

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.

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

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

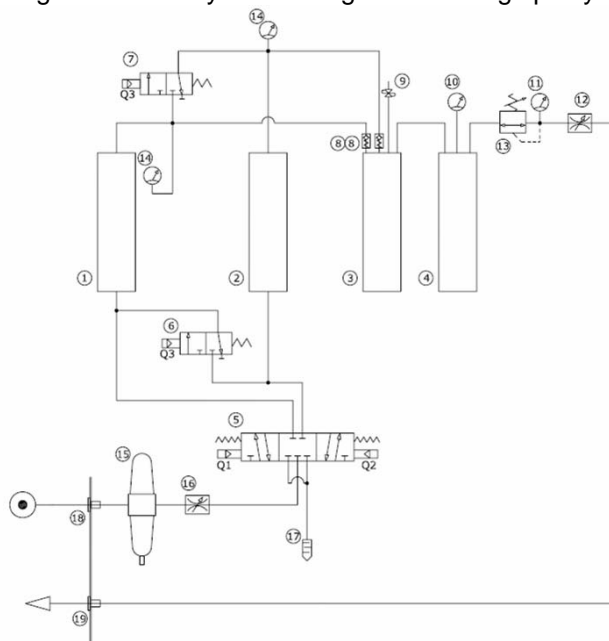
The Nitrogen Generator should be connected to a clean dry source of compressed air. A minimum pressure of 120 psig is required. Any doubts as to the suitability of the compressed air supply should be referred to the factory for advice.

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 2nd 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.



PARTS LIST:

1	CMS COLUMN #1
2	CMS COLUMN #2
3	NITROGEN STORAGE TANK, INTERMEDIATE
4	NITROGEN STORAGE TANK, FINAL
5	PNEUMATIC PROCESS CONTROL VALVE
6	BOTTOM PRESS. EQUALISING SOL. VALVE
7	TOP PRESS. EQUALISING SOLENOID VALVE
8	NON-RETURN VALVE
9	SAFETY PRESSURE RELIEF VALVE
10	TANK PRESSURE GAUGE, INTERNAL
11	FRONT PANEL OUTPUT PRESSURE GAUGE
12	OUTPUT FLOW REGULATOR
13	OUTPUT PRESSURE REGULATOR
14	CMS COLUMN PRESSURE GAUGE, INTERNAL
15	FILTER, DOUBLE BREATHING AIR
16	INLET FLOW REGULATOR
17	SILENCER
18	AIR INLET BULKHEAD CONNECTION
19	N ₂ GAS OUTLET BULKHEAD CONNECTION

Compressed Air passes through the inlet double breathing air filter No:15 and then flow is controlled No:16 depending on the cycle the PLC set Output Q1 'ON' with Outputs Q2 and Q3 set to 'OFF', allowing column # 1 to pressurise and column #2 to vent to atmosphere. After the set time of 2 minutes, the PLC will pulse Outputs Q1 & Q2 to 'OFF' and setting Output Q3 to 'ON' for 1 second allowing the pressure in both columns to equalise. The PLC will then set Output Q2 'ON', with Outputs Q1 and Q3 set to 'OFF', allowing Column #2 to pressurise while permitting Column #1 to vent to atmosphere. Again after 2 minutes the PLC will pulse Outputs Q1 & Q2 to 'OFF' and setting Output Q3 to 'ON' for 1 second allowing the pressure in both columns to equalise. This cycle will continue even if there is no demand of the gas. Delivery pressure is controlled using regulator No:13 and the flow regulated using flow controller No:12.

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 1st 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

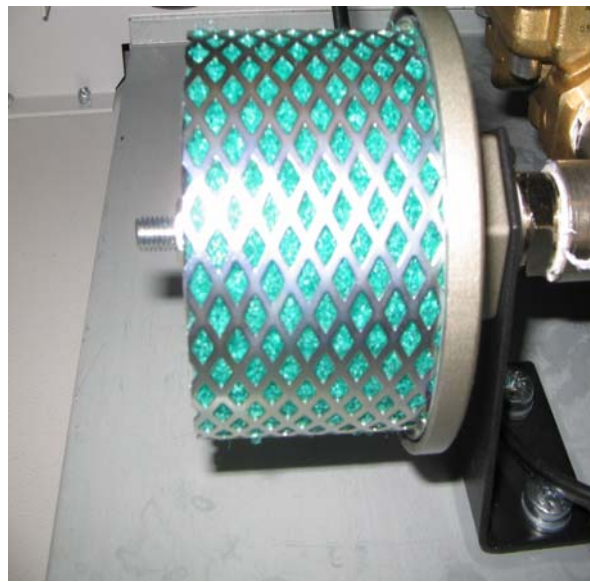
The Inlet Flow restrictor has been set at the factory and should **NOT** be adjusted by the user. Altering the setting of this restrictor will have an effect on the operation of the generator.

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.

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)
Inlet Air Requirements	
Minimum Air Pressure	120 psig (8.2 barg)
Maximum Air Pressure	130 psig (8.96 barg)
Outlet Conditions	
Nominal Outlet Pressure	80 psig (5.5 barg)

Physical Details

Model	NG10L-HP
Max Output (Ltr/min)	10
Current Load (230V)	2.0A
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

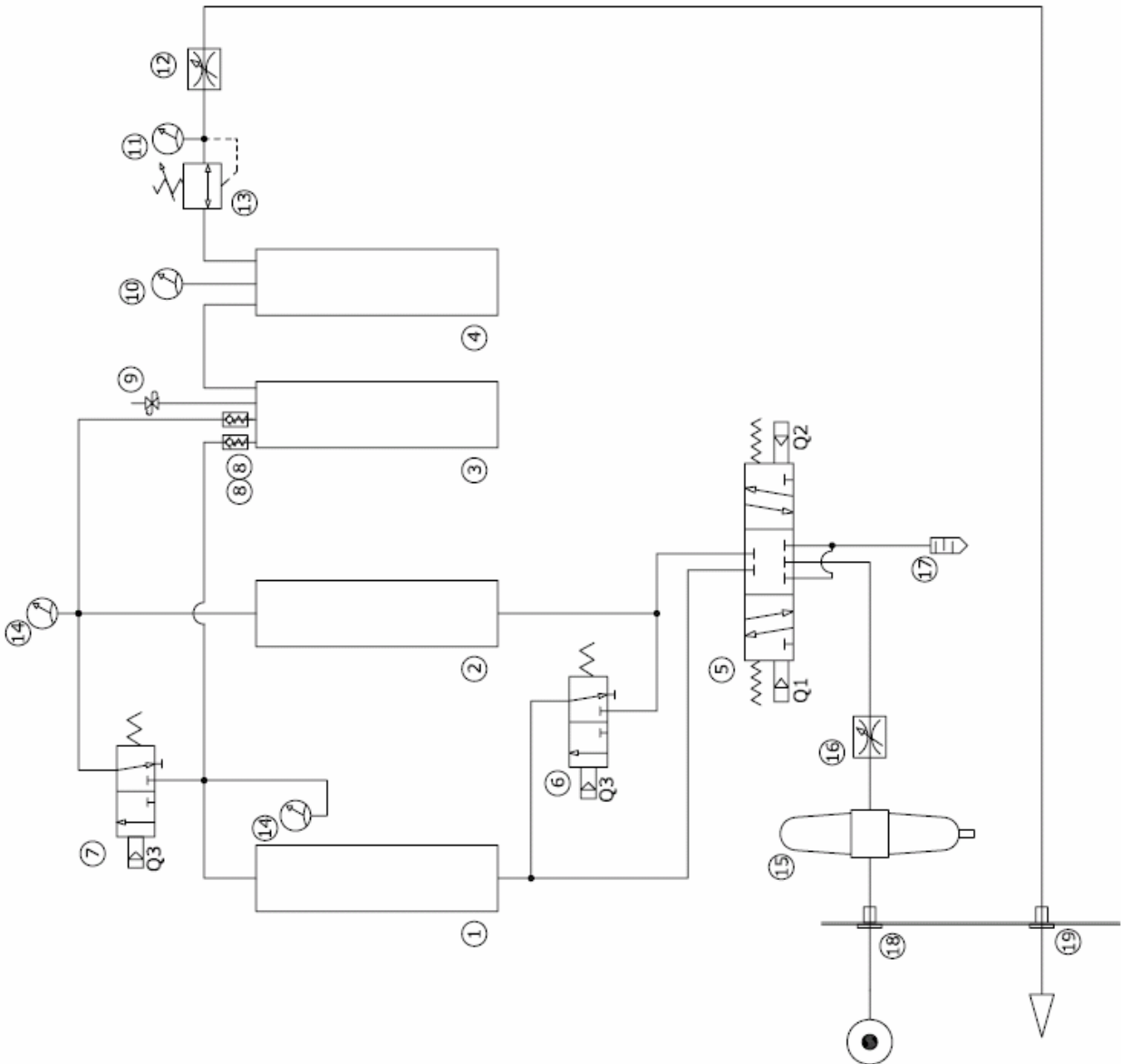
Model	NG10L
Coalescing Element	00-4426
RAC Filter Element	00-4427
Exhaust Silencer Element	02-4336

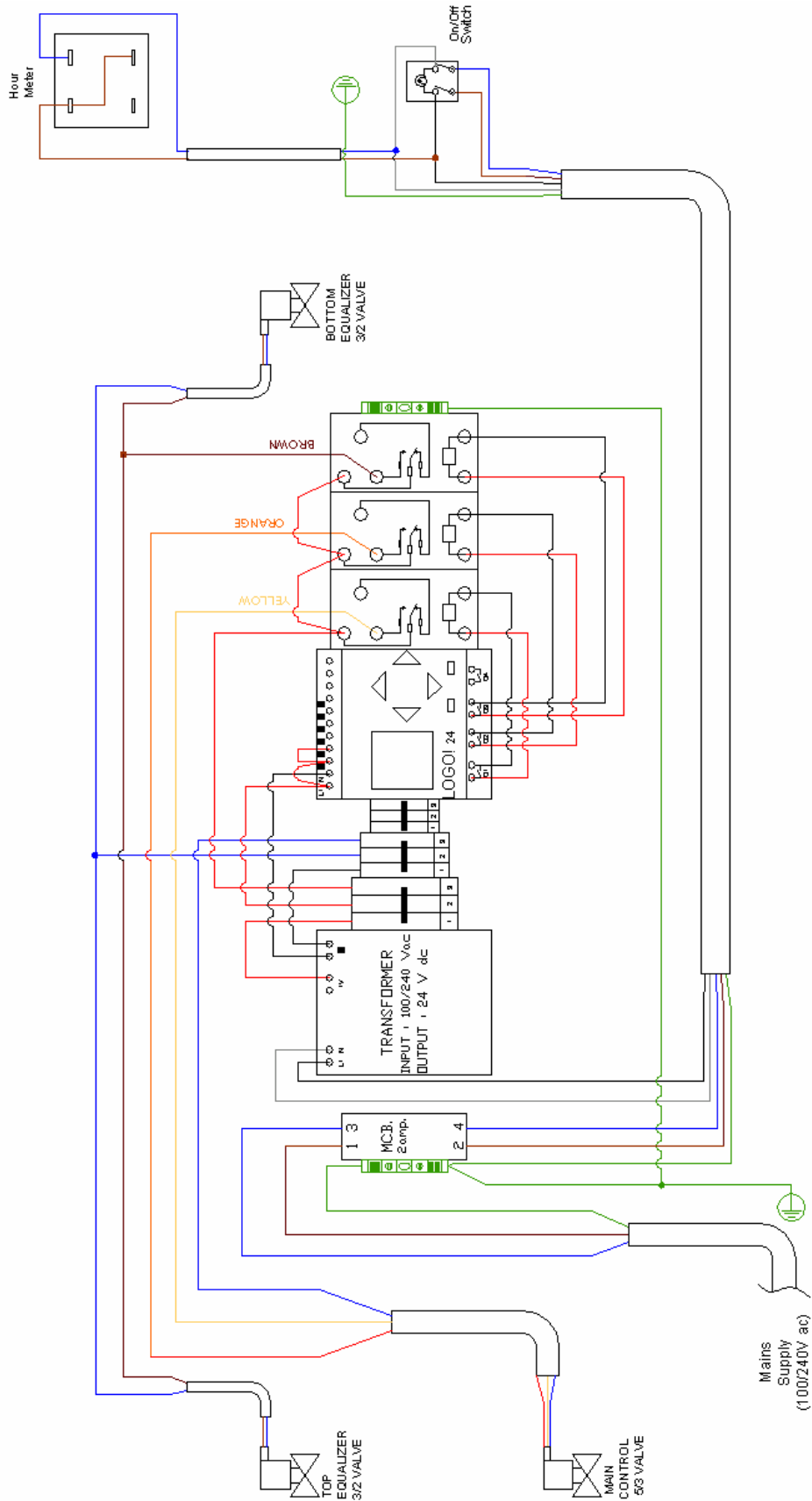
Service Schedule

Interval	Action
12 Months	Replace Filter/Separator Element Replace Exhaust Silencer

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1	CMS COLUMN #1
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3	NITROGEN STORAGE TANK, INTERMEDIATE
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5	PNEUMATIC PROCESS CONTROL VALVE
6	BOTTOM PRESS. EQUALISING SOL. VALVE
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Maintenance Record Log

Model- NG _____.

Serial number _____

Work done	Remarks	Date	Name

Notes