EASYCHLORGEN

Operating instructions

Read the operating manual!

The user is responsible for installation and operation related mistakes!

Original operating instructions

BA-65002-02-V03

Dosing Conveying Control | Liquids Gases Systems

Table of Contents

1 Notes for the Reader

This operating manual contains information and behaviour rules for the safe and designated operation of the system.

Observe the following principles:

- Read the entire operating manual prior to commissioning the system.
- Ensure that everyone who works with or on the system has read the operating manual and follows it.
- Keep the operating manual throughout the service life of the system.
- Pass on the operating manual to any subsequent owner of the system.

1.1 General non-discrimination

In this operating manual, only the male gender is used where grammar allows gender allocation. The purpose of this is to make the text easy to read. Men and women are always referred to equally. We would like to ask female readers for understanding of this text simplification.

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.
NOTE	Refers to a danger which, if ignored, may lead to risk to the machine and its function.

Table 1: Explanation of the signal words

1.3 Explanation of the warning signs

Warning signs represent the type and source of a danger:

Warning sign	Type of danger
	General danger
	Danger from poisonous substances
	Danger of explosions
	Danger from electrical voltage
	Danger of damage to machine or functional influences

Table 2: Explanation of the warning signs

1.4 Identification of warnings

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

This is how warnings are identified:

Warning sign	**SIGNAL WORD**
Description of danger. 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.

🛠 A resource such as a tool or auxiliary materials required to perform the operating instructions.

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 Notes for the operator

The operating company is to add operating instructions to the operating manual to ensure compliance with national accident and environmental protection specifications. These are to include information pertaining to supervision duties and to take into account special conditions at the company pertaining to e.g. work organization, working procedures and the personnel deployed.

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 operating company may not perform any changes, modifications or conversions to the system which could impair safety. 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 employ trained or instructed personnel. Clearly specify the responsibilities of the personnel for operating, servicing and repairing the system.

1.8 Instruction and training course assistance

As a operator you are obligated to inform and/or instruct the operating personnel about existing provisions of law and accident prevention regulations as well as about 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 operator you should therefore obtain confirmation of each of the employee s attendance in writing.

The following section lists a number of examples of topics for training.

If the operating personnel still require further training after the system has been delivered to the operator, please contact Lutz-Jesco GmbH regarding the agreement conditions.

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
- The interpretation of malfunction messages.

For maintenance and service instructions:

- Inspection/test of the system
- Cleaning the system and replacing spare parts

2 Safety

2.1 General warnings

The following warnings are intended to help you to eliminate the dangers that can arise while handling the system. 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.

DANGER

Mortal danger from electric shock!

Live parts can inflict fatal injuries.

⇨ Ensure that the mains voltage is switched off before opening the control cabinet door.

DANGER

Danger to life through explosions!

The use of systems without ATEX certification in a potentially explosive area can lead to explosions which result in fatal injuries.

⇨ Never use the system in potentially explosive areas.

WARNING

Increased risk of accidents due to insufficient qualification of personnel!

This 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.

⇨ Prevent access to the system for unauthorised persons.

NOTE

Damage to the system due to incorrect salt quality.

Use of the incorrect salt quality can result in damage to the electrolytic cell and the voiding of your warranty.

⇨ Make sure that you use only salt which complies with the specifications made in section 3.3 “Salt quality” on page 8.

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.

The specific consequences can be:

- The failure of important system functions 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 this operating manual, further safety rules apply and must be followed:

- accident prevention regulations
- safety and operating provisions,
- safety regulations on handling hazardous substances,
- 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. Read the Accident Prevention Regulations and the Safety Data Sheets to the dosing media find out what protective equipment you need.

You will require the minimum of the following personal protective equipment:

Personal protective equipment required	
	Protective goggles
	Protective clothing
	Protective gloves

Table 3: Personal protective equipment required

Wear the following personal protective equipment when performing the following tasks:

- Commissioning,
- Operation,
- Shut-down,
- Maintenance work,
- Disposal.

2.5 Personnel qualification

Any personnel who work on the system must have appropriate special knowledge and skills.

Anybody who works on the system 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 system,
- knowledge of safety equipment and the way this equipment functions,
- knowledge of this operating manual, 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 system unsupervised,
- sufficient training that they can work on the system under the supervision and guidance of a trained specialist.

These operating instructions differentiate between these user groups:

2.5.1 Specialist staff

Thanks to their professional training, knowledge, experience and knowledge of the relevant specifications, specialist staff are able to perform 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 qualifications are the pre-condition for the respective tasks. Only people with appropriate qualifications are allowed to perform these tasks!

Qualification	Activities
Specialist staff	■ Installation ■ Hydraulic installations ■ Commissioning ■ Taking out of operation ■ Fault rectification ■ Maintenance ■ Repairs ■ Disposal
Trained electricians	■ Electrical installation ■ Rectifying electrical faults ■ Electrical repairs
Trained persons	■ Transportation ■ Control ■ Storage

Table 4: Personnel qualification

3 Intended use

3.1 Notes on product warranty

Any non-designated use of the system can compromise its function or intended protection. This leads to invalidation of any warranty claims!

Please note that liability is on the side of the user in the following cases:

- the system 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” on page 12) is not adhered to.
- If people operate the system 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 system.
- The user uses different dosing media than those indicated in the order.
- Maintenance and inspection intervals are not adhered to as required or not adhered to at all.
- The system 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 electrolysis chlorination system on site is intended to serve the following purpose: Generating a less than 1 % sodium hypochlorite solution using salt, water and electricity. The resulting medium is intended for use as a disinfectant for the chlorination of drinking water, swimming pools and industrial water.

The sodium hypochlorite solution produced has a concentration of 0.6 % (±0.1 weight %) of the chlorine (Cl_2) weight.

3.3 Salt quality

The system is intended for use with dry crystalline / granular salt. For price reasons, salt can be purchased in large quantities / by the pallet. When ordering salt, always specify the required brand or specific quality, so that in the unlikely case of a shortage, you will receive an equivalent quality of salt. We recommend that before using highly-pure dried evaporated salt (Pure Vacuum Dried, PVD), you first install a (cleaned) fine grit bed in the salt dissolving container.

Characteristic	Unit	Specification
Arsenic (As)	mg/kg	<13
Cadmium (Cd)	mg/kg	<1.3
Chrome (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

Table 5: Chemical specification of sodium chloride

The EASYCHLORGEN is a system for the "in situ” production of the biocide active agent “active chlorine produced from sodium chloride via electrolysis“. In accordance with the biocide ordinance, as of 01/09/2015, the member states of the European Union may only use precursors for biocidal active agents produced "in situ" and which are used as disinfectants. These precursors must satisfy the quality requirements made of these substances by DIN EN and be sourced from a manufacturer or supplier listed in accordance with article 95 of the biocide ordinance. Please ask your supplier to confirm conformity with the biocide ordinance (certificate).

Biocidal active agent:

“Active chlorine generated from sodium chloride by electrolysis.”

EC-no. mixture;
CAS no. not applicable

Precursors:

Sodium chloride

EC-no. 231-598-3;
CAS-no. 7647-14-5;
Special salt for the electrolytic cell
DIN EN 16401 and 14805

3.4 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 lie between 5 and 20 °C.

4 Product description

4.1 Scope of delivery

Please compare the delivery note with the scope of delivery. The following items are part of the scope of delivery:

- EASYCHLORGEN system
- Operating instructions
- Accessories (optional)

4.2 Design and function

4.2.1 System structure

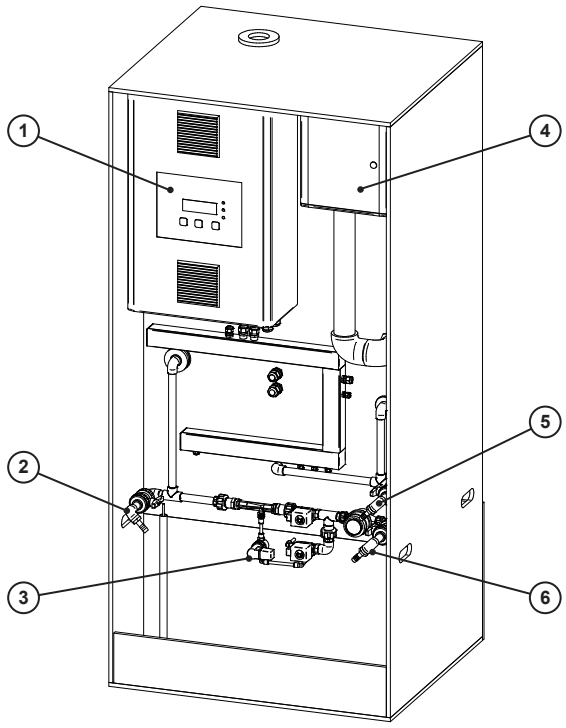


Fig. 1: Fore side with control

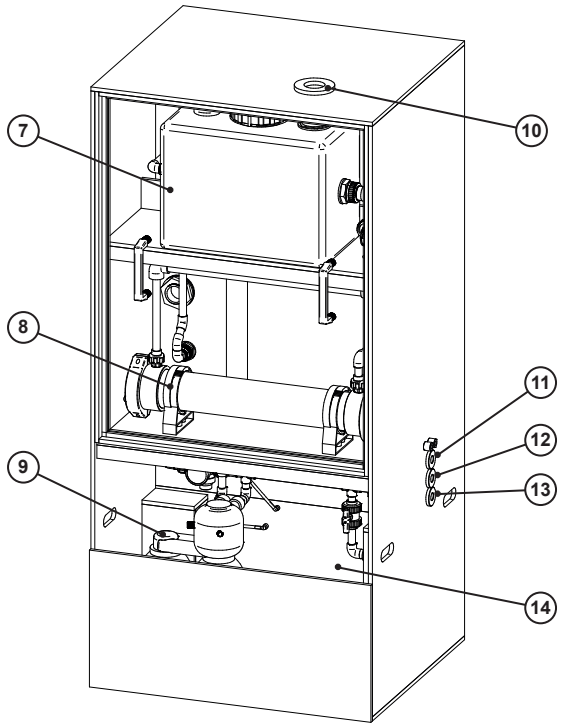


Fig. 2: Rear side with electrolytic cell

Position	Description
1	Control box
2	Sampler tap for diluted brine
3	Brine solenoid valve
4	Fan
5	Water inlet
6	Product discharge
7	De-gassing tank

Position	Description
8	Electrolytic cell
9	Water Softener
10	Ventilation connection
11	Product discharge connection
12	Discharge for softened water
13	Water inflow connection
14	Salt dissolving container

Table 6: Description of components

4.2.2 Function sequence in automatic operation

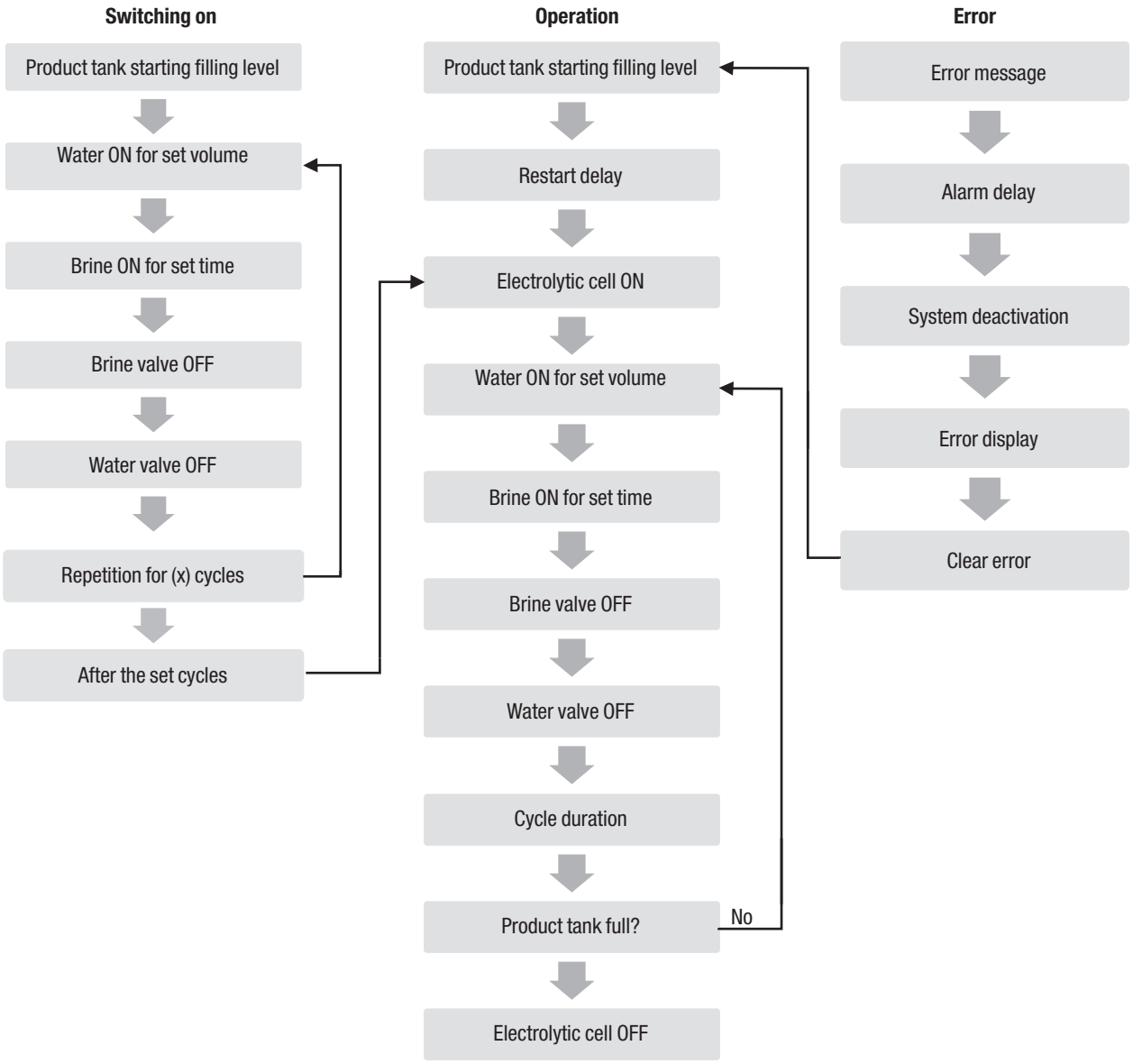


Fig. 3: Function sequence

4.2.3 Function description

EASYCHLORGEN is a fully-automatic system for the production of thinned sodium hypochlorite solution with 0.5 - 0.7 % Cl_2 made of salt, softened water and electrical energy.

The operator only needs to fill the salt dissolving container (14) with salt. The system automatically produces a concentrated brine solution out of the salt, which is then diluted with water in the water inflow fitting (5) to the correct strength for efficient electrolysis. The diluted brine is transported to the electrolytic cell (8). DC current is added to the solution; this produces sodium hypochlorite. The produced hypochlorite solution is transported to a product storage tank, where it is held ready for dosing via a dosing pump (optional accessories). The batch process is continued automatically until the product storage tank has been filled. The filling of the product storage tank and the batch process is automatically controlled by the control (1). A small quantity of hydrogen gas is generated as a by-product of the electrolysis. This gas is led away to the surroundings via a pipe connected to the vent connection (10).

4.3 Rating plate

There is information on the equipment about safety or the product's way of functioning. The information must stay legible for the duration of the service life of the product.

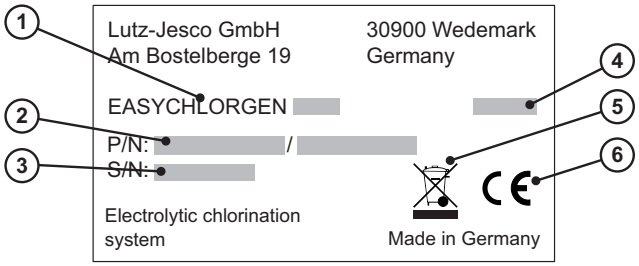


Fig. 4: Rating plate

No.	Description
1	Product name
2	Part number
3	Serial number
4	Month/year of manufacture
5	WEEE label
6	CE marking

Table 7: Rating plate

5 Technical data

5.1 Output data

EASYCHLORGEN							
Model:		280	560	1100	2200	4250	8500
Chlorine capacity	g/h	280	560	1100	2200	4250	8500
Chlorine concentration	g/l	5 – 7				5 – 8	
Liquid product output	l/h	46	92	183	366	650	1300
Liquid product storage*	l	50					
Salt storage capacity	kg	250					

Table 8: Output data

5.2 Operating conditions and limits

EASYCHLORGEN							
Model:		280	560	1100	2200	4250	8500
Nominal water consumption	l/h	49	98	196	392	650	1300
Nominal salt consumption	kg/h	0.9	1.8	3.6	7.3	14	28
Operating pressure	bar	1.5 – 8.5					
Ambient temperature	°C	+5 to + 40*					
Water supply temperature	°C	+8 to +20**					

Table 9: Operating conditions and limits

* Please ask for the venting upgrade kit.
** The water cooler is required from 20 °C.

5.3 Electrical specifications

EASYCHLORGEN							
Model:		280	560	1100	2200	4250	8500
Power supply	Ø	230 V AC				340 – 530 V AC (4 wire Y) 196 – 305 V AC (3 wire Δ)	
Power consumption	kWh	1.4	2.8	5.6	12	24	47
Protection class	IP	44					

Table 10: Electrical specifications

5.4 Dimensions of the connections

Description	Size:	280	560	1100	2200	4250	8500
Water inlet		0.5" / 20 mm					
Product discharge							
Discharge for softened water							
Brine inlet		3/4" BSPm					
Softener backwashing discharge		12 mmOD					
Hydrogen vent line		2" / 63 mm					
Electrical connection		M20			M25		
Control unit cable connection		2.5 – 4 mm²			2.5 – 6 mm²		

Table 11: Dimensions of the connections

5.5 Components coming into contact with the media

Description	Material
Electrolytic cell	PVC, Titan, PTFE, FPM
Product transfer pipe	PVC
Product tank	MDPE
Product fill level switch assembly	PVDF/PVC, FPM/PPS

Table 12: Components coming into contact with the media

5.6 Other data

Size:		280	560	1100	2200	4250	8500
Empty weight	kg	155	159	173	197	210	270

Table 13: Other data

6 Dimensions

All dimensions in millimetres (mm).

6.1 EASYCHLORGEN 1100

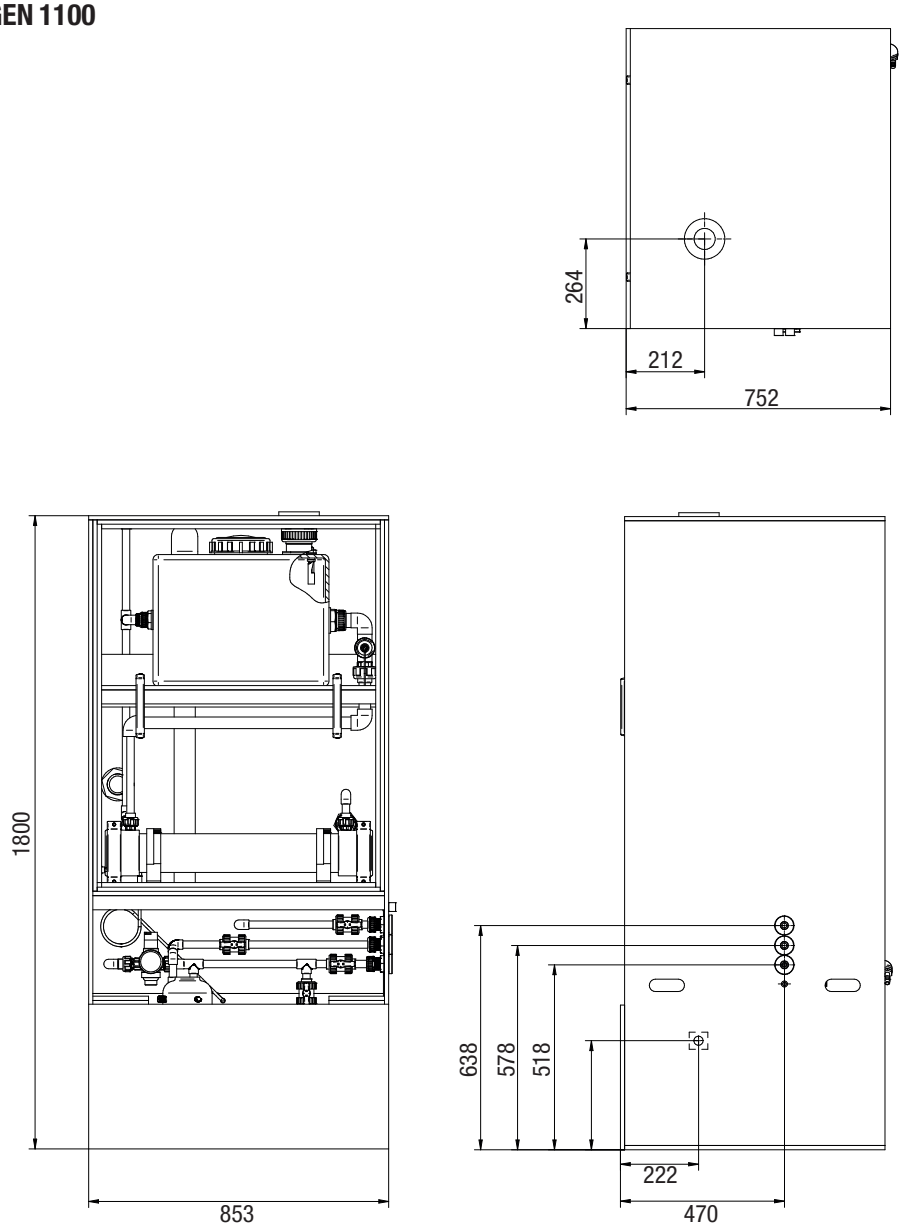


Fig. 5: Dimensions 1100

6.2 EASYCHLORGEN 2200

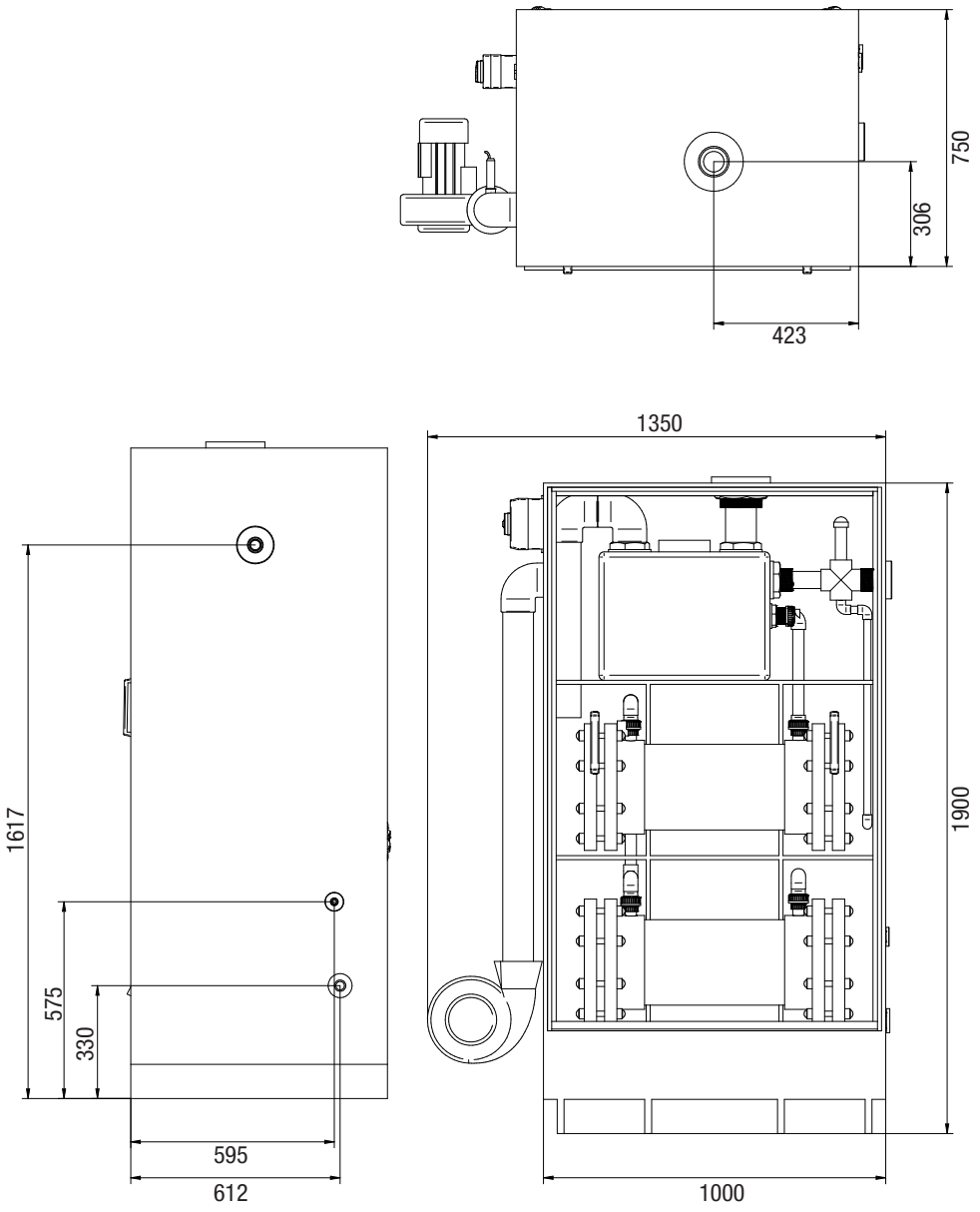


Fig. 6: Dimensions 2200

7 Installation

WARNING

Danger of personal injury and material damage!

The system is extremely 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 system is set up.

⇨ Transport the system using a floor conveyor that is suitable for the load such as a pallet truck, forklift truck or crane.

⇨ Wear safety shoes while transporting the device.

NOTE

Damage to the system due to incorrect installation

The failure to observe installation instructions (e.g. use of unsuitable tools) can damage the system parts.

⇨ Use suitable tools.

⇨ Tighten the screw connections by hand.

7.1 Installation location

- The system requires a stable base. Comply with section 6 “Dimensions” on page 14.
- The system must be easily-accessible for operation, filling with salt and maintenance.
- A waste water discharge must be present.
- The setup room must be well ventilated.
- A ventilation outlet outside on the building.
- Comply with 7.5 “Installation example” on page 27.

7.2 Hydraulic Installation

7.2.1 Water supply

NOTE

Damage to the system due to solids in the water.

Water that contains solids can damage the system or restrict its performance.

⇨ Ensure that the water is always free of solids.

Precondition for action:

✓ A minimum water pressure of 1.5 bar is required.

✓ The system must be supplied with purified, clean water of drinking water quality. Water with a high magnesium quantity could shorten the service life of the water softener.

✓ A pipe disconnecter is installed in the drinking water supply in front of the whole system. An additional water softener must be installed if the local conditions require this.

✓ If the supply pressure exceeds 8.5 bar, a pressure reduction valve must be installed in the water supply.

Perform the following working steps:

➔ Connect the system with a ½" (20 mm) PVC-U water supply. Install a shutoff valve.

7.2.2 Supply with softened water

If an external water softener is included in the scope of delivery of the system, comply with the following instructions.

Precondition for action:

✓ Suitable water supply available.

✓ A waste water outlet is available

Perform the following working steps:

1. Install the water softener on a solid foundation close to the system and close to a local waste water outlet.
2. Comply with the specifications of the operating manual of the water softener. Make sure that the softener is fitted with shutoff valves in the inflow and discharge.
3. A water sampling tap should be installed to permit checks of the water hardness after the water softener and before the system.
4. Connect the water softener with the system using the hose connection adapter included in the scope of delivery of the system. Use a flexible hose.

✓ **External water softener installed.**

7.2.3 External product tank

NOTE

Install the product tank correctly.

To ensure that the system retains its functionality, the product tank must be installed correctly.

⇨ Install the product tank on the ground level.

⇨ An air gap from the internal de-gassing tank to the external product tank must be ensured.

⇨ The maximum filling level of the external product tank must be min. 15 cm under the discharge.

7.2.4 External salt dissolving container

Precondition for action:

✓ Supply with softened water is present.

✓ The lowest level of the brine must lie above the inlet of the internal salt dissolving container (min. 15 cm).

Perform the following working steps:

➔ Connect the salt dissolving container with the system Install the shutoff valve.

✓ **Salt dissolving container is connected.**

7.2.5 Hydrogen ventilation

DANGER

Danger to life through explosions!

Incorrect installation of the hydrogen ventilation could cause irreversible damage to the system components and even create a potentially explosive atmosphere.

⇨ Ensure that the hydrogen ventilation is installed correctly.

The system requires the installation of a vent pipe between it and a suitable ventilation outlet on the building exterior (minimum height of 3 m over the ground) to dissipate the hydrogen gas generated in the electrolysis process safely into the surroundings.

Plan the pipeline as direct and straight as possible and always ensure an inclination from the ventilation connection to the ventilation outlet. The pipe should ideally have a length of 15 m.

Pipes longer than 15 m require the installation of an additional fan. Use a pipe with a diameter of 2" / 63 mm to maintain the air volume flow over 40 m^3 per hour.

Use wide-radius bends to reduce the friction drag. Do not install any screw connections or other section points along the entire vent pipe.

Make sure that the ventilation outlet is located on the outside wall of the building and not directly underneath an air-intake. It must also be located min. 0.8 m from a window or a potential source of ignition. If the external vent pipe is installed in a public area or is open to the possibility of vandalism, protect it with a suitable steel cage or pipe casing.

We recommend installing the following warnings signs in the system room and the external ventilation outlet.

- Warning of a danger point
- Smoking forbidden!
- No naked flames!

7.2.5.1 Hydrogen ventilation (< 15 m)

Precondition for action:

✓ Provision of a suitable ventilation outlet on the outside of the building.

Perform the following working steps:

1. Install a ½" / 20 mm vent pipe from the ventilation connection to the external ventilation outlet.
2. Apply the signage to the ventilation point required by local regulations.

✓ **Standard ventilation installation completed.**

7.2.5.2 Venting fan (> 15 m)

It is possible that the scope of delivery of the scope of delivery includes and additional fan. This device is intended to support the safe discharge of hydrogen through a vent pipe with a length of over 15 m.

Precondition for action:

✓ The additional fan is set up at a suitable location.

✓ A suitable external ventilation outlet is present

Perform the following working steps:

1. Install a 2" / 63 mm PVC U pipe from the ventilation connection to the T-piece in the fan collector line.
2. Install a 3" / 90 mm PVC U pipe from the fan collector line to the external ventilation outlet.
3. Apply the signage to the ventilation point required by local regulations.

✓ **Standard ventilation installation completed.**

7.3 Electrical installation

DANGER

Mortal danger from electric shock!

Live parts can inflict fatal injuries.

⇨ Disconnect from the electricity supply before working on the system.

⇨ Secure the system to prevent it from being switched on again.

7.3.1 EASYCHLORGEN

Precondition for action:

✓ The system is fitted in the installation location.

Perform the following working steps:

➔ Connect the voltage supply, level switch and all alarm signal lines in accordance with the corresponding circuit diagram for your model. Comply with section 7.4 “Electrical connections” on page 18.

✓ **Electrical installation completed.**

7.3.2 External water softener

Precondition for action:

✓ The water softener required a 110 - 240 V AC power supply.

Perform the following working steps:

1. Remove the plastic cover of the water softener.
2. Connect the power cable of the switching power supply with the mains network power via a fused switch.
3. Connect the connector of the low-voltage cable in the socket on the rear-side of the softener control.

4. Connect the backwashing signal cable from the softener valve head with the system control in accordance with section 7.4 “Electrical connections” on page 18.
5. Replace the plastic cover on the water softener.

✓ **Softener connection completed.**

7.3.3 Venting package

Precondition for action:

✓ The system and the vent pipe have been setup and installed correctly.

✓ A suitable power supply fused by a switch is present within a distance of 2 m from the installed device.

Perform the following working steps:

1. Connect the power cable of the fan with a voltage supply fused with a switch.
2. Connect the air flow sensor with the system control in accordance with the specifications of section 7.4 “Electrical connections” on page 18.

✓ **Fan connection completed.**

7.4 Electrical connections

7.4.1 Terminal connection of the system control

Consult the circuit diagrams on the following pages.

Terminal I.D.		PCB	Function	
1	I	Mains voltage output	230 V AC output voltage for power supply of the electrolytic cell	230 V AC
2	N			
3	E			
4	I	Power input	230 V AC Input voltage	
5	N			
6	E			
7	N.C.	Alarm 2	Alarm relay	Voltage-free alarm contacts
8	C			
9	N.O.			
10	N.O.	Alarm 1	Alarm relay	
11	C			
12	N.C.			
13	C	Operation relay	Electrolytic cell operating signal	Signals
14	N.O.			
15	+	+24 V DC output	Shared supply voltage	
16	+	Sig Amps	Signal to read the current	
17	-	0 V	Shared 0 V	
18	+	Sig Volts	Signal to read the voltage	
19	-	0 V	Shared 0 V	
20	+	Sig Air Flow	Signal to read the air flow (if a venting fan is installed)	
21	+	+24 V DC output	Output voltage for the air flow meter (if installed)	
22	-	0 V	Shared 0 V	
23	-	0 V	Shared 0 V	
24	+	Sig Flow Meter Pulses	Signal for incoming water flow rate sensor pulses	
25	+	+ 5 V DC output	Voltage supply for the water flow rate sensor	
26	+	Sig Product Temp	Not used	
27	-	0 V	Shared 0 V	
28	+	Sig Hydrogen	Signal for reading out the hydrogen sensor	
29	+	+5 V DC output	Voltage supply of the hydrogen sensor	

Table 14: Terminal connection of the system control

Terminal I.D.		PCB	Function	
30	N.C.	Ext Alarm N/C	External N.C. Emergency alarm, connected with terminal 15 when not used	Signals
31	-	0 V	Shared 0 V	
32	+	Sig Panel Temp	Signal for temperature of the operating panel	
33	-	0 V	Shared 0 V	
34	+	Sig Emergency Stop	Signal for emergency stop switch	
35	-	0 V	Shared 0 V	
36	+	Sig Softener Regen	Signal for the softener regeneration input	
37	-	0 V	Shared 0 V	
38	+	Sig Flood	Signal for the overflow of the external collecting tank / connected with shared 0 V, not in use	
39	-	0 V	Shared 0 V	
40	+	Sig Door	No function - connected with shared 0 V	
41	-	0 V	Shared 0 V	
42	+	Sig tank start/ stop	No function - connected with shared 0 V	
43	-	0 V	Shared 0 V	
44	+	Sig Ext Tank Run/stop	Signal for product tank Start/Stop switch / external input for chlorine signal	
45	-	0 V	Shared 0 V	
46	+	Sig Ext Tank Low Lv	Signal for low filling level in the external product tank	
47	-	0 V	Shared 0 V	
48	+	Sig Ext Tank H-H	Signal for high filling level in the external product tank	
49	-	0 V	Shared 0 V	
50	*	Reserve	Reserve connection terminal	
51	+	+24 V DC	24 V DC supply for brine solenoid valve	Control outputs
52	-	0 V	Shared 0 V	
53	+	+ 24 V DC	24 V DC supply for water solenoid valve	
54	-	0 V	Shared 0 V	
55	+	+ 12 V DC	12 V DC supply for electrolytic cell LEDs	Electrolytic cell LED outputs
56	+	Green	Connection for green LED	
57	+	Blue	Connection for blue LED	
58	+	Red	Connection for red LED	
59	-	0 V	Shared 0 V	

Table 14: Terminal connection of the system control

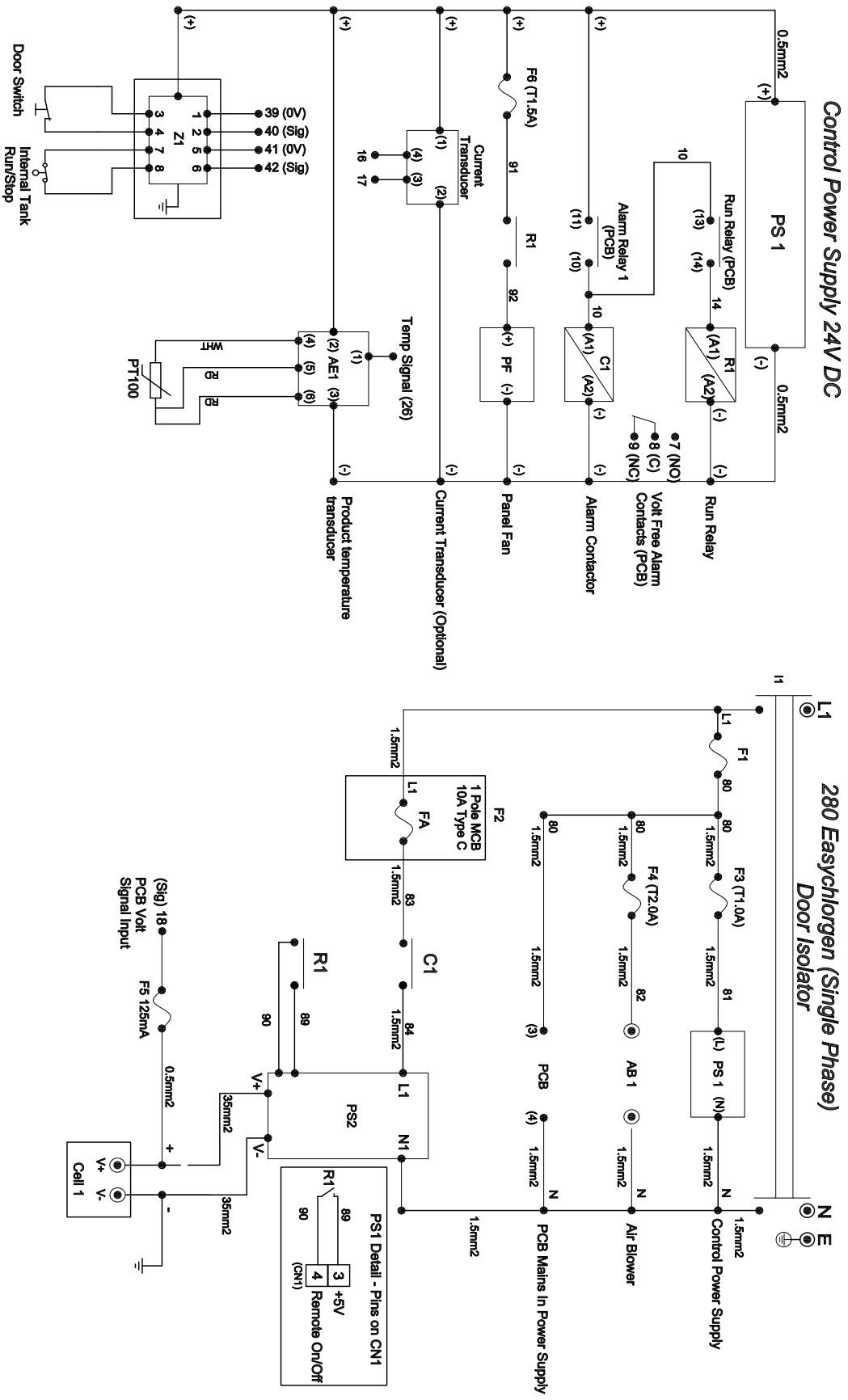
Terminal I.D.		PCB	Function	
60	+	Digital inputs	No function	
61	+			
62	+			
63	+			
64	RX	Received	Data received	Telemetry option
65	TX	Transferred	Data transferred	
66	+	Aux Alarm	Additional alarm	Not used
67	-	0 V	Shared 0 V	
68	+	Remote Inh	Remote stop	
69	-	0 V	Shared 0 V	

Table 14: Terminal connection of the system control

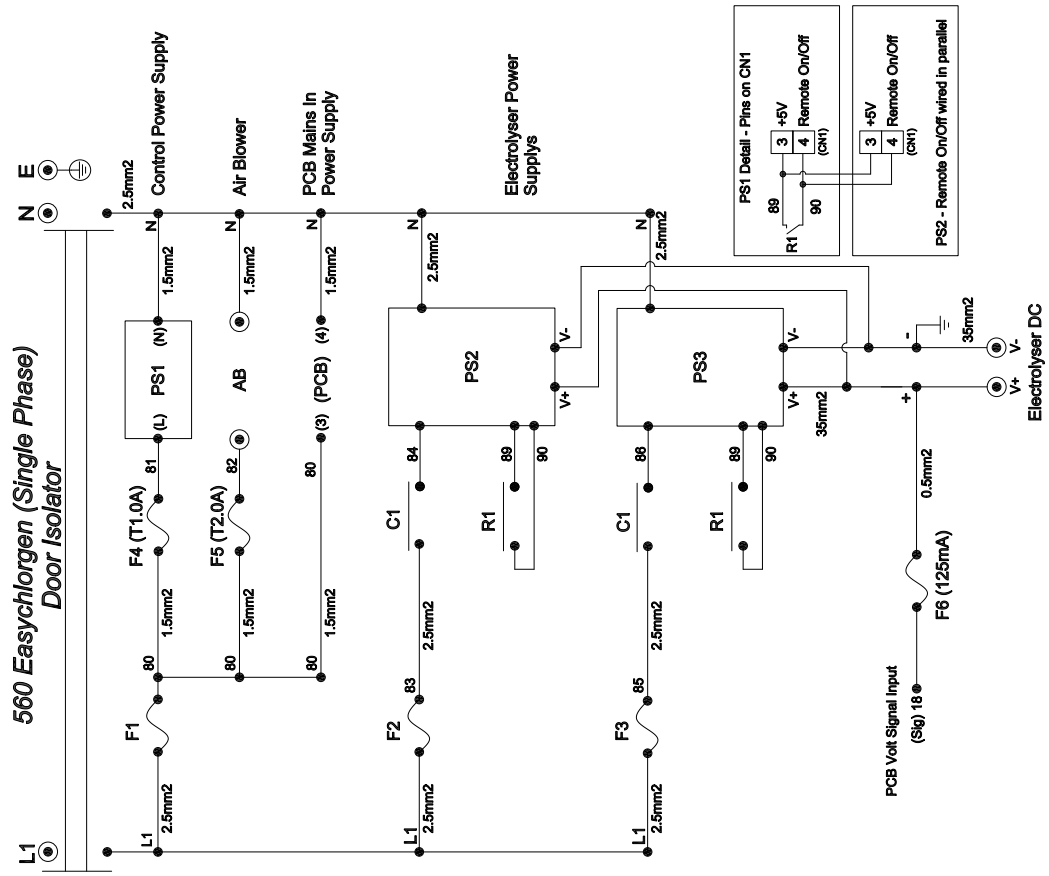
Product tank with double level switch		
Cable ID	**Function**	**Clamps**
Green/yellow (pin 1 and 2)	Start-Stop filling level	43 / 44
Brown/white (pin 3 and 4)	High filling level	47 / 48

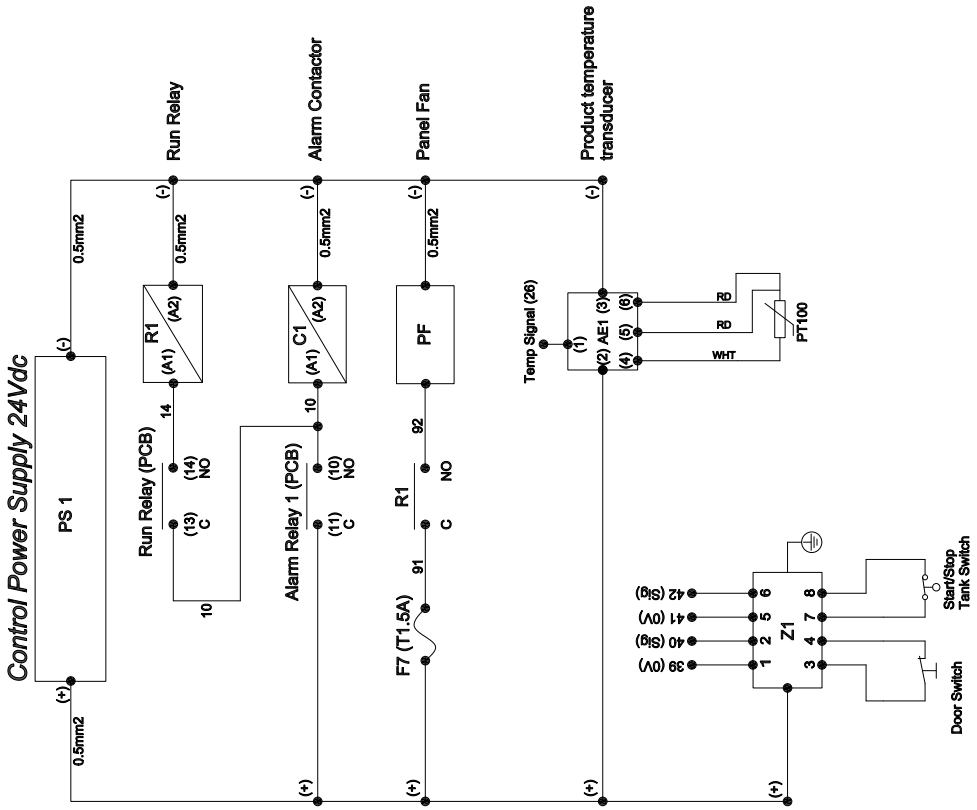
Table 15: Level switch terminal connection

7.4.2 Circuit diagram 280

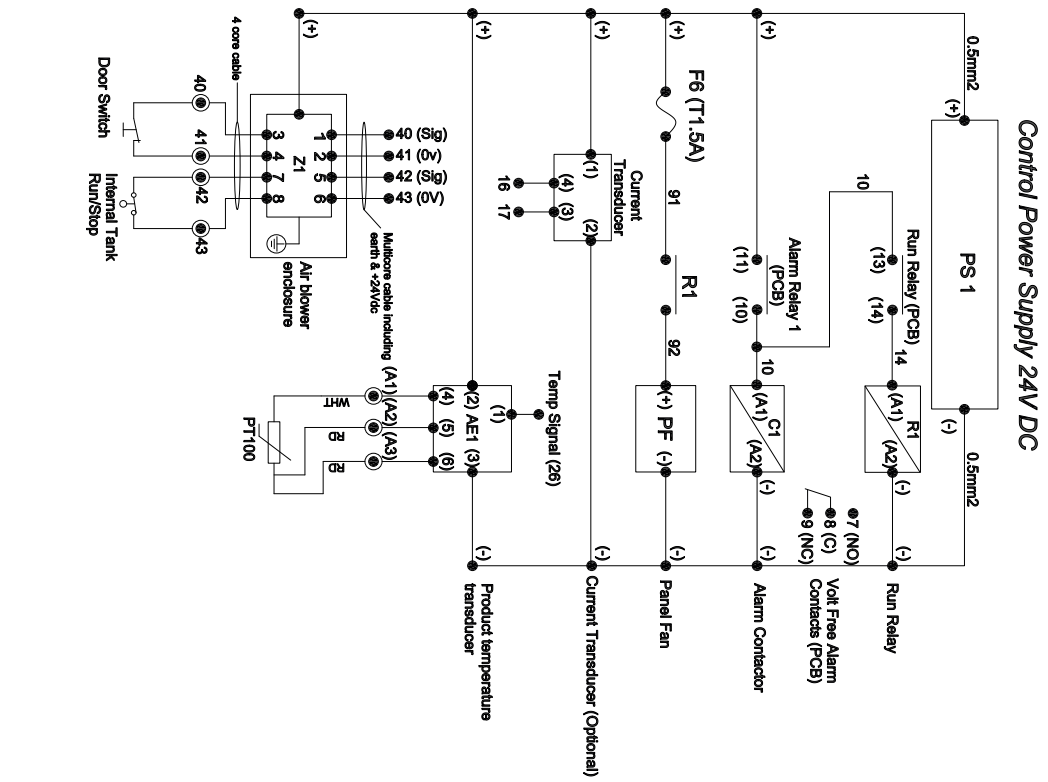


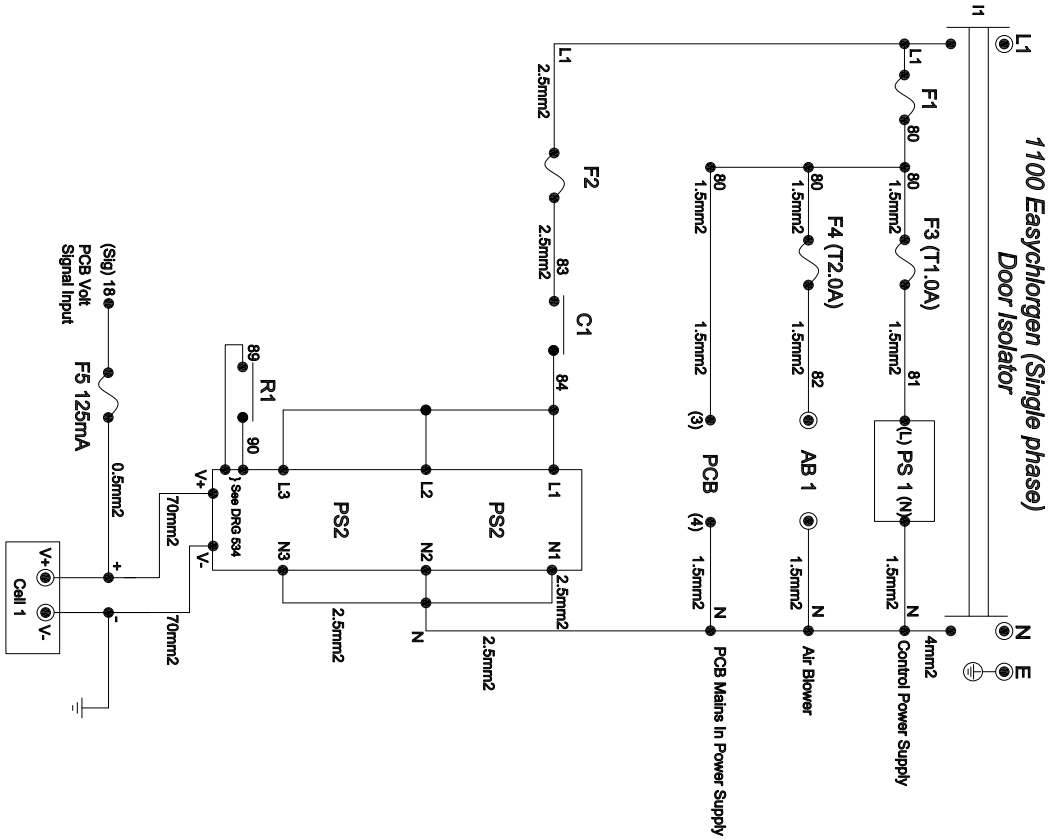
7.4.3 Circuit diagram 560



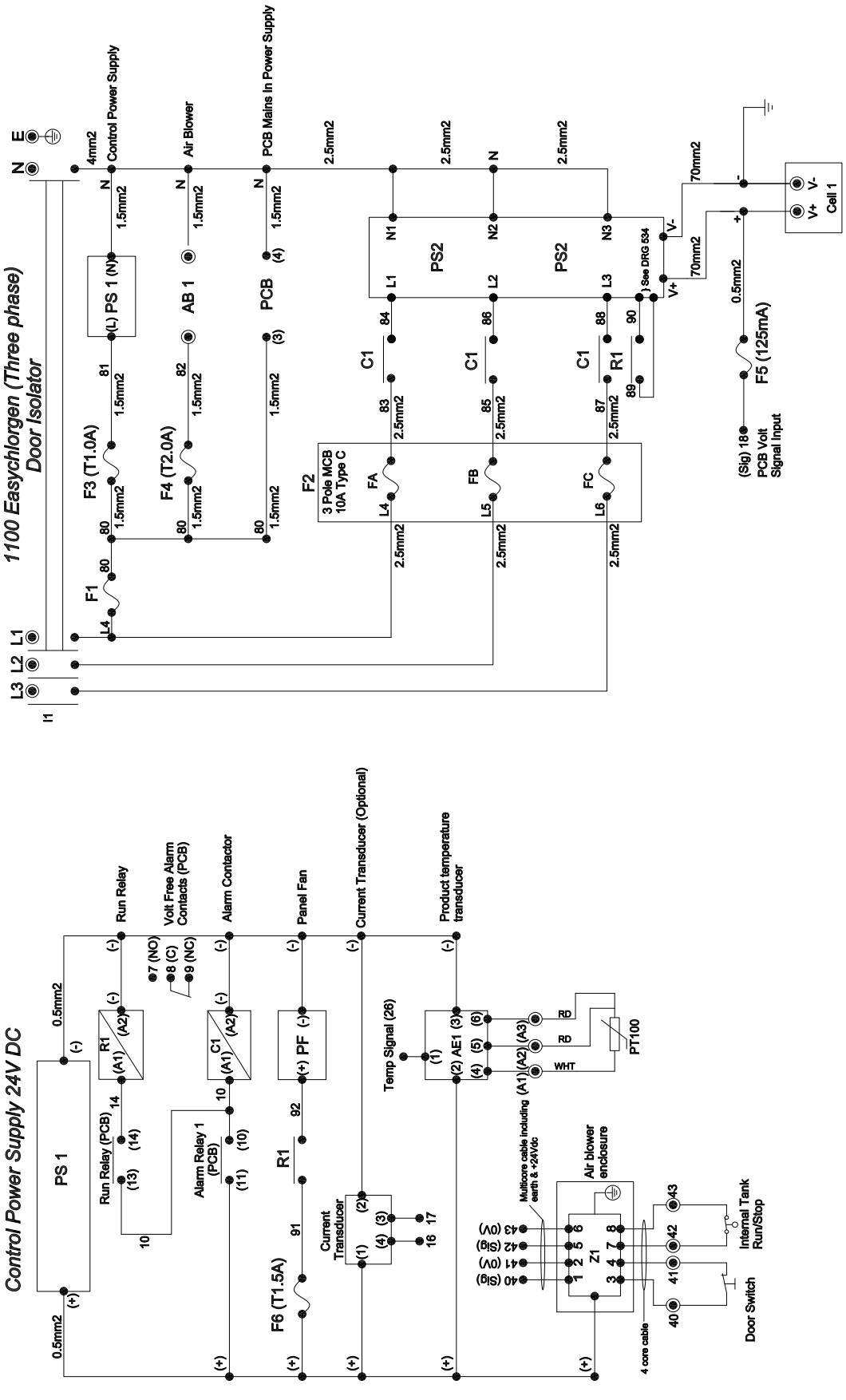


7.4.4 Circuit diagram 1100, 1-phase

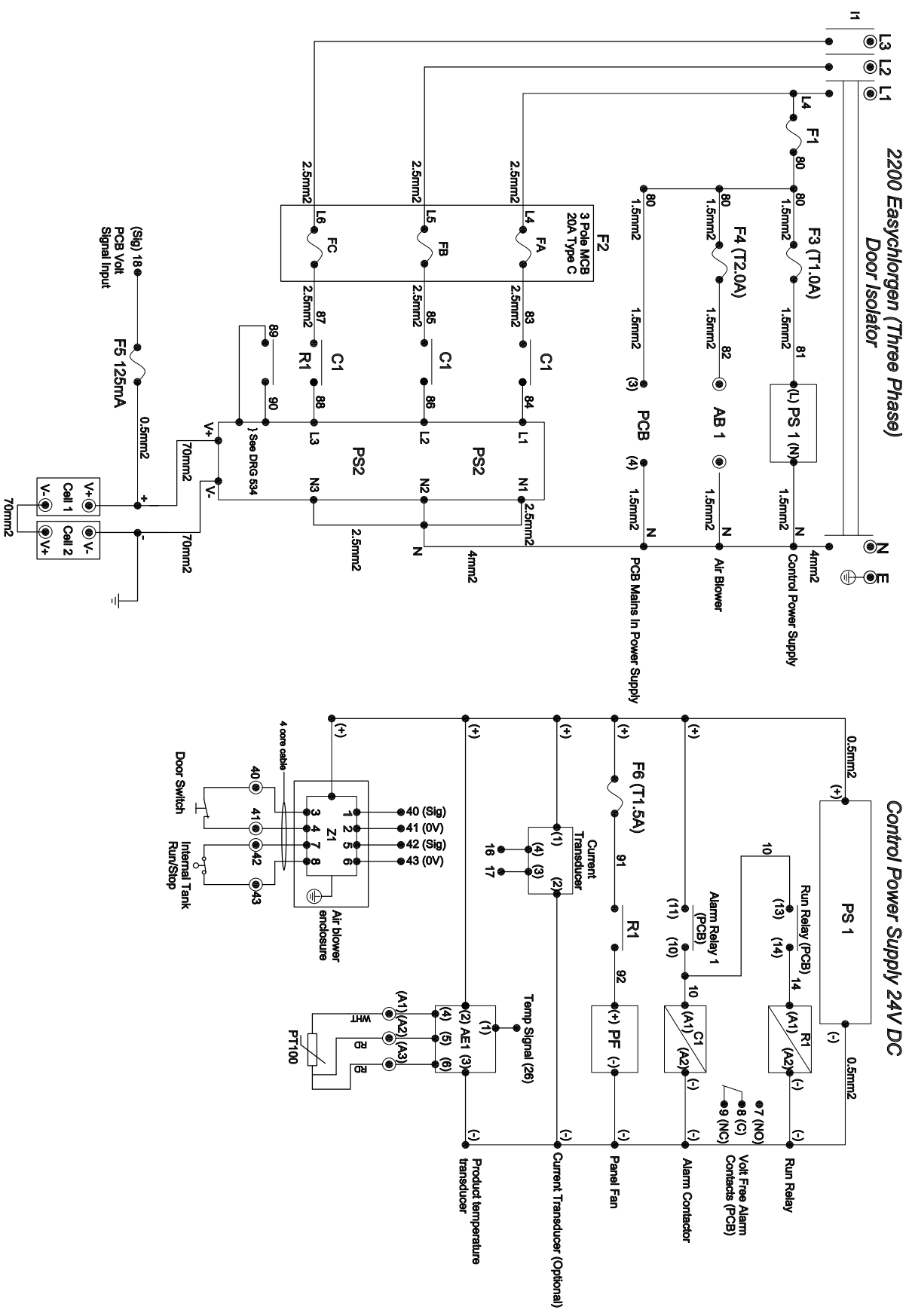




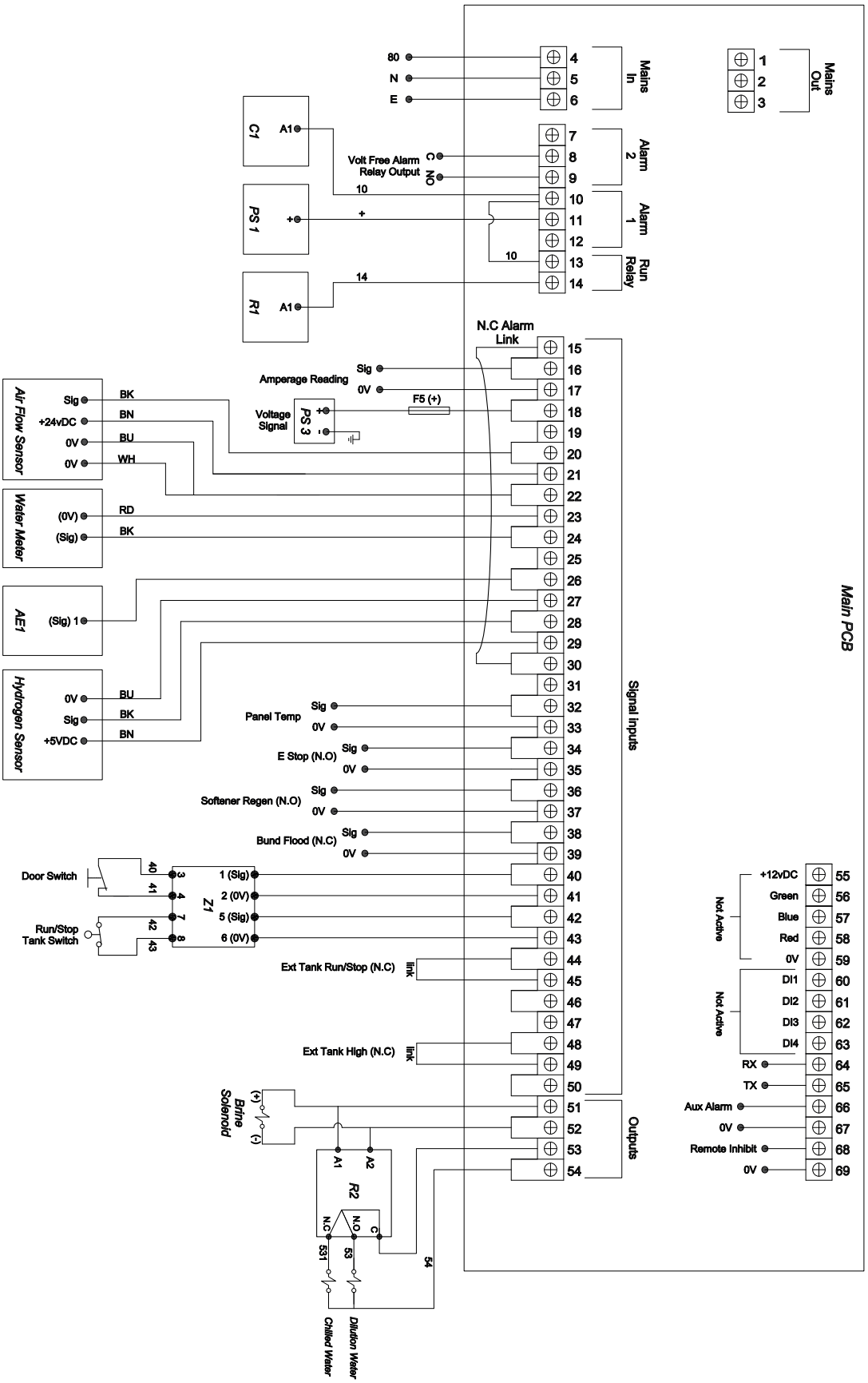
7.4.5 Circuit diagram 1100, 3-phase



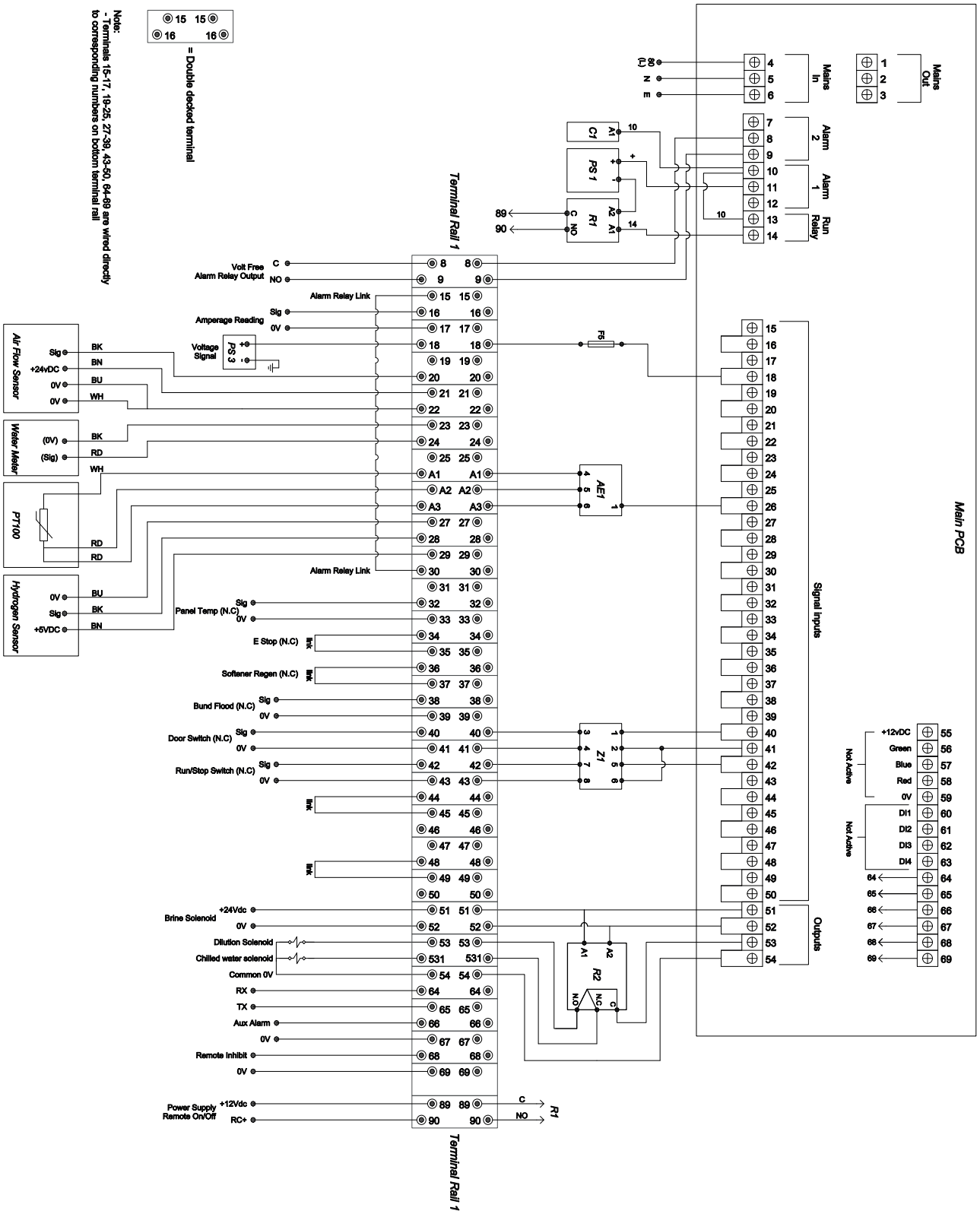
7.4.6 Circuit diagram 2200, 3-phase



7.4.7 280 & 560 Terminal connection



7.4.8 1100 & 2200 Terminal connection



7.5 Installation example

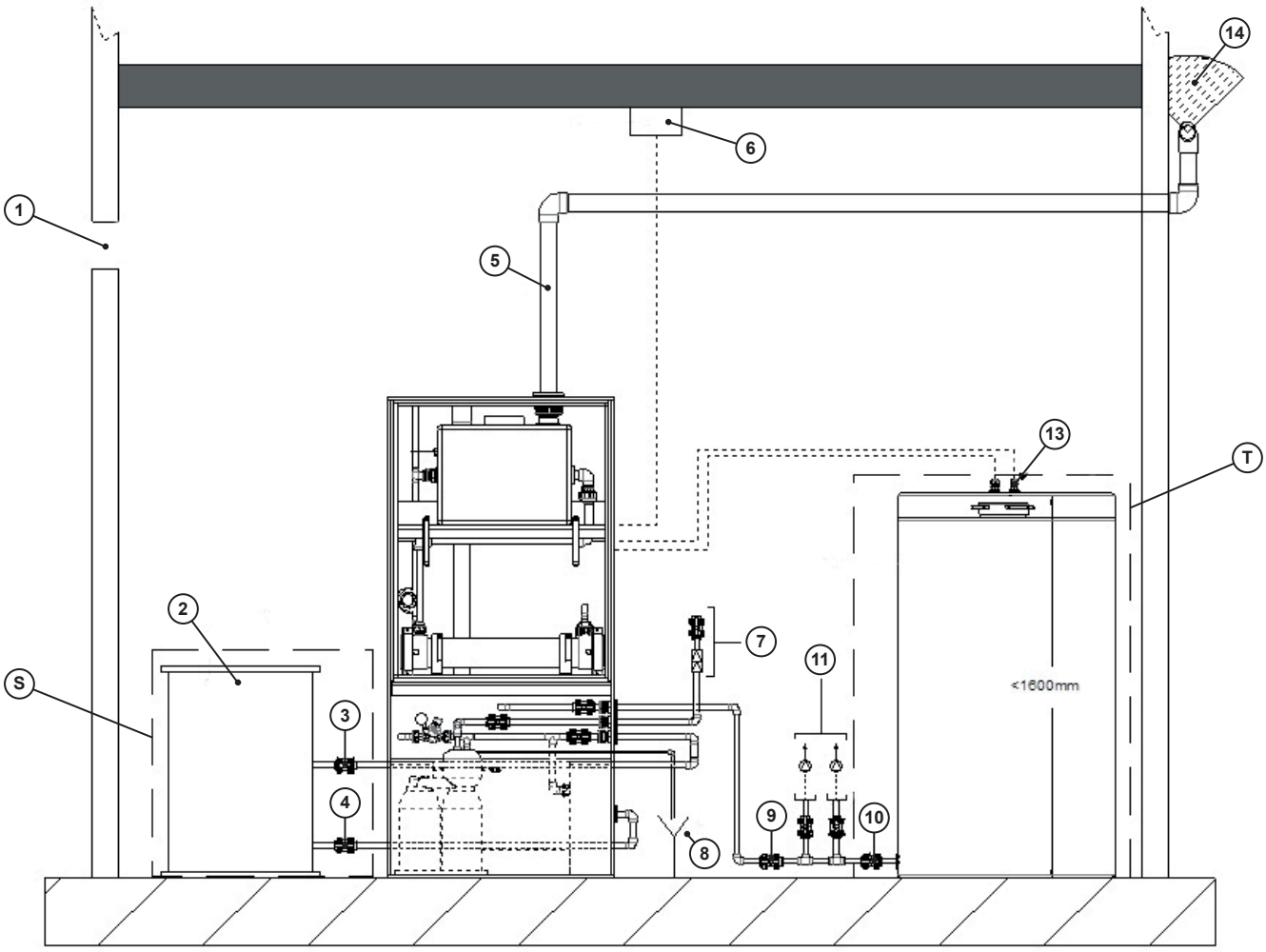


Fig. 7: Installation example

Position	Description
S	External salt dissolving container
1	Venting
2	Salt dissolving container
3	Shutoff valve for softened water
4	Brine shutoff valve
5	Vent pipe
6	Hydrogen gas detector
7	Water connection

Position	Description
T	External product tank
8	Softener waste water discharge
9	Product shutoff valve
10	Shutoff valve external product tank
11	Dosing pumps shutoff valve
12	Product tank
13	Level switch
14	Ventilation outlet (zone 2)

Table 16: Example installation - key

8 Control box

8.1 Control display

The system is operated via the universal EASYCHLORGEN control.

Fig. 8: Control display

The system can be configured and operated via the control. An operating panel with two direction buttons and an entry confirmation button is available to this end.

Key	Function
	Page UP button
	Page DOWN button
	ENTER button

Table 17: Key functions

The control interface also shows the current operating status of the system using three light LEDs.

8.2 LEDs

Symbol	Description
	GREEN The system is in normal operation and there are no system messages or errors.
	YELLOW (system messages) A set limit value has been exceeded and the alarm delay was triggered. If the triggering value reaches the normal range within the delay time, the system returns to normal operation. If the normal range is not reached within the delay time, an alarm will be triggered. If a softening cartridge is used instead of an automatic softener, this message is displayed if the cartridge needs to be replaced.
	RED (system error) A limit value was exceeded above the set delay time. The system halts production. The time and error message are logged and the potential-free alarm relay is activated. The cause must be remedied before restarting the system and the operator must clear the error.

Table 18: LED description

The display screen always shows the system status or fault state via the corresponding LED symbol.

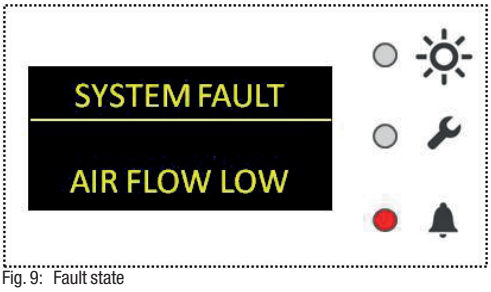


Fig. 9: Fault state

This example shows a system fault; the ENTRY button has the following function:

Pressing the ENTRY button accepts the fault. The system is reset and attempts to return to normal operation.

9 Commissioning

NOTE

Damage to the system due to incorrect water quality!

Failure to maintain the correct specifications for supply with softened water for normal system operation will very probably result in system outage and restriction of the warranty conditions.

⇨ Use softened water.

⇨ Install a water softener in the water supply of the system.

9.1 Switching the system on

Precondition for action:

✓ The system is configured according to the factory setup.

✓ The system was installed in accordance with section 7 “Installation”.

✓ The control unit is earthed.

Perform the following working steps:

1. Switch the main switch to ON.

▶ The commissioning screen is displayed:

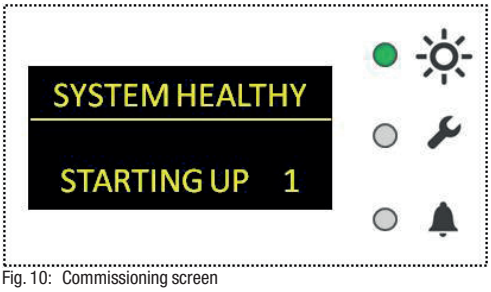


Fig. 10: Commissioning screen

▶ The system now performs a pre-set series of water and brine batch cycles to fill the electrolytic cell initially with a minimum volume of brine solution before the normal production/batch cycles begin.

✓ **Device switched on.**

9.2 Commissioning the system

Precondition for action:

✓ A softened water supply is connected and is ready to operate.

✓ The softened water supply should first be checked for its suitability by a water hardness test. The sensor will provide a GREEN notification for softened water or a RED notification for hard water. The result MUST BE GREEN, i.e. confirm softened water. PROCEED WITH THE COMMISSIONING ONLY if a reliable softened water supply is ensured.

✓ The salt dissolving container is pre-filled with granular salt of the correct specification.

✓ Two litres of cold (ideally softened) water have been added to the salt dissolving container 30 minutes before initial commissioning to ensure the availability of a suitable quantity of saturated brine solution. (This is only necessary for initial commissioning).

✓ The hydrogen sensor is connected in accordance with section 7.4 “Electrical connections” on page 18.

Perform the following working steps:

1. If an automatic water softener is fitted to the system, the hardness setting of the softener should be set to 50 mg/l $CaCO_3$ above the hardness value of the tap water.
2. Start the system.
3. Check the clock settings by pressing the page UP button (with display of the “System OK” screen) and holding depressed for 5 seconds. The following "MAN OFF" screen is displayed and the system stops:

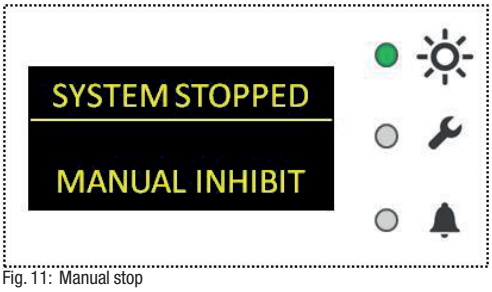


Fig. 11: Manual stop

4. Press and hold the ENTER button for 5 seconds to access the service menu. The following screen will appear.

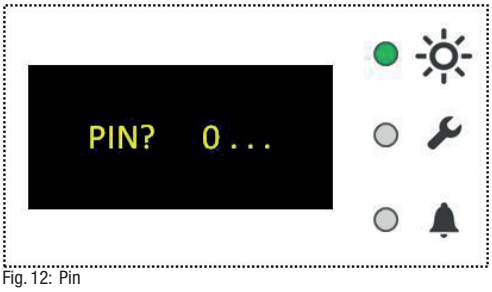


Fig. 12: Pin

5. Enter the service code 2236 using the UP/DOWN buttons. To this end, every character must be selected and entered individually.
6. Page UP until “Program 6” is displayed:

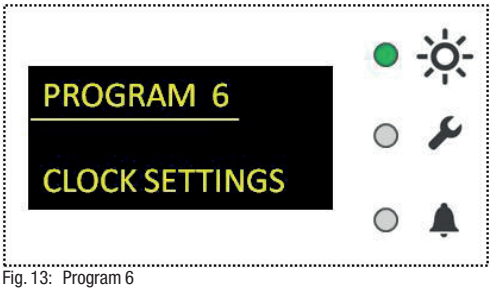


Fig. 13: Program 6

7. Press the ENTRY button and page DOWN to set the date and time accordingly. Pressing the ENTER button on the END screen returns you to the service menu.
8. Page UP until you reach “End program 1 / program mode”. Press the ENTER button; the display will return to the “MAN. STOP” screen.
9. Press and hold the page UP button for 5 seconds to restart the system.
10. The system will now resume its earlier automatic status.

11. If the “SYSTEM OK” screen is displayed, page DOWN to display Technical display 1:

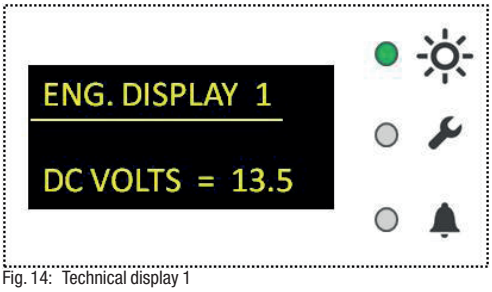


Fig. 14: Technical display 1

12. The normal DC volt display:

- The DC volt display could require a number of seconds to stabilize after initial commissioning (i.e. the stabilization of the strength of the water/brine solution takes some time).

13. Page DOWN further to the Technical display 4 which depicts the hydrogen threshold as a percentage value. An acceptable value should always lie under 50 %. The hydrogen sensor is set in the factory and requires only an annual service inspection/test.

14. We recommend that you check the chlorine concentration after a working period of 12 to 24 hours. The result should ideally amount to 0.6 % ±0.1 % of the chlorine (Cl_2) weight.

✓ **Commissioning completed.**

10 Operation

NOTE

Damage to the system from the incorrect salt.

Failure to comply with the specifications of the salt used by this system will highly probably result in the system outage and restrict the conditions of the warranty.

⇨ Use the correct salt.

NOTE

Damage to the system from a hard water supply.

Failure to maintain the correct specifications for supply with softened water for normal system operation will very probably result in system outage.

⇨ Use softened water.

10.1 Automatic operation

The system is automated. The softened water supply is controlled automatically in accordance with the system requirement. The salt dissolving container should be refilled with salt manually before the salt store is exhausted. Ensure that the salt level does not fall under 25 %.

The system process STARTS and STOPS in dependence on the filling level of the product storage tank.

When the tank is full, the display shows the following:

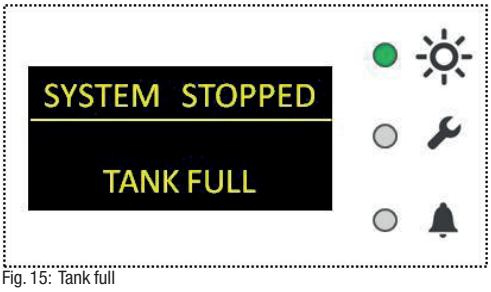


Fig. 15: Tank full

When the system produces and the tank is filled, the display will show the following:

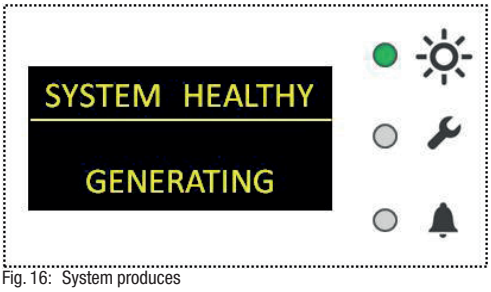


Fig. 16: System produces

10.2 Manual stop

The automatic process can be interrupted by setting the control cycle to the “MAN. LOCK” mode. This STOPS the automatic electrolysis process.

Whilst the system shows “SYSTEM STOPPED” or “SYSTEM OK”, you can depress and hold the page UP button for 5 seconds to set the system in the “MAN STOP” mode, in which the system will be stopped:

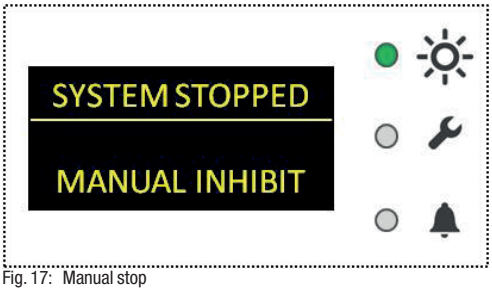


Fig. 17: Manual stop

Pressing the page UP button again for five seconds, the system returns to automatic operation.

10.3 Remote stop

The system can be connected to an external switch with which the system can be stopped remotely. If the system is subject to a remote stop, the screen will display “REMOTE STOP”. The system will resume automatic operation when the remote stop function is unlocked.

10.4 Softener regeneration

NOTE

Damage to the system

The system can suffer damage if the automatic water softener has not been filled with salt.

⇨ Perform regular checks of the salt levels in the water softener salt dissolving container and ensure that it is always filled with the softening salt of the correct specification.

⇨ We recommend that you use the same salt for the system and this water softener.

If an automatic water softener was included in the scope of delivery of the system, the softener will regenerate automatically and place the softener in STOP mode for the duration of this procedure:

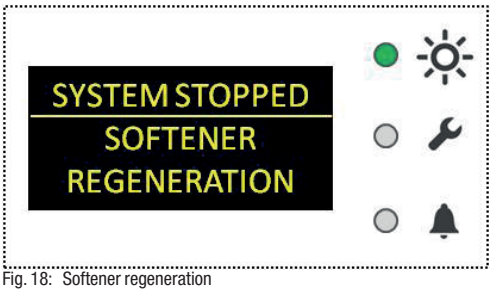


Fig. 18: Softener regeneration

As soon as the c. 60 minute regeneration process has been completed, the system returns to automatic operation.

10.5 Emergency shutoff

In an emergency, disconnect the system from the power supply immediately. To this end, you can move the main switch into the OFF position.

If the device is fitted with an additional Emergency-Off pushbutton, you can press the pushbutton to stop the system. In this case, the system must be reset on the control by pressing the ENTER button once again after releasing the Emergency-Off pushbutton.

10.6 Keep an operating logbook

To retain and monitor the performance of the system and to ensure that the system is operated within the manufacturer warranty conditions, the operating company is obliged to keep an operating logbook.

Perform the following working steps:

➔ Note the parameters according to the logbook sheet every time you add salt.

➔ Note the time intervals (c. weekly) according to the logbook sheet every time you add salt.

✓ **Warranty requirements fulfilled.**

11 Shut-down

11.1 Short-term shutdown (up to 6 months)

Perform the following working steps:

1. Disconnect the power supply to the system using the main switch.
2. Switch the mains voltage back on to start a commissioning cycle. When the commissioning cycle has ended, switch the system off again. Repeat this procedure twice. The process is intended to rinse the electrolysis circuit to remove the residual brine and sodium hypochlorite solution.
3. Disconnect the water supply to the system.
4. Switch off the automatic water softener (if fitted to the system).

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

11.2 Long-term shutdown

Perform the following working steps:

1. Disconnect the power supply to the system using the main switch.
2. Empty the salt dissolving container. Salt residue can be removed with a wet vacuum cleaner.
3. Pour 4 litres of cold water into the salt dissolving container to rinse the residual sodium hypochlorite product solution from the electrolytic cell system. The solution is rinsed safely into the tank system.
4. Apply a sign to the system which indicates that the unit must be commissioned before the next start.

11.3 Storage

Precondition for action:

✓ The system was shut down in accordance with section 11.2 “Long-term shutdown”.

Correct storage of the system increases 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 well ventilated.
- Temperatures between 0 °C and +50 °C.
- Relative air humidity must not exceed 90 %.

11.4 Transportation

Precondition for action:

✓ The system was shut down in accordance with section 11.2 “Long-term shutdown”.

- The system may only be transported if the entire salt/water solution has been removed from the system.
- Use suitable lifting and transport equipment as required.
- 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 you return the system to the supplier/manufacturer, comply with the information in section 16 “Declaration of no objection” on page 42 and in section “Warranty claim” on page 43.

11.5 Disposal of the device

The device must be disposed of in a responsible fashion, in accordance with applicable local laws and regulations. It should not be disposed of as domestic waste!

As the disposal regulations may differ from country to country, please consult your supplier if necessary.

In Germany, the manufacturer must provide free-of-charge disposal, as long as the system is safely returned together with a declaration of no objection (see page 42).

12 Maintenance

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

DANGER

Mortal danger from electric shock!

Live parts can inflict fatal injuries.

⇨ Always disconnect the system from the power supply before carrying out any maintenance work.

⇨ Secure the system against unintended activation.

WARNING

Increased risk of accidents due to insufficient qualification of personnel!

The system and the 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 must be subject to regular maintenance to avoid errors, poor performance and faults. This table gives you 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
As required	Operator	■ Replace the softening cartridge if present.
Monthly	Operator	■ Clean the salt dissolving container.
Annually	Technician	■ Clean the flow limiter. ■ Check the water and brine solenoid valve. ■ Check the hydrogen sensor.
Every 2 years (or >10.000 h)	Technician	■ Replace the pipe seals ■ Check the function of the hydrogen sensor. Replace if necessary
Every 5 months	Technician	■ General overhaul

Table 19: Maintenance intervals

12.1.1 Clean the flow limiter

The red flow limiter could sometimes become blocked through deposits and soiling in the water supply. A blockage in the limiter could represent a reason for the “NO WATER FLOW” alarm on the system.

Precondition for action:

✓ Disconnect the power supply to the system using the main switch.

✓ Disconnect the water supply to the system.

Perform the following working steps:

1. Dismantle the fore, outside red plastic mechanical protective cover from the system by removing the black nut protecting cap. Unscrew the individual locknuts and remove the red cover.
2. Slide back the collar of the hose plug connection with finger and thumb and slide the red limiter out of the assembly. Check that the interior opening is clean and free of impurities.
3. Install the limiter in the reverse order to remove and make sure that it locks completely in the pipe fitting and constitutes a leak-proof connection.
4. Return the red cover.
5. Commission the system in accordance with section 9 “Commissioning” on page 29.

✓ **Flow limiter checked successfully.**

12.1.2 Check for damage of the water/brine solenoid valve

With time, one or both of the solenoid valves could suffer wear or blockage so that a low water flow in a normally-closed valve state could develop. One reason for a “HIGH VOLTAGE” alarm on the system is that the solenoid valves allow water to pass inadvertently. This means that a solution with a low salt content enters the electrolytic cell.

Precondition for action:

✓ Disconnect the power supply to the system using the main switch.

Perform the following working steps:

1. Dismantle the fore, outside red protective cover from the system by removing the black nut protecting cap. Unscrew the nuts and remove the red cover.
2. Pull the flexible hose from the upper outlet point of the water solenoid valve. Remember to press down the hose plug connection collar with finger and thumb to release the hose.
3. The solenoid valve should not let any water through / should not show a leak. Should a leak be detected, dismantle and clean the solenoid valve or change it.
4. After inspecting/cleaning the water solenoid valve, connect the hose to the hose fixture. Make sure that the hose latches fully into the hose fitting to ensure a leak-proof connection.
5. Repeat steps 1 to 4 for the brine solenoid valve.
6. Commission the system in accordance with section 9 “Commissioning” on page 29.

✓ **The solenoid valve has been checked successfully or replaced.**

12.1.3 Inspection of the hydrogen sensor

The hydrogen sensor is very important for ensuring a secure operating environment. The hydrogen sensor should be subject to annual routine testing to verify it safe function. The hydrogen (H_2) released in the immediate atmosphere is displayed on the screen and should usually lie under 50 %. This value can be displayed on the control by paging to “ENG. DISPLAY 4”:

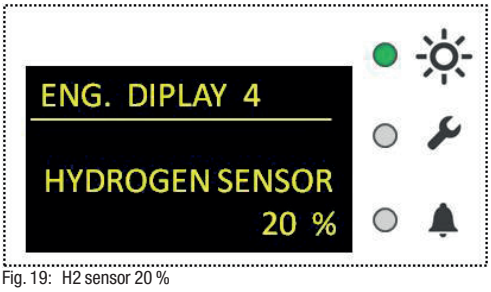


Fig. 19: H2 sensor 20 %

Precondition for action:

✓ The system works in normal automatic operation.

Perform the following working steps:

1. Operate the H_2 test device (available separately) in accordance with the operating instructions.
2. Position the test device so that its test gas is released directly on the sensor head (see device instructions).
3. The value on the display will soon increase to 100 %. At this point, the hydrogen sensor warning is triggered.

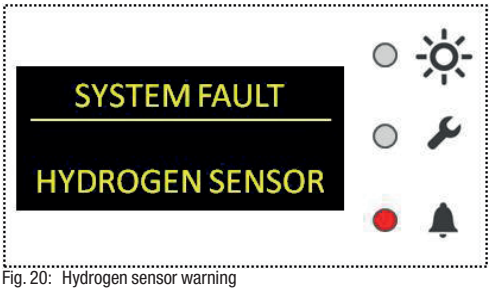


Fig. 20: Hydrogen sensor warning

4. Remove the H_2 test device from the sensor. The display value will immediately return to a value under 50 %. If the sensor does not activate or displays 100 % during the test, it must be changed.

▶ If the display shows 100 %, this corresponds to an H_2 recognition content in the atmosphere of less than 25 % of the lower explosive limit (LEL).

✓ **The hydrogen sensor has been checked successfully or replaced.**

12.1.4 Replace seals

WARNING

Increased danger of accident from leaking brine solution.

The residual brine solution could drop out of the salt dissolving container.

⇨ Mop up any spilled fluid immediately!

Elastomers which have come into contact with the electrolysis process suffer wear and must be replaced every two years as a matter of routine, irrespective of the actual number of operating hours.

The electrolysis hydraulic circuit must be rinsed before commencing this maintenance work.

Precondition for action:

✓ Decommission the system for a short period of time (see section 11.1).

Perform the following working steps:

1. Remove the housing window of the electrolytic cell by removing the vertical window brackets and then the horizontal window bracket.
2. Proceeding with caution, loosen the union nut on the cell inflow and outflow until the cell can be placed carefully on the baseplate of the electrolytic cell chamber with the inlet and outlet connections pointing upwards to prevent further spillage of the fluids.
3. Change the flat gaskets.
4. Screw the cell back on using the union nuts. Tighten the nut hand-tight.
5. If this system is a framed skid model, replace the o-ring on the screw connection on the product inlet with an original spare o-ring.
6. Before commissioning, make sure that the pipe connections are set up correctly and have been tightened hand-tight.
7. Make sure that the window of the electrolytic cell chamber is installed in the correct position.
8. Make sure that the system water supply is switched on.
9. Perform the commissioning of the system in accordance with section 9.1.

✓ **Seal changed successfully.**

12.1.5 General overhaul

NOTE

Damage to the system due to incorrect maintenance!

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

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

The system must be subject to a general overhaul every 5 years irrespective of the actual operating hours run. This work must be performed by an authorized customer services technician.

The control unit, electrolytic cell, salt dissolving container and all appendant pipes must be subject to close inspection and cleaned. Worn or defective parts must be changed as necessary.

The water and brine solenoid valves must be changed.

The electrolytic cell must be cleaned with acid and its two cell-housing end-cap seals and the two connection O-rings must be changed.

All standard pipe connection elastomers must be changed.

The hydrogen sensor head must be changed.

If the system is fitted with an automatic water softener, the valve head assembly of the softener must be maintained and the softener resin changed.

All safety switches and safety equipment must be subject to thorough testing.

Tasks to be performed:

➔ Contact the customer services to arrange for a general overhaul of the system.
✓ The general overhaul guarantees continued safe system operation.

12.2 Cleaning the electrolytic cell

WARNING

Increased danger of accident from leaking brine solution.

The residual brine solution could drop out of the salt dissolving container.

⇨ Mop up any spilled fluid immediately!

The electrolytic cell could require periodic acid cleaning to remove limescale deposits resulting from hard water and deposits of heavy metals such as iron and manganese.

One of the reasons for a "HIGH VOLTAGE" alarm issued from the EASYCHLORGEN is calcification of the electrolytic cell or its impurity with heavy metals.

Precondition for action:

✓ Decommission the system for a short period of time (see section 11.1).

Perform the following working steps:

1. Remove the housing window of the electrolytic cell by removing the vertical window brackets and then the horizontal window bracket.
2. Proceeding with caution, loosen the union nuts on the cell inlet and outlet until the cell can be placed carefully on the baseplate of the electrolytic cell chamber with the inflow and outflow connections pointing upwards to prevent further spillage of the fluids.
3. Connect the acid cleaning system with the electrolytic cell in accordance with the operating manual of the acid cleaning kit.
4. Rinse the electrolytic cell thoroughly with water and then let the water run off before installing the cell in the electrolytic cell chamber.
5. Screw the cell back on using the union nuts. Tighten the nut hand-tight.
6. Make sure that the window of the electrolytic cell chamber is installed in the correct position.
7. Make sure that the system water supply is switched on.
8. Perform the commissioning of the system in accordance with section 9.1.

✓ **The electrolytic cell has been washed with acid 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 all the pages of the operation, service or commissioning log books for the system and any other documents in this manual.
3. Attach a sticker displaying the maintenance date to the system.
4. To ensure correct commissioning, consult 9 “Commissioning” on page 29.

✓ **System maintenance completed.**

13 Troubleshooting

See below for information about how to rectify faults on the control device or the system. If you cannot eliminate the fault, please consult with the manufacturer on further measures or return the system for repair.

13.1 Faults

Display	Fault	Possible causes	Corrective measure
System fault / Emergency-Off	The Emergency-Off pushbutton has been pushed.	■ Manual activation. ■ Inadvertent activation. ■ Cable break / loose connection.	■ Reset the Emergency-Off pushbutton and clear the error. ■ Reset the Emergency-Off pushbutton and clear the error. ■ Check the wiring and ensure that the switch is set at NC.
System fault / system fault temperature	The temperature in the control is above 50 °C.	■ Blocked inlet/outlet filter. ■ Fault of the control cooling ventilator. ■ Fault of the control temperature switch. ■ Cable break / loose connection.	■ Clean or change the filter and clear the error. ■ Clean and change and clear the error. ■ Clean and change and clear the error. ■ Check the wiring and ensure that the switch is set at NC.
System fault / Ext. Tank high	The high filling level in the external product tank has been exceeded.	■ Fault of the Start/Stop switch. ■ Solenoid valve leaks. ■ Return movement through the dosing system. ■ Cable break / loose connection.	■ Clean and change and clear the error. ■ Check for chips or a worn valve seat or diaphragm. ■ Check the cleanliness of the dosing system non-return valve. ■ Check the wiring and ensure that the switch is set at NC.
System fault / Ext. Tank low	The low filling level in the external product tank has been reached.	■ Fault of the Start/Stop switch. ■ The system is in manual stop. ■ The system is in remote stop. ■ The system is in fault condition. ■ Too much removed. ■ Switch fault for lower filling level.	■ Clean and change and clear the error. ■ Take the system from the manual stop. ■ Take the system from the remote stop. ■ Check the system fault and clear the error. ■ Reduce the production dosing rate. ■ Check the wiring and ensure that the switch is set at NC.
System fault / additional alarm	An additional alarm input is activated.	■ An additional alarm is activated. ■ Cable break / loose connection.	■ Check, remedy the error and clear. ■ Check the wiring and ensure that the switch is set at NC.
System fault / housing door	The electrolysing chamber and de-gassing chamber door/window is open.	■ The door has been removed manually. ■ Door switch fault. ■ Cable break / loose connection.	■ Insert the door and clear the error. ■ Check and change. ■ Check the wiring and ensure that the switch is set at NC.
System fault / H2 sensor	The hydrogen concentration has exceeded 100 % of the alarm value (< 25 % LEL).	■ Broken or damaged pipe line. ■ Venting is blocked. ■ The sensor is not connected. ■ Cable break / loose connection.	■ Check and change. ■ Check and clean. ■ Connect the sensor. ■ Cable break / loose connection.

Table 20: Troubleshooting

Display	Fault	Possible causes	Corrective measure
System fault / voltage high	The maximum voltage for the electrolytic cell has been exceeded.	■ Insufficient salt content in the electrolytic cell. ■ Limescale on the electrodes. ■ The alarm point has been set too low. ■ Cable break / loose connection.	■ Check all blockages and the salt content of the brine. ■ Check the correct operation of the softener. Check the salt quality. ■ Check and set up. ■ Change the cable. Tighten the connection. Clean the connection.
System fault / voltage low	The minimum voltage for the electrolytic cell has been undercut.	■ High salt content in the electrolytic cell. ■ Fault in the power supply. ■ Fault in the operating relay.	■ Check the salt setting, set and reset. ■ Check and change. ■ Check and change.
System fault / no water flow	Insufficient water flow within the batch process.	■ Low water pressure. ■ Blocked water pipeline. ■ Blocked softener. ■ Fault in the flow meter ■ Cable break / loose connection. ■ Blocked flow limiter.	■ Contact the service provider. ■ Check and clean. ■ Clean, service or change. ■ Check and change. ■ Cable break / loose connection. ■ Check and clean.
System fault / low air flow	Insufficient air flow from the fan.	■ Blocked vent pipe line. ■ Fan fault. ■ Air flow sensor fault. ■ Cable break / loose connection.	■ Check and remedy the blockage. ■ Check and change. ■ Check, clean or change. ■ Cable break / loose connection.

Table 20: Troubleshooting

13.2 System messages (orange LED)

Possible causes	Description
Startup operation	When starting the system after opening the cabinet door or after disconnecting from the mains, the system will run through a certain number of startup cycles so as to ensure that the water/brine mixture in the cell has the correct concentration. The number of startup cycles has been factory set and can be changed as required.
System warning (all errors)	A set limit value has been exceeded and the alarm delay was triggered.
System warning (water softening cartridge)	When using a water softening cartridge, the message indicates the end of your treatment volume. Caution: This message does not stop the system! If the cartridge is not changed soon, deposits in the cell can damage the system.

Table 21: System messages (orange LED)

13.3 System error (red LED)

Possible causes	Description
EMERGENCY STOP	The system was stopped via an Emergency-Off switch.
PANELTEMP. high	The interior temperature of the control cabinet is too high. At 50 °C, the alarm is triggered and the production stops. If necessary, check the housing fan and clean or replace the air filter.
EXT TANK FULL	The level switch of an external product tank shows that the tank is full. Production stops.
EXT TANK EMPTY	The level switch of an external product tank shows that the tank is empty. Production stops. The message can be cleared and the error is ignored for the following 24 hours. Once the product tank is full again, the 24 h timer is reset early.
ADDITIONAL ALARM	This alarm can be activated via the settings and is used to integrate additional components in the system. This alarm first triggers after the delay time has been exceeded and must be cleared by the operator.
CABINET DOOR	The alarm is triggered by an installed door switch. After being cleared, the system runs through the startup cycles before production re-starts.
H_2 SENSOR	An alarm is triggered if the H_2 value reaches 100 %; a display of 100% means a H_2 concentration of 25 % of the lower explosion level (LEL). The alarm is triggered if a sensor is not connected with the system.
HIGH VOLTAGE	This alarm is triggered if the voltage exceeds the set value. Possible causes include scaling, electrode wear or insufficient salt saturation in the brine. This alarm is suppressed 60 minutes after commissioning to enable stable values to be set.
LOW VOLTAGE	This alarm is triggered if the voltage falls below the set value. Possible causes include too high a salt concentration or a faulty voltage supply.
LOW INFLOW	This alarm is triggered if the water flow is so low that the cycle cannot be performed in the foreseen time.
LOW AIR FLOW	This alarm is triggered if the venting air flow falls below the set volume.
HIGH AIRFLOW	This alarm is triggered if the ventilation air flow exceeds the set volume.
LEAKAGE	This alarm is triggered if the leakage sensor switches.
PRODUCT TEMP.	This alarm is triggered if the temperature sensor in the external product tank measures too high a temperature.

Table 22: System error (red LED)

14 EU Declaration of Conformity

(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 EG-Richtlinien entspricht. Bei einer nicht mit uns abgestimmten Änderung am Gerät verliert diese Erklärung ihre Gültigkeit.

(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 EC 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.

(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 CE 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.

(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.

Bezeichnung des Gerätes: **Description of the unit:** **Désignation du matériel:** **Descripción de la mercancía:**	Elektrolysechlorungsanlage zur Verwendung vor Ort On-site electrolytic chlorination system	
Typ: **Type:**	EASYCHLORGEN Compact EASYCHLORGEN	25 / 50 / 100 180 / 280 / 560 / 1100 / 2200 / 4250 / 8500
EG-Richtlinien: **EC directives:**	Maschinenrichtlinie / Machinery (2006/42/EC) Niederspannungsrichtlinie / Electrical equipment designed for use within certain voltage limits (2006/95/EC) Elektromagnetische Verträglichkeit / Electromagnetic compatibility (2004/108/EC)	
Dokumentationsbevollmächtigter: **Authorized 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

15 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.: .....

Order No.: ..... Date of delivery: .....

Reason for repair: .....

.....

.....

Dosing medium

Description: ..... Irritating: ☐ Yes ☐ No

Properties: ..... Corrosive: ☐ Yes ☐ 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: .....

16 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 claim.

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 conditions of the device

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

.....

.....

Accessories used (suction line etc.): .....

.....

.....

.....

.....

Commissioning (date): .....

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

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

Appendix I - Extended settings

You can perform extended settings to the EASYCHLORGEN system in the Service menu. Only ever make alterations to these settings if you fully understand the consequences. Incorrect settings can result in hazardous situations and cause damage to the system. If you are unsure, please consult the manufacturer.

Change the settings

DANGER

Danger from faulty settings.

A number of the settings described here can result in considerable personal injury and damage to property if security-relevant limit values are not maintained or automatic deactivation following a limit value being exceeded. Only ever make alterations to these settings if you fully understand the consequences and this action does not produce a hazard.

⇨ Never change the safety-relevant factory settings: No. 4 (alarm delay), no. 5 (high voltage), no. 6 (low voltage), no. 14 (start-up cycles), no. 16 (ventilator alarm), no. 21 (air-flow sensor), no. 25 (air-flow calibration).

⇨ Consult the manufacturer if you are unsure whether one of your settings constitutes a danger.

Precondition for action:

✓ Section 7 “Installation” on page 16 and 9 “Commissioning” on page 29 were implemented completely and successfully.

✓ The system is switched on and has been activated.

Perform the following working steps:

1. Press and hold the ENTER button for 5 seconds to navigate to the Service menu.
▶ A PIN query appears.
2. Use the arrow button to enter the service code 2236 and confirm with ENTER.
3. Using the arrow button, navigate through the menu described below until you come to the second PIN query.
4. Using the arrow button, enter the service code 6322, confirm with ENTER and proceed with the settings.

Number	Function	Description
0	PIN query	PIN: 2236
1	End the settings	Press Enter to return to the “Manual stop” display.
2	Reboot delay	Factory setup This timer starts once the upper tank level has been reached, in order to prevent a premature restart. It can be reset by triggering the manual stop for a short time.
3	Shut-down delay	Factory setup The time from triggering deactivation to the actual safe deactivation of the system. For instance, the current cycle can be ended before shut-down.
4	Alarm delay	Factory setup A notification is displayed following a limit value infringement and the orange LED illuminates. The system continues to produce after the alarm delay and stops only after the end of the set time. A system error message appears, which is connected with the red LED. Should the limit value within the alarm delay return to the normal range, the yellow light will extinguish and the system will return to normal operation.
5	High voltage	Factory setup The maximum-permissible voltage depends on the electrolytic cell installed in the system.

Table 23: Extended settings in the Service menu

Number	Function	Description
6	Low voltage	Factory setup The minimum-permissible voltage depends on the electrolytic cell installed in the system.
7	Set the clock.	Setting the date and time for the correct display in the error logbook.
8	Brine timer	Factory setup This timer is only used with those models aspirating water through a water-jet pump and regulates the brine quantity which enters the electrolytic cell with every cycle. This setting has no function for the compact models.
9	Softening cartridge	If the water softening is performed using a water softening cartridge, the type selected can be indicated under this point. Using the type and (if given) water hardness, the system calculates the total capacity and provides the user with timely warning about the necessity of replacement. If an automatic water softener is connected to the system, the selection “none” must be made and the signal cable be connected to the control for regeneration.
10	Water hardness	Entry of the raw water hardness in ppm $CaCO_3$ plus 20% as a security reserve.
11	PIN query	PIN: 6322
12	Brine impulse	Factory setup The number of pulses of the flow measurement. The standard setting is 2 for compact systems and 1 for other types.
13	Ratio water/brine	Factory setup This is the setting of the ratio of water to brine with compact systems. For example, a value of 15 means 15 parts water to 1 part brine. With the other models, select 1 as setting.
14	Start-up cycles	Factory setup The number of filling cycles which need to be performed before commissioning or after maintenance work in order to ensure that the cell is filled with a sufficient quantity of thinned brine before the electrolysis flow is switched on.
15	Cycle duration	Factory setup The cycle duration described the time between two batches and thereby determined the system volume flow.
16	Alarm ventilator	Factory setup If the air volume flow falls under the pre-set value, an alarm is triggered, as thinning the hydrogen below 25% of the lower explosion limit (LEL) is no longer guaranteed.
17	External tank full	“Yes” if an external tank is used with a level switch (NC).
18	External tank empty	“Yes” if an external tank is used with a level switch (NO).
19	Additional alarm	“Yes” if an external alarm (NC) is connected to the system.
20	Current sensor	Factory setup “Yes” if a current sensor (0 - 10 V DC input) is connected to the system. The calculated range must also be entered in Menu 24.
21	Air flow sensor	Factory setup “Yes” if an air flow sensor (0 - 10 V DC input) is connected to the system. The calculated range must also be entered in Menu 25.
22	Leakage warning	“Yes” if a leakage switch (NC) is connected to the system.

Table 24: Extended settings in the Service menu

Number	Function	Description
23	Remote stoppage	“Yes”, if a remote stoppage is connected. In normal operation, if the contact is closed, the system will produce. If the contact is open, the system will stop without triggering an alarm.
24	Current calibration	Please contact the manufacturer to find out the entered values.
25	Air flow localisation	Please contact the manufacturer to find out the entered values.
26	Modbus address	Optional: Enter the address of the Modbus.
27	Modes/Modbus	Selection of the desired best communication methods.
28	Air flow high	Please contact the manufacturer to find out the entered values.
29	Product temperature	“Yes”, if a temperature sensor is installed in the product tank.
30	Temperature high	Please contact the manufacturer to find out the entered values.

Table 25: Extended settings in the Service menu

Appendix II - Commissioning / service sheet

Commissioning / Service sheet

Complete and retain

(a) Commissioning (b) Repair after defect (c) Service visit

Date of visit					
VOLTAGE MEASUREMENT (V)					
AMP MEASUREMENT (A)					
OPERATING HOURS					
AIRFLOW RATE (m3/hr)					
HARDNESS TEST (green / red)					
PRODUCT TEST (free chlorine)					
PRODUCT TEST (salt content)					
H_2 SENSOR TEST					
VOLUME OF THE SALT ADDED					
PRODUCT removal: Type:					
Setting:					
PRODUCT removal: Type:					
Setting:					
WATER SOFTENER Settings:					
VISUAL INSPECTION WATER SOFTENER					
VISUAL INSPECTION VENT LINE EXIT OPENING					
VISUAL INSPECTION LEAKAGES					
OTHER INFORMATION / SETTINGS					
WHO CHECKED (SIGNATURE)					
Comments / observations / settings performed:					

Appendix III - Operating logbook

Operating logbook

Complete and store

(a) Salt refilled (b) Weekly system check

Date of visit	VOLTAGE MEASUREMENT (V)	AMP MEASUREMENT (A)	AIRFLOW RATE (m3/hr)	H_2 SENSOR (%)	RUNTIME	VISUAL INSPECTION LEAKAGES	HOW MUCH SALT WAS REFILLED?	WHO CHECKED (SIGNATURE)	COMMENTS
Comments / observations / settings performed:									

Appendix IV - Service Check Sheet

Service Check Sheet

Complete and store

Date:		System type / model:
Serial number:		Runtime:
Check	**OK**	**Comments**
Check the product storage tank ■ Leakage		
Check the electrodes ■ 1) Deposits ■ 2) Leakage ■ 3) Function		
Check the water softener See water softener documentation		
Check the solenoid valve ■ Water dosing ■ Brine dosing		
Check the hydrogen sensor ■ Function		
Check the brine container ■ Leaks and soiling		
Check the control and the system 1) Check the electrical connections 2) Check for completeness, correct installation / function 3) Check the fuses 4) Function		
Check the fan		
Check the operating logbook		
System settings		
H_2 sensor (%):	Volt:	Amps:
Cycle time:	Brine timer:	

Appendix V - Water Softener

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

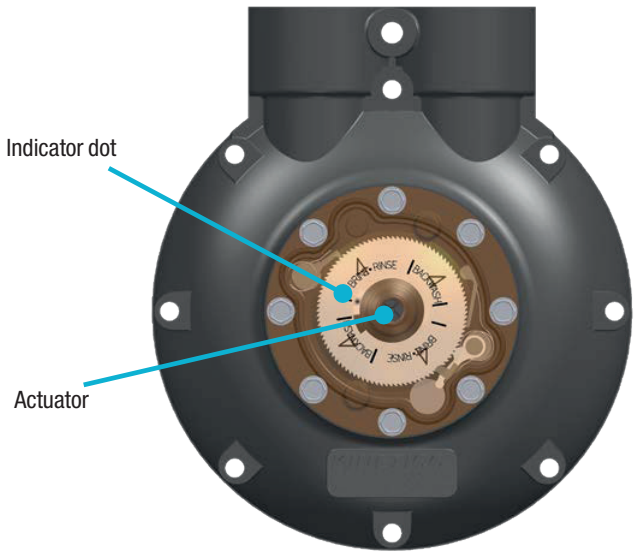
If the salt saturator does run out of salt you will have to manually regenerate the unit after adding salt, or you can wait for it to go through regeneration automatically.

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 120 psi (8.3 BAR) or water temperature that exceeds 120°F (48.8°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. I 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 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 10 bar.

• Maximum Operating Pressure is 120 psi (8.3 BAR).

• Minimum Operating Pressure is 12 psi (0.83 BAR).

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	1,98 LPM
Salt used	0,45 kg
Regeneration time	13 mins
Water used per cycle	24 ltr
Vessels	500 x 400 x 200 mm
Brine tank	500 x 330 x 150 mm
Maximum temperature	50 °C
Maximum operating pressure	125 psi (8.5 bar)
Minimum operating pressure	15 psi (1.0 bar)
Differential pressure to give service flow	15 psi (1.0 bar)

Water Flow Rate	HF
Service flow rate	28 LPM
Max backwash flow	2,7 LPM
Peak flow rate	51 LPM
Minimum flow rate	1,98 LPM
Salt used	0,45 kg
Regeneration time	13 mins

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

Lutz-Jesco GmbH

Am Bostelberge 19
D-30900 Wedemark

Telefon: +49 5130 5802-0
info@lutz-jesco.com
www.lutz-jesco.com

Operating instructions
EASYCHLORGEN