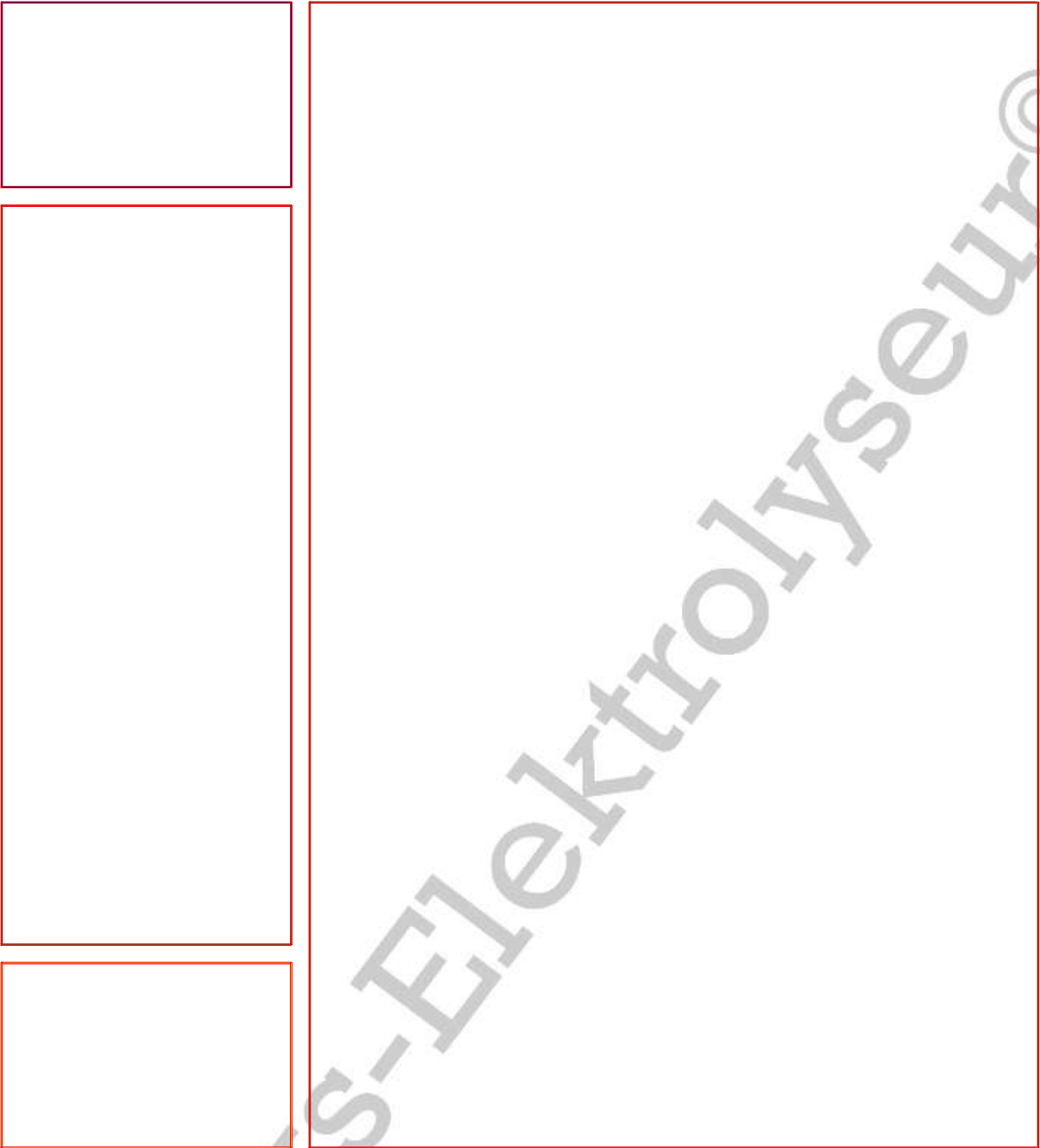




Hydrogen Gas Generator with Compressor
Seasonal Energy Storage

User Guide / Gebruikershandleiding / Benutzerhandbuch
Guide d'utilisation / Guía del usuario / Manuale utente
Original Language / Oorspronkelijke taal / Sprache des Originaltexts / Langue d'origine /
Idioma original / Lingua originale

E N D F E I

HYDROGEN
FOR ALL

INDEPENDENCE
SUSTAINABILITY
AUTONOMY
ENERGY SAFETY

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1 Safety Information

Do not operate this equipment until the safety information and instructions in this user guide have been read and understood by all personnel concerned.

USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Volks-Electrolyzer Corporation, its subsidiaries and authorised distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyse all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalogue and in any other materials provided from Volks-Electrolyzer or its subsidiaries or authorised distributors.

To the extent that Volks-Electrolyzer or its subsidiaries or authorised distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Only competent personnel trained, qualified, and approved by Volks-Electrolyzer should perform installation, commissioning, service and repair procedures.

This equipment is for indoor and outdoor use.

This equipment is not suitable for use in any Hazardous, Flammable, or Explosive environments. Hydrogen is a highly flammable gas. Keep the generator away from excessive heat and naked flames.

With the exception of oxygen, any gas can cause asphyxiation in high enough concentrations. In most scenarios, however, because hydrogen rises and disperses so rapidly, it is unlikely to be confined where asphyxiation might otherwise occur. Always ensure that the generator is operated in a well-ventilated area and all of the vent ports on the rear of the generator are kept clear and free from blockages.

Use of the equipment in a manner not specified within this user guide may result in an unplanned release of pressure, which may cause serious personal injury or damage.

When handling, installing or operating this equipment, personnel must employ safe engineering practices and observe all related regulations, health & safety procedures, and legal requirements for safety.

Ensure that the equipment is depressurised and electrically isolated, prior to carrying out any of the scheduled maintenance instructions specified within this user guide.

Volks-Electrolyzer cannot anticipate every possible circumstance which may represent a potential hazard. The warnings in this manual cover the most known potential hazards, but by definition cannot be all-inclusive. If the user employs an operating procedure, item of equipment or a method of working which is not specifically recommended by Volks-Electrolyzer the user must ensure that the equipment will not be damaged or become hazardous to persons or property.

Most accidents that occur during the operation and maintenance of machinery are the result of failure to observe basic safety rules and procedures. Accidents can be avoided by recognising that any machinery is potentially hazardous.

Note: Any interference with the calibration warning labels will invalidate the gas generator's warranty and may incur costs for the recalibration of the gas generator.

Should you require an extended warranty, tailored service contracts or training on this equipment, or any other equipment within the Volks-Electrolyzer range, please contact your local Volks-Electrolyzer office.

Details of your nearest Volks-Electrolyzer sales office can be found at www.V-Electrolyzer.de

Retain this user guide for future reference.



1.1 Markings and Symbols

The following markings and international symbols are used on the equipment or within this manual:

	Caution, Read the User manual.		Highlights actions or procedures which, if not performed correctly, could lead to electric shock.
	Risk of electric shock.		When disposing of old parts always follow local waste disposal regulations.
	Warning		Conformité Européenne
	Caution		Waste electrical and electronic equipment should not be disposed of with municipal waste.
	Wear disposable gloves.		Do not expose to naked flame.
	DO NOT OBSTRUCT VENT PORTS LEAVE OPEN TO ATMOSPHERE OR PIPE TO VENTILATED AREA WARNING GENERATOR MUST BE SHUT DOWN AND DEPRESSURIZED BEFORE PERFORMING ANY MAINTENANCE (REFER TO USER manual)		

2 Description

This generator with compressor will produce a constant stream of high purity hydrogen at a predetermined flow rate and pressure when connected to a suitable power supply and fed with a suitable quality of deionised water. It is suitable for use in garages, technical rooms, basements, outside, laboratories and light industrial environments and is non-hazardous for transportation purposes.



Caution

In order to guarantee the optimum efficiency of the PEM cell, this generator must be installed and running within three months of dispatch from Volks-Electrolyzer. Failure to do this may invalidate the warranty.

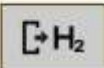
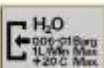
You have to perform a 240 minute (4 hours) initialisation sequence when powered for the first time. This sequence, which cannot be aborted, is necessary to guarantee the correct hydration of the cell.

2.1 Technical Specification Electrolyser

This specification is valid when the equipment is located, installed, operated, and maintained as specified within this user guide.

	Version	830 W	3050 W	
Water				
Water quality		Deionised, ASTM II, >1 M, <1S, filtered to <100m		
Consumption (Approximate) ¹	L/week	22	78	
Supply pressure (max) ²	bar g (psi g)	1,5 (22)		
Supply flow rate (max) ²	L/min	4,75		
Supply temperature (max) ²	°C (°F)	20 (68)		
High Purity Hydrogen (H ₂)				
Outlet flow rate	l/min	160	570	
Outlet pressure	bar g (psi g)		300 (4350)	



Purity ³	%	> 99.999%
Mechanical Connections		
Hydrogen outlet		1/4 " Compression fitting
Water drain		Unhook water pipe
Automatic water fill inlet (factory or field fit option)		Blank

Electrical Data		
Connection type		IEC320
Supply voltage range	Vac	12 48
Power consumption ⁴	W	830 3050
Fuse ⁵	A	80
Data		
Ambient Temperature	°C (°F)	5–40 (41–104)
Relative Humidity	-	50% @ 40°C (104°F) (80% MAX < 31°C (87.8°F))
IP Rating	-	IP20, NEMA 1, indoor use only
Pollution Degree	-	2
Installation Over voltage Category	-	II
Maximum Altitude	m (ft.)	<2000 (6562)
Noise	dB(A)	< 60

1. Based on full flow with 24 hour 7 day operation at 22°C (72°F) ambient temperature.
2. Applies to generators with auto water fill only.
3. The balance is O₂ and moisture.
4. The power consumption when in standby mode is 20W.

2.1 Compressor

Electrical Data	
Model	SS-PAC02A/SS-PAC02B
Voltage:	DC 12V
Power	300W
Inflation pressure	4500Psi / 30Mpa
Stop mode	AUTOSTOP
Cooling system	Built-in fan cooling
Cooling method	Fan Cooled
Noise	< 60



2.2 Approvals

Safety and Electromagnetic Compatibility (EMC)



This equipment has been tested and complies with the following European Standards:

EN61010-1: 2001 — Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory use - Part 1: General Requirements.

EN61326: 2006 — Electrical Equipment for Measurement, Control, and Laboratory use, EMC Requirements.

EN50366: 2003 (+ A1: 2006) — Household and similar electrical appliances. Electromagnetic fields. Methods for evaluation and measurement.

IEC 62233: 2008 — Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure.

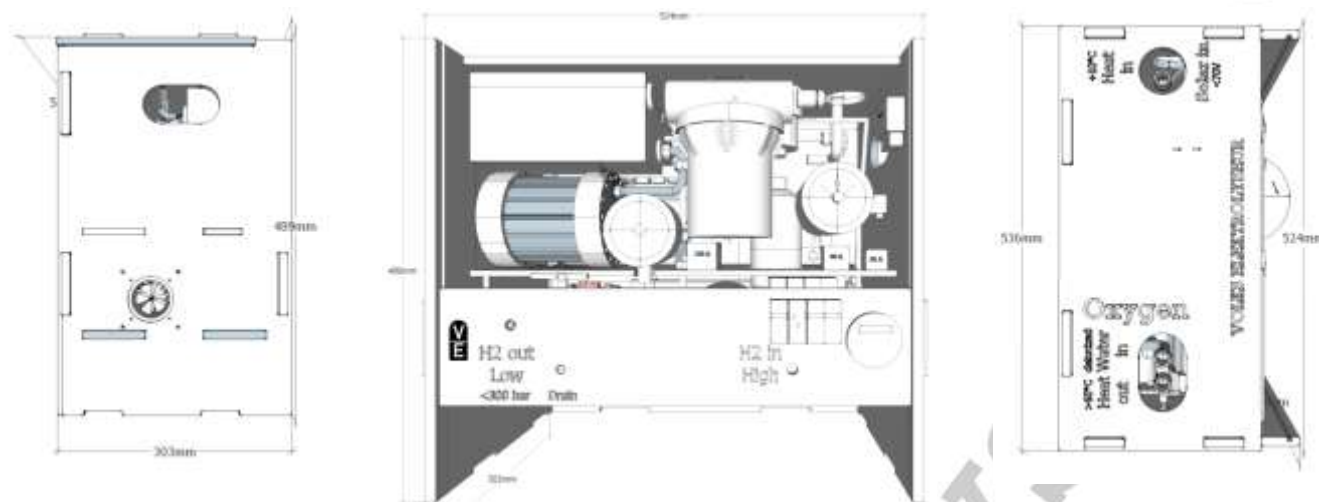
2.3 Materials of Construction

Facia and Covers	Wood
Chassis	Wood
Seal Materials	Nitrile, Viton, EPDM, PTFE (tape)
Display Pressure	Stainless and safety glass
Display Facia	Safety glass
Deionised Water Circuit Tubing	Latex
Hydrogen Circuit Tubing	316l Stainless
Inlet/ Outlet Circuit Tubing	Cleaned* Stainless Steel 316 (Inlet/ outlet Piping)
Satellite filter	Polypropylene
Barbed Fittings	
Water Reservoir	Laboratory glass
Float	Stainless
Conductivity Sensor	
	Handheld conductivity sensor suggested
Floats	Stainless
Manifold, Bowl and Spigot	Stainless
JG Fittings	Stainless
Conductivity Probes	Clean 316 Stainless Steel
Water Bottle to Pump Fitting	
Pressure Switch	
PEM Cell	Iridium, Platinum and Titanium
Desiccant Cartridge (adsorbent)	Molecular Sieve MS 544/Clear Polycarbonate Cal. 300EP-22 / Silicagel Orange (2-5mm)
Mounting Feet	Wood



2.4 Weight and Dimensions

The dimensions and weight of the equipment are specified below.



Dimension	Units	830 W	3050 W	
H	mm (in)	305 (12)		
W	mm (in)	536 (21,1)		
D	mm (in)	490 (19,3)		
Weight	kg	60		

Table 2.2 Weight and Dimensions

2.5 Receiving and Inspecting the Equipment

On receipt of the equipment carefully inspect the packaging for damage. If the packaging is damaged inform the delivery company immediately and contact your local Volks-Electrolyzer office.

2.5.1 Storage

If the equipment is to be stored prior to installation, do not remove it from the packaging. Ensure that it is stored in an upright position as indicated by the arrows on the packaging.



Warning

Do not attempt to lift the generator by yourself. It is recommended that the generator be carried by a minimum of two persons or transported on a pallet truck.

Note. The storage area should be secure, and the environmental conditions should fall within those specified in the technical specification. If the generator is stored in an area where the environmental conditions fall outside of those specified, it is essential that it be moved to its final location (installation site) and left to stabilise prior to unpacking. Failure to do this could cause condensing humidity and potential failure of the generator.

2.5.2 Unpacking

Once ready to install, remove the equipment from the packaging and check for signs of damage. Verify that the items specified on the hydrogen product packaging list have been included with the shipment. If any items are missing or damaged, please contact your local Volks-Electrolyzer office. Do not attempt to power up the generator.



2.5.3 Overview of the equipment

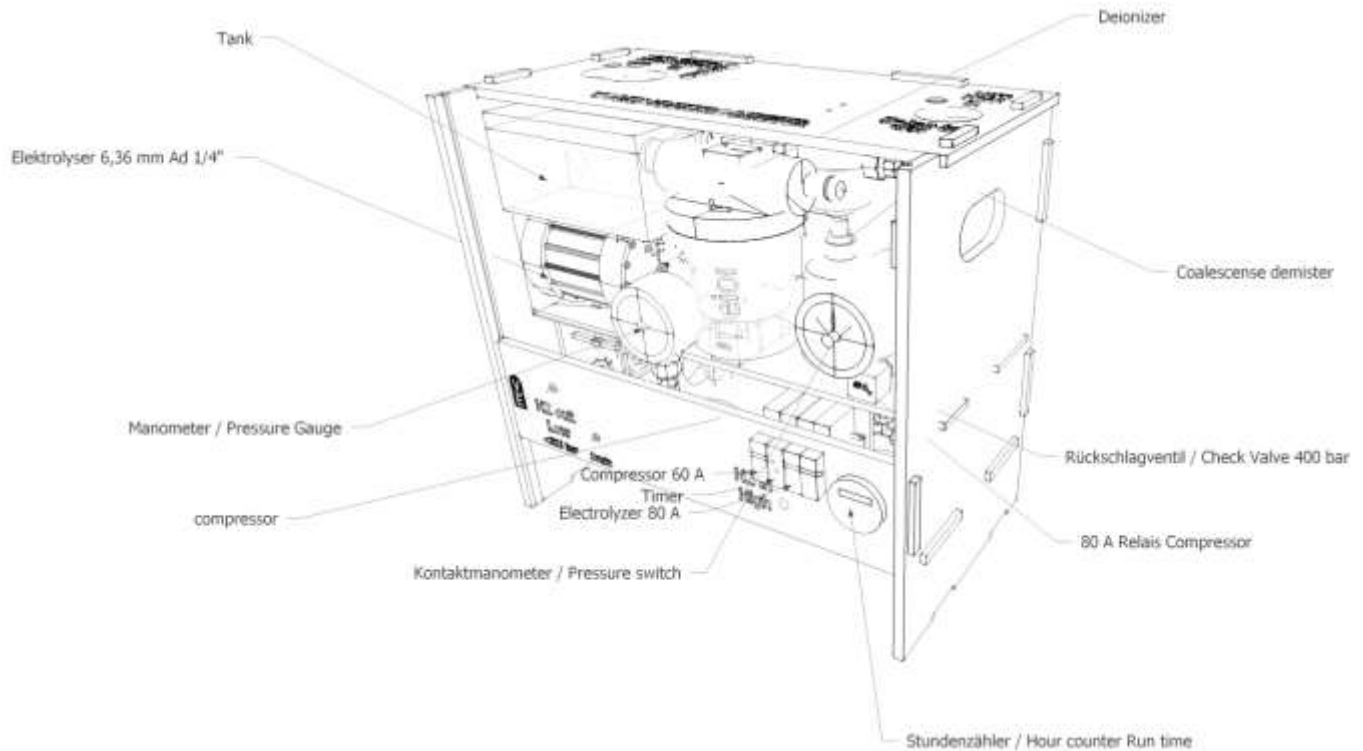


Figure 1 Electrolyser main components

2.6 Locating the Equipment



Warning

This equipment is not suitable for use in any Hazardous, Flammable, or Explosive environments. Keep the generator away from excessive heat and naked flames.

2.6.1 Environment

The equipment should be located indoors in an environment that protects it from direct sunlight, moisture, and dust. Changes in temperature, humidity, and airborne pollution will affect the environment in which the equipment is operating and consequently may impair the safety and operation.

It is the customers' responsibility to ensure that the conditions specified in table 2.1 are maintained.

2.6.2 Space Requirements

The equipment should be mounted on a flat surface, capable of withstanding the weight of the equipment and all ancillary parts. A minimum clearance of 150mm (5.9in) should be provided on all sides of the generator for air flow. Additional space should be provided so that the generator can be moved to allow unrestricted access to the generator during servicing and maintenance.

Do Not block the top vents or the fans located on the side panel of the generator.

When considering the vertical clearance you must take into account the height required when the front upper access panel is in the open position. Refer to table 2.2 for overall dimensions of the equipment.

Do Not position the equipment so that it is difficult to operate or disconnect from the electrical supply.

2.6.3 Ventilation Requirements



Warning

The accumulation of hydrogen can displace oxygen thereby creating an asphyxiation hazard. Always ensure that the equipment is operated in a well ventilated area.

2.6.4 Water Supply Requirements

Generators fitted with automatic water fill system maintain the water level from a gravity fed fresh deionised water supply. Refer to "Technical Specification" on page 3 for the supply requirements.



Caution

The use of any water, other than deionised water (Deionised, ASTM II, >1 M, <1S, filtered to <100m), within this generator will damage and reduce the life time of the hydrogen cell.

The generator should be connected to the supply using 1/4" tubing (not supplied).

Note. Tygon or PTFE is available as a factory or field fit optional extra. Contact Volks-Electrolyzer for further details.

2.6.5 Electrical Supply Requirements

The equipment should be connected directly to the fuse inlet socket to the electrical supply using the power cord min 12 mm² not supplied. The equipment should be positioned so that it can be connected to the electrical supply without the use of an extension cord.

It is the customers responsibility to provide reverse polarity protection and an earthed (grounded) electrical connection to the equipment (Refer to table 2.1 for the electrical specification). It is recommended that this supply have surge protection.



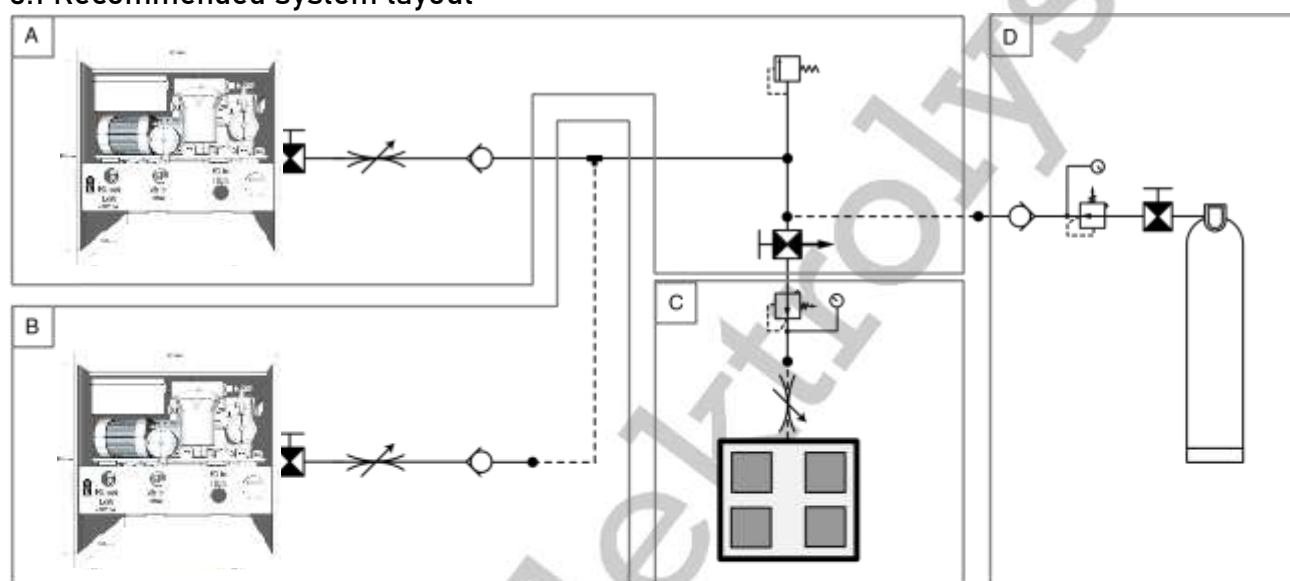
The equipment is connected to protective earth (ground) through the power cord. It is essential that electrical supply is equipped with a protective earth (ground) terminal. If an alternative power cord is used to connect the equipment to the electrical supply, ensure that it is suitably rated for the application and contains a protective earth (Ground) conductor.

3 Installation & Commissioning



Only competent personnel trained, qualified, and approved by Volks-Electrolyzer should perform commissioning and service procedures.

3.1 Recommended system layout



A	Single generator	C	Application Instrument		Non return valve
B	Multiple generators	D	Back up supply		Flow Controller
	Isolation Valve		Pressure regulator		Pressure relief valve
	3-way ball valve with vent line.	<i>Note. The pressure regulator and flow controller shown in (C) are recommended to account for pressure drop across the piping. This may be integrated in to the application instrument.</i>			

3.1.1 Installation Parts.

Installation Parts display Volks-Electrolyzer Master Catalogue part number and may ordered through your local authorised Volks-Electrolyzer Sales Company. Please note gas bottle and/or gas bottle regulator are not supplied by Volks-Electrolyzer.



3.2 Connecting the generator

Connect 12 V DC and ground to the fuses at the bottom of the case. There is another hole in the case to guide the conduit along the walls of the installation room. Fill the water reservoir on top with deionised or distilled water. If you have the permanent water supply or automatic water fill system, connect the water permanently with a pressure less than 1 bar. Connect Heat out and Heat in to recover the Energy for shower water or simply dissipate it.

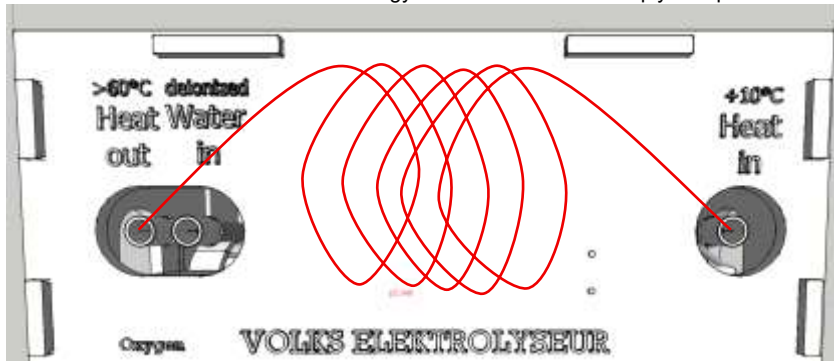


Figure 3 Heat recovery

Fasten the hydrogen out and the hydrogen in port to your hydrogen storages. Connect the 12 V signal (grey) to the 100 A relay and you are good to go.

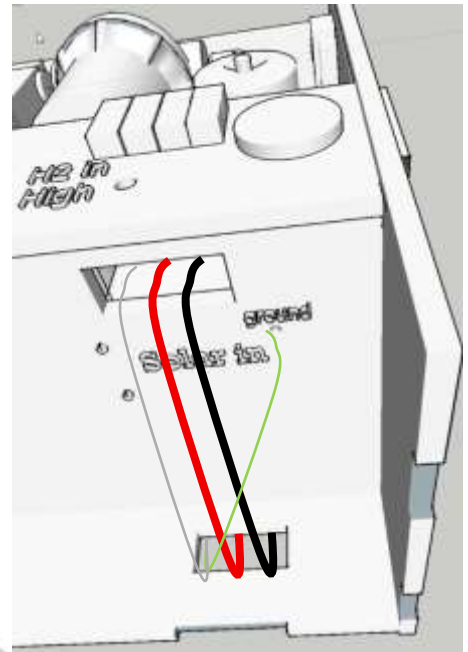


Figure 2 Electrical connections

3.2.1 Filters

Remove the transit plugs from the vent ports, on the rear of the generator, and fit the filters as shown.

3.2.2 Hydrogen outlet port

Refer to "Recommended system layout" on page 7 for the desired system configuration.

The generator should be connected to the application instrument using either high quality stainless steel tube or grade (B-280) copper tube. Remove the protective dust cap from the hydrogen outlet port compression fitting. Insert the tube into the outlet port fitting and rotate the tube nut until finger tight. Using a spanner (wrench) tighten the nut one and one-quarter (1 1/4) turns. When cutting the tubes always use the correct tools to allow a clean perpendicular cut. Cutting tubes will cause debris that, if not removed, may damage the downstream instrumentation. It is recommended that all pipes are purged to remove any debris that may exist. When routing the tubes ensure that they are adequately supported to prevent damage and leaks in the system.

All components used within the system must be rated to at least the maximum operating pressure of the equipment. Always protect the system by installing suitably rated pressure relief valves.



Warning

To prevent injury, and damage to the application instrument, the system piping will require purging for at least 15 minutes to remove any trapped oxygen. If using a 3-way ball valve with vent line, as recommended on page 8, ensure that the valve is open to the vent line and not to the application instrument. If a ball valve is not being used, ensure that the application instrument is not connected to the system piping. Refer to "Commissioning the Generator" on page 11 for details on purging.

3.2.3 Drain ports

The overflow drain and the water bottle spillage drain can be permanently piped away using 1/2" and 1/4" tubing respectively. The tube connected to the overflow drain should have a u-bend to prevent contamination of the internal water bottle. Always check with local guidelines for disposing of deionised water.

3.2.4 Electrical supply

Check the rating plate for the correct supply voltage and frequency. Select the required power cord and connect it to the switched IEC 320 socket on the generator. Connect the plug directly to the electrical supply. Do not use an extension cord.

3.2.5 Filling the water bottle



Caution

The use of any water, other than deionised water (Deionised, ASTM II, >1 M, <1S, filtered to <100m), within this generator will damage and reduce the life time of the hydrogen cell.

Fill the water bottle using fresh deionised water to a level approximately 15mm below the upper lip of the neck of the bottle.

Wearing suitable gloves to prevent contamination, insert the deioniser cartridge into the water filter and fit the cap securely.

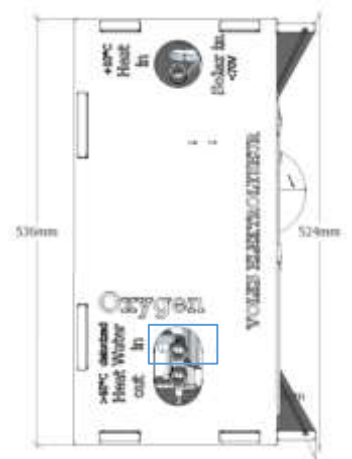


Figure 4 Water filling quick connector

3.2.6 Water supply (generators fitted with Auto Water Fill)

The optional water fill allows the generator's water bottle to be gravity fed from a suitable deionised water supply. When the water level falls below the mid-point, the water bottle will be replenished from the deionised water supply.

Connect the deionised water supply to the automatic water fill inlet using an adaptor not provided and clean tubing. It is recommended that a balance line is fitted at the inlet to prevent air locks. Flush the line through to remove any trapped air. Refer to "Technical Specification" on page 3 for water supply requirements.

3.3 Commissioning the Generator



Warning

Ensure that a suitable vent line is provided during the commissioning stage as hydrogen will flow from the unterminated system piping.



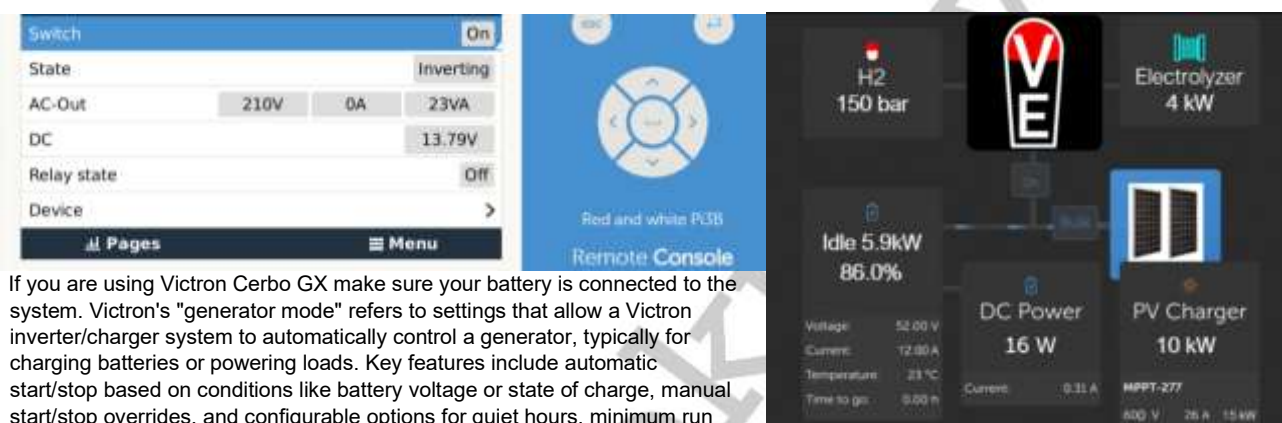
Caution

In order to guarantee the optimum efficiency of the PEM cell, this generator must be installed and running within three months of dispatch from Volks-Electrolyzer. Failure to do this may invalidate the warranty.

The generator has to perform a 240 minute (4 hours) initialisation sequence when powered for the first time. This sequence is necessary to guarantee the correct hydration of the cell.

4 Operating the equipment

4.1 Overview of controls



If you are using Victron Cerbo GX make sure your battery is connected to the system. Victron's "generator mode" refers to settings that allow a Victron inverter/charger system to automatically control a generator, typically for charging batteries or powering loads. Key features include automatic start/stop based on conditions like battery voltage or state of charge, manual start/stop overrides, and configurable options for quiet hours, minimum run times, and warm-up/cool-down periods. These settings are configured through devices like the Victron GX and the VRM portal.

Figure 5 Victron Energy Management System

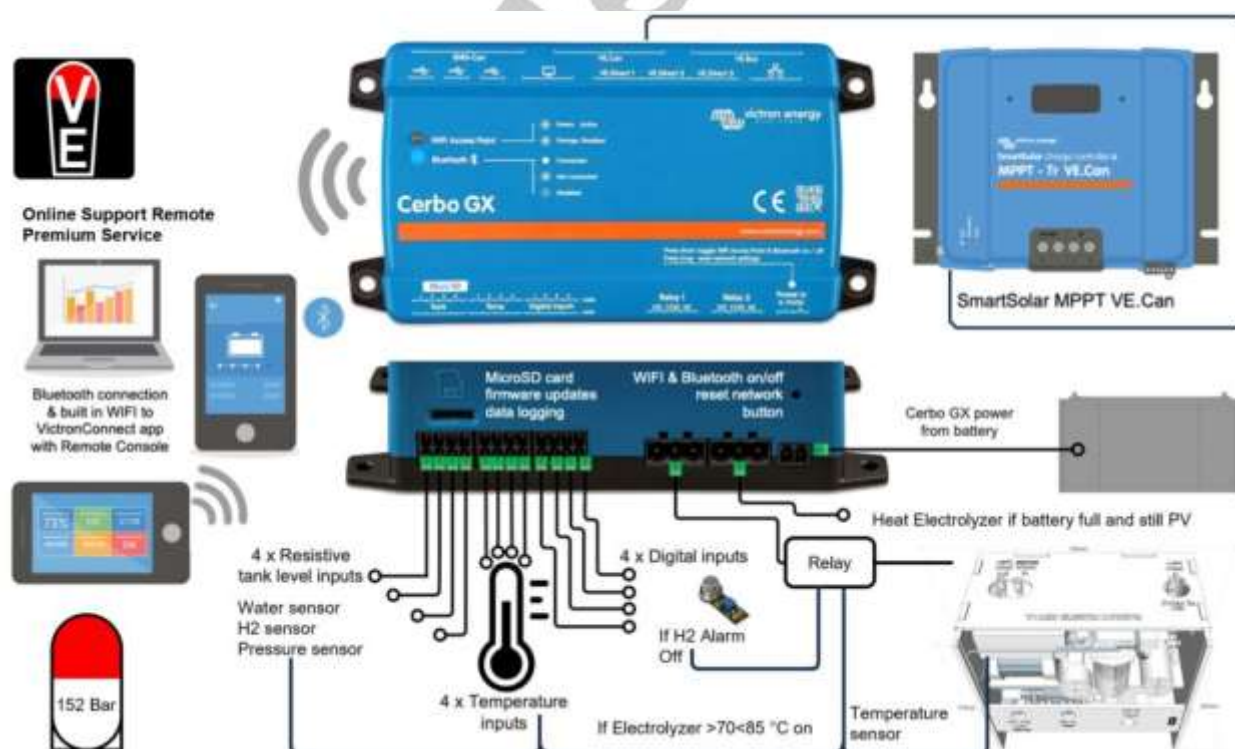


Figure 6 Electrolyser Electric Scheme



Select the State of Charge (95 %) for the Generator to switch off and 30 % for the starting point. Connect the electrolyzer Relais with a 1,5 mm² Cable to the Normally Closed Pin at the Cerbo relay 1. The electrolyzer will start operation whenever the battery is 95 % full and stop at 30 %. You can monitor additional information about your hydrogen system like:

- Temperature
- Pressure (you will need a Tank 140 to measure Amperage signals)
- Water level (resistive)
- H2 sensor

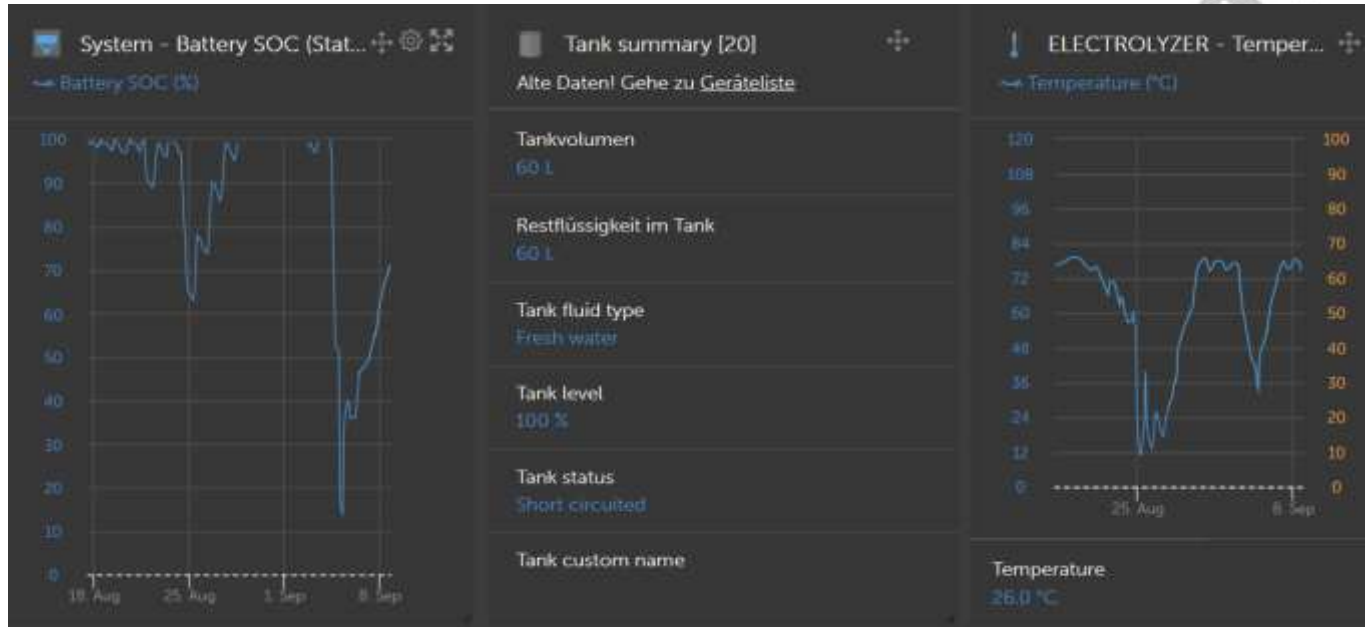


Figure 7 Victron Web Portal

To use different Inverter, Charge controller equipment, ask the manufacturer for switching options.



4.2 Starting the equipment

Verify that the water reservoir is full the hoses are flushed, and the circulation pump works.

Connect the generator to electrical supply and switch it on at the relays. The generator turns on. It won't turn on if the water level is low, the temperature is too high, or the pressure limit is reached.

The internal pressure of the generator will build up to the required operating pressure. Once the required pressure is reached, the compressor will switch on for a set period of time.



Caut'on

If the generator is being powered for the first time, it will take approximately 48 hours for the generator to reach the purity specified.

4.3 Operating Gauges

Generator pressure 30 bar

Compressor pressure 300 bar

4.3.4 Run Time

You see the runtime on the counter at the front panel. You cannot reset these hours.

4.3.5 Flow

Optionally you can have a flow meter indicating the oxygen production. Multiply the l/m shown in the flow meter by 2 in order to know the hydrogen flow rate.

4.5 Stopping the equipment and depressurising



Warning

Ensure that the generator is fully depressurised prior to shipment or servicing.

- 1 Ensure that the application instrumentation no longer requires hydrogen.
- 2 Switch the generator off at the power switch and disconnect it from the electrical supply.
- 3 Slowly disconnect the Hydrogen outlet connection pipe from the front of the generator allowing the system to depressurise.



Warning

Hydrogen gas will escape under pressure when the piping is disconnected.

- 4 The generator is now shut down.
- 5 If the generator is to be transported drain the water from the generator as described in section 6. Refit the hydrogen outlet port cover and the three transit plugs to the O₂ vent, excess H₂ vent and the water bottle vent.



5 Servicing

The recommended service procedures identified below, along with all other repair and calibration work, should be undertaken by a Volks-Electrolyzer approved engineer.

5.1 Cleaning

Clean the equipment with a damp cloth only and avoid excessive moisture around any electrical sockets. If required you may use a mild detergent, however, do not use abrasives or solvents as they may damage the warning labels on the equipment.

5.1 Service Intervals

Component	Operation	Daily	Weekly	6 Months (4000 Hrs)	12 Months (8000 Hrs)	24 Months (16000 Hrs)
Generator	Check the temperature					
Generator	Check the pressure					
Generator	Check the water level.					
Generator	Check the water conductivity.					
Generator	Check the water bottle spillage drains					
Generator	Check for leaks.					
Generator	Recommended Service A 6 Month Service.					
Generator	Recommended Service B 24 Month Service.					
Generator	Recommended Service C Check the desiccant cartridge and replace if opaque.					

5.2 Service Kits

5.2.1 Recommended Service A - Required every 4000Hrs (6 months)



Figure 8 filter



Description	Contents
H2 6 Month PM Kit	(1) Deioniser (2) 90-micron gas filter (3) Water filters (x2) (4) Molecular sieve



5.2.2 Recommended Service B - Required every 16000Hrs (24 months)



Description	Contents
H2 24 Month PM Kit	(1) Deioniser (2) 90 micron gas filter (3) water filter (4) filters (x2) (5) Gas leakage detector (6) Float (7) Water pump (8) Desiccant (9) 1/4" Latex tube (10) Gaskets and O-rings (11) Replacement cylinder with piston

5.2.3 Recommended Service C - 50000 Hrs. (5 years)



Description	Contents
Electrolyzer refreshing	Send Electrolyzer to the manufacturer to replace membranes

Note: The desiccant should be changed as and when required, however it is recommended that it is changed at least every 6, 4, and 2 months on the 830 W, 3050 W and 60H respectively.

5.3 Consumable Replacement Procedures

5.3.1 Draining the water bottle (A)

Locate the drain port on the front of the generator and insert the drain line. Ensure that the line is locked in position to obtain a complete seal. Leave the water to drain into a suitable container and remove the line.



Figure 9 deioniser in the water filter



In order to prevent contamination and prolong the life of the cell do not reuse the old water.

5.3.2 Replacing the deioniser and water filter (B)

Use only virgin deioniser. The recycled one might damage your electrolyser, and the warranty claims extinct. (purolite-mb-400)



Change the deioniser every 4000 hours (6 months), or if it has become contaminated.



Switch the generator off and remove the top cover of the water tank.

Wearing disposable gloves, remove the deioniser and discard. Extract the 100 micron water filter using the H₂ filter replacement tool (5). Push the tool over the filter so that the webs on the filter fit into the slots on the end of the tool. Unscrew the filter and remove it from the water bottle.

Fit the replacement filter and ensure that it is secured into the water bottle. Refill the water bottle with deionised water, ASTM II, >1 M, <1S, filtered to <100m, as described below, and fit the replacement deioniser cartridge.

Refit the water bottle cap and the top front cover and restart the generator.

5.3.3 Replacing the Filter

Remove the three filters from the vent ports by pushing the push in fitting upwards to release. Fit the replacement filters and check that they are secure.

Note: filters should be changed every six months as there is no visual indication of exhausted filters.



Figure 10 new desiccant orange (left), used desiccant transparent (right)



5.3.4 Replacing the Desiccant



Figure 11 Dryer and Ball Valve closed for maintenance

Close all valves. Depressurise the generator as specified in “Stopping the equipment and depressurising” on page 11. You find the maintenance hatch in the back of the generator. Open the vessel by turning clockwise. Empty it and fill dry silica gel into it using a funnel. Use little PTFE tape before closing strong by hand.

Open the filter by hand change the desiccant and close it manually.

5.3.5 Filling the water bottle (E)



The use of any water, other than deionised water (ASTM II, >1 M, <1S, filtered to <100m) within this generator will damage and reduce the lifetime of the hydrogen cell.

Remove the top cover of the water tank. Fill the water bottle using fresh deionised water to a level approximately 15mm below the upper lip of the neck of the bottle.

Note: If the water has been changed due to high conductivity, the deioniser cartridge must also be changed.



5.3.6 Changing the filter

Change PTFE filters in the coalescence divider and in the inline filter before the compressor. Open the vessel by turning clockwise. Use 3/4" or 19 mm wrench. Change 90 µm filter.

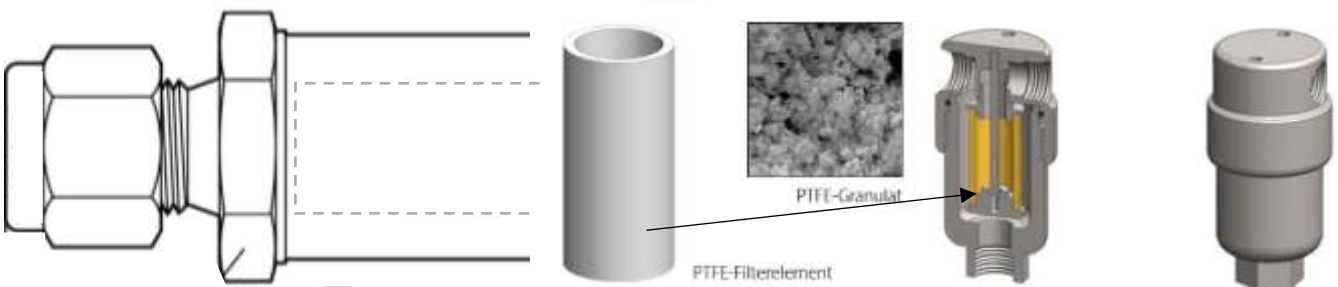


Figure 12 Inline filter, coalescence divider right

5.3.7 Winterising the electrolyzer

The electrolyzer can be stored in unheated places in cold climates. You need to prepare the electrolyzer for freezing.

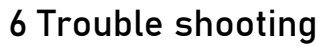
1. Drain the water out of the electrolyzer
 - a. Use the drain port at the cover for the major part
 - b. Empty the water tank on top
 - c. **DO not blow air in the electrolyzer. It causes CO poisoning**
 - d. Close all ports
 - e. Empty the heat exchanger
2. Depressurize the piping system
3. Replace the silica gel
4. Take of all electrical leads

If you have excess heat and electricity also in winter feel free to use the electrolyzer all year round ensuring temperatures above 5 °C and below 50 °C,



5.4 Service Record

Generator Details				
Model Number:				
Serial Number				
Supply Voltage				
Commissioned details:				
Type (electric, pneumatic or electro-chemical)				
Sealing and pistons rings change (date)				
Runtime				
Fax:				
Contact Name:				
Date of Commission:				
Service Interval Months (Hours)	Date	Print	Serviced By Sign	Comments
6 (4,000)				
12 (8,000)				
18 (12,000)				
24 (16,000)				
30 (20,000)				
36 (24,000)				
42 (28,000)				
48 (32,000)				
54 (36,000)				
60 (40,000)				
66 (44,000)				
72 (48,000)				
78 (52,000)				
84 (56,000)				
90 (60,000)				
96 (64,000)				
102 (68,000)				
108 (72,000)				



- # Legend
- | | | | |
|--|-----------------------------|---|------------------------------|
|  | Electric cable zone |  | Flux |
|  | Storage Manager |  | Storage unit 2 |
|  | Protections |  | Storage unit 1 |
|  | Wind turbine |  | Cable core layout |
|  | Ball beam clean up |  | Motor |
|  | No exchange zone |  | Storage unit 1 core gauge |
|  | Storage unit 1 |  | Cable core separator |
|  | Gears connection |  | Energy cable |
|  | Cable core layout |  | Battery Management System |
|  | Temperature |  | Maximum Power Point Tracking |
|  | Storage unit 1 core | | |
|  | Storage unit 2 core | | |
|  | Storage unit 1 red cable | | |
|  | Flux | | |
|  | Storage unit 2 | | |
|  | Flux unit for exchange zone |  | Positive cable |
|  | Choke cable |  | Power cable positive |
|  | Shunt inductor |  | Power cable negative |
|  | Choke cable |  | Zero cable |
| | |  | Energy cable positive |
| | |  | Disconnection |
| | |  | Flux to zero |
| | |  | Flux to negative |
| | |  | Flux to positive |





7. Declaration of Conformity EN

Volks-Elektrolyzer

Friedrichstrasse. 76
10117 Berlin Germany

Long Duration Energy Storage

830 W, 3050 W, 1.1 and 1.2

Directives

2006/95/EC

2004/108/EC

2014/68/EU

Standards used

EN 61010-1 : 2001 + CORR 1 & 2

EN 61326 : 2006

EN 50366 : 2003 (A1 : 2006) IEC 62233 : 2008

PED Assessment Route :

N/A

EC Type-examination Certificate:

N/A

Notified body for PED:

N/A

Authorised Representative

Andreas Esser

Divisional Quality Manager

Volks-Elektrolyzer, Industrial Division

Declaration

I declare that as the authorised representative, the above information in relation to the supply / manufacture of this product, is in conformity with the standards and other related documents following the provisions of the above Directives.

Signature: **Date:** 04/01/2024

Declaration Number: 23051985

www.V-Elektrolyzer.de