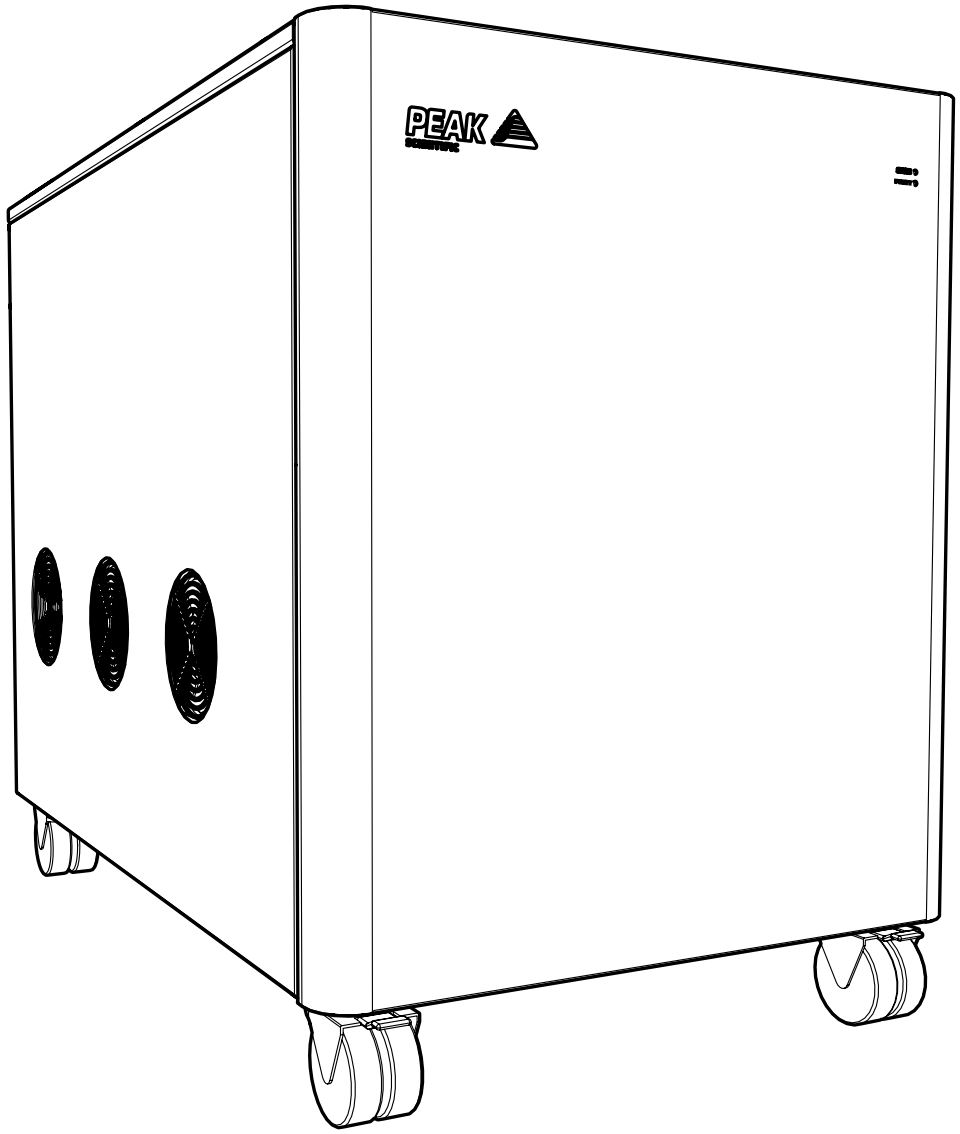
Halo

User Manual



PEAK SCIENTIFIC

Halo User Manual Rev 7 RSID 2624 EN 30/11/21

Contents

Change History

Rev	Comment	Name	Date
1	Initial Release	Liam Couttie	11/07/2018
2	Tech Spec Update	Liam Couttie	20/07/2018
3	Tech Spec Update	Liam Couttie	13/03/2019
4	Power Cord Update	Liam Couttie	15/10/2019
5	Declaration	David Lai	16/10/2021

How to use this Manual

This manual is intended for end users and has been written as a reference document where you can skip to the relevant information.

Users can refer to the contents page to find the relevant information.

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 the Peak Partner from which you purchased your generator.

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

Peak Scientific Instruments cannot anticipate every possible circumstance which may represent a potential hazard. The warnings detailed within this manual refer to the most likely 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 Peak Scientific, the user must ensure that the equipment will not be damaged or become hazardous to persons or property.

Symbols

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

 WARNING	A WARNING 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 WARNING notice until the indicated conditions are fully understood or met.
 CAUTION	A CAUTION 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 CAUTION 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


WARNING

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


WARNING

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.


WARNING

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

EU Declaration of Conformity

We Peak Scientific Instruments Ltd.

Of Fountain Crescent, Inchinnan, Renfrewshire, PA4 9RE

Hereby declare that, this declaration of conformity is issued under the sole responsibility of the manufacturer.

Equipment Type: Nitrogen & Dry Air Generator

Model Designator: Halo

To which this declaration relates, is in conformity with the following applicable EU Directives, harmonized standards, and other normative requirements.

- **Low Voltage Directive 2014/35/EU**
  EN 61010-1: 2010 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.
- **Electromagnetic Compatibility Directive 2014/30/EU**
  EN 61326-1: 2013 Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements. (Class A)
- **Restriction on the use of certain hazardous substances in electronic equipment (RoHS) Directive 2011/65/EU as amended by EU 2015/863.**
- **FCC 47 CFR Part 15 class A**
  Unintentional radiators; Conducted and Radiated emissions limits.

Signed for and on behalf of Peak Scientific by

Signed: 

Name: Fraser Dunn

Position: Design Engineering Manager
Peak Scientific Instruments ltd,
Inchinnan, Renfrew, Scotland, PA4 9RE, UK.

Date: 30th November 2021

UK Declaration of Conformity

We Peak Scientific Instruments Ltd.

Of Fountain Crescent, Inchinnan, Renfrewshire, PA4 9RE

Hereby declare that, this declaration of conformity is issued under the sole responsibility of the manufacturer.

Equipment Type: Nitrogen & Dry Air Generator

Model Designator: Halo

To which this declaration relates, is in conformity with the following applicable UK Statutory Instruments, Standards and other normative requirements.

- **The Electrical Equipment (Safety) Regulations 2016 (SI 2016 / 1101) as amended.** BS61010-1:2010 Safety Requirements for Electrical Equipment for Measurement Control and Laboratory Use.
- **The Electromagnetic Compatibility Regulations 2016 (SI 2016 / 1091) as amended.** BS61326-1:2013 Electrical Equipment for Measurement , Control and Laboratory Use – EMC Requirements.
- **The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (SI 2012 / 3032) as amended.**

Signed for and on behalf of Peak Scientific by

Signed: 

Name: Fraser Dunn

Position: Design Engineering Manager
Peak Scientific Instruments ltd,
Inchinnan, Renfrew, Scotland, PA4 9RE, UK.

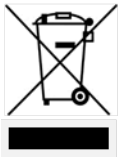
Date: 30th November 2021

UK
CA

WEEE Compliance Statement

The Waste Electrical and Electronic Equipment (WEEE) Regulations SI 2013 No 3113 and or the Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU apply to all electrical and electronic equipment placed on the market in the UK and EU covered by the scope of regulations which can be found in the Government Guidance Notes (PDF) produced by the Department for Business Innovation and skills for the UK and here for Europe.

All PEAK products that are subject to the WEEE directive are compliant with the WEEE marking requirement. Such products are marked with the “crossed-out wheelie bin” symbol (shown below) in accordance with European standard EN50419. All old electrical equipment can be recycled. Please do not dispose of any electrical equipment (including those marked with this symbol) in general rubbish bins. Please contact your dealer or distributor for clarity.



Technical Specification

Halo

Environment

Minimum Operating Ambient Temperature	5°C (41°F)
Maximum Operating Ambient Temperature	35°C (95°F)
Maximum Relative Humidity	80% Non-Condensing
Minimum Storage Temperature*	-20°C (-4°F)
Maximum Storage Temperature*	60°C (140°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

Plasma N_2 Maximum Flow	25 L/min (0.88 cfm) @ 87 psi (6 bar)
Pop Air Maximum Flow	36.5 L/min (1.28 cfm) @ 87 psi (6 bar)
Atmospheric Dew Point (Dry Air)	-20°C / -4°F
Nitrogen Purity	99.5%
Particles	NONE
Phthalates	NONE
Suspended Liquids	NONE
Gas Outlets	2 x ¼" BSPP Female
Drain Outlet	1 x ¼" BSPP Female
Pressure Gauges	3
Start-Up Time for Purity	< 20 mins

Electrical Requirements

Voltage	230 VAC ± 10%
Frequency	50/60 Hz
Current	8.0 Amps
Input Connection	C20 Plug
Power Cord	C19 socket to local connection (10A minimum)
Pollution Degree	2
Insulation Category	II

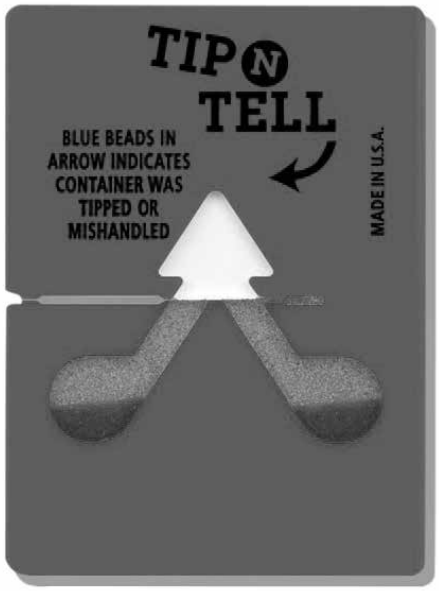
General

Dimensions mm (inches) WxDxH	570 x 870 x 765 (22.4 x 34.2 x 30.1)
Generator Weight Kg (lbs)	155 Kg (341.7 lbs)
Shipping Weight Kg (lbs)	182 Kg (401.2 lbs)

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' and 'TIP-N-TELL' labels for signs of rough handling prior to unpacking.



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 to the desired location.

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 and warranty registration card. Be careful not to discard these with the packaging.

Fittings Kit Contents

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

1. 5mm Allen key x 2
2. 6mm Push Fit Tube Fitting x 3
3. ¼" Compression Tube Fitting x 2
4. 6mm High Temp Tubing x 6m
5. ¼" Teflon Tubing x 6m
6. C19 Mains Cable (UK) x 1
7. C19 Mains Cable (Euro) x 1
8. C19 Mains Cable (US) x 1
9. Flow Control Silencer x 2

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

Installation

Generator Environment

The generator is designed for indoor use only. It should be installed adjacent to the application it is supplying. If this is not convenient then the unit can be sited elsewhere, however, consideration should be made of the lengths of pipe runs as pressure drops can result from extended runs of pipe.

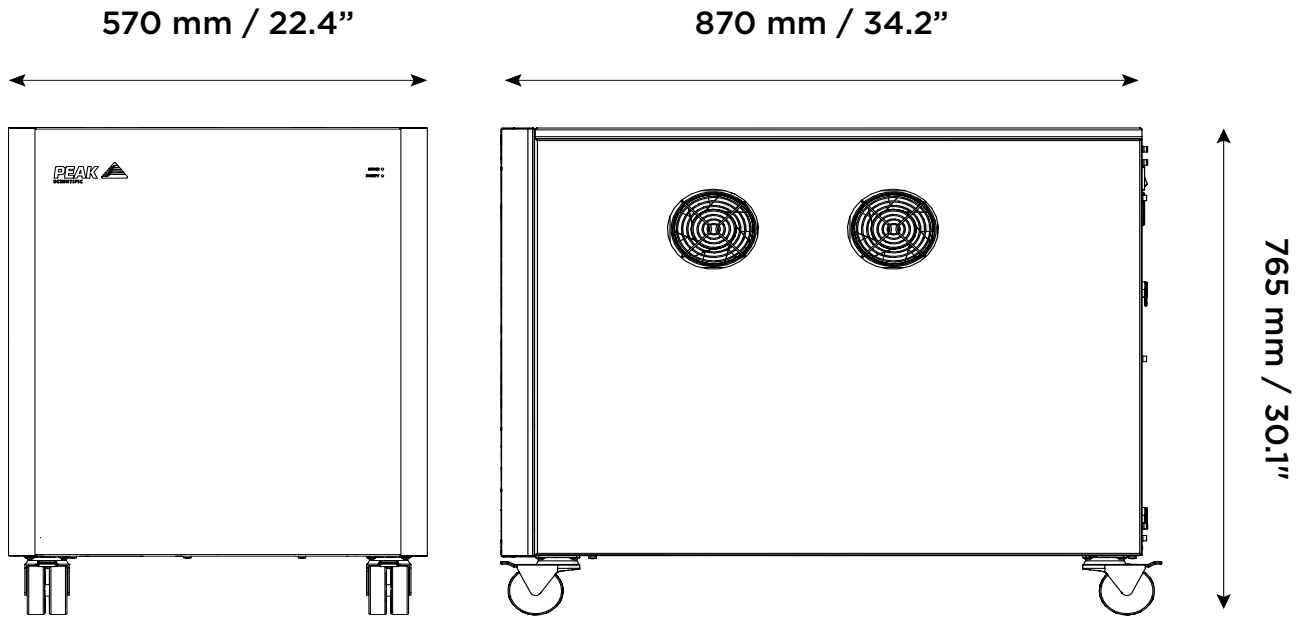
Performance of the generator (like all sophisticated equipment) is affected by ambient conditions. Note should also be taken to the proximity of Air Conditioning outlets. These can sometimes give rise to “pockets” of air with high relative humidity. Operation of the unit within such a pocket could adversely affect its performance. Consideration should also be given to the air flow around the unit. It is recommended that an air gap of 75mm (3”) should be maintained down both sides and at the rear of the unit. Please refer to the drawing on the following page for the general dimensions of the unit.

Minimum Operating Ambient Temperature: 5 °C (41 °F)

Maximum Operating Ambient Temperature: 35 °C (95 °F)

Generator Overview

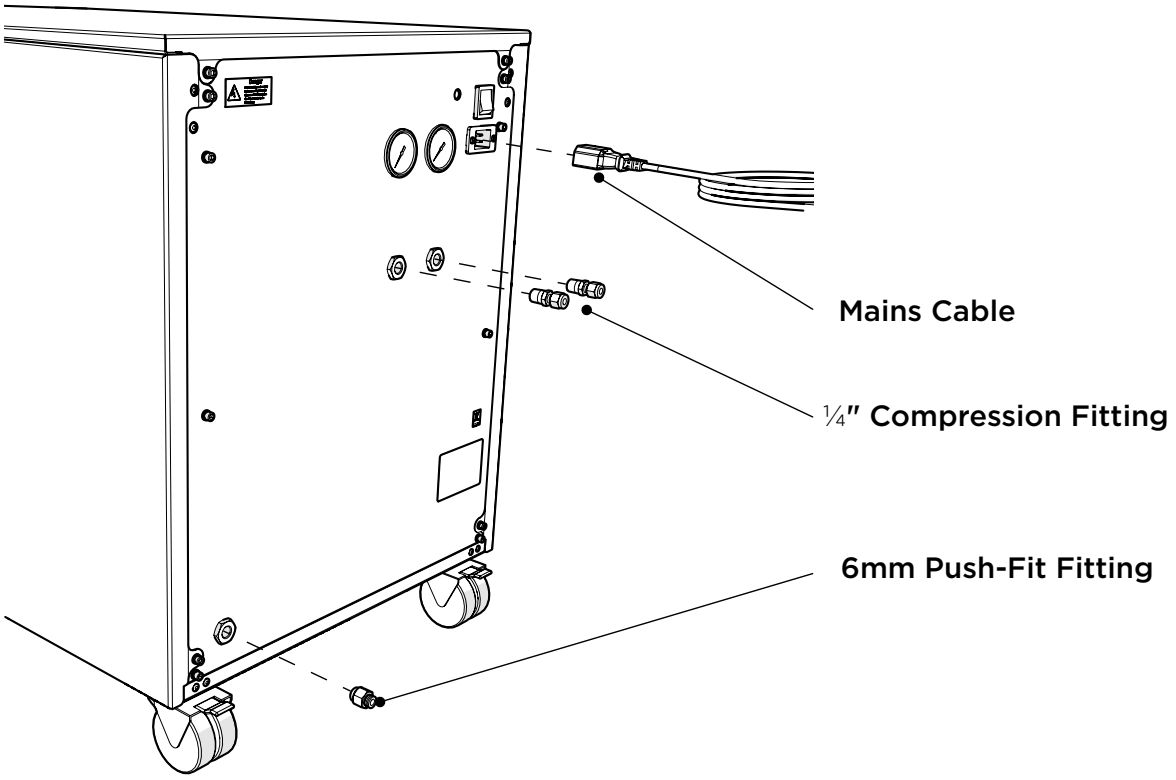
General Dimensions



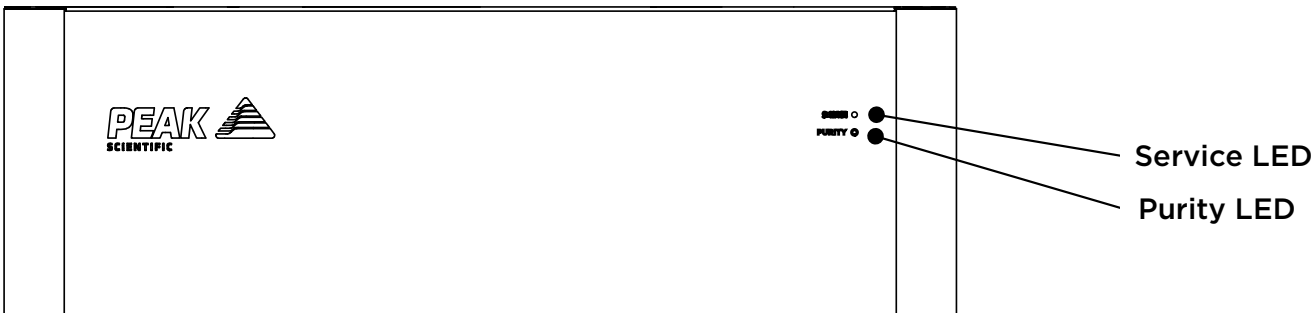
WARNING

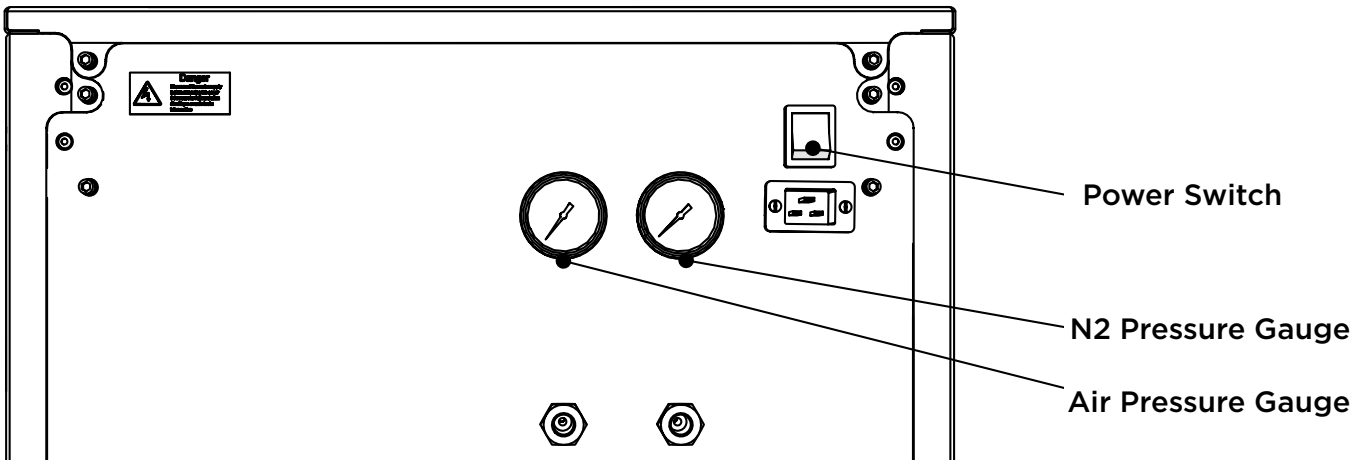
The generator must always be placed on a flat, level surface. Failure to do so will affect the performance of the generator.

Rear Connections



Unit Controls





Drain Connection

Fit the 6mm push fit fitting (item 2 from fittings kit) to the drain port located on the output panel (see Figure). Tighten using a 16mm or 5/8” spanner. Use the 6mm tubing (item 4 from fittings kit) to connect this to a suitable drain connection or container. It should be noted that the Generator can expel a considerable amount of water from this (dependant on ambient humidity).

If a container is used it should be emptied at regular intervals. The container must NOT have an air tight seal as water and air are expelled at pressure.

Electrical Connection

Connect the generator to an appropriate 230 volt single-phase supply, 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, appropriately rated, 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

Our electrical requirements are 230VAC nominal +/- 10%. This means that the Generator can accommodate transients between 207VAC and 253VAC. However, running continuously at voltages less than 220V is not recommended and extended periods at these extremes can have a detrimental effect on the operation and life of the Generator. If the voltage supply is uncertain then a voltage check is highly recommended.

If a substitute main supply cord is used, ensure that it has adequate rating. Failure to do so could cause damage to the generator.

Do not touch anything inside the Generator whilst the side panels are removed and the mains power is connected to the unit

If the customer site is known to have a low power supply where the voltage reading is 219V or less, then we would highly recommend fitting a **Dual Tap Transformer 06-3210**. This can be ordered directly from Peak Scientific.

Start-Up Sequence

Before the Generator is connected to the application, the Generator should be operated in isolation (i.e. not connected to the application) until the light on the front cover illuminates green. This signifies that the purity of the output nitrogen is 99.5% and ensures any impurities present are purged from the system. Failure to do this may harm the application.

Following the voltage check, the unit should be switched off and silencers fitted to each of the three outlet ports of the output panel (ref Install Guide).

Once this is done, the Generator can be re-connected to the mains and switched on.

Pressure will start to build in the internal storage tanks which can be monitored by watching the output pressure gauge on the front panel. This will climb to the factory set pressure as noted in the specifications.

The Generator is now purged and the tubes can be connected at the rear of the unit.

Connecting to the application

Once the initial purge run has completed, the generator is ready to be connected to the application(s)

The pressure in the internal storage tanks must be allowed to dissipate before connecting the generator to the application(s)

Attach either the 6mm elbow or ¼" compression fitting to the outlet of the Generator. Using the 6mm or ¼" tubing supplied, connect the outlet of the Generator to the inlet on the application.

If you require more tubing than is supplied please refer to the Tubing Lengths section.

Once the tubing is connected to the application, please ensure that it is thoroughly checked for being leak-tight. Even the slightest leak in the gas supply between the generator and the application can lead to a reduction in efficiency.

Tubing Lengths

The diameter of the tubing which will be connected to the gas outlets is important and is determined by the length of tubing required. Failure to follow these recommendations could lead to pressure between generator and application.

< 10 meters:	Use 6/4 (6mm O/D, 4mm I/D) P.T.F.E. tubing.
> 10 - 40 meters:	Use 10/8 (10mm O/D, 8mm I/D). Tubing and fittings not supplied in the fittings kit.
> 40 metres:	Please contact Peak Scientific with the relevant distance and we will calculate the flow resistance and the tubing size required.

A combination of 6/4 and 10/8 tubing may be used to ensure that there is no large diameter tubing within the lab (i.e. for the first 20 meters from the Generator use 10/8 and the final 10 meters to the application use 6/4 tubing). Keep the connections and bends to a minimum.

The imperial equivalents are: 6/4 = 1/4" O/D, 3/16" I/D.

10/8 = 3/8" O/D, 5/16" I/D.

Normal Operation

The generator is designed specifically to minimize operator involvement. Given that the system is installed as described in earlier sections and is serviced in accordance with the specified maintenance recommendations (see Service Requirements), then it should simply be a matter of turning the generator on when it is required.

The generator will automatically produce the factory set flow and pressure as detailed in the Technical Specifications.

On Demand Gas

When the application requires a gas flow, the generator will produce gas on demand.

The generator will continue to supply gas whilst the application is in a ‘Standby’ mode. As soon as a demand is detected from the application, the generator will match the applications requirements.

Unusual Operation

If at any time the generator begins to emit excessive noise or vibration, then it should be switched off and you should contact Peak Scientific or the Peak Partner from which the generator has been purchased.

Service Requirements

Service Schedule

Purchase Interval	Component	Visit
12 Months	Halo Annual Maintenance Kit*	www.peakscientific.com/ordering

* Please quote your generator serial number when ordering your Annual Maintenance Kit to ensure selection of the appropriate kit for your generator.

Service Indication

The generator has the following Service Indication Stages:-

Stage 1

Once either compressor requires a service the LED indicator (yellow) on the front of the generator will illuminate.

This is to make the user aware that a service of the generator is due and should be planned at the earliest convenience. The generator will continue to operate as normal with the LED on.

Stage 2

If the service is not completed the generator will continue to run. After 2 weeks, the service LED indicator (yellow) will start to flash.

This is to make the user aware that the service of the generator is now overdue and must be completed immediately to ensure the continuous trouble free operation of the generator.

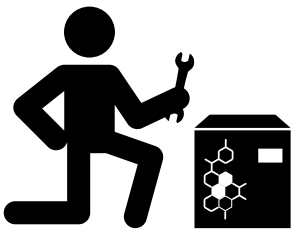
Service Indication Reset

Once the service has been completed the Service Indication LED can be reset in the main control PCB. This will be performed by the Peak Service Engineer or trained service representative that completes the service operation.

Peak Protected

With Peak Scientific you invest in not only a product but peace of mind. With a network of certified Peak engineers stationed throughout the globe, Peak's rapid response team are never far away and our commitment is to keep your generator running day in, day out, protecting your laboratory workflow.

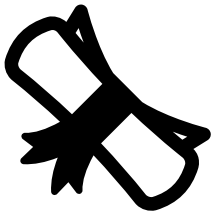
[Peak Protected] can provide...



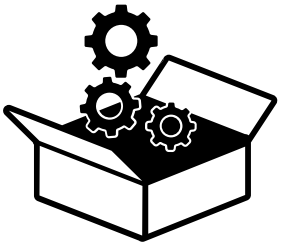
Installation
A dedicated Peak engineer will visit your lab to install and setup your generator

Complete plan
Swift response by a Peak Service Engineer within 72 hours & planned preventative maintenance

Premium Protected
Guaranteed rapid on-site response within 24 hours & planned preventative maintenance



IQ/OQ
Certified assurance for applications requiring documented qualification



Spares
Genuine Peak parts with express delivery, ensuring optimal performance and lifetime

Technical Support Hotline
Around the clock support by phone or online with our global technical helpdesk

To find out more about protecting your investment visit: www.peakscientific.com/protected

Cleaning

Clean the outside of the generator only using warm soapy water and a clean damp cloth. Ensure all excess fluid is thoroughly removed from the cloth 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.

Care should be taken with Leak Detections Liquids.

Troubleshooting

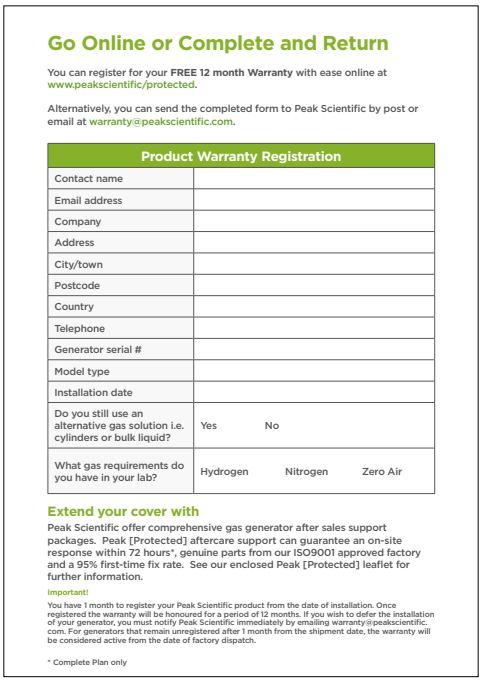
Problem	Possible Solution
The Generator will not switch on and the power switch does not illuminate.	• Ensure power cord is plugged into the Generator and that the power socket is turned on. • Check the fuse in the power cord plug. • Contact your service provider. 
The Generator will not switch on but the power switch is illuminated.	• Ensure power cord is plugged into the Generator and that the power socket is turned on. • Check the fuse in the power cord plug. • Contact your service provider. 
Compressors are running but pressure is not building.	• Contact your service provider.
The MP-AES reporting low pressure.	• Check pressure gauges are showing normal pressure. • Contact your service provider.
Yellow “SERVICE” LED on front panel is on constantly.	• A compressor(s) due for service. Contact your service provider. • Refer to Service Indication section of this manual for further information.
Yellow “SERVICE” LED on front panel is flashing.	• A compressor(s) has not cycled for 8 hours. Refer to the Run Time Alarm section of this manual. • Ensure ambient temperatures are within the specification. • Turn the Generator off and on to reset the alarm and contact your service provider.

Go Online or Complete and Return

We know that registering any of your recently purchased products is not the first thing on your mind- but it is very important to both of us. Not all warranties are alike and Peak Scientific stand out against other gas suppliers as we offer a comprehensive, quick response, on-site warranty. This means that in the very unlikely case that your gas generator develops a fault we have rapid support teams on-hand around the world who are able to come to your lab and get you back up and running in no time.

Register for your **comprehensive 12 month on-site warranty** with ease online at www.peakscientific.com/protected.

Alternatively, you can send the completed form to Peak Scientific by post or email at warranty@peakscientific.com.



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Alternatively, you can send the completed form to Peak Scientific by post or email at warranty@peakscientific.com.

Product Warranty Registration	
Contact name	
Email address	
Company	
Address	
City/town	
Postcode	
Country	
Telephone	
Generator serial #	
Model type	
Installation date	
Do you still use an alternative gas solution i.e. cylinders or bulk liquid?	Yes No
What gas requirements do you have in your lab?	Hydrogen Nitrogen Zero Air

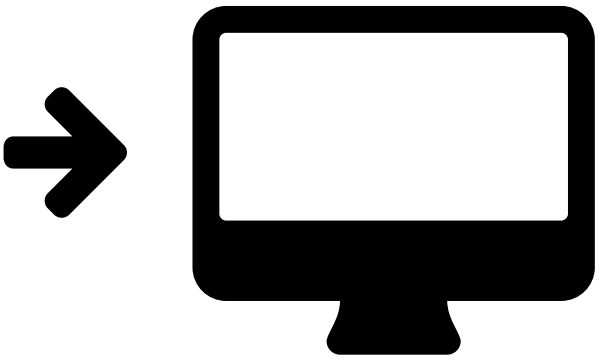
Extend your cover with

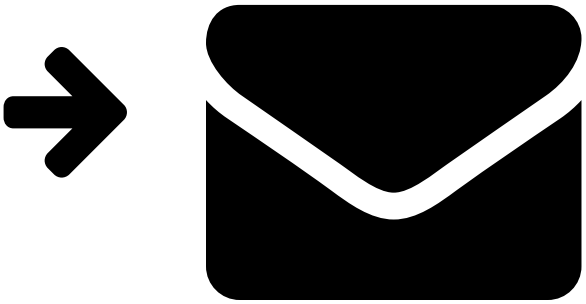
Peak Scientific offer comprehensive gas generator after sales support packages. Peak [Protected] aftercare support can guarantee an on-site response within 72 hours*, genuine parts from our ISO9001 approved factory and a 95% first-time fix rate. See our enclosed Peak [Protected] leaflet for further information.

Important!

You have 1 month to register your Peak Scientific product from the date of installation. Once registered the warranty will be honoured for a period of 12 months. If you wish to defer the installation of your generator, you must notify Peak Scientific immediately by emailing warranty@peakscientific.com. For generators that remain unregistered after 1 month from the shipment date, the warranty will be considered active from the date of factory dispatch.

* Complete Plan only





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CSA Compliance Statement

CSA Group (Canadian Standards Authority) is a Nationally Recognised Testing Laboratory (NRTL), headquartered in Toronto Canada.

They are authorised to evaluate product to both their own and Underwriters Laboratory (UL) standards and certify the product to be in compliance to the relevant standards.

Peak products are certified to the current in force revision of the following standards in order to cover both Canadian and United States requirements for “Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use, Part 1: general Requirements”.

Canada: CAN/CSA C22.2 No 61010-1-12

United States: UL 61010-1

As a result the products covered by this statement are certified and listed by CSA accordingly and are entitled to carry the CSA mark with both Canadian and United States subscripts , as shown below on the product rating label.

[PEAK Protected]™

Peak Scientific has highly trained, fully certified Field Service Engineers located in over 20 countries across every continent around the world. This allows us to provide an industry-leading rapid response service to our customers. With **[Peak Protected]**, your laboratory's productivity becomes our top priority.

To discuss Peak Protected generator cover and payment options speak to your local Peak Representative or for further information contact: **protected@peakscientific.com**

Peak Scientific
Fountain Crescent
Inchinnan Business Park
Inchinnan
PA4 9RE
Scotland, UK
Tel: +44 141 812 8100
Fax: +44 141 812 8200

For further information on any of our generator products please contact **marketing@peakscientific.com**

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PEAK SCIENTIFIC