



## EASYCHLORGEN Compact 240 & 480

Electrolysis system for on-site hypochlorite generation



## Installation, Operation & Maintenance Instructions EN

Read these operation and maintenance instructions before start-up!

To be held for further reference.

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For service and spares contact your local approved EASYCHLORGEN supplier/distributor:

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## 1. Notes for the reader

### 1.1 Introduction

This operating manual provides significant assistance in the successful and smooth running of the EASYCHLORGEN Compact 240 & 480 series electrolysis systems, also referred to, in short, as "system" in the following instructional text.

The operating manual for the EASYCHLORGEN Compact 240 & 480 electrolysis systems must always be available where the system is located and it has to be read and used by every person who is assigned to working on the system. This includes amongst other things:





- the installation
- the servicing and repair work
- the maintenance (maintenance, care, repair)
- the transport

### 1.2 Explanation of the signal words

Different signal words in combination with warning signs are used in this operating manual. Signal words illustrate the gravity of possible injuries if the risk is ignored.

Signal Word	Meaning
DANGER!	Refers to imminent danger. Ignoring this sign may lead to death or the most serious injuries.
WARNING	Refers to a potentially hazardous situation. Failure to follow this instruction may lead to death or severe injuries.
CAUTION	Refers to a potentially hazardous situation. Failure to follow this instruction may lead to minor injury or damage to property.
<i>Note</i>	Refers to a danger which, if ignored, may lead to risk to the machine and its function.

### 1.3 Explanation of the warning signs

Signal Word	Meaning
	General danger zone
	Danger of electric shock
	Danger of explosion
	Danger of damage to machine or functional influences

### 1.4 Identification of warnings

Warnings are intended to help you recognize risks and avoid negative consequences.

This is how warnings are identified:

Warning sign	SIGNAL WORD
<b>Description of danger.</b>  Consequences if ignored.  ⇒ The arrow signals a safety precaution to be taken to eliminate the danger.	

### 1.5 Instruction for action identification

This is how pre-conditions for action are identified:

- ✓ Pre-condition for action which must be met before taking action.

This is how instructions for action are identified:

➔ Separate step with no follow-up action.

1. First step in a series of steps.
2. Second step in a series of steps.
  - ▶ Result of the above action.

✓ **Action completed, aim achieved.**

### 1.6 References to intellectual property rights

This operating manual must be treated confidentially. Only authorised persons should have access to it. It may only be given to third parties with the written consent of Lutz-Jesco GmbH.

All documents are protected in the sense of the copyright law. It is forbidden to forward on and copy the documents, even in part, as well as to use and communicate their contents, insofar as this is not expressly conceded in writing. Violations are punishable and incur an obligatory payment of damages. Lutz-Jesco GmbH reserves all the rights for the practice of industrial property rights.

### 1.7 Details for the operator

The operating manual is a significant component of the EASYCHLORGEN Compact electrolysis system. The operator must ensure that the service personnel learn these guidelines.

The operating manual is to be supplemented by the operator regarding the operating instructions; national regulations for Health and Safety at Work and Environmental Protection, including information on the responsibilities of supervision and the observance of operational specifics, e.g. concerning labour organisations, operational sequences and appointed personnel.

Besides the operating manual and the obligatory regulations for Health and Safety at Work applicable in the country of use, as well as in the place of use, the recognised specialist technical regulations for safe and professional work must also be observed.

The operator of the EASYCHLORGEN system may not make any changes, attach fittings or make alterations to the construction of the EASYCHLORGEN system that may impair security, without the written consent of Lutz-Jesco GmbH. This also applies to the installation and setup of safety devices.

Any replacement parts to be used have to correspond to the technical requirements specified by Lutz-Jesco GmbH. This is always guaranteed in the case of original spare parts. Only appoint trained or instructed personnel. Clearly specify the responsibilities of the personnel for operating, servicing and repairing the system.

### 1.8 Instruction & training course assistance

As a contractor/operator you are obligated to inform and/or instruct the operating personnel about existing provisions of law and accident prevention regulations, as well as existing safety regulations at the plant. In doing so, the different technical qualifications have to be taken into account. The operating personnel must have understood the training and it must be ensured that the training is adhered to.

Only in this way can you ensure that your personnel work in a safety conscious and risk aware manner. This should be controlled on a regular basis. As the contractor/operator you should therefore obtain confirmation of each of the employee's attendance in writing.

On the following pages you will find examples of the training course topics, as well as a main form to copy for the confirmation of attendance.

If the operating personnel still require further training after the system has been delivered to the operator, please contact your equipment provider or Lutz-Jesco GmbH.

### 1.9 Example of training course topics

For safety:

- Accident prevention regulations
- General safety precautions
- Action to be taken in an emergency
- Safety precautions for operating
- Safety devices
- Definition of symbols and signs

To operate

- How to operate the controls
- Elimination of operational disturbances
- Interpretation of fault indications

For maintenance and service instructions:

- Inspection/testing of the system
- Cleaning the system and exchange of replacement parts

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Confirmation of the training instruction

Topic of the training instruction:

---

---

Date: 

---

Training instructor:

---

Training instructor's signature:

---

No.	Surname	First Name	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			





## 2. Safety


### 2.1 General warnings

The following warnings are intended to help you to eliminate the dangers that can arise while handling the device. Risk prevention measures always apply regardless of any specific action.

Safety instructions warning against risks arising from specific activities or situations can be found in the respective sub-chapters.

	<b>DANGER!</b>
<b>Mortal danger from electric shock!</b>  Live parts can inflict fatal injuries.  ⇒ Ensure that the mains voltage is switched off before opening the control cabinet door.	

	<b>DANGER!</b>
<b>Danger to life through explosions!</b>  When using dosing devices without ATEX certification in a potentially explosive area, explosions can occur that result in fatal injuries.  ⇒ Never use the device in potentially explosive areas	

	<b>DANGER!</b>
<b>Increased risk of accidents due to insufficient qualification of personnel!</b>  The equipment and accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.  ⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications. ⇒ Prevent access to the system for unauthorised persons.	

### 2.2 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 of important functions of the device and of the corresponding system
- failure of required maintenance and repair methods
- danger to persons
- danger to the environment caused by substances leaking from the system.

### 2.3 Working in a safety-conscious manner

Besides the safety instructions specified in these operating instructions, further safety rules apply and must be followed:

- accident prevention regulations
- safety and operating provisions
- environmental protection provisions
- applicable standards and legislation

### 2.4 Personal protective equipment

Based on the degree of risk posed by the dosing medium and the type of work you are carrying out, you must use corresponding protective equipment. Although the dosing media produced by the EASYCHLORGEN system is classified non-hazardous, the following protective equipment is recommended when carrying out certain tasks:

- Commissioning
- Working on pressurised dosing devices
- Shutdown
- Maintenance
- Disposal



Protective clothing



Protective gloves



Goggles

### 2.5 Personnel qualification

Any personnel who work on the device must have appropriate special knowledge and skills. Anybody who works on the product must meet the conditions below:

- attendance at all the training courses offered by the owner
- personal suitability for the respective activity
- sufficient qualification for the respective activity
- training in how to handle the device

- knowledge of safety equipment and the way this equipment functions
- knowledge of these operating instructions, particularly of safety instructions and sections relevant for the activity
- knowledge of fundamental regulations regarding health and safety and accident prevention.

All persons must generally have the following minimum qualification:

- training as specialists to carry out work on the device unsupervised
- sufficient training that they can work on the device under the supervision and guidance of a trained specialist

These operating instructions differentiate between these user groups:

### 2.5.1 Specialist staff

Specialist staff are able, thanks to their professional training, knowledge and experience as well as knowledge of the respective provisions, to do the job allocated to them and recognise and/or eliminate any possible dangers by themselves.

### 2.5.2 Trained electricians

Due to their professional training, knowledge and experience as well as knowledge of specific standards and provisions, trained electricians are able to do the electrical work assigned to them and to recognise and avoid any potential dangers by themselves.

They are specially trained for their specific working environment and are familiar with relevant standards and provisions.

They must comply with the legally binding regulations on accident prevention.

### 2.5.3 Trained persons

Trained persons have received training from the operator about the tasks they are to perform and about the dangers stemming from improper behaviour.

Trained persons have attended all trainings offered by the operator.

### 2.5.4 Personnel tasks

In the table below, you can check what personnel qualifications are the pre-condition for the respective tasks. Only people with appropriate qualifications are allowed to perform these tasks!

Specialist staff	<ul style="list-style-type: none"> <li>• Installation</li> <li>• Hydraulic installations</li> <li>• Commissioning</li> <li>• Taking out of operation</li> <li>• Fault rectification</li> <li>• Maintenance</li> <li>• Repairs</li> <li>• Disposal</li> </ul>
Trained electricians	<ul style="list-style-type: none"> <li>• Electrical installation</li> <li>• Rectifying electrical faults</li> <li>• Electrical repairs</li> </ul>
Trained persons	<ul style="list-style-type: none"> <li>• Control</li> <li>• Storage</li> <li>• Transportation</li> </ul>

### 3. Intended Use

#### 3.1 Notes on product warranty

Any non-designated use of the device can impair its function and the protection provided. This leads to invalidation of any warranty claims! Please note that liability is on the side of the user in the following cases:

- The device is operated in a manner which is not consistent with these operating instructions, particularly safety instructions, handling instructions and the section "Intended Use".
- Information on usage and environment (see section 5 "Technical data") is not adhered to.
- If people operate the device who are not adequately qualified to carry out their respective activities.
- No original spare parts or accessories of Lutz-Jesco GmbH are used.
- Unauthorised changes are made to the device.
- The user uses different salt quality than that indicated in this instruction manual.
- Maintenance and inspection intervals are not adhered to as required or not adhered to at all.
- The device is commissioned before it or the corresponding system has been correctly and completely installed.
- Safety equipment has been bridged, removed or made inoperative in any other way.

#### 3.2 Intended purpose

The EASYCHLORGEN on-site electrolytic chlorination system is intended for the following purpose: Generation of a <1% sodium hypochlorite solution using salt, water and electrical energy, with the resulting media to be used as a disinfection agent for the chlorination of drinking water, swimming pool and industrial waters.

The concentration of the sodium hypochlorite solution produced is 0.6% (+/-0.1%) Cl<sub>2</sub> by weight.

#### 3.3 Device revision

This operating instruction manual applies to the following devices:

Device	Month /year of manufacture
EASYCHLORGEN Compact 240, Compact 480 models.	07/2015 onwards

#### 3.4 Sodium chloride chemical specification

The EASYCHLORGEN system is designed to be used with dry crystalline/granular salt. When ordering salt from your supplier always specify the brand or specific quality you require, so that, in the unlikely event of any shortage of stock, you will still receive an equivalent grade of salt. The use of pure vacuum dried (PVD) salt is not recommended without first installing a pea gravel bed (pre-washed) into the saturator tank.

Property	Unit	Specification
Arsenic (As)	mg/kg	<13
Cadmium (Cd)	mg/kg	<1.3
Chromium (Cr)	mg/kg	<13
Iron (Fe)	mg/kg	<10
Mercury (Hg)	mg/kg	<0.26
Nickel(Ni)	mg/kg	<13
Manganese (Mn)	mg/kg	<0,5
Lead (Pb)	mg/kg	<13
Antimony (Sb)	mg/kg	<2.6
Selenium (Se)	mg/kg	<2.6
Bromide	% of NaCl	<0.01
Calcium	% of NaCl	<0.01
Magnesium	% of NaCl	<0.01



#### Note

#### Damage to the system due to incorrect salt.

Using the incorrect grade of salt may cause damage to the electrolyser cell and invalidate your warranty!

⇒ Please check with your supplier that the salt product supplied meets the minimum specification above.

#### 3.5 Water quality

Drinking water or water of a similar quality should be used. It should be free of solids and suspended matter. The temperature of the water entering the system must be in the range of 8-20°C.

#### 3.6 Standard warranty conditions

Equipment	Warranty period*
Electronic devices	2 years
Electrolyser	5 years limited, pro-rata
Wearable items	12 months

\* From the date of invoice

## 4. Product description

### 4.1 Scope of delivery

Please compare the delivery note with the scope of delivery:

- EASYCHLORGEN system
- Operating Instructions
- Optional - dosing pump/s, accessories.

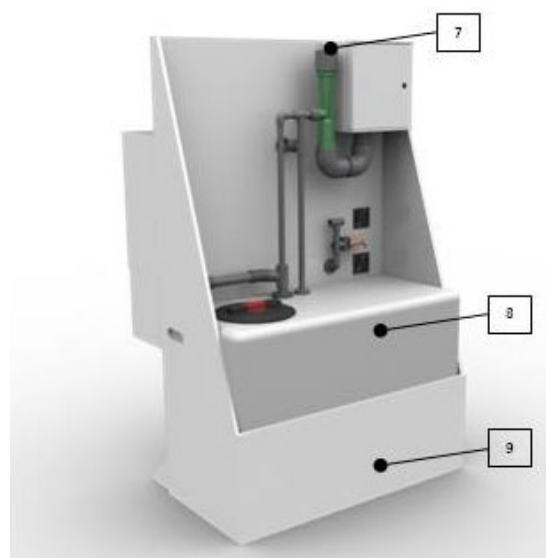
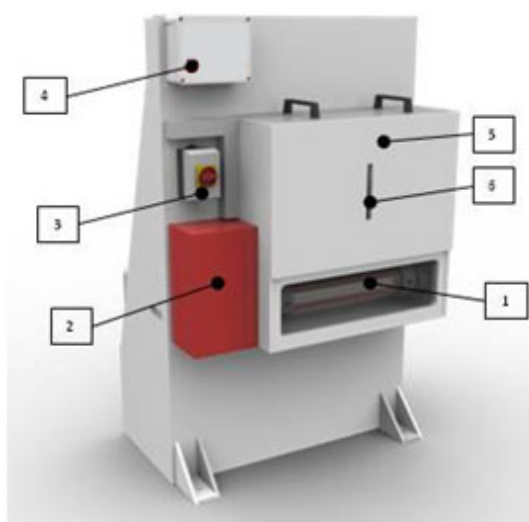
### 4.2 Design and function

#### 4.2.1 Structure of the device

Item	Description
1	Electrolyser
2	Water flow management control module
3	Electric supply isolator
4	Control panel
5	Salt saturator / hopper
6	Visual salt level indicator and brine saturation chamber
7	Ventilation exhaust
8	Product storage tank
9	Floor standing skid and integrated spill containment

#### 4.2.2 Function description

##### EASYCHLORGEN COMPACT 240/480 SKID

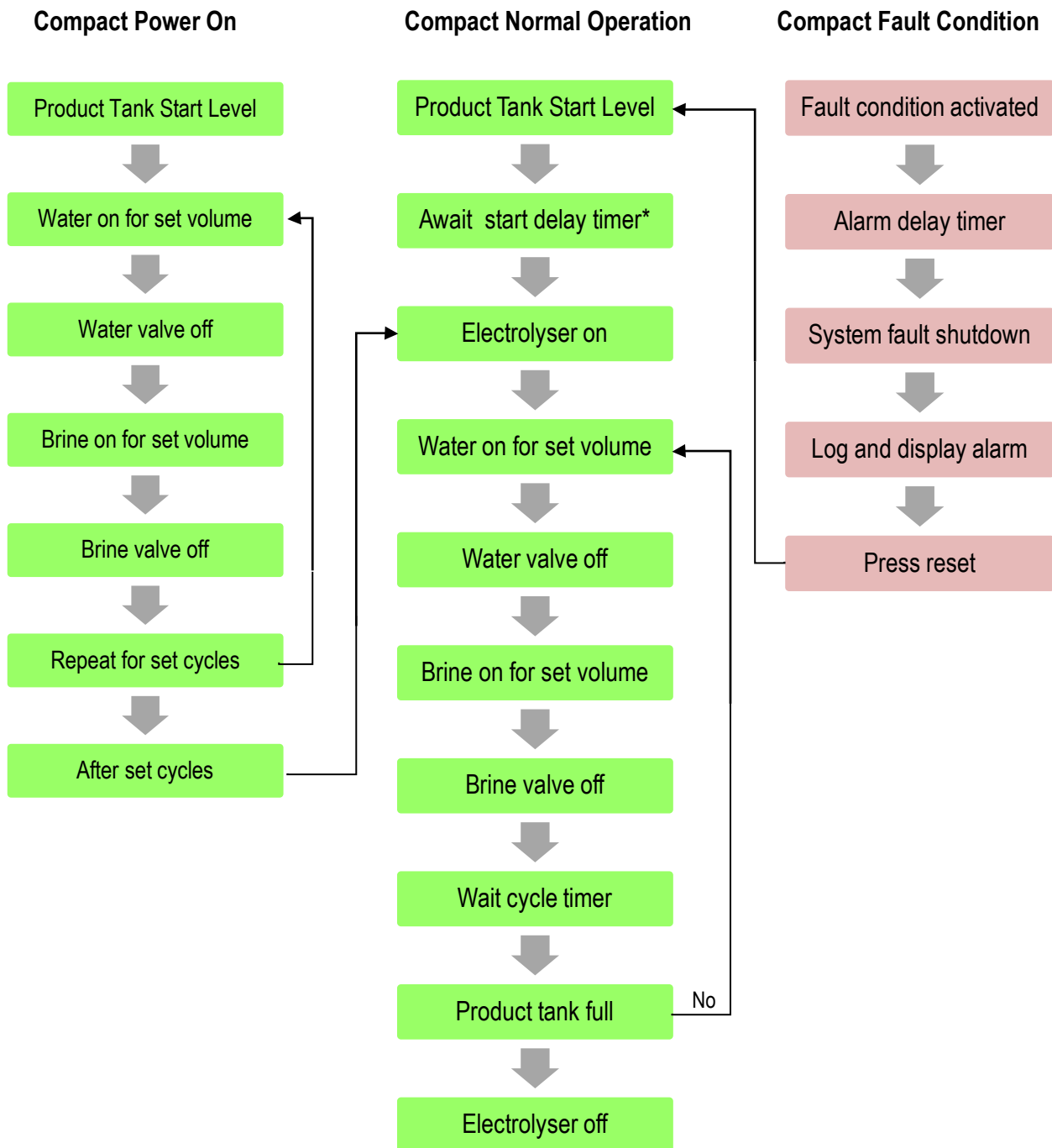


EASYCHLORGEN Compact is a fully automatic system for the preparation of dilute sodium hypochlorite solution containing 0.5-0.7%  $\text{Cl}_2$  from the raw materials of salt, softened water and electrical energy.

The operator is required to fill the salt saturator hopper (5) with salt. From this, the system automatically produces a concentrated brine solution which is then diluted with water to the correct strength for efficient electrolysis at the water flow control module (2). The diluted brine is then delivered to the electrolytic cell (1) where a low voltage DC current is passed through the solution, producing sodium hypochlorite. The hypochlorite solution produced is delivered to a product storage tank (8) ready for dosing via a chemical dosing pump (optional extra). The batching process is continued automatically until the product storage tank (8) is filled. The filling of the product storage tank and the batching process is managed automatically by the control panel (4). A small quantity of Hydrogen gas is produced as a by-product of electrolysis. This gas is safely vented to an outdoor position via a dedicated centrifugal fan and venturi system (7).

The control sequence is managed by the control panel according to the diagram in 4.2.2.1 on the following page. In automatic operation the sequence continues until the product tank is full.

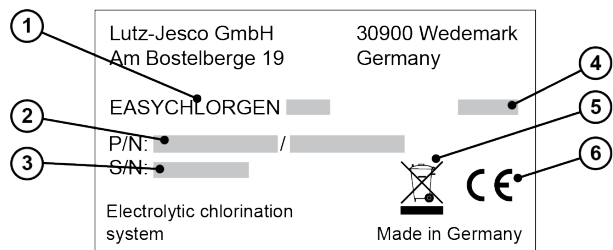
## 4.2.2.1 Function sequence in automatic operation



\* The *Start Delay* timer can be set in the engineers menu to prevent frequent stop/starting of the electrolysis cycle when the product tank is full (default setting 60 minutes).

### 4.2.3 Rating Plate

The rating plate contains information on the safety and functional method of the product. The rating plate must be kept legible for the duration of the service life of the product.



No.	Description
1	Product name and size
2	Part number
3	Serial number
4	Month of manufacture
5	WEEE label
6	Label showing conformity with European directives

## 5. Technical data

### 5.1 Output data

EASYCHLORGEN Compact 240 / 480			
Model:		<b>240</b>	<b>480</b>
Chlorine capacity	g/h	240	480
Chlorine concentration as Cl <sub>2</sub>	g/l	5 - 7	
Liquid product output	l/h	40*	80*
Liquid product storage*	L	200	200
Salt storage capacity	kg	100	

\* at the default production setting of 6g Cl<sub>2</sub>/L (0.6%).

### 5.2 Operating conditions and limits

EASYCHLORGEN Compact 240 / 480			
Model:		<b>240</b>	<b>480</b>
Nominal water consumption	l/h	40	80
Nominal salt consumption	kg/h	0.72	1.44
Operating pressure	Bar	1.5 – 8.0	
Ambient temp	°C	+5 to + 45	
Water supply temp	°C	+8* to +20*	

\* Water heating required below 8°C. Water chiller required above 20°C.

### 5.3 Electrical specifications

EASYCHLORGEN Compact 240 / 480			
Model:		<b>240</b>	<b>480</b>
Power supply		~1, 230VAC	
Power consumption	kWh	1.75 (7.6A)	3.33 (14.5A)
Protection class	IP	54	

## 5.4 Connection dimensions

Description	Size
EASYCHLORGEN Water connection	½" BSPm x 8mmOD push-fit tube adaptor
Water softener connections	¾" BSPm
Hydrogen vent line	2" / 63mm uPVC solvent socket
Electrical connection point	M20 x 1,5 female thread, or M25 cut-out.
Control panel cable terminations	M20, max. 12mmOD 3 core cable, 1.0mm <sup>2</sup>

## 5.5 Components coming into contact with the media

Description	Material
Electrolytic cell	PVC, titanium, PTFE, FPM.
Product transfer pipe	PVC
Product tank	MDPE
Product tank level switch assy	PVDF/PVC, FPM

## 5.6 Other data

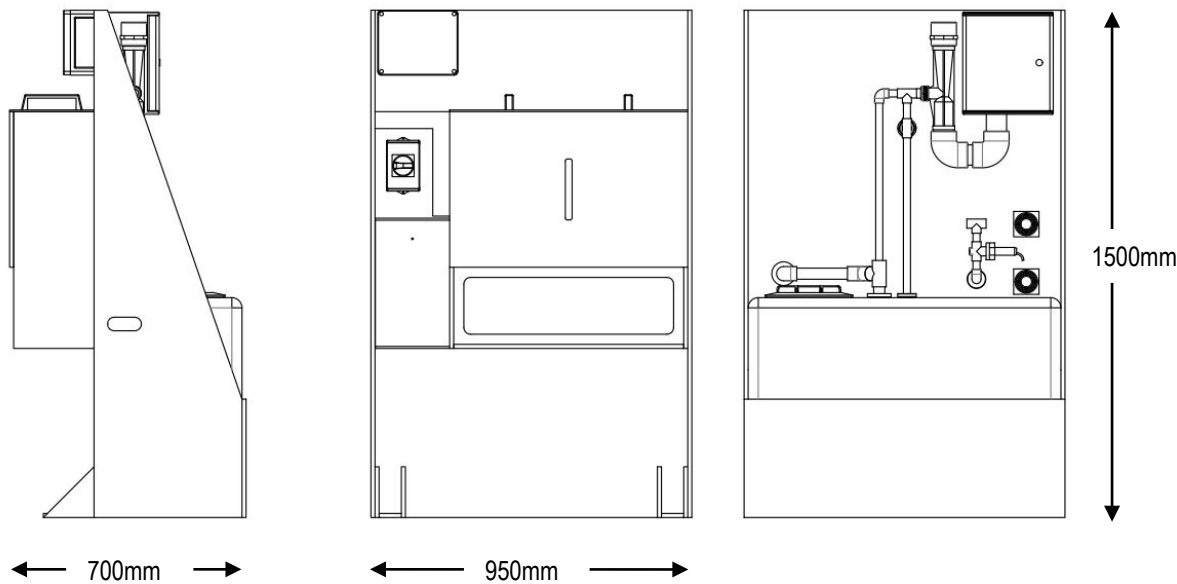
EASYCHLORGEN Compact 240/480			
Model:		240	480
Empty weight	kg	92	96



6. Dimensions

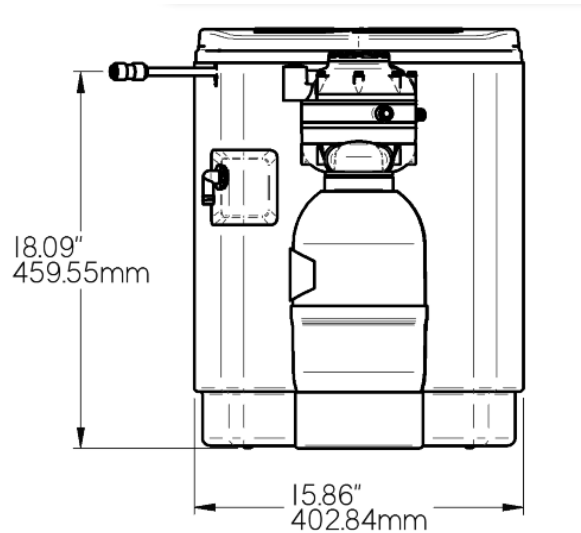
All dimensions in mm.

EASYCHLORGEN Compact 240 / 480




EASYCHLORGEN Automatic Regenerative Water Softener


This item is included as standard with all Compact 240 & 480 models and must be installed on the water supply to the EASYCHLORGEN system.




Modular component option	Dimension in mm		
	A	B	C
Auto regenerative softener filter	520	195	496

## 7. Installation

	<b>WARNING</b>
<p><b>Increased risk of accidents due to insufficient qualification of personnel!</b></p> <p>The equipment and accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.</p> <p>⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.</p> <p>⇒ Prevent access to the system for unauthorised persons.</p>	

	<b>WARNING</b>
<p><b>Danger of personal injury and damage to property!</b></p> <p>The device is heavy. The failure to take adequate safety precautions during transportation and to act with caution can lead to accidents involving personal injuries and damage to property. Limbs can be crushed when the device is set up.</p> <p>⇒ Transport the device using a floor conveyor that is suitable for the load such as a pallet truck or forklift truck.</p> <p>⇒ Wear safety shoes when handling the device.</p>	

	<b>Note</b>
<p><b>Damage to the system due to incorrect installation.</b></p> <p>The failure to observe installation instructions (e.g. use of unsuitable tools, incorrect torque) can damage the system parts.</p> <p>⇒ Use suitable tools.</p> <p>⇒ Take care not to over-tighten fittings</p>	

### 7.1 Installation location

#### 7.1.1 Space requirements

Precondition for action:

- ✓ A firm and level floor is required for the skid mounted system. Refer to dimensions section 6.
- ✓ The plant room has high level natural ventilation.
- ✓ The system must be accessible for operation, day-to-day filling with salt and for maintenance.
- ✓ Refer to installation schematic on page 23.

Perform the following steps:

1. Locate the skid unit into its intended permanent position allowing sufficient space to connect services to the connection ports to the side and top of the system.
2. Install the hydrogen gas detector above the location of the EASYCHLORGEN system, preferably up against the underside of the room ceiling or at the highest point in the immediate room. The sensor head unit is supplied with a fixing bracket that must be used in order to facilitate quick and easy replacement of the sensor head at the time of future maintenance/replacement.

- ✓ **Location of skid system complete**

## 7.2 Hydraulic installation

### 7.2.1 Water supply



#### Note

#### Damage to the system due to sediment in water.

Water containing sediment may damage or adversely impact on the performance of the system.

⇒ Make sure that the water is always free of sediment.

Precondition for action:

- ✓ A minimum cold water supply pressure of 1.5 bar is required for the water softener to operate correctly.
- ✓ A verifiable double check valve or pipe disconnecter is installed in the drinking water supply and fitted upstream of the entire EASYCHLORGEN system and any water softening equipment, if the local regulations require it.
- ✓ A pressure reducing valve should be fitted to the water supply if the supply pressure is greater than 8.0 bar.

### 7.2.2 Auto regenerative water softener

A hydraulically operated duplex water softener is provided with the EASYCHLORGEN 240 / 480 models. It must be installed in all circumstances. Please refer to the appendix IV section for installation and commissioning details.

Precondition for action:

- ✓ Suitable water supply available

Perform the following steps:

1. Install the softener unit on a firm level base within easy reach of the EASYCHLORGEN system and near to a local waste water drain point.
2. Follow the general installation instructions detailed in Appendix IV. Ensure the softener is fitted with isolation valves on the inlet and outlet connections in order to facilitate future maintenance of the unit.
3. A softened water sample tap should be fitted to the pipe-work between the water softener and the EASYCHLORGEN to enable regular testing of the softened water.

4. Connect the softener's water outlet to the EASYCHLORGEN using the 1/2" BSPm x 8mmOD tube adaptor supplied with the system. Use flexible 8mmOD tubing to connect to the 8mmOD inlet fitting of the EASYCHLORGEN unit.

### 7.2.3 Product Tank

The EASYCHLORGEN Compact 240 / 480 models are provided with an integrated product tank of 200 litres capacity. The product tank is pre-plumbed and wet tested at the factory.

### 7.2.4 Installation of dosing pumps

**IMPORTANT:** Dosing pumps should not be mounted directly onto the product tank. A wall or floor mounted bracket/shelf should be used. A suction line grommet in chemical resistant PVC (4 provided) must be used when installing the dosing pump suction lines to ensure the air tightness of the tank.



#### Note

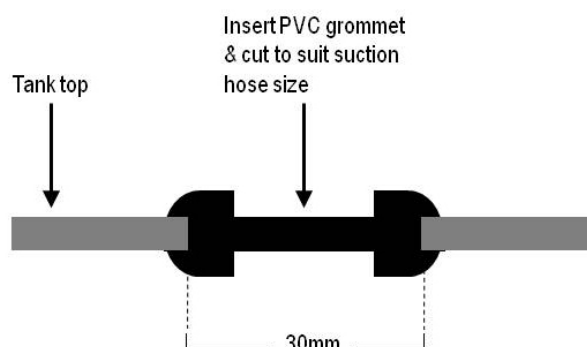
#### Damage or failure of the system due to incorrect installation of dosing pumps.

The EASYCHLORGEN system will not operate if the air tightness of the product tank or ventilation system is compromised.


⇒ Always use the correct suction line grommet and installation method for each pump suction line and pressure relief line.

⇒ Mount the dosing pumps on a wall or floor mounted bracket.

PVC Grommet



## 7.2.5 Hydrogen ventilation



**DANGER!**

**Danger to life through explosion!**

Incorrect installation of the hydrogen vent may cause irreversible damage to the system components and may even create an explosive atmosphere!

⇒ Make sure to install the hydrogen vent correctly.

The EASYCHLORGEN Compact requires the installation of a ventilation pipe duct between the unit and a suitable outside termination vent point (normally at high level >3m), in order to safely vent any hydrogen gas liberated from the electrolytic process.

The exterior vent pipe termination point must be installed so as to respect zone-2 safety requirements around the opening of the vent. Refer to section 7.2.4.1 "External zoning requirement" for guidance.

Plan the pipe route as direct and straight as possible and always on a slight incline from the vent discharge connection on the EASYCHLORGEN skid to a discharge point within 15 metres.

For pipe runs longer than 15m a larger diameter duct pipe should be used, according to the table below, so that the airflow volume can be maintained above the minimum of 40m<sup>3</sup> per hour.

Vent pipe length	Minimum duct size
≤ 15m	2"/63mm
> 15m	3"/90mm
> 30m	4"/110mm

For vent lines longer than 30m use wide radius bends instead of elbows to reduce air friction. DO NOT install any unions or any disconnection points at any point along the vent pipe work. All vent pipe/ductwork should be solvent welded throughout its length.


To comply with Health & Safety requirements the vent termination point on the external wall should not be located directly beneath any air intake and must be located at a minimum distance (zone 2 radius, below) from any window or possible source of ignition. If the external vent pipe work is located in a public area, or there is a possibility of vandalism, it should be protected with a suitable steel cage/pipe capping.

The ventilation ducting should be labelled for clear identification at regular intervals along its length.

It is advisable to provide the following warning sign at the external vent exhaust position:



### 7.2.4.1 External Zone 2 requirement



**DANGER!**

**Danger to life through explosions!**

An external Zone 2 area clearance is required at the external vent opening to avoid potential explosive environment!

⇒ Make sure to apply the correct Zone 2 external clearance.

The following Zone 2 requirements are necessary at the point of the external vent as indicated in section 7.4 "Installation schematic" on page 23:

System type	External vent "Zone 2" radius
Compact 240	0.8m
Compact 480	1.0m

If in doubt, contact your supplier for further advice.

### 7.2.4.2 Standard hydrogen ventilation (<15m)

Precondition for action:

- ✓ suitable outside vent point provided
- ✓ adequate natural room ventilation

Perform the following steps:

1. Install 2"/63mm ventilation piping from the 2" socket connection (item no.7 on page 12) at the EASYCHLORGEN Compact to the exterior vent point.
2. Provide and fix appropriate signage at the vent point in accordance with local rules.

✓ **standard ventilation installation complete.**

### 7.3 Electrical Installation



#### **DANGER!**

##### **Mortal danger from electric shock!**

Live parts can inflict fatal injuries.

⇒ Disconnect from the electricity supply before working on any equipment.

⇒ Secure all isolation devices to prevent the supply from being switched on again.

Precondition for action:

- ✓ Unit located correctly
- ✓ Identify system model/type

Perform the following working steps:

1. Use the correct cable size for the load, length of the circuit and installation conditions. Select the circuit protection device according to local regulations. Refer to 5.3 Electrical specifications.
2. Connect the mains power supply to the rotary isolating switch located beneath the EASYCHLORGEN control panel. Access is provided for 20mm or 25mm cable glands.
3. Earth the equipment in accordance with local regulations.
4. EASYCHLORGEN Compact 240 & 480 skid system components are pre-wired according to the diagram on page 22.



## Terminal connection of the system control

Consult the circuit diagrams on the following pages.

Terminal	PCB	Function	
1	I	Mains voltage output	230VAC
2	N		
3	E		
4	I	Power input	230VAC
5	N		
6	E		
7	N.C.	Alarm 2	Voltage-free alarm contacts
8	C		
9	N.O.		
10	N.O.	Alarm 1	Voltage-free alarm contacts
11	C		
12	N.C.		
13	C	Operation relay	Signals
14	N.O.		
15	+		
16	+	Sig Amps	Signals
17	-	0V	
18	+	Sig Volts	
19	-	0V	Signals
20	+	Sig Air Flow	
21	+	+24V DC output	
22	-	0V	Signals
23	-	0V	
24	+	Sig Flow Meter Pulses	
25	+	+5V DC output	Signals
26	+	Sig Product Temp	
27	-	0V	
28	+	Sig Hydrogen	Signals
29	+	+5V DC output	
30	N.C.	Ext Alarm N/C	
31	-	0V	Signals
32	+	Sig Panel Temp	
33	-	0V	
34	+	Sig Emergency Stop	Signals
35	-	0V	
36	+	Sig Softener Regen	
37	-	0V	Signals
38	+	Sig Flood	

Table 14: Terminal connection of the system control

Terminal	PCB	Function	
39	-	0V	Signals
40	+	Sig Door	
41	-	0V	
42	+	Sig tank start/stop	Signals
43	-	0V	
44	+	Sig Ext Tank Run/stop	
45	-	0V	Signals
46	+	Sig Ext Tank Low Lv	
47	-	0V	
48	+	Sig Ext Tank H-H	Signals
49	-	0V	
50	*	Reserve	
51	+	+24 V DC	Control outputs
52	-	0V	
53	+	+24V DC	
54	-	0V	Control outputs
55	+	+12V DC	
56	+	Green	
57	+	Blue	Electrolytic cell LED outputs
58	+	Red	
59	-	0V	
60	+	Digital inputs	Not used
61	+		
62	+		
63	+		
64	RX	Received	Telemetry option
65	TX	Transferred	
66	+	Aux Alarm	Not used
67	-	0V	
68	+	Remote Inh	
69	-	0V	

Table 14: Terminal connection of the system control

Product tank with double level switch		
Cable ID	Function	Clamps
Green/yellow (pin 1 and 2)	Start-Stop filling level	43 / 44
Brown/white (pin 3 and 4)	High filling level	47 / 48

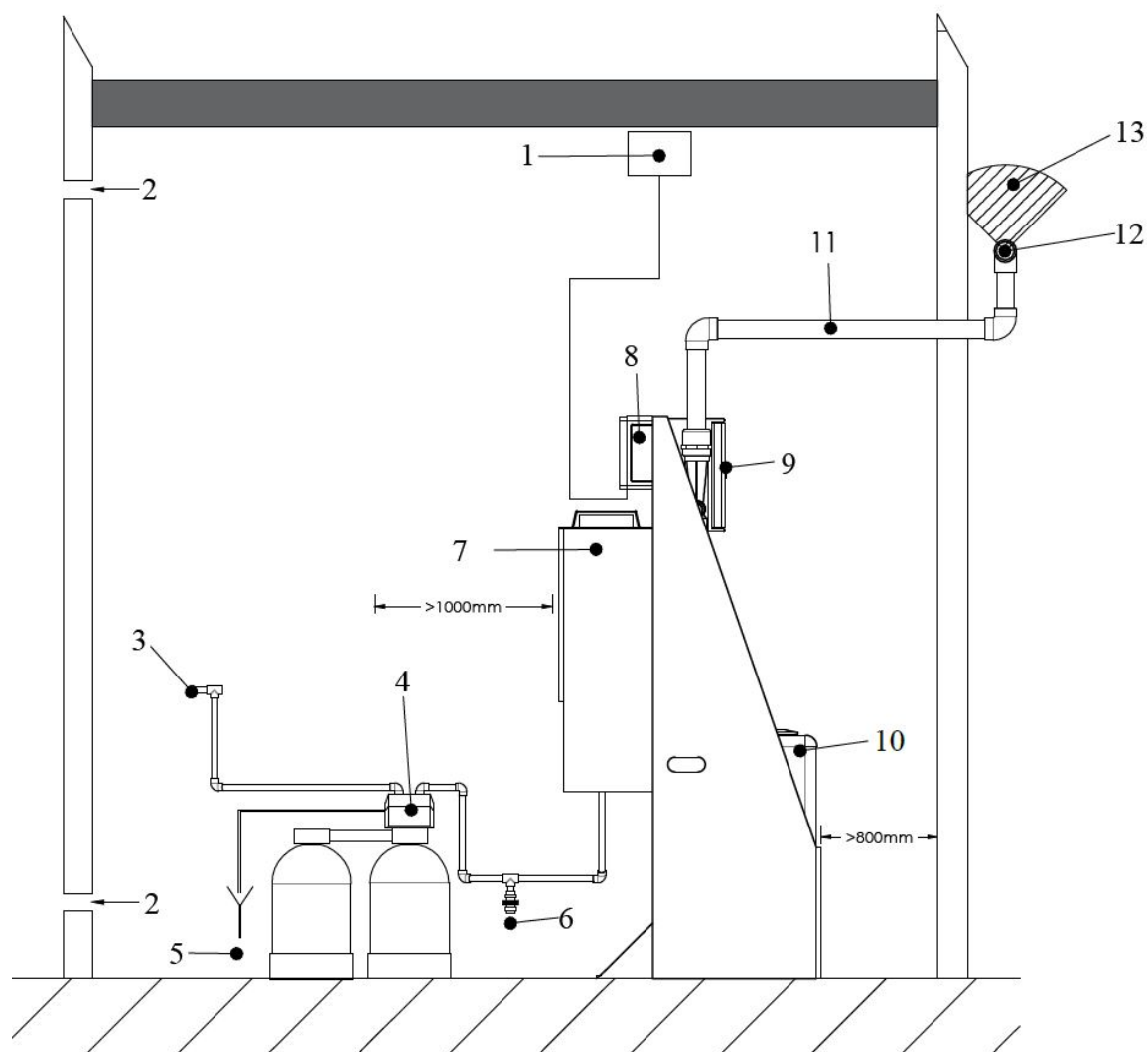
Table 15: Level switch terminal connection



## 7.4 Installation schematics

### 7.4.3 Compact 240 / 480 SKID – Ventilation & Installation

**Allow sufficient space around the equipment to allow safe operation and service access!**



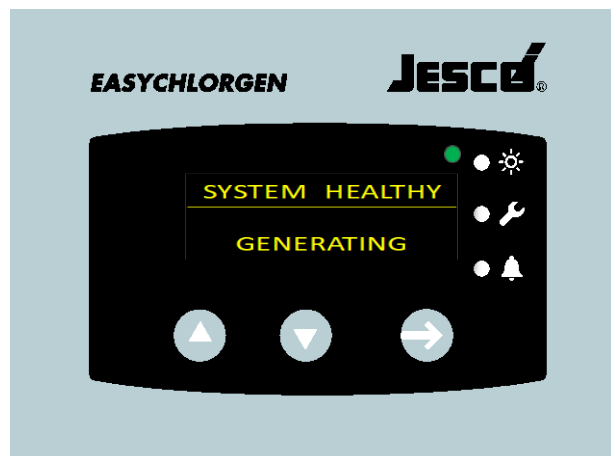
Key	Description
1	Hydrogen sensor
2	Natural air ventilation
3	Mains cold water supply (>1.5 bar)
4	Auto regenerative water softener
5	Water softener waste line
6	Softened water sample valve
7	Salt saturator tank
8	Control panel
9	Venturi ventilation device
10	Product tank
11	Ventilation 2" (50 mm) pipe work
12	External ventilation point (terminated with a 'T' piece)
13	External EX Zone 2



## 8. Control

### 8.1 Control display

The operation of the EASYCHLORGEN Compact system is performed via the universal EASYCHLORGEN control panel.



The system can be configured and operated via the control interface. An operating field with two direction keys and an enter confirmation key are available for this purpose.

#### Key representation:



**Scroll UP selection button**



**Scroll DOWN selection button**



**ENTER selection confirmation button**

The control interface also indicates current operational system status via three bright LEDs:

- Green LED = system healthy
- Amber LED = maintenance action
- Red flashing LED = system fault

#### Symbol representation:



System healthy (GRN)

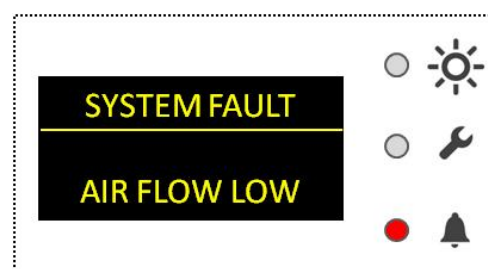


System warning /Maintenance action (AMB)



System fault (flashing RED)

The display screen will always describe the system status or fault condition in conjunction with the appropriate LED symbol representation:



System fault is the present condition in this example and the ENTER key has the following assignment:



By pressing the ENTER button the fault will be accepted and the system will reset and attempt to resume normal operation.

## 9. Start-up

### 9.1 Turning on the system

Precondition for action:

- ✓ The system is configured according to the factory setup.
- ✓ The system has been installed in accordance with section 7, Installation.

- ✓ The control device is earthed.

Perform the following working steps:

- Set the main rotary isolator switch to ON
- Start-up screen appears:



- System will perform a set number of water and brine batch cycles to initially charge the electrolytic cell with a minimum volume of brine solution prior to automatically starting normal generation/batch cycles.

- ✓ **Device switched on.**

### 9.2 Commissioning the system

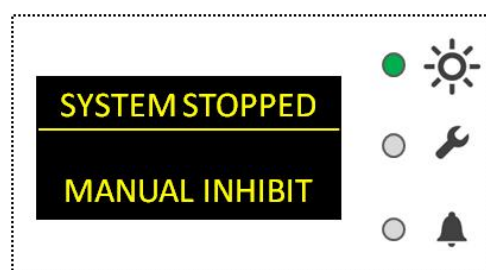
Precondition for action:

- ✓ A softened water supply is connected and ready either via a regenerative softener (commission as per Appendix IV "Softener Manual) or softener filter cartridge supplied within the scope of the system or via an existing soft water supply already available on site.
- ✓ The softened water supply should be confirmed by performing a water hardness YES/NO test. The sample will be a GREEN result for soft water and RED result for hard water. The result MUST BE GREEN, i.e. soft water. DO NOT PROCEED further until a reliable softened water supply is available.
- ✓ The salt saturator is filled with a pre-charge of the correct specification of granular salt.

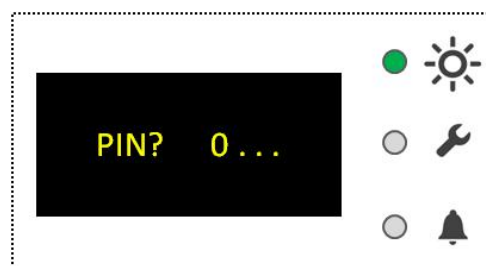
- ✓ Four (4) litres of cold (softened) water has been manually added to the salt saturator 30 minutes prior to initial start-up to ensure an adequate volume of saturated brine solution is available (only necessary for initial start-up event).
- ✓ The hydrogen gas sensor detection kit is correctly installed and electrically connected via the 4-pin plug/M12 cable assembly as per installation instruction.

Perform the following working steps:

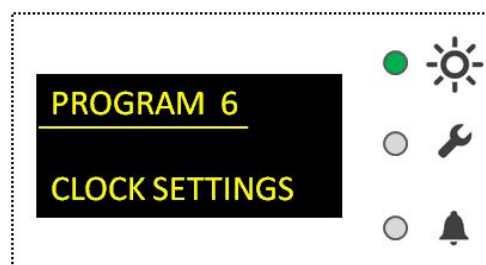
1. If an auto regenerative softener is fitted to the system, the hardness setting of the softener should be set to 50mg/l CaCO<sub>3</sub> above the hardness value of the source water. See Appendix IV.
2. Start-up the EASYCHLORGEN.
3. Check the clock settings by pressing and holding the scroll UP key (whilst in System Healthy display screen) for 5 seconds. The following MANUAL INHIBIT screen will appear and stop the system:



4. Press the ENTER button for 5 seconds to access the Service Menu. The following screen will appear:

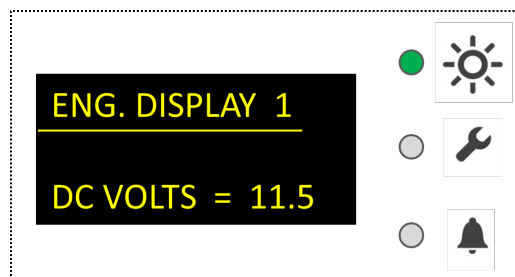


5. Using the UP/DOWN scroll keys enter the service code 2236 – each digit needs to be individually selected and entered
6. Scroll UP until Program 6 is revealed:



7. Press ENTER and then scroll DOWN to adjust date and time accordingly. Pressing ENTER at the EXIT screen will revert to Service Menu.

8. Scroll UP until Program 1 / End Program Mode is reached. At this point press ENTER and the display will return to the MANUAL INHIBIT screen.
9. To restart the system press and hold the scroll UP key for 5 seconds.
10. System will now resume its previous automatic status.
11. When the SYSTEM HEALTHY screen is visible, scroll DOWN to observe engineer display 1:



The normal DC Volts reading should be in the range of:  
 EASYCHLORGEN Compact 240 = 12v (+/-1v) 100A  
 EASYCHLORGEN Compact 480 = 24v (+/-1v) 100A

- N.B.** The DC volts reading may take several hours to stabilize on initial commissioning owing to the water/brine solution strength stabilising.
12. Using a DC clamp ammeter, check that the DC current is at 100A (+/- 5A during the initial running-in period).
  13. Continue to scroll DOWN to observe Eng. Display 4 which provides a visual indication of the hydrogen threshold as a percentage. An acceptable level of <50% should always be the case. The hydrogen gas detect system is factory set and requires only an annual service inspection/test.
  14. After 12 to 24 hours operation it is recommended to perform a chlorine product strength test. The result should ideally read 0.6% +/- 0.1%.
  15. Complete the Commissioning record log sheet in Appendix I.
- ✓ **System commissioning completed.**

## 10. Operation



### Note

#### Damage to the system due to incorrect salt supply!

Failure to observe the correct specification of salt with this system will most likely result in failure of the system and affect the warranty conditions.

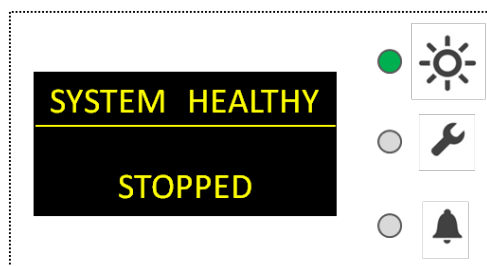
⇒ Use the correct salt.

### 10.1 Automatic Operation

The on-site electrolytic chlorine generation and preparation EASYCHLORGEN system is automated. The softened water supply is automatically regulated according to the system demand. The salt saturator should be refilled with salt manually before allowing it to become empty. Try not to allow level to drop <25% full.

The system process will START and STOP according to the level of the product storage tank facility.

When the tank is full the display will show:



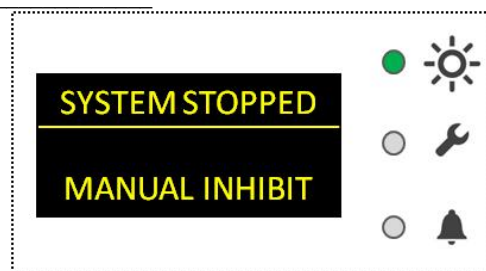
When the system is generating and the tank is filling the display will show:



### 10.2 Manual Inhibit

The automatic process may be interrupted by placing the control cycle in to MANUAL INHIBIT mode. This will STOP the automatic electrolytic process.

Whilst the system is displaying SYSTEM STOPPED or SYSTEM HEALTHY, the scroll UP key may be pressed for 5 seconds to place the system into MANUAL INHIBIT mode which halts the system:



Press the scroll UP key again for 5 seconds to resume automatic operation.

### 10.3 Remote Inhibit

The EASYCHLORGEN may be connected to an external switch intended to stop the system remotely. If the system is stopped remotely the screen will display REMOTE INHIBIT. The system will not resume automatic operation until the remote inhibit function is released.

### 10.4 Softener Regeneration



### Note

#### Damage to the system due to hard water supply!

Hard water may damage or adversely impact on the performance of the system.

⇒ Regularly check and verify the softened water supply.  
⇒ If a regenerative softener device is fitted, make sure that the correct salt level is regularly checked and maintained in the softener brine tank.

Failure to provide a softened feed water supply for the normal operation of the system will most likely result in failure of the system and affect the warranty conditions.

If an automatic regenerative softener has been fitted as part of the scope of the system, the softener will automatically regenerate and whilst doing so place the system into STOP mode:



The system will resume automatic operation once the regenerative process, approximately 60 minutes, is complete.

## 10.5 Emergency Shutdown

In the event of an emergency, you must immediately disconnect the device from the mains supply. This can be achieved by switching the rotary isolator to the off position.

If an auxiliary Emergency Stop device has been connected to the device then this can be activated to stop the system. If this is the case, the EASYCHLORGEN system will need to be reset on the panel by pressing the ENTER button once the Emergency Stop device has been released.

## 10.6 Record Log of Operation

In order to maintain and monitor the performance of the system and ensure the system is operated within manufacturer warranty conditions, the operator has the responsibility to complete the Operator Log in Appendix II.



### Note

#### Long term damage due to incorrect maintenance.

Without good operational record keeping, operational efficiency cannot be monitored and may lead to unnecessary maintenance in the future.

- ⇒ Record parameters as required on the log sheet each time salt is added.
- ⇒ Record parameters as required on the log sheet at regular intervals, approximately weekly.

✓ **Warranty compliance**

## 11. Shutdown

### 11.1 Short-term shutdown (up to 6 months)

Perform the following working steps:

1. Isolate the power supply to the EASYCHLORGEN via the rotary isolator switch.
2. Switch the mains on again to create a Start-up cycle. When the start-up cycle finishes immediately switch off again. Repeat this regime twice in total. The purpose of this regime is to rinse the electrolytic circuit of residual brine and sodium hypochlorite solution.
3. Isolate the feed water supply.
4. Switch off the auto regenerative softener if fitted to the system.

✓ **System shut down for the short term.**

### 11.2 Long-term shutdown

Perform the following working steps:

1. Isolate the power supply to the EASYCHLORGEN via the rotary isolator switch.
2. Empty the contents of the salt saturator. Any salt residue can be removed using a wet and dry vacuum cleaner.
3. Pour 4 litres of cold water into the salt saturator to purge the electrolytic cell system of residual sodium hypochlorite product solution. The solution will safely rinse into the tank system.
4. Place a sign on the system indicating that the unit will require commissioning prior to the next Start-up.

### 11.3 Storage

Required actions:

✓ The system has been shut down in accordance with the section 11.2 "Long-term shutdown".

Storing the system correctly will extend its service life. You should avoid negative influences such as extreme temperatures, high humidity, dust, chemicals, etc.

Ensure ideal storage conditions where possible:

- The storage place must be cold, dry, dust-free and generously ventilated,
- Temperatures between +0°C and +50°C,
- Relative air humidity must not exceed 90%.

### 11.4 Transportation

Required actions:

✓ The system has been shut down in accordance with the section 11.2 "Long-term shutdown".

- The system may only be transported when empty of all salt and water/solution throughout the system.
- Use suitable lifting and transport equipment where necessary.
- The danger of cold embrittlement of the plastics which it contains means that the system may not be transported at temperatures under 0°C. Cracks in welded seams, container walls and piping could result.

If the system is sent back to the supplier/manufacturer, please follow sections 16 "Declaration of no objection" on page 37 and section 17 "Warranty claim" on page 38.

### 11.5 Disposal of old equipment

- The system must be disposed of responsibly and in accordance with applicable local laws and regulations. It should not be disposed of as domestic waste.
- As the disposal regulations differ from country to country, please consult your supplier if necessary.
- In Germany, the manufacturer must provide free-of-charge disposal, provided the system has been safely returned along with a declaration of no objection (see page 37).

## 12. Maintenance

Products by Lutz-Jesco GmbH are manufactured to the highest quality standards and have along service life. However, some parts are subject to operational wear. This means that regular visual inspections are necessary to ensure a long service life. Regular maintenance will protect the system from operational interruptions.

**DANGER!**

**Mortal danger from electric shock!**

Live parts can inflict fatal injuries.

⇒ Disconnect from the electricity supply before working on any equipment.

⇒ Secure all devices to prevent it from being switched on again.

**WARNING**

**Increased risk of accidents due to insufficient qualification of personnel!**

The system and its accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.

⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.

### 12.1 Maintenance Intervals

The system requires regular maintenance to prevent errors, poor performance and even failure. This table gives an overview of maintenance work and the intervals at which you must carry it out. The next few sections contain instructions for carrying out this work.

Interval	Level	Maintenance
On demand	Operator	<ul style="list-style-type: none"> <li>▪ Replace softener cartridge if fitted</li> </ul>
Annual	Technician	<ul style="list-style-type: none"> <li>▪ Clean water flow restrictor</li> <li>▪ Check water &amp; brine solenoid valve integrity</li> <li>▪ Check/Test hydrogen gas sensor</li> </ul>
2 yrs (or >10,000 operating hours)	Technician	<ul style="list-style-type: none"> <li>▪ Replace pipe gaskets</li> <li>▪ Check/Test/Replace hydrogen gas sensor</li> </ul>
5 yrs	Technician	<ul style="list-style-type: none"> <li>▪ Major overhaul</li> </ul>

#### 12.1.1 Clean water flow restrictor

The flow restrictor may occasionally be compromised due to sediment fouling carried in via the water supply. One of the reasons the EASYCHLORGEN may alarm on "NO WATER FLOW" could be a result of a blockage at the point of the restrictor.

Precondition for action:

- ✓ Isolate the power supply to the EASYCHLORGEN via the rotary isolator switch.
- ✓ Isolate the feed water supply to the EASYCHLORGEN.

Perform the following working steps:

1. Remove the EASYCHLORGEN front outer red plastic protective mechanical cover by removing the black protective nut cap. Unscrew the single retaining nut and remove the red cover.
2. Push back the tube fitting collar with finger and thumb and pull out the red restrictor from the assembly. Check the internal orifice is clean and free of debris.
3. Replace the restrictor in reverse operation to above ensuring that the restrictor fully engages into the tube fittings to make a water tight seal.
4. Refit the red mechanical cover.
5. Start-up the system as per section 9.1.

✓ **The restrictor has been successfully checked.**

#### 12.1.2 Check water & brine solenoid valve integrity

One or both solenoids may eventually wear and allow a small discharge flow of water when normally closed.



One of the reasons the EASYCHLORGEN may alarm in "VOLTAGE HIGH" is due to the water solenoid valve inadvertently passing water and producing a low salinity brine solution entering the electrolytic cell.



One of the reasons the EASYCHLORGEN may alarm in "VOLTAGE LOW" is due to the brine solenoid inadvertently passing brine, allowing a high salinity brine solution to build up in the electrolytic cell.

Precondition for action:

- ✓ Isolate the power supply to the EASYCHLORGEN via the rotary isolator switch.

Perform the following working steps:

1. Remove the EASYCHLORGEN front outer red plastic protective mechanical cover by removing the two black protective nut caps. Unscrew the two nuts and remove the red cover.
2. Detach the flexible tubing from out of the top exit point of the relevant solenoid valve (or both solenoid valves during major service), refer to the Water Control Circuit Schematic on page 33. Remember to push the tube fitting collar down with finger and thumb to enable the release of the tubing.

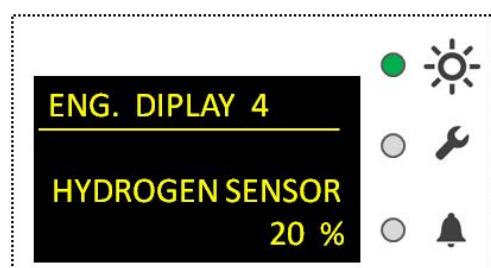


- There should be no water passing/leaking through the solenoid valve. If there is any slight leakage then the solenoid should be dismantled and cleaned or replaced.
- After checking/replacing the water solenoid valve, reinsert the tubing into the tube fitting. Ensure the tube fully engages into the tube fitting to make a water tight seal.
- Start-up the system as per section 9.1.

✓ **The solenoid valves have been successfully checked/replaced.**

### 12.1.3 Hydrogen gas detector inspection

The hydrogen gas (H<sub>2</sub>) detection system is very important to ensure a safe environment. The H<sub>2</sub> detector should be routinely tested annually in order to verify a safe system of work. For reference, a hydrogen sensor reading of 100% is equivalent to less than 25% of the Hydrogen LEL value. The H<sub>2</sub> level detected in the immediate atmosphere is displayed on the screen and should normally be below 50%. This reading can be displayed by scrolling DOWN at the EASYCHLORGEN panel to reveal Eng.Display 4:

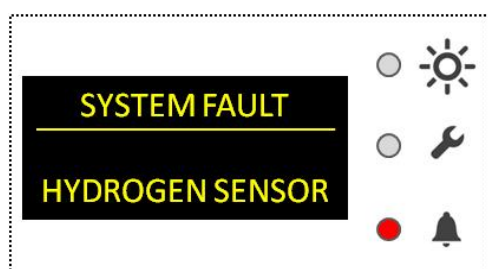


Precondition for action:

- ✓ EASYCHLORGEN system in normal automatic operation.

Perform the following working steps:

- Prepare the EASYCHLORGEN H<sub>2</sub> test device (available separately) as per device instructions.
- Position the tester device so that it liberates its test gas directly at the sensor head as per the device instructions.
- The reading on the display will quickly rise to 100% at which point will trigger the hydrogen sensor fault:



- Remove the H<sub>2</sub> test device from the sensor and the reading will quickly return to a low reading below 50%. If the sensor does not react or read 100% during the test then the sensor must be replaced.

**N.B.** When the display reads 100%, this is equivalent to a H<sub>2</sub> detection level in the atmosphere of less than 25% of the LEL threshold.

✓ **The hydrogen gas detection system has been successfully checked/sensor replaced.**

### 12.1.4 Replace gaskets

Elastomers exposed to the electrolytic process are subject to wear and require routine replacement every two years regardless of operating hours.

Prior to commencing this maintenance action, the electrolytic hydraulic circuit requires purging.

Precondition for action:

- ✓ Perform Short-term shut down procedure; see section 11.1, on page 29.

Perform the following working steps:

- Remove the electrolyser cell enclosure window by removing the vertical window bead retainers and then the horizontal window bead retainers.
- Carefully loosen the cell inlet and outlet union collars until the cell can be carefully rested on to the base of the electrolyser chamber with the inlet and outlet connections facing upward to prevent further spillage.

	<b>WARNING</b>
<b>Increased risk of accidents due to chemical exposure!</b>	
A residual of brine/chlorine solution may drip from the pipe work and fittings.	
⇒ Wear correct personal protective equipment.	
⇒ Wipe away any spillage immediately.	

- Replace the flat gaskets with the correct spare parts.
- Refit the cell to the union assemblies taking care not to over-tighten the union collars.
- If the EASYCHLORGEN is a manufactured skid system model, the o-ring at the product tank inlet union connection will require replacement with the correct o-ring part.
- Ensure all pipe connections are correctly aligned and hand-tight prior to start-up.
- Ensure the electrolyser chamber window is refitted correctly back into position.
- Ensure the water supply is turned on to the system
- Perform start-up as per section 9.1 on page 25.

✓ **Gasket replacement successfully carried out.**



## 12.1.5 Major service

**Note****Damage to the system due to incorrect maintenance!**

The system and its accessories may only be installed, operated and maintained by personnel with sufficient qualifications.

⇒ Make sure the maintenance is performed correctly by qualified personnel.

A major overhaul of the EASYCHLORGEN system is required every 5 years, regardless of operating hours. An approved EASYCHLORGEN service technician will be required to conduct this maintenance regime.

Control devices, the electrolytic cell, the salt saturator and all associated pipe work will require thorough inspection and cleaning and worn/defective parts replaced as necessary.

The water and brine solenoid valves will require replacement.

The electrolytic cell will require an acid clean and its two cell casing end cap gaskets replacing and the two terminal o-rings replacing.

All standard pipe connection elastomers will require replacement.

The hydrogen gas detect sensor head will require replacement.

If an auto regenerative softener is fitted, the softener will require a full service of its valve head assembly and the internal softener resin replacing.

All safety switches and safety devices to be fully tested.

Action to be taken:

⇒ **Contact your EASYCHLORGEN service provider to arrange a major overhaul service.**

✓ **General overhaul will provide for future safe operation and continued routine service.**

## 12.2 Electrolyser cleaning

The electrolyser (electrolytic cell) may require acid cleaning periodically to remove the presence of water hardness scaling and also any metal deposition e.g. iron and manganese deposits.



One of the reasons the EASYCHLORGEN may alarm in "VOLTAGE HIGH" is due to the electrolyser becoming heavily scaled or fouled with other deposits.

Precondition for action:

✓ Perform Short-term shut down procedure; see section 11.1, on page 29.

Perform the following working steps:

1. Remove the electrolyser cell enclosure window by removing the vertical window bead retainers and then the horizontal window bead retainers.
2. Carefully loosen the cell inlet and outlet union collars until the cell can be carefully rested on to the base of the electrolyser chamber with the inlet and outlet connections facing upward to prevent further spillage.

**WARNING****Increased risk of accidents due to chemical exposure!**

A residual of brine/chlorine solution may drip from the pipe work and fittings.

- ⇒ Wear correct personal protective equipment.  
⇒ Wipe away any spillage immediately.

3. Connect the acid wash cleaning system to the electrolyser in accordance with the operating instructions provided with the EASYCHLORGEN acid washing kit.
4. Completely rinse out and drain the electrolyser with water prior to refitting into the electrolyser chamber.
5. Refit the electrolyser cell to the union assemblies taking care not to over-tighten the union collars.
6. Ensure the electrolyser chamber window is refitted correctly back into position.
7. Ensure the water supply is turned on to the system
8. Perform start-up as per section 9.1, on page 25.

✓ **Electrolyser acid wash carried out successfully.**

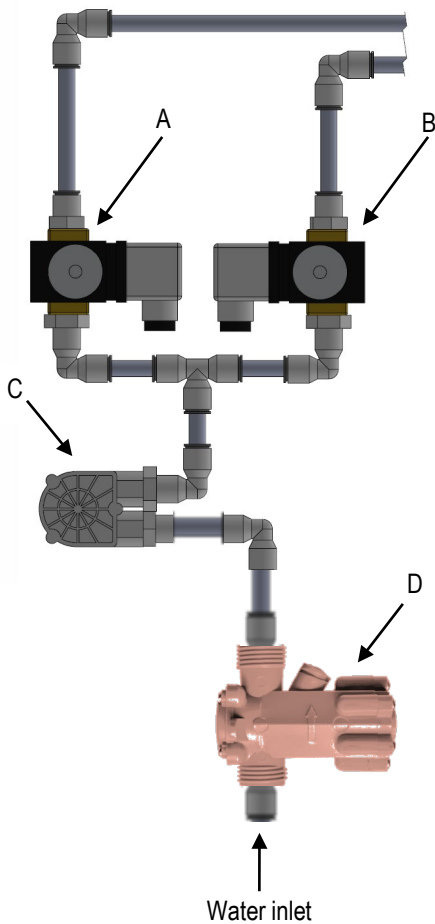
12.3 Finishing maintenance

Perform the following working steps:

- 1. Make a note of the date and scope of the maintenance performed.
- 2. Complete any operational, service or commissioning log sheets associated with the EASYCHLORGEN system and as per any associated documents which are contained within this manual.
- 3. Attach a sticker displaying the maintenance date to the system.
- 4. To assure correct start-up procedures, refer to section 9 “Start-up” on page 25.

✓ Maintenance completed.

Water control circuit schematic:



Key ID	Component Description
A	Water solenoid valve
B	Brine solenoid valve
C	Water flow sensor
D	Pressure regulator (1bar)

## 13.Troubleshooting

See below for information about how to rectify faults on the control device or the system in general. If you cannot eliminate the fault, please consult with your approved EASYCHLORGEN service provider on further measures or return the device/system component for repair.

Display	Fault	Possible causes	Remedy
<b>System Fault / Emergency Stop</b>	The Emergency Stop Button has been depressed	Manually Activated	Reset Emergency stop switch and then Reset
		Accidentally Activated	Reset Emergency stop switch and then Reset
		Wire Breakage/Loose connection	Check wiring and ensure switch is NC when Healthy
<b>System Fault / Panel Temperature</b>	The Temperature of 50 Deg.C has been exceeded within the control panel	Blocked inlet/outlet filters	Clean or replace filters then Reset
		Panel cooling fan Fault	Check and replace then reset
		Panel Temperature switch fault	Check and replace then reset
		Wire Breakage/Loose connection	Check wiring and ensure switch is NC when Healthy
<b>System Fault / Ext Tank High</b>	The High Level point within the external product tank has been exceeded.	Failure of the Start/Stop Switch	Check and replace then reset
		Solenoid valve passing	Check for swarf or worn valve seat or diaphragm
		Back filling through dosing system	Check dosing system non return valves clean
		Wire Breakage/Loose connection	Check wiring and ensure switch is NC when Healthy
<b>System Fault / Ext Tank Low</b>	The Low Level point within the external product tank has been reached.	Failure of the Start/Stop Switch	Check and replace then reset
		System in Manual Inhibit	Remove system from Manual Inhibit
		System in Remote Inhibit	Remove system from Remote Inhibit
		System in Fault Condition	Check system fault and reset
		Take of demand too high	Reduce product dose rate
		Failure of the low Level switch	Check wiring and ensure switch is NC when Healthy
<b>System Fault / Auxiliary Alarm</b>	An Auxiliary Alarm input has been activated.	Auxiliary Alarm has been Activated	Check and Reset
		Wire Breakage/Loose connection	Check wiring and ensure switch is NC when Healthy
<b>System Fault / Enclosure Door</b>	Electrolyser & De-Gassing Chamber door/window open	Door has been manually removed	Replace door and reset
		Faulty Door switch	Check and replace
		Wire Breakage/Loose connection	Check wiring and ensure switch is NC when Healthy
<b>System Fault / Hydrogen Sensor</b>	Hydrogen Level has exceeded 100% of the alarm value (<25% LEL)	Broken or damaged pipe work	Check and replace
		Ventilation Blockage	Check and clean
		Sensor not connected	Connect sensor
		Wire Breakage/Loose connection	Wire Breakage/Loose connection
<b>System Fault / Voltage High</b>	Electrolyser High Volt Set Point has been exceeded.	Lack of Salinity within the Electrolyser	Check for blockages then check S.G.
		Scale on Electrodes	Check Softener operating correctly, Check salt Quality then
		Alarm point set too low.	Check and Adjust
		Wire Breakage/Loose connection	Replace wire/Tighten connection/Clean Connection
<b>System Fault / Voltage Low</b>	Electrolyser Low Volt Set point has been reached.	High Salinity within Electrolyser	Check Salt setting adjust and reset
		Power Supply Failure	Check and replace
		Faulty Run Relay	Check and Replace
<b>System Fault / No Water Flow</b>	Insufficient Water Flow within the batch process cycle time period.	Low Water Pressure	Check service provider
		Blockage within water pipe work	Check and Clean
		Blockage within Softener	Check, Service or replace
		Faulty Flow Meter	Check and replace
		Wire Breakage/Loose connection	Wire Breakage/Loose connection
<b>System Fault / Low Air Flow</b>	Low Air flow from Blower	Blockage in ventilation pipe work	Check and remove blockage
		Air Blower Failure	Check and Replace
		Air Flow Sensor Failure	Check Clean or Replace
		Wire Breakage/Loose connection	Wire Breakage/Loose connection

## 14. Spare Parts

Recommended spare parts

### 14.1 EASYCHLORGEN Compact 25/50/100 models

Part	Content	Code
Water flow restrictor	8mmOD red restrictor	202-260
Tank level switch (universal)	PVDF/FPM level switch assembly with 1.5m cable	202-150
Hydrogen gas sensor	Hydrogen gas detector head unit & spare bracket.	210-018



#### Note

#### Failure of the system due to incorrect maintenance!

The EASYCHLORGEN system will not operate with a defective hydrogen sensor.

⇒ Make sure the maintenance is performed correctly by qualified personnel.

### 14.2 Maintenance sets

Part	Content	Code
Electrolyser cell Compact 240/480 models	Two cell casing gaskets (75mmOD), two union flat gaskets, two terminal o'rings.	
Hydraulic pipe circuit O rings	Two union flat gaskets (cell), one union o'ring (product tank).	

## 15. EU declaration of conformity



### (EN) EU Declaration of Conformity

We hereby certify that the device described in the following complies with the relevant fundamental safety and sanitary requirements and the listed EU regulations due to the concept and design of the version sold by us.

If the device is modified without our consent, this declaration loses its validity.

### (DE) EU-Konformitätserklärung

Hiermit erklären wir, dass das nachfolgend bezeichnete Gerät aufgrund seiner Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der aufgeführten EU-Richtlinien entspricht. Bei einer nicht mit uns abgestimmten Änderung am Gerät verliert diese Erklärung ihre Gültigkeit.

### (ES) Declaración de conformidad UE

Por la presente declaramos que, dados la concepción y los aspectos constructivos del modelo puesto por nosotros en circulación, el aparato mencionado a continuación cumple con los requisitos sanitarios y de seguridad vigentes de las directivas de la U.E. citadas a continuación. Esta declaración será invalidad por cambios en el aparato realizados sin nuestro consentimiento.

### (FR) Déclaration de conformité UE

Nous déclarons sous notre propre responsabilité que le produit ci-dessous mentionné répond aux exigences essentielles de sécurité et de santé des directives UE énumérées aussi bien sur le plan de sa conception et de son type de construction que du modèle que nous avons mis en circulation. Cette déclaration perdra sa validité en cas d'une modification effectuée sur le produit sans notre accord explicite.

Description of the unit:	On-site electrolytic chlorination system
Type:	EASYCHLORGEN Compact 25 / 50 / 100 / 240 / 480
EU directives:	<ul style="list-style-type: none"> <li>• Machinery Directive (2006/42/EC).</li> <li>• Electrical equipment designed for use within certain voltage limits (2014/35/EU). Standards used: EN 60335-1: 2002 and EN 60335-2-51: 2003.</li> <li>• Electromagnetic compatibility (2014/30/EU).</li> </ul>

Authorised person for documentation: Lutz-Jesco GmbH

Heinz Lutz  
Geschäftsführer / Chief Executive  
Officer  
Lutz-Jesco GmbH  
Wedemark, 01.11.2016

Lutz-Jesco GmbH  
Am Bostelberge 19  
30900 Wedemark  
Germany



## 16. Declaration of no objection

Please copy the declaration, stick it to the outside of the packaging and return it with the device.

### Declaration of no objection

Please fill out a separate form for each appliance!

We forward the following device for repairs:

Device and device type: .....Part-no.: .....

Reason for repair:

.....

.....

.....

.....

Dosing medium				
Description:		Irritating:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Properties		Corrosive:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

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 the manufacturer finds 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 requirements.

Company / address:

.....Phone: .....

.....Fax: .....

.....Email: .....

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

Date: ..... Signature: .....

## 17. Warranty claim

### Warranty claim

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: ..... Phone: ..... Date: .....

Address: .....

Contact person: .....

Manufacturer order no.: ..... Date of delivery: .....

Device type: ..... Serial number: .....

Nominal capacity / nominal pressure: .....

Description of fault: .....

.....

.....

.....

.....

.....

.....

#### Service and conditions of the device

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

.....

.....

Accessories / Accessories used: .....

.....

.....

.....

Commissioning (date): .....

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

Please describe the specific installation and enclose a simple drawing or picture of the system installation, showing materials of construction, diameters, lengths and heights of interconnecting pipe work, ducting, devices, etc.



**To be completed and kept on Site for:**

(a) Commissioning (b) When attending a call-out for fault (c) After service visit

DATE OF VISIT					
VOLTMETER READING (V)					
HOURS RUN					
AIRFLOW RATE (m³/hr)					
HARDNESS TEST (Green / Red)					
PRODUCT TEST (% Av. Cl₂)					
PRODUCT TEST (S.G.)					
HYDROGEN SENSOR TEST					
QUANTITY OF SALT ADDED					
PRODUCT Dosing                      Type					
Setting					
PRODUCT Dosing                      Type					
Setting					
WATER SOFTENER                      Settings					
VISUAL ELECTROLYSER INSPECTION					
VISUAL VENTILATION PIPEWORK INSPECTION INCLUDING DISCHARGE POINT					
VISUAL INSPECTION FOR LEAKS					
OTHER SITE INFORMATION / ADJUSTMENTS					
WHO COMPLETED THE CHECKS (Sign)					

Appendix II – Operators Log

To be completed and kept on site:

- (a) When salt is added    (b) When visiting site approximately weekly

DATE OF VISIT	VOLTMETER READING (V)	AIRFLOW RATE (m <sup>3</sup> /hr)	HYDROGEN SENSOR %	HOURS RUN	VISAUL CHECK FOR DAMAGE OR LEAKS	QUANTITY OF SALT ADDED	WHO COMPLETED THE CHECKS (Sign)	Comments / Observations

## Appendix III – Service Check Sheet

Date:		System type / model:	
Serial number:		Hour meter:	
<b>Service Item</b>	<b>OK</b>	<b>Comments</b>	
<b>Electrochlorinator</b>			
<b>Check Product tank</b>			
1) For Leaks			
<b>Check Electrodes for</b>			
1) Scale			
2) Leaks			
3) Correct operation			
<b>Check Softener</b>			
See Operator Manual			
<b>Solenoid Valves</b>			
1) Water Correct operation			
2) Brine Correct operation			
<b>Hydrogen Sensor</b>			
1) Correct operation			
<b>Brine Tank</b>			
1) Check for leaks and clean tank			
<b>Control Panel Check</b>			
1) Terminals for security and signs of over heating			
2) Check all components are present, correctly installed, and operating correctly			
3) All fuse rating are correct			
4) Correct operation of panel			
<b>Ventilation</b>			
1) Check pipe work			
2) Check air flow sensor			
3) Check room ventilation			
<b>Fill In Operators Log</b>			
<b>System Operation / Settings</b>	Water : Brine		
Hydrogen Sensor%	Cycle Time	Volts	

**Appendix IV - Water Softener Installation & Operating Guide**

# **WATER SOFTENER**

## **INSTALLATION & OPERATION INFORMATION**

## HOW THE WATER SOFTENER WORKS

Hard water contains calcium and magnesium. The water softener contains resin beads, which hold sodium ions. When hard water passes through the resin beads inside a water softener, the beads attract and hold the calcium and magnesium ions in exchange for sodium. After this ion exchange process, the water leaving your water softener is soft.

Once the resin bed is loaded with calcium and magnesium ions, it must be cleansed (or regenerated) so that it can continue to soften water. The salt in the salt saturator mixes with water to wash the resin beads. The brine solution loosens the hardness minerals that have built up on the resin beads; then the system backwashes and flushes the hardness minerals away.

Once this is complete, the resin beads hold sodium ions. The system is again ready to exchange the sodium ions for more calcium and magnesium ions. The water softener's "cleaning" or regeneration process is done with soft water. Only clean, softened water is used to make the salt solution in the salt saturator.

### Maintaining the water softener

The water softener is engineered to provide quality water without requiring extensive maintenance. However, some routine maintenance is necessary to keep the softener working properly.

Should you have any questions or need any assistance, please contact your authorised maintenance company.

### Adding salt (regenerant)

Make sure that the salt saturator never runs out of salt. We recommend that you use only high quality granular salt that meets with the specification as detailed in this manual. Some salt contains foreign particles that can cause problems with your system so be sure to use a quality grade of salt

### Manual regeneration

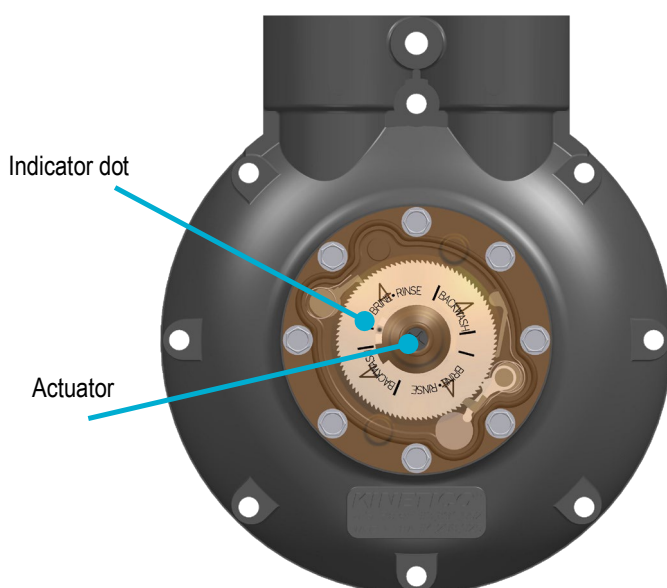
If the salt saturator does run out of salt you will have to manually regenerate the unit after adding salt, or you can wait for it to go through regeneration automatically.

Using a cross head screwdriver push down firmly on the actuator screw and slowly turn CLOCKWISE until the actuator has advanced the indicator dot to the "BRINE" position. You should hear at least five clicks while turning the screw before the indicator dot reaches the "BRINE" position. At this point you will hear water flowing to the drain. This indicates that you have successfully initiated a regeneration.

NOTE: If you do not hear a flow of water to drain, contact your authorised maintenance company.

Repeat the procedure for manual regeneration after the water flow stops (approximately 11 minutes) to be sure both resin tanks are regenerated.

NOTE: Never turn the actuator anti-clockwise.



---

## INSTALLATION NOTES

Read all steps, guides, and rules carefully before connecting and using the softener.

### Safety information

Check the local building and sanitation codes for installation compliance.

**Adhere to all local water undertaking regulations** including, but not limited to:

- Distances between equipment and main panel box and electrical outlets.
  - Air gaps for all drain lines.
  - recommends that a qualified installer perform the installation. Failure to install the system as instructed will void the warranty.
  - Do not use on water pressure that exceeds 8.0 bar (116 psi) or water temperature that exceeds 120°F (48°C).
  - Do not install the Softener in an area where the temperature can cause the unit to freeze. Freezing temperatures will damage the system.
  - Provide proper ventilation when using PVC cleaner or glue.
- Use a ladder for all overhead work beyond your natural reach. Use appropriate safety devices if working continuously at a height of six feet (1.8 meters) or more. Use an appliance dolly when transporting equipment on stairways.

**Adhere to the following guidelines when soldering:**

- Use only LEAD FREE solder.
- Close or remove PVC containers and other flammable materials to prevent fire or explosions.
- Do not wear loose clothing (i.e. shirt tails, sleeves, etc.) while using a torch for soldering.
- Notify the customer if you will be disabling smoke alarm(s) during installation. Be sure to reconnect the smoke alarm(s) upon completion of work.
- Use a scorch pad to protect any surface that may be exposed to a torch flame or excessive heat.
- The materials used in the soldering process may attack certain types of plastics. Take care during the installation process to assure that solder and flux do not come in contact with media tanks, the control module, and related plastic components.

**NOTE:** Clear area along wall where PVC drain line will be run to floor drain. It is not recommended running flexible tubing across floor or along walls, as it may be kicked out of discharge point at floor drain, or line may become pinched resulting in improper backwashing.

- When installing a plastic component on a copper pipe in line, recommends placing earth-grounding straps ACROSS the component being fitted to ensure that the earth ground is never broken.

Determine correct positioning

Make sure that the unit is level. If sand/silt or turbidity is present in the feed water, you must install a separate pre-filter. Test and record the water pressure by checking with a gauge. If pressure exceeds or is close to the maximum operating pressure, you must fit a pressure-limiting valve set to 8 bar.

- Maximum Operating Pressure is 8.0 BAR (116 psi).
- Minimum Operating Pressure is 1.5 BAR (22 psi).

**NOTE:** Verify installation complies with water regulations before continuing.

Connect the drain:

Run the drain line with flexible hose to discharge point checking for any obstruction or possible kinks.

**NOTE:** On drain lines that must travel more than 2.4m (8 ft.) vertically and 9m (30 ft.) horizontally, it is best to take the 12.5 mm (1/2") drain line that fits the valve and attach it to a larger diameter line or pipe to eliminate chances of restrictions.

**NOTE:** You must provide an air gap for all drain lines. Consult WRAS guidance note on air gap connections.

## SPECIFICATIONS

Water Flow Rate	HF
Service flow rate	28 LPM
Max backwash flow	2.7 LPM
Peak flow rate	51 LPM
Minimum flow rate	1.89 LPM

Salt used	0.45 kg
Regeneration time	13 mins
Water used per cycle	24 ltr
Vessels	500x400x200 mm
Brine tank	500x330x150 mm
Maximum temperature	50°C
Maximum operating pressure	116 psi (8.0 bar g)
Minimum operating pressure	22 psi (1.5 bar g)
Differential pressure to give service flow	15 psi (1.0 bar g)

Capacity charts – Meter Disc Number						
Hardness range	1	2	3	4	5	6
Model HF	92 - 181	182 - 269	270 - 356	357 - 442	443 - 524	525 - 607
Litres between regeneration		1103	736	441	368	315

## Trouble shooting

System Troubleshooting		
Problem	Possible cause	Solution
1. Regenerant Tank Overflow.  See also 4.	a. Drain line restricted. b. Uncontrolled refill flow rate c. Air leak in regenerant line d. Drain control clogged with resin or other debris. e. Sinking air check ball (255 only) f. Incorrect drain control fitted. g. Regenerant valve disc 1 being held open. h. Valve disc 2 not closed during regenerant draw causing a refill.	a. Check the drain line is not blocked or kinked. b. Remove refill flow control to clean ball and seat. c. Check all connections in regenerant line for leaks. d. Clean drain control. e. Replace air check ball. f. Too small of a drain control with a larger injector may reduce draw rates. g. Remove obstruction. h. Remove obstruction.
2. Water flow from drain or regenerant line when in service.	a. Flapper valve return spring weak. b. Debris stopping flapper valve from closing.	a. Replace valve spring. (contact dealer) b. Remove debris.
3. Hard water after regeneration.	a. Incorrect / failed regeneration. b. Leaking external bypass valve. c. O-Ring around riser damaged. d. Capacity too low due to incorrect setting.	a. Repeat regeneration after checking settings. b. Replace bypass (contact dealer) c. Replace O Ring (contact dealer) d. Check settings and adjust if required.
4. Will not draw regenerant or intermittent or irregular draw.	a. Low water pressure b. Drain line restricted. c. Injector plugged. d. Injector defective. e. Flapper valve 2 &/or 3 not fully closed. f. Air check prematurely closed.	a. Fit pump (contact dealer) b. Check the drain line is not blocked or kinked. c. Clean injector and screen. d. Replace injector. e. Remove debris, check flapper for closing or replace. (contact dealer) f. Put control into refill C8, replace or repair air check if needed. (contact dealer)
5. System will not regenerate automatically.	a. Power not connected. b. Defective motor c. Fouled or defective turbine d. Defective turbine cable.	a. Connect power. b. Replace motor. (contact dealer) c. Clean or replace turbine. d. Replace turbine cable.
6. System regenerated at the wrong time.	a. Settings incorrect.	a. Correct settings.



7. No conditioned water after regeneration.	a. No salt in regenerant tank. b. Injector plugged. e. Air check closes prematurely.	a. Add salt to regenerant tank. (Salt must be above the water level) b. Clean injector and screen. e. Check connections for air leaks and check air check ball (255) floats. See also 1.e. & 4.f.
8. Backwashes at excessively low or high rate.	a. Incorrect drain controller used. b. Debris affecting valve operation.	a. Replace with correct size. b. Remove drain controller and clean volume to correct setting.

## System Troubleshooting

Problem	Possible cause	Solution
9. Valve will not draw brine.	a. Low water pressure b. Drain line restricted.  c. Injector plugged. d. Injector defective. e. Air check closes prematurely.	a. Fit pump (contact dealer) b. Check the drain line is not blocked or kinked. c. Clean injector and screen. d. Replace injector.  e. Put control into brine draw C2 to check. Repair or replace if needed.
10. Uses more or less salt than setting.	a. Foreign matter in valve causing incorrect flow rates.	a. Remove brine control and flush out any debris. Put system through a regeneration to flush valve.
11. No water flow display on metered valves.	a. Bypass valve in bypass. b. Meter probe not connected to control or turbine housing. c. Restricted turbine rotation due to foreign matter in turbine.	a. Open bypass. b. Connect correctly. c. Remove and clean turbine, Turbine should spin freely, if not replace.
12. Run out of conditioned water between regenerations.	a. Improper regeneration.  b. Incorrect regenerant setting. c. Incorrect hardness or capacity settings. d. Water hardness has increased. e. Restricted turbine rotation	a. Repeat regeneration after checking the correct regenerant dosage is set. b. Set correct salt setting. c. Set to correct values.  d. Set hardness to new value. e. See 11.c

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