SCTOCA User Manual

Contents

Change History

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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 the Peak Partner from which you purchased your Generator.

Introduction

The SCTOCA 500cc generator has been developed to cater for systems which require a pure gas supply free of hydrocarbons with no carbon dioxide.

This model provides a source of gas with other features including:

- Quiet in operation – noise level of 57 db(A)
- Anti-vibration – maximum reduction of vibration
- Minimum user intervention
- Improved drainage – reduction of moisture carry over and thus increased reliability
- Robust control system – improves safety and reliability of units.

With the SCTOCA based on proven technology, it removes moisture, hydrocarbons and CO_2. Its own internal air compressor makes this unit independent from in–house air.

To ensure this Generator model meets our high expectations with regards to reliability and performance, we have tested this new model extensively at our manufacturing plant and with end users around the world 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 **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.
	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.

Table 1 - Safety Symbols

Safety Notice to Users

These instructions must be read thoroughly and understood before installation and operation of your Peak SCTOCA 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.

Declaration of Conformity

We **Peak Scientific Instruments Ltd.**

of **Fountain Crescent, Inchinnan. Renfrewshire PA4 9RE**
declare that:

Equipment **TOC Gas Generator**

Model **SCTOCA**

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

- **Low Voltage Directive 2006/95/EC**
  EN 61010-1: 2010
  Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.

- **Electromagnetic Compatibility Directive 2004/108/EC**
  EN 61326-1: 2006
  Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements.

All evaluation, testing and certification issued by:

York EMC Services Ltd.
Donibristle Industrial Park
Dunfermline
Fife
KY11 9HZ

Signed By: 

Name: Chris Pugh

Position: Engineering Director

Done at: Peak Scientific Instruments Ltd, Inchinnan, Scotland.

Date: 20th of November 2011

CE

Environmental Declaration

We **Peak Scientific Instruments Ltd.**

of **Fountain Crescent, Inchinnan. Renfrewshire PA4 9RE**

declare that:

Equipment **Generator**

Model **SCTOCA**

Is fully compliant with the following Directives:

2002/96/EC WEEE (Waste of Electrical and Electronic Equipment)

2002/95/EC RoHS (Restriction of Hazardous Substances)

Peak Scientific Instruments Ltd fully complies with its obligations towards the European WEEE (Waste of Electrical and Electronic Equipment) Directive 2002/96/EC. These obligations are being met within the B2B compliance group.

Peak Scientific Instruments Ltd has developed all reasonable 'due diligence' controls to ensure that our products comply with the principles and requirements of the European RoHS (Restriction of Hazardous Substances) Directive 2002/95/EC. Similar directives in the United States and China, for example, have also been captured within this program.

Where a specific certificate of compliance is required, this can be requested, on a product serial number basis, directly from Peak Scientific Instruments Ltd, by contacting us through our website on www.peakscientific.com

Signed By: 

Name: Chris Pugh

Position: Engineering Director

Done at: Peak Scientific Instruments Ltd, Inchinnan, Scotland.

Date: 6th December 2010

Technical Specification

Environment

Minimum operating ambient temperature	5°C (41°F)
Maximum operating ambient temperature	30°C (86°F)
Maximum relative humidity	70%
Maximum altitude	2000 Meters
Minimum storage temperature*	-20°
Maximum storage temperature*	60°

*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

Maximum Output Flow	500CC/Min
Purge Flow Rate	2600CC/Min
Maximum Output Pressure	80psig
Pressure Dew Point	-70°C (94°F)
Particles	<0.01 µm
Gas Outlets	1 x ¼" BSP
Drain Outlets	1 x ¼" BSP
Pressure Gauges	1
Phthalates	NONE
Suspended Liquids	NONE

Electrical Requirements

@230V AC+-10% (50/60Hz)	4 Amps
Fuse	6.3 Amps
Electrical Connection	Single Phase Power Cord
Noise Level	57 dBA @ 1m

General

Dimensions in cm (inches) W x D x H	361.5 x 570 x 714.5 (14.2 x 22.4 x 28.1)
Weight	55kg (121lbs)
Shipping weight	80kg (176lbs)

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 floor.

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 and US also all the required fittings. Be careful not to discard these with the packaging.

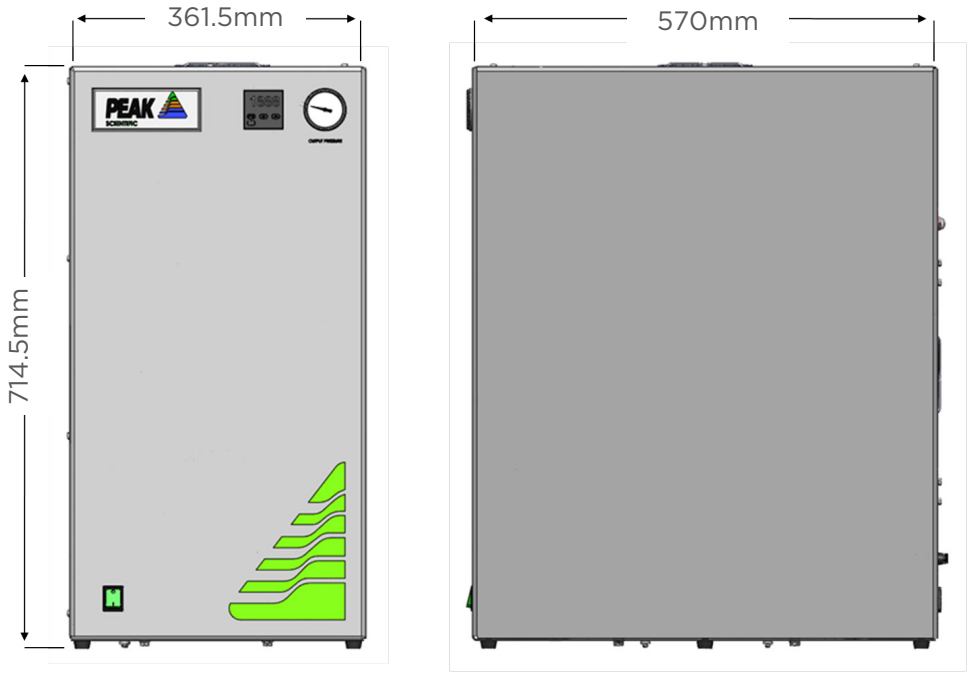
Installation

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 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 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.

General Dimensions



Removal of Transit Brackets

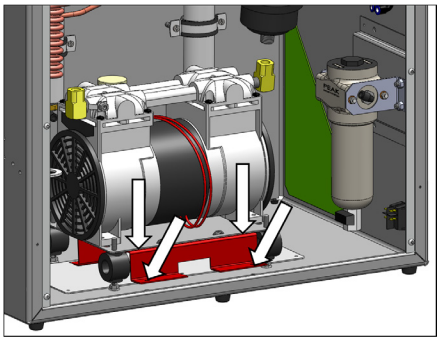
The transit bracket must be removed prior to switching the unit on. Failure to do so will result in damage to the equipment. This will void the warranty on the generator and will result in a chargeable repair.

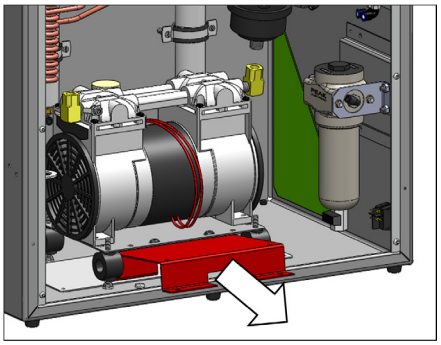
1. Use a Phillips screw driver to remove the side cover from the cabinet ensuring that the earth and fan cables are disconnected.

2. Remove the four screws with a #3 Pozidrive Screwdriver.

3. Slide the transit bracket out from under the compressor by pulling it up and towards you.

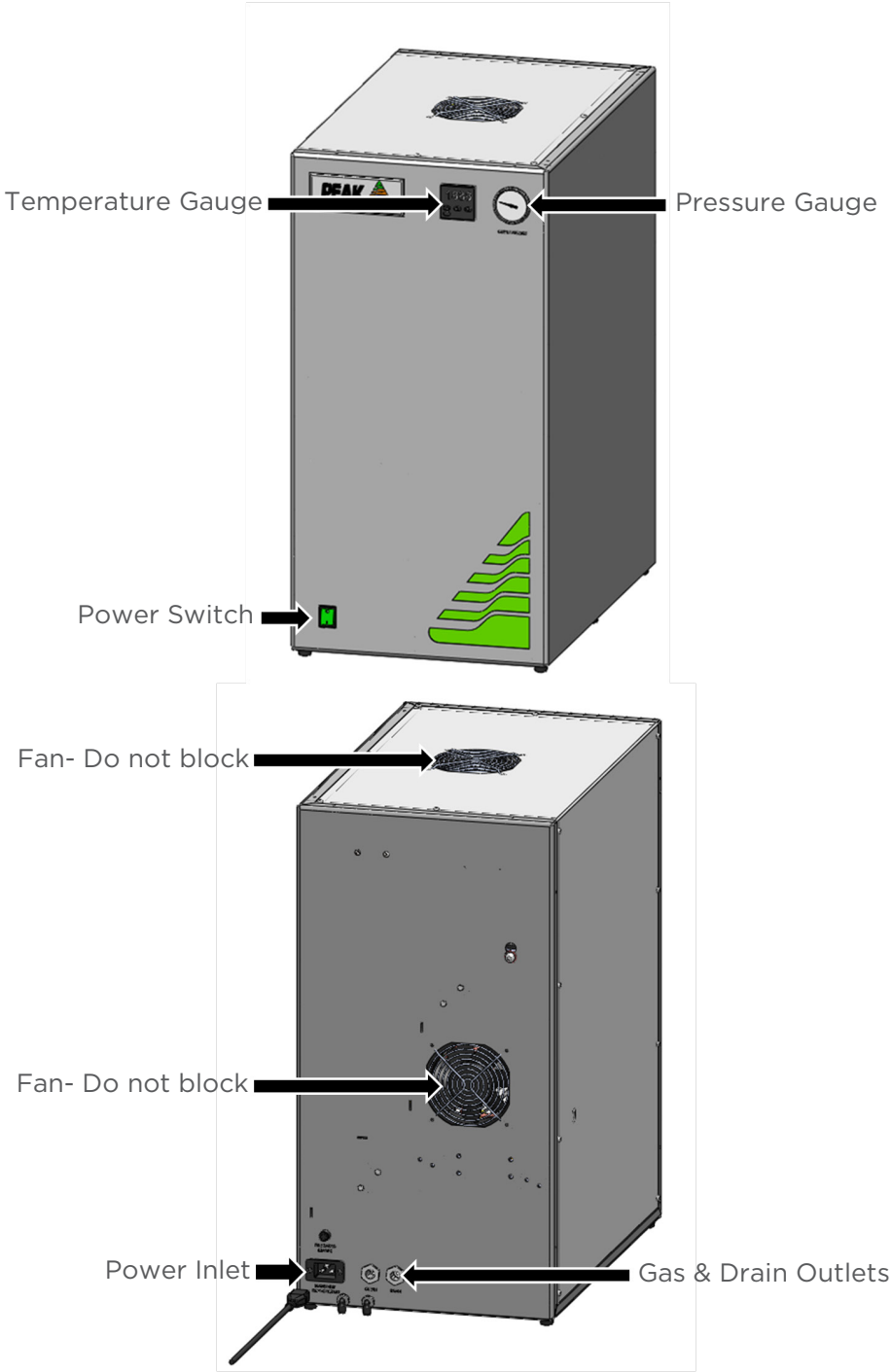
4. Retain the transit brackets as these must be refitted if the generator is to be transported again.





During and after operation of the generator, the internal components of the generator will be extremely hot for several hours. Access should be limited to suitably trained personnel. Allow 6 hours for the components to cool down.

Unit Controls & Rear Connections



Fittings Kit

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

Description	Quantity
User manual CD	1
Cable UK	1
Cable Euro	1
Cable US	1
¼" 6mm Push fit elbow	2
6mm Teflon tubing	3m
6mm Nylon tubing	3m

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

Drain Connection

Fit the 6mm push fit fitting to the drain port located at the rear of the generator and 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 must be emptied at regular intervals. The container must NOT have an airtight 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. If the appropriate power cord is not supplied; a new plug, rated to at least 12 amps, can be fitted by a qualified electrician.

This unit is classified as SAFETY CLASS 1. THIS UNIT MUST BE EARTHED. Before connecting 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 220VAC is not recommended and extended periods at these extremes can have a detrimental effect on the operation and life of the Generator.

If when the Generator is switched on, the input voltage is 219V or less, then we would recommend fitting a transformer. This can be ordered directly from Peak Scientific with the order number below.

Product Description	Part Number
Dual Tap Transformer 200V – 230	06-3200

Start Up Procedure

For a more detailed procedure, please refer to the SCTOCA installation guide supplied with the generator.
Make sure the mains power supply is switched on.
Switch on power switch located at front of generator.
Confirm LED/Temperature display is illuminated.
Almost immediately, the compressor should be heard running.
During the initial 90-120 minutes the required temperature of 400°C should be reached.
Allow a total 24 hours running, the generator can be switched off before connecting to the application.

Pressure/Flow Adjustment

The system is configured in the factory to give standard outlet pressure and flow rate (see technical specification). These settings should never require adjustment.

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 authorised service provider or Peak Scientific as soon as possible.

IMPORTANT DOCUMENTS

Warranty Entitlement

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

- **Email** warranty@peakscientific.com
- **Online** 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 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

The SCTOCA Gas Generator is designed specifically to minimize operator involvement. Given that the system is suitably matched to the application, installed as described in earlier sections, and is serviced in accordance with the specified maintenance recommendations; it should act as a long trouble free source of air to meet your needs.

In normal operation, the ON/OFF switch will be illuminated. The pressure gauge will show 80psi and the temperature display will show approximately 400°C.

The temperature may fluctuate up or down by up to 4°C.

The generator will automatically produce the factory set flow and pressure as detailed in the Technical Specifications. It should not be altered at any time.

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).

Please note that even when no gas is consumed from the generator, it will continue to cycle such to ensure immediate readiness when demand resumes.

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.

If the temperature display indicates that the system is not heating or the gauge shows that the pressure is not building, please contact your local representative or Peak Scientific as soon as possible.

Principal of Operation

The inlet air first passes through a pre-filtration process where it undergoes particulate removal (≤0.01 micron) and bulk moisture removal (by a coalescing element). A membrane dryer further reduces the moisture content before the filtered air is stored in a receiver to be consumed as required.

The SCTOCA generator works on the basis of two fundamental processes to produce the output gas.

The first process utilizes a 'Zero Air' catalytic combustion chamber. This works on the principle of catalytic oxidation where hydrocarbons from the incoming compressed air supply, from the internal receiver, are cracked to carbon dioxide and water. The hydrocarbon level in the form of methane is reduced to <0.1ppm. For this process to work the catalyst requires to be heated to approximately 400°C. Because water and also carbon dioxide are created in the catalytic process there is a necessity to effectively remove them both.

Moisture/ CO_2 Removal:-

The second process utilizes a 'Pressure Swing Adsorption' (PSA) method to further treat the air. This is where contaminant gases and moisture can be selectively adsorbed from compressed air into a porous crystalline sieve material. The adsorption process is aided by the electrostatic interaction between the adsorbent sieve material and the gaseous adsorbate. The Peak Scientific Instruments Ltd. PSA dryer system utilizes the 'Skarstrom' process where there are two columns of adsorbent used alternatively and described as follows:-

Air is fed at pressure into one of the columns and the outlet air from this column is split into two paths. Most of the air is directed to the outlet of the generator for use by the consuming instrument. The remainder, 2.6lpm, is fed back down the 'off line' column to purge out the adsorbed impurities and subsequently regenerate the column. After a time period the columns swap over to ensure on going regeneration of the previously used column thus maintaining output gas quality.

During this process CO_2 is reduced to a level of <1ppm and water moisture is removed to a level of -70°C dew point (2.5ppm @ATP).

Service Requirements

Service Schedule

Service Interval	Component	Part No.	Qty.
12 months	Coalescing filter element	00-0032	1
	Inlet filter element	02-4640	1
	RAC Filter element	00-4425	1
	Silencer	02-6005	1
	Fixed orifice fitting	02-1272	2

Table 2: Service schedule

As an alternative to purchasing the 12 month service items individually an Annual Service Kit is available as one part number. This contains all the filters required for this Generator and offers a costs saving over buying the components separately.

Purchase Interval	Component	Part No.	Qty.
12 months	SCTOCA 500cc annual service kit	08-8326	1

Table 3: Annual Service Kit

Compressor Service

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

** 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.

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

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.

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