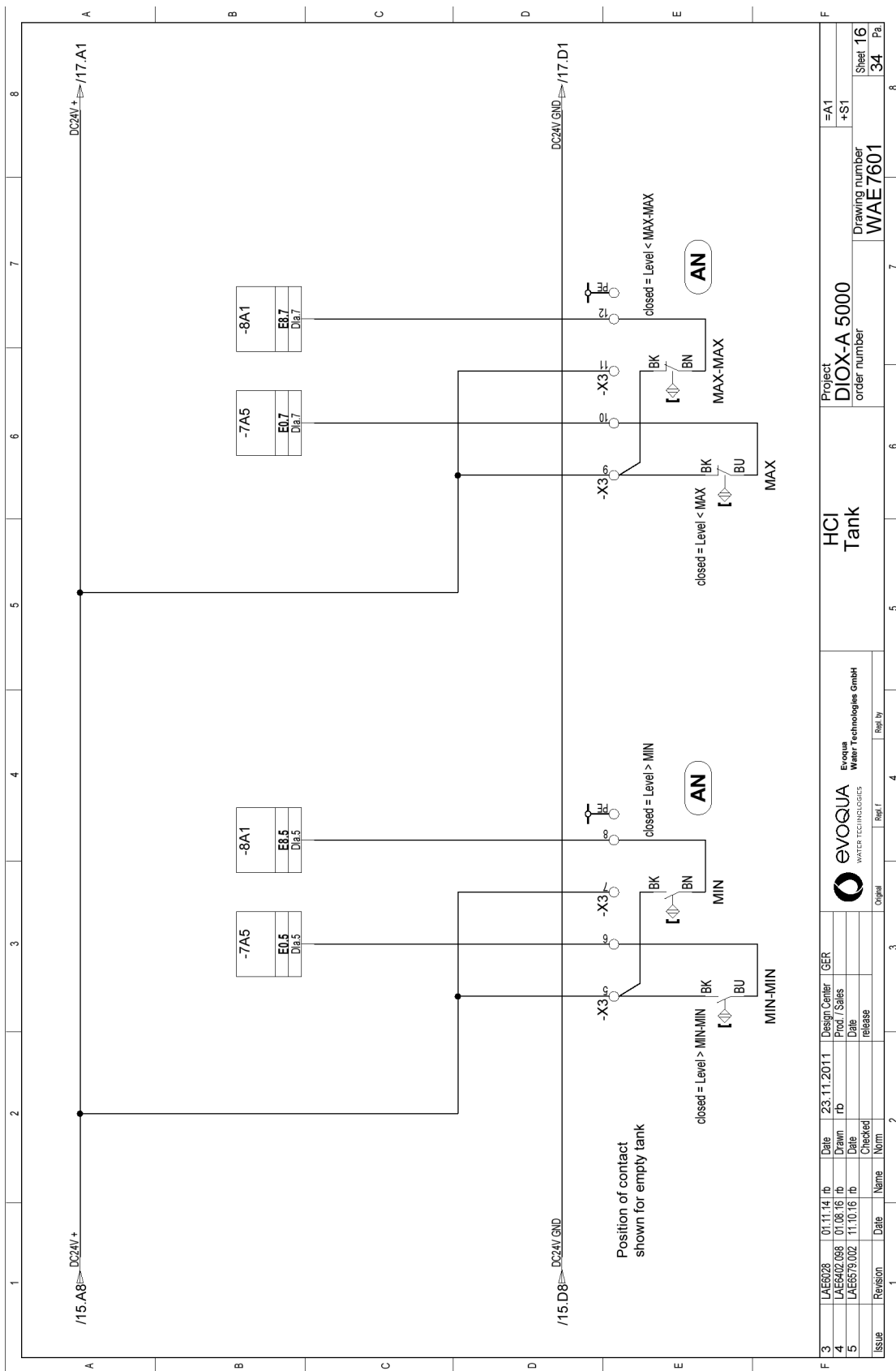
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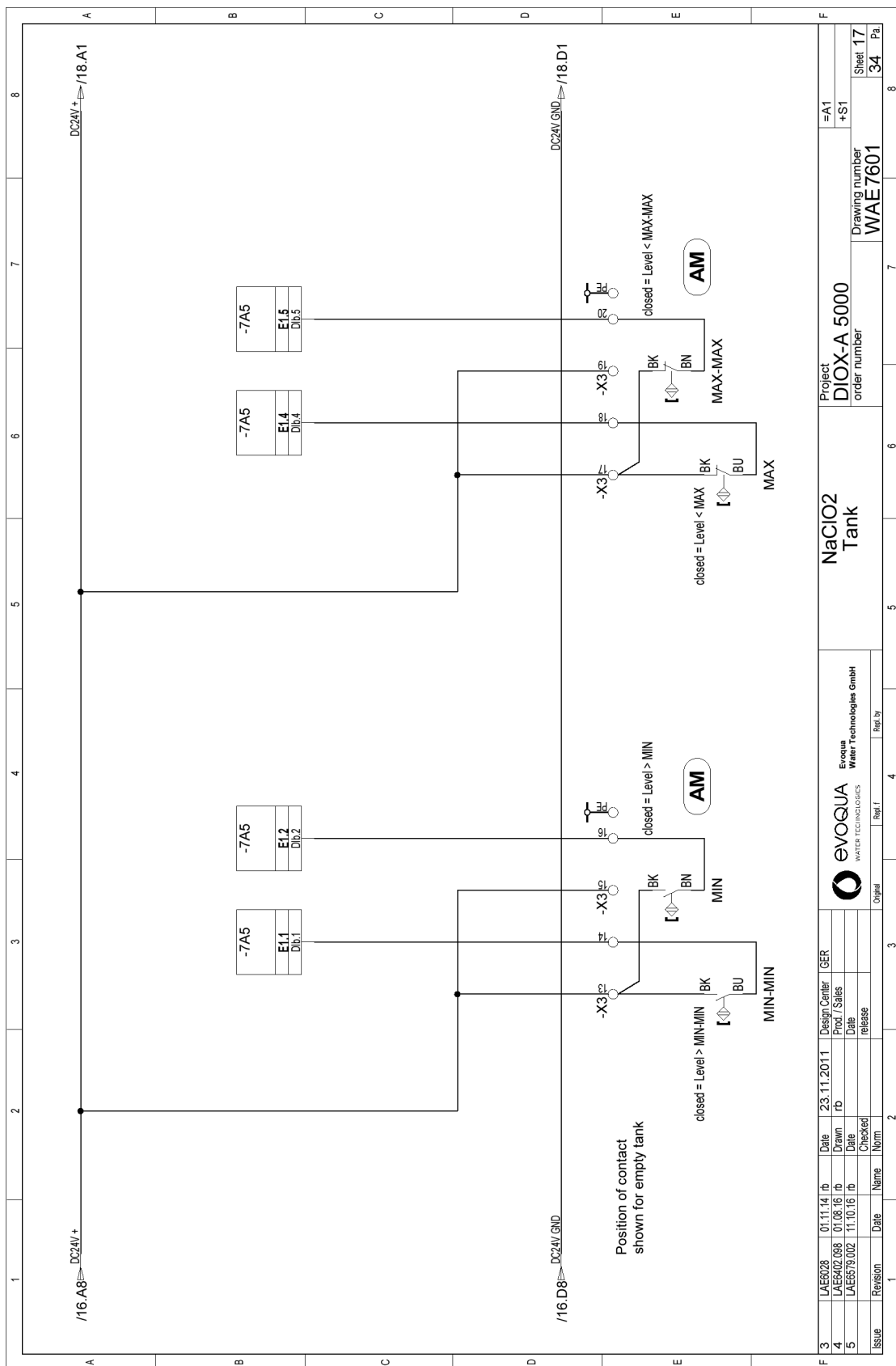
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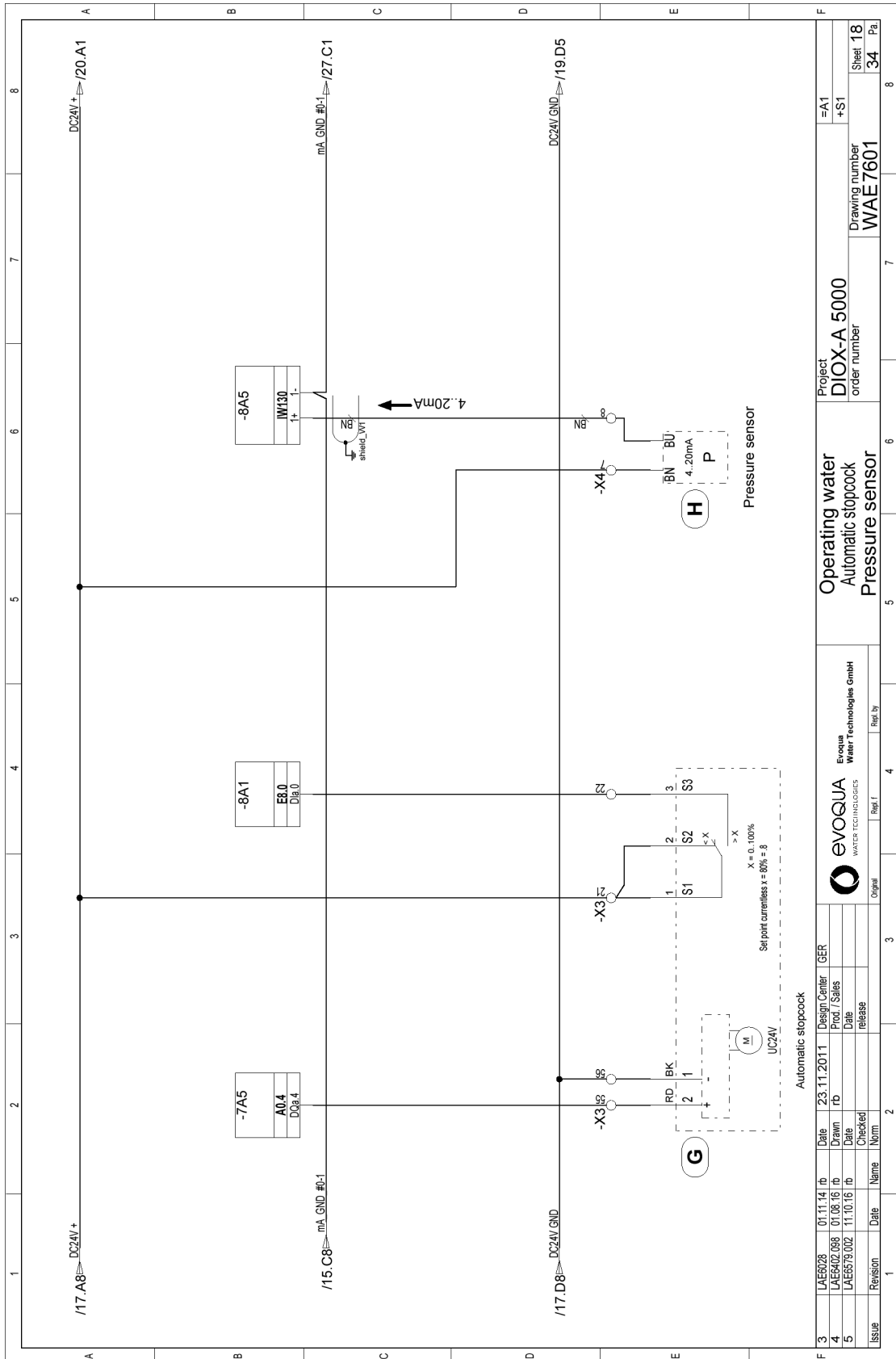
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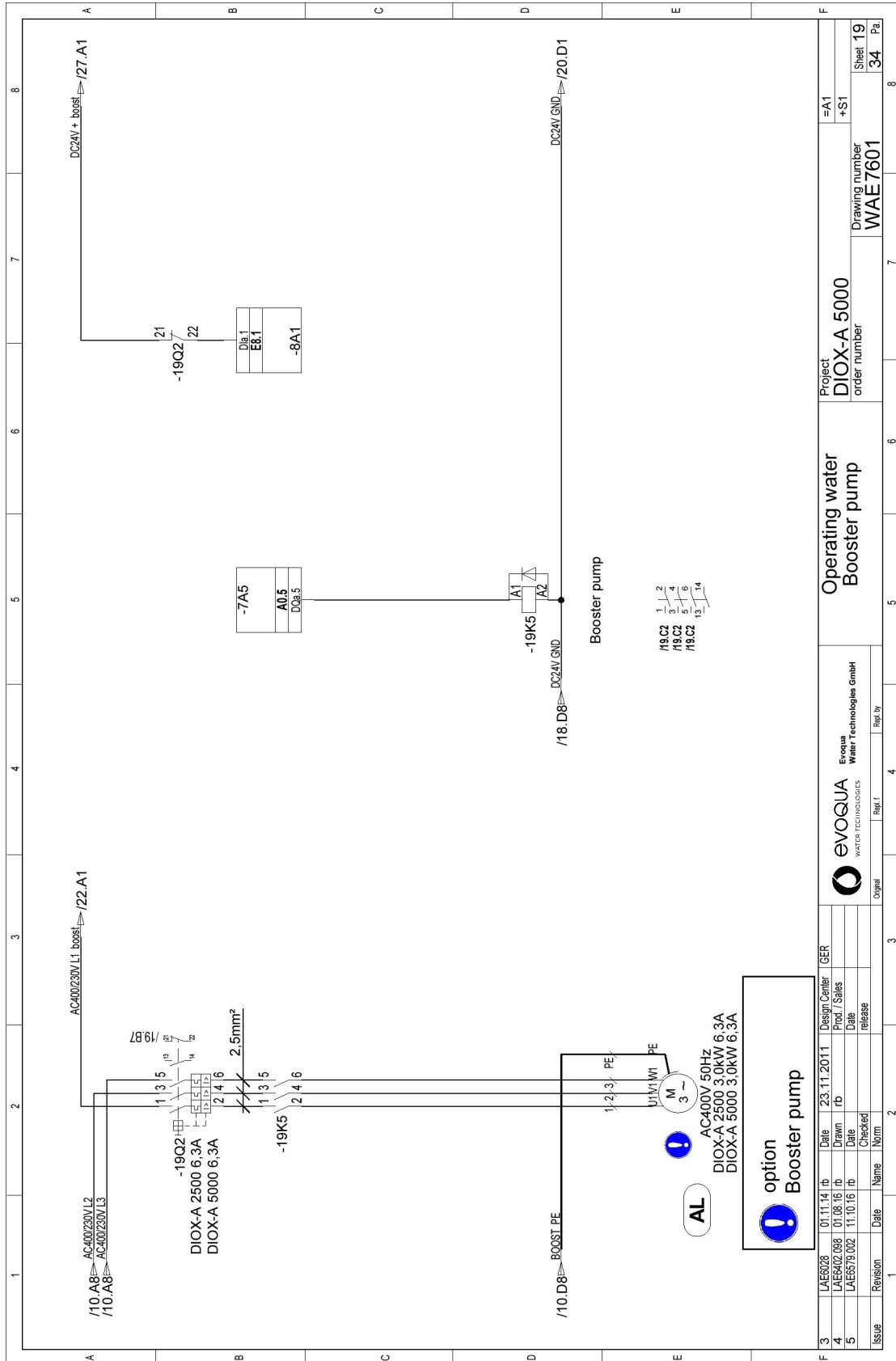


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| order number  |  |             |  | Sheet          |  | 16          |  |
|               |  |             |  | 34             |  | P2          |  |
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| Date          |  | 23.11.2011  |  | Project        |  | DIOX-A 5000 |  |
| Drawn         |  | FD          |  | order number   |  | WAE 7601    |  |
| Date          |  | 01.08.16    |  | Sheet          |  | 16          |  |
| Checked       |  |             |  | 34             |  | P2          |  |
| Date          |  | 11.10.16    |  |                |  |             |  |
| Norm          |  |             |  |                |  |             |  |
| Issue         |  | Date        |  | Name           |  |             |  |
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| 5             |  |             |  |                |  |             |  |
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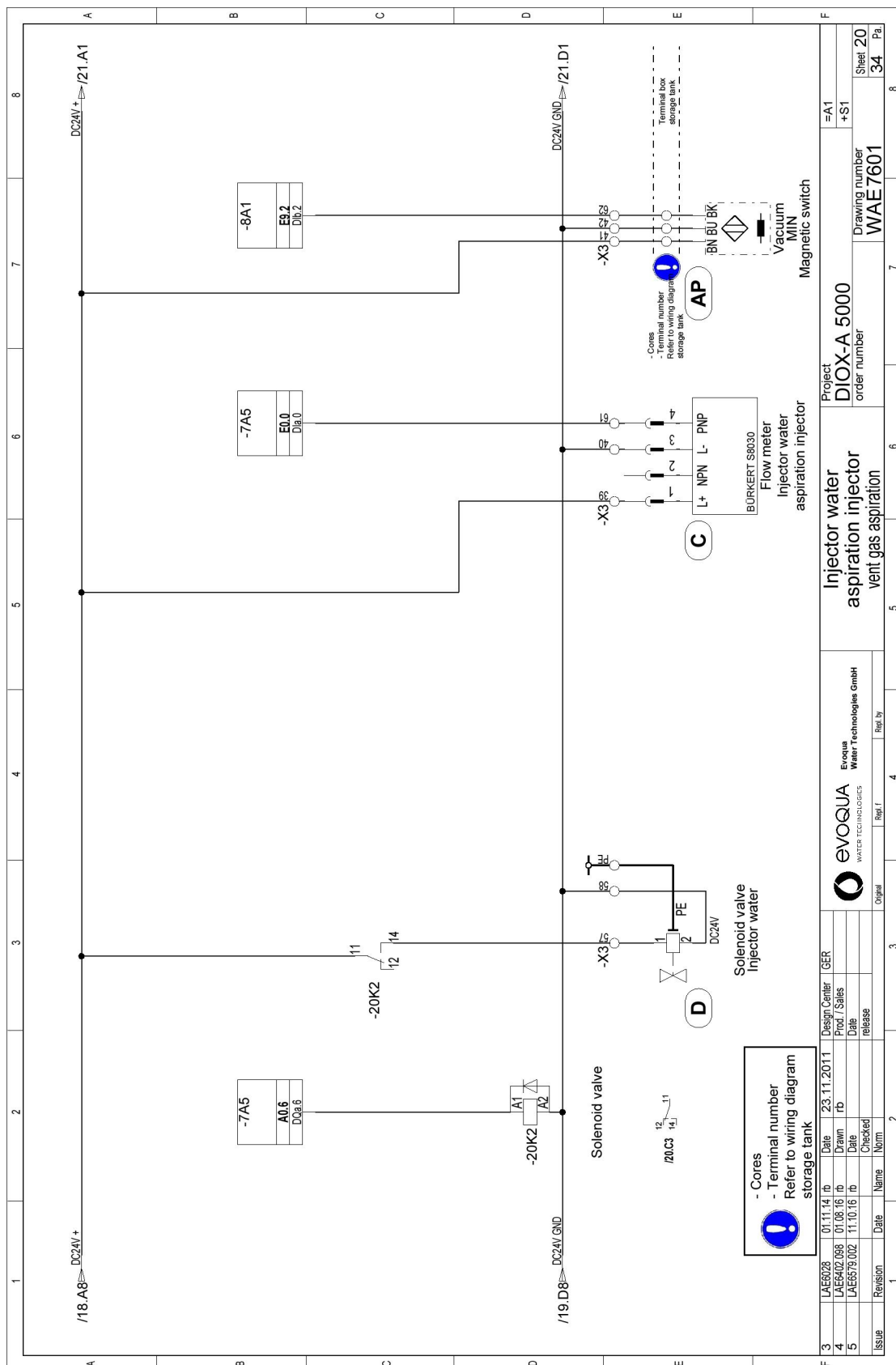


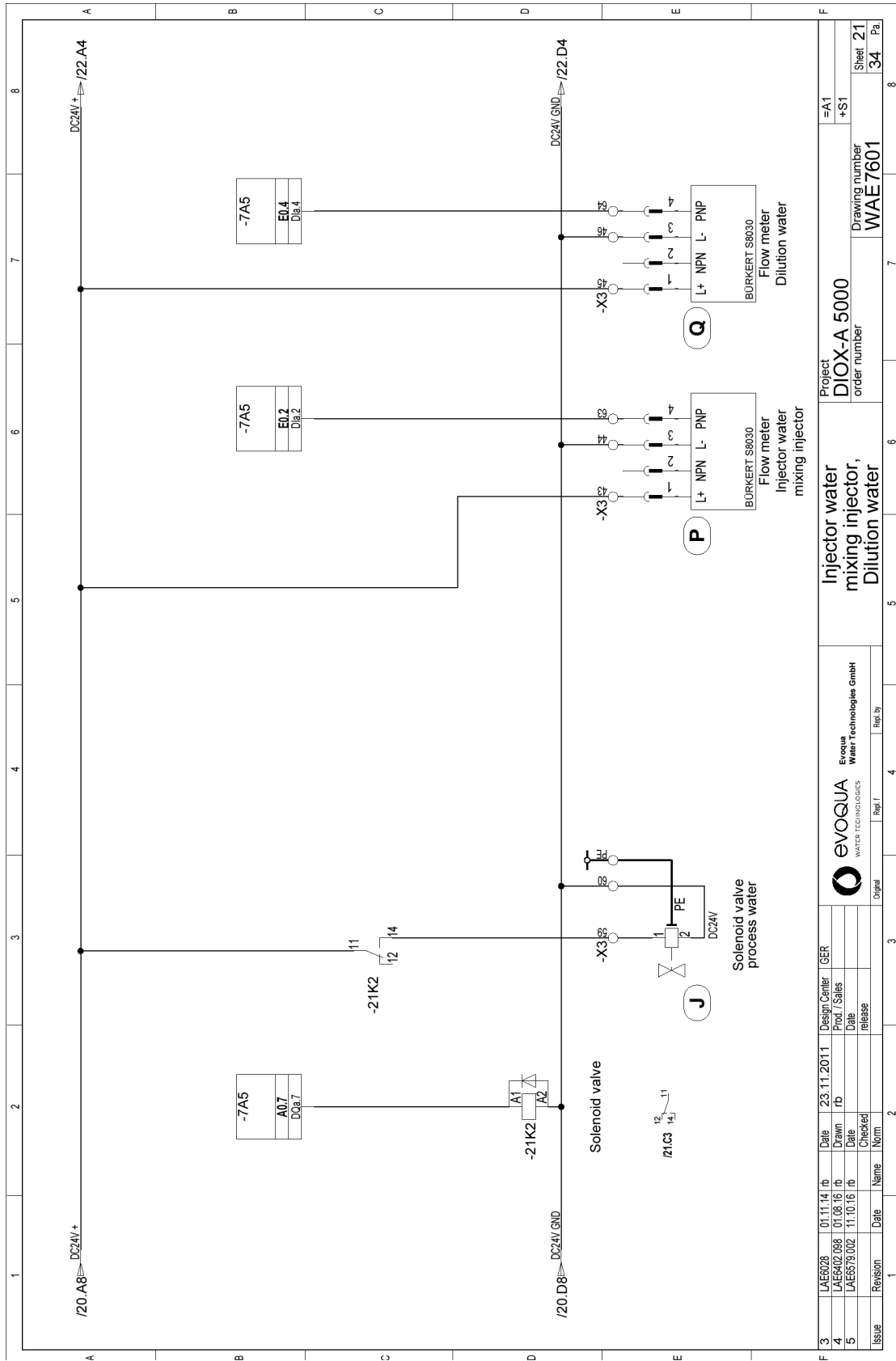
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| Issue |         | Revision | Date | Name | Drawn | Checked | Released | Design Center | GER | Date | 23.11.2011 | Proj. / Status | RD | Design Center | GER | Project | DIOX-A 5000 | order number | WAE 7601 | Drawing number | WAE 7601 | Sheet | 17 | 34 | Pg. | 8 |
| 3     | LAES708 | 01.11.14 | 10   |      |       |         |          |               |     |      |            |                |    |               |     |         |             |              |          |                |          |       |    |    |     |   |
| 4     | LAES708 | 01.08.16 | 10   |      |       |         |          |               |     |      |            |                |    |               |     |         |             |              |          |                |          |       |    |    |     |   |
| 5     | LAES702 | 11.10.16 | 10   |      |       |         |          |               |     |      |            |                |    |               |     |         |             |              |          |                |          |       |    |    |     |   |

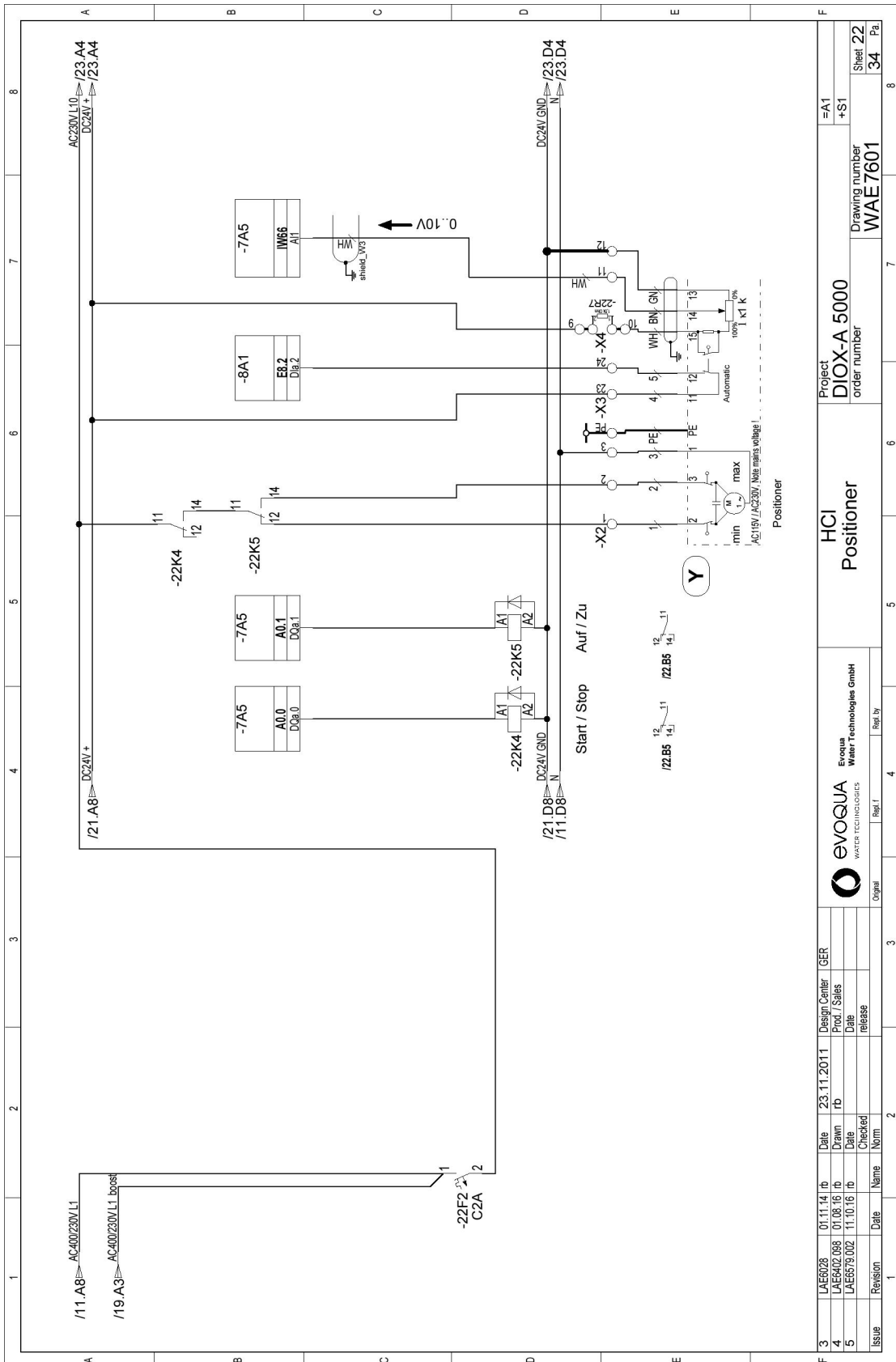












| Issue | Revision | Date     | Name | Norm | Checked | Date | Checked | Date | Prod / Sales | Design Center | GER |
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| 3     |          | 01.11.14 | fb   |      |         |      |         |      |              |               |     |
| 4     |          | 01.08.16 | fb   |      |         |      |         |      |              |               |     |
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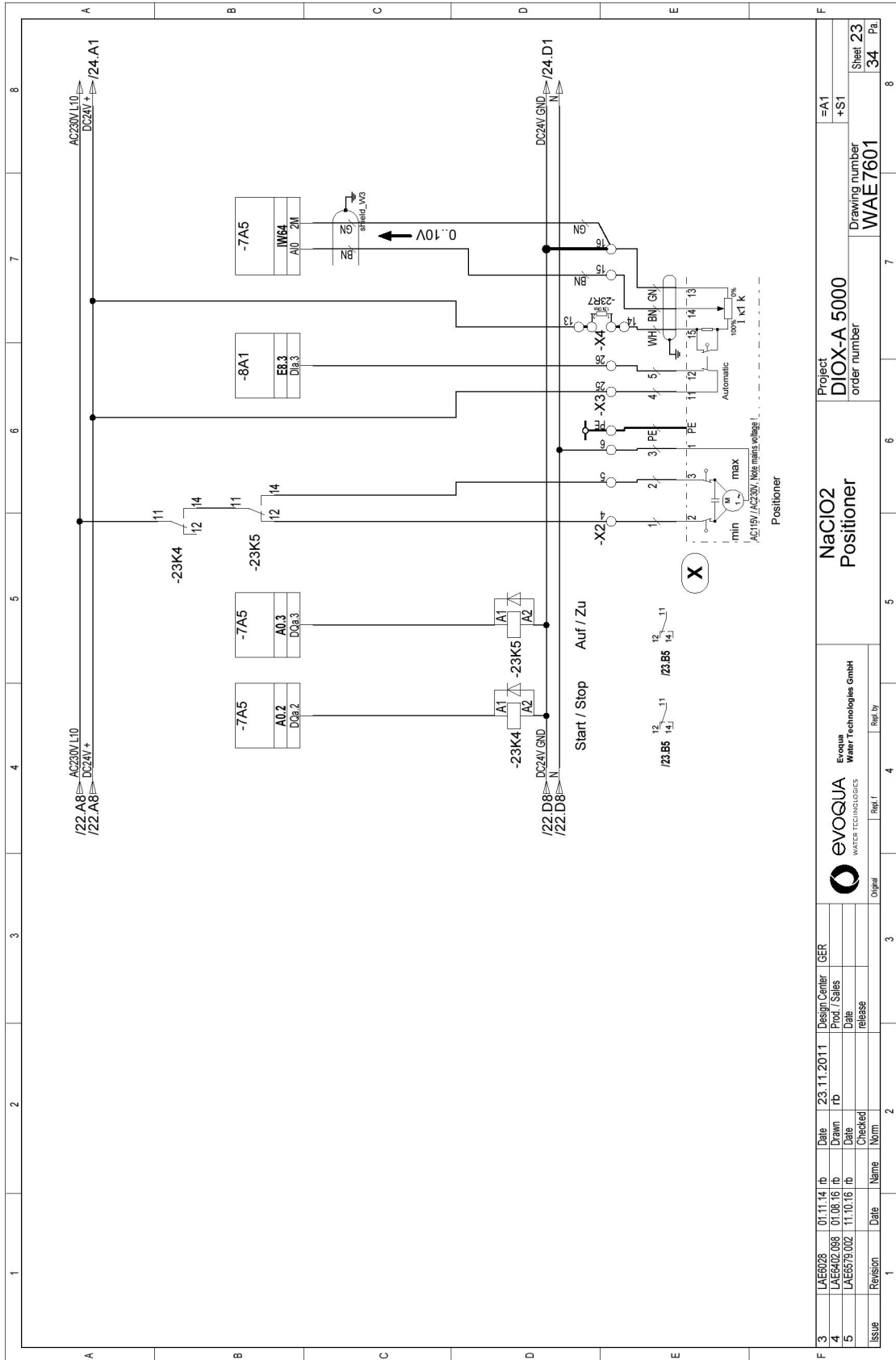
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| order number       |                | 34    |

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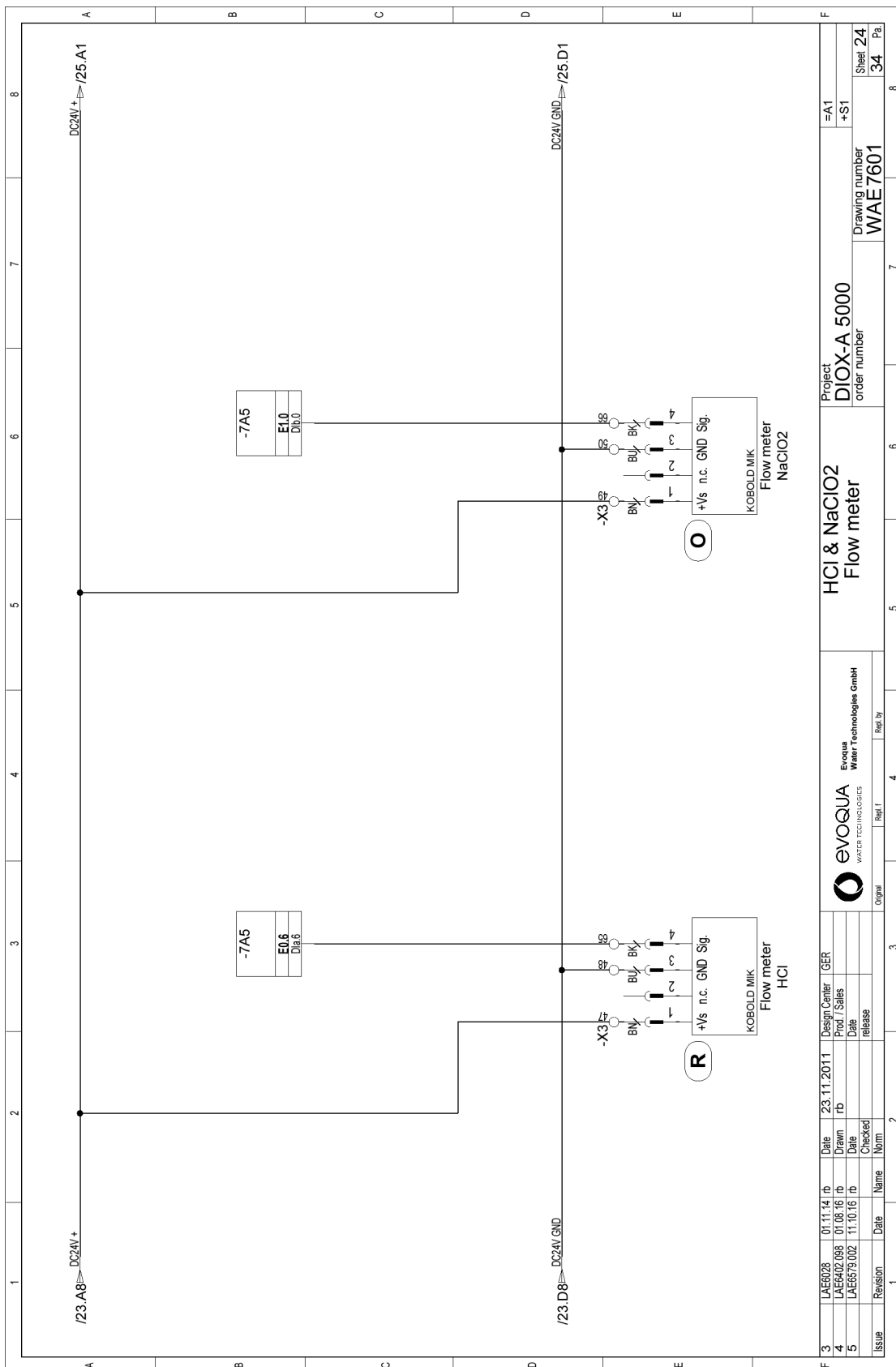
evoqua WATER TECHNOLOGIES

Evocqua Water Technologies GmbH

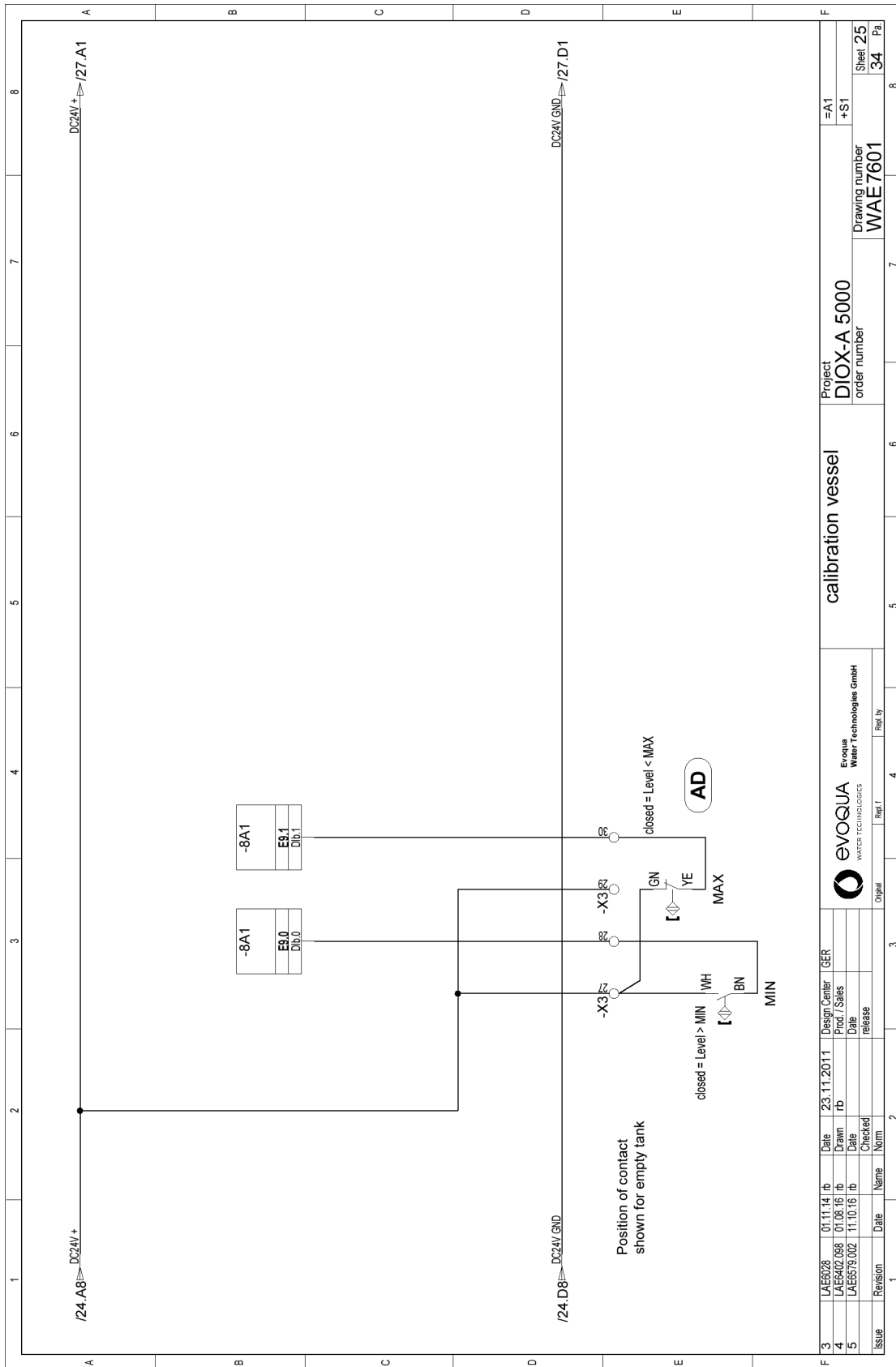
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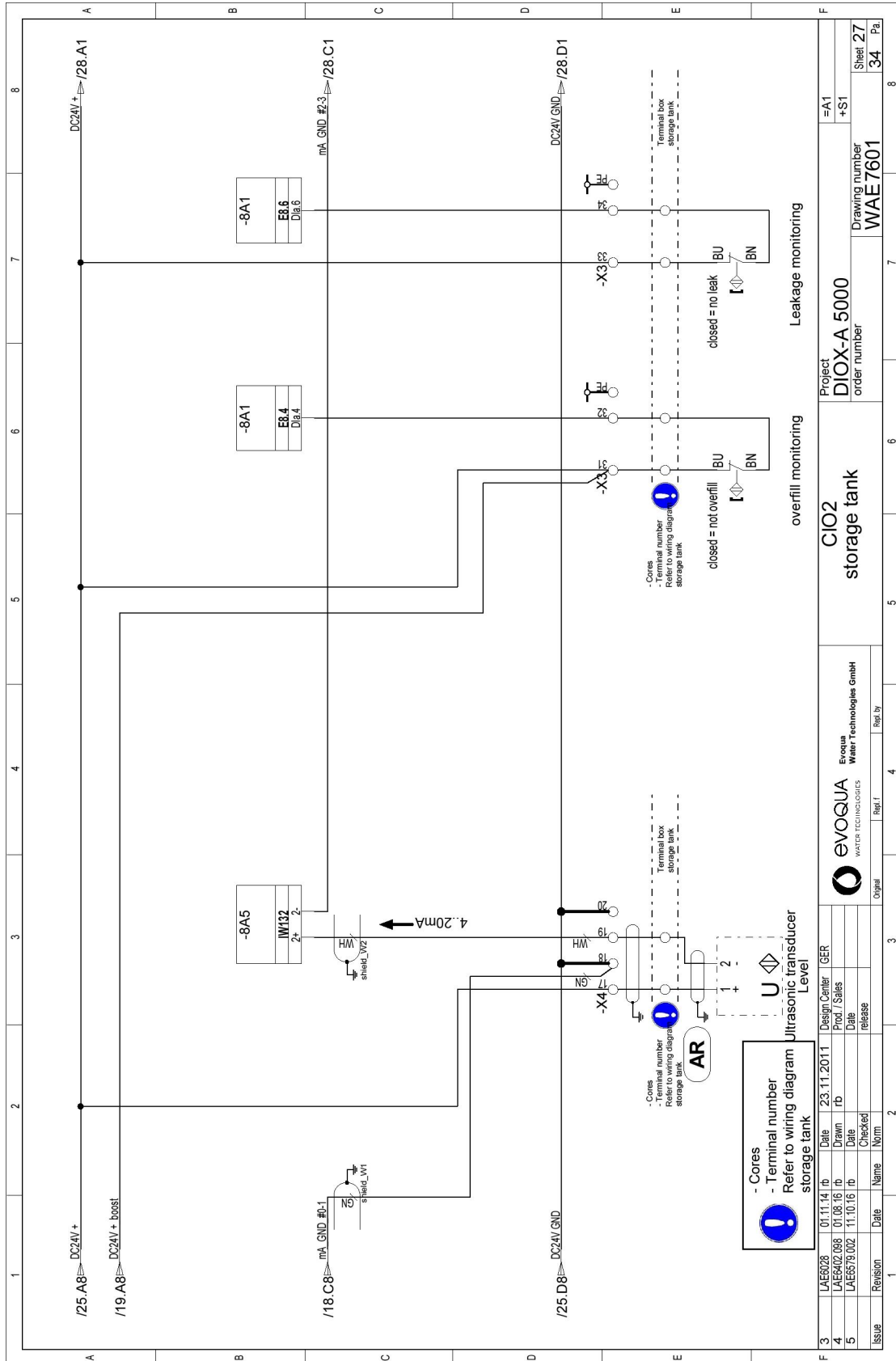
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| 3             | LAES928    | 01.11.14    | RD   |     |   |     |   |                |   |          |   |
| 4             | LAES402886 | 01.08.16    | RD   |     |   |     |   |                |   |          |   |
| 5             | LAES579.02 | 11.10.16    | RD   |     |   |     |   |                |   |          |   |
| Design Center |            | 23.11.2011  | GER  |     |   |     |   |                |   |          |   |
| Prod. / Sales |            |             |      |     |   |     |   |                |   |          |   |
| Date          |            |             |      |     |   |     |   |                |   |          |   |
| release       |            |             |      |     |   |     |   |                |   |          |   |
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| Repl. /       |            |             |      |     |   |     |   |                |   |          |   |
| Repl. by      |            |             |      |     |   |     |   |                |   |          |   |
| Project       |            | DIOX-A 5000 |      | =A1 |   | +S1 |   | Drawing number |   | Sheet 23 |   |
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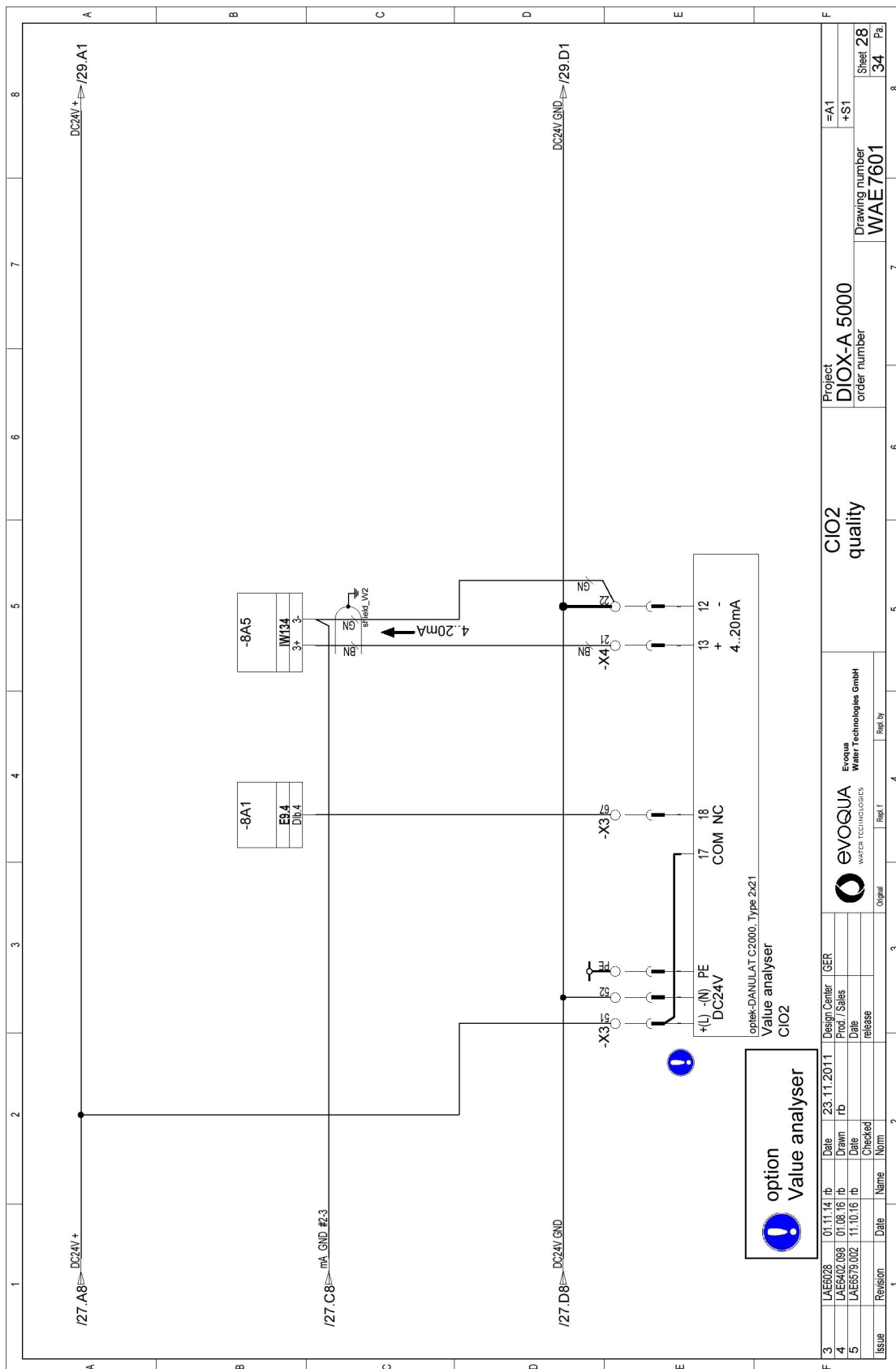
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| 3              | LAES028 | 01.11.14    | FD   |                         |      |                         |   |                         |   |                         |   |                         |  |
| 4              | LAES028 | 01.08.16    | FD   |                         |      |                         |   |                         |   |                         |   |                         |  |
| 5              | LAES028 | 11.10.16    | FD   |                         |      |                         |   |                         |   |                         |   |                         |  |
| Design Center  |         | GER         |      | 23.11.2011              |      | Date                    |   | 23.11.2011              |   | Date                    |   | 23.11.2011              |  |
| Prod./Sales    |         | release     |      | release                 |      | release                 |   | release                 |   | release                 |   | release                 |  |
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| eVOQUA         |         | Evocqua     |      | Water Technologies GmbH |      | Water Technologies GmbH |   | Water Technologies GmbH |   | Water Technologies GmbH |   | Water Technologies GmbH |  |
| Project        |         | DIOX-A 5000 |      | DIOX-A 5000             |      | DIOX-A 5000             |   | DIOX-A 5000             |   | DIOX-A 5000             |   | DIOX-A 5000             |  |
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| Drawing number |         | =A1         |      | =A1                     |      | =A1                     |   | =A1                     |   | =A1                     |   | =A1                     |  |
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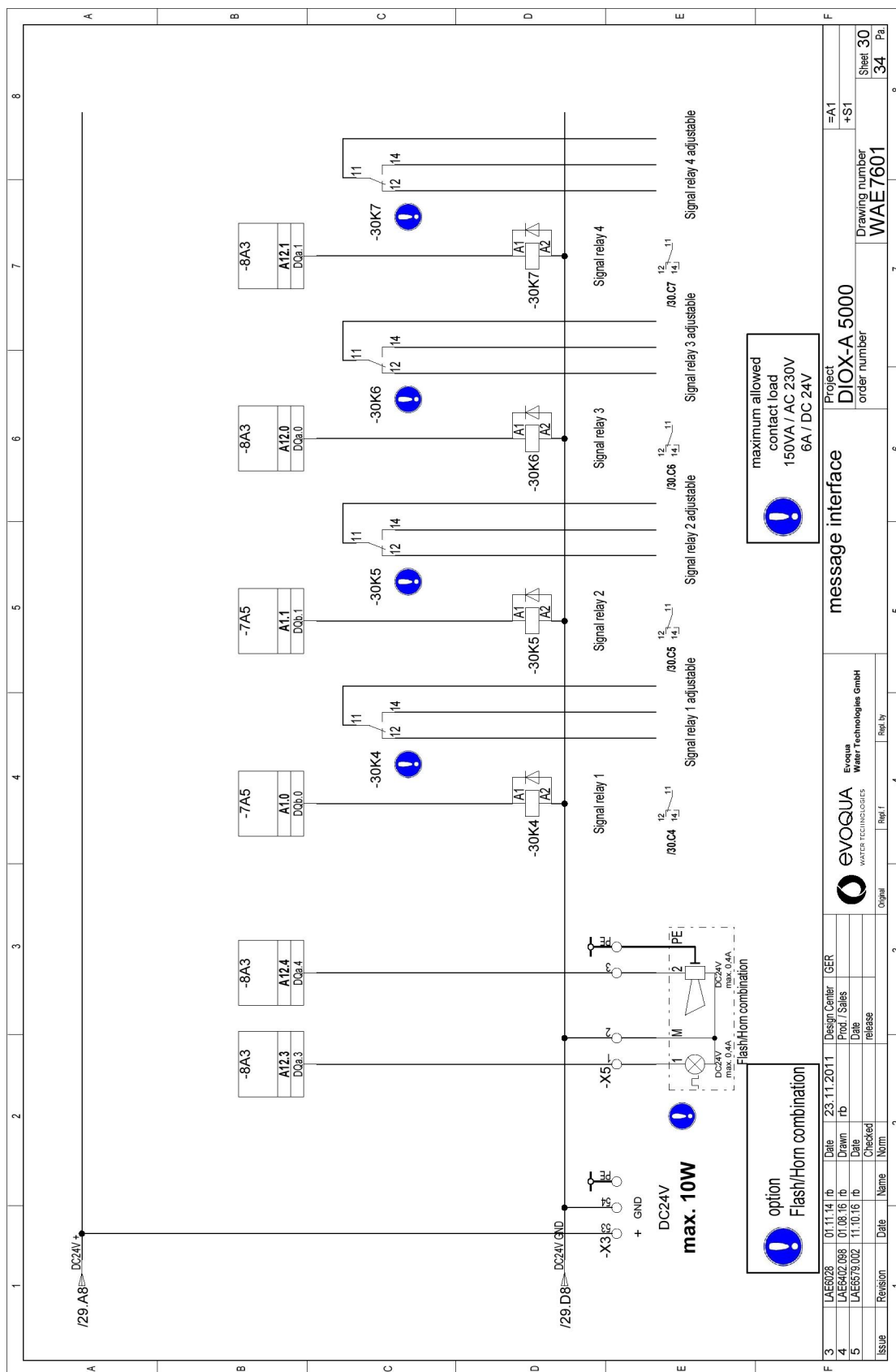
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| 3     | LA66028  | 01.11.14 | ID                                      | 23.11.2011 | Design Center | GER     | Project                 |         |          |
| 4     | LA66028  | 01.06.16 | ID                                      |            | Prod. Status  |         | DIOX-A 5000             |         |          |
| 5     | LA6579   | 11.10.16 | ID                                      |            | Date release  |         | order number            |         |          |
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|       |          |          |   |            |               |         | Water Technologies GmbH |         |          |
|       |          |          |   |            |               |         | Original                | Repl. I | Repl. by |
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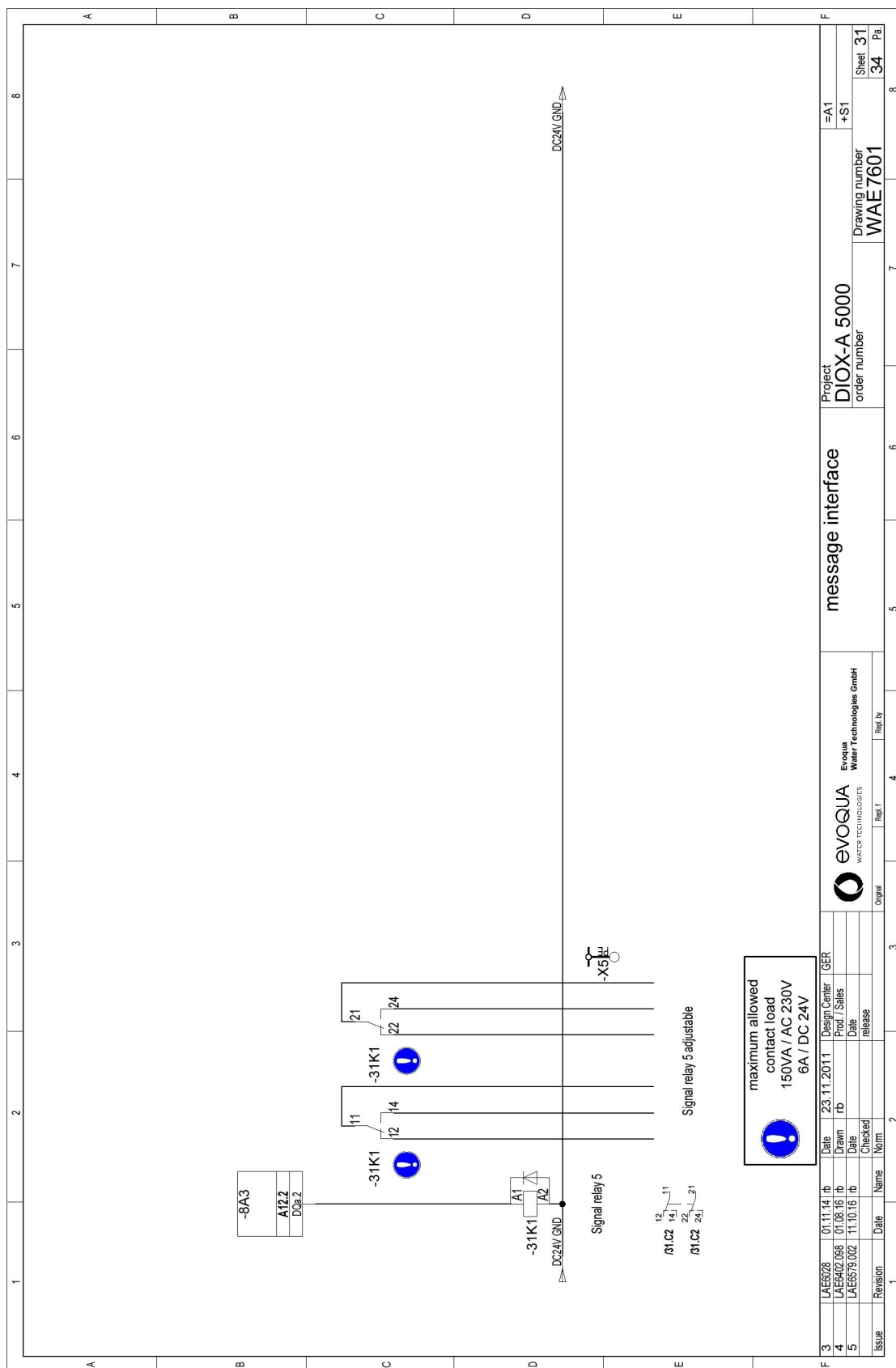




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| 4     | LAE6402.068 | 01.08.16 | ib   | Drawn | td         | Prof / Sales  |     |
| 5     | LAE6579.002 | 11.10.16 | ib   | Date  | release    |               |     |
| Issue | Revision    | Date     | Name | Norm  | Checked    | By            |     |

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| Project        |    | DIOX-A 5000 |
| Drawing number |    | WAE.7601    |
| Sheet          | 30 | Pa          |
| 34             |    |             |



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| 4     |  | LAE9402.068             | 01.08.16 | fb   | Drawn | fd         | Print / Sales |     | Original |  | Reg. I |  | Reg. II |  | Reg. by |  |
| 5     |  | LAE6579.002             | 11.10.16 | fb   | Date  |            | release       |     | Original |  | Reg. I |  | Reg. II |  | Reg. by |  |
| Issue |  | Revision                | Date     | Name | Norm  |            |               |     | Original |  | Reg. I |  | Reg. II |  | Reg. by |  |
| F     |  | Project DIOX-A 5000     |          |      |       |            |               |     |          |  |        |  |         |  |         |  |
| F     |  | Drawing number WAE 7601 |          |      |       |            |               |     |          |  |        |  |         |  |         |  |
| F     |  | order number            |          |      |       |            |               |     |          |  |        |  |         |  |         |  |
| F     |  | Sheet 32                |          |      |       |            |               |     |          |  |        |  |         |  |         |  |
| F     |  | 34 Pk.                  |          |      |       |            |               |     |          |  |        |  |         |  |         |  |
| F     |  | =A1                     |          |      |       |            |               |     |          |  |        |  |         |  |         |  |
| F     |  | +S1                     |          |      |       |            |               |     |          |  |        |  |         |  |         |  |

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| bill of materials: W3T218472 |      |  |           |  |              |           |  |  |  |
|------------------------------|------|--|-----------|--|--------------|-----------|--|--|--|
| No.                          | Qty. | Equipment identifier                                   | Part-no.  | Description                                      | Manufacturer | Order no. |  |  |  |
| 1                            | 1    | -19K5  | W2T504917 | Surpression diode S00                            |              |           |  |  |  |
| 2                            | 1    | -10Q1  | W2T504315 | emergency stop switch 25A 4-p                    |              |           |  |  |  |
| 3                            | 1    | -33A5.1  | W3T218476 | terminal DIOX-A HCL                              |              |           |  |  |  |
| 4                            | 1    | -31K1  | W2T504096 | Switching relays DC24V, 2NONC                    |              |           |  |  |  |
| 5                            | 10   | -20K2-21K2-22K4-22K5-23K4-23K5<br>-30K4-30K5-30K6-30K7 | W2T504273 | Switching relays DC24V, 1NONC                    |              |           |  |  |  |
| 6                            | 10   | -20K2-21K2-22K4-22K5-23K4-23K5<br>-30K4-30K5-30K6-30K7 | W2T505827 | Relays terminal                                  |              |           |  |  |  |
| 7                            | 1    | -20K2  | W2T506866 | relay bridge 1NONC                               |              |           |  |  |  |
| 8                            | 1    | -22F2  | W2T504080 | circuit breaker C2A, 1-p                         |              |           |  |  |  |
| 9                            | 1    | -11F2  | W2T504084 | circuit breaker C10A, 1-p                        |              |           |  |  |  |
| 10                           | 1    | -33A5  | W3T218542 | Mounting kit DIOX-A HCl                          |              |           |  |  |  |
| 11                           | 1    | -19K5  | W2T506255 | contactor DC24V, 4kW                             |              |           |  |  |  |
| 12                           | 1    | -11G2  | W2T504673 | DC-power-supply SITOP smart AC120/230V/DC24V 10A |              |           |  |  |  |
| 13                           | 1    | -A1  | W3T218474 | control cabinet 600x600x200mm                    |              |           |  |  |  |
| 14                           | 1    | -101   | W2T504903 | sticker Rotating-field clockwise                 |              |           |  |  |  |
| 15                           | 1    | -105   | W2T505826 | label "attention"                                |              |           |  |  |  |
| 16                           | 1    | -106   | W2T507237 | label "attention"                                |              |           |  |  |  |
| 17                           | 1    | -6A1   | W2T533234 | Operator Panel KTP600 Basic color                |              |           |  |  |  |
| 18                           | 1    | -7A5   | W2T533221 | S7-1200, CPU1214 DC/DC/DC                        |              |           |  |  |  |
| 19                           | 1    | -8A5   | W2T533228 | S7-1200 SM1231 4AI                               |              |           |  |  |  |
| 20                           | 1    | -6A1   | W2T533292 | Connecting cable RJ45/RJ45 1m                    |              |           |  |  |  |
| 21                           | 1    | -7A7   | W2T536242 | S7-1200 SB1231 RTD 1xAI                          |              |           |  |  |  |
| 22                           | 1    | -8A1   | W2T536695 | S7-1200 SM1221 16DI DC24V                        |              |           |  |  |  |
| 23                           | 1    | -8A3   | W2T536697 | S7-1200 SM1222 8DO DC24V                         |              |           |  |  |  |
| 24                           | 1    | -7A4   | W2T536698 | S7-1200 CM1242-5 Profibus DP-Slave               |              |           |  |  |  |

| Issue | Revision   | Date     | Name | Norm | Checked | Date       | Drawn | Date | Design Center | GER |
|-------|------------|----------|------|------|---------|------------|-------|------|---------------|-----|
| 3     | LAE6028    | 01.11.14 | fb   |      |         | 23.11.2011 | rd    |      |               |     |
| 4     | LAE60288   | 07.08.16 | fb   |      |         |            |       |      |               |     |
| 5     | LAE6519.02 | 11.10.16 | fb   |      |         |            |       |      |               |     |

| Original | Reg. I | Reg. II | Reg. III |
|----------|--------|---------|----------|
|          |        |         |          |

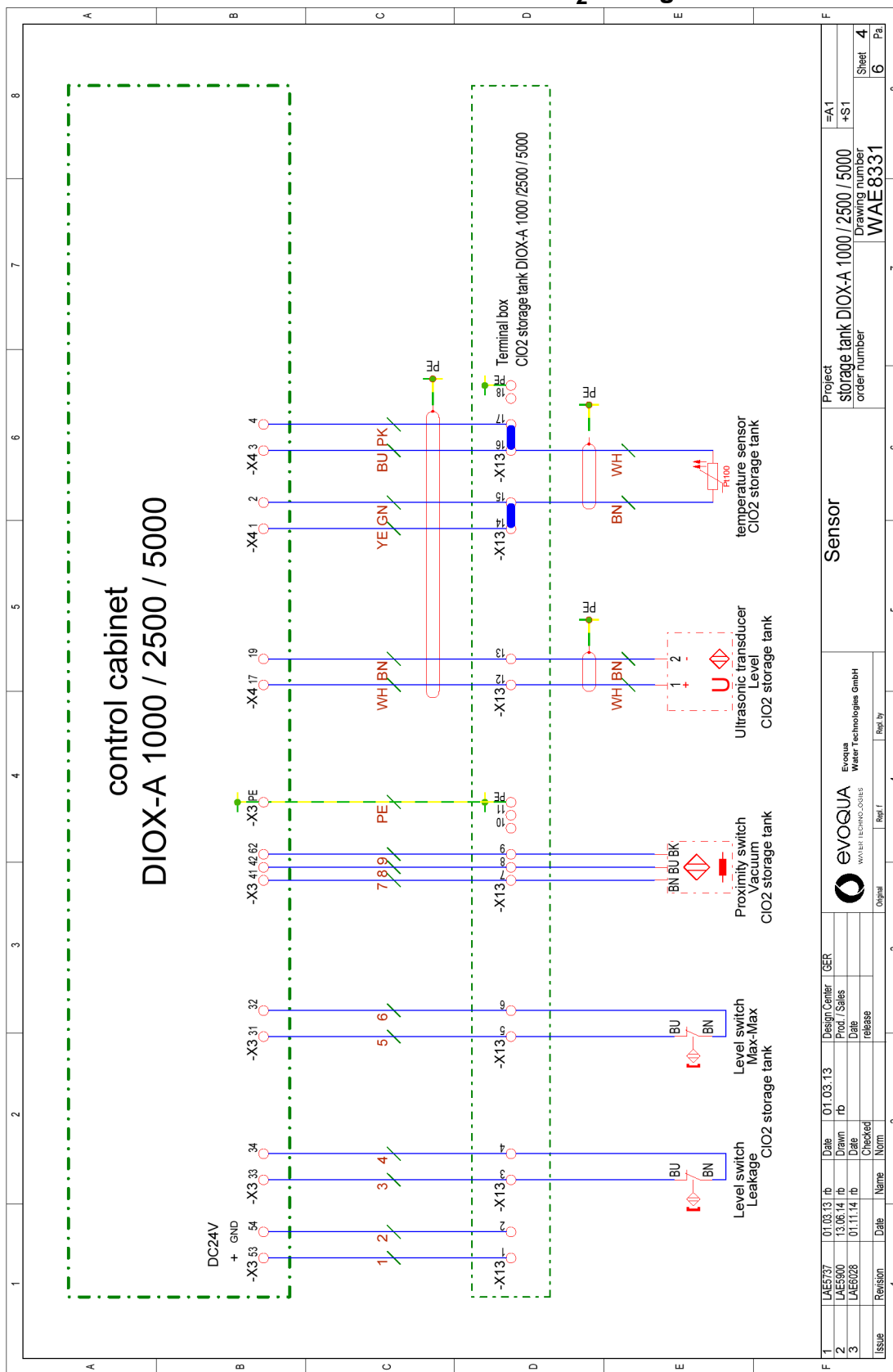
  

| Project     |              | bill of materials |                |
|-------------|--------------|-------------------|----------------|
| DIOX-A 5000 | order number | WAE 7601          | Drawing number |
|             |              |                   |                |

| Project     |              | =A1 |          |
|-------------|--------------|-----|----------|
| DIOX-A 5000 | order number | +S1 | Sheet 34 |
|             |              |     | 34       |

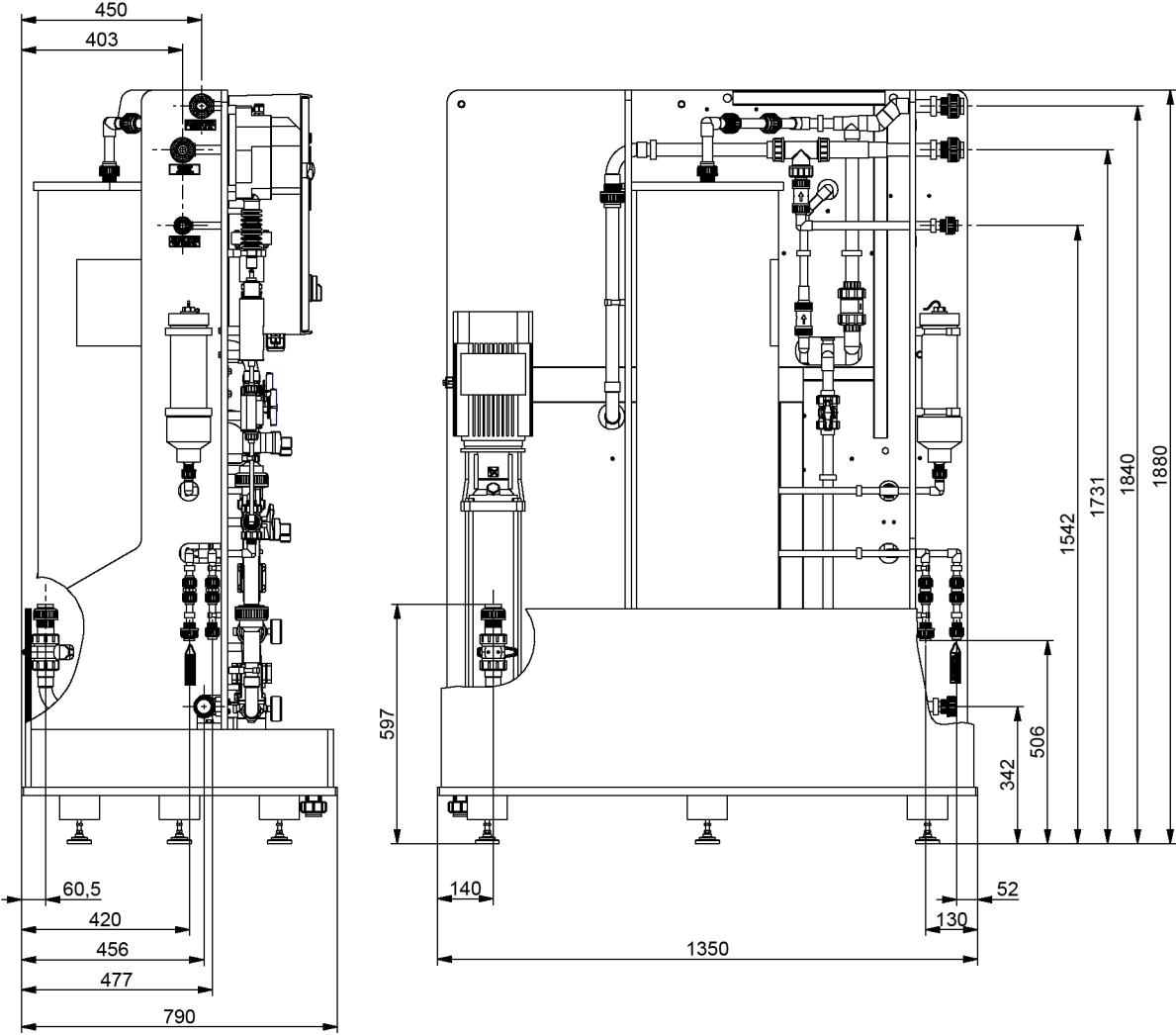
9.2 Terminal box on the ClO<sub>2</sub> storage tank



|         |         |              |    |                |          |               |     |      |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |
|---------|---------|--------------|----|----------------|----------|---------------|-----|------|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| Issue   |         | Revision     |    | Date           |          | Name          |     | Norm |  | 2 |  | 3 |  | 4 |  | 5 |  | 6 |  | 7 |  | 8 |  |
| 1       | LAE5737 | 01.03.13     | rb | Date           | 01.03.13 | Design Center | GER |      |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |
| 2       | LAE5900 | 13.06.14     | rb | Drawn          | rb       | Prod. / Sales |     |      |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |
| 3       | LAE6026 | 01.11.14     | rb | Date           |          | release       |     |      |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
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| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         | order number |    | Drawing number |          | Sheet         |     | Pa   |  | 8 |  | 7 |  | 6 |  | 5 |  | 4 |  | 3 |  | 2 |  |
| Project |         |              |    |                |          |               |     |      |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |



10.Drawings





## 11.Declaration of conformity



### EG-Konformitätserklärung EC Declaration of Conformity Déclaration CE de conformité

No. MAE1527

Ausgabe/issue/édition 2

|  |  |
|--|--|
| Hersteller/Manufacturer/Constructeur:                                  | Evoqua Water Technologies GmbH   |
| Anschrift/Address/Adresse:   | Auf der Weide 10, D-89312 Günzburg   |
| Produktbezeichnung:<br>Product description:<br>Description du produit: | Chlordioxid-Bereitungsanlage DIOX-A 2500 und DIOX-A 5000<br>Chlorine Dioxide Generator DIOX-A 2500 and DIOX-A 5000<br>Générateur de dioxyde de chlore DIOX-A 2500 et DIOX-A 5000 |

Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender europäischer Richtlinien überein:

*The product described above in the form as delivered is in conformity with the provisions of the following European Directives:*

**Le produit désigné est conforme, dans la version que nous avons mise en circulation, avec les prescriptions des directives européennes suivantes :**

- |             |   |
|-------------|---|
| 2006/42/EG  | Richtlinie des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG (Neufassung).<br><i>Directive of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/ED (recast).</i><br><b>Directive du Parlement européen et du Conseil du 17 mai 2006 relative aux machines et modifiant la directive 95/16/CE (refonte).</b>   |
| 2004/108/EG | Richtlinie des Europäischen Parlaments und des Rates vom 15. Dezember 2004 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit.<br><i>Directive of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility.</i><br><b>Directive du Parlement européen et du Conseil du 15 décembre 2004 relative au rapprochement des législations des Etats membres concernant la compatibilité électromagnétique.</b>   |
| 2006/95/EG  | Richtlinie des Europäischen Parlaments und des Rates vom 12. Dezember 2006 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.<br><i>Directive of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.</i><br><b>Directive du Parlement européen et du Conseil du 12 décembre 2006 concernant le rapprochement des législations des Etats membres relatives au matériel électrique destiné à être employé dans certaines limites de tension.</b><br>CE-Kennzeichnung / CE marking / Marquage CE: 2014 |

Ersteller : SR  
Ausgabe : 13.05.2014  
Dokument: VD130-1\_CE\_Konformitätserklärung.doc

Evoqua Water Technologies GmbH  
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Deutschland

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[www.evoqua.com](http://www.evoqua.com)

Seite 1 von 2



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

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Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie nach §443 BGB. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

*This declaration certifies the conformity to the specified directives but does not imply any warranty for properties. The safety documentation accompanying the product shall be considered in detail.*

La présente déclaration atteste de la concordance avec les directives citées, elle n'offre cependant pas de garantie quant à la nature ou la durabilité selon l'article 443 du code civil allemand. Les consignes de sécurité de la documentation du produit fournie sont à respecter.

## 12.Index

### A

Abbreviations 21, 141  
Additional tools 150  
Alarm relay 55  
Annual maintenance 112  
Automatic mode 91  
    switch off 95

### B

Basic chemicals 19  
Buttons 86

### C

Calibrate the display 138  
Calibrate the display control 138  
Calibration factor 128  
Change ClO<sub>2</sub> concentration 134  
Change display language 137  
Change motive water aspiration injector 134  
Check product concentration 179  
Chemical reaction 19  
ClO<sub>2</sub> concentration, correction factor 128  
Connect outputs 55  
Control and display unit 85  
Control unit 26  
Conventions 10  
Correction factor 128  
Correction factors 128  
    current values 128  
Customer service 149

### D

Date 64  
Date / Time set 139  
Date of last maintenance 128  
Device label 25  
Diag 68  
Diagnostics 127  
Digital inputs 130  
Digital outputs 55  
Dimensional drawings 37

Display 27, 85  
Display unit 26  
Documentation 9

### E

EMERGENCY-STOP 54  
Error (LED) 68  
External release 102

### F

Faults 148  
    Operating journal 187  
First aid 15  
Flashing alarm light/horn 55  
Flow chart 24

### H

Hazardous material 13

### I

i (info) 105  
In the event of fire 15  
Installation 36  
Intended use 11  
Interfaces 27

### L

Language 137  
Leaks 114, 141  
Liability for defects 150  
Log in 89

### M

Main menus 124  
Main screen 86  
Main switch 26  
Maintenance 133

- annually 112
  - Checklist 151
  - Customer service 149
  - daily 142
  - Date 128
  - Level 1 141
  - Level 2 141
  - monthly 112, 143
  - Operator 141
  - weekly 142
  - Maintenance overview 142
  - Maintenance part kits
    - 2 years 174
    - 5 years 174
  - Maintenance part sets 150, 171
    - 1 year 172
    - to use 177
  - Maintenance work
    - Replace wear parts 179
  - Menu selection 124
  - Menus 124
  - Mobile use 11
- N
- Neutralization 16
- O
- Operating data 68, 127
  - Operating hours 127
  - Operating journal 187
  - Operating messages 98
  - Operating water 142
  - Operation 85
  - Output contacts 68
  - Outputs 55, 125
- P
- Password 28
    - entering 89
  - Password levels 28
  - Password protection 88
  - Perform monthly maintenance 112
  - Personnel 12, 141
  - Preparation
    - external release 102
    - switch on manually 96
  - Preparation active 94, 100
  - Preparation cycles 127
  - Preparation off 99
  - Preparation standby 99
  - Process water 31
  - PROFIBUS DP
    - Connect PROFIBUS DP 72
    - Technical data 71
  - Protective measures 13
- R
- Release
    - Preparation 54
    - System EMERGENCY-STOP 54
  - Renewed start up 184
  - Replace
    - Components 179
  - Replace suction lance 184
  - Replace wear parts 179
- S
- Safety data sheet 17
  - Serial number 130
  - Service 132, 149
  - Set PROFIBUS DP 68
  - Shut down 184
  - Signal contact 55
  - Software 130
  - Stand pipe, replacing 183
  - Standby
    - Operating state 91
  - Start preparation. 96
  - Start up
    - Overview 151
    - Renewed start up 184
  - System 137, 140
  - System data 130
- T
- Touch panel 27, 85
- W
- Warning message log 129
  - Warning messages 105
  - Warranty 150



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