ZA070A-180A
User Manual

Contents

Change History

Rev.	Comment	Name	Date
1	First Issue	Stephen Murray	21/10/98
2	Spare Parts	Stephen Murray	11/12/98
3	Moisture Carry Over	Stephen Murray	01/04/99
4	Re-setting Information	Stephen Murray	11/06/99
5	2002 Revised Design	Stephen Murray	14/11/01
6	Compressor Service No Longer Valid	Stephen Murray	07/01/03
7	USA Technical Support Updated	Fiona Dunn	16/11/04
8	New Style Front Added	Fiona Dunn	30/03/05
9	Filter Details Updated	Gavin Logan	23/06/06
10	Remove ref. to PSA Air Purifier	Safder Khan	04/09/06
11	Updated 110v Compressor Model	Gavin Logan	12/10/06
12	Updated to New Format	Liam Couttie	25/08/14
13A	Added Removal Information	Liam Couttie	06/10/14
14A	Added Declarations	Liam Couttie	09/10/14
15A	Added ZA070A reference	Liam Couttie	26/01/15

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

The Peak Scientific range of Zero Air Gas Generators is designed to produce a constant flow of Zero Grade Air with a hydrocarbon content of less than 0.1ppm.

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.
	Hot Surface. Do NOT touch.

Safety Notice to Users

These instructions must be read thoroughly and understood before installation and operation of your Peak ZA180A 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.

Safely Isolated Condition

Definition: The unit is in a Safely Isolated Condition when it is disconnected from its application, fully de-pressurised, cooled down and isolated from the Electrical Supply. Directions for isolating the Generator are shown below.

Failure to place the Generator in a safely isolated condition when instructed to do so may lead to personal injury or injury to others and even death.

Hot Surface. Do NOT touch.

Isolating the Generator:

a) Switch off the unit.

b) Unplug the unit from the mains supply and remove the power cord from the rear of the unit.

c) Ensure the output pressure gauge read zero. (If gauge does not fall to zero, loosen the outlet fitting slightly to allow trapped gas to escape.)

d) Ensure that tank pressure gauge located on electrical panel reads zero. (If gauge does not fall to zero, close pressure regulator and loosen the outlet fitting to allow trapped air to escape.)

e) Ensure the temperature display on the front panel reads <50°C.

f) Disconnect from the application.

Safe State After Repair

To guarantee the generator is in a safe state after a repair, please ensure the following conditions are met;

- **The electricity cable has been correctly refitted.**
  The mains cable should be plugged into the IEC power inlet located on the side panel of the generator. **This unit is classified as SAFETY CLASS 1. THIS UNIT MUST BE EARTHED.**

Declaration of Conformity

We Peak Scientific Instruments Ltd.

Of Fountain Crescent, Inchinnan, Renfrewshire, PA4 9RE

Declare that:

Equipment: Zero Air Generator

Model: ZA180A

Date: 18 / 09 / 2014

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 Electrical Equipment for measurement, control and laboratory use.
- **Electromagnetic Compatibility Directive 2004/108/EC**
  EN 61326-1: 2013 Electrical Equipment for measurement, control and laboratory use.

All evaluation, testing and certification issued by:

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

Signed:  Name: Chris Pugh

Date: 18th September 2014 Position: Engineering Director

CE

Environmental Declaration

We Peak Scientific Instruments Ltd.

Of Fountain Crescent, Inchinnan, Renfrewshire, PA4 9RE

Declare that:

Equipment: Zero Air Generator

Model: ZA180A

Is fully compliant with the following Directives

- 2002/96/EC **WEEE (Waste of Electrical and Electronic Equipment)**
- 2002/95/EC **RoHS (Restriction of Hazardous Substance)**

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 Instrument Ltd have developed all reasonable 'due dilligence' 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:  Name: Chris Pugh

Date: 18th September 2014 Position: Engineering Director

Technical Specification

Environment

	ZA070A	ZA180A
Minimum Operating Ambient Temperature	5°C / 41°F	
Maximum Operating Ambient Temperature	30°C / 86°F	
Maximum Altitude	2000 meters	
Maximum Relative Humidity	70%	
Minimum Storage Temperature	10°C / 50°F	
Maximum Storage Temperature	25°C / 75°F	

Generator Outlets

	ZA070A	ZA180A
Maximum Flow Rate	7L/min	18 L/min
Maximum Gas Outlet Pressure	80 psi	80 psi
Particles	0.01µm	0.01µm
Hydrocarbon Concentration	0.1ppm	0.1ppm
Gas Outlets	1	1
Drain Outlets	1	1
Pressure Gauges	2	2
Start-Up Time For Purity	40 minutes	40 minutes

Electrical Requirements

	ZA070A & ZA0180A	
Voltage	230VAC	110VAC
Frequency	50 Hz	60 Hz
Current	4.9 AMPS	8.8 AMPS
Input Connection	C14 Plug	
Power Cord	C13 Socket to Local Connection	
Pollution Degree	2	
Insulation Category	II	

General

	ZA070A & ZA0180A
Generator Dimensions cm	43 x 41 x 88
Generator Weight	64 Kg
Shipping Crate Dimensions cm	100 x 57 x 67
Shipping Weight	91 Kg

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.

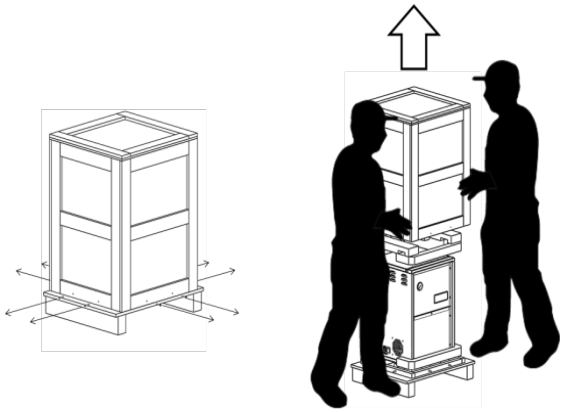
Please save the product packaging for storage or future shipment of the Generator.

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.

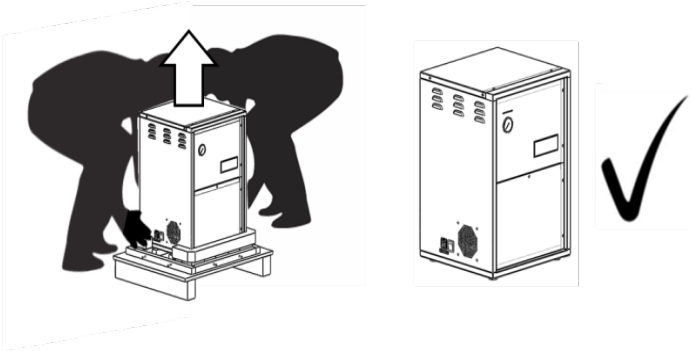
Removing the generator from the crate

The generator weighs over **64kg** and as such should be unpacked by two people using the following method.

All the screws encircled in **RED** should first be removed from the shipping crate, there are approximately 8 screws. Now, with someone positioned at either side of the shipping crate, the top half of the crate can be lifted upwards and away from the rest of the crate. With the top of the crate removed the foam insert of top of the generator should also be taken off.



The generator can now be lifted out of the crate base and onto the floor. This should be done again with someone positioned at either side. There is a gap in the foam base for hand access; one hand should be positioned here underneath the generator and the other at the back supporting the weight. The generator should then be tilted back slightly and then up and out of the foam base and onto the floor.



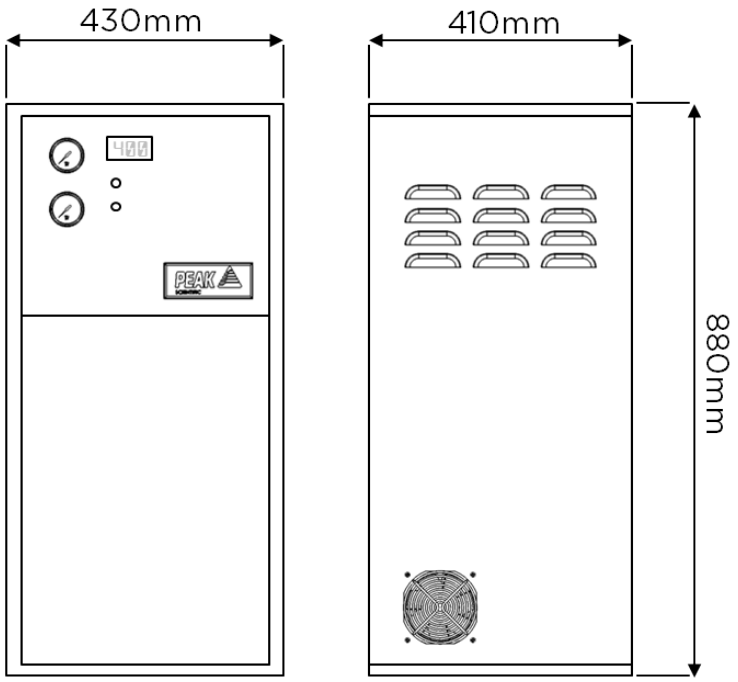
Installation

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. Please see the Tubing lengths section for further details.

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.

General Dimensions



Rear Connections

The outlet connections are 1/4" BSP female.

Note the platinum catalyst within the Zero Air Catalytic Chamber will become poisoned if it comes into contact with any halogenated hydrocarbons, silicone sprays, silicone greases, phosphorous compounds, lead components, high sulphur vapours or other catalyst poisons.

Electrical Connection

Connect the Generator to a 230 volt 50Hz single-phase supply using the power cord provided. If the appropriate power cord is not supplied; a new plug, rated to at least 13 amps, can be fitted by a qualified electrician.

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

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

Commissioning

With the generator installed as described earlier remove the front cover. Check that all the internal components are securely located and have not moved during transit.

Connect the generator to the electrical supply and turn the unit *ON.* The unit will begin to build up pressure as will be seen from the two pressure gauges. The lower gauge indicates the Output Pressure which is factory-set at 80 psig. The upper gauge indicates the internal receiver pressure which will fluctuate between 120 and 90 psig.

The Digital Display shows the Catalyst Chamber temperature. This is factory set at 400ºC. There are two Status LEDs on the front panel. Once the Catalyst reaches operating temperature the RED will switch off and the GREEN will illuminate indicating that the generator is ready for use. The generator should reach operating temperature within 40 minutes of switch-on.

Check that the cooling fans are operating and exhausting air out of the generator.

Do not touch any part of the Catalytic Chambers or Copper Lines, as they will be VERY hot.

Hot Surface. Do NOT touch.

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

Zero Air Generation

Ambient air is compressed and after cooling is passed through the *Filter Separator* which removes liquid moisture to and particles down to 0.1 micron. The air is then passed through a *Membrane Dryer* to remove any remaining moisture and on into and internal *Receiver.* The receiver is designed to provide volume within the system to cope with different flow rates and to allow the compressor to operate a duty cycle.
When the Receiver reached its maximum pressure the *Pressure Switch* will operate stopping the compressor and opening the unloading valve.

Air from the Receiver is regulated for pressure and flow and passed to the 'Zero Air' catalytic combustion chamber. This works on the principle of catalytic oxidation where hydrocarbons from the incoming compressed air supply 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 degrees Celsius. The free Carbon and Hydrogen atoms then combine with Oxygen in the air to form Carbon Dioxide and Water. After the catalytic chamber the air passes through a cooling coil to reduce its temperature to a safe level.

Catalytic Chamber

The Catalytic Chamber is heated to 400ºC and will cause severe burns if touched. If for any reason the chamber or its associated parts need to be examined the generator must be switched off and allowed to cool. THIS COULD TAKE UP TO 10 HOURS.

Hot Surface. Do NOT touch.

The Catalytic Chamber takes the form of cylindrical chamber with a heated central core. The annular space is specifically designed to allow the required contact time with the catalyst to ensure complete oxidization. The complete chamber is contained within an insulated enclosure as shown below.

Heater

Regardless of the supply voltage the heater is rated at 110 Vac. This minimizes the volt drop across the conductors and prolongs the life of the element. The Heater is contained within a stainless steel sleeve to facilitate removal should replacement be required.

Thermocouple

The thermocouple is “K” type spring-loaded bayonet fitting to ensure good contact with the chamber core.

Thermal Fuse

The thermal fuse is provided as a safety feature to cut supply to the heater thus preventing chamber overheating in the event of a control or ventilation failure. It is a fail-safe device and if blown requires replacing.

Note: - The thermal fuse will not blow under normal operation. A blown thermal fuse indicates that a fault exists which MUST be rectified before attempting

Service Requirements

Service Schedule

Service Interval	Component	Part No.	Qty.
12 months	ZA Annual Service Kit Kit Includes; 2 x Inlet Filter Element* 1 x Ultra-Fine Element	08-4708	1

Table 1: Service schedule

*Note: There are 2 Inlet Filter Elements supplied, one for each six months of usage.

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.

Trouble Shooting

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.	• Disconnect power cord from the rear of the Generator. Open the left hand panel are check that both circuit breakers are turned on (switch in the up position). Reconnect power cord. • Contact your service provider. 
Temperature is not rising	• Contact your service provider.
Temperature controller is not lit	• Check the fuse in the power cord plug. • Contact your service provider.
Pressure not building	• Contact your service provider.
Excessive noise	• Contact your service provider.

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