

# A measured step forward™

Operations & Maintenance Manual

**EASYZON 5**

**Chlorine Dioxide System**



Read the operating instructions!

The user is responsible for installation and  
operation related mistakes!

## Table of Contents

<b>1. Safety Instructions .....</b>	<b>3</b>	<b>9. Shutdown and Disposal.....</b>	<b>19</b>
1.1 General .....	3	9.1 Rinsing the unit.....	19
1.2 Identification of safety instructions in the operating manual .....	3	9.2 Disposal of the chemicals .....	19
1.3 Operator qualifications and training .....	3	9.3 Disposal of old equipment .....	20
1.4 Important electrical safety tips .....	3	<b>10. Maintenance .....</b>	<b>20</b>
1.5 Hazards due to non-compliance with the safety instructions .....	3	10.1 Basic maintenance information .....	20
1.6 Safety awareness at work.....	3	<b>11. Spare parts.....</b>	<b>21</b>
1.7 Safety instructions for the operating company/operator .....	4	11.1 Maintenance kit overview .....	21
1.8 Safety instructions for installation, maintenance and inspection.....	4	<b>13. Installation example .....</b>	<b>22</b>
1.9 Modifications and obtaining spare parts .....	4	<b>14. Device revision.....</b>	<b>22</b>
1.10 Systems working with chemicals.....	4	<b>Index .....</b>	<b>23</b>
1.11 Chemicals .....	4	<b>CE Declaration of conformity .....</b>	<b>24</b>
<b>2. Before start-up .....</b>	<b>6</b>	<b>Declaration of harmlessness .....</b>	<b>25</b>
2.1 Use in accordance with regulations .....	6	<b>Warranty Application.....</b>	<b>26</b>
2.2 Delivery contents .....	6		
2.3 Start-up procedure.....	6		
<b>3. Dimensional drawing.....</b>	<b>6</b>		
<b>4. Technical data.....</b>	<b>7</b>		
<b>5. Function .....</b>	<b>7</b>		
5.1 Chlorine dioxide (ClO <sub>2</sub> ) in water purification.....	7		
5.2 Preparation of Chlorine dioxide .....	7		
5.3 Description of the unit / Flow chart.....	8		
5.4 Additional functions.....	8		
5.5 Dosing of chlorine dioxide.....	8		
<b>6. Installation .....</b>	<b>9</b>		
6.1 General information.....	9		
6.2 Wall assembly.....	9		
6.3 Hydraulic Installation .....	9		
6.3.1 Installation diagram.....	9		
6.3.2 Water connection .....	9		
6.3.3 Suction lines.....	10		
6.3.4 Pressure lines.....	11		
6.3.5 Injection nozzle .....	11		
6.3.6 Emptying the supply tank.....	11		
<b>7. Electrical control.....</b>	<b>12</b>		
7.1 View of the circuit board .....	12		
7.2 Connection specifications .....	12		
7.3 Navigation / Programme structure.....	13		
7.4 Operating modes .....	13		
7.5 Status display .....	14		
7.6 Default settings.....	14		
7.7 Special functions.....	14		
<b>8. Start-up .....</b>	<b>17</b>		
8.1 Starting the system .....	17		
8.2 Configuration of the control system .....	17		
8.3 Start of production .....	17		
8.4 Start of dosing .....	17		
8.5 Setting of dosing pump .....	18		

## 1. Safety Instructions

### 1.1 General

This operating manual contains basic instructions to be followed during installation, operation and maintenance. Please have your staff and any person in charge of the unit read and understand this manual before starting any work with it. Store this manual safely in a place where mechanics, installers and other technical staff as well as operators can rapidly access it in case of emergency. Pay attention also to all the safety instructions in this manual.

Follow the safety instructions in the operating manual for the dosing pump and other accessories.

### 1.2 Identification of safety instructions in the operating manual

This Operation & Maintenance Manual contains vital information which may endanger people, the environment and the device if they are disregarded. These statements are identified by the following symbols:



#### **DANGER!**

Indicates an immediate danger. Failure to follow this instruction may lead to death or extremely serious injuries.



#### **WARNING!**

Indicates a potentially hazardous situation. Failure to follow this instruction may lead to death or severe injury.



#### **CAUTION!**

Indicates a potentially hazardous situation. Failure to follow this instruction may lead to minor injury or damage to property.



#### **ATTENTION! or NOTICE!**

Failure to follow these safety instructions may endanger the machine and its functions.



#### **IMPORTANT!**

This refers to additional information to facilitate operation and ensure the smooth running of the equipment.

Appropriate reference attached directly on the unit or any of its other parts like markings for electrical connections or process fluid connections must absolutely be considered and held in completely readable condition for future reference.

### 1.3 Operator qualifications and training

The personnel employed for operation, maintenance, inspection, and installation must be suitably qualified for this work. Personnel areas of responsibility, tasks and supervision must be controlled and ensured by the operating company at all times. Personnel who do not have the required know-how must be duly trained and instructed. If necessary, this can also be performed by the manufacturer or certified supplier on behalf of the operating company.

The operating company must also ensure that the operating manual has been understood.

### 1.4 Important electrical safety tips

Basic safety precautions should always be followed when installing and using this electrical equipment. These include the following:

Read and follow all instructions.



#### **WARNING!**

*To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.*



#### **WARNING!**

*Risk of electric shock. Connect the device only to a SCHUKO socket outlet protected by a ground fault circuit interrupter (GFCI). Contact a qualified electrician if you cannot verify that the connector is protected by a GFCI. Do not bury the cable. Secure the cable to avoid damage by lawn mowers, hedge trimmers and other equipment.*



#### **WARNING!**

*To reduce the risk of electric shock, replace the cable immediately if damaged.*

Keep these instructions for future reference.



#### **DANGER!**

*Risk of burning.  
Shock wave: flying parts can result in fatal injuries  
Under no circumstances must the device be used in potentially explosive atmospheres.*

The cable connections must be closed after changing the electrical connections in order to ensure the unit's degree of protection.

### 1.5 Hazards due to non-compliance with the safety instructions

Failure to follow the safety instructions may endanger not only persons, but also the environment and the device. Failure to follow the safety instructions will invalidate any damage claims.

Non-compliance with the safety instructions may give rise to the following hazards:

- Failure of major functions of the device.
- Failure of important methods for maintenance and repair.
- Danger to persons due to electrical, mechanical and chemical effects.
- Danger to the environment due to leakage of hazardous substances.

### 1.6 Safety awareness at work

The safety instructions contained in this operating manual must be observed. The operating company is responsible for ensuring compliance with local safety regulations. Any faults that could affect safety must be rectified immediately.

## 1.7 Safety instructions for the operating company/operator

### **Legal requirements must be observed.**

Leakages of dangerous substances (e.g. aggressive, toxic), for example due to a broken diaphragm, must be suitably drained away so that they do not cause danger to persons or the environment.

A safe and ecologically beneficial disposal of process materials as well as replacement parts must be ensured.

Risks from electric power must be excluded (for further details, refer to the VDE regulations and the requirements of the local public utilities as well as section 7).

## 1.8 Safety instructions for installation, maintenance and inspection

The operating company must ensure that all installation, maintenance and inspection work is carried out by qualified and authorised personnel.



### **WARNING!**

*Assembly and maintenance work on the control system must only be carried out after disconnecting the device from the power supply. The procedure specified in the operating manual for shutting down the installation must be observed without fail. Whilst the work is in progress, the unit must be safeguarded from being reactivated! Cables must only be connected in this condition. Non-compliance can lead to defects in the unit and will invalidate the warranty.*

Pumps or units in contact with potentially harmful media must be decontaminated.

All safety and protective equipment must be reattached and activated immediately after the work has been completed.

## 1.9 Modifications and obtaining spare parts

The device should only be modified or converted by qualified technical personnel.

If the device is wrongly configured by assembly or service personnel, errors and dangers in the function of the machine can result. In this case the manufacturer declines any liability.

Genuine spare parts and accessories authorized by the manufacturer ensure greater safety. Failure to comply will invalidate the warranty.

## 1.10 Systems working with chemicals



### **CAUTION!**

*When working on systems with chemicals, the accident prevention regulations applicable on site must be observed and the specified personal protective equipment worn. The following protective equipment is recommended:*



Breathing gear



Hand protection



Protective footwear



Face protection



Protective clothing

All people responsible for installation and maintenance are advised to wear this protective equipment.

Before working on the device, disconnect it from the mains supply and protect it against reconnection.



### **CAUTION!**

*Any chemical still present in the hydraulic system may spray out when the voltage supply is reconnected. This may lead to chemical or other burns to the face and hands. Dosing lines must always be connected before switching on again.*

System parts and lines may be pressurised. Working on the device requires special safety precautions and may only be carried out by instructed technical personnel.



### **CAUTION!**

*Always relieve the pressure before starting work on the device. Chemical may spray out. This may lead to chemical or other burns.*

The unit must be rinsed out with water when work is carried out in order to prevent any unintentional contact with the dosing medium.



### **WARNING!**

*Never look into the open end of a blocked line. Chemicals may emerge unexpectedly and cause caustic or other burns to hands and face.*

Before start up, all hydraulic connections must be inspected for correct tightness and, if necessary, must be tightened up using appropriate tools.



### **CAUTION!**

*If connections are loosened for venting or other reasons, leaking chemical must be removed professionally. This is the only way to avoid the danger of physical injury and corrosion at the components.*

## 1.11 Chemicals

The supplier of the chemicals provides the chemical safety data sheets. They must be followed and must be accessible to anyone who uses the unit. The following data does not replace the supplier's EEC safety data sheets.

Personal protection equipment must be used during all work involving chemicals. The following protective equipment is recommended as a minimum:



Breathing gear



Hand protection



Protective footwear



Face protection



Protective clothing

### 1.11.1 Special notes on hydrochloric acid

A concentrated (9%) hydrochloric acid (HCl) must be used as per EN 939. Other concentrations are not permissible.



#### **CAUTION!**

Hydrochloric acid vapour is corrosive on many materials. Keep containers closed at all times.

### 1.11.2 Special notes on sodium chlorite

Concentrated (7.5%) sodium chlorite ( $\text{NaClO}_2$ ) must be used as per EN 938. Other concentrations are not permissible.



#### **DANGER!**

There is a risk of explosion for use in higher concentrations (e.g. 24%)!



#### **DANGER!**

Sodium chlorite must not be mixed with acid. A poisonous chlorine dioxide gas develops.

Do not alternate the use of chemical containers and intake lines. The chemical containers must be arranged in separate catch basins. It is strongly recommended that the catch basins and intake lines be clearly marked.



#### **CAUTION!**

Dried up sodium chlorite has an oxidising effect and can ignite flammable materials. Never leave sodium chlorite to dry up on a cloth or paper towel. Wash away spilt chemicals with plenty of water. Immediately rinse out splashes of chemicals on articles of clothing with water.

### 1.11.3 Special reference to chlorine dioxide

Chlorine dioxide ( $\text{ClO}_2$ ) is an orange-yellow gas with a density of  $3 \text{ kg/m}^3$  under standard conditions. It is heavier than air and thus accumulates itself at ground level. At high levels of concentration it breaks down into chlorine and oxygen.



#### **WARNING!**

Chlorine dioxide is a very toxic substance if inhaled and very irritant for the eyes, the respiratory organs and skin. A suitable breathing mask must be worn when handling chlorine dioxide. The relative TLV ("Threshold Limit Value", i.e. the reasonable ambient-air level or concentration to which a worker can be exposed without adverse health effects) is set to 0.1 ppm in Germany.



#### **NOTICE!**

In Germany the Accident Prevention Regulation GUV-V D5 "Chlorination of water" specifies the requirements regarding personal protective equipment and constructional equipment.



#### **DANGER!**

The chlorine dioxide solution may not be heated, since this will cause an explosive gas phase above the solution.

## 2. Before start-up

### 2.1 Use in accordance with regulations

The device is exclusively intended for the production and dosing of a chlorine dioxide solution for water treatment. The operational safety of the unit can only be ensured if used according to its purpose.

All other types of use are prohibited and will invalidate the warranty.

### 2.2 Delivery contents

Carefully check the delivery prior to installation and refer to the delivery note to ensure the delivery is complete and to check for any transport damage. Contact the supplier and/or carrier regarding any questions concerning the delivery and/or transport damage.

Do not operate defective devices.

The scope of delivery includes:

- Production and dosing system on wall panel incl.
  - Control system with peristaltic pumps
  - Reactor with level sensors
  - Solenoid valves
  - Supply tank with level sensors
  - MAGDOS dosing pump with
  - PENTABLOC multifunction valve

- Screws for wall mounting
- Intake lines for the chemicals suitable for normal commercial canisters
- Other accessories depending on scope of order:
  - Warning signs
  - Catch basins
  - Leakage sensors
  - Ambient air sensors
  - measuring instruments

### 2.3 Start-up procedure

The manufacturer recommends the following steps to successfully start-up the device:

- Reading the operating manual
- Assembly of the device (Chapter 6.2)
- Make the water connection (Chapter 6.3.2)
- Installation and connection of the injection nozzle (Chapter 6.3.4+6.3.5)
- Electrical connection of the device (Chapter 7.1+7.2)
- Configuration of the control system according to the local regulations (Chapter 8.2)
- Add the chemicals (Chapter 6.3.3)
- Start production (Chapter 8.3)
- Activate and adjust the dosing (Chapter 8.4)

## 3. Dimensional drawing

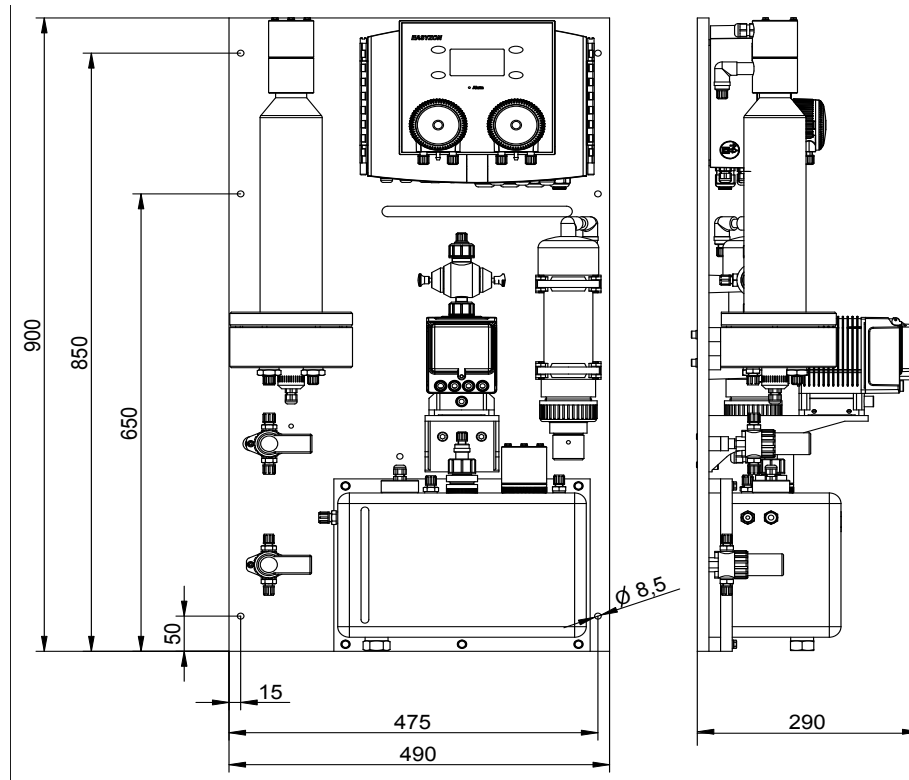


Fig. 3.1 Dimensioned drawing [dimensions in mm]



## 4. Technical data

Production capacity	5 g/h ClO <sub>2</sub>
Product concentration	2 g/l ClO <sub>2</sub>
Weight with filled tank	approx. 25 kg
Operating voltage	230 V AC, 50/60 Hz
Protection class	IP 65
Power consumption	max. 100 W
Current consumption during dosing stroke	max. 2.3 A
Alarm relay	max. 230 V AC, 3 A max. 30 V DC, 8 A max. 110 V DC, 0.3 A max. 220 V DC, 0.12 A
External isolation	Potential-free
Ambient temperature	10 ... 40°C
Dilution water	Drinking water quality min. 2.5 l/h, 1 ... 2 bar, 5 ... 30 °C
Chemicals used	Hydrochloric acid 9% according to EN939 Sodium chlorite 7.5% according to EN938
Chemical consumption with full production capacity	Hydrochloric acid: 12 l/day Sodium hydroxide: 3 l/day
Utilisable volume of the product tank	5,700 cm <sup>3</sup>
Service life of ClO <sub>2</sub> solution at 15 °C	> 24 hours
pH value of ClO <sub>2</sub> solution	approx. pH 1.3
Chloride loading of ClO <sub>2</sub> solution	19 g/l (shown as Cl)
ClO <sub>2</sub> dosing pump	MAGDOS DX4
Dosing pressure	up to 10 bar
Dosing pump actuation	Pulse frequency (up to 100 pul/min) or 0/4 ... 20 mA signal
Hydraulic connections	Water feed, intake lines and dosing line: hose 4/6 mm

## 5. Function

### 5.1 Chlorine dioxide (ClO<sub>2</sub>) in water purification

Chlorine dioxide is a potent, fast-acting oxidizing and disinfectant agent, with the following properties:

- ClO<sub>2</sub> is characterised by its excellent effectiveness levels against bacteria, viruses, spores and algae.
- ClO<sub>2</sub> has full disinfection power within the pH range of 6.5 ... 11
- ClO<sub>2</sub> has a higher disinfection strength than chlorine, it therefore also works against chlorine resistant organisms.
- The implementation of ClO<sub>2</sub> prevents the generation of trihalomethanes (THM) and chloramines.
- Due to its high latency period in drinking water, ClO<sub>2</sub> provides prolonged, continuous disinfection, e.g. in extensively branched-out piping networks.
- The odour threshold of ClO<sub>2</sub> lies approximately 4 times higher compared to Chlorine.

ClO<sub>2</sub> is not chemically stable in higher concentrations. It spontaneously breaks down (explosively) into chlorine and oxygen. It is therefore not possible to store ClO<sub>2</sub> on a long-term basis or to transport it in canisters.

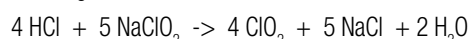
That is why ClO<sub>2</sub> is produced in a strongly diluted concentration at the place of use.

Some typical uses of ClO<sub>2</sub> are:

- Combating Legionnaire's Disease in warm and cold water
- Preventing biofilm and algae proliferation in cooling water circuits
- Treating process water
- Treating food

### 5.2 Preparation of Chlorine dioxide

EASYZON produces a chlorine dioxide as per the acid-chlorite procedure. Hydrochloric acid (HCl) and sodium chlorite (NaClO<sub>2</sub>) are mixed in the reactor, where they undergo a reaction process resulting in chlorine dioxide:



A significant surplus of Hydrochloric acid in the reactor provides for the virtually total transformation of the sodium chlorite into chlorine dioxide. The surplus acid ensures the product's low pH-value, which is necessary for its shelf-life.

### 5.3 Description of the unit / Flow chart

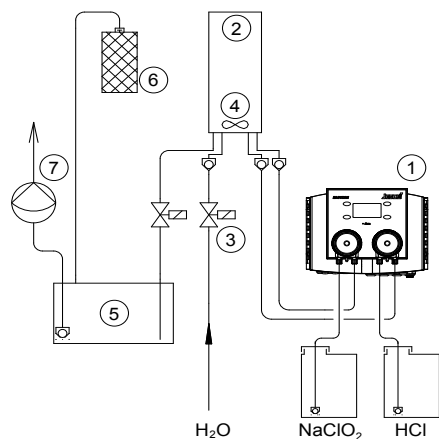


Fig. 5.3: Flow chart of the unit

EASYZON produces the chlorine dioxide in a batch process. In the control system ① (see Section. 5.3) integrated hose pumps feed both of the output chemicals into reactor ② and the single solenoid valve ③ injects the dilution water from the drinking water line. Mixer ④ ensures that the chemicals are thoroughly mixed through for an optimal reaction result. When reaction is complete, the product flows into the supply tank ⑤. The active carbon cartridge ⑥ ensures that no chlorine dioxide can escape into the ambient air.

A dosing pump ⑦ is controlled on site by a flow meter or automated regulator and is supplied from the supply tank.

The control system ① monitors the status of all liquids and ensures that there is always sufficient in the supply and product tank ⑤. It monitors the chemical supply and notifies the need for a canister change before the production stops.

### 5.4 Additional functions

#### Gas warning device

The functionality of a gas warning device is integrated in the control system. It has to be activated after the ambient air sensor has been connected. When the gas alarm goes off the production stops and the unit activates the alarm.

#### Leakage monitoring

Optionally leakage sensors can be recorded in the catch basins under the unit and chemical containers and be analysed.

#### Service life monitoring

As chlorine dioxide has a limited service life, a safe disinfection can no longer be guaranteed after the storage time has been exceeded. The control warns of the use of old solutions. The dosing can be automatically interrupted.

### 5.5 Dosing of chlorine dioxide

As per the drinking water ordinance, the drinking water may contain 0.05 to 0.2 mg/l  $\text{ClO}_2$  after it has been treated. As some

contents in the water cause a loss of  $\text{ClO}_2$ , the drinking water is only allowed max. 0.4 mg/l  $\text{ClO}_2$ .



#### NOTICE!

If chlorine dioxide was already added to the water in other preparatory steps, this must be considered. The limit values apply to the total of all the stages of the treatment.

Therefore the addition is done in drinking water circuits proportionally to the quantity of water fed through. An automatic regulation dependent on the content of  $\text{ClO}_2$  in the water is not recommended.

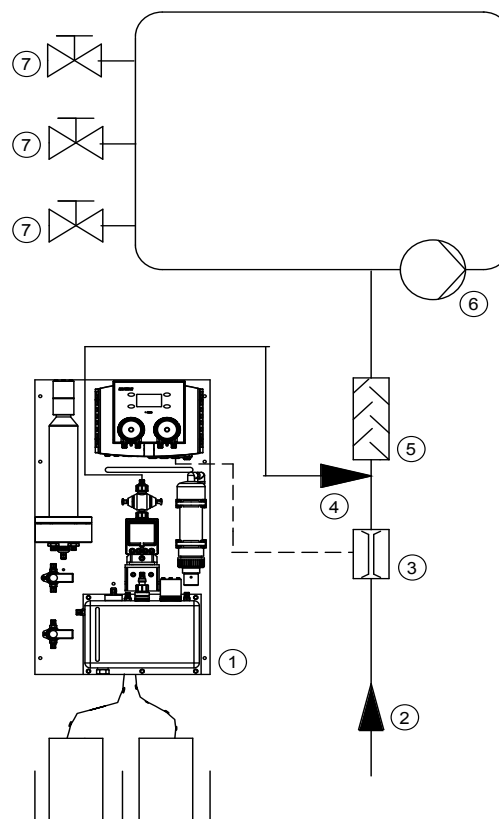


Fig. 5.5: Dosing for one water cycle

- ① EASYZON chlorine dioxide unit
- ② Water supply
- ③ Flow meter
- ④ Injection nozzle
- ⑤ Mixing section
- ⑥ Circulation pump
- ⑦ Tap connection



#### NOTICE!

The chlorine dioxide solution is acidic and alters the pH value of the treated water. In order to prevent corrosion of the piping, the pH value should not be above 0.5 pH. For this reason, a total water hardness of at least 5° dH or Ks 4.3 = 0.9 mmol/l is recommended.



## 6. Installation

### 6.1 General information

For installation, the local directions and regulations have to be adhered to. This applies to the choice of suitable materials, the handling of chemicals, the hydraulic and electrical installation.

The designer and operating company are responsible for ensuring that the entire system, including the integrated equipment, are designed in such a way that neither system equipment nor buildings are damaged in the case of chemical leakage due to the failure of wearing parts (e.g. pump hose) or burst hoses. The installation must be arranged in such a way that even if the device breaks down no disproportionately high consequential damages can arise. We therefore recommend installing leakage monitors and collecting pans.

The functional security requires, depending on the application, the use of suitable accessories, for example: injection nozzle and static mixer.

### 6.2 Wall assembly

#### Installation location

The assembly site must be selected in line with the local regulations accordingly. In Germany the Regulation for the Prevention of Accidents GUV-V D5 "Chlorination of water" must be observed.

The ambient conditions are to be maintained in accordance with the technical data. Exposure of the unit to direct heat and sunlight must be avoided.

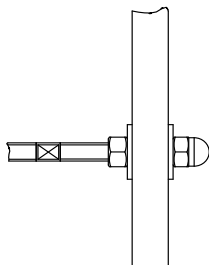
The device must be installed perpendicularly in a way that makes it easily accessible to the operator. There must be sufficient space underneath the unit to place the chemical canisters. The underside of the unit should be approx. 1 m above the ground.

#### Wall mounting

In the delivery scope of the device there is mounting material for brick-work or concrete. Suitable material has to be provided by the customer for any other sub-surface.

The position of the fastening point is to be inferred from the dimensioned drawing (Chapter 3). All 6 drill-holes have to be used.

The wall panel is clamped on the mounting bolts between two nuts with washers. The unevenness of the wall can be levelled out by adjusting the nuts until the wall panel is kept level and free from tension.



### 6.3 Hydraulic Installation

Always use appropriate tools for the installation of plastic connection parts. To avoid damage, never apply excessive force.

#### Hose connectors

All hoses are connected with hose clamping connections. The connection consists of the integrated hose taps, a clamping ring and a union nut. The clamping ring provided is suitable for hoses made from PVC, PE or PTFE. Attaching the hose:

- cut the hose end at a right angle
- push the union nut and clamping ring on the end of the hose (pay attention to the alignment of the clamping ring)
- push the hose end up to the stop position on the taps
- push the clamping ring on the taps
- tighten the union nut by hand (approx. 10 Ncm)

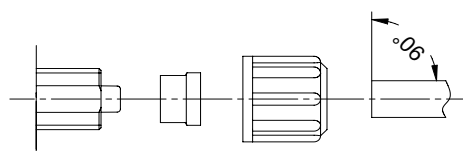


Fig. 6.3.0: Hose clip

#### 6.3.1 Installation diagram

(See figure 6.3.1 on the following page.)

#### 6.3.2 Water connection

EASYZON requires a water supply with drinking water quality at a temperature of 5 ... 30 °C.



#### NOTICE!

When connecting to the drinking water supply the local regulations have to be observed. In most cases the installation of a piping or system separator is mandatory.

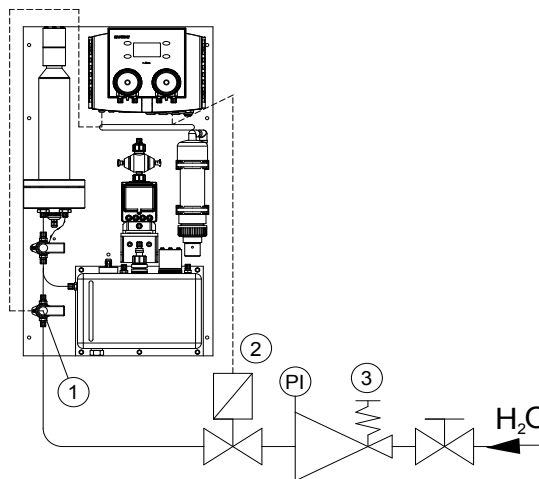


Fig. 6.3.2: Water valves

EASYZON controls two independently switching supply valves for the dilution water. Valve ① (in Fig. 6.3.2) is mounted on the wall panel and controls the quantity of water in the reactor. Valve ② is optional. EASYZON turns this valve OFF during the operational mode and during disturbances such as power failure or, for example, report of a leak.

The pressure reducing valve ③ is required if the line pressure is over the permissible supply pressure level of 1 ... 2 bar.

### 6.3.3 Suction lines

The standard intake lines provided are suitable for customary chemical canisters. The screw cap can be adjusted to fit the different receptacle sizes on the intake line.

The intake lines are fitted with float switches to monitor the level in the canister. The cables are laid out as per the terminal diagram in Chapter 7.



#### ATTENTION!

*The intake lines have to be clearly marked according to the chemical. It is strongly recommended to also label up the catch basins with signs of the same inscription and colour. A mix-up in the intake lines leads to an uncontrolled formation of chlorine dioxide and then the product may not be dosed into the drinking water.*

The suction hoses are led through behind the product and respectively attached at the left connection of the hose pump.

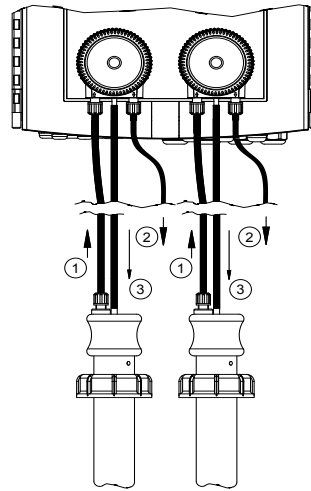


Fig. 6.3.3 Direction of the hoses

- ① Suction line
- ② Line to the reactor
- ③ Drainage line

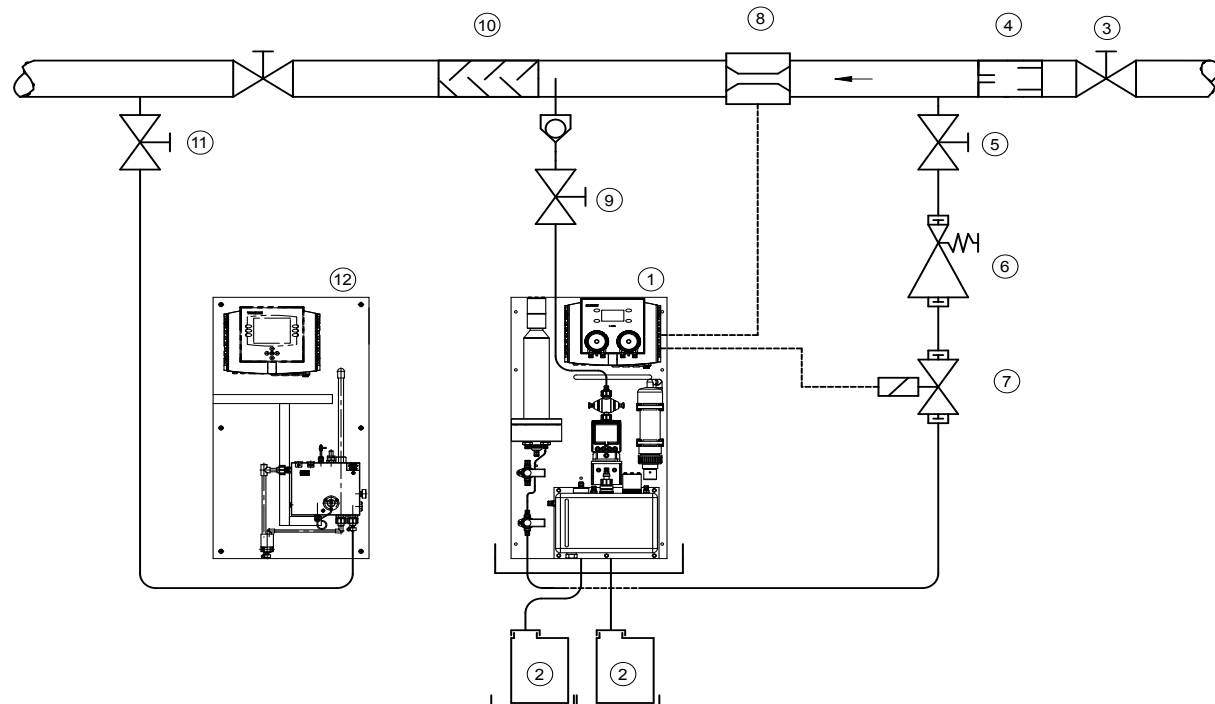


Fig. 6.3.1 Installation diagram

- ① EASYZON
- ② Chemical container
- ③ Stop valve
- ④ Piping or system separator
- ⑤ Water withdrawal
- ⑥ Pressure reducers
- ⑦ Additional shutoff valve
- ⑧ Water meters
- ⑨ ClO<sub>2</sub> injection nozzle
- ⑩ Mixing section
- ⑪ Test water withdrawal (after a good mixing and sufficient contact time)
- ⑫ Analytical equipment

The drainage adaptors of the pump head must be attached in such a way that leaks from the pump head cannot cause any damage. The hose should, for example, lead to the return connection of the intake line or end in a catch basin with a leakage monitor. The flow of the drainage drilling must be on a free downwards gradient if possible.



**DANGER!**

*Under no circumstances may the drainage hose supply the wrong chemical. The consequences would be an uncontrolled production of chlorine dioxide.*

### 6.3.4 Pressure lines

A PTFE-hose is to be used as the pressure line from the dosing pump for the chlorine dioxide solution to the injection nozzle. The diameter and compression stroke are to be interpreted according to the installation. The hose line has to be fastened in a suitable hose support.



**NOTICE!**

*When selecting the pressure hose the total pressure of the installation has to be taken into consideration, it consists of the system pressure and all the pressure losses at the fittings in the hoses. This total pressure must not exceed the specification in the technical data (Chapter 4).*



**IMPORTANT!**

*The local valid regulations must be taken into consideration when laying the hose line. It may be necessary to lay down a protective pipe, for example, under unfavourable conditions. The labelling of the lines is stipulated in part in accordance with the materials conveyed.*

### 6.3.5 Injection nozzle

Injection nozzles are used to inject the metered medium into the main flow, while at the same time acting as non-return valve. The piping near the injection nozzle must be sufficiently resistant to chemicals. It is recommended to use a chemical resistant plastic piping with a static mixer.

System					
max. flow rate	2.2 m³/hr	6 m³/hr	9 m³/hr	14 m³/hr	36 m³/hr
Static mixer selection					
Nominal diameter	DN20	DN32	DN40	DN50	DN80
Part No.	30200029	30200017	30200030	30200031	30200042



**ATTENTION!**

*The nominal pressure level of the injection nozzle and the flange is PN16 and applies up to 20 °C water temperature. At increased temperatures the compression strength lessens. (30 °C: 13 bar / 40 °C: 10 bar)*



**ATTENTION!**

*If an electro-conductive pipe is interrupted with the installation of the injection nozzle, then an electrically conductive connection must be made between the two pipe ends.*



**NOTICE!**

*The water line must be removable in front and behind the injection nozzle so that injection nozzle can be dismantled for maintenance purposes.*

### 6.3.6 Emptying the supply tank

The residual product must be able to be disposed of according to the local regulations in order to activate the latency period control for the chlorine dioxide solution. (Neutralisation of solution: see Chapter 9.2) In addition a drain valve can be installed on the product tank in place of the blanking plug. An O-ring serves to seal it.

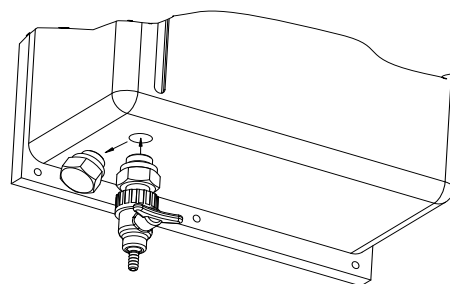


Fig. 6.3.6: Drain valve



**NOTICE!**

*Only materials that are chemically resistant to chlorine dioxide may be used. A replacement valve can be ordered under Part-no. 38512.*

## 7. Electrical control

The electrical connection of the device must correspond to local regulations and may only be carried out by qualified personnel.

The device does not have a mains plug. The voltage is supplied via the mains cable with a mains plug. A suitable plug socket that is sufficiently fused is to be provided in the proximity of the device.

The required protection class must be ensured by professional-standard installation of the electrical connections. Unused cable entry points must be capped shut.

All mounted units and sensors are attached for the delivery. Only the electrical connections have to be made during the installation for on-site assembly equipment. The dosing pump is attached directly to the signal generator for the dosing signal (e.g. water contact meter).

### Opening the housing

The hinge axes of the casing are screwed together and can only be opened with a tool. After the slotted nut ① on the left hinge axis is removed with the help of a screwdriver, this axis ② can be pulled out downwards. The curled thumb screw provided serves as a tool for this, which is screwed in the axis from underneath. The slotted nut ③ has to be mounted again when assembling.

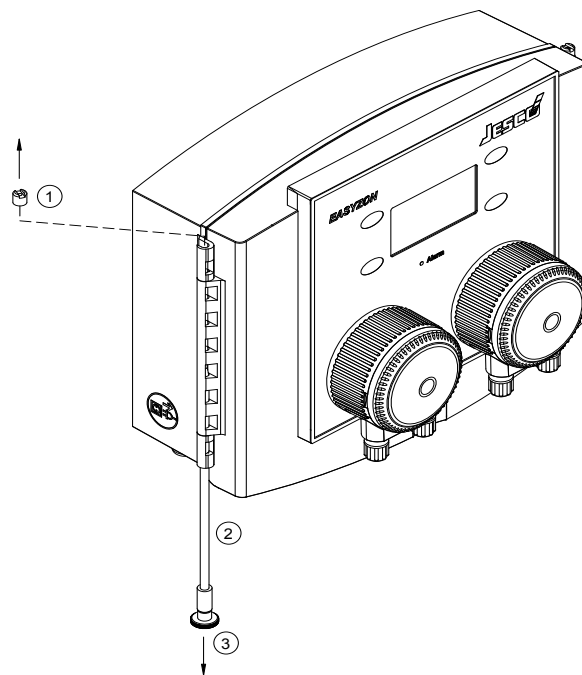


Fig. 7.0: Opening the casing

## 7.1 View of the circuit board

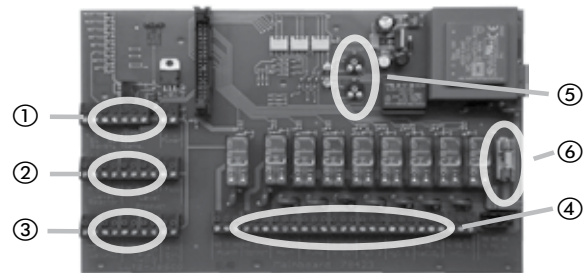


Fig. 7.1.0: Mainboard

- ① Terminal strip 1
- ② Terminal strip 2
- ③ Terminal strip 3
- ④ Terminal strip 4
- ⑤ Adjustment tension of the probe sensors (preset to 5 V  $\pm$  0.5 V)
- ⑥ Micro-fuse (230 V, 6.3 A delay fuse)

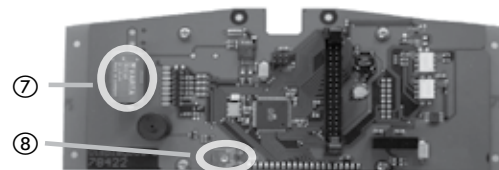


Fig. 7.1.1: Display circuit board

- ⑦ Soldered battery (life expectancy approx. 10 years)
- ⑧ Adjustment Display-Contrast

## 7.2 Connection specifications

Terminal	Function	
1	+	Digital input
2	-	Safety S1
3	+	Digital input
4	-	Safety S2
5	U+	Analogue input
6	4 ... 20	Gas sensor
7	GND	Gas sensor with 20 mA-output and 3 wire connection see 7.7.1

Table 7.2.1: Terminal strip 1

Terminal	Function	
18	2	Level monitoring in the product tank
		Increased supply (see 7.7)

Table 7.2.2: Terminal strip 2

Terminal	Cable	Function	
Hydrochloric acid (HCl) intake line			
21	+	BK (black)	Level alarm Hydrochloric acid
22	-	RD (red)	Contact break alarm (normally closed, N.C.)
23	+	= 21	Level pre-alarm Hydrochloric acid
24	-	WH (white)	Contact break pre-alarm (normally closed, N.C.)
Sodium chlorite (NaClO <sub>2</sub> ) intake line			
25	+	BK (black)	Level alarm Sodium chlorite
26	-	RD (red)	Contact break alarm (normally closed, N.C.)
27	+	= 25	Level pre-alarm Sodium chlorite
28	-	WH (white)	Contact break pre-alarm (normally closed, N.C.)
External shut-off			
29	+	Production stop in the event of contact break	
30	-		

Table 7.2.3: Terminal strip 3

Terminal	Function	
31	N.O.	Alarm relay (two-way contact)
32	C	Alarm or power failure
33	N.C.	Middle contact
34	N.O.	Active if there is no alarm
35	C	Reserve relay (two-way contact)
36	N.C.	not used
37	N	Horn relay
38	PE	Active if there is an alarm
39	L	Normally Closed (N.C.)
		Can be acknowledged
49	N	Relay output
50	PE	Water intake 1
51	L	Customer-provided solenoid valve in water supply closed - without power

Table 7.2.4: Terminal strip 4

### 7.3 Navigation / Programme structure

The keys to operate the controls are on both sides of the display and are not marked. The function of each key is indicated on the display as is relevant for the operating situation at that time.

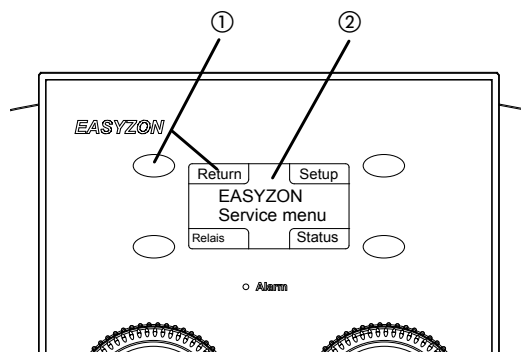


Fig. 7.3.1: Function keys ① and display ②

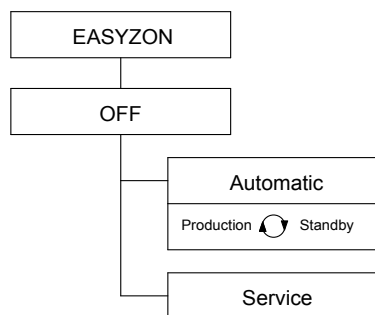


Fig. 7.3.2: Outline of the programme structure

### 7.4 Operating modes

#### Operating mode OFF

In the operating mode OFF, all of the safety functions are active and the voltage supply for the ClO<sub>2</sub> dosing pump is switched on as long as there is sufficient supply in the product tank.

#### Operating mode AUTOMATIC

In the operating mode „AUTOMATIC“ the device changes between PRODUCTION and STANDBY depending on the level in the product tank. Thus the unit constantly ensures there is sufficient supply in the product tank. All safety functions are active and the voltage supply for the ClO<sub>2</sub>-dosing pump is switched on as long as there is sufficient supply in the product tank.

During the PRODUCTION the actual procedural step is shown on the display screen and the progress can be seen on a time bar.

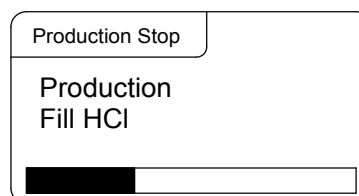


Fig. 7.4.1 Display during the production

The production can be interrupted at any time. After pressing the key at the top left twice the unit switches to OFF.

#### Monitoring the level of chemicals

With the help of the float switches, the control system checks the supply of chemicals in the canisters. The monitoring is done in two stages.

Low level alert is visually and audibly signalled, the unit continues to run unchanged. The alarm relay is released. The alerting cannot be quit.

The main level alarm is also visually and audibly signalled. The alarm relay is released. The initiated filling of the reactor is sealed off until the reactor is emptied, if the pumps still deliver sufficient residual chemicals. The exchange of the chemical canisters is acknowledged at the control system.

## 7.5 Status display

The status display is a sub-item in the Service Menu. It is not protected by a password. It shows system information, which is in part helpful for diagnostic purposes.

Status display 1	
Display	Meaning
Reactor 0 0 0	Level status in the reactor. Each digit represents a probe of the level sensor. The left digits represent the lowest level. At "1" the probes are submerged.
Product 0 0 0 Max 0	Level status in the reactor. Each digit represents a probe of the level sensor. The left digits represent the lowest level. At "1" the probes are submerged. The digits behind Max represent the float switches of the overflow safety device. At "1" the float is above.
HCl E:1 L:1	Level status of the hydrochloric acid canisters E= empty container, L=low level alert At "1" the float is above
NaClO <sub>2</sub> E:1 L:1	Level status of the sodium chlorite canisters E= empty container, L=low level alert At "1" the float is above
Safety S1:0 S2:0	Leakage sensors in the catch basins S1: catch basin under the unit S2: catch basins for the chemical canister At "0" the float is below

Table 7.5.1: Status display 1

Status display 2	
Display	Meaning
Ext.On: 0	External clearance Clearance is given at "0"
ClO <sub>2</sub> Gas: 0.00 ppm	Gas sensor reading "Sensor fault": There is a fault with the sensor. "No sensor": The sensor is not connected.
ProdTimer: 1:23	Age of the product in hours and minutes. With new manufacture the time is reset.
Runtime:123:45	Run time meter. Meters the voltage supply time.
ProdLoops: 123	Batch meter Number of reactor fillings made.

Table 7.5.2: Status display 2

## 7.6 Default settings

All the parameters of the control system are set in such a way by the factory so that the unit can produce and dose chlorine dioxide under normal conditions. Special requirements at the operator's site may necessitate adjusting the settings.



### ATTENTION!

*These settings require an exact understanding of the consequential effects on the product and the operating performance. That is why only qualified service personnel may make these settings.*

Changes to the functions can be made in the sub-item SETUP in the Service Menu. It is protected with a four digit code against unauthorised entries. If the code is changed, be sure to make a

note of the new code. Otherwise access will be impossible. The factory settings are presented below:

Display	Standard	Limit values	Meaning
Time HCl	800 s	200 ... 1500	Max. cycle duration of the hydrochloric acid pump for a reactor filling
Time NaClO <sub>2</sub>	400 s	100 ... 500	Max. cycle duration of the sodium chlorite pump for a reactor filling
Time water	120 s	60 ... 300	Max. filling time of the dilution water for a reactor filling
Time emptying	360 s	60 ... 500	Time needed to empty the reactor into the product tank
Time reaction	2520 s	900 ... 3600	Reaction time for the production of chlorine dioxide in the reactor
Gas warning delay	10 s	0 ... 120	Before a gas warning is triggered, the measured value must exceed the danger threshold for this period of time.
Gas warning limit	0.20 ppm	0,1 ... 0,5	Measured value to trigger the gas warning
Gas alarm limit	0.40 ppm	0,2 ... 1,0	Measured value to trigger the gas alarm
Language	German	German/English	Language selection
Mixer slow	45	40 ... 50	Signal strength for slow mixer speed
Mixer fast	70	50 ... 75	Signal strength for fast mixer speed
Time mixer	200 s	60 ... 360	Duration of the mixing in time-controlled procedural steps
External shut-off	not active	active/not active	Mode of operation of the external shutdown (see 7.7.5)
Product service life	24 h	12 ... 48	Time basis for the service life monitoring (see 7.7.3)
Service life monitoring	on	on/off	Activation or deactivation of the service life control (see 7.7.3)
Increased supply	off	on/off	Activates the option of stocking greater product quantities. (see 7.7.4)
Gas sensor	off	on/off	Activates the functions of the gas warning device. (see 7.7.1)
Service Code	Entry of own Service Codes. See service instructions		

Table 7.6: SETUP Menu



### NOTICE!

*The relay can be controlled manually for service purposes. For this the sub-item OUTPUTS should be selected from the Service Menu. When quitting the sub-item all relays switchback into the normal mode of operation.*

## 7.7 Special functions

### 7.7.1 Gas warning device

The EASYZON control system includes the function of a gas warning device, which can be activated by connecting a suitable gas sensor (Part.-no. 78393, transmitter DM 601) in the SETUP. Then as soon as the power is connected the gas warning device is always active. The measuring range amounts to 0 ... 1 ppm ClO<sub>2</sub>.



The gas sensor supplies usable signals only after approx. 90 seconds after the voltage supply has been switched on.

### Installation

The sensor is assembled with the measuring opening facing downwards approx. 40 cm above the bottom. It is a 4 to 20 mA-Sensor in 3-wire-system, it is powered by the control system with a 24 V operating voltage. A screened line (Part-no. 78017) is used. The screen is to be clamped under the cable connection to the sensor. It is not connected to the power system.

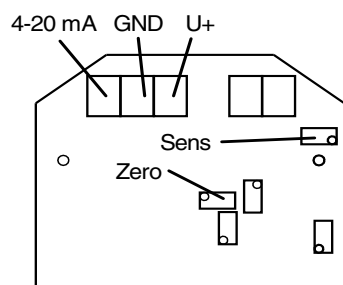


Fig. 7.7.1 Terminal connection gas sensor

### Functions

The gas warning device has two limit values: a lower value for the gas warning and an upper value for the gas alarm. The values can be set in the SETUP.

The unit continues to run as under normal operating conditions during the gas warning. The display shows the adjustable "gas warning" delay time and the measured value of the gas sensor. The alarm relay is released and the warning is signalled visually and acoustically on the unit. When the reading falls below the limit value, the warning is automatically triggered.

With the gas alarm the production process for the chlorine dioxide is also aborted and the "horn" relay connects through. The gas alarm has to be manually acknowledged.

### 7.7.2 Leakage monitoring

EASYZON is set up for monitoring leakages in the catch basins. The digital entries are co-ordinated for the use of float switches as per the closed current principle, which interrupts the contact when they float upwards.

### Installation

The float switch (Part-no. 78703) is appropriately installed on the wall of the catch basin in a pipe clamp for pipes measuring Ø 16 mm. Turning the float on the shaft can set the switch direction. If a sensor is not connected then the inlet has to be closed with a cable protector.

Input	Allocation
Safety S1	Catch basin unit
Safety S2	Chemical catch basins

Table 7.7.2: Allocation of the inlets



### NOTICE!

The float switches for the hydrochloric acid and sodium chlorite catch basins are connected together in the series connection to S2.



### DANGER!

Never store the two chemical containers in the same catch basin. Avoid mixing the chemicals. Otherwise there is a danger of poisonous chlorine dioxide gas occurring.

### Functions

When a float switch responds the production and dosing are interrupted, the alarm relay is released and the disturbance is visually and acoustically signalled on the unit. The loop relay switches and can be acknowledged manually.

### 7.7.3 Service life control

Chlorine dioxide solutions are subject to a chemical breakdown. When the max. storage time is exceeded (see technical data) the solution should no longer be dosed into the drinking water, because its disinfection effect is weakened. A drain valve is required on the product tank to discard the old solution (see 6.3.6).



### CAUTION!

The solution creates a dangerous chlorine dioxide steam. It must be neutralised immediately. (see 9.2.)

### Functions

The service life control is activated or deactivated in the SETUP and the control time can be adjusted. It starts again respectively with each new production. The time that has already transpired can be read off the status display.



### ATTENTION!

These settings require an exact understanding of the consequential effects on the product and the operating performance. That is why only qualified service personnel may make these settings.

If the set permissible storage time is exceeded then the dosing of the solution is interrupted, the alarm relay is released and the timeout is visually and acoustically signalled on the control unit.

After the solution has been professionally disposed of, the alarm is to be stopped manually and a new production will start.



**NOTICE!**

*If the application process does not allow the dosing to be interrupted at all, the service life control should be deactivated. Then after a very long storage time it should only be suspected that the disinfection effect will be weaker from the degraded product instead of a complete interruption.*

**7.7.4 Increased supply**

A considerably higher supply quantity might be needed for applications with a higher supply need in a limited timeframe. In such cases of application a larger product tank is used, its volume has to be calculated on an individual basis. The EASYZON control system comes with this function as standard, but it has to be deactivated in the SETUP when it is delivered.

**Installation**

The standard product tank is not suitable for this function. A sufficiently chemical resistant tank has to be used, its volume has to be co-ordinated with the individual supply need. The tank is fitted with a 4-bar electrode instead of the standard 3-bar electrode, the length of the bars are co-ordinated with the case of application.



**NOTICE!**

*The tank should not be larger than the unit's daily output, because the effect of the solution is already reduced by the chemical breakdown before the solution is dosed.*

All connections of the unit to the standard product tank (cables and hoses) have to be adapted to be suitable for the enlarged product tank.

**Function**

When the "increased supply" function is activated the function "supply+" appears on the start display. If this key is moved the unit performs a single production up to the increased level in the AUTOMATIC operating mode and then switches to STANDBY. The unit then functions as in normal operation.

**7.7.5 External switch off**

So as to integrate into a central process control system the EASYZON is fitted with a digital entry for an external shut-off. It works according to the closed current principle – when the contact is interrupted, the unit is switched off. The SETUP offers three possible settings:

Selection	Meaning
Production off	Production is switched off, but the dosing pump can continue to extract until the dry run safety device reacts.
Dosing off	Production and dosing pump are switched off.
not active	The entry for the external shut-off is not evaluated.

Table 7.7.5: Options for the external shut-off

A production that has been initiated is completed according to the normal time sequence even with an external shut-off to and filled into the product tank.

**7.7.6 Operating meter**

In total there are three meters running in the control system, which are shown in the status display.

- Operating hours

The hours of the voltage supply are metered. The meter cannot be reset.

- Batch meter

counts the number of times the reactor is filled. This meter can also not be reset.

- Service life meter  
establishes the age of the last chlorine dioxide solution produced. When a new production batch is completed it is reset.

## 8. Start-up

The start-up is only carried out after the hydraulic and electric installation has been completed.

### CAUTION!

Personal protection equipment must be worn at all times when working on the unit in accordance with the valid regulations for accident prevention!



Breathing gear



Hand protection



Protective footwear



Face protection



Protective clothing



### ATTENTION!

Before start up, all hydraulic connections must be inspected for correct tightness and, if necessary, must be tightened up using appropriate tools.

## 8.1 Starting the system

The equipment does not have a mains switch and is switched on by connecting it to the mains. After it has been switched on, the control system displays the programme version for a few seconds and then goes into the operating mode OFF.

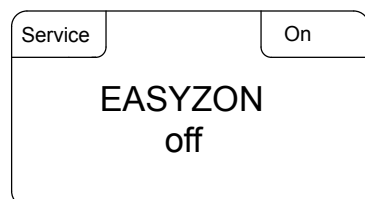


Fig. 8.1: Display in the operating mode OFF

## 8.2 Configuration of the control system

The configuration options for the control system are described in the service instructions. All settings are adjusted in the Service Menu's sub-menu SETUP. This Menu is protected with a code against unauthorised access.



### ATTENTION!

These settings require an exact understanding of the consequential effects on the product and the operating performance. That is why only qualified service personnel may make these settings.

## 8.3 Start of production

Install the intake lines in the chemical canisters. The screw cap on the intake line can be pushed onto the outer pipe of the intake line so as to adapt it to the size of the canister.



### ATTENTION!

Do not swap the intake lines under any circumstances. A mix-up in the intake lines leads to an uncontrolled formation of chlorine dioxide and then the product may not be dosed into the drinking water.

Before the start of the production, the dosing pump has to be switched to STOP (see the dosing pump operating manual) in order to avoid inadvertent dosing of the chlorine dioxide. The intake lines must be filled with the chemical.

Item	Menu item	Work procedure
1	INFLOW	Open the solenoid valve until the reactor is half full.
2	Pump HCl (Hydrochloric acid)	Operate pump until no more air bubbles are rising.
3	NaClO <sub>2</sub> pump (Sodium chlorite)	Operate pump until no more air bubbles are rising.
4	DRAINAGE	Open the solenoid valve until the reactor is empty.
5	Drain medium in product tank and dispose of.	

Process menu outputs

The production is started with the ON key on the control system and the unit switches to the AUTOMATIC operating mode. The unit produces chlorine dioxide until the product tank is sufficiently filled and then switches to STANDBY. (A condition of the process is not to fill the tank up to the top.)

## 8.4 Start of dosing

The dosing pump has to be adjusted according to the conditions on-site with the help of the dosing pump operating manual. The fundamental information regarding the dosing of the chlorine dioxide in the drinking water has to be considered when calculating the setting. (see 5.5)

The EASYZON is fitted with a PENTABLOC multi-function valve as standard to ventilate the dosing pump. The term "intake" is to draw in from outside when the dosing pump is switched on.

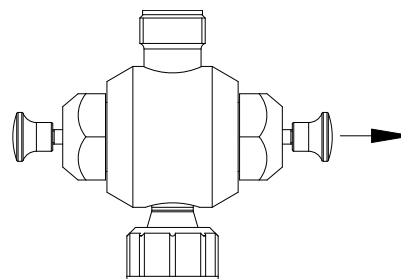


Fig. 8.4: Ventilation with PENTABLOC

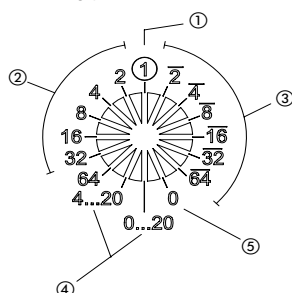
The pump now supplies in the circulation line, the line's end is attached to the product tank. After the ventilation the dosing pump has to be switched back into the automatic operating mode.

After the dosing pump has started, the content of chlorine dioxide in the treated water has to be checked and if nec. the dosing pump setting may be adjusted. Suitable check devices, which work according to the DPD methods, are for example a comparison system or a photometer.

The sampling has to be repeated on a regular basis depending on the local regulations in order to ensure a consistent disinfection.

### 8.5 Setting of dosing pump

When using a contact water meter, the following table facilitates (table 8.5.1) the setting of the MAGDOS DX 4 dosing pump. The selector switch for external operation of the MAGDOS DX has the following positions:



- ① Pulse 1:1
- ② Pulse multiplication 2 / 4 / 8 / 16 / 32 / 64
- ③ Pulse division 2 / 4 / 8 / 16 / 32 / 64
- ④ Signal input 0 ... 20 mA or 4 ... 20 mA
- ⑤ Pump stop at "0"

Contact sequence Contact water meter [l/imp]	MAGDOS DX4 dosing pump settings	Chlorine dioxide ClO <sub>2</sub> Dosing concentration [ppm]			
		0,1	0,2	0,3	0,4
0,5	Pulse division	16:1	8:1	8:1	4:1
	Stroke length	3,2	3,2	4,2	3,2
1	Pulse division	8:1	4:1	4:1	2:1
	Stroke length	3,2	3,2	4,2	3,2
1,5	Pulse division	8:1	4:1	2:1	2:1
	Stroke length	4,2	4,2	3,5	4,2
2	Pulse division	4:1	2:1	2:1	1:1
	Stroke length	3,2	3,2	4,2	3,2
2,5	Pulse division	4:1	2:1	2:1	1:1
	Stroke length	4	4	5,5	4
5	Pulse division	2:1	1:1	1:1	1:1
	Stroke length	4	4	5,5	7,2
10	pulse multiplication	1:1	1:1	1:2	1:2
	Stroke length	4	7,2	5,5	7,2
20	pulse multiplication	1:1	1:2	1:4	1:4
	Stroke length	7,2	7,2	5,5	7,2
25	pulse multiplication	1:1	1:2	1:4	1:4
	Stroke length	10	10	6,5	10
50	pulse multiplication	1:2	1:4	1:8	1:8
	Stroke length	10	10	6,5	10

Table 8.5.1: Setting of dosing pump

Example		
Pulse division	„2:1“	2 impulses = 1 stroke
pulse multiplication	„1:2“	1 impulse = 2 strokes

Table 8.5.2: Example for pulse setting at the dosing pump



#### NOTICE!

The settings apply with backpressure of 6 bar in the system.

For other system pressures, correct the stroke length at the dosing pump according to table 8.5.3.

Backpressure of the system	Correction stroke length
2 bar	-30 % compared to table 8.5.1
4 bar	-15 % compared to table 8.5.1
6 bar	See tab. 8.5.1
8 bar	+10 % compared to table 8.5.1
10 bar	+20 % compared to table 8.5.1

Table 8.5.3: Stroke length correction for backpressure of the system

The set values are suitable for initial adjustment of the dosing pump. After starting the dosing process, the actual concentration of ClO<sub>2</sub> must be verified with water samples and the setting of the pump adjusted accordingly, if necessary.

## 9. Shutdown and Disposal



### CAUTION!

Personal protection equipment must be worn at all times when working on the unit in accordance with the valid regulations for accident prevention!



Breathing gear



Hand protection



Protective footwear



Face protection



Protective clothing

No special measures are necessary for a brief shutdown of the unit (e.g. one day). After the changeover to the operating mode OFF it is advisable to have the residual chlorine dioxide in the product tank disposed of professionally (see 9.2).



### NOTICE!

With this procedure the chemicals are still attached so that the renewed start-up can be quickly accomplished. Therefore the voltage supply should be left on so that all of the safety devices remain functional.

For lengthier interruptions to the running of the unit it must be rinsed off thoroughly with water (see 9.1). The intake lines are taken out of the chemical canisters, the canisters are closed and the water supply is turned off. The voltage supply can be disconnected.

### 9.1 Rinsing the unit

It is necessary to rinse the unit before a long shutdown for maintenance purposes.

If the product tank is filled its contents must be removed professionally before the rinsing as per 9.2.

The intake lines are taken out of the chemical canisters for the rinsing and placed into tubs filled with water. The canisters have to be closed with their corresponding lids.

The OUTLETS Menu has to be selected for the actual rinse procedure. The following rinse procedure has to be repeated twice and in between times the tank has to be emptied and neutralised.



### WARNING!

The order must be strictly adhered to during the rinse procedure. Failure to observe this can result in an overconcentration of chlorine dioxide. Explosion hazards!

Item	Menu item	Work procedure
1	INFLOW	Open the solenoid valve until the reactor is 3/4 filled (up to level 1). Afterwards close the solenoid valve again.
2	Pump HCl (Hydrochloric acid)	Run for approx. 2 minutes and then switch it off again when level 3 is reached.
	NaClO <sub>2</sub> pump (Sodium chlorite)	Run for approx. 2 minutes and then switch it off again when level 3 is reached.
3	Mixer	Run for approx. 1 minute and then switch it off again
4	DRAINAGE	Open the solenoid valve until the reactor is empty. Afterwards close the solenoid valve again.

Table 9.1 Rinse procedure

Then the metering pump for chlorine dioxide is rinsed. If necessary, the power supply must be switched off in the OUTPUTS menu.



### ATTENTION!

The hose line is still filled with the chlorine dioxide solution. Care must be taken that there is no fear of overdosing in the process.

### 9.2 Disposal of the chemicals

The chemicals must be removed without fail in such a way that there is no fear of any detrimental effects to people, equipment and the environment. In this sense the following references must be observed.



### CAUTION!

Personal protection equipment must be worn at all times when working with chemicals in accordance with the valid regulations for accident prevention! You can find the special safety guidelines for the chemicals used in Chapter 1.11.



Breathing gear



Hand protection



Protective footwear



Face protection



Protective clothing



### WARNING!

Chlorine dioxide is poisonous when inhaled, it has a pungent smell and can cause chemical burns in the respiratory system. Therefore, observe the instructions for neutralisation in all cases.

### Disposal of the chlorine dioxide solution

The chlorine dioxide solution to be disposed of is conveyed directly into a solution of sodium thiosulphate pentahydrate for neutralisation (available, for example, as chlorine eliminator in the specialised swimming pool trade). For a completely filled product tank approx. 150 g of sodium thiosulphate pentahydrate is dissolved into 2 litres of water in a 10l-tub.

A hose is attached to the drain valve of the product tank, its end is submerged in the neutralisation liquid.

After a reaction time of approx. 5 minutes the solution can be disposed of via the drainage system.

#### Disposal of activated carbon

The activated carbon absorbs the chlorine dioxide from the atmosphere in the product tank. Completely loaded activated carbon has a strong smell of chlorine dioxide and has to be neutralised.

For this purpose the contents of the activated carbon cartridge are put in a neutralisation solution. After 5 minutes of reaction time the liquid is disposed of via the drainage system and the used activated carbon via domestic waste.

#### 9.3 Disposal of old equipment

If the equipment is to be disposed of after its service life, it has to be thoroughly rinsed out first, the contents of the tank and the activated carbon have to be disposed of by professionals as per 9.2.

The equipment was manufactured in accordance with the ROHS guideline and the waste electrical equipment legislation. The manufacturer will take care of disposal if the equipment is returned free of charge. It should not be included with household waste.

## 10. Maintenance

### 10.1 Basic maintenance information

EASYZON is a device manufactured to the highest quality standards with a long service life. Some parts are subject to wear due to chemical and mechanical stress. Regular visual inspections are therefore necessary in order to ensure a long operating life. Regular preventative maintenance of the unit protects it against operational failure.

Maintenance intervals depend only on how frequently the equipment is used. Chemical wear, for example of rubber parts, begins with the initial medium contact and continues irrespective of the usage.



#### CAUTION!

*Before any maintenance work is carried out the unit has to be thoroughly rinsed out as per the instructions under 9.1 and the dosing line has to be relieved of its pressure so that the chemicals cannot spray out. Personal protection equipment must be worn in accordance with the valid regulations for accident prevention!*



Breathing gear



Hand protection



Protective footwear



Face protection



Protective clothing



#### CAUTION!

*The voltage supply must be disconnected for maintenance work on the EASYZON and secured against being turned on again.*



#### NOTICE!

*Plastic threads (especially PVC threads) are easier to screw on and unscrew again if they are lightly rubbed with silicon grease beforehand.*



#### NOTICE!

*The maintenance for dosing pumps and other accessories are referred to in separate instructions.*



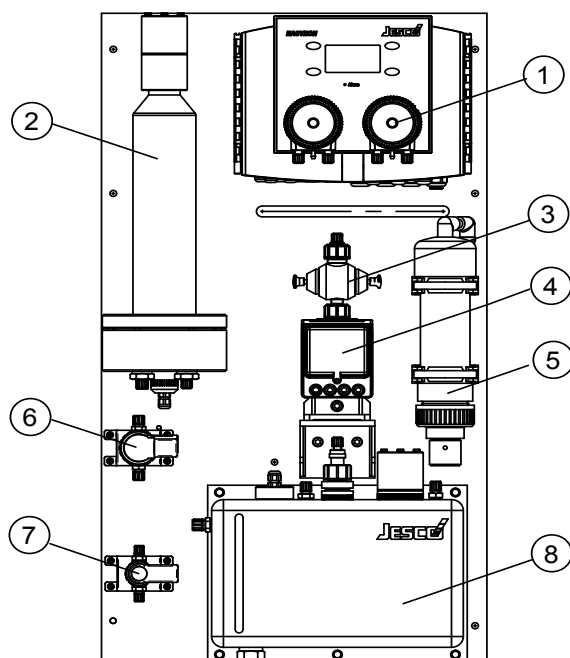
#### NOTICE!

*The maintenance may only be carried out by trained experts, and is described in an additional service instruction.*



## 11. Spare parts

### 11.1 Maintenance kit overview



Item	Description	No.	Part no.
1	Replacement hose for the hose pump	2	38519
	Replacement rotor for the hose pump	2	38105
2	Maintenance kit for rotor (all seals, balls and valve seats)	1	38520
3	Pentabloc servicing kit	1	35326
4	MAGDOS DX 4 maintenance kit, including diaphragms	1	39692
	Only MAGDOS DX4 diaphragms	1	81864
5	Replacement filling for the activated carbon cartridge	1	28552
6	Chlorine dioxide ClO <sub>2</sub> valve	1	79220
	Maintenance Kit for Solenoid Valve (for EASYZON 5 production date < 10/2013)	1	39187
	Maintenance Kit for Solenoid Valve (for EASYZON 5 production date > 10/2013)	1	40913
7	Water valve	1	79219
8	Maintenance kit for the product tank (all seals)	1	38523
-	PTFE-hose 4/6 mm	~3 m	97389
-	PTFE-hose 6/8 mm	~1 m	97620
-	Tube of silicone grease		35537

Table 11.1: Maintenance kit overview

## 12. Troubleshooting

The following table highlights common faults that may occur and the simple measures the operator can take to solve them. A professional firm should in all cases deal with the more complex issues regarding the unit.

In most incidents the display shows the cause of the fault in plain text.

Fault	Possible cause	Fault remedy
The unit does not produce any chlorine dioxide	The unit is switched off	Switch the unit on
	The product tank is sufficiently filled	When it has fallen below the minimum level the product tank will then automatically begin a new production
	A chemical is empty	Attach a new chemical canister
	Overrunning the time limit in a procedural step	Rectify the source of the fault and continue with the production
	The rod sensors are not reading the level in the reactor or in the product tank correctly	Adjust the potentiometer on the circuit board (see section 7.1)
	No water	Switch the water supply on
	External shut-off	Check to see if the external shut-off was knowingly activated, otherwise disconnect in the SETUP.
	Leakage detected	Check whether a leak is actually present and then rectify it. A float switch may just have been pushed upwards or a cable break has occurred.
No dosing despite having a supply in the tank	External shut-off	Check to see if the external shut-off was knowingly activated, otherwise disconnect in the SETUP.
	Permitted service life exceeded	Drain the tank contents and neutralise (see Chap. 9.2).
	The dosing pump is receiving power but is not dosing.	Check application process to establish whether the dosing pump is being actuated. The dosing pump may be switched off.
	Gas bubbles in the dosing head of the pump.	Ventilate the dosing head with the help of the PENTABLOC (see Chap. 8.4)
Gas alarm or pungent odour	Activated carbon depleted	Replace the activated carbon (see service instructions, Chap. 10.4)
	Faulty seal	Look for leaks and remedy

### 13. Installation example

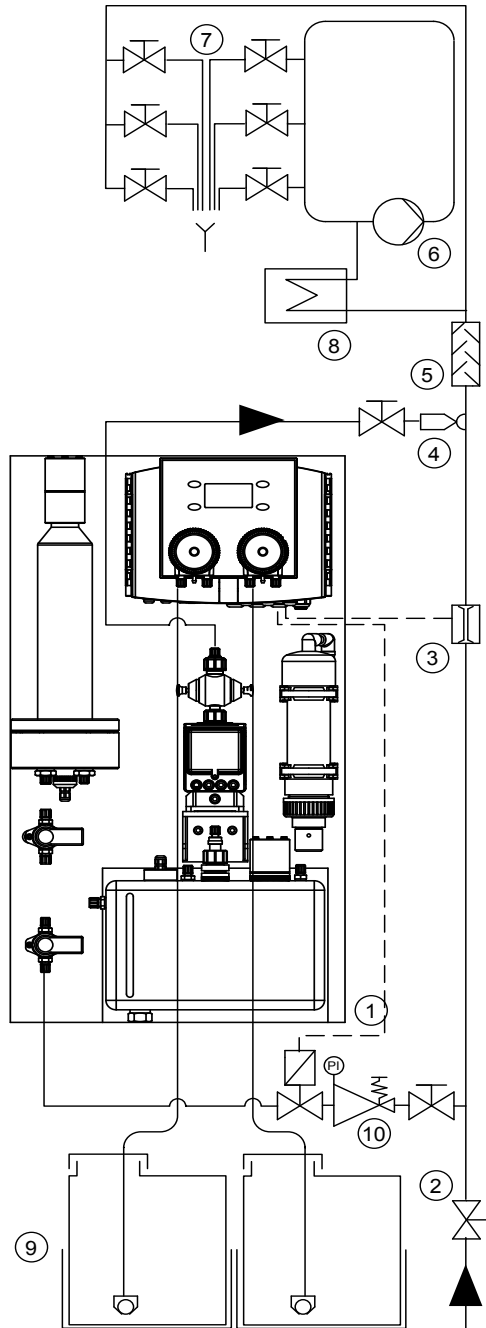


Fig. 13.1: Chlorine dioxide in a drinking water system with cold water and hot water circuit:

- ① EASYZON chlorine dioxide system
- ② Water supply
- ③ Flow meter (e.g. contact water meter)
- ④ Injection nozzle and ⑤ Mixing section
- ⑥ Hot water circuit circulation pump
- ⑦ Tap connection
- ⑧ Boiler
- ⑨ Chemicals
- ⑩ Solenoid valve, pressure reducer and shut-off valve

### 14. Device revision

This operating manual applies to the following devices:

Device and model	Revision status	Software version
EASYZON 5	≥ 07/2007	1.x

It contains technical information for the installation, start-up and maintenance. If you have any questions or require any information, which is not included in the operating manual, then please contact the manufacturer and/or their official national representative.

## Index

<b>A</b>	
Auxiliary functions .....	8
<b>B</b>	
Before Using the Equipment .....	6
<b>C</b>	
Chemicals .....	4
Chlorine dioxide .....	5
Connection specifications .....	12
<b>D</b>	
Declaration of conformity .....	24
Declaration of harmlessness .....	25
Description of the unit .....	8
Device revision .....	22
Disposal .....	19
<b>E</b>	
Electrical control .....	12
External shut-off .....	16
<b>F</b>	
Function .....	7
<b>G</b>	
Gas warning device .....	14
<b>H</b>	
Hydraulic Installation .....	9
Hydrochloric acid .....	5
<b>I</b>	
Increased supply .....	16
Injection nozzle .....	11
Installation .....	9
Installation example .....	22
<b>L</b>	
Leakage monitoring .....	15
Level monitoring .....	13
<b>M</b>	
Maintenance .....	20
<b>N</b>	
Navigation .....	13
<b>O</b>	
Operating meter .....	16
Operating modes .....	13
Operators qualification and training .....	3
<b>P</b>	
Pressure lines .....	11
<b>S</b>	
Safety instructions .....	3
Service life monitoring .....	15
Shutdown .....	19
Sodium chlorite .....	5
Spare parts .....	21
Start up .....	17
Status display .....	14
Suction lines .....	10
Supply tank .....	11
<b>T</b>	
Technical data .....	7
Troubleshooting .....	21
<b>W</b>	
Wall assembly .....	9
Warranty application .....	26
Water connection .....	9
Water purification .....	7

## CE DECLARATION OF CONFORMITY



### EU-Konformitätserklärung

Der Unterzeichnete Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, bestätigt, dass die nachfolgend bezeichneten Geräte in der von uns in Verkehr gebrachten Ausführung die Anforderungen der harmonisierten EU-Richtlinien, EU-Sicherheitsstandards und produktspezifischen Standards erfüllen. Bei einer nicht mit uns abgestimmten Änderung der Geräte verliert diese Erklärung ihre Gültigkeit.

### (EN) EU Certificate of Conformity

The undersigned Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, hereby certifies that, when leaving our factory, the units indicated below are in accordance with the harmonised EU guidelines, EU standards of safety and product specific standards. This certificate becomes void if the units are modified without our approval.

### (FR) Certificat de conformité aux directives européennes

Le constructeur, soussigné: Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, déclare qu'à la sortie de ses usines le matériel neuf désigné ci-dessous était conforme aux prescriptions des directives européennes énoncées ci-après et conforme aux règles de sécurité et autres règles qui lui sont applicables dans le cadre de l'Union européenne. Toute modification portée sur ce produit sans l'accord express de Jesco supprime la validité de ce certificat.

### (ES) Declaración de conformidad de la UE

El que suscribe Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, declara que la presente mercancía, objeto de la presente declaración, cumple con todas las normas de la UE, en lo que a normas técnicas, de homologación y de seguridad se refiere. En caso de realizar cualquier modificación en la presente mercancía sin nuestra previa autorización, esta declaración pierde su validez.

### (NL) EU-overeenstemmingsverklaring

Ondergetekende Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, bevestigt, dat het volgende genoemde apparaat in de door ons in de handel gebrachte uitvoering voldoet aan de eis van, en in overeenstemming is met de EU-richtlijnen, de EU-veiligheidsstandaard en de voor het product specifieke standaard. Bij een niet met ons afgestemde verandering aan het apparaat verliest deze verklaring haar geldigheid.

### (HU) EG (EK)– Egyezőségi nyilatkozat

A Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark ezúton kijelenti, hogy a szóban forgó termék annak tervezése és szerkezeti módja, valamint forgalomba hozott kivitele alapján a vonatkozó alapvető biztonságtechnikai és egészségügyi követelményeknek és az alábbi felsorolt EG-irányelveknek minden szempontból megfelel. A terméken engedélyünk nélkül végrehajtott módosítások következtében jelen nyilatkozat érvényét veszti.

Bezeichnung des Gerätes:	<b>Anlage zur Herstellung und Dosierung von Chlordioxid</b>
Description of the unit:	<b>Chlorine dioxide system</b>
Désignation du matériel:	<b>Dioxyde de chlore</b>
Descripción de la mercancía:	<b>Dioxydo de cloro</b>
Omschrijving van het apparaat:	<b>Installatie voor aanmaak en dosering van Chloordioxide</b>
A termék megnevezése:	<b>Klórdioxid előállító és adagoló berendezés</b>

Typ / Type / Tipo / Típusjelölés:

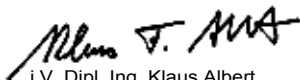
**EASYZON 5**

EU-Richtlinie / EU directives/  
Directives européennes / Normativa UE /  
EU-richtlijnen / Vonatkozó EG-irányelvek

**2006/95/EG**  
**2004/108/EG**  
**2006/42/EG**

Harmonisierte Normen / harmonized  
standards / Normes harmonisées /  
Estándares acordemente / Toegepaste  
normeringen / Hatályos normák

**EN ISO 12100-1 : 2003**  
**EN 61010-1 : 2001**  
**EN 61000-6-2 : 2005**  
**EN 61000-6-3 : 2001**  
**EN 938**  
**EN 939**

  
i.V. Dipl. Ing. Klaus Albert

Lutz-Jesco, Wedemark, 01.02.2008

Technische Leitung / Technical Department Manager / Direction technique /  
Dirección Técnica / Hoofd technische dienst / Műszaki irodavezető

CE-Chlordioxidanlagen-V02

### Declaration of harmlessness

Please copy and enclose with the unit.  
Attach it to the outside of the packaging.

### Declaration of harmlessness

(Please fill out separately for each device – unit, pump or accessory)

We are forwarding the following device for repair:

type: EASYZON 5, more:.....  
 Part No.: .....  
 Serial number: .....  
 Date of delivery: .....  
 Reason for repair: .....  
 Medium to be pumped: hydrochloric acid, sodium chlorite, chlorine dioxide  
 Properties: Irritating, corrosive, toxic

We hereby certify, that the product has been cleaned thoroughly inside and outside before returning, that it is free from hazardous material (i.e. chemical, biological, toxic, flammable, and radioactive material) and that the lubricant has been drained. \*)

If further cleaning is required by the manufacturer, this will be charged for.

We certify that the aforementioned information is correct and complete and that the unit is dispatched in accordance with legal requirements.

Company: .....  
 Address: .....  
 .....

Telephone: .....  
 Fax: .....  
 .....

Customer No.: .....  
 Contact person: .....

Date: .....

Signature / stamp .....

\*) Delete where not applicable

## Warranty Application

Please copy and enclose with the unit.

If the unit breaks down within the warranty period, please return it in a clean conditions with the warranty application duly completed.

### Sender

Company:.....

Address:.....

.....

.....

Date:.....

Contact person: .....

Telephone:.....

### The device

Manufacturer order No.: .....

Date of delivery:.....

Device type:.....

Serial number: .....

Fault details: .....

.....

.....

.....

### Type of fault:

1. Mechanical fault .....

Premature wear .....

Wearing parts .....

Breakage/other damage .....

Corrosion.....

Damage in transit.....

2. Electrical fault.....

Loose connections such as connectors or cables .....

Controls (e.g. switches / buttons) .....

Electronics.....

### Further details

Application site / site description:.....

Accessories used (e.g. measuring cells, etc.): .....

.....

Setup (date):.....

Runtime (approx. number of operating hours):.....

Please describe the specific installation and enclose a basic sketch of the chemical feed system, showing materials of construction, diameters, lengths and heights of suction and discharge lines.







Accessories



Chemical Feed Systems



Measuring and Control Technology



Transfer Pumps

Metering Pumps

December 2014