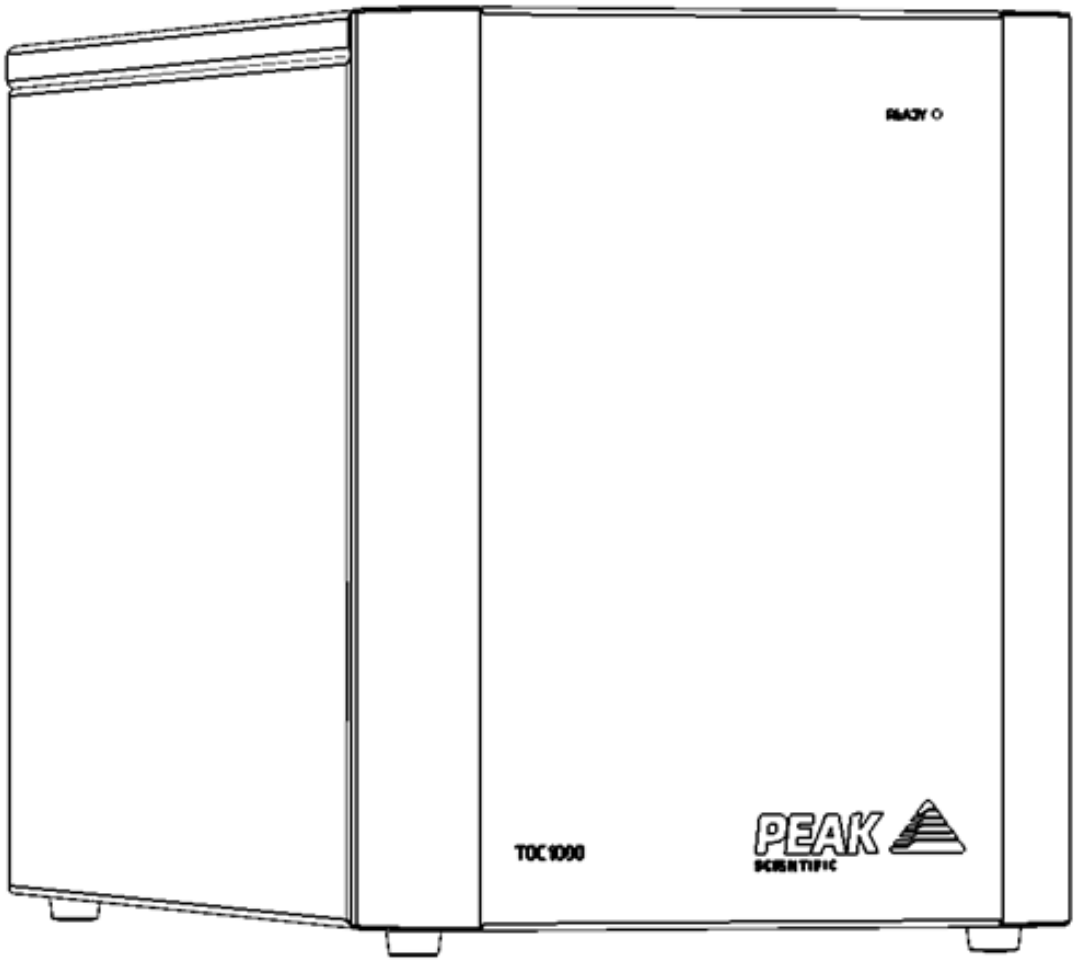
TOC 1000

User Manual



PEAK SCIENTIFIC

Contents

Change History

Rev	Comment	Name	Date
1	Initial Release	Liam Couttie	18/02/2020
2	Declarations Update	Cleo Denholm	31/08/2021
3	Compressed Air Supply Update	L. Couttie	28/07/2023
4	Spec. Update	L. Couttie	22/03/2024
5	Sticker added on	Cleo Denholm	07/06/2024

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

Warranty & Liability Coverage

1. Peak warrants that, subject to the provisions in this statement, purchased Peak generators, whether purchased directly from Peak or indirectly via an approved, certified and trained distributor or partner (referred to hereafter as a "Peak Partner") will comply in all material respects with any specifications referred to in your customer order confirmation and, subject to installation and operational guidelines being followed as described in applicable product manuals, shall be free from any defects in quality of materials or workmanship for a period of one year from the date of installation, provided this takes place within 3 months of factory dispatch.
2. Where the purchased generator is from the Precision Hydrogen series, Peak further warrants that, subject to installation and operational guidelines being followed as described in applicable product manuals, the hydrogen cell shall be free from any defects in quality of materials or workmanship for a total period of three years (inclusive of warranty period specified in clause 1) from date of installation, provided this takes place within 3 months of factory dispatch.
3. Where the purchased generator is from the i-Flow 6000 series, Peak further warrants that, subject to installation and operational guidelines being followed as described in applicable product manuals, the generator shall be free from any defects in quality of materials or workmanship for a total period of two years (inclusive of warranty period specified in clause 1) from the date of installation, provided this takes place within 3 months of factory dispatch and the following provisions have also been met:
   a. you must purchase a service plan, ensuring the generator is serviced by Peak or a Peak Partner on or before the end of the first 12 months of your ownership, and serviced at least once during each subsequent 12 month period thereafter;
   b. the generator (and any associated equipment) must have been commissioned by Peak or a Peak Partner;
   c. the feed air or inlet air supply to the generator must comply with ISO 8573-1:2010 Class 1.2.1 at all times;
   d. your air compressor, dryer, filtration and oil removal systems must be deemed suitable for use by Peak or a Peak Partner, and must be changed and serviced regularly, in line with the equipment manufacturer's recommended guidelines; and
   e. any generator failure or fault that is deemed to have been caused by the failure of any upstream equipment, component, part or system (such as air compressor, air treatment or filtration) will be excluded from the warranty described herein.
4. Where the purchased generator is from the Genius XE range, Peak further warrants that, subject to installation and operational guidelines being followed as described in applicable product manuals, the generator shall be free from any defects in quality of materials or workmanship for a total period of two years (inclusive of warranty period specified in clause 1) from the date of registration, provided the following provisions have also been met:
   a. The product must be registered within 12 months of the build date, to the end user (registrations to 3rd party resellers or other channel partners will not qualify for the warranty extension).
   b. You must purchase a service plan, ensuring the generator is serviced by Peak or a Peak Partner on or before the end of the first 13 months of your ownership
   c. The product is required to be serviced in accordance with manufacturer requirements, preventative maintenance visit must be arranged within 13 months of installation, and the generator must be serviced by Peak, or a Peak Partner within 13 months of installation.
   d. Products purchased via Peak Partners may be subject to call-out and labor charges, which is at the discretion of the Peak Partner.
5. Peak also warrants that any replacement parts whether purchased (directly from Peak, or via a Peak Partner) or supplied as part of any remedial action undertaken in line with the provisions of clauses 13 and 14, shall be free from any defects in quality of materials or workmanship for a period of 180 days from the date of factory dispatch, provided its installation is performed by Peak or a Peak Partner.
6. This warranty does not exclude Peak's liability in respect of any claim for death or personal injury to

1. any person, in so far as such can be attributed to negligence or breach of duty of care directly resulting from failure of Peak to comply with the provisions in clauses 1, 2, 3, 4 & 5.

Exclusions & Limitations

2. This warranty does not cover:
   a. damage, deterioration or malfunction resulting from an alteration or modification to a generator which has not been carried out by Peak or a Peak Partner;
   b. damage, deterioration or malfunction resulting from what Peak reasonably believes to be abuse, or misuse of a generator by you or any third party;
   c. liability for accident or neglect (other than pursuant to clause 6);
   d. maintenance or repairs which have not been carried out by Peak or a Peak Partner;
   e. operation of a generator or exposure of a generator to environmental conditions that fall out-with operational guidelines as specified in the applicable product user manual; and
   f. lightning, power surges or any other acts of God or nature.
3. This warranty is non-transferrable. Only the original owner of the generator may benefit from the terms within this statement.
4. Peak shall not be liable in respect of any claim made for costs, damages, losses or expenses (whether consequential, direct, indirect or otherwise) or in any respect howsoever arising including, but not limited to, liability from accident or negligence (other than pursuant to clause 6) that may be suffered by you or any third party.
5. No person or entity is authorised to change the terms and conditions outlined in this warranty statement in any respect, or to create any additional obligations or liabilities for any party involved.
6. This warranty statement supersedes any and all prior warranty agreements between the parties and constitutes the complete, final and exclusive understanding of the parties with respect to the subject matter. All prior negotiations, representations, or promises, whether oral or written, of either party shall be deemed to have been merged herein.
7. If any part of this warranty statement is invalidated, for whatever reason, such part will be deleted and the rest shall remain unaffected, continuing to be in full force and effect.

Delivery of Warranty Service

8. Subject to clause 14, and:
   a. Peak being notified by you, within the duration of the applicable warranty period, of any defect that you think is subject to any warranty valid under clauses 1, 2, 3, 4 or 5; and
   b. Peak being permitted to inspect the generators, parts and their installation (along with any relevant packaging)
   Peak shall at its option repair or replace defective generators or parts (including, if necessary, any moving parts and irrespective of runtime). No additional charges will apply, for parts or delivery and, where applicable, labour or travel. Peak will endeavour to deliver this service within 3 working days of your notification.
9. Where, in Peak's reasonable opinion, a defect is subject to an exclusion described in clause 7, Peak reserves the right to charge for parts or delivery and, where applicable, you may also be charged by Peak for call out, labour or travel in respect of any repair or replacement which you authorize Peak to carry out.

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: TOC Air Generator

Model Designator: TOC 1000

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: 31st August 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: TOC Air Generator

Model Designator: TOC 1000

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.

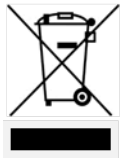
Date: 31st August 2021

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

TOC 1000

Environment

Minimum Operating Ambient Temperature	5°C (41°F)
Maximum Operating Ambient Temperature	35°C (95°F)
Maximum Altitude	2000m
Maximum Relative Humidity	70% @ 35°C
Minimum Storage Temperature*	5°C (41°F)
Maximum Storage Temperature*	35°C (95°F)
Maximum Storage Temperature*	90% non-condensing

Inlet Conditions

Min/Max Inlet Air Pressure	100psi / 6.9bar - 145psi / 10bar
Minimum Air Inlet Flow	6 LPM
Minimum Air Inlet Quality	ISO 8573 - 1:2010 Class 1.4.1†
Maximum Inlet CH_4 Concentration	100ppm CH_4

Generator Outlets

Maximum Gas Output Pressure	50 psi / 3.4 bar
Maximum Outlet Flow Rate**	1000 cc/min
Gas Purity	<1ppm CO2 <1ppm CO <1ppm SOx <1ppm NOx<0.05ppm CH4
Dewpoint (°C)	-60°C / -76°F
Particles	<0.01 µm
Phthalates	Phthalate & BHT Free
Suspended Liquids	None
Gas Outlets	1 x 1/4" BSPP x 6mm push-fit connection
Start-Up Time	120 minutes

Electrical Requirements

Voltage	120V±5% / 230V ±10%
Frequency	120V/ 60Hz / 230V 50/60Hz
Current	120V 4A / 230V 1A
Power Cord (Supplied)	C13 Plug
Circuit Breakers	10A
Pollution Degree	2
Insulation Category	Class 1
Transient Over Voltages	Over Voltage Category II

General

Dimensions mm (inches) HxWxD	343 x 270 x 530 mm (13.5 x 10.7 x 20.9")
Shipping Dimensions mm (inches) WxDxH	435 x 650 x 400mm (17.1 x 25.5 x 15.7")
Generator Weight Kg (lbs)	27kg (59.6lbs)
Shipping Weight Kg (lbs)	38kg (83.8lbs)
Noise Level	Virtually Silent

* Note: Please ensure generator is situated in a well ventilated environment.

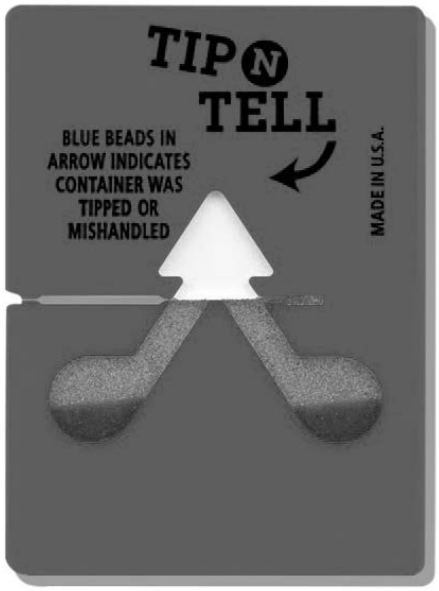
** Note: Flows in LPM are expressed as normalised volumes at 101.3kPa, 20°C.

† This unit should be connected to an air supply that, as a minimum, meets ISO 8573-1:2010 Class 1.4.1 or connected to the relevant Peak air compressor model.

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.	Tube PE 6mmOD 4mmID	x3m
2.	Cable C13 BS 1363 UK 230V 10A 2m	x1
3.	Cable C13 Nema 6 15 US 220V 2m	x1
4.	Cable C13 Schuko H05VV-F EU 230v 2.5m	x1
5.	Cable C13 Nema 5 15 US 110V 2m	x1
6.	Elbow ¼”M BSPPx6mm Push Fit	x2
7.	TOC 1000 Installation guide	x1

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

Installation

Generator Environment

The generator should, if possible, be installed next to the application,. If, however, this is not possible, please consider the distance between the generator and your application, since pressure drops can result from extended lengths of tubing and may affect gas delivery.

Performance of the generator is affected by ambient conditions. Note should also be taken to the proximity of Air Conditioning outlets. Air conditioning systems 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 below for the general dimensions of the unit.

Please ensure Generator is situated in a well ventilated environment and is positioned to allow easy disconnection from the mains supply if required.

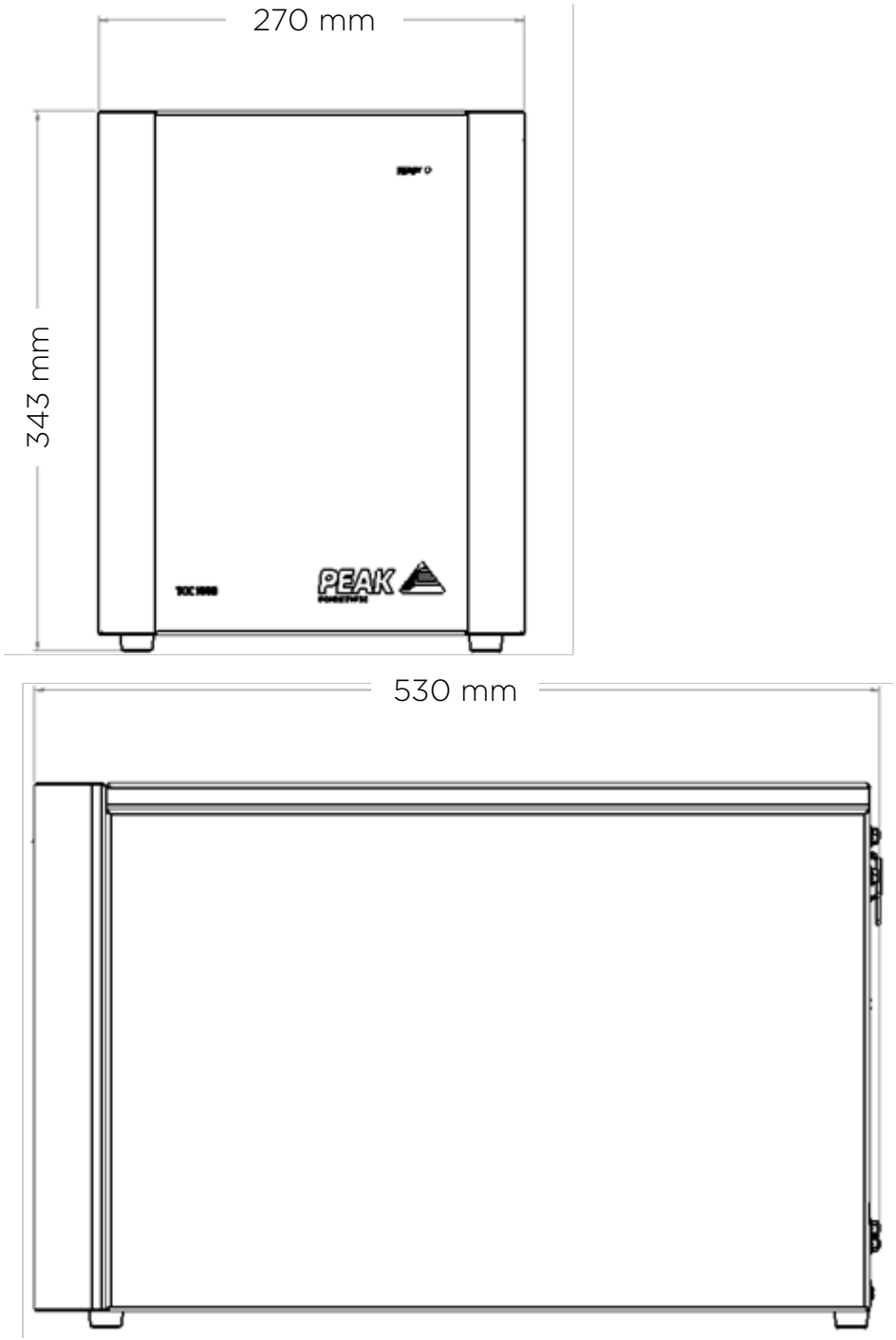
Minimum Operating Ambient Temperature: 5 °C (41 °F)

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

Compressed air supplied to the TOC 1000 generator should meet ISO 8573-1:2010 Class 1.4.1 standard and should be supplied at 100psi (6.9bar) - 145psi (10 bar) pressure. Supply of compressed air at a pressure of below 100psi may result in poor quality air that may not meet instrument requirements. Supply of compressed air at a pressure greater than 145psi may cause damage to the generator and could result in damage to any instrument supplied.

Generator Overview

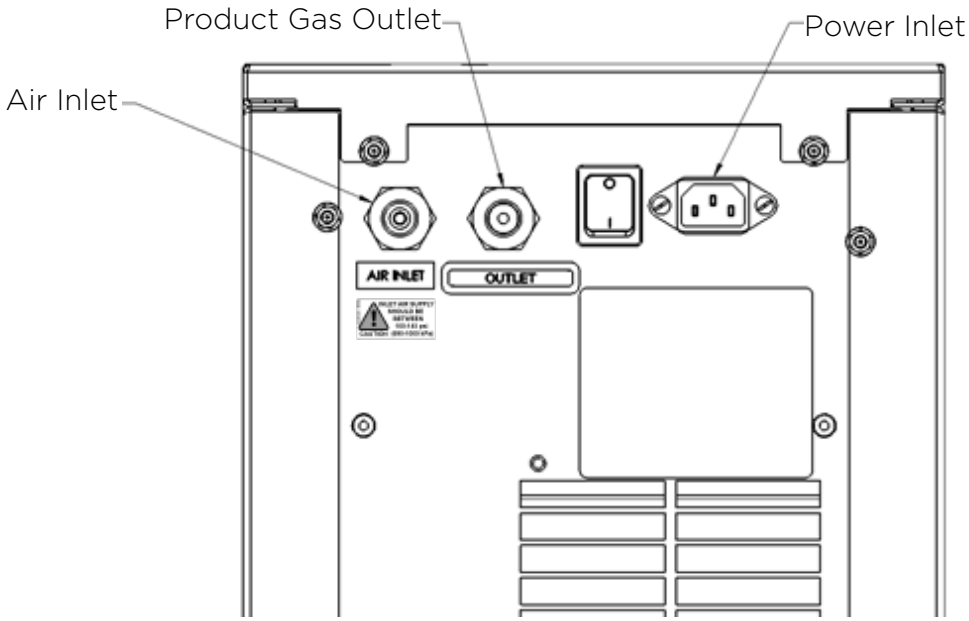
General Dimensions



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



WARNING

Ensure all inlets and outlets are connected to correct sources and applications.

WARNING

All Connections should only be carried out by trained personnel. Generator must be switched off and unplugged prior to any cleaning or maintenance operations.

Electrical Connection

Connect the generator to an appropriate 120 or 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 with correct rating can be fitted by a qualified electrician, ensuring that it has adequate ratings and appropriate approvals for the country of operation. Failure to do so could cause damage to the generator or risk of overloading of the power cord.

If a substitute main supply cord is used, ensure that it has adequate ratings and appropriate approvals for the country of operation. Failure to do so could cause damage to the generator or risk of overloading of the power cord.

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 120VAC nominal +/- 5% or 230VAC nominal +/- 10% depending on chosen model. Extended periods at extremes can have a detrimental effect on the operation and life of the generator.

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

Air Purity

The Precision Zero Air Series generator should be connected to an air supply that, as a minimum, meets ISO8753-1:2010 Class 1.4.1

Class 1 Particulate

In each cubic metre of compressed air, the particulate count should not exceed 20,000 particles in the 0.1 - 0.5 micron size range, 400 particles in the 0.5 - 1 micron range and 10 particles in the 1 - 5 micron size range.

Class 4 Water

A pressure dew point (PDP) of +3°C or better is required and no liquid water is allowed.

Class 1 Oil

In each cubic metre of compressed air, not more than 0.01mg of oil is allowed. This is a total level for liquid oil, oil aerosol and oil vapour.

Start-Up Sequence

Before the generator is first connected to the application, the generator should be operated in isolation (i.e. not connected to the application) for 120 minutes. This is to ensure that any impurities are purged from the system. Failure to do this may harm the application.

Connecting to the application

Using the tubing provided, connect the outlet of the unit to the inlet on the application.

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

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

Compressed air supplied to the TOC 1000 generator should meet ISO 8573-1:2010 Class 1.4.1 standard and should be supplied air at a pressure of 100psi (6.9bar) - 145psi (10bar). Supply of compressed air at a pressure of below 100psi may result in poor quality air that may not meet instrument requirements. Supply of compressed air at a pressure greater than 145psi may cause damage to the generator and could result in damage to any instrument supplied.

Tubing Lengths

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

< 3 meters: Use 6mm OD / 4mm ID or 1/4” OD / 3/16” ID tubing.

> 3-10 meters: Use 8mm OD / 6mm ID or 5/16” OD / 1/4” ID tubing.

Some tubing and fittings not supplied in the fittings kit.

> 10 - 40 meters: Use 10mm OD / 8mm ID or 3/8” OD / 5/16” ID tubing.

> 40 metres: Please contact Peak Scientific with the relevant distance and we will calculate the flow resistance and the tubing size required.

Service Requirements

Service Schedule

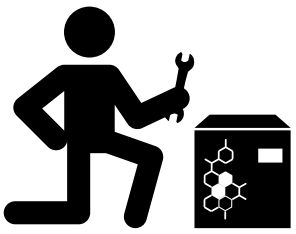
Purchase Interval	Component	Qty.	Visit
12 Months	TOC 1000 Annual Maintenance Kit	1	www.peakscientific.com/ordering

Note: Only Peak approved components should be used.

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.

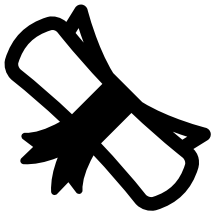
[Peak Protected] can provide...



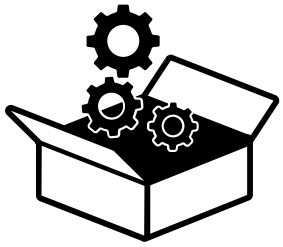
Installation
A dedicated Peak engineer will visit your lab to install and setup your generator

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 Detection Liquids.

Troubleshooting

Problem	Possible Solution
The application is reporting low pressure.	• Check for leaks between the TOC 1000 and the application. • Contact your service provider.
Unstable baseline	• Check inlet air pressure is set to 100psi • Check inlet air flow is 6LPM • Check outlet air flow is 1LPM • 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.

Go Online or Complete and Return

You can register for your **FREE 12 month Warranty** with ease online at www.peakscientific/protected.

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

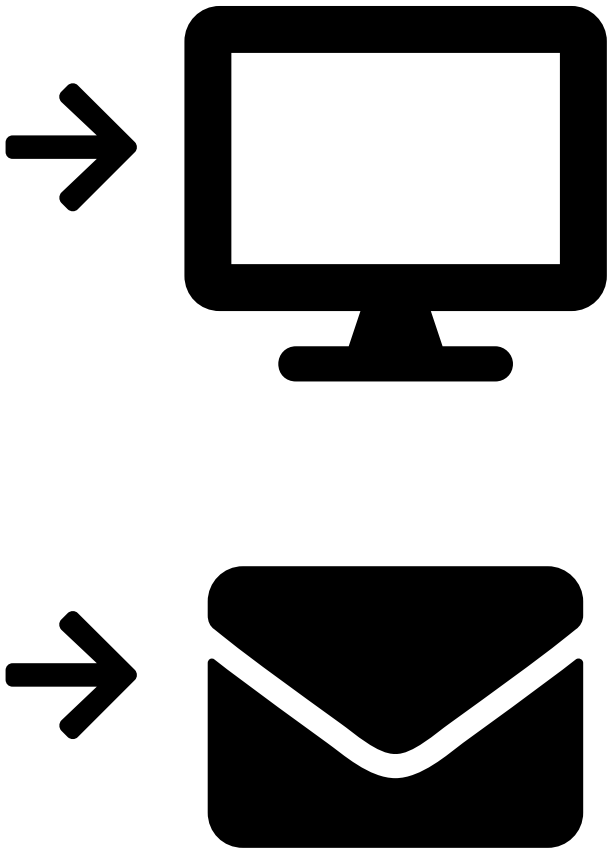
Extend your cover with

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



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.

[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**

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

PEAK SCIENTIFIC