

# Precision Hydrogen User Manual



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## Change History

| Rev. | Comment | Name | Date |
|------|---------|------|------|
| 1    |         |      |      |
| 2    |         |      |      |
| 3    |         |      |      |
| 4    |         |      |      |

## How to use this Manual

This manual is intended for end users and has been written so that it can either be read as a step by step guide to installation and usage or as a reference document where you can skip to the relevant information.

Users of a hard copy version can refer to the contents page to find the relevant information. Users of the soft copy version can use the hyperlinks from the contents page as well as the hyperlinks between sections.

Please review each of the following sections carefully.

Thank you for selecting Peak Scientific to meet your Gas Generation needs, and should you require any further assistance or support please do not hesitate to contact Peak Scientific or Peak Partner from which you purchased your Generator.

# Precision Hydrogen UM

## Introduction

The Precision Hydrogen has been developed to cater for the requirements of GCMS instruments.

This model provides a source of High Purity Hydrogen gas, suitable for carrier gas and flame gas at non-trace detection limits.

Other features include:

- Touch screen interface
- >99.9995% purity
- Robust dryer technology

With the Precision Hydrogen based on proven technology, it produces Hydrogen by electrolysis using a Proton exchange membrane (PEM) cell. Moisture removal is achieved by a desiccant drying process.

To ensure this Generator model meets our high expectations with regards to reliability and performance, we have tested this model extensively at our manufacturing plant to ensure reliability and longevity of the system.

## Warranties and Liabilities

1. The Company warrants that it has title to the Goods.
2. Subject to the provisions of this clause the Company warrants that the Goods shall comply in all material respects with any specification referred to in the Order Confirmation (as the same may be amended) and shall, subject thereto, be free from defects in material and workmanship for the lesser of a period of twelve months from the date of delivery or thirteen months from the date of dispatch from the factory.
3. Save as provided in this clause and except where the Goods are sold to a person dealing as a consumer (within the meaning of the Unfair Contract Terms Act 1977) all warranties, conditions or other terms implied by statute or common law are hereby expressly excluded save to the extent they may not be lawfully excluded. When the Goods are sold to a consumer within the meaning of the Unfair Contract Terms Act 1977 their statutory rights are not affected by the provisions of this clause.
4. In the event of the Customer making a claim in respect of any defect in terms of clause 2 hereof the Customer must.
  1. Reasonably satisfy the Company that the Goods have been properly installed, commissioned, stored, serviced and used and without prejudice to the generality of the foregoing that any defect is not the direct or indirect result of lack of repair and/or servicing, incorrect repair and/or servicing, use of wrong materials and/or incorrect spare parts
  2. Allow the company to inspect the Goods and/or any installation and any relevant packaging as and when reasonably required by the Company.
5. Subject to the Company being notified of any defect as is referred to in sub-clause 2 hereof within a reasonable time of it becoming apparent and subject always to the terms of sub-clause 4 hereof, the Company shall, in its option, replace or repair the defective Goods or refund a proportionate part of the Price. The Company shall have no further liability to the Customer (save as mentioned in sub-clause 6 hereof).
6. The Company shall be liable to indemnify the Customer in respect of any claim for death or personal injury to any person in so far as such is attributable to the negligence or breach of duty of the Company or any failure by the Company to comply with the provisions of sub-clause 2 hereof.
7. Save as provided in sub-clause 2 hereof the Company shall not be liable in respect of any claim by the Customer for costs, damages, loss or expenses (whether direct, indirect, consequential or otherwise) or indemnity in any respect howsoever arising including, but not by way of limitation, liability arising in negligence (other than pursuant to clause 6 above) that may be suffered by the Customer or any third party.

## Safety Notices

### Symbols

This manual uses the following symbols to highlight specific areas important to the safe and proper use of the Generator

|                                                                                   |                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | A <b>WARNING</b> notice denotes a hazard. It calls attention to an operating procedure, process or similar, which if not correctly performed or adhered to, could cause personal injury or in the worst case death. Do not proceed beyond a <b>WARNING</b> notice until the indicated conditions are fully understood or met. |
|  | A <b>CAUTION</b> notice denotes a hazard. It calls attention to an operating procedure, process or similar, which if not correctly performed or adhered to, could cause damage to the Generator or the Application. Do not proceed beyond a <b>CAUTION</b> notice until the indicated conditions are fully understood or met. |
|  | Caution, risk of electric shock. Ensure power to the Generator has been removed before proceeding.                                                                                                                                                                                                                            |

### Safety Notice to Users



These instructions must be read thoroughly and understood before installation and operation of your Peak Precision Hydrogen Generator. Use of the Generator in a manner not specified by Peak Scientific MAY impair the SAFETY provided by the equipment.



When handling, operating or carrying out any maintenance, personnel must employ safe engineering practices and observe all relevant local health and safety requirements and regulations. The attention of UK users is drawn to the Health and Safety at Work Act 1974, and the Institute of Electrical Engineers regulations.



If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment maybe impaired.

# Precision Hydrogen UM

## ATTENTION - IMPORTANT NOTICE TO ALL USERS

These instructions must be read thoroughly, section by section and understood before installation and operation of your Peak Scientific Hydrogen Generator. Please follow the appropriate safety standards for handling hydrogen gas and other gases as determined by the laws and regulations of your country.

Please save the product packaging for storage or future shipment of the generator.

1. For your own personal safety and to prevent accidental damage to your generator please ensure that you read and understand our Directions for Use Manual.
2. Do not store away the generator when not in operation. The generator should be powered up at least twice a month and a small flow taken for 1 hour. It is recommended that you replace the water weekly to prevent biological growth developing in the tank and tubing. Failure to do this will greatly reduce the life of the generator and render the warranty void.
3. Do not place the external water bottle above the height of the generator. The bottle may be placed at the same level or below the generator. External water bottles must be made of a dark coloured glass in order to prevent biological growth.
4. Use only high grade de-ionised water ( $1\mu\text{S}/\text{cm}$  or better). Do not attempt to connect pressurised water to the generator.
5. It is recommended that you operate the generator at the lowest pressure permissible for your particular application. Do not automatically set the pressure to maximum if not required.
6. Failure to maintain the Deioniser Column as recommended will reduce the operational life of your generator and render its warranty void.
7. Do not attach any additional tanks or gas cylinders to your generator without first consulting Peak Scientific.
8. Ensure your entire installation, both pipe work and analysers, are completely gas tight. Even minor leaks will affect the operation of your generator and generally reduce its operational life.
9. Has your generator been correctly sized for your application? If in doubt, consult your dealer or Peak Scientific.
10. Ensure the ambient temperature inside your laboratory does not rise above  $25^{\circ}\text{C}/77^{\circ}\text{F}$ . Extremes of operating temperature will reduce cell life.





## Technical Specification

### Environment

|                                       |                    |
|---------------------------------------|--------------------|
| Minimum operating ambient temperature | 10°C (50°F)        |
| Maximum operating ambient temperature | 25°C (77°F)        |
| Maximum relative humidity             | 90% Non-Condensing |
| Minimum storage temperature*          | 10°C (50°F)        |
| Maximum storage temperature*          | 25°C (77°F)        |

\*NOTE – When taken out of storage the Generator should be allowed to acclimatize at room temperature for a minimum of 3 hours before operation.

### Generator Outlets

|                   |                                       |            |            |            |
|-------------------|---------------------------------------|------------|------------|------------|
| Max Flow Rate     | 100 cc/min                            | 200 cc/min | 300 cc/min | 400 cc/min |
| Purity            | 99.9995%                              |            |            |            |
| Gas outlet        | 1 x 1/8" Swagelok compression fitting |            |            |            |
| Delivery pressure | 0-100 psi (0-6.9 bar)                 |            |            |            |

### Electrical Requirements

|                       |                                              |
|-----------------------|----------------------------------------------|
| Voltage               | 100-240V rms                                 |
| Frequency             | 47-63 Hz                                     |
| Fuse                  | 0217005.MXP                                  |
| Current               | 6 Amp Max.                                   |
| Input connection      | C14 Connection                               |
| Power cord (Supplied) | C13 socket to local connection (10A minimum) |
| Pollution degree      | 2                                            |
| Insulation category   | II                                           |

### General

|                                           |                                         |
|-------------------------------------------|-----------------------------------------|
| Generator dimensions in cm W x D x H      | 38.0 (14.9) x 54.0 (21.2) x 40.6 (15.9) |
| Generator weight                          | 29 kg (64 lbs)                          |
| Shipping crate dimensions in cm W x D x H | 54.0 (21.2) x 70.0 (27.5) x 49.0 (19.2) |
| Shipping weight                           | 34 kg (75 lbs)                          |
| Water purity requirement                  | <1.0µ Siemens/cm OR >1 Mohm-cm          |

## Principle of Operation

The Peak Scientific Hydrogen Generator uses a proton exchange membrane (PEM) that is extensively used in industrial and laboratory applications. The reliability of this type of membrane is assured as it was originally developed for NASA. To produce the highest purity of hydrogen that an analytical laboratory requires, Peak Scientific employs the services of a platinum catalyst in the electrode area.

Electrolysis of water is the best method of producing high purity hydrogen on demand. The most important element of the generator is the electrolyser cell where the electrolysis reaction takes place. This consists of two electrodes (an anode and a cathode), which are separated by the ion exchange membrane.

When a continuous voltage is applied to the electrodes on the electrolyser cell, the following reactions take place: -

At the anode (the positively charged electrode), the water molecules lose two electrons forming an oxygen molecule and four hydrogen ions.



The oxygen that is produced in this half of the reaction is safely vented to atmosphere at the back of the generator. The four hydrogen ions that have been produced then pass through the ion exchange membrane (attracted by the negatively charged cathode) and collect four electrons reducing them to two hydrogen molecules.



The hydrogen produced is separated from the oxygen by the ion exchange membrane, which is impervious to molecular oxygen. Deionised water is the raw material of the system and must have a purity of 1µs/cm or better to prevent damage to the membrane.

**Failure to use this grade of deionised water will invalidate the warranty of your generator.**

The water is automatically loaded (either at power-up or periodically during operation) and the rate, at which the water is consumed, depends on the amount of hydrogen used - 1cc of water produces 1244cc of hydrogen. Some electrical energy is lost as heat, which is removed from the generator by the ventilation system.

Hydrogen is generated on demand. By maintaining the user's pre-set pressure and using this as a reference value, the generator will produce the exact amount of hydrogen required. As soon as the demand from the consuming application stops, then no gas is generated and the generator will maintain the supply lines at the pre-set pressure.

## General Safety

The construction of the Precision Hydrogen generator conforms to CEI / OSHA regulations as they do not store any appreciable amount of hydrogen internally. The generator only produces gas when the application places a demand on the unit. The unit also meets the European Electromagnetic Compatibility and Low Voltage Directives. The Generator is CE approved and has the CE mark attached.

The **maximum** quantity of hydrogen stored in the generator at any one time is 400cc at a pressure of 6.9bar (100psi). This means that the Hydrogen Generator can be safely installed in your laboratory and does not classify the surrounding area as dangerous.

All the Precision Hydrogen generators have the necessary control circuitry, both electrical and mechanical, to ensure the shutdown of the instrument in the event of a fault or faults occurring.

## Generator Safety Features

The Precision Hydrogen generator has the following safety features to ensure safe and reliable operation:

1. To avoid any build up of hydrogen from leaks inside the unit; the generator features forced air ventilation. This ensures that a hydrogen / oxygen mixture cannot form inside the generator.
2. On power-up the generator self checks for internal leaks and if required it will shutdown at the end of the System Check informing the operator with a visual alarm.
3. The generator will detect any hydrogen leaks that occur within the generator, the user's application and gas lines. In the event of a major leak the generator will automatically shut down within 20 minutes.
4. The hydrogen pressure inside the generator should only reach a maximum of 7.5 bar (110psi) and this is controlled in two ways:
  - a. Gas pressure is monitored and controlled electronically by a pressure sensor
  - b. A mechanical pressure switch (Fail Safe) will electrically isolate the hydrogen cell should the internal pressure reach 7.5 bar (110psi)
5. When the generator is in alarm status the following occurs:
  - a. The current to the cell is stopped so no hydrogen is generated therefore preventing a hazardous situation.
  - b. The over pressure relief valve opens allowing the unit to depressurise.
  - c. An audible and visual alarm relevant to the fault condition is displayed. The generator can sense for internal and external leaks, excessive gas demand and lack of water.

## Unpacking

Although Peak Scientific takes every precaution with safe transit and packaging, it is advisable to fully inspect the unit for any sign of transit damage.

Check 'SHOCKWATCH' label for signs of rough handling prior to un-packing –



**Any damage should be reported immediately to the carrier and Peak Scientific or the Peak Partner from where the unit was purchased.**

Follow the unpacking instructions posted on the side of the crate. It will require two people to remove the unit from the shipping crate and to manoeuvre the Generator onto the bench.

Please save the product packaging for storage or future shipment of the Generator.

Note: Included with the Generator is a "Fittings Kit" containing mains power leads for UK, EU & US and also all the required fittings. Be careful not to discard these with the packaging.

# Precision Hydrogen UM

## Contents

Each shipping box should contain the following: -

Hydrogen Generator

Tygon Tubing (use as Water Feed Hose)

Deioniser Column Resin Refill

Barbed Hose Fitting

¼" & ⅜" Transport Plugs

UK Mains Cable

EU Mains Cable

US Mains Cable

Installation Guide— Precision Hydrogen

User Manual CD— Precision Hydrogen

## Unpacking Instructions

The Precision Hydrogen generator weights approximately 29Kg, and as such should only be lifted by two people; do not attempt to lift on your own, as you will significantly increase the chance of injury & damage to yourself and other around you.

1. Remove the screws encircled in red around the bottom of the crate lid and lift upwards.
2. Next, with someone on either side of the unit, position your hands underneath the unit ready to lift.
3. Ensuring your knees are bent and your back is straight, lift the unit to the desired location.

## Installation

### Location

The generator should be located on a flat, level surface for operation - this will ensure that the water level sensors within the unit operate correctly. Some components in the generator produce heat during operation and therefore an adequate airflow must be maintained around the generator to allow the ventilation system to perform efficiently. The rear of the generator will become warm to the touch during operation - a minimum clearance of 15 cm (6") from other bodies is recommended. Do not locate the generator in a sealed or unventilated room, or in close proximity to any ignition sources.

### Caution - Remove Transport Plugs

Before installation, remove the blanking plugs fitted to the vents at the rear of the generator. Do not obstruct or connect the vents to any application. Failing to observe this could lead to permanent damage of the generator.

Please ensure that the Transport plugs are retained for future transportation.

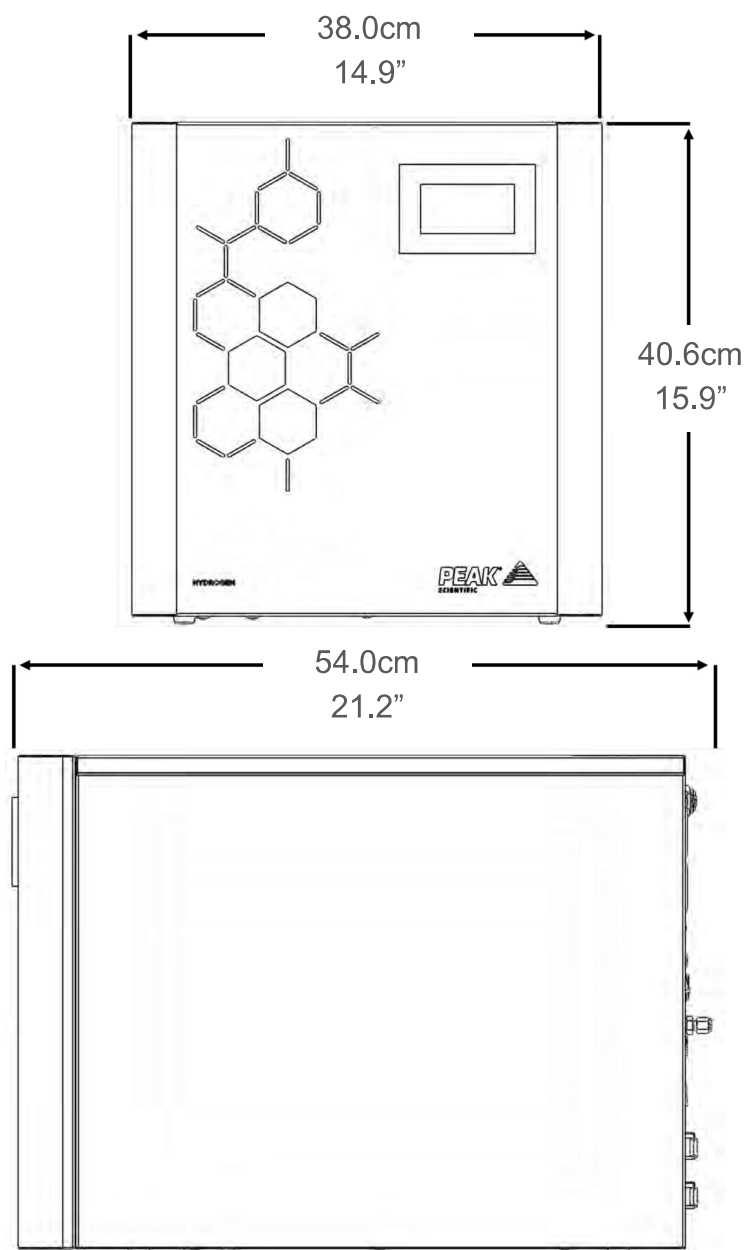
Do not expose the unit to freezing conditions. Please adhere to the operating temperatures below:

|                                        |               |
|----------------------------------------|---------------|
| Minimum Operating Ambient Temperature: | 10 °C (50 °F) |
| Maximum Operating Ambient Temperature: | 25 °C (77 °F) |

**Note: It is recommended that the unit is left to run for 12 hours before utilisation.**

# Precision Hydrogen UM

## General Dimensions



The Generator must always be placed on a flat, level surface. Failure to do so will affect the performance of the Generator.



## Unit Controls

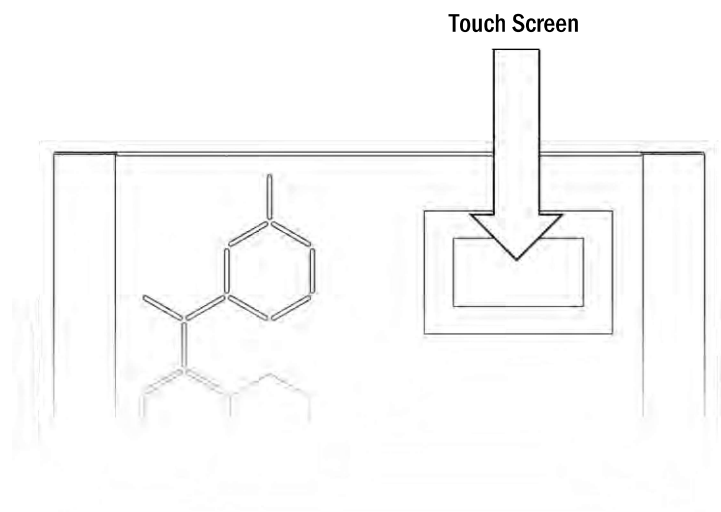


Figure 1: Unit controls

## Rear Connections

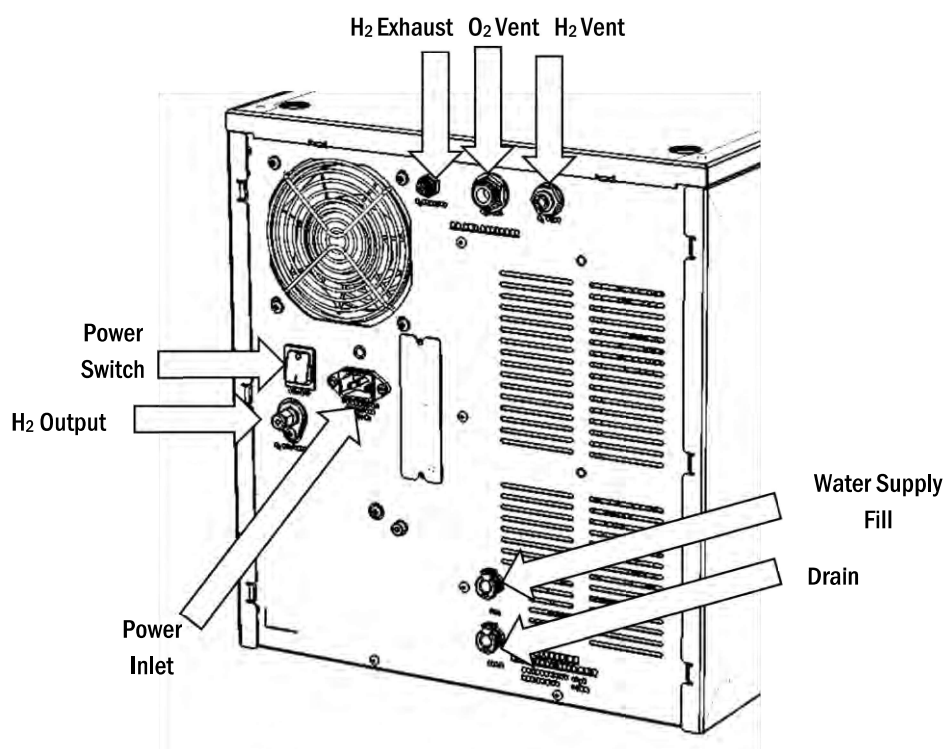


Figure 2: Rear Connections

# Precision Hydrogen UM

## Tubing

For the hydrogen supply line, it is recommended that only clean grade copper or stainless steel tubing should be used.

Plastic tubing material such as Teflon®, polyvinyl chloride, or Tygon® should not be used when plumbing GCs since these materials will allow air and water to diffuse into the gas lines. In addition, plastic tubing can give off organic impurities which can cause ghost peaks and baseline instability.

Furthermore Peak Scientific recommend that Swagelok® fittings are used, and that the fittings are free from Teflon® tape.

## H<sub>2</sub> Ventilation

Peak Scientific recommends that both the H<sub>2</sub> Exhaust and H<sub>2</sub> Vent ports at the rear of the unit should be connected to an exhaust hood, or other ventilation system, to ensure safe disposal of vented gasses. Tubing sizes for the vent ports are 1/8" OD for the H<sub>2</sub> Exhaust and 3/8" OD for the H<sub>2</sub> Vent.

## Fittings Kit

Supplied in the Fittings Kit are all the fittings required to connect the Precision Hydrogen Generator to the application. The contents of the Fittings Kit are as follows:

|                                           |      |
|-------------------------------------------|------|
| 1. Tygon Tubing (use as Water Feed Hose)  | x 1m |
| 2. Deioniser Column Resin Refill          | x 1  |
| 3. Barbed Hose Fitting                    | x 1  |
| 4. 1/4" & 3/8" Transport Plugs            | x 1  |
| 5. UK Mains Power Cable                   | x 1  |
| 6. EU Mains Power Cable                   | x 1  |
| 7. US Mains Power Cable                   | x 1  |
| 8. Installation Guide– Precision Hydrogen | x 1  |
| 9. User Manual CD– Precision Hydrogen     | x 1  |

All of the Generator output ports are located on the output panel at the rear of the Generator.

# Precision Hydrogen UM

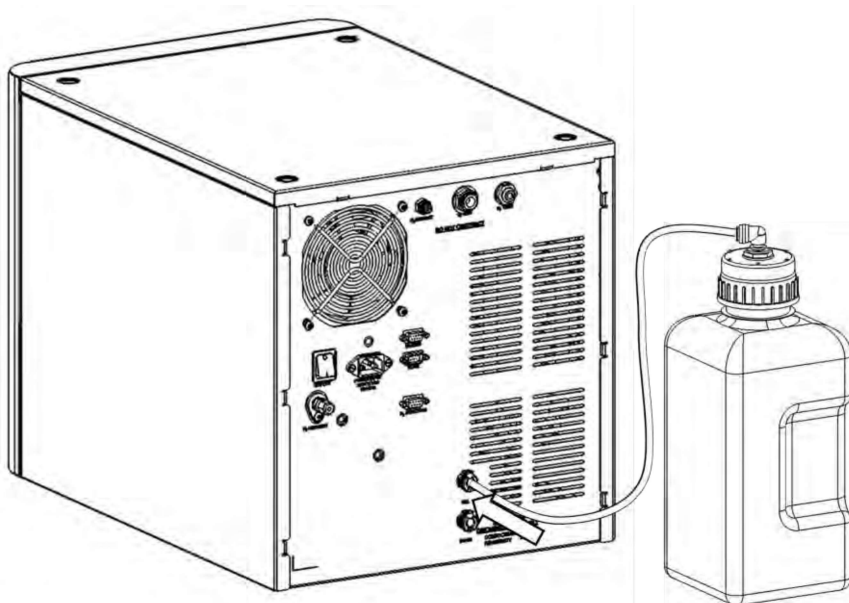
## Automatic Filling

The Precision Hydrogen generator uses an automatic water filling system, whereby sensors in the unit's internal water tanks detect when the water level reaches a minimum.

This then refills the tank using a rear connection to an external DI water supply.

The unit should be connected to the Water supply as shown below.

Using the length of Tygon® tubing and the hose barb fitting from the fittings kit, attach the barb to the tubing. Then connect one end to the water supply and the other to the Fill port at the rear of the Precision Hydrogen.



## Electrical Connection

Connect the generator into an appropriate voltage supply between 100-240V rms, refer to the generator serial plate for input specification and ensure your supply matches the requirements.

If the appropriate power cord is not supplied; a new plug, rated to at least 10 amps, can be fitted by a qualified electrician.



**This unit is classified as SAFETY CLASS 1. THIS UNIT MUST BE EARTHED. Before connecting the unit to the mains supply, please check the information on the serial plate. The mains supply must be of the stated AC voltage and frequency.**

|                    |                |    |       |
|--------------------|----------------|----|-------|
| EARTH/GROUND (E):- | Green & Yellow | or | Green |
| LIVE (L):-         | Brown          | or | Black |
| Neutral (N):-      | Blue           | or | White |

Electrical requirements are 110-240V rms nominal. However, running continuously at voltages outwith this is not recommended. Extended periods at extremes can have a detrimental effect on the operation and life of the Generator.

## Start-up Sequence

CHECK:

1. Transport plugs have been removed
2. H2 Outlet is connected to application
3. Mains power is connected

Turn the power switch ON. The digital display will light up, the cooling fans will rotate and the internal pumps may automatically run to load water if the internal tanks are not full.

On power up the generator performs a diagnostic check including a leak test, this should take approximately six minutes.

Upon successful completion of the leak test, the operator is presented with the main screen and the generator is ready to deliver hydrogen.

The next screen displayed to the user will be the Home screen, where two options will be available, Start and Menu. The first time the unit is switched on the user should select the Menu option which allows the desired Unit of measure and delivery pressure to be selected.

Also displayed on this screen are the Shutdown and Back options. Shutdown will depressurize the generator. This should be selected before turning the unit off using the Power switch at the rear of the unit. Finally, the Back option returns the user to the home screen where the Start option will allow the flow of hydrogen to the application.

Upon selection the unit will take a few moments to adjust to the desired delivery pressure. If the unit has been used previously the Start button will initiate the supply of hydrogen to the application at the last used pressure.

Note: If leak test is unsuccessful, and alarm will sound and a red failure screen will be displayed complete with a mute button. The user is prompted at this point to contact their Peak service provider.

## Liquid Leak Detectors

Liquid leak detectors should not be used on the Precision Hydrogen. These solutions are easily drawn into the high purity hydrogen gas system and can cause irreparable damage to a GC column. If a liquid solution has to be used, then it should be IPA based, or a portable hydrogen detector should be used.

# Precision Hydrogen UM

## Gas Traps

It is recommended that Moisture, Oxygen and Hydrocarbon traps are used on the gas supply line between the Peak generator and the instrument to provide back-up contaminant protection for your instrument.

The hydrogen gas produced by the Precision Hydrogen will be sufficiently pure for these contaminant traps to last a long time, but should a leak ever occur on the gas line, the traps will ensure that any harmful contaminants are caught, therewith preventing potential damage to the instrument.

## Switching the unit off

The unit can be switched off at any time using the following procedure.

Firstly press the Stop button on the Touch screen, then press Menu, and finally select Shut Down.

The unit will take a few moments to depressurize after which the power switch at the rear of the generator can be switched off.

## Cleaning

Clean the outside of the Generator only using warm soapy water and a clean damp cloth. Ensure the cloth is thoroughly rung out to remove excess fluid prior to use.



**Cleaning should only be undertaken with the power switched off and the power cord removed from the rear of the Generator.**

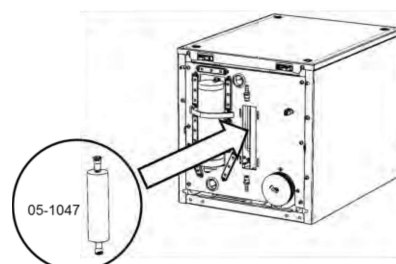
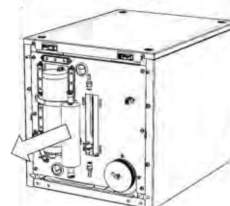
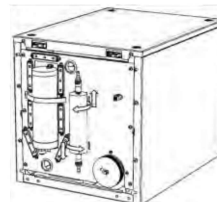
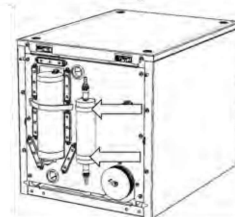
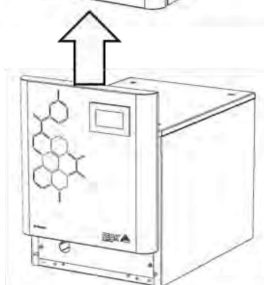
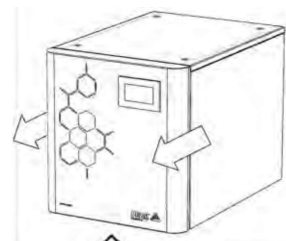


**Under no circumstances should any solvents or abrasive cleaning solutions be used as these can contain fumes that could be harmful to the Generator.**

## Replacement of Deioniser Resin Column

The resin, in the Deioniser column, in the unit should be replaced every 6 months. Listed below are the instructions for replacing the Deioniser column.

1. The HMI screen will display – Change DI Column. This screen has 3 options, Later will postpone the change, Continue will take the user to the next screen where pressing Change, will stop H<sub>2</sub> production.
2. Remove the Fascia by first pulling it forwards and then sliding it up.
3. The Deioniser Column is held in place by two Velcro straps, these must be unfastened.
4. Next disconnect the fittings at the top and bottom of the Deioniser Column. The top is released by pushing the column upwards and rotating it anticlockwise. The bottom is released by pushing downwards and rotating the column clockwise.
5. Remove the used column by pulling it towards you.
6. Fit a new Deioniser Column (05-1047) into the generator and reconnect the tubing.
7. Replace the front fascia.
8. Push confirm on the HMI screen.





## Replacement of Desiccant Column

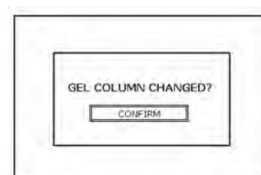
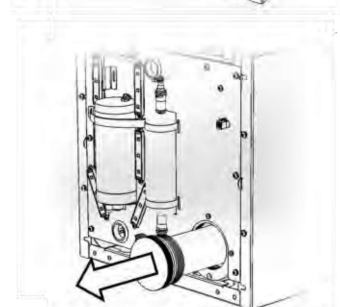
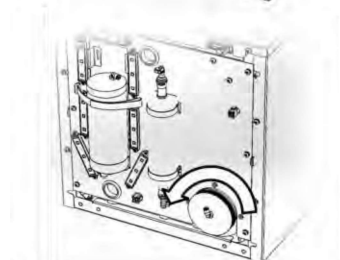
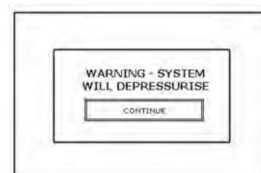
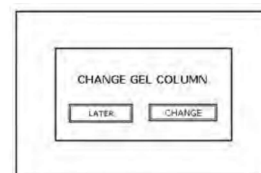
The silica gel in the Desiccant Column must be removed and either regenerated or replaced once it becomes saturated.

The silica gel can be regenerated by tipping the gel into a suitable container and placed into an oven in accordance with the guidelines on the next page.

The HMI screen prompts the user to do this.

Instructions are listed below on how to do this.

1. The HMI screen will display CHANGE GEL COLUMN, press CHANGE.
2. The screen will then warn the user that the system will depressurise, press CONTINUE.
3. Now that the unit is depressurised, remove the front fascia and disconnect the tubing connected to the Desiccant Column.
4. Next unscrew the column by turning to the left, this should be handtight.
5. Remove the column from the generator and unscrew the cap. The gel inside should now be removed and replaced with new gel OR regenerated.
6. The column should now be reassembled, and then screwed back into the generator, again this must only be hand tight.
7. Next reconnect the tubing to the push fit fitting on the cap of the column.
8. Now replace the fascia of the Hydrogen generator.
9. Finally press CONFIRM on the HMI screen which will display a GEL COLUMN CHANGED? screen. This will bring the generator back up to pressure.



## Health and Safety Data- Deioniser Resin

This sheet to be retained by the 'Health & Safety Officer'

The recipient of this Health & Safety Data sheet is required to ensure that all personnel handling, using or likely to come into contact with the material are made aware of the Health & Safety information contained herein.

### General Description

Bag containing ion exchange resin. 60% Cation and 40% Anion by mass.

### Chemical Components

Polystyrene divinylbenzene cation and ion exchange resin.

|                                     |                                                                            |
|-------------------------------------|----------------------------------------------------------------------------|
| <b>Form</b>                         | Solid beads                                                                |
| <b>Flash Point</b>                  | N/A                                                                        |
| <b>Colour</b>                       | Tan                                                                        |
| <b>Ignition Temperature</b>         | 427 °C (Estimated)                                                         |
| <b>Odour</b>                        | None                                                                       |
| <b>Explosion Limits</b>             | N/A                                                                        |
| <b>Decomposition Temperature</b>    | Over 220 °C                                                                |
| <b>Vapour Pressure @ 25 °C</b>      | 17mm CFH @ 20 °C (Water)                                                   |
| <b>Viscosity @ 25°C</b>             | N/A                                                                        |
| <b>Solubility in Water</b>          | Negligible                                                                 |
| <b>Specific Gravity @ 25°C</b>      | 1.1-1.3                                                                    |
| <b>pH @ 25 °C</b>                   | 7-9.5 in aqueous slurry                                                    |
| <b>Eye Protection</b>               | Safety Glasses (BS2092C)                                                   |
| <b>Storage</b>                      | Store in a cool place above 0 °C, out of direct sunlight                   |
| <b>Fire &amp; Explosion Hazards</b> | Toxic combustion products may include sulphur dioxide and sulphur trioxide |
| <b>Disposal</b>                     | This product can be disposed as ordinary waste if local regulations permit |

## **Emergency & First Aid Procedures**

### **Spillages**

Floor may be slippery. Use care to avoid falls. Wear protective glasses.

Sweep up and transfer to containers for recovery and disposal.

### **Extinguishing Media**

Carbon Dioxide (CO<sub>2</sub>), Water Fog and Dry Powder.

### **Fire Fighting and Protection**

Wear HSE approved, pressure demand, self-contained breathing apparatus or equivalent.

### **First Aid**

#### **Skin Contact**

Wash effected areas with soap and water. Consult doctor if irritation persists.

#### **Eye Contact**

Product can cause severe eye irritation. Flush eyes with large amounts of water for at least 15 minutes. Consult a doctor if irritation persists.

#### **Inhalation**

This product should present no hazard if operated under normal conditions. If irritation persists, move patient to fresh air.

#### **Ingestion**

If resin has been confined to the mouth, administer 250 ml. of water as a mouthwash. Avoid swallowing. This product is considered non-hazardous if ingested in small amounts; however, it is advisable to seek medical advice.

## **Toxicological Data**

No toxicity data available on this product

### **Occupation exposure limits**

STEL/TLV = None established.

### **Incompatible Materials (to avoid hazardous reactions)**

Avoid contact with concentrated nitric acid and any other strong oxidising agents at all times.

## IMPORTANT DOCUMENTS



### Warranty Entitlement

To register your generator for your warranty entitlement, send the completed form to Peak Scientific by:

- **Email** [warranty@peakscientific.com](mailto:warranty@peakscientific.com)
- **Online** [http://www.peakscientific.com/service-and-support/warranty\\_registration](http://www.peakscientific.com/service-and-support/warranty_registration)
- **Phone** +44 (0)141 530 4185
- **Fax** +44 (0)141 812 8200

| PRODUCT WARRANTY REGISTRATION |                                 |
|-------------------------------|---------------------------------|
| COMPANY:                      | CONTACT NAME:                   |
| ADDRESS:                      |                                 |
|                               | EMAIL ADDRESS:                  |
|                               |                                 |
| CITY/TOWN:                    | GENERATOR SERIAL NUMBER:        |
| POSTCODE:                     |                                 |
| COUNTRY:                      | MODEL TYPE:                     |
| TELEPHONE:                    | INSTALLATION DATE (DD/MM/YYYY): |
|                               |                                 |

### Important Please Note:

You have 1 month to register your Peak Scientific product from the date of shipment.

If you wish to defer installation of your generator you must notify Peak Scientific within 1 month of the shipment date. This can be done by emailing [warranty@peakscientific.com](mailto:warranty@peakscientific.com) Once registered the warranty will be honoured for a period of 12 months after the installation date.

**For any generators that remain unregistered the warranty will begin from date of shipment.**

Thank you on behalf of Peak Scientific.

## Service Requirements

### Service Schedule

| Purchase Interval | Component                             | Part No. | Qty. |
|-------------------|---------------------------------------|----------|------|
| 12 months         | Precision Hydrogen Annual Service Kit | 08-3609  | 1    |

Table 1: Service Schedule

### Annual Service Kit Contents

2 x Deioniser Resin Cartridges

1 x 0.5kg Desiccant

2 x Small O ring

2 x Large O ring

## Service Plans

Peak Scientific offer two service plans. The Complete Service Plan, specifically designed for Generators operated in critical environments, also includes full breakdown cover, guaranteed response times and Generator upgrades if available. Our Standard Service Plan, covering the basic needs of our Generators, features special deals on spare parts and breakdowns.

If you want to know more about our Service Plan options and how we ensure that your instrument can run with the maximum uptime and performance, please contact us at [maintenance@peakscientific.com](mailto:maintenance@peakscientific.com)

## Trouble Shooting

| Problem                                                                    | Possible Solution                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Generator will not switch on and the power switch does not illuminate. | <ul style="list-style-type: none"><li>• Ensure power cord is plugged into the Generator and that the power socket is turned on.</li><li>• Check the fuse in the power cord plug.</li><li>• Contact your service provider.</li></ul> |
| Diagnostics Failed Alarm                                                   | <ul style="list-style-type: none"><li>• Contact your service provider.</li></ul>                                                                                                                                                    |
| Low Water Supply Alarm                                                     | <ul style="list-style-type: none"><li>• Check Water Supply level, and fill if necessary,</li><li>• Contact your service provider.</li></ul>                                                                                         |
| Over Pressure Alarm                                                        | <ul style="list-style-type: none"><li>• Contact your service provider.</li></ul>                                                                                                                                                    |
| Capacity Excess Alarm                                                      | <ul style="list-style-type: none"><li>• Check <u>external</u> pipework for leaks.</li><li>• Contact your service provider.</li></ul>                                                                                                |
| Water Level Fault                                                          | <ul style="list-style-type: none"><li>• Contact your service provider.</li></ul>                                                                                                                                                    |



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