NM20Z User Manual

Contents

Change History

Rev.	Comment	Name	Date
1	Initial Release	Steven Murray	19/11/01
2	Exhaust flow valves updated	Ben Cotton	23/09/02
3	Pneumatic and bulkhead diagrams updated	Gavin Logan	10/12/02
4	USA technical support number added	Fiona Duncan	10/11/04
5	Flows updated in line with API-5000 requirements	Gavin Logan	10/02/05
6	Serviceable parts list updated	Fiona Duncan	01/03/05
7	Generator flows updated	Fiona Duncan	24/03/05
8	New style front added and manual updated	Fiona Duncan	08/04/05
9	Flow details brought in line with test settings	Gavin Logan	24/06/06
10	Manual revision updated to include MFC	Safder Khan	16/04/07
11	Manual in new format, Annual service kit added	Safder Khan	27/01/09
12	New MFC included and front added	Safder Khan	10/03/09
13	Updated to new format	Liam Couttie	21/10/11
14	Updated wall mounting information	Liam Couttie	09/02/12

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.

Please review each of the following sections carefully.

Thank you for selecting Peak Scientific to meet your Gas Generation needs, 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

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 **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.

Table 1 - Safety Symbols

Safety Notice to Users

These instructions must be read thoroughly and understood before installation and operation of your Peak Scientific NM20Z. 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.

Nitrogen is not a poisonous gas, but if the concentration in the inhaled air becomes too high there will be a risk of asphyxiation.

Declaration of Conformity

We **Peak Scientific Instruments Ltd.**

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

Equipment **Nitrogen Gas Generator**

Model **NM20Z**

Has been designed & manufactured in accordance with ISO 9001:2008 (certificate number FM515973) and complies with the relevant directive below,

- **Machinery Directive - 2006/42/EC**

BS EN ISO 12100:2010	Safety of machinery. General principles for design. risk assessment and risk reduction.
BS EN ISO 4414:2010	Pneumatic fluid power. General rules and safety requirements for systems and their components.

Signed By:

Name: Chris Pugh

Position: Engineering Director

Done at: Peak Scientific Instruments Ltd, Inchinnan, Scotland.
Date: 10th of August 2011

FM515973

THE QUEEN'S AWARDS FOR ENTERPRISE 2007

THE QUEEN'S AWARDS FOR ENTERPRISE 2011

Environmental Declaration

We Peak Scientific Instruments Ltd.

of Fountain Crescent, Inchinnan. Renfrewshire PA4 9RE

declare that:

Equipment Nitrogen Gas Generator

Model NM20Z

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: 10th of August 2011

Technical Specifications

Environment

Min/Max Air Operating Temperature	5°C-30°C / 41°F-86°F
Maximum Relative Humidity	70%

Inlet Conditions

Min/Max Air Inlet Pressure	8.3-10 bar / 120-145 psi
Minimum Air inlet Flow	90 l/min

Outlet Gas

Maximum Gas output Pressure	110 psig
Maximum Pressure Drop (Outlet-Inlet)	8 psig
Maximum Source gas output flow (zero grade	26 l/min (ATP)
Maximum Exhaust gas output flow (zero grade	8 l/min (ATP)
Maximum Curtain gas outlet flow (High purity	12 l/min (ATP)
Start up time for purity	60 minutes
General	0.01um

General

Dimensions (cm/ins) WxDxH	25x43x76 / 10x17x30
Shipping Weight (Kg/lbs)	21 / 46

Introduction

The Peak Scientific Nitrogen Generator is designed specifically for use with Mass Spectrometer applications. The Generator has been designed to produce Nitrogen from an existing source of dry, oil free, compressed air in the laboratory.

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.

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.

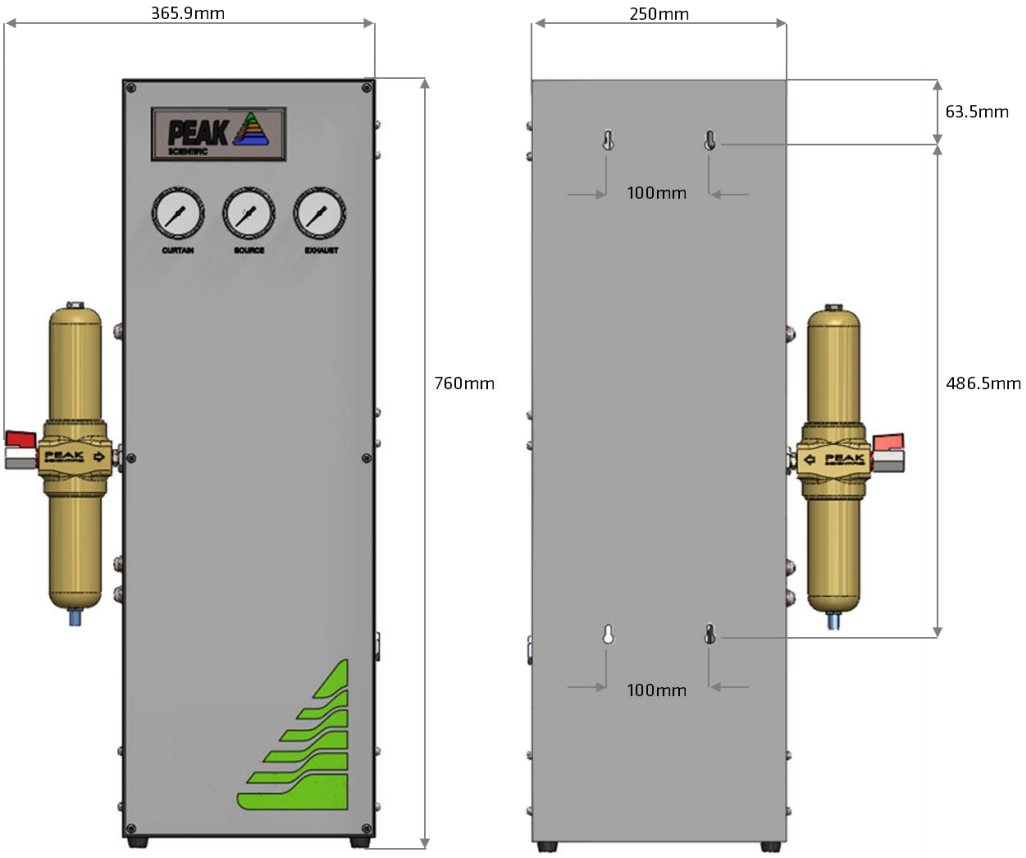
Follow the unpacking instructions posted on the side of the crate. It will require two people to remove the unit from the shipping crate and to manoeuvre the Generator onto the floor.

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

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 side of the unit. The Generator should be placed on a steady and level base. The NM20Z has been designed to fit under most workbenches. Alternatively, the unit may be wall mounted using the fixing slots provided.

Performance of the Generator (like all sophisticated equipment) is affected by ambient temperatures. Prolonged operation in temperatures exceeding 30°C will shorten the life of the unit.

General Dimensions



Air Connection

NM20Z Generator should be connected to a clean, dry, OIL - FREE source of compressed air. A minimum inlet pressure of 120 psig (8.3 barg) is required. Any doubts as to the suitability of your compressed air supply should be referred to Peak Scientific or any of their authorised partners.

The generator has a *Breathing Air Filter* with ¼" BSPT connection to the left side of the unit. The Compressed Air supply should be connected here. This filter will drain moisture and is equipped with an automatic drain. The drain should be led to a convenient place. There are 3-off ¼" BSPT Female bulkhead connections to the right of the unit. Fittings are provided to connect these ports to the gas connections of the Mass Spectrometer.

LC/MS with 3-off Connections (e.g. Api2000)

Connect the 3-off gas ports at the right side of the generator to their respective ports on the Mass Spectrometer using the 3-off ¼" BSPT x ¼" Swagelok fittings. Use ¼" tubing throughout.

LC/MS with 4-off Connections (e.g. Api3000)

Connect *Curtain Gas* and *Exhaust* to their respective ports using ¼" tubing as per above. The *Source Gas* will have to be split into *Gases 1 & 2* at the Mass Spectrometer. Connect *Gases1 & 2* with 1/8" tubing to the ¼" Tee Piece with the 2-off ¼" BSPT x 1/8" Swagelok fittings. Connect the inlet branch of the tee to the *Source Gas* connection at the rear of the generator using ¼" tubing as above.

NB: - To minimize pressure losses position the Tee as close to the Mass Spectrometer as possible

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Commissioning

With the Generator installed (as described earlier), connect compressed air to the unit and open the air supply to the Unit. Disconnect the Outlet connections to allow the generator to vent to atmosphere until the unit is stabilised. The Generator has been pre-set in the factory to give the specified output flow-rate and pressure in line with known requirements. Once the Membranes reach the design pressures the Generator will stabilise and produce Nitrogen. Maximum purity will be achieved after approximately 1 hour. The generator can then be re-connected to the application.

The design of the generator is such that it can deliver up to 26 Litres / min of Zero Grade Air at up to 110 psig and 8 litres / min at 60psi with an additional 12 Litres / min of High Purity Nitrogen at 80 psig. Should the demand for gases be less than the rated output flow at any time is determined by demand of the consuming equipment. In circumstances of no demand, the Generator remains operational and will provide Nitrogen immediately as demand resumes.

Pressure & Flow Settings

Port	Usage/Connection	Flow/Pressure
Curtain	Curtain Gas	12l/min – 80 psig
Source	Ion Source/Nebuliser	26l/min – 110 psig
Exhaust	Exhaust Gas	8l/min – 60 psig

The above settings should allow the NM20Z to be operated with all standard configurations for the AB Sciex API range of LC/MS/MS instruments. Should the above settings not provide sufficient flow or pressure for your application please contact Peak Scientific for assistance.

Maintenance Schedule

Servicing and/or repair of the Generator should only be undertaken by a TECHNICALLY COMPETENT PERSON with the Generator in a safely isolated condition.

Due to the simplicity of the design and the small number of moving parts the NM Series Nitrogen Generators will have a long and trouble free life. However as with all scientific and technical equipment it should be regularly inspected and serviced as below.

Service Schedule

Service interval	Component	Part No.
12 months	Element Active Carbon	00-4427
	Element 0.01 micron	00-4424
	RAC Filter Element	00-4425 x 2

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.

Purchase Interval	Component	Part No.
12 months	Annual Service Kit	08-4631

Safely Isolated Condition

The unit is in a safely isolated condition when it is disconnected from its application and fully de-pressurised. 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.

a) Disconnect from air supply.
b) 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).

Disconnect from the application.

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