

# *Fusion 1010 User Manual*



## Contents

Change History	4
How to use this Manual	4
Introduction	5
Warranties and Liabilities	6
Safety Notices	7
Symbols	7
Safety Notice to Users	7
EU Declaration of Conformity	8
UK Declaration of Conformity	9
WEEE Compliance Statement	10
Technical Specification	11
Environment	11
Generator Outlets	11
Electrical Requirements	11
General	11
Unpacking	12
Installation	13
Generator Environment	13
General Dimensions	13
Removal of Transit Bracket	14
Unit Controls	14
Rear Connections	16
Drain Connection	16
Electrical Connection	17
Connecting to the Application	18
IMPORTANT DOCUMENTS	19
Normal Operation	20
Start-up Sequence	20

Normal Operation	20
Restart Times	21
On Demand Gas	21
Generator Cycling	21
Unusual Operation	21
Service Requirements	22
Compressor Service	22
Service Indication	22
Service Indication Reset	23
Service Plans	23
Cleaning	23
User Interface	24
Indicator Chart	24
Trouble Shooting	25

## Change History

Rev.	Comment	Name	Date
1	Initial release	Colin Marshall	05/04/2011
2	Content update	Liam Couttie	10/06/2014
3	Technical Specification Update	Liam Couttie	11/01/2016
4	Fittings Kit Update	Liam Couttie	25/01/2016
5	Declarations Update	Liam Couttie	22/11/2021

## 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.

## *Introduction*

Designed primarily for ultra high purity gas chromatographs where even the smallest amount of hydrocarbon contamination can give rise to a high base line. The Fusion 1010 Gas Generator combines efficient and regenerative PSA Technology with Heated Catalyst Technology to effectively produce Zero Nitrogen and Zero Air from two separate outlets.

The Generator is suitable to supply Zero Nitrogen and Zero Air to applications which require a gas input free of any hydrocarbon content. The Generator further provides the ideal solution for customers performing analysis in environments with high hydrocarbon content due to industrialization.

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

Enclosed in this manual you will find the information required to ensure that your Generator is operated according to our recommended guidelines which will prepare you for long and trouble free compressed air generation.




## *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.
  - 4.1. 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
  - 4.2. 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 Fusion 1010 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.*

## 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: Fusion 1010

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.**

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: 22nd 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: Fusion 1010

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,  
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Date: 22nd November 2021



## 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

### Environment

Minimum operating ambient temperature	5°C (41°F)
Maximum operating ambient temperature*	30°C (86°F)
Maximum relative humidity	80% Non-Condensing
Maximum operating altitude	2000 meters
Minimum storage temperature*	-20°C (-4°F)
Maximum storage temperature*	60°C (140°F)

\* 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

Zero Air	1.5 L/min @ 4.2 Bar (60 PSI)
Zero Nitrogen	0.6 L/min @ 5.6 Bar (80 PSI)
Particles	<0.01µm
Phthalates	NONE
Suspended liquids	NONE
Gas outlets	2 x 1/4" BSPP
Drain outlet	1 x 1/4" BSPP
Pressure gauges	2

### Electrical Requirements

Voltage	230 VAC ± 10%
Frequency	50/60 Hz
Current	4.5 Amps
Input connection	C20 Plug
Power cord (Supplied)	C19 socket to local connection (13A minimum)

### General

Dimensions in cm (inches) W x D x H	51.1 x 76.2 x 71.2 (20.1 x 30 x 28)
Weight	86.5kg (191 lb)
Shipping weight	128kg (282 lb)
Noise level	54 dBA @1m

## 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 unpacking –



*Any damage should be reported immediately to the carrier and peak scientific or peak partner / distributor 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 create and to manoeuvre the Generator onto the floor.

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

Note: Included with the Generator is a "Fittings Kit" with all the required fittings. Be careful not to discard these with the packaging.

## Installation

### Generator Environment



The Generator is designed for indoor use only. It should be installed adjacent to the instrument it is supplying. If this is not convenient then the unit can be sited elsewhere, however, consideration should be made to 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, at the rear and across the top of the unit. Please refer to the drawing below for the general dimensions of the unit.

Maximum Operating Ambient Conditions: 30°C (dry bulb) 80%RH (Max)

### General Dimensions

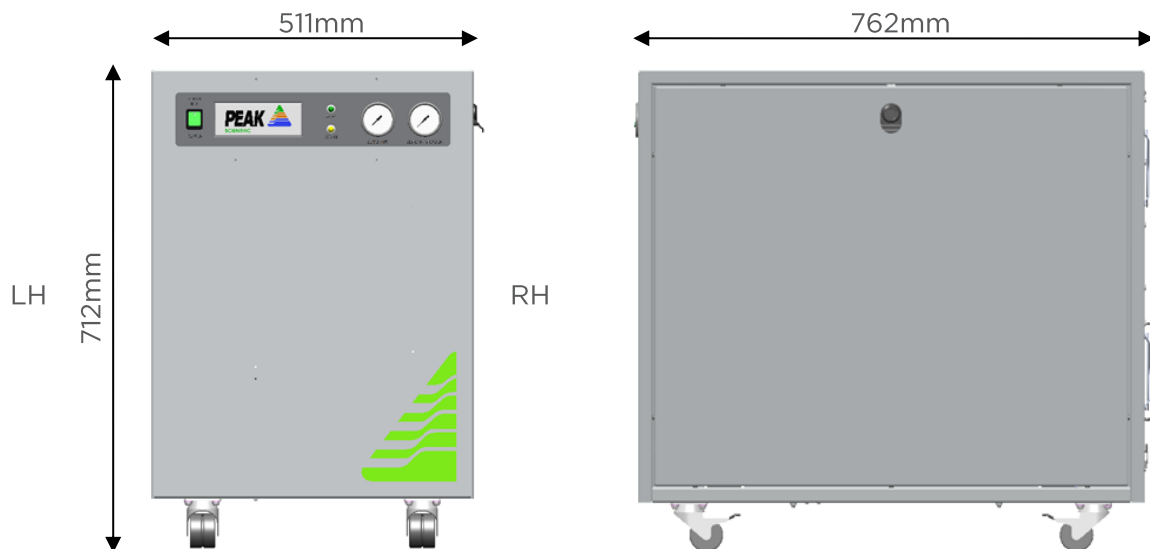


Figure 1: General Dimensions



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

## Removal of Transit Bracket



The transit bracket must be removed prior to switching the unit on. Failure to do so will result in damage to the equipment. This will void the warranty on the Generator and will result in a chargeable repair.

1. Using the 8mm hex key from the Fittings Kit, remove the right hand side cover from the cabinet. Ensure the earth cable is disconnected.
2. Remove the four screws with a #3 Pozi-drive Screwdriver. See figure 2.
3. Slide the transit bracket out from under the compressor by pulling it towards you. See figure 3.
4. Retain the transit bracket as this must be refitted if the Generator is to be transported again.

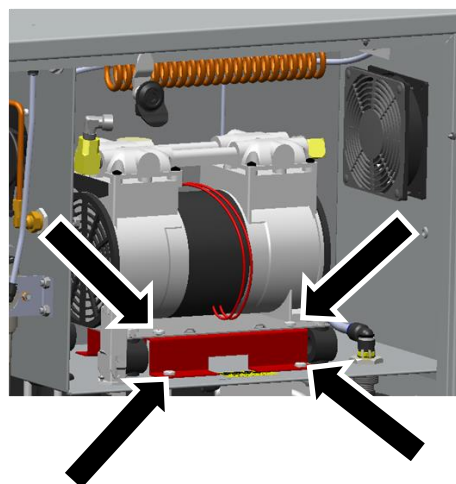


Figure 2: Remove the four screws

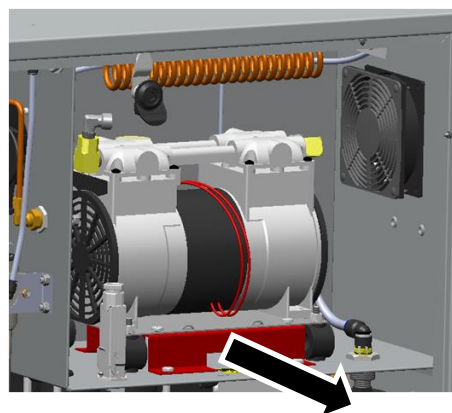


Figure 3: Slide out Bracket



Ensure the Earth wires are reconnected to the side cover when refitting.

### Unit Controls

Power  
switch

Ready  
LED

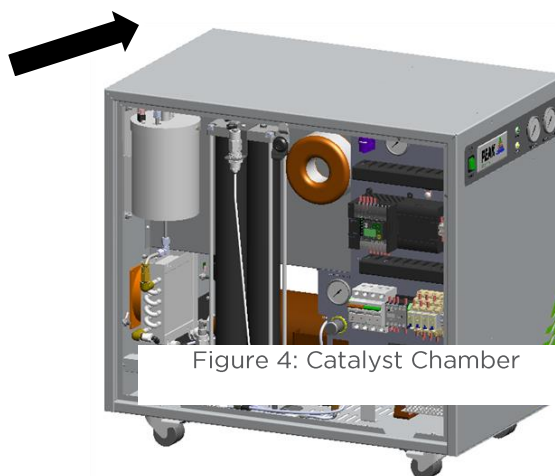
Pressure gauges  
Zero Air    Zero Nitrogen



*The Catalyst chamber and connecting components are extremely HOT.*



*DO NOT REMOVE left hand side panel unless suitably qualified.*



## Rear Connections

Supplied in the Fittings Kit are all the fittings required to connect the Fusion 1010 Generator to the appliance. The contents of the Fittings Kit are as follows:

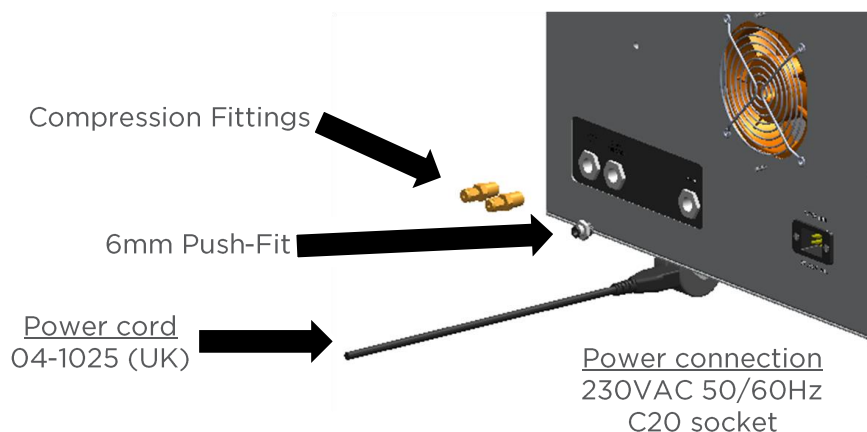


Figure 3: Rear connections

1.	8mm Hex Key	x 1
2.	6mm Push-Fit Fitting	x 1
3.	1/4 x 1/8" Compression Fitting	x 2
4.	6mm PE Tubing	x 3m
5.	1/8" Copper Tubing	x 3m
6.	C19 Mains Cable (UK)	x 1
7.	C19 Mains Cable (EU)	x 1
8.	C19 Mains Cable (US)	x 1

All of the Generator output ports are located on the output panel at the rear of the Generator. See Figure 3.

## Drain Connection

Fit the 6mm push fit fitting (item 2 from fittings kit) to the drain port located on the output panel (see Figure 3). 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 a 230 volt single-phase supply using the power cord provided (Figure 3). If the appropriate power cord is not supplied; a new plug, rated to at least 13 amps, can be fitted by a qualified electrician.

### Important Electrical Notice



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.

## Connecting to the Application

Please refer to and follow the Installation Guide provided in the fittings kit.

Once the initialisation has completed, attach the two compression fittings supplied in the fitting kit with the Generator. Using the copper tubing supplied connect each outlet of the Generator to the corresponding inlet .

Note: Ensure that the correct output ports on the generator are connected to the correct input ports on the Application.

Failure to do so will result in the wrong type of gas at the wrong pressure being delivered and could damage the Application.



It should be noted that the gas pressures and flows are factory set.



Once the tubing is connected, please ensure that they are thoroughly checked for being leak-tight. Even the slightest leak in the gas supply between the Generator and the consuming instrument can lead to a reduction in efficiency, or possible alarm of the Generator.

## 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:	<b>GENERATOR SERIAL NUMBER:</b>
POSTCODE:	
COUNTRY:	MODEL TYPE:
TELEPHONE:	<b>INSTALLATION DATE (DD/MM/YYYY):</b>

### *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.

## Normal Operation



Please ensure the Installation guide, supplied in the fittings kit, is followed before operation of the generator.

## Start-up Sequence

Once connected to the mains supply the Generator can be switched on. Turn on the Generator using the power switch on the front panel.

Once the Generator is switched on it will step through its initialisation procedure as follows, (throughout this initialisation process the green indicator will pulse to indicate initialising):

1. The Catalyst chamber will heat up to the required temperature. (>360°C) accompanied by a slow green LED pulse, this will take approximately 24 minutes.
2. When the required temperature is reached the compressor will start. A visible increase in pressure will be witnessed on the front panel Zero Air gauge (fig 3) indicating output flow of Zero Air up to 60 psi. The tank pressure will increase higher.
3. Once the relevant tank pressure is reached, the Zero N2 system will start its purge cycle. The green LED pulse will quicken. A visible increase in pressure will be witnessed on the front panel Zero Nitrogen gauge (fig 3) indicating output flow of Nitrogen. The following will be true.
  1. The Generator has reached temperature
  2. The Generator has reached pressure
  3. The Generator is now purging impurities.
4. Once the purge cycle is complete the green LED will illuminate to signal that both outputs of the Generator are ready to use, i.e. when it stops pulsing and remains 'on' continuously.

The compressor will then cycle as and when required by the internal system.

## Normal Operation

The Fusion 1010 Gas 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](#)), 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.

## *Restart Times*

The start time for the Fusion 1010 generator on first time power up is approximately 3 hours. Subsequent initialisation times are proportional to the length of time since it was last in a 'ready' state.

Please note these times should be considered an estimate and will vary dependent on ambient temperature.

Typical start-up estimates are shown below.

<b>Power Outage Time</b>	<b>Start Up (approx)</b>
to 1 hours	Up to 12 minutes
1-2 hours	1 hour 20 mins
More than 2 hours	2 ½-3 hours



Using the generator out with these times may result in a lower purity gas supply

## *On Demand Gas*

The Generator has its own internal gas reservoirs to enable it to meet demand as and when required by the application.

## *Generator Cycling*

The Generator is designed for the internal compressor to cycle. This cycling reduces the duty (run time) on the compressor. The rate at which it cycles will be dependent on the gas required to satisfy demand. If the application demands the maximum gas flow of the Generator, the compressor duty will be higher, (the rest period in the compressor cycle will be shorter).

## *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 your local representative or Peak Scientific as soon as possible.

## Service Requirements

Service Interval	Component	Part No.	Qty.
12 months	First stage filter element	00-0031	1
	Second stage filter element	00-0032	1
	Inlet filter element	02-4640	1
	Silencer	02-6005	2

Table 2: Service

As an alternative to purchasing these 12 month service items individually an Annual Service Kit is available as one part number. This offers a costs saving over buying the components separately. Please note this does not include the compressor service.

Purchase Interval	Component	Part No.	Qty.
12 months	Fusion 1010 annual service kit	08-8313	1

Table 3: Annual service kit

## Compressor Service

The Fusion 1010 Gas Generator features a built-in low noise oil-free compressor. In order to prevent unexpected loss of pressure it is recommended that the compressor be either serviced or replaced at the same time as the Annual Service is carried out.

Compressor Service	Component	Part No.	Qty.
12 months	Compressor assembly	08-8314	1
	**Compressor re-fit	06-5542	1

Table 4: Compressor Service

\*\* Compressors can be re-fitted as an alternative to replacement up to a maximum of 3 times, this is a more cost effective solution, however a degree of technical expertise is required and can be time consuming. Please contact your service provider for more information.

After servicing, the Fusion 1010 Generator should be allowed to run for three hours prior re-connection to the application.

## Service Indication

Due to the simplicity of the design and the small number of moving parts in the 'Fusion 1010', the generator will have a long and trouble free life. However, the components mentioned should be replaced to maintain optimum performance levels and maximum runtime.

Peak Scientific has programmed the generator to go through the following Service Indication Stages:

### Stage 1

12 months from first power on, the service LED indicator (yellow) on the front of the generator will light.

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

## *Stage 2*

14 months after first power on, the service LED indicator (yellow) will begin to pulse. This is to indicate that a service is now overdue and should be carried out immediately.

Failure to follow the recommended maintenance will invalidate the product warranty.

Servicing and/ or repair of the generator should only be undertaken by a technically competent person with the generator safely isolated.

## *Service Indication Reset*

Only once the service has been completed can the Service Indication LED be reset. This will be performed by the Peak Service Engineer or trained service representative that completes the service operation.

## *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 uninterrupted with maximum uptime and performance, please contact us at [maintenance@peakscientific.com](mailto:maintenance@peakscientific.com)

## *Cleaning*



CAUTION

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.



CAUTION

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.

## User Interface

### Indicator Chart


The Fusion 1010 monitors the cycling of its internal compressor and heater element. During abnormal operation or component failure the system will signal fault by means of altering the Green and Yellow LED indicator states. These LED's will also indicate a Service due.

These differing states are shown below in the Indicator Chart

<b>Green</b>	<b>Yellow</b>	<b>State</b>
Off	Off	No power
Slow Pulse	Off	Catalyst chamber heating
Quick Pulse	off	Purging impurities
On	Off	Ready to use
Any status	ON	Compressor service due
Any status	Pulse	Compressor service overdue



## 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> 
The Generator will not switch on but the power switch is illuminated.	<ul style="list-style-type: none"> <li>• Contact your service provider.</li> </ul>
Compressor is running but pressure is not building.	<ul style="list-style-type: none"> <li>• Contact your service provider.</li> </ul>
The application is reporting low pressure.	<ul style="list-style-type: none"> <li>• Check pressure gauges are showing <u>normal pressure</u>.</li> <li>• Check for leaks between the generator outputs and consuming instrument.</li> <li>• Contact your service provider.</li> </ul>
Green LED is Flashing.	<ul style="list-style-type: none"> <li>• The Generator is in initialising i.e start up mode. If pressure does not build after 30 minutes, Contact your service provider.</li> <li>• Refer to <u>Service Indication</u> section of this manual for further information.</li> </ul>
Yellow LED on front panel is on	<ul style="list-style-type: none"> <li>• A compressor is due for service. Contact your service provider and make arrangements for this.</li> </ul>
Yellow LED on front panel is flashing	<ul style="list-style-type: none"> <li>• A compressor is overdue for service. Contact your service provider urgently.</li> </ul>
Other LED combinations	<ul style="list-style-type: none"> <li>• Refer to <u>Service Indication</u> section of this manual for further information.</li> </ul>

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