Directions For Use
Zero Air Gas Generator

ZA015 - ZA180

Peak Scientific Instruments Ltd
Fountain Crescent
Inchinnan Business Park
Inchinnan
Renfrewshire
PA4 9RE

T.(Europe) +44 (0) 141 812 8100
T.(USA) +1 866 647 1649 (sales)
T.(USA) +1 866 732 5427 (tech support)

F.(Europe) +44 (0) 141 812 8200

info@peakscientific.com
sales@peakscientific.com
support@peakscientific.com

www.peakscientific.com

CE

Document Change History

Issue No	Changed	Initials	Date
1	Document Created	SGM	01/09/98
2	USA Technical support number updated	FAD	16/11/04
3	New style front added	FAD	30/03/05

Contents

	Page No
Document History	2
Warranty Statement	5
Introduction	6
Unpacking & Installation	6
Electrical Connection	6
Air Connection	7
Principle of Operation	8
Commissioning	9
Routine Maintenance	9
Troubleshooting	10
Technical Specifications	11
System Diagrams	12
Maintenance Log	13
Notes	14

Safety First

It is important that you thoroughly read and understand this manual before operating or servicing this Peak Scientific Instruments Gas Generator. PLEASE NOTE THE FOLLOWING CAUTIONS AND WARNINGS FOR YOUR OWN SAFETY.

! Caution –
Only authorized persons should operate or service this equipment.

! Warning –
To avoid risk of electrical shock, personal injury, or death disconnect power before removing any cover of this equipment.

! Caution –
To avoid risk of personal injury NEVER disconnect any pipe, fitting, or filter bowl while the system is pressurized. Always allow pressure to dissipate before opening the system.

! Warning –
The Catalytic Process requires very high temperatures. Internal surfaces and copper lines are extremely hot and will cause burns. Always allow the generator to cool before carrying out any servicing.

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; and

   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 NOTICE TO USERS

These instructions must be read thoroughly and understood before installation and operation of your Peak Gas Generator. Use of the Generator in a manner not specified by Peak Scientific Inst. 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.

1 Introduction

The Peak Scientific Instruments range of Zero Air Gas Generators is designed to produce a constant flow of Zero Grade Air with a Hydrocarbon content (as Methane) of less than 0.1 ppm.

2 Unpacking and Installation

Although Peak Scientific take every precaution with safe transit and packaging, it is advisable to fully inspect the unit for any sign of transit damage.

ANY DAMAGE SHOULD BE REPORTED IMMEDIATELY TO THE CARRIER AND PEAK SCIENTIFIC OR THE DISTRIBUTOR FROM WHERE THE UNIT WAS PURCHASED.

After unpacking and a visual inspection, the unit should be placed in a ventilated area away from direct sunlight. Care should be taken not to obstruct the ventilation holes on the sides of the unit nor, on the ZA180, the fan outlet on the top.

The generator should be placed on a steady and level base. Alternatively, the unit may be wall mounted using the slots on the rear of the cabinet. These are on 100mm centres.

3 Electrical Connection

Important Electrical Notice

This unit is classified as SAFETY CLASS 1 equipment. 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**		**Black**
Neutral (N): -	**Blue**		**White**

Fuse

The generator protection fuse in the pull out drawer of the mains inlet IEC euro connector located on the bottom right hand side of the cabinet adjacent to the off/on switch. The fuse is rated at 6.3 AMP.

Connect the generator to a single-phase supply using the power cord provided.

4 Air Connection

The inlet and outlet connections are 1/4" BSP female.
The Inlet air should conform to the following specifications:

Minimum Pressure	0.69 Barg / 10 psig
Maximum Pressure	8.62 Barg / 125 psig
Maximum Hydrocarbon Content	100 ppm

The inlet air should be oil free and pre-filtered to remove bulk moisture. Although not essential, an air drier up-stream of the generator will ensure a long and trouble free life.

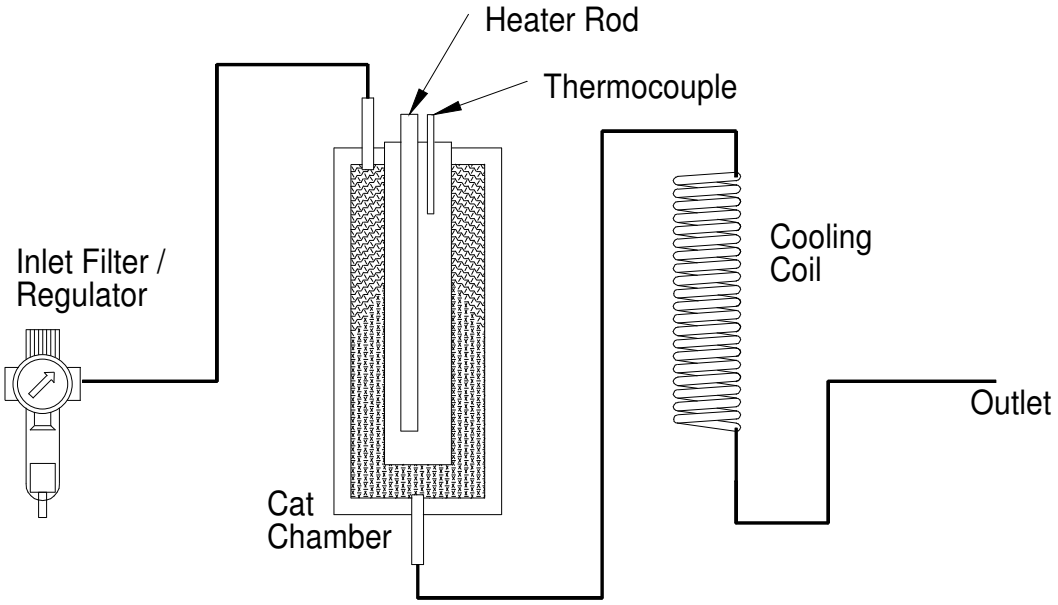
Note:- The platinum catalyst within the Zero Air Catalytic Chamber will become poisoned if it comes into contact with any halogenated hydrocarbons, silicone sprays, silicone greases, phosphorous compounds, lead components, high sulphur vapours or other catalyst poisons.

The air supply should be connected to the generator inlet on the left side of the cabinet. The user's application should be connected to the outlet on the right side of the cabinet. To avoid leakage/impurity ingress, use PTFE tape on all fittings.

Slowly, turn on the air supply until the required pressure is attained. There is no physical method of restricting the gas output from the generator. The user should therefore ensure that the application only receives a maximum flow not exceeding the rating for the generator. Demand in excess of the rated capacity of will result in higher levels of hydrocarbons in the delivered gas.

5 Principle of Operation

The Z015-108 Zero Air generator works on the fundamental principle of Catalytic Oxidation as illustrated in the following pneumatic diagram.



ZAxxx Pneumatic Diagra

Zero Air Generation

Inlet air is passed into the Generator via a coalescing filter, which removes bulk moisture and particles down to 0.1 micron. The air is then 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 simple cooling coil to reduce its temperature to a safe level. In the ZA180 this is assisted by a cooling fan.

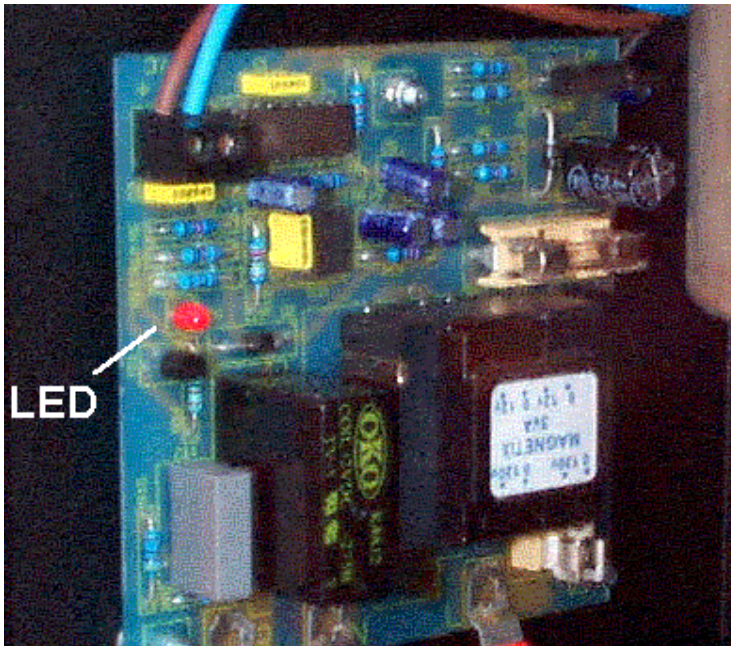
6 Commissioning

This should be undertaken by a technically competent person.

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.

Open the air supply and turn the unit *ON*. Set the regulator on the Inlet Filter/Regulator to the desired pressure.

Check that the cooling fan (ZA180) is operating and exhausting air out of the generator. Check that the red LED on the temperature control board is lit.



After a period of time (around 40 minutes) the Catalytic Chamber should have reached the required temperature. When this happens the relay on the Temperature Controller will “click” and the red LED will go out. The heater will then cycle on & off as required.
Replace the front cover, the generator is now operational.

Do not touch any part of the Catalytic Chamber or Copper Lines as they will be VERY Hot.

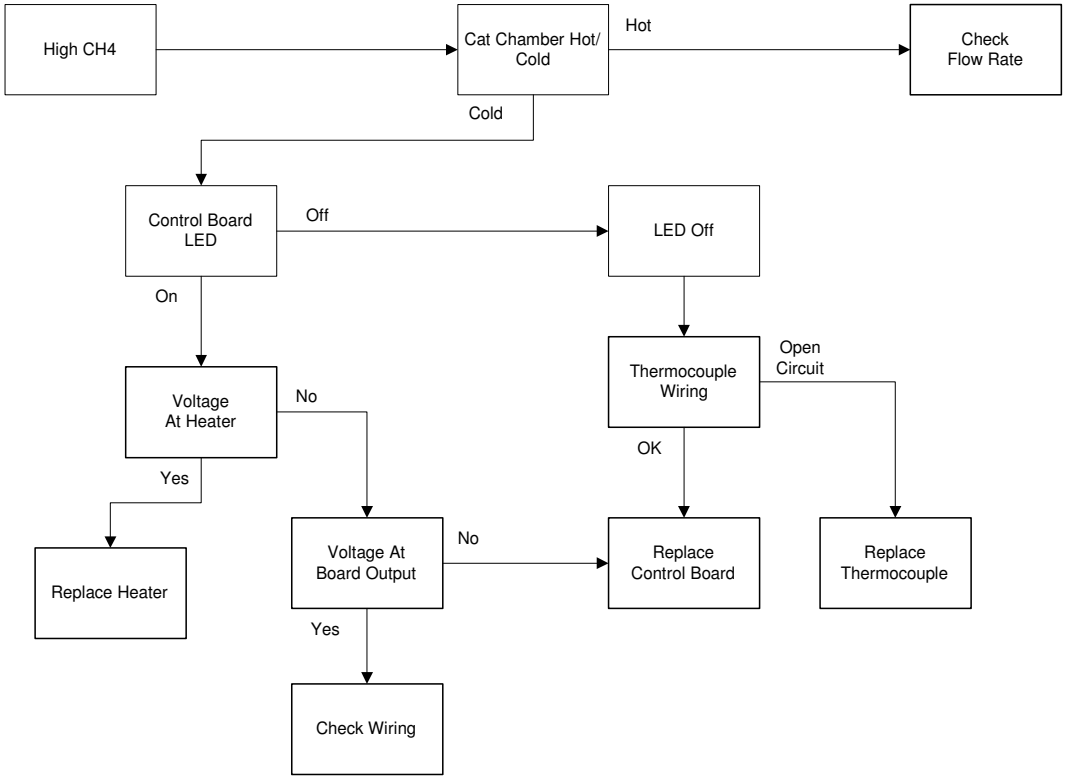
7 Routine Maintenance

Due to the simplicity of design and the small number of parts the Peak Zero Air Generator will have a long and trouble free life. However as with all scientific and technical equipment it should be regularly inspected by a competent person and the following points noted.

1. Inlet Filter. Condensed moisture should be periodically drained from the filter.
2. Temperature Control. Check that the red LED cycles On & Off.

8 Troubleshooting

Problems with the Zero Air Generator will probably be shown up by increased levels of Hydrocarbons being detected on the baseline. Reference to the following Fault Finder Chart will identify the source of the problem.



9 Technical Specifications

General Details

Minimum Operating Ambient Temperature	5 °C (41 °F)
Maximum Operating Ambient Temperature	45 °C (113 °F)
Inlet Conditions (Free of oil and bulk moisture)	
Minimum Air Inlet Pressure	0.69 Barg (10 psig)
Maximum Air Inlet Pressure	8.6 Barg (125 psig)
Maximum Hydrocarbon Content	100 ppm (CH_4)
Start up time for specified hydrocarbon concentration	40 minutes

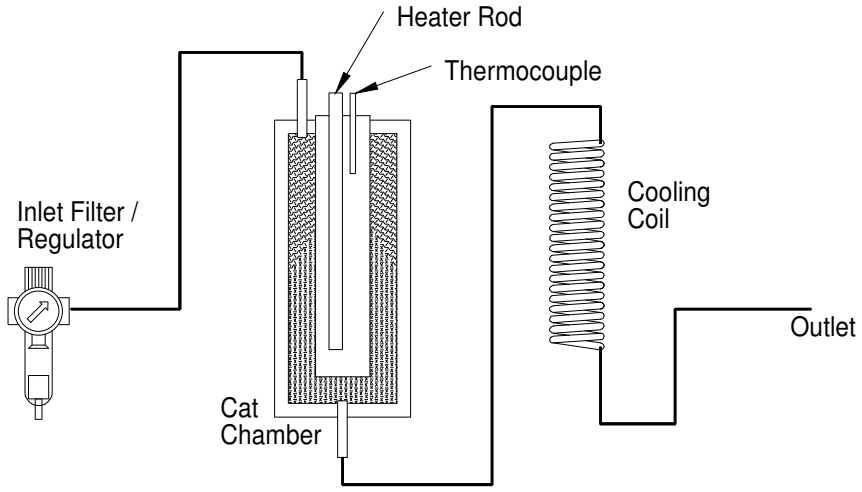
Physical Details

Model	ZA015	ZA035	ZA070	ZA180
Max Output (Litres/min)	1.5	3.5	7.0	18.0
Heater Watts	250	250	250	450
Fan Watts	N/A	N/A	N/A	9.0
Electrical Requirements (230V 50Hz) (110V 60Hz)	1.2A 2.3A	1.2A 2.3A	1.2A 2.3A	2.0A 4.5A
Dimensions (H x W x D) cm Inches	51x25x16 20x10x6.3	51x25x16 20x10x6.3	51x25x16 20x10x6.3	76x25x16 30x10x6.3
Shipping Weight Kg Lbs	10Kg 22lb	10Kg 22lb	10Kg 22lb	12Kg 26.4lb

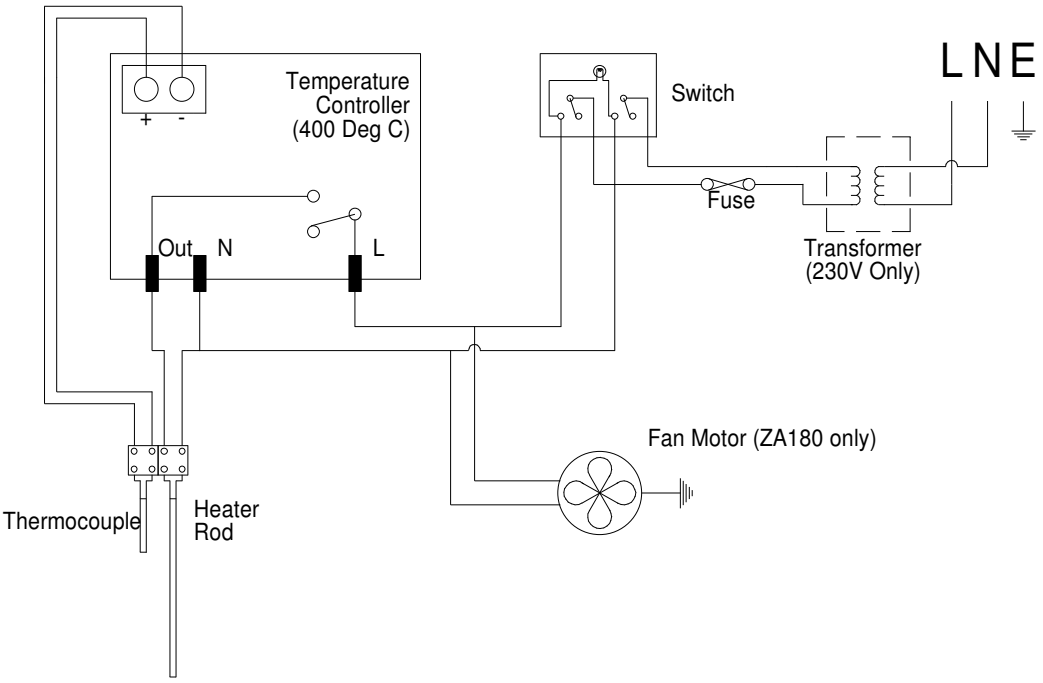
Parts List

Model	ZA015	ZA035	ZA070	ZA180
Inlet Filter Element (110V)	02-1031	02-1031	02-1031	02-1031
Catalytic chamber	06-1075	06-1075	06-1075	06-1075
Heater Element	04-1059	04-1059	04-1059	04-1059
Thermocouple	04-1051	04-1051	04-1051	04-1051
Temperature Controller	04-1170	04-1170	04-1170	04-1170
Cooling Fan (240V)	04-1021	04-1021	04-1021	04-1021
Cooling Fan (110V)	04-1022	04-1022	04-1022	04-1022
Transformer (230V Only)	04-4356	04-4356	04-4356	04-4356

10 System Diagrams



ZAxxx Pneumatic Diagra



ZAxxx Electrical Diagra

Maintenance Log

Model- **Serial number**

Work Done	Remarks	Date	Name

Notes