

# A measured step forward™

Operations & Maintenance Manual

## EASYZON D Chlorine Dioxide System



## Contents

<b>1. Safety .....</b>	<b>3</b>	<b>10. Spare parts.....</b>	<b>26</b>
1.1 General .....	3	<b>11. Troubleshooting .....</b>	<b>27</b>
1.3 Operators qualification and training .....	3	11.1 Error messages of the control system.....	27
1.4 Important electrical safety tips .....	3	11.2 Errors in the hydraulic system.....	27
1.5 Hazards due to non-compliance with the safety instructions .....	3	<b>Device revision .....</b>	<b>28</b>
1.6 Safe operation .....	4	<b>Declaration of conformity.....</b>	<b>29</b>
1.7 Safety instructions for the owner/operator .....	4	<b>Declaration of harmlessness .....</b>	<b>30</b>
1.8 Safety instructions for installation, maintenance and inspection.....	4	<b>Warranty Application.....</b>	<b>31</b>
1.9 Self-made modifications and spares procurement.....	4		
1.10 Systems working with chemicals.....	4		
1.11 Safety instructions on chemicals .....	5		
<b>2. Information and Safety Warnings on Chlorine Dioxide .....</b>	<b>6</b>		
2.1 The product chlorine dioxide .....	6		
2.2 Chlorine dioxide for disinfection applications .....	6		
2.3 Preparation of Chlorine dioxide .....	6		
<b>3. Before placing in operation.....</b>	<b>7</b>		
3.1 Use in accordance with regulations .....	7		
3.2. Scope of delivery.....	7		
<b>4. Technical description .....</b>	<b>7</b>		
4.1 Dimensions .....	7		
4.2 Technical data.....	8		
4.3 Functional description .....	8		
4.4 Optional accessories .....	9		
<b>5. Electrical control.....</b>	<b>10</b>		
5.1 Display and operating elements .....	10		
5.2 Terminal connection .....	10		
5.3 Internal fuses.....	11		
5.4 Menu structure .....	11		
5.5 Default settings.....	11		
5.6 Operating modes .....	12		
<b>6. Installation .....</b>	<b>16</b>		
6.1 Installation examples.....	16		
6.2 General notes of instruction .....	16		
6.3 Installation location .....	17		
6.4 Wall mounting.....	17		
6.5 Hydraulic connection .....	17		
6.6 Electrical connection .....	18		
6.7 Connection diagrams of the auxiliary controls .....	19		
<b>7. Start up.....</b>	<b>20</b>		
7.1 Configuration of the control system .....	20		
7.2. Dilution water adjustment .....	20		
7.3 Bleed the pumps.....	20		
7.4 Adjust the dosing controls.....	20		
7.5 Calibrate the dosing pumps .....	20		
7.6 Batch system.....	22		
7.7 Start of production .....	23		
<b>8. Shutdown and disposal.....</b>	<b>24</b>		
8.1 Rinsing the unit.....	24		
8.2 Disposal of the chemicals.....	24		
8.3 Disposal of old equipment .....	24		
<b>9. Maintenance .....</b>	<b>25</b>		
9.1 Fundamental information for maintenance.....	25		
9.2 Description of maintenance .....	25		

## 1. Safety

### 1.1 General

This Operating & Maintenance Manual contains basic information to be noted 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. The safety instructions must be observed.

Obey the safety instructions in the Operation & Maintenance manual for the dosing pumps and other accessories.

#### 1.2 Warnings used in this Operation & Maintenance 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!**

Refers to an imminent danger. Non-compliance can lead to death or extremely serious injury.



**WARNING!**

Refers to a potentially hazardous situation. Non-compliance can lead to death or extremely serious injury.



**CAUTION!**

Refers to a potentially hazardous situation. Non-compliance can lead to minor injury or property damage.



**IMPORTANT! or NOTICE!**

Appears in conjunction with safety instructions which may endanger the machine and its operation if disregarded.



**IMPORTANT!**

Draws attention to supplementary information to make the work easier and ensure troublefree operation.

Markings which are affixed directly to the unit, such as

- Cable markings
- Markings for process fluid connections

must be observed without fail and must remain fully legible at all times.

### 1.3 Operators qualification and training

The personnel employed for installation, operation, inspection, and maintenance, must be suitably qualified for this work. Area of responsibility, tasks and supervision of the personnel must be provided at all times by the customer. Personnel who do not have the required know-how must be duly trained and instructed. If necessary, this can also be undertaken by the manufacturer or certified supplier on behalf of the owner. Operators who are to work with the meter must read and understand the manual in all of its parts.

### 1.4 Important electrical safety tips

When installing and using this electrical equipment, basic safety precautions should always be followed, including 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 only to a grounding type receptacle protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the receptacle is protected by a GFCI.



**WARNING!**

To reduce the risk of electric shock, replace damaged cord immediately.



**DANGER!**

Fire hazard. Pressure surge: parts may burst and cause fatal injury. The equipment may not be used in a highly combustible area under any circumstances.

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 comply with the safety instructions may endanger not only people, but also the environment and the unit. Non-compliance with the safety information will immediately cancel your rights of claiming for damages even during the warranty period. The following hazards in particular may arise:

- Failure of major unit functions.
- Failure of specified methods for maintenance and repair.
- Danger to people or damage of devices due to electrical, mechanical and chemical effects.
- Danger to the environment due to leakage of hazardous substances.

### 1.6 Safe operation

The safety instructions contained in this Operation & Maintenance Manual must be observed. The owner is responsible for ensuring compliance with local safety regulations. Disturbances susceptible of impairing safety are to be eliminated immediately!

### 1.7 Safety instructions for the owner/operator

Statutory regulations must be observed.

Leakages (e.g. when a membrane breaks) of dangerous materials to be conveyed (e.g. aggressive, poisonous) must be purged in such a way that they do not become a risk to people and the environment.

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

Danger due to electric current must be excluded (for further details, refer to the German VDE standards as well as local rules and regulations as well as chapter 6.6).

### 1.8 Safety instructions for installation, maintenance and inspection

The operator has to ensure that all assembly, maintenance and inspection works are done by authorized and qualified technical operators.



**WARNING!**

*Assembly and maintenance of the control system are to be strictly done after disconnecting the device from the power supply. The procedure specified in the Operation & Maintenance Manual for shutting down the system must be observed without fail. It must be secured against reconnection during the works! Cables are to be attached likewise only in this condition. Neglecting of these instructions can lead to severe damages of device and loss of warranty.*

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

All safety mechanisms and guards must be refitted and reactivated as soon as the work is complete.

### 1.9 Self-made modifications and spares procurement

The device may be converted or changed only by qualified technical personnel.

If the configuration of the device is wrongly made 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. Otherwise the guarantee expires.

### 1.10 Systems working with chemicals

**CAUTION!**

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



Protective clothing    Protective gloves    Goggles

All people responsible for installation and maintenance should 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 power supply is reconnected. This may lead to caustic or other burns to the face and hands. Dosing lines must always be connected before starting the pump 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 could spray out. This may lead to caustic 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 chemicals.



**WARNING!**

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

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 Safety instructions on 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:



Protective clothing



Protective gloves



Goggles

#### 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!**

*Concentrated (9%) hydrochloric acid is irritating.*



**CAUTION!**

*Hydrochloric acid steam has a corrosive effect on many materials. Make sure the container is always closed.*

#### 1.11.2 Special notes on sodium chlorite

A 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!*



**DANGER!**

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

## 2. Information and Safety Warnings on Chlorine Dioxide

### 2.1 The product chlorine dioxide

Chlorine dioxide (molecular formula  $\text{ClO}_2$ ) is an orange-yellow gas featuring a density of  $3 \text{ kg/m}^3$ , in standard conditions. It is heavier than air and thus accumulates itself at ground level.



**WARNING!**

*Chlorine dioxide is a very toxic substance if inhaled and very irritant for the eyes, the respiratory organs and skin. Exposure to chlorine dioxide requires the use of a specific respirator mask. 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, in Germany, at 0.1 ppm.*



**NOTICE!**

*The requirements in Germany for what concerns personal protective equipment and structural equipment are determined and set forth by the regulation for the prevention of industrial accidents "BGV-V D5" on "the chlorination of water".*



**WARNING!**

*Explosion hazards! At critical concentrations, chlorine dioxide explosively decomposes into chlorine and oxygen. As a dissolved gas in water, chlorine dioxide is not explosive.*

The following rules must thus be held valid at all times:

- The plant can be operated only at the specifically prescribed chemical concentrations (consult the technical data)
- The chemicals cannot be mixed outside of the reactor.
- The reactor must consistently be maintained at an overpressure level of at least 1 bar.
- The chlorine dioxide solution must be diluted with water directly at the reactor outlet, at max.  $2 \text{ g ClO}_2/\text{l}$ .
- Prior to starting up plant operations, the reactor must be filled with water. (delivered state)
- The chlorine dioxide solution must strictly not be heated.

The EASYZON device has been engineered in consideration of all the rules herein. There need not be any fear of explosion, provided of course that the unit is implemented in compliance with all the specifications provided and as per its intended uses. All directions on installation, initial operations, operation and maintenance must be observed at all times.



**IMPORTANT!**

*Chlorine dioxide solutions are chemically unstable. Meaning that long-term storage is not possible.*

Should storage nevertheless be necessary, the storage concentration range should lie between 0.5 up to a maximum of  $2 \text{ g ClO}_2/\text{l}$ . Storage times should not overrun 30 minutes. The storage tank is required to be clean and dark. High temperatures will accelerate deterioration.

### 2.2 Chlorine dioxide for disinfection applications

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

- $\text{ClO}_2$  distinguishes itself due to excellent effectiveness levels against bacteria, viruses, spores and algae.
- Even at pH values ranging between pH 6,5 and 11,  $\text{ClO}_2$  features top disinfection power levels. (The disinfection power levels registered with chlorine instead decrease considerably in presence of increasing pH values.)
- $\text{ClO}_2$  has a higher disinfection strength than chlorine, it therefore also works against chlorine resistant organisms.
- The implementation of  $\text{ClO}_2$  prevents the generation of trihalomethanes (THM) and chloramines.
- Due to its high latency period in drinking water,  $\text{ClO}_2$  provides for prolonged, continuous disinfection, e.g. in extensively branched-out piping networks.
- The odour threshold of  $\text{ClO}_2$  lies approximately 4 times higher compared to Chlorine.

Some typical uses of  $\text{ClO}_2$  are:

- the disinfection of drinking water
- the prevention of biofilm and algae proliferation in cooling water circuits
- the treatment of process water
- the treatment of foodstuff
- for odour-control in a wide selection of processes

### 2.3 Preparation of Chlorine dioxide

EASYZON D is engineered for the preparation of Chlorine dioxide by the oxidation of sodium chlorite method. Hydrochloric acid (HCl) and sodium chlorite ( $\text{NaClO}_2$ ) are mixed into a 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. Directly at the reactor outlet, the chlorine dioxide preparation is then diluted with water.



**NOTICE!**

*The preparation of 1 kg of chlorine dioxide requires: 25 litres of 9% hydrochloric acid solution and 25 litres of 7.5% sodium chlorite solution.*

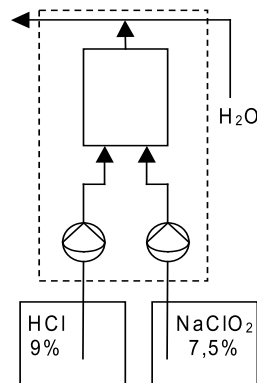


Fig. 2.3.1: Simplified scheme of the installations



### 3. Before placing in operation

#### 3.1 Use in accordance with regulations

The device is exclusively intended for the production and metering of a chlorine dioxide solution. The operation parameters specified in the instruction manual must be strictly adhered to and observed at all times. The operational safety of the delivered unit can only be guaranteed when it is used in conformity with its intended use.



**WARNING!**

The EASYZON D must only be used with the following chemicals: Concentrated (9%) hydrochloric acid according to EN 939 and sodium chlorite solution (7.5%) according to EN 938.

Other usage and modifications will determine the immediate cancellation of the warranty and any other manufacturer's liability.

#### 3.2. Scope of delivery

Prior to starting any installation operation you are kindly required to check the delivery against the packing list to ensure it is complete and has not been in any way subject to transport damages. Contact the supplier and/or carrier regarding any questions concerning the delivery and/or transport damages.

Do not operate any defective devices.

EASYZON D is assembled onto a panel together with the following assembly components

- Metering pumps with pressure control valves and flow-monitoring units
- Calibration cylinders for the metering pumps
- Reactor built into a safety cabinet provided with active aeration
- Control and display of all operating condition
- Pre-dilution of the chlorine dioxide solution with shut-off stop cocks, non-return valves and flow measuring device.

The standard delivery also comprises

- Flexible intake lines with a 2.5 m hose line
- Float switches for the chemical containers
- Control cabinet key for the reactor safety cabinet
- Operation manuals for EASYZON D, dosing pumps and PENTABLOC

All optional accessories are specified separately on the relative packing list.

### 4. Technical description

#### 4.1 Dimensions

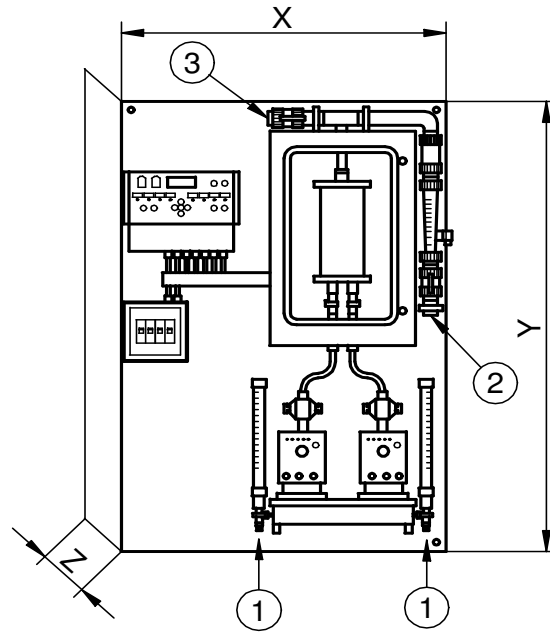


Fig. 4.1: Dimensions

EASY-ZON	width [mm]	Height [mm]	Depth [mm]	Connection Suction lines	Connection for Dilution water
Type	X	Y	Z	①	② and ③
35 D	750	1000	340	PVC tube 4/6mm	PVC pipe d25/DN20
60 D	750	1000	340	PVC tube 4/6mm	PVC pipe d25/DN20
130 D	750	1000	340	PVC tube 4/6mm	PVC pipe d25/DN20
300 D	900	1350	420	PE tube 6/8mm	PVC pipe d25/DN20
700 D	900	1350	420	PE tube 6/8mm	PVC pipe d32/DN25
1400 D	900	1350	450	PE tube 8/12mm	PVC pipe d32/DN25

Tab. 4.1: Dimensions of system

#### 4.2 Technical data

EASYZON		35 D	60 D	130 D	300 D	700 D	1400 D
Max. pressure	[bar]	12	12	12	8	10	4
Production capacity at max. pressure	[g/h]	48	99	130	316	800	1440
Dosing pumps MAGDOS Type		LT 1	LT 3	LT 4	LT 10	DE 20	DE 40
used Chemicals		Concentrated (9%) hydrochloric acid according to EN 939 Sodium chlorite (7.5%) according to EN 938					
Consumption per chemical for 100% production	[l/h]	1,2	2,5	3,2	7,9	20	36
Water flow rate approx.	[l/h]	500	500	500	500	800	1500
Max. pressure loss water		max. 0,2 bar					
Product concentration		Reactor output: 20 g ClO <sub>2</sub> /l, after dilution < 2 g ClO <sub>2</sub> /l					
Operating voltage		230 V 50 Hz					
Protection class		IP 54					
Power consumption	[W]	100	100	100	100	200	200
Max. Power consumption during dosing stroke	[A]	2,9				4,1	
Weight	[kg]	25	25	25	50	70	70
Ambient temperature	[°C]	5...40 (no exposure to direct sunlight)					
Media temperature	[°C]	5...35					
Atmospheric moisture		...90 % (non-condensing)					

Tab. 4.2: Technical data

#### 4.3 Functional description

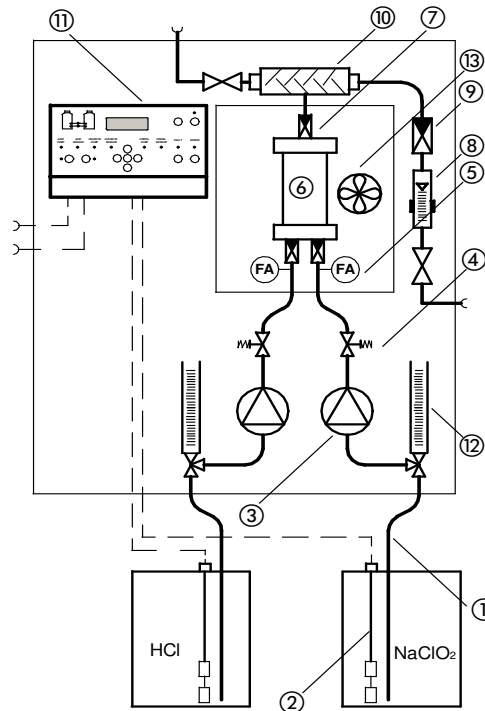


Fig. 4.3: Functional diagram

- ① intake line
- ② float switch
- ③ dosing pump
- ④ back-pressure valve
- ⑤ flow pulse monitor
- ⑥ reaktor
- ⑦ reactor output
- ⑧ flow meter
- ⑨ non-return valve
- ⑩ static mixer
- ⑪ electrical control
- ⑫ calibration cylinder
- ⑬ ventilator

Fig. 4.3 gives a schematic overview of the unit. Two dosing pumps ③ feed the starting chemicals at a volume ratio of 1:1 into the reactor ⑥ and after a dwell of approx. 10 minutes, the chlorine dioxide solution with 20 g ClO<sub>2</sub>/l is available.

The reactor output ⑦ opens into a static mixer ⑩, in which the chlorine dioxide solution is highly diluted directly inside the unit. In most cases, this dilute solution flows directly into the application process. In so-called batch systems, a supply tank may be used from which dosing pumps meter solution into the process. (Examples are given in the chapter "Installation".)



A control system ⑪ is installed directly on the unit and connected to all assembly equipment. It controls and monitors all functions of the unit:

- Control of the dosing pumps ③
- Monitoring of each dosing stroke by analysing the flow pulse monitors ⑤
- 2-stage monitoring of the remaining chemical supply at the float switches ②
- Switching on the dilution water supply
- Monitoring of the dilution water at the flow meter ⑧
- Control of the ventilator ⑬
- Alerting of error conditions

The control system uses fixed settings or acts according to signals from the water meter, the process control or measurement instruments in the production of chlorine dioxide.

#### 4.4 Optional accessories

The optional accessories expand the unit with additional functions, which are useful or necessary for certain applications. Most options are individually produced for the specific application. A principle description is therefore only provided in the following. For details, refer to the separate operation manuals.

##### 4.4.1 Control fittings for dilution water

The basic unit can control a solenoid valve or a pump in the feed line for the dilution water (for the arrangement of the devices refer to the installation examples). Upon receipt of an order, the control fittings are selected according to local conditions.

##### 4.4.2 Batch system

If the consumed quantity is subject to strong fluctuation or if several consumers are supplied by one EASYZON unit, a supply tank (batch tank) for the chlorine dioxide solution is installed. Several dosing pumps may for instance feed chlorine dioxide from this tank into different applications.

The system consists of

- Tank with filling line
- Float switches for level control and monitoring
- Control cabinet for START and STOP of the production unit
- Extraction system and adsorption cartridge to avoid the smell of chlorine dioxide in the ambient air.

For batch systems, the dilution water must be controlled by means of a solenoid valve. (For the arrangement of the devices refer to the installation examples.)

##### 4.4.3 Rinsing of the reactor

Chlorine dioxide that stays in the reactor for several hours due to a unit standstill is subject to chemical breakdown and loses its disinfectant effect. The reactor should therefore be rinsed before or after longer periods of standstill.

The simplest rinsing system consists of several ball valves for manual rinsing. For automatic rinsing, solenoid valves and a proper control system are required.

##### 4.4.4 Measuring instruments

Depending on the application, photometers for the manual measuring of chlorine dioxide and automatic systems for the permanent monitoring and recording of the chlorine dioxide content in the water are available.

##### 4.4.5 Gas warning device

Warning devices for the monitoring of the ambient air warn the personnel of dangerous concentrations of chlorine dioxide and may provide for alerting or counter measures.

## 5. Electrical control

### 5.1 Display and operating elements

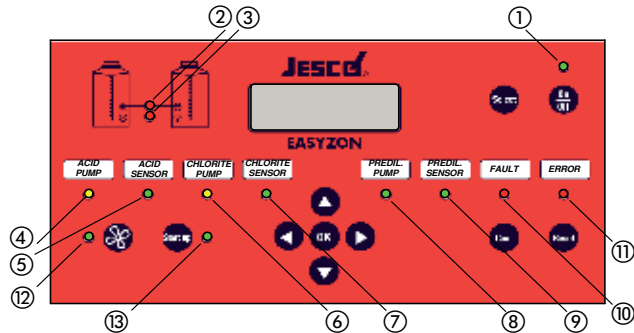


Fig. 5.1.1: Operating panel of the control system

Designation	Function
On/Off	Switching the device on and off
Select	Selection of manual or automatic operation
Reset	Display of alarms (press "OK" to acknowledge)
Conf	Change-over to the configuration mode
Start up	Bleeds the unit
	Activates the ventilator of the reactor cabinet for 1 minute
OK	Change-over to the EDIT mode In the EDIT mode: Confirming the entry and switching to the next parameter Acknowledging an alarm
	Modification of the cursor position
	Change-over to the next display window In the EDIT mode: Modification of the values of the cursor position

Tab. 5.1.2: Description of the functions of the keys

LED no.	Col-our	Designation	Function
①	green		flashes when the unit is switched on
②	red		flashes when the supply of chemicals is almost exhausted
③	red		flashes when the supply of chemicals is exhausted
④	green	Acid Pump	flashes when the acid pump is activated
⑤	yellow	Acid Sensor	goes off when the acid sensor reacts
⑥	green	Chlorite Pump	flashes when the chlorite pump is activated
⑦	yellow	Chlorite Sensor	goes off when the chlorite sensor reacts
⑧	green	Predil. Pump	flashes when the control output for dilution water is active
⑨	yellow	Predil. Sensor	flashes when the flow rate of the dilution water is sufficient
⑩	red	Fault	flashes in the case of a disturbance (level, dilution water, dosing)
⑪	red	Error	flashes in the case of an alarm (dosing)
⑫	green		flashes when the cabinet ventilator is switched on
⑬	green		flashes during the bleed phase

Tab. 5.1.3: Description of the LED's

### 5.2 Terminal connection

terminal	Function	
1	L	input supply voltage
2	N	
3	PE	
4	L	output power supply for the dosing pumps
5	N	
6	PE	
7	+	24 VDC for terminals 38 and 40, if these terminals are used as impulse inputs.
8	-	no function
9	+	power supply 24 VDC for the ventilator
10	-	
11	+	impulse output acid pump
12	-	
13	+	impulse output chlorite pump
14	-	
15		no function
...		
18		
19		control output dilution system for pump or solenoid valve, closed when water is required
20		max. 24V/0.1A
21	-	common ground
22	+	flow monitor acid pump
23	+	flow monitor chlorite pump
24	+	no function
25	-	flow monitor dilution water
26	+	
27, 28		no function
29	-	common ground
30	+	acid empty
31	+	acid pre-alarm
32	+	chlorite empty
33	+	chlorite pre-alarm
34	-	common ground
35	+	remote contact OFF
36	+	remote contact RESET
37	+	remote contact reduced production
38	+	20mA input guide signal, e.g. flow meter or SPS
39	-	
40	+	20mA input chlorine dioxide controller (signal is invertible)
41	-	
42	+	20mA input for reduced production
43	-	
44	+	20mA output for current production
45	-	
46		relay output unit in operation
47		
48		relay output disturbance dosing
49		
50		relay output disturbance dilution water
51		
52		relay output warning
53		
all relay outputs max. 250VAC / 1A (ohmic resistive load)		
load of the analogue inputs approx. 50 ohms		

Tab. 5.2.1 Terminal connection

### 5.3 Internal fuses

The internal fuses of the control system are installed on the bottom left-hand side of the circuit board.

Internal fuse	Function	value
F6	power supply of the control system	250 V 1 A (delay fuse)
F1	power supply of the dosing pumps	250 V 4 A (delay fuse)

Tab. 5.3 Internal fuses



**NOTICE!**  
Use only fuses with identical technical data.

### 5.4 Menu structure

The following figure gives an outline of the menu structure of the control system.

The adjustments are only possible when the unit is switched OFF.

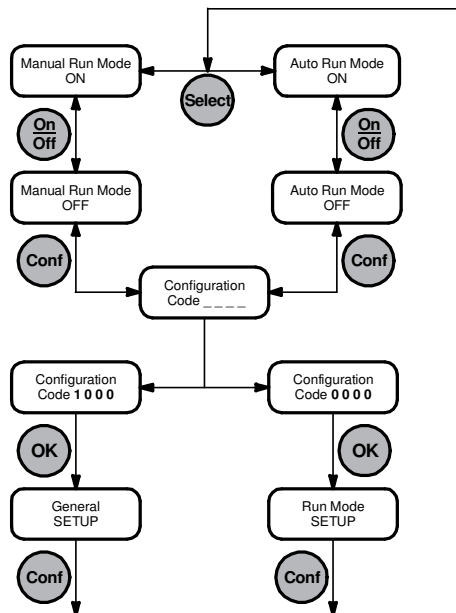


Fig. 5.4: outline of the menu structure

The adjustments which can be made in the individual menus are described in the following.

### 5.5 Default settings

The general settings apply independently of the selected operation mode.

- Press the "On/Off" key to switch off the unit
- Press the "Conf" key to call up the configuration menu
- Enter the code 1000 and press "OK" to confirm

The following values are adjustable:

parameter	Explanations
<b>AUT. RUN_MODE= 1</b> 1=FLOW RATE RUN MODE 2=DIRECT RUN MODE 3=FLOW+AN. RUN MODE	Selection of the operation mode for automatic operation (for explanations refer to the next chapter)
<b>REM_OFF [1=NO, 0=NC]=0</b>	Mode of action of the remote contact OFF (terminals 34+35) "NC": A closed contact switches OFF the unit
<b>REM_RES [1=NO, 0=NC]=0</b>	Mode of action of the remote contact RESET (terminals 34+36) "NC": A closing contact initiates a RESET
<b>LANGUA [0=IT, 1=ENG]=1</b>	Selection of the menu language Italian or English
<b>START_UP_S [str]= 100</b>	Number of dosing strokes to be performed for the bleeding of the unit after pressing the "Start up" key.
<b>PRED_S_DELAY [sec]=10</b>	Time delay between the switching ON of the unit and the beginning of the monitoring of the dilution water by the flow meter.
<b>A_BLEED [1=YES 0=NO]=0</b>	This function allows for a one automatic bleeding of the dosing pumps if dosing errors have been detected. Number of strokes see START_UP_S[str].
<b>MAIN_S [1=mA, 0=fre]=0</b>	Type of signal of the main signal (water meter or SPS) 4...20mA --> terminals 38+39 0...100 imp/min --> terminals 7+38
<b>ANALIS [1=mA, 0=fre]=0</b>	Type of signal of the subsidiary signal (chlorine dioxide controller) 4...20mA --> terminals 40+41 0...100 imp/min --> terminals 7+40
<b>REV_SIG_AN. (1=REV)=0</b>	Invert subsidiary signal 0: max. production at 20 mA or 100 imp/min 1: max. production at 4 mA or 0 imp/min
<b>TIME ADJUST</b> Day (0=Mo, 6=Su) = 1 HOU=07 MIN=10 SEC=13 DAY=05 MON=02 YEAR=08	Setting of date and time

Tab. 5.5: Basic configurations

Press the "Conf" key with no parameter selected to quit the menu.



**NOTICE!**  
If the signal type 4...20mA is selected for incoming signals, the cable break monitoring is active and alerts the user when the value is below 4mA. This setting must therefore only be made when a 4...20mA signal is connected.

## 5.6 Operating modes

For automatic operation, there are three different operating modes. Manual operation is possible in all automatic operating modes by pressing the SELECT key.

### 5.6.1 Manual operation MANUAL RUN MODE

#### Mode of action of this operation mode

The desired production output is entered in the control system and the unit operates without external signals. If connected, remote signals can initiate Start/Stop and reduced production. All monitoring devices of the unit are active.

Typical examples for an application of this operation mode are batch systems and applications with a fixed required supply.

#### Settings

To make adjustments,

- Press the "On/Off" key to switch off the unit
- Press the "Conf" key to call up the configuration menu
- Press the "OK" key to confirm code 0000

parameter	Explanations
C_P_ACID [ml/s] = 1.23	Stroke volume of the acid pump in ml/stroke. Must be entered after calibration.
C_P_CHLOR [ml/s] = 1.23	Stroke volume of the chlorite pump in ml/stroke. Must be entered after calibration.
%_PROD [1=YES, 0=NO] = 0	Allows for a reduction of the production by an analogue signal (terminals 42+43). 4 mA lead to a 0% production. To be activated only if a mA signal is connected. Otherwise error message!
RED_%_PROD [%] = 100	Production is reduced to this value when terminals 34+37 are closed.

Tab 5.6.1: manual operation

## Operation

Adjustable values are highlighted in grey on the display.

Switching on and off with the ON/OFF key.

Starting and finishing the adjustment with OK.

```

MANUAL RUN MODE
Set: 0032 g/h of 0161
StrokeLength: 100%
RUN
    
```



```

MANUAL RUN MODE
Reduction: 025%
RUN
    
```

*Set: 0032 g/h of 0161*

Production output without consideration of the reduction. The maximum value 0161 g/h is calculated by the control system on the basis of the calibration of the pumps.

*StrokeLength: 100 %*

Stroke length of the dosing pumps. If the stroke length is reduced, the control system increases the pulse frequency of the pumps.

*Reduction: 025%*

Reduction of the production by remote signals. In this example, the current production is  $32\text{g/h} - 25\% = 24\text{g/h}$ .

## 5.6.2 Flow rate controlled operation FLOW RATE RUN MODE

### Mode of action of this operation mode

EASYZON receives an electrical signal from a flow meter and doses proportionally to the water flow. For fluctuations in the water flow, the addition of ClO<sub>2</sub> is automatically adapted.

The operator enters the desired dosing concentration and EASYZON calculates the dosing quantity on the basis of the characteristics of the water meter. If connected, remote signals can initiate Start/Stop and reduced production.

Typical examples for an application of this operation mode are water works in which EASYZON is directly connected to the water meter.

### Settings

To make adjustments,

- Press the "On/Off" key to switch off the plant
- Press the "Conf" key to call up the configuration menu
- Press the "OK" key to confirm code 0000

parameter	Explanations
C_P_ACID [ml/s] = 1.23	Stroke volume of the acid pump in ml/stroke. Must be entered after calibration.
C_P_CHLOR [ml/s]=1.23	Stroke volume of the chlorite pump in ml/stroke. Must be entered after calibration.
MAX.FLOW [m <sup>3</sup> /h] = 0100	Maximum flow rate of the flow meter
K_FL_METE [l/imp]=010	Constant of the water meter If the analogue signal was selected as the main signal in menu 1000, this parameter is ineffective.
%_PROD [1=YES, 0=NO]=0	Allows for a reduction of the production by an analogue signal (terminals 42+43). 4 mA lead to a 0% production. To be activated only if a mA signal is connected, otherwise error message!
MAX.METERING [%] = 100	Limitation of the dosing rate in automatic operation.

Tab 5.6.2: Flow rate controlled operation

### Operation

Adjustable values are highlighted in grey on the display.

Switching on and off with the ON/OFF key.

Starting and finishing the adjustment with OK.

```

FLOW RATE RUN MODE
Set: 0.25mg/l of 1.25
StrokeLength: 100%
RUN
    
```



```

FLOW RATE RUN MODE
Flow Rate: 050%
Reduction: 000%
RUN
    
```

*Set: 0.25mg/l of 1.25*

Dosing concentration without consideration of the reduction. The maximum value 1.25 mg/l is calculated by the control system on the basis of the calibration of the pumps and the water meter characteristics. In the example, the unit operates at 20 % maximum.

*StrokeLength: 100 %*

Stroke length of the dosing pumps. If the stroke length is reduced, the control system increases the pulse frequency of the pumps.

*Flow Rate: 050%*

Current flow rate at the water meter. In the example, the dosing pumps operate at only 20% x 50% = 10% of the maximum capacity.

*Reduction: 000%*

Reduction of the production by the analogue remote signal. Not active in the example.

**5.6.3 Directly controlled operation  
DIRECT RUN MODE**

**Mode of action of this operation mode**

EASYZON doses proportionally to an electrical signal from a process control system. If connected, remote signals can initiate Start/Stop and reduced production.

Typical examples for an application of this operation mode are all installations with a process control system.

**Settings**

To make adjustments,

- Press the "On/Off" key to switch off the plant
- Press the "Conf" key to call up the configuration menu
- Press the "OK" key to confirm code 0000

parameter	Explanations
C_P_ACID [ml/s]= 1.23	Stroke volume of the acid pump in ml/stroke. Must be entered after calibration.
C_P_CHLOR [ml/s]=1.23	Stroke volume of the chlorite pump in ml/stroke. Must be entered after calibration.
%_PROD [1=YES,0=NO]=0	Allows for a reduction of the production by an analogue signal (terminals 42+43). 4mA lead to a 0% production. To be activated only if a mA signal is connected, otherwise error message!
MAX.METERING [%]= 100	Limitation of the dosing rate in automatic operation.
F_MAX_INP [str/m]=100	Maximum pulse frequency of the guide signal Adjustment range: 1...120 impulses/minute If the analogue signal was selected as the main signal in menu 1000, this parameter is ineffective.

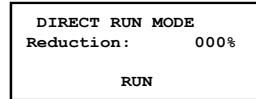
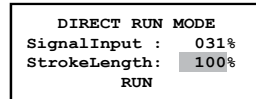
Tab 5.6.3: directly controlled operation

**Operation**

Adjustable values are highlighted in grey on the display.

Switching on and off with the ON/OFF key.

Starting and finishing the adjustment with OK.



*Signal input: 075%*

This value is the strength of the signal from the process control system. In the example, it is 75% for remote signal 16 mA.

*StrokeLength: 100%*

Stroke length of the dosing pumps. If the stroke length is reduced, the control system increases the pulse frequency of the pumps.

*Reduction: 000%*

Reduction of the production by the analogue remote signal. Not active in the example.

### 5.6.4 Flow rate and controller controlled operation FLOW+AN.RUN MODE

#### Mode of action of this operation mode

EASYZON operates according to the combination of two electrical signals. The signal from the water meter is the main signal. On the basis of this signal, EASYZON calculates the general dosing. The impact of the subsidiary signal from the chlorine dioxide controller can be adjusted with the value BEARING\_ANALIS and has a multiplying effect on the flow rate portion. The chlorine dioxide controller is therefore only effective when there is a flow of water. The table illustrates this with examples.

Signal inputs		Setting	Dosing rate		
Water meter	ClO <sub>2</sub> Controller	BEARING ANALIS	Flow rate Portion	Controller Portion	Total
0%	0%	20%	0%	0%	0%
100%	0%	20%	80%	0%	80%
0%	100%	20%	0%	0%	0%
50%	0%	20%	40%	0%	40%
50%	100%	20%	40%	8%	48%
50%	100%	50%	25%	13%	38%
100%	100%	20%	80%	16%	96%
100%	100%	50%	50%	25%	75%

Tab 5.6.4.1: Mode of action Flow+An.Run Mode

The settings MAX.METERING and the dosing concentration have a multiplying effect on the dosing rate which is thus calculated.

The operator enters the desired dosing concentration. EASYZON calculates the dosing quantity on the basis of the characteristics of the water meter and the signal of the chlorine dioxide controller. If connected, remote signals can initiate Start/Stop and reduced production.

#### Settings

To make adjustments,

- Press the "On/Off" key to switch off the plant
- Press the "Conf" key to call up the configuration menu
- Press the "OK" key to confirm code 0000

parameter	Explanations
C_P_ACID [ml/s]= 1.23	Stroke volume of the acid pump in ml/stroke. Must be entered after calibration.
C_P_CHLOR [ml/s]=1.23	Stroke volume of the chlorite pump in ml/stroke. Must be entered after calibration.
MAX.FLOW [m3/h]= 0100	Maximum flow rate of the flow meter
K_FL_METE [1/imp]=010	Constant of the water meter If the analogue signal was selected as the main signal in menu 1000, this parameter is ineffective.
BEARING_ANALIS [%]=50	Impact of the controller signal (terminals 40+41 or 7+40) maximum value: 50%
%_PROD [1=YES, 0=NO]=0	Allows for a reduction of the production by an analogue signal (terminals 42+43). 4 mA lead to a 0% production. To be activated only if a mA signal is connected, otherwise error message!

MAX.METERING [%]= 100	Limitation of the dosing rate in automatic operation.
F_MAX_AN [str/m]= 100	Maximum pulse frequency of the chlorine dioxide controller Adjustment range: 1...120 If the analogue signal was selected as the controller signal in menu 1000, this parameter is ineffective.

Tab 5.6.4.2 Flow rate and controller controlled operation

#### Operation

Adjustable values are highlighted in grey on the display.

Switching on and off with the ON/OFF key.

Starting and finishing the adjustment with OK.

```

FLOW+AN.RUN MODE
Set: 0.25mg/l of 1.34
StrokeLength: 100%
RUN
    
```

▲ ▼

```

FLOW+AN.RUN MODE
Flow Rate: 050%
Signal Analysis: 000%
RUN
    
```

▲ ▼

```

FLOW+AN.RUN MODE
Reduction: 000%
RUN
    
```

Set: 0.25mg/l of 1.25

Dosing concentration without consideration of the reduction. The maximum value 1.25 mg/l is calculated by the control system on the basis of the calibration of the pumps and the water meter characteristics. In the example, the unit operates at 20 % maximum.

StrokeLength: 100 %

Stroke length of the dosing pumps. If the stroke length is reduced, the control system increases the pulse frequency of the pumps.

Flow Rate: 050%

Current flow rate at the water meter. In the example, the dosing pumps operate at only 20% x 50% = 10% of the maximum capacity.

Signal Analysis: 000%

Strength of the signal from the controller.

Reduction: 000%

Reduction of the production by the analogue remote signal. Not active in the example.



## 6. Installation

### 6.1 Installation examples

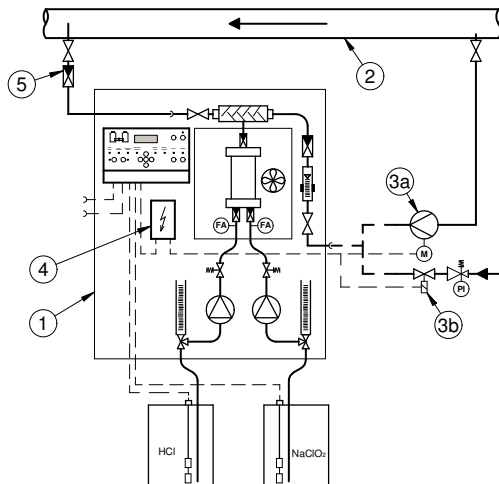


Abb. 6.1.1: Installation with direct dosing

- ① Chlorine dioxide unit EASYZON D
- ② Water flow that is treated with chlorine dioxide.
- ③a Circulation pump for dilution water
- ③b Solenoid valve for dilution water
- ④ Control system for the dilution system
- ⑤ Injection point

Fig. 6.1.1 shows a typical installation for the dosing in a water flow. Water must be provided for the dilution of the produced chlorine dioxide. Either a circulation pump (③a) supplies the pressure for the flow or the dilution water comes from a line with a higher pressure. Pressure-reducing valves and solenoid valves are installed in this case (③b). The water dilutes the chlorine dioxide solution directly at the reactor output to approx. 1 g/l and transports it to the injection point ⑤.

At a constant water flow rate in the line ②, the dosing rate of the unit is set to a fixed value. If the water flow rate is subject to fluctuations, the unit can follow an electrical signal which may come from a flow meter installed in the piping ②.

Fig. 6.1.2 shows an installation with a supply tank. If the level switch in the tank ④ indicates a need, the control system ⑥ activates the production unit EASYZON ①. The solenoid valve ② opens and provides for a sufficient dilution of the produced chlorine dioxide. The valve ③ provides for pressure after the reactor to avoid the production of dangerous chlorine dioxide gas bubbles. When the supply tank ④ is full, the control system ⑥ interrupts the production and the flow of water.

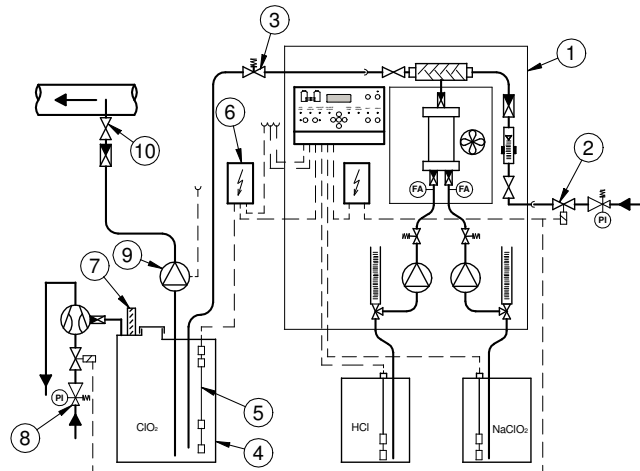


Abb. 6.1.2: Installation with batch operation

- ① Chlorine dioxide unit EASYZON D
- ② Intake dilution water with pressure-reducing valve and solenoid valve
- ③ Back-pressure valve in the product line
- ④ Supply tank for chlorine dioxide solution
- ⑤ Level switch in the product tank
- ⑥ Control system for batch operation
- ⑦ Adsorption unit to avoid the smell of ClO<sub>2</sub> in the ambient air.
- ⑧ Extraction unit for the product tank with pressure-reducing valve, solenoid valve and ejector
- ⑨ Dosing pump for the withdrawal of chlorine dioxide solution
- ⑩ Injection point

During the filling of the tank ④ the extraction unit is activated ⑧ which extracts atmosphere containing chlorine dioxide from the tank ④. During breaks in production, the adsorption cartridge ⑦ ensures an odour-free operation.

Any number of consumers can be supplied by the supply tank. The dosing pump ⑨ is directly controlled by the consumer process.

### 6.2 General notes of instruction

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

It is part of the planner's and operator's responsibility to ensure that the entire unit and its integrated equipment are designed to avoid that chemicals which escape due to a failure of wear parts (e.g. the pump membrane) or burst hoses lead to any permanent damage to the unit parts or buildings. The installation must be arranged in such a way that even if the device breaks down no

disproportionally high consequential damages can arise. We therefore recommend the installation of leakage monitoring devices and collection tanks.

### 6.3 Installation location

The assembly site must be selected in line with the local regulations accordingly. Fundamental requirements concerning the installation location are specified in the German regulation for the prevention of industrial accidents GUV-V D5 "Chlorination of water":

- The room must be lockable.
- If the room is intended for a permanent presence of people, the unit has to be protected against access by unauthorised persons and only the chemicals which are instantaneously needed may be stored there.
- The room must be frostproof.
- There must be a possibility of ventilation.
- There must be the possibility to dispose of the chemicals without any risk. A water connection and a floor drain must therefore be available.
- The installation location must be separated from other spaces by fireproof equipment.

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. Cool rooms are preferable, especially for batch systems.

The regulation for the prevention of industrial accidents recommends the following warning signs:

DO NOT USE CONTAINERS AND DEVICES ALTERNATELY!	
SODIUM CHLORITE + CHLORINE GAS	-> HIGHLY TOXIC
SODIUM CHLORITE + ACID	-> CHLORINE DIOXIDE GAS!
DANGER TO LIFE!	

Abb. 6.3.1: At the unit or near the unit



Fig. 6.3.2: At every access to the installation location

### 6.4 Wall mounting

The installation height has to allow for an easy operation of the control system and an uphill installation of the intake lines for the chemicals.

Choose a vertical wall and align the unit with a water level.

The unit is installed on the wall with screws and rawplugs at 6 points. The installed plate must be free from tension.



#### **IMPORTANT!**

Use the provided stainless steel screws! Hydrochloric acid from canisters which are not fully closed causes a corrosive atmosphere.

### 6.5 Hydraulic connection

Always use appropriate tools for the installation at plastic connecting parts. To avoid damage, never apply excessive force. A thin layer of silicone grease is applied to plastic threads for smooth running.

The piping must be installed on the unit free from any tension.

#### 6.5.1 Water supply

The dilution water must be free from impurities. If necessary, a particle filter (80 µm) must be installed.

The manufacturer recommends drinking water quality.



#### **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.

Depending on the type of installation (see installation examples), a circulation pump or a solenoid valve is used. Before the installation, make sure that the technical data (pressure class, flow rate characteristic, operating voltage) is appropriate for the respective application. If a solenoid valve is used, an upstream pressure-reducing valve is recommended.

#### 6.5.2 Intake lines

Each intake line is installed in a cover of the chemical tank. The hole diameter for flexible intake lines must allow for a tight passing of the hose so that the immersion depth can be adjusted as required.

The length of the hose must be adapted to allow for a replacement of the container without a previous detaching of the hose from the unit. The hose should be installed with a constant uphill gradient.

For the connection of the intake lines to the chemical supply, the unit is equipped with hose clamp connections. For a sound connection, proceed as follows:

- 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 of the connection
- push the clamping ring on the taps
- Tighten the union nut by hand



#### **NOTICE!**

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.

### 6.5.3 Bleed lines

For units with the multifunctional valve PENTABLOC, make sure to install the bleed lines in a way that definitely prevents a mixing of the chemicals. The optimum is one separate collecting vessel for each chemical.



**NOTICE!**

*PENTABLOC is at the same time a bleed valve and a safety valve for the dosing pumps. In the case of a disturbance (e.g. a closed injection point) chemicals may therefore also come from these lines during operation.*



Fig. 6.5.3: PENTABLOC

### 6.5.4 Chlorine dioxide line

PVC pipes with FPM sealings are used as lines for chlorine dioxide solution.



**NOTICE!**

*PVC becomes brittle when exposed to chlorine dioxide for a long time. The pressure class of the pipe must therefore be higher than actually required by the system pressure.*

Example: System pressure 10 bar, piping PN16

The piping must be installed with a constant uphill gradient to avoid any accumulation of gas bubbles. If a downhill gradient of the piping cannot be avoided, a permanent overpressure of at least 1 bar in the reactor must be maintained, for example by means of a back-pressure valve.

The injection point is installed in the piping from the bottom, for vertical lines horizontally.

### 6.5.5 Batch system

A back-pressure valve is mandatory for batch systems (see installation example). Adjust the valve to a minimum holding pressure of 1 bar.

The filling line in the tank goes down to ground level and its diameter should be generously measured. The maximum flow velocity is 2m/s. Recommendations:

Model	Size
up to EASYZON 300 D	DN 15
EASYZON 700 D ... 1400 D	DN 25

Tab. 6.5.5: Diameter filling line

Dosing pumps should either be connected with a PVC pipe or a PTFE hose. PE or PVC hoses are not suitable for this purpose. Holes are drilled into the tank for the installation of the intake

lines. The hole diameter depends on the diameter of the intake line. Make sure that the connections are gas-tight. The intake lines must have a foot valve and should end about 1-3 cm above the ground.

The waste water from the extraction unit must be able to drain off without any back pressure. The extraction unit must be adjusted to extract the same volume flow of gas as the amount of chlorine dioxide that flows in. A pressure-reducing valve is necessary for this purpose.

### 6.6 Electrical connection



**WARNING!**

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

For the cable feedthrough, use cable screw connections with at least IP65, which are tightened after the installation, to maintain the IP protection class of the unit.

Respect the voltage values in accordance with the technical data. Mains fuse of max. 16 A.

Immerse the level switches in the chemicals containers until they almost touch the ground. Drill a hole in the cover of the chemicals container to put through the cable and attach it in this position. For intake lines with integrated float switches, these steps are not necessary.

Switch direction of the float switches. The contact is closed if there is a lack of chemicals. The float switches are connected to the terminals 29-33 in the control system. If there is a lack of chemicals, the red LED's L2 or L3 flash.

When you connect the input signals, check if 4...20mA signals or impulse signals are available. The terminal connection varies and the respective adjustment must be made in the main menu (code 1000). The possibilities of remote control and remote signalling are described in detail in Chapter 5.

The dilution system (solenoid valve or circulation pump) is not connected to the electronic control, but to the control system of the dilution system. This control system provides a power output. (see 5.7.1)

#### Control cabinet for the batch system

Power supply with fuse max. 16A.

The level switches in the batch tank are connected to terminals X3 (1-8).

Switch direction of the float switches. The contact is closed when the float is in the bottom position.

The switching height of the float switches is adjustable allowing for an adaption of the minimum supply to the application.

The output at terminal X2 (1+2) is connected to terminal 34+35 of the central control system. If the tank is full, the production is interrupted via this contact.

The output at terminal X2 (3+4) is an alarm output. The contact is closed if:

- the product tank is empty
- the product tank is overfilled
- there is a power failure

The solenoid valve for the extraction unit is controlled together with the valve for the dilution water. That is why it is connected to the control system for the dilution water.

The control and the power supply of the dosing pumps for the withdrawal of chlorine dioxide are provided by the operator. It is recommended to interlock the pumps with the alarm relay of the batch control to avoid the intake of air in the case of an empty product tank.

## 6.7 Connection diagrams of the auxiliary controls

### 6.7.1 Dilution control

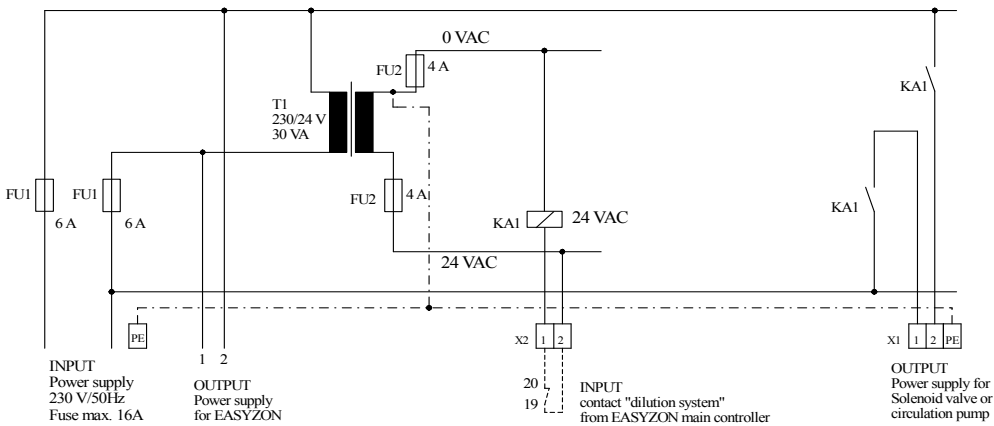


Fig. 6.7.1 Dilution control

### 6.7.2 Batch control

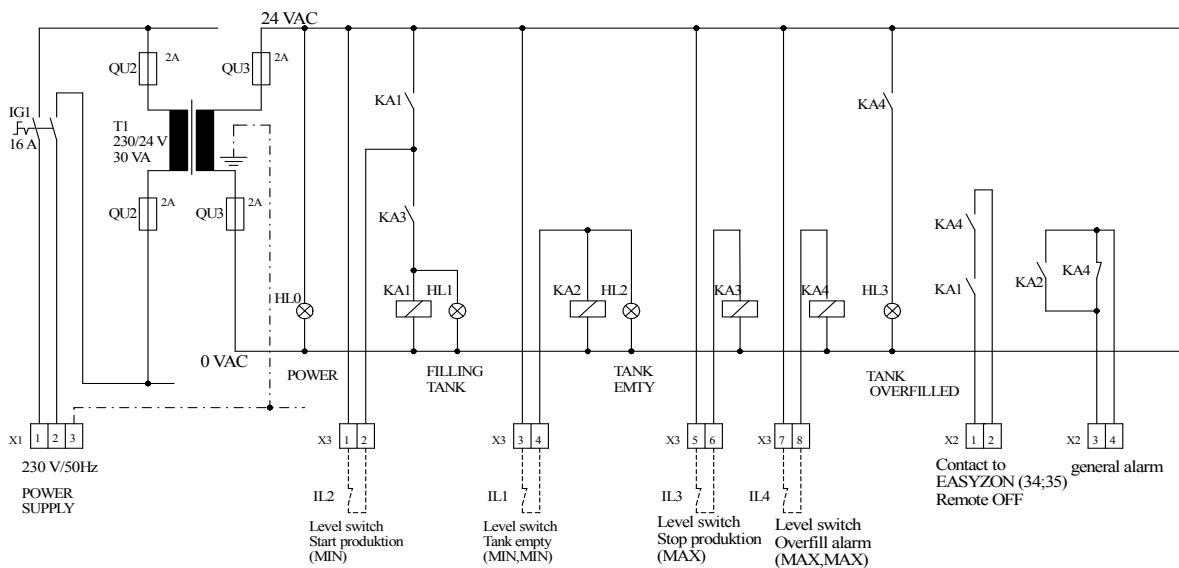


Fig 6.7.2 Batch control

## 7. Start up

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

Before the start-up, get familiar with the control system. (see Chapter 5)



### CAUTION!

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



Protective clothing



Protective gloves



Goggles

To avoid an unintentional dosing of chlorine dioxide, use water at the beginning of the start-up and only later use chemicals. Before the start-up, put the intake lines for the chemicals in a tub filled with water.

### 7.1 Configuration of the control system

The device does not have a mains switch and when the power supply is switched on, the display is illuminated. Press the "On/Off" key to switch off the unit. "OFF" is shown on the display.

All configuration options are described in Chapter 5. Please read this thoroughly and set the control system's parameters according to local requirements.



### NOTICE!

*The adjustments require a detailed knowledge of the related processes. That is why these adjustments are only to be made in accordance with the responsible personnel.*

After having completed the configuration, switch the unit to "MANUAL RUN MODE".

### 7.2. Dilution water adjustment

Switch on the dilution water supply. If it is not possible to do this manually, press the "Select" key to switch the EASYZON to the MANUAL RUN MODE and then press the "On/Off" key to switch on the unit.

When you adjust the water flow rate, make sure that at least 1 l water flows per 1 g chlorine dioxide production. This means for example at least 130 l/h for the EASYZON 130D. A higher flow rate is not harmful.

Adjust the switching contact at the flow meter for dilution water until the LED "PREDIL. SENSOR" flashes.



### NOTICE!

*At this point, the dosing pumps have not yet been bled and error messages can be expected. Press the "Reset" key to display the error messages and press "OK" to confirm them.*

### 7.3 Bleed the pumps

- Put the intake lines in a tub filled with water.

- Fill the calibration cylinders with water.
- Adjust the ball valves until the dosing pumps extract water from the calibration cylinders. Please note the red markings on the ball valves (see Fig. 7.5.2).
- Switch on the dilution water supply. For dilution water systems with a circulation pump or a solenoid valve, the systems starts automatically when you press the "Start Up" key.
- Press the "Start Up" key to start the dosing pumps.

The dosing pumps now perform a fixed number of dosing strokes without the flow rate sensors at the reactor input being active. (Presetting is START\_UP\_S=100).

While the dosing pumps are operating, do the following steps:

- Set the stroke length of the pumps to 100%.
- If the pump does not bleed automatically, pull the two handles at the multifunctional valve PENTABLOC to the outside. Now the dosing pump does not feed the reactor, but the bleed line.



### CAUTION!

*A hose must be connected to the bleed connection which discharges escaping chemicals without any risk.*

- For units without a multifunctional valve, relieve the back-pressure valves between the dosing pump and the reactor. (After bleeding, the valves have to be re-adjusted to the same setting.)
- Refill the water in the calibration cylinder to avoid an intake of air.
- Switch the ball valves to intake from the intake lines and bleed them in the same way.



### NOTICE!

*Press the "Start Up" key again to restart the bleeding procedure.*

If you press the key while the pumps are operating, EASYZON stops the process.

### 7.4 Adjust the dosing controls

Push the green sensor of the dosing control at the reactor input to the top position.

Push the sensor slowly down while the dosing pump is operating until the LED at the control system goes off for a short time with each pump stroke.

To be sure, reduce the stroke of the dosing pump. After 8 non registered dosing strokes, the control switches to alarm.



### NOTICE!

*If the stroke length of the dosing pump is modified, the position of the green sensor must be newly adjusted.*

### 7.5 Calibrate the dosing pumps

Before the calibration of the dosing pumps, the pumps must be bled and the operating pressure of the unit must comply with

the final application. If there is a change of pressure, another calibration is required.

- Switch the EASYZON control system to "OFF".
- Fill the calibration cylinders up to the top line of scale "0".
- Switch the two ball valves to intake from the calibration cylinder (see Fig. 7.5.2).
- Press the "Start Up" key to start the dosing pumps. The dosing pumps now perform a fixed number of dosing strokes. (Presetting is START\_UP\_S=100.)
- Determine the withdrawn quantity for each pump.
- Divide the values by the number of dosing strokes performed (the value START\_UP\_S can be checked or modified with code 1000 in the default settings).
- Press "Conf" and "OK" to switch to the calibration menu. (code 0000)

```
C_P_ACID[ml/s]= 0,95
C_P_CHLOR[ml/s]=0,96
%_PROD[1=YES,0=NO]=0
RED_%_PROD[%]= 100
```

Fig. 7.5.1 Calibration menu

- Enter the calculated values in ml/stroke in the highlighted (in grey) fields.
- Press "OK" to confirm several times until none of the values is highlighted on the display.
- Press "Conf" to quit the menu.
- Switch the two ball valves to intake from the intake lines (see Fig. 7.5.2).



**NOTICE!**

*The values for C\_P\_ACID and C\_P\_CHLOR must not deviate by more than 30%. If the deviation is higher the control system automatically corrects the calibration value of the other pump.*

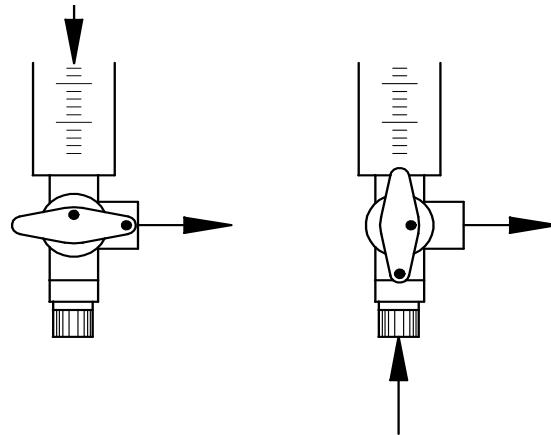


Fig. 7.5.2: Valve positions ball valves



### 7.6 Batch system

For batch systems, switch the unit to MANUAL RUN MODE. In batch systems, the flow rate of the dilution water determines the product concentration. Adjust the dilution water supply carefully. The recommended concentration in the storage tank is 1g/l.



**NOTICE!**

*Concentrations superior to 1g/l tend to a result in a quick chemical breakdown of the chlorine dioxide and the production of odour. Lower concentrations reduce the storage capacity of effective chlorine dioxide and the withdrawing dosing pumps have to be larger than actually necessary.*

#### 7.6.1 Adjustment of the extraction unit

The extraction unit for the product tank is adjusted to extract the same volume of air as the amount of product that flows into the tank. The adjustment is done at the pressure-reducing valve. The performance curves (Fig. 7.6.1...4) of the ejectors in use serve as a reference value.

To check if the extracted quantity is correct, you can for instance put a sheet of paper on the adsorption cartridge. It must be slightly sucked in. Remove the paper after the check.

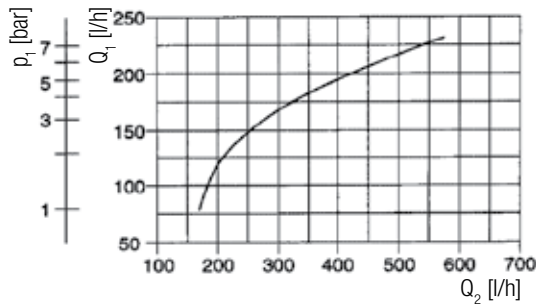


Fig.: 7.6.1: EASYZON 35 D - 130 D, DN10, nozzle Ø 1.5mm  
p<sub>1</sub>: Driving water pressure, Q<sub>1</sub>: Driving water quantity, Q<sub>2</sub>: Extracted quantity (air)  
Valid without back pressure

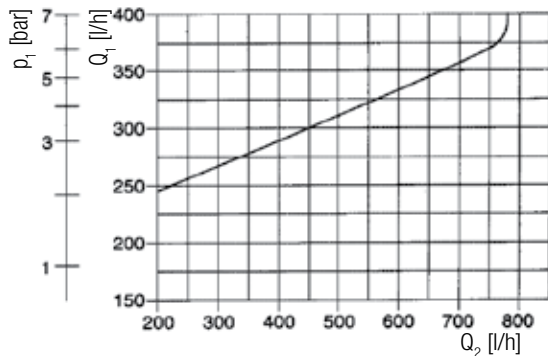


Fig.: 7.6.2: EASYZON 300 D, DN10, nozzle Ø 2.0mm  
p<sub>1</sub>: Driving water pressure, Q<sub>1</sub>: Driving water quantity, Q<sub>2</sub>: Extracted quantity (air)  
Valid without back pressure

#### 7.6.2 Adjust the level switches

The product tank is equipped with 4 level switches. The function from the top down is:

- MAXMAX Overfill alarm
- MAX Production stop
- MIN Production start
- MINMIN Protection against dry running

At the container leadthrough, the level switches have a clamp connection that allows for an adjustment of the height.

The protection against dry running is adjusted to make it possible to switch off the withdrawing dosing pumps before they take in air from the empty container.

Start and Stop of the production can be adjusted to adapt to the consumer process. Criteria for the adjustment are:

- The product should not be stored for more than 1-2 hours.
- The quantity stored between MIN and MINMIN allows for a short-time a higher consumption of chlorine dioxide than the unit can produce.
- The operating time of the unit between Start and Stop should not be less than 1/2 hour.

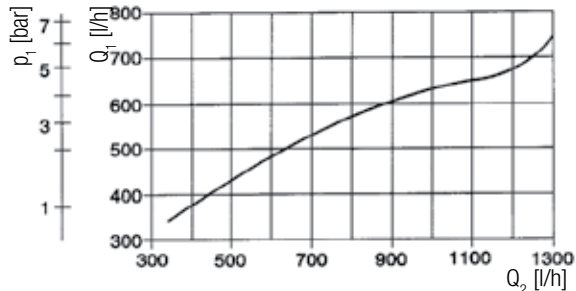


Fig.: 7.6.3: EASYZON 700 D, DN15, nozzle Ø 3.0mm  
p<sub>1</sub>: Driving water pressure, Q<sub>1</sub>: Driving water quantity, Q<sub>2</sub>: Extracted quantity (air)  
Valid without back pressure

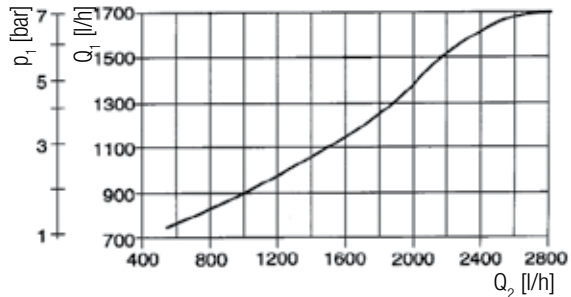


Fig.: 7.6.4: EASYZON 1400 D, DN20, nozzle Ø 4.5mm  
p<sub>1</sub>: Driving water pressure, Q<sub>1</sub>: Driving water quantity, Q<sub>2</sub>: Extracted quantity (air)  
Valid without back pressure



### 7.7 Start of production

Immerse the intake lines in the respective chemicals and close the covers of the tanks. Check the position of the ball valves at the calibration cylinders (see Fig. 7.5.2).



**NOTICE!**

*Do not swap the intake lines under any circumstances.*

Enter all parameters in the control system which are required for the desired operation mode and activate the desired operation mode. (see Chapter 5.6)

Constantly check the concentration of chlorine dioxide in the treated water until the desired result is achieved. If required, correct the entered values in the control system. Suitable instruments for the measurement of the concentration of chlorine dioxide in the water, which work according to the DPD methods, are for example a comparison system or a photometer.



**NOTICE!**

*It is not recommended to reduce the stroke length of the dosing pumps. Especially for hydrochloric acid, there is the risk of an accumulation of gas bubbles in the dosing head and a resulting supply interruption.*

If you nevertheless want to reduce the stroke length, enter the new stroke length as "StrokeLength" in the control system.



**NOTICE!**

*Troubleshooting for error messages can be found in the chapter "Troubleshooting".*

## 8. 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!*



Protective clothing  
Goggles



Protective gloves

No special measures are necessary for a brief shutdown of the unit (e.g. several hours). Press the "On/Off" key to switch off the unit.

For lengthier interruptions to the running of the unit it must be rinsed off thoroughly with water (see 8.1). Remove the intake lines from the chemicals tanks and close the tanks. After you have rinsed the unit, close the feed line for the dilution water and if required close the ball valve at the injection point.

### 8.1 Rinsing the unit

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

The intake lines are taken out of the chemical tanks for rinsing and put into tubs filled with water. The tanks are closed.

Switch the unit to "MANUAL RUN MODE" and operate the unit for about 1/4 hour at the maximum production capacity. The dosing pumps feed water into the reactor thus rinsing the entire system.



### CAUTION!

*During the rinsing procedure, a small quantity of chlorine dioxide is produced and the residual chlorine dioxide from the reactor is used in the process. Make sure that this does not result in overdosing.*

In batch systems, a weak chlorine dioxide solution remains in the supply tank after rinsing. If the remaining solution must not be used in the process, it must be neutralised before it can be drained off into the waste water.

### 8.2 Disposal of the chemicals

The chemicals must be disposed of without any risk of sustainable effects on people, equipment and the environment. On this background, the following notes must be respected.



### 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.*

### Neutralisation of the chlorine dioxide solution

For 1 g chlorine dioxide, approx. 18 g sodium thiosulphate pentahydrate are required. An overdosing is not harmful. Sodium thiosulphate pentahydrate is usually available as crystals. For the dissolving of 1 kg, approx. 5 l water are required.

Example: A supply tank with 100 l chlorine dioxide solution with a concentration of 1 g/l should be neutralised. Dissolve 1800 g sodium thiosulphate pentahydrate in a tub with 10 l water and slowly add the chlorine dioxide solution.

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

### Disposal of used 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.

Put the content of the activated carbon cartridge into a neutralisation solution that consists of 1 l water and 200 g sodium thiosulphate pentahydrate.

### 8.3 Disposal of old equipment

If the equipment is to be disposed of after its service life, it has to be thoroughly rinsed. The equipment is manufactured allowing for the ROHS guideline and the old electrical equipment law. The manufacturer takes care of the disposal if the equipment is sent back free of charge. It is not part of domestic waste.

## 9. Maintenance

### 9.1 Fundamental information for maintenance

EASYZON is a device manufactured to the highest standard of quality with a long service life. Some parts are subject to wear due to chemical and mechanical loading. To ensure a long operating life, visual inspections are recommended regularly. Regular preventative maintenance of the unit protects it against operational failures.

The frequency of the maintenance is only conditionally dependent on the intensity of its use. The chemical wear, for example of rubber parts, starts with the first medium contact and is then irrespective of its type of use.

The manufacturer specifies a maintenance once a year minimum. Use spare parts kits which comprise the typical wear parts. (see chapter "Spare parts")



**CAUTION!**

*Before any maintenance work, the unit must be thoroughly rinsed as specified in 8.1 and the system must be relieved from pressure. Personal protection equipment must be worn in accordance with the valid regulations for accident prevention!*



Protective clothing



Protective gloves



Goggles



**CAUTION!**

*The power supply must be disconnected for maintenance work on EASYZON D and secured against unintentional restart.*



**NOTICE!**

*Plastic threads (especially PVC threads) are easier to screw on and unscrew again if a thin layer of silicone grease has been applied to them.*

### 9.2 Description of maintenance

#### Dosing pumps

At the dosing pumps, maintenance is restricted to the replacement of the seals and the balls in the check valves at the dosing head and the replacement of the pump membranes. The maintenance work is described in the operation manual of the dosing pumps.

#### Multifunction valve PENTABLOC

The membranes at the multifunctional valve PENTABLOC must be replaced. To replace the membranes, remove the spring guides from the base body. Make sure that you do not mix up the parts. In some cases, different springs are installed.

Before you install the new membranes, thoroughly rinse the valve with water to remove crystals of dried chemicals.

The spring guides are screwed in by hand and should not be tightened by more than 1/6 turn with an appropriate tool.



Fig. 9.2.1: PENTABLOC

#### Back pressure regulating valve

For larger plants, a back-pressure valve is installed instead of the multifunctional valve Pentabloc. For these valves, it is only necessary to replace the membranes. Loosen the union nut to remove the membrane. You do not need to loosen the adjustment screw when replacing the membrane.

#### Flow monitors

The flow monitors for the chemicals are subject to mechanical wear and the float and the housing are replaced as part of the maintenance. The ring sensors are installed with the cable down and must not be mixed up. It is recommended to mark them before the disassembly.

**Reactor valves**

All seals for the reactor valves are included in the servicing kit. To disassemble the valve, push the valve ball with a blunt object. The valve ball is not a wear part.

Make sure not to mix up the valve parts as the valves at the reactor input and output are not identical. Apply a thin layer of silicone grease to all o-rings before you install them.

**Batch system**

Replace the filling of the adsorption cartridge at the supply tank. Note the instructions on neutralisation and disposal in Chapter 8.2.

In the extraction system, rinse the filter in the pressure-reducing valve, replace the inner parts of the ejector non-return valve and check the extraction unit for correct functioning.

Replace the membrane at the back-pressure valve in the line between the reactor and the product tank.

**Other components**

All other parts are usually not subject to wear. If you detect leak-ages or other damages, replace the seals or replace the entire part.

**Safety devices**

Push up the contactor at the flow meter for dilution water. If the unit is operating, an alarm is signalised after about 10 seconds. If required, check the preset delay time PRE\_S\_DELAY in menu 1000.

Change the position of one of the ring sensors at the flow rate monitor for chemicals. If the LED does not flash at each dosing stroke any more, an alarm must be signalised after 8 dosing strokes.

For batch systems, check the overfill monitor for correct function- ing. Lift the float of the level switch MIN MAX and check if the safety functions react.

**Dosing result**

If it is not checked during daily operation, it must be at the latest checked as part of maintenance if the dosing concentration of chlorine dioxide complies with the requirements in the applica- tion process.

**10. Spare parts**

**EASYZON basic unit**

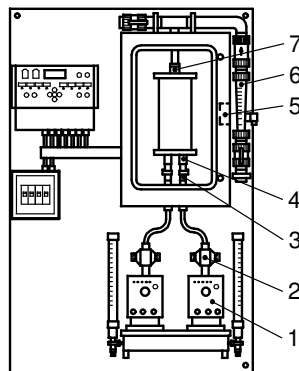


Fig. 10.1: Spare parts basic unit

EASYZON	35 D	60 D	130 D	300 D	700 D	1400 D
Servicing kit (Content see below)	38817	38818	38819	38820	38821	38822
<b>Spare parts</b>						
Dosing pump (1)	38753	38754	38755	38756	38748	38749
Back-pressure valve (2)	12601062			12500003		
Activated carbon filter for the ventilator (5)	38823					
Flow meter (6)	38887			38889		
Contactor for flow meter (6)	38888					

Tab. 10.1: Spare parts basic unit

The servicing kit includes:

- Membranes and valve seals for the dosing pumps (1)
- Membranes and seals for the back-pressure valve (2)
- Float and housing for the flow monitors (3)
- Seals for valves (4) and (7)

**Batch system (additionally to the basic unit)**

EASYZON	35 D	60 D	130 D	300 D	700 D	1400 D
Servicing kit for the batch system (Content see below)	39005			38824		
<b>Spare parts</b>						
Back pressure regulating valve	DN15 12500068			DN25 12500052		
Ejector	88617		88618	88619	88620	
Ejector non-return valve	20400018					
Pressure-reducing valve PN16	G 1/2 36022			G 3/4 82027		
Solenoid valve 230V 50/60Hz	G 1/2 88099			G 1/2 82029		

Tab. 10.2: Spare parts batch system

The servicing kit includes:

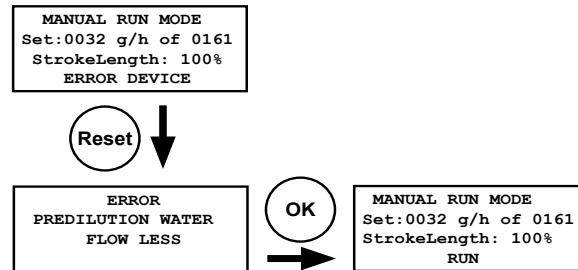
- Replacement filling for the adsorption cartridge

## 11. Troubleshooting

### 11.1 Error messages of the control system

The control system detects error conditions at sensors or incoming signals and indicates them with the message "ERROR DEVICE" in the bottom line of the display. The production is interrupted and an internal acoustic warning device indicates the disturbance. Depending on the type of error, different relays are operated.

If you press the "RESET" key, a message appears and the acoustic signal stops. Press "OK" to acknowledge the error. Depending on the type of error, the unit restarts after the acknowledgement of the error or the error must first be eliminated.



Message	Relay	Possible cause	Action
<b>EMPTY LEVEL ACID TANK</b>	48+49	Acid supply is exhausted	Fill acid tank or replace it
<b>EMPTY LEVEL CHLORITE TANK</b>	48+49	Chorite supply is exhausted	Fill chlorite tank or replace it
<b>ERROR PREDILUTION WATER FLOW LESS</b>	50+51	Flow rate dilution water to low	Open valve further, increase pressure or eliminate impurities
		Contact at the flow meter is manipulated	Re-adjust the contact
		Cable break	Replace the cable
<b>FAILURE ACID DOSING  or  FAILURE CHLORITE DOSING</b>	48+49	Gas bubble in the dosing pump	Bleed the pump
		Three-way ball valve at the calibration cylinder is incorrectly adjustly	Bleed the pump and adjust the ball valve
		The intake line is not immerged in the chemical	Immerge the intake line, fix it and bleed the pumps
		The intake line is bended or blocked	Install the hose correctly or clean it
<b>READING FAILURE WATER FLOW METER (4-20 mA)</b>	52+53	The stroke sensor at the reactor input is manipulated	Re-adjust the sensor
		Signal is 0-20mA, EASYZON requires 4-20mA	Adjust the signal output at the device to 4-20mA
		No cable connected or cable break	Check the cables and terminals 38-39
<b>READING FAILURE CLO2 CONTROLLER (4-20 mA)</b>	52+53	Signal type is set to mA, but the connected device transmits impulses	Set the signal type to impulses in code 1000 or connect mA signal
		see above	see above but terminals 40+41
<b>READING FAILURE % PRODUCTION OR GAS DETECTOR (4-20 mA)</b>	52+53	FLOW+AN.RUN MODE is selected, but no controller signal is available	Select FLOW RATE RUN MODE in code 1000 or connect signal
		see above	see above but terminals 42+43
		The reduced operation with mA signal is selected, but not connected	Switch off %_PROD in code 0000 or connect a signal
		The option gas sensor is activated, but no gas sensor is connected	Deactivate the gas sensor in code 3000.

### 11.2 Errors in the hydraulic system

Disturbance	Possible cause	Action
Dosing pump for chemical does not feed	Gas bubble in the dosing head	Bleed the pump (see 7.3)
	Ball valve at the calibration cylinder in the wrong position	Adjust the ball valve and bleed the pump
	The intake line is not immerged in the chemical	Push the intake line further into the tank and fix it in this position.
	The intake line is bended or blocked	Install the hose correctly or rinse the intake line with water.
The tank of the batch system is temporarily emptied.	The withdrawal quantity is temporarily superior to the production output	Adjust the level switch in the batch tank to make a larger supply available. (see 7.6.2)
Strong production of smell at the batch system	The adsorption cartridge is charged with chlorine dioxide	Replace the filling
	Filter in the water supply for the extraction unit is blocked	Clean the filter
	The pressure-reducing valve in the extraction unit is not correctly adjusted	Adjust the pressure-reducing valve (see 7.6.1)

### Device revision

This operation manual apply to following units:

Type of device	Revision
EASYZON D	02/2009

It contains all the technical information required for installation, start-up and maintenance. Should you have any questions or require further informations regarding these operating instructions, please contact the manufacturer or its official national representative.

## 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 veszíti.

### (PT) Certificado de conformidade da UE

Os abaixo mencionados Lutz-Jesco GmbH, Am Bostelberge 19, 30900 Wedemark, por este meio certificam que ao sair da fábrica o aparelho abaixo mencionado está de acordo com as directrizes harmonizadas da UE, padrões de segurança e de produtos específicos. Este certificado ficará nulo se a unidade for modificada sem a nossa aprovação.

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 előállítás és adagoló berendezés</b>
Designação do aparelho:	

Typ / Type / Tipo / Típusjelölés:

**EASYZON D**

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

**98/37/EG**  
**73/23/EWG**  
**89/336/EWG**

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

i.V. Dipl. Ing. Klaus Albert  
Lutz-Jesco, Wedemark, 01.02.2009

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

CE-Chlordioxidanlagen2-V02



**Declaration of harmlessness**

Please copy and send it back with the unit!  
Please attach it to the outer side of the packing!

**Declaration of harmlessness**

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

We forward the following device for repairs:

type: EASYZON D, other:.....  
 Part-no.: .....  
 Serial number: .....  
 Date of delivery: .....  
 Reason for repair: .....  
 ChemiChemical metered: .....hydro-  
 chlorid acid, sodium chlorite, chlorine dioxide  
 Properties: Irritating, corrosive, toxic

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

If the manufacturer find it necessary to carry out further cleaning work, we accept the charge will be made to us.

We assure that the aforementioned information is correct and complete and that the unit is dispatched according to the legal require-  
ments.

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

Phone: .....  
 Fax: .....  
 E-Mail: .....

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

Date: .....

Signature / stamp .....

\*) If not applicable please cross out!

**Warranty Application**

Please copy and send it back with the unit!

If the device breaks down within the period of warranty, please return it in a cleaned condition with the complete warranty application, filled out.

**Sender**

Company:.....

Address:.....

.....

.....

.....

Date:.....

Contact person: .....

Phone: .....

**The device**

Manufacturer's part number: .....

Date of delivery:.....

Device type:.....

Serial number: .....

Description of fault: .....

.....

.....

.....

**Type of fault:**

1. Mechanical fault .....

Premature wear .....

Wear parts.....

Breakage / other damage .....

Corrosion.....

Damage in transit.....

2. Electrical fault .....

Connections, plug connectors or cables loose .....

Operating elements (e.g. switches / push-buttons) .....

Electronic unit.....

**More specifications**

Point of use / system designation:.....

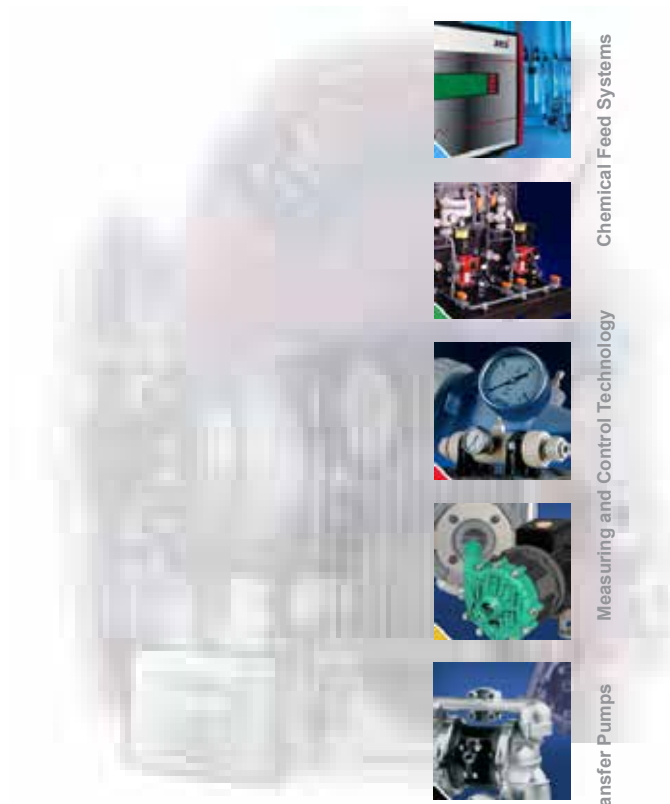
Accessories used (e.g. sensors, etc.):.....

.....

Commissioning (date):.....

Duty period (approx. operating hours): .....

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



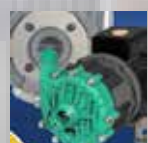
Accessories



Chemical Feed Systems



Measuring and Control Technology



Transfer Pumps



Metering Pumps

May 2016