

## Directions For Use

# *High Purity Nitrogen Generator In-House Air Supply*

## NG10L-HP

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## 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 Nitrogen 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.**

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

## **1 Introduction**

The Peak Scientific Instruments High Purity Nitrogen Generator is designed specifically for use with Laboratory Analytical Instruments as a source of carrier gas. The generator has been designed to operate from a laboratory dry air supply and requires an electrical supply to deliver high volume, high pressure, clean, dry, high purity Nitrogen.

## **2 Unpacking and Installation.**

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.

**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 the fan outlet at the rear.

The generator has been designed to be free standing and should be placed on a steady and level base. Performance of the generator (like all sophisticated equipment) is affected by ambient temperatures. Continuous operation in ambient temperatures exceeding 25°C will lead to a reduction in capacity and prolonged operation in temperatures exceeding 35°C will shorten the life of the unit. Note should also be taken of the proximity of Air Conditioning outlets. These can sometimes give rise to "pockets" of air with high relative humidity. Operation of the generator within such a pocket could adversely affect its performance.

## **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.**

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

### **Fuse**

**The generator protection circuit breaker is located on the control panel left hand side behind the side panel of the Generator.**

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

## 4 Air Connection

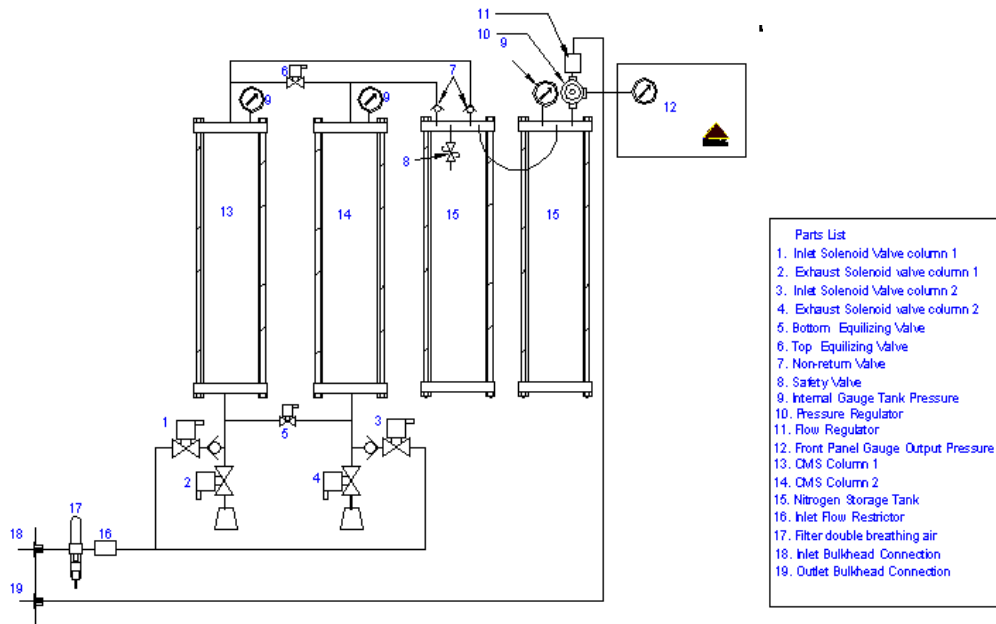
The Nitrogen Generator should be connected to a clean dry source of compressed air. A minimum pressure of 120 psig is required. Any doubts as to the suitability of the compressed air supply should be referred to the factory for advice.

The generator has two Female BSP bulkhead connections to the rear of the unit. Ports are marked for inlet and outlet. In-house Compressed Air supply should be connected to the 3/8" port marked Inlet via, A 1/4" BSP x 6mm fitting, and a 1/4" BSP x 1/4" compression fitting is supplied along with a length of each size tube for connection to the application, select the relevant tube and fitting for you application and connect to the 1/4" BSP outlet.

There is an 1/8" BSP drain on the rear of the generator please ensure this is led to a suitable connection or container.

## 5 Principle of Operation

The High Purity Nitrogen Generator utilizes a 'Pressure Swing Adsorption' (PSA) method to extract pure Nitrogen from air. This is where un-wanted gases can be selectively adsorbed from compressed air into a porous carbon molecular sieve material (CMS). The Peak Scientific Instruments Ltd. generator utilizes a double column system where one column is pressurised, then equalised with the 2<sup>nd</sup> column momentarily, prior to venting taking place for the first column. The rates of pressurisation, equalisation and venting are accurately set which guarantees high purity of Nitrogen.



Air passes through the inlet double breathing air filter No:17 and then flow is controlled No:16 depending on the cycle column 1 inlet valve No:1 and exhaust valve No:4 will be energized open, while column 1 is Pressurized column 2 will be venting to atmosphere after the set time all four inlet and exhaust valve will be shut and equalizers valve No5 and No6 will energize to equalise both columns before vent valve for column 1 is opened and vents while column 2 inlet valve is open to pressurize. This cycle will continue even if there is no demand of the gas.

## **6    Commissioning**

With the Generator installed as described earlier connect power to the unit and turn it on. Disconnect the Nitrogen Outlet connection to allow the generator to vent to atmosphere until the unit is stabilised. At *Switch-On* the Inlet valve will be energised open this will allow in-house compressed air supply to build pressure in column 1 and after 2 minutes momentarily equalisation will take place allowing the second column to boost start and then the 1<sup>st</sup> column will be exhausted.

The Generator has been pre-set in the factory to give the specified output flow-rate and pressure. Once the pressure in the Nitrogen receiver exceeds that setting the Generator will stabilise and produce pure Nitrogen. Maximum purity will be achieved after around 8 hours. After this time the generator can be re-connected to the application.

The design of the generator is that it will deliver up to rated output flow of Nitrogen at 80 psig. Should the demand for Nitrogen be less than the rated output flow, or indeed should the demand stop the generator will continue to operate without any problems. The generator is protected from over-pressure and its normal operating cycle ensures frequent venting.

### **Timer Setting**

The Cycle Timer has been set in the factory and should not require adjustment. Adjusting the timer will affect the volume and purity of the delivered nitrogen and should **NEVER** be adjusted.

### **Pressure Setting**

Output pressure is controlled by a pressure regulator located on the internal storage tank inside of the generator. This has been factory set at 80 psig.

### **Inlet Flow Setting**

The Inlet Flow restrictor has been set at the factory and should **NOT** be adjusted by the user. Altering the setting of this restrictor will have an effect on the operation of the generator.

### **Output Flow Setting**

Output flow is controlled by a Flow controller. Depending on the model used this will be attached to the outlet from the Pressure Regulator. This is factory set should **NOT** be adjusted by the user. Altering the output flow setting will have an effect on Nitrogen Purity.

## 7    Routine Maintenance

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

Due to the simplicity of the design and the small number of moving parts the Nitrogen Generator will have a long and trouble free life. However the following components should be replaced as follows:

<b>RAC Filter Elements</b>	<b>Every 12-months</b>
<b>Inlet Coalescing Element</b>	<b>Every 12-months</b>

Service kits are available for all routine maintenance; please contact the factory for further details.

### **FAILURE TO FOLLOW THE PRESCRIBED MAINTENANCE PLAN WILL INVALIDATE THE PRODUCT WARRANTY**

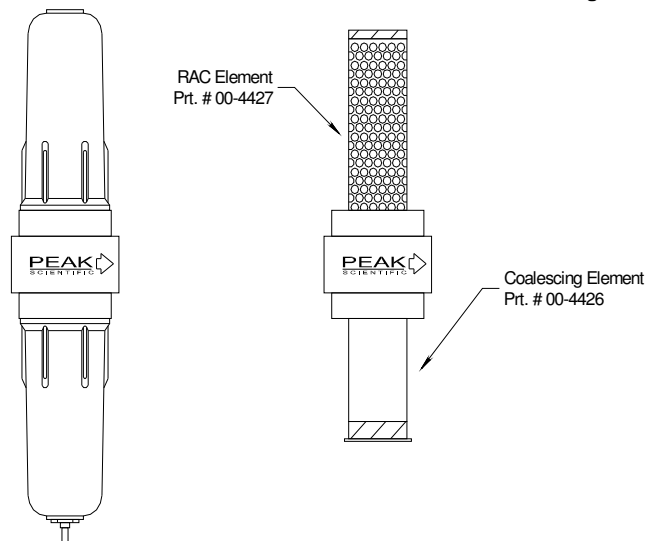
**The Air supply to Generator MUST be turned OFF and the Generator MUST be de-pressurised prior to attempting to remove ANY filter bowl. Failure to do this may cause injury.**

#### **Inlet Filter / Separator Elements**

These should be changed at intervals as indicated below. In addition filter bowls should be cleaned with cold tap water.

#### **Inlet *Breathing Air Filter* / Separator Elements**

The top Filter Element (00-4427) should be changed at 12-month intervals. The bottom element should be changed at 12-month intervals. The Part Numbers are as shown in the drawings below.

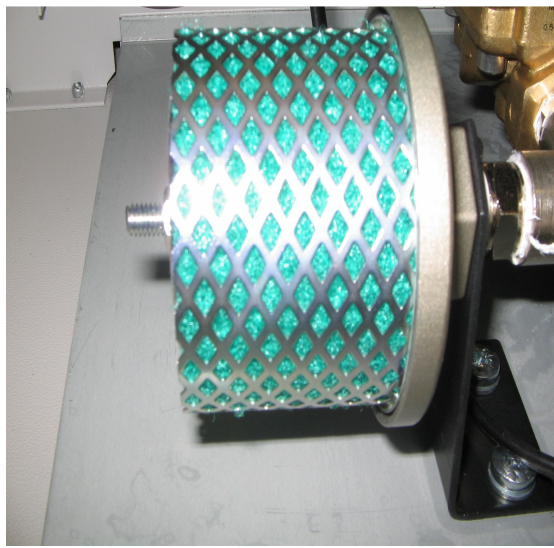


The filter housing is removed by un-screwing in a counter clockwise direction.



### Exhaust Silencer Element

The Exhaust silencer is located as shown, and should be changed at 12-month intervals.



The *Plastic Cover* indicated above is un-screwed by hand to reveal the element. Removing the retaining nut (shown above) releases the element. Re-assembly is the reverse procedure.  
The Element Part No is 02-4336

## 8 Technical Specifications

### General Details

Minimum Operating Ambient Temperature	5 °C (41 °F)
Maximum Operating Ambient Temperature	35 °C (95 °F)
<b>Inlet Air Requirements</b>	
Minimum Air Pressure	120 psig (8.2 barg)
Maximum Air Pressure	130 psig (8.96 barg)
<b>Outlet Conditions</b>	
Nominal Outlet Pressure	80 psig (5.5 barg)

### Physical Details

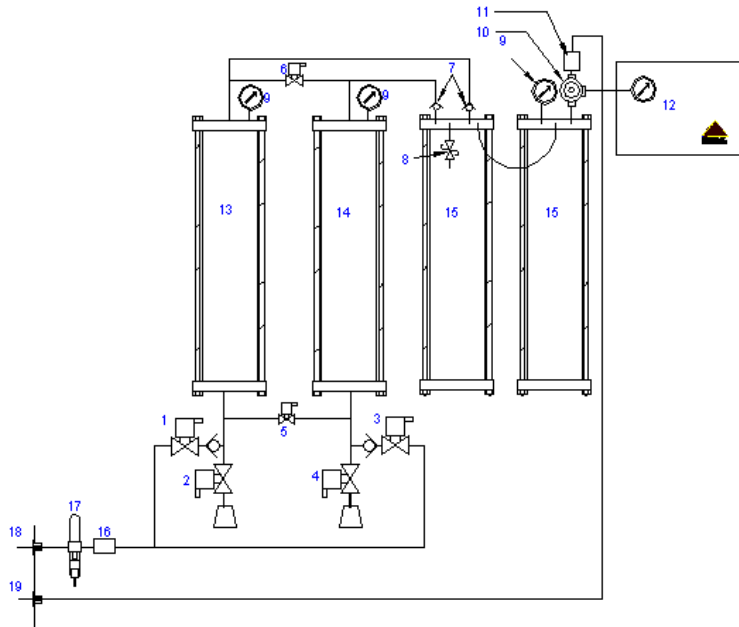
<b>Model</b>	<b>NG10L-HP</b>
Max Output (Ltr/min)	10
Current Load (230V)	1.0A
Dims (W x D x H) cm	60 x 67 x 138
ins	24 x 27 x 55
Shipping Weight Kg	166
lbs.	365
Shipping Weight Dims	78x80x160
	31x32x63

### Serviceable Parts list

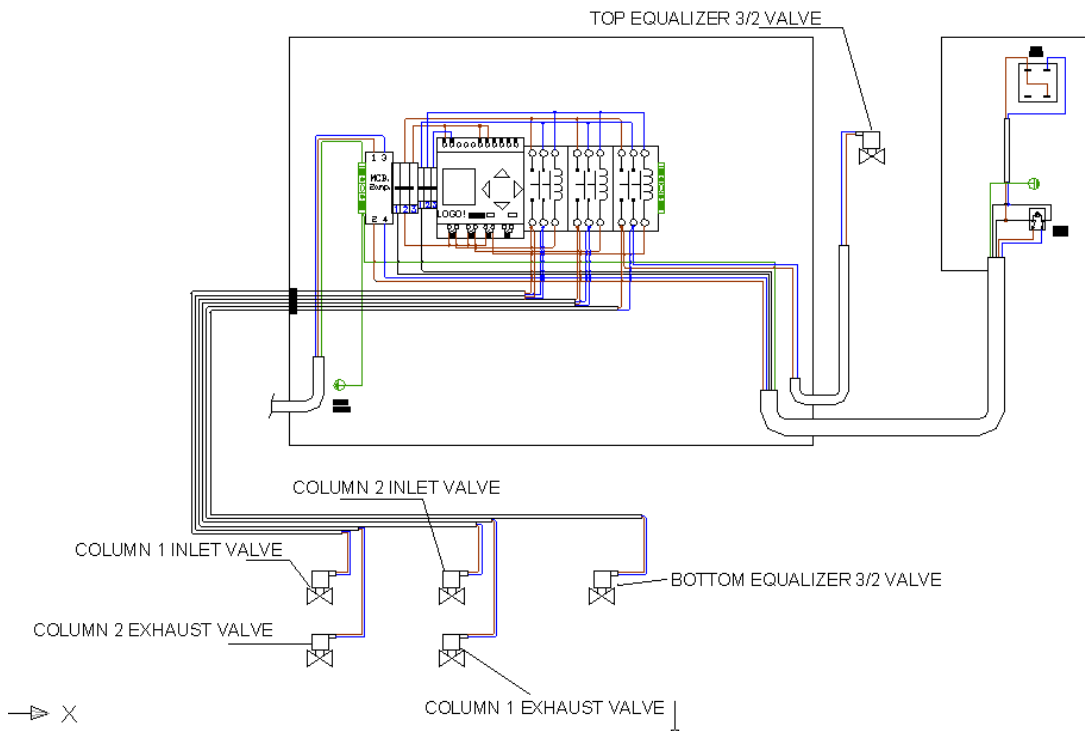
<b>Model</b>	<b>NG10L</b>
Coalescing Element	00-4426
RAC Filter Element	00-4427
Exhaust Silencer Element	02-4336
Inlet/exhaust solenoid valve	02-4289
Equalising valve	02-4334

### Service Schedule

<b>Interval</b>	<b>Action</b>
12 Months	Replace Filter/Separator Element Replace Exhaust Silencer



- Parts List**
1. Inlet Solenoid Valve column 1
  2. Exhaust Solenoid valve column 1
  3. Inlet Solenoid Valve column 2
  4. Exhaust Solenoid valve column 2
  5. Bottom Equalizing Valve
  6. Top Equalizing Valve
  7. Non-return Valve
  8. Safety Valve
  9. Internal Gauge Tank Pressure
  10. Pressure Regulator
  11. Flow Regulator
  12. Front Panel Gauge Output Pressure
  13. CMS Column 1
  14. CMS Column 2
  15. Nitrogen Storage Tank
  16. Inlet Flow Restrictor
  17. Filter double breathing air
  18. Inlet Bulkhead Connection
  19. Outlet Bulkhead Connection





## Notes