



domnick hunter

**Laboratory Nitrogen Generator
G1 – G9**



USER GUIDE

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Symbols used within this guide



Warning

Highlights actions or procedures, which if not performed correctly, may lead to personal injury or death.



Caution

Highlights actions or procedures, which if not performed correctly, may lead to damage to this product.



Warning

Highlights actions or procedures, which if not performed correctly, could lead to electric shock.



Safety Glasses must be worn.



Suitable gloves must be worn.



Highlights the requirements for disposing of used parts and waste.



1. Safety Warnings

Do not operate this product until the instructions in this manual have been read and understood by all personnel concerned. Should you require training on this product, or any other product within the domnick hunter range, please contact your local domnick hunter office.

Nitrogen is not a poisonous gas but, in a concentrated form, there is a risk of asphyxiation.

The generator will produce a constant stream of nitrogen (and / or Air on G6,G7,G8 & G9 Generators) at a pre-selected flow and purity when connected to a suitable power supply (plus a compressed air supply for non-compressor models).

The generator also produces a small flow of nitrogen (and / or Air on G6,G7,G8 & G9 Generators), which quickly disperses in the atmosphere. Do not directly inhale the output gas from the outlet pipes.

The generator is classified as non-hazardous for transportation purposes and as non-flammable for fire regulations. (Any fire should be fought by means appropriate to the material causing the fire with the exception being the use of water). The plastic covers conform to UL 94 VO fire retardant specifications.

Disposal of the unit should be at a licensed landfill site.

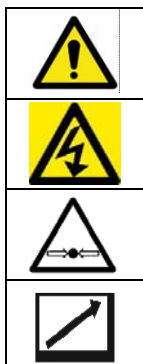
When handling, installing or operating this product, personnel must employ safe engineering practices and observe all related regulations, health & safety procedures, and legal requirements for safety.

Most Accidents that occur during the operation and maintenance of machinery are the result of failure to observe basic safety rules and procedures. Accidents can be avoided by recognising that any machinery is potentially hazardous.

domnick hunter can not anticipate every possible circumstance, which may represent a potential hazard. The warnings in this manual cover the most known potential hazards, but by definition cannot be all-inclusive. If the product user employs an operating procedure, item of equipment or a method of working which is not specifically recommended by **domnick hunter** the user must ensure that the product will not be damaged or made potential hazard to persons or property.

Ensure that the product is depressurised and electrically isolated, prior to carrying out any work.

Symbols used on the product are shown below:



Caution, Read the manual

Risk of Electric Shock

Pressurised Components on System

May Start Automatically Without Warning

This product should be installed in accordance with the recommendations outlined in this manual. Commissioning and service should be undertaken by a **domnick hunter** trained, qualified and approved engineer to maintain warranty. Any interference with the calibration warning labels will invalidate the generator's warranty and may incur costs for the re-calibration of the generator.

Extended warranty and tailored service contracts are available for this product. Please contact your local **domnick hunter** sales office for a tailored service agreement to meet your specific requirements.

Details of your nearest **domnick hunter** sales office can be found at www.domnickhunter.com.

2. Technical Specification

Nitrogen N2	Models		Outlet Pressure bar g	Flowrate L/min	Purity % O ₂	Connections BSP		Dimensions mm			Weight (kg)	
						Air inlet	Gas outlet	W	H	D	With compressor	Without compressor
	G1	0	5	0.55	10 ppm	1/8"	1/8"	345	842	842	52	56
		1		0.75	10 ppm							
	G2	0	5	1.5	10 ppm	1/8"	1/8"	345	873	663	77	90
		1		3.0	10 ppm							
	G3	0	5	2.5	100 ppm	1/8"	1/8"	345	873	663	71	83
		1		4.0	0.1							
		2		5.0	0.5							
		3		7.0	1							
		4		8.0	2							
	G4	0	5	5.0	100 ppm	1/8"	1/8"	345	873	663	77	90
		1		6.0	0.1							
		2		10.0	0.5							
		3		12.5	1							
		4		14.0	2							
		5	7	12.0	0.5	1/8"	1/8"	345	873	663	N/A	
		6		18.0	0.5							
7		20.0		1								
8		25.0		1								

Zero N ₂	G5	0	5	1.0	10 ppm	1/8"	1/8"	345	842	413	51	55
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N ₂ & Dry Air	G6	0	5	N ₂ : 0.6	10 ppm	1/8"	1/8"	345	842	413	54	58
				Air: 1.5	-55°C adp							
	G7	0	5	N ₂ : 3.0	10 ppm	1/8"	1/8"	345	873	663	80	93
				Air: 3.0	-55°C adp							

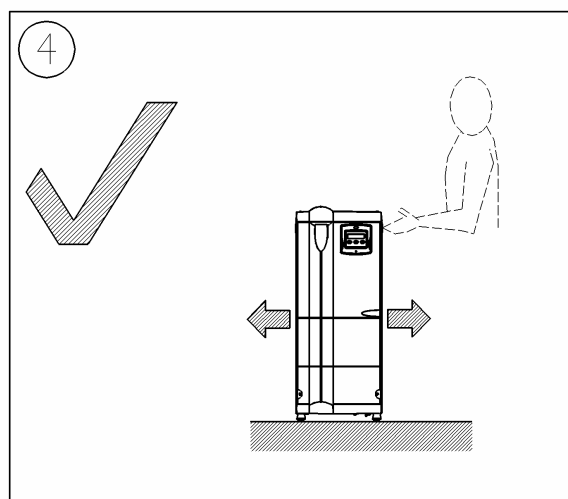
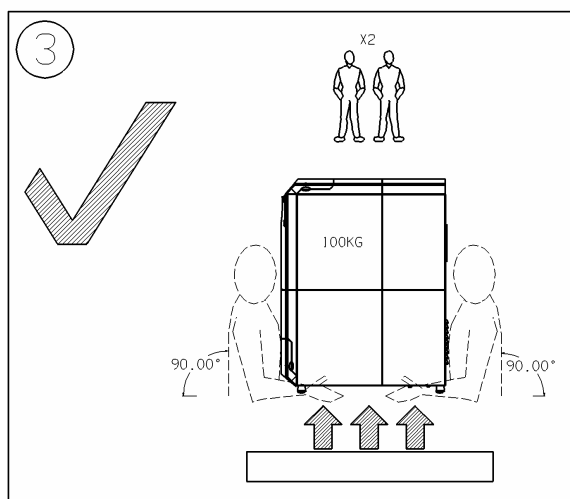
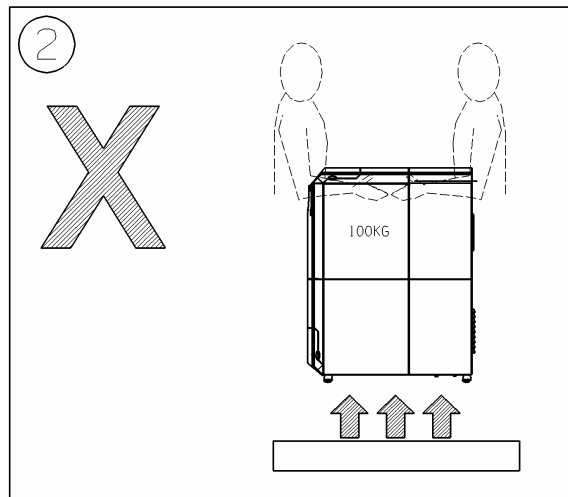
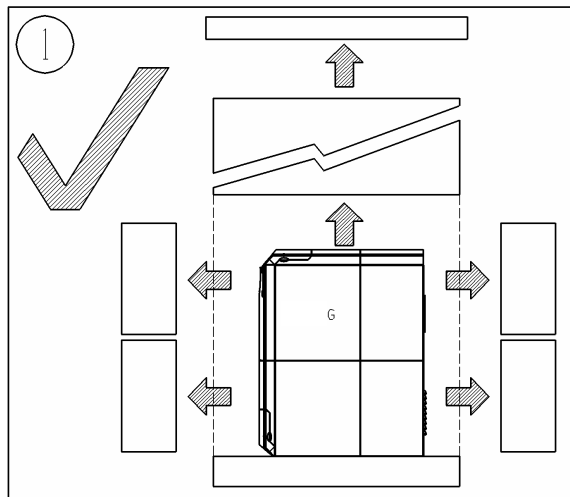
Dry Air	G8	0	5	3.0	-55°C adp	1/8"	1/8"	345	842	413	50	54
	G9	0	5	6.0	-55°C adp	1/8"	1/8"	345	842	413	50	54

Description	Units	
Inlet Air Quality		ISO 8573.1: 2001, Class 1.2.1
Input Voltage	V ac	115/230V ac 50/60Hz ± 10%
Temperature	°C (°F)	5 – 45 (41 – 113)
Altitude	m (ft)	< 2000 (6562)
Pollution Degree		2
Installation Category		II
Humidity		50% @ 40°C (80% MAX ≤ 31°C)
IP Rating		IP20 / NEMA 1

3. Unpacking the Generator

The generator is supplied in a wooden crate. It is recommended that the crate be moved into position using a forklift truck or pallet truck.

Remove the generator from the wooden crate using the following illustrations for guidance.



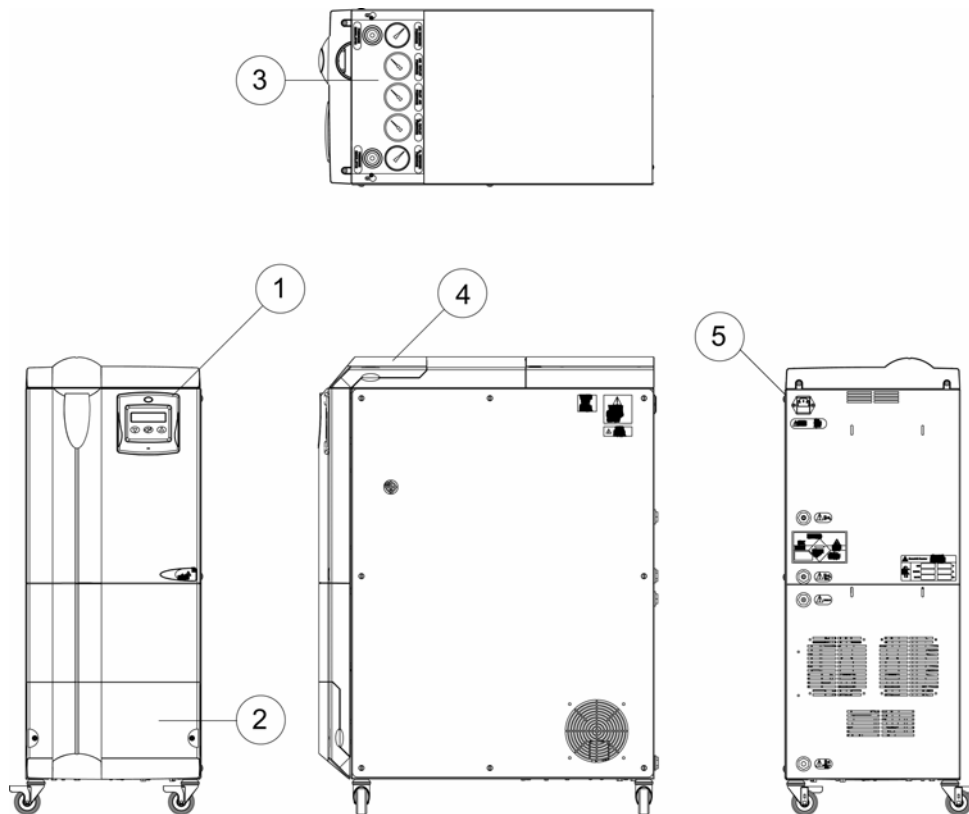
Care should be taken and inspection undertaken during unpacking to ensure that the product is not damaged.

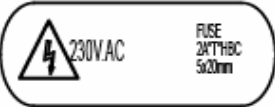







All packing material should be disposed of in accordance with local regulations.

4. Generator Interface

All connection points are clearly marked on the generator and are represented in the diagram below.



Ref	Connection	Description
1	Control Console	
2	Lower Service Hatch	
3	Pressure Gauges	Where fitted.
	Pressure Regulator	
	Air receiver pressure gauge	
	Air outlet pressure gauge.	
	Inlet air pressure gauge.	
	N2 outlet pressure gauge.	
	N2 receiver pressure gauge.	
	Pressure regulator	
4	Upper Service Hatch	
		Mains Inlet Socket.
		Nitrogen Outlet Port.(G4 Models Only)
		Air Outlet Port G6 and G7 Models only
		Mass Flow Control Outlet (All Models)
		Drain (G4 Models only)
		Air Inlet Port (Used on all models without integral compressor).

5. Recommended System Layout



Caution

Gas outlet tube for G1 and G6 generators must be a minimum of 1/8".
Gas outlet tube for G2, G3, G4, G5, G7, G8, and G9 generators must be a minimum of 1/4".
Gas outlet tube must be copper or stainless steel.

Air inlet tube for all non-compressor generators must be a minimum of 1/4".
Air inlet tube must be copper or nylon.

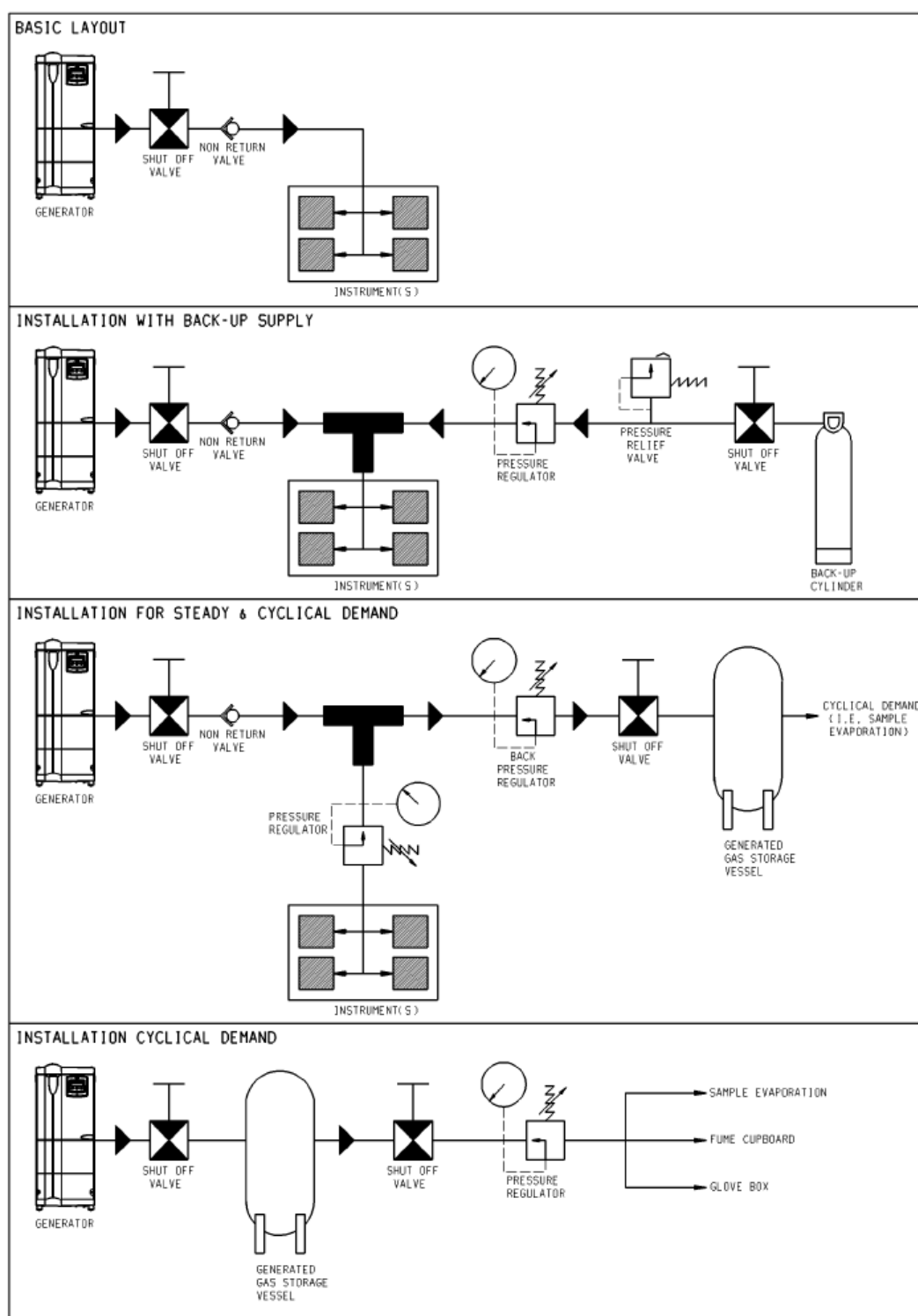


Figure 6.1 Recommended System Layout

6. Installation & Commissioning



Warning

Only competent personnel trained, qualified, and approved by domnick hunter should perform commissioning and service procedures.

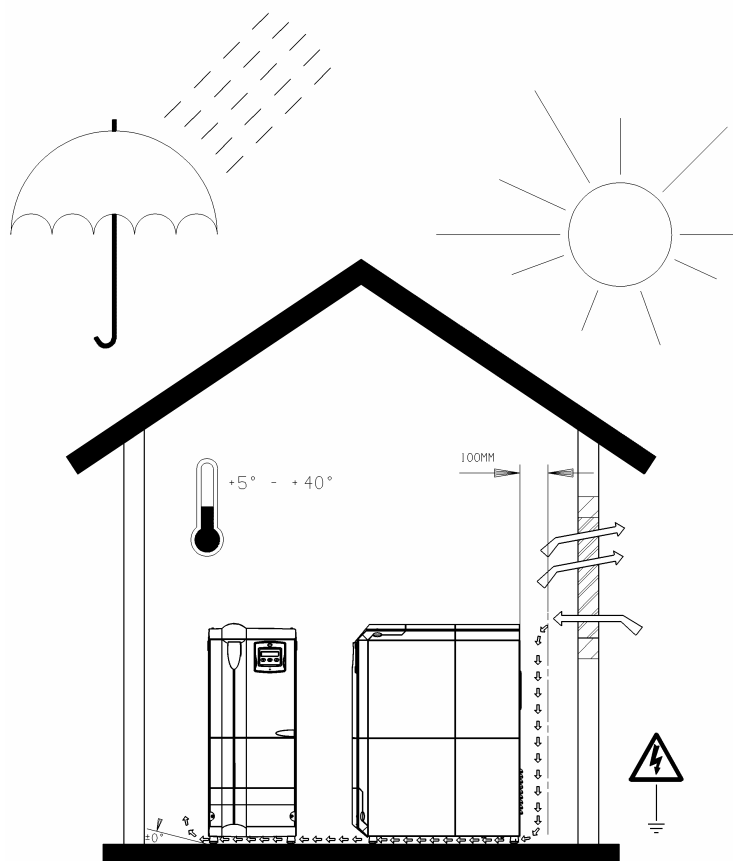


Caution

Failure to meet any of the following requirements could result in a loss of performance or invalidate the generator's warranty.

6.1 Locating the generator

Identify a suitable location for the generator, taking into consideration the space requirements shown below.



6.2 Installation

1. Site generator in the location it will be normally used. It is recommend that the generator be sited as close to application as possible. Do not connect the gas supply pipeline to the generator (refer to recommended system layout).
2. Remove the blanking plugs and install the Swagelok“ fittings supplied with the generator (leave ports open to atmosphere).
3. For non-compressor options only, connect a suitable compressed air line to the generator.



Caution

**Compressed air must be filtered to ISO 8573.1, Class 1.2.1 Dirt, Water, Oil.
(For required pressure refer to unit specification).**

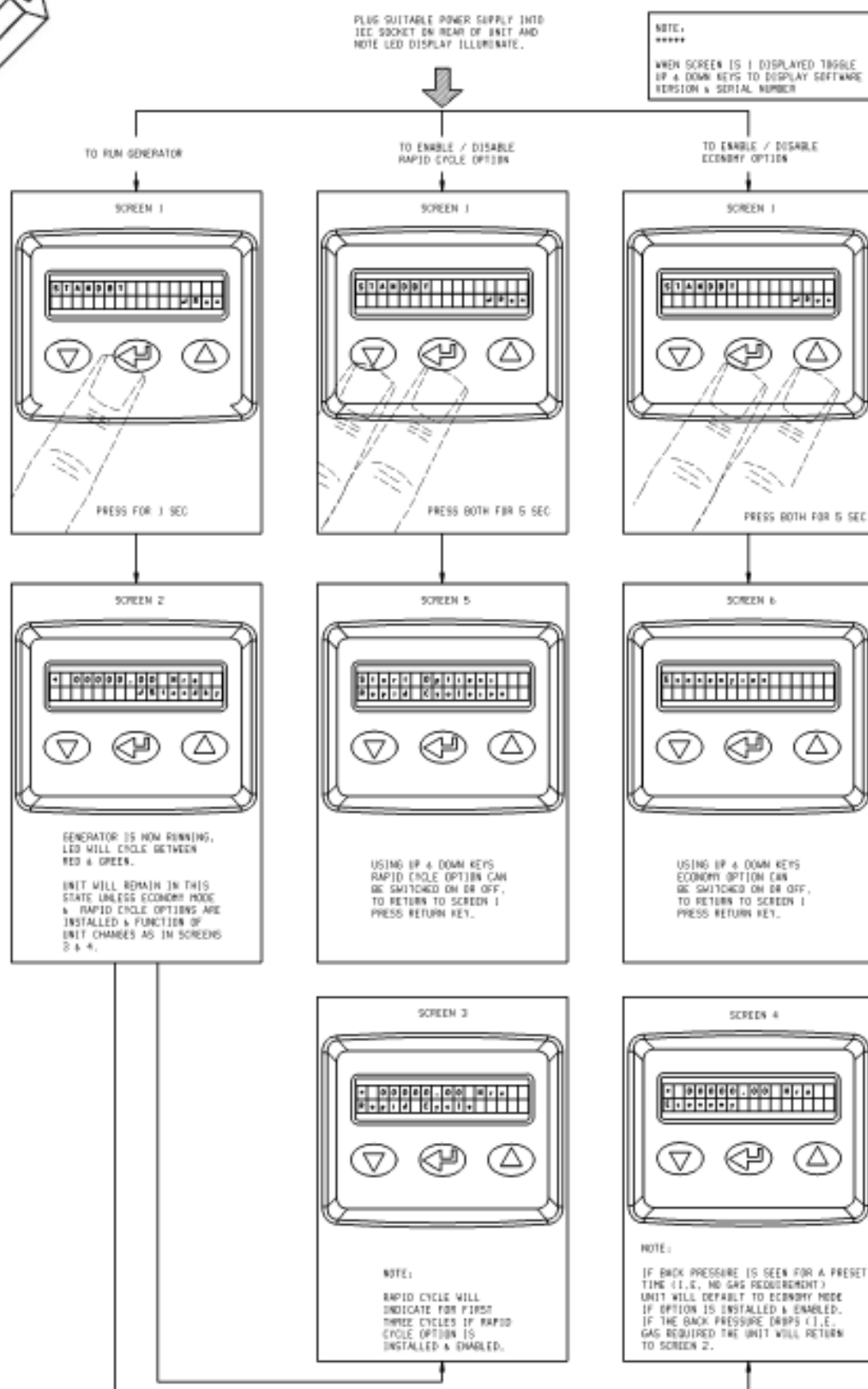
4. Connect the mains lead supplied to the electrical connector on the rear of the generator and connect to a suitably rated power supply (110v 60Hz / 230v 50Hz), ensuring that a suitable earth connection exists.
5. The LCD & LED on the front console will illuminate.
6. Press [↵], located on the controller console, to switch (refer to Start-up & Operation Procedure).
7. The generator will display hours run, cycle from Red LED to Green LED and supply a continuous supply of gas to the application. If the unit has rapid cycle & economy mode the unit will initially display “Rapid Cycle” for the first few cycles (the unit will not be delivering gas during this period - refer to unit functions for details on operation). The generator should be run for a minimum of six hours prior to use with the application to ensure that the required purity of gas required is achieved.
8. After a minimum of six hours connect the generator to the application via the outlet port & ensure any shut off valves are open. (Note: The application supply pipeline will need to be flushed through for one hour by the generator for every ten metres of pipeline, before normal operation can proceed).
9. The generator is now supplying gas to the application.



Caution

The generator is designed to run continuously (unless economy option is fitted – see unit functions). In the event of any kind of interruption to the operation, the unit must be run for 1-hour offline (i.e. no gas to application) to ensure unit purity.

7. Start-up & Operation



8. Generator Shut down Procedure.



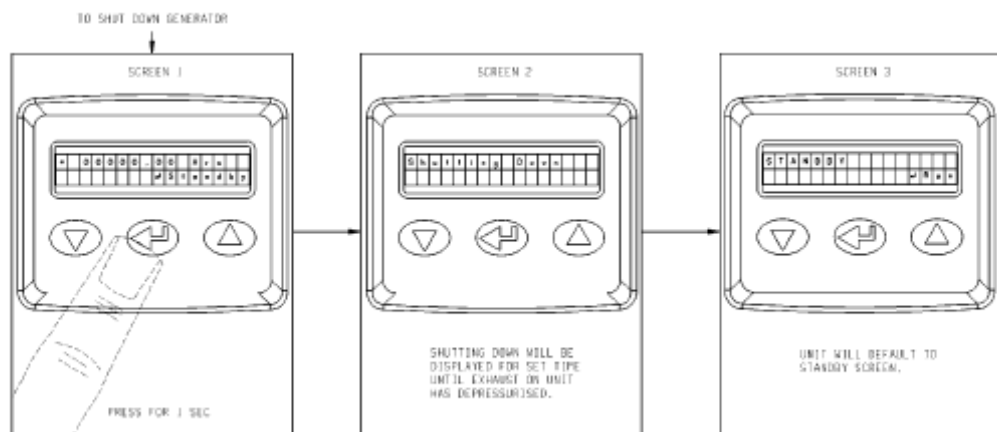
Warning

The generator will build up a residual internal pressure that must be released if unit is to be shipped or serviced. In order to depressurise the unit follow the “Shut Down” procedure below:

- a) Close external shut off valves as recommended in system layout.
- b) Shut down generator as in diagram below (note: allow unit to fully shut down).

Note: When the generator is shutting down the unit may continue to run for up to 10 minutes. This will permit the unit cycle to finish and ensures that the inlet pipework & CMS columns are fully depressurised

c)



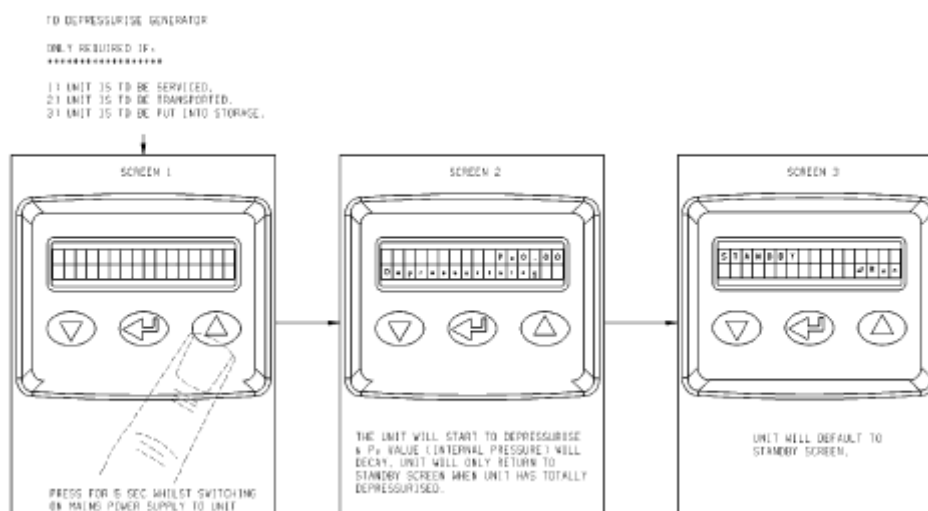
Warning

The storage receivers will still be pressurised, In order to depressurise receivers follow instruction (d) (for non-economy option) or (e) (with economy option).

- d) On all units without the economy option fitted the outlet must flow to atmosphere (i.e. disconnect system pipework) and the unit must remain in standby. The “Online Pressure” gauge (within upper service hatch) will decay, when pressure equals 0 bar the gas generator is depressurised and can be blanked.
- e) On all models with economy option fitted the outlet must flow to atmosphere (i.e. disconnect system pipework) and the unit must be switched off. Then follow the “Depressurising Economy Units” instruction below. Note: once this procedure has started the gas generator will not return to standby until it has depressurised.

Generator Shut down Procedure Continued...

f)



- g) Disconnect mains supply from generator.
- h) On non-compressor models: isolate inlet compressed air supply and disconnect from generator.
- i) Generator is now shut down.



Warning

The compressor heads are very hot! Leave units for 30 minutes following shutdown to cool.

9. Generator Functions

9.1 Economy Mode:

Economy mode is the function whereby the generator will detect & monitor any backpressure from the application. If the pressure exceeds a limit for a preset time (i.e. the application requires no gas) the generator will stop cycling and turn off all valves, and will display "Economy." When the application requires gas, the backpressure will drop & the generator will restart, defaulting into "Rapid Cycle"

Whilst in economy mode the unit will occasionally restart and display "Cleaning Bed", this will flush the system and ensure that the unit reaches the desired purity faster when returned online.

9.2 Rapid Cycle

Rapid cycle is the function of flushing the system of impurities in order to allow the generator to reach desired purity faster. In this mode the generator will not deliver gas to the application for up to 15 minutes and will activate every time the unit comes out of standby or economy mode.

Important: It should be noted that when using economy & rapid cycle functions that the generators will not deliver gas for up to 15 minutes every time the unit is initially taken out of standby or economy. It should also be understood that the purity of the gas will deteriorate when first returned online, the quality depends on how long the generator has been in "Economy". The following table shows how long it will typically take for a unit to return to online purity following a period in economy.

Time Unit Is In Economy Mode	Time To Deliver High Purity Gas (Directly out of Economy Mode)
4 Hours	20 Minutes
12 Hours	20 Minutes
24 Hours	20 Minutes
48 Hours	30 Minutes
48+ Hours	60 Minutes

Important: If the economy and rapid cycle function is included on your generator and the above performance characteristics are unacceptable for your application. (i.e. you require an uninterrupted constant flow of high purity gas). Both rapid cycle & economy can be disabled via the keypad menu structure detailed in the "Start Up & Operation Procedure".

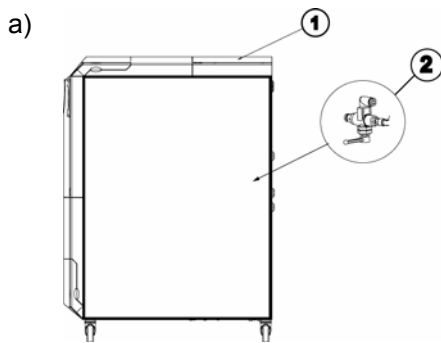
9.3 Mass Flow Controller Bypass Assembly Function (G4 Models only)

This function can be used to bypass the integral mass flow controller. It should only be used if there is an additional mass flow controller downstream from this generator (i.e. external to this unit or built into the supplied equipment). The flow on any external mass flow controller must be set exactly as per the original unit specification. In order to set this function follow the shut down procedure in this manual and then follow the procedure outlined below.



The unit must not be allowed to run and flow to atmosphere when this bypass function is activated. It must flow through a suitable mass flow controller at the units original specified flow.

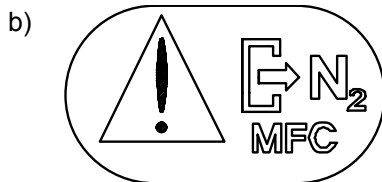
Setting the Mass Flow Controller Bypass Function.



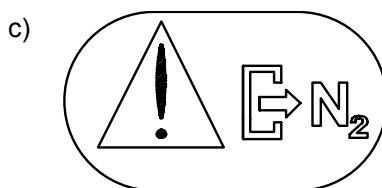
Remove the Upper rear cover (1) and locate the 3 Way Valve (2).

Turn the handle of the 3 Way valve 180°.

Re-attach the Upper rear cover (1)



Blank off the N2 port with the 1/8" Fitting.



Connect this port to the application.

d) Set the flow on the external Mass Controller.

e) Start up the generator.

10. Installation Errors & General Fault Finding Procedure.

General

- Failure to observe recommended actions outlined in this manual causing the warranty to be invalidated
- Insufficient ventilation around the generator causing heat build-up
- Use of non-genuine or non-recommended domnick hunter spare parts
- The application requires more gas than can be supplied by the generator, which means the wrong generator has been requested or the generator is being used for too many applications at the same time
- Leaks on external gas supply pipework causing decreased performance and supply of gas to the application

Inlet Connections

- Unsupported pipework causing stress on pipework joints leading to gas leakage
- Disturbing existing piping could cause debris to flow into the generator and adversely affect the generator's performance
- Unsuitable compressed air supply. Compressed air must be filtered to ISO 8573.1, Class 1.2.1 Dirt, Water, Oil
- Inlet pipe diameter too small causing insufficient inlet air supply to the generator and consequently reduced outlet gas flow

Outlet Connections

- Use of porous or ferrous piping allowing ingress of oxygen
- Outlet pipe diameter too small causing insufficient gas flow to the application

Electrical

- Voltage drop on incoming supply causing the generator to malfunction
- Incorrect supply cable causing overheating and potential fire risk
- Lack of suitable earth connection, causing potential electric shock hazard
- Incorrect mains voltage supply causing the generator to malfunction

General Fault Finding

Fault	Probable Cause	Remedy
Power Connected But LCD/LED Not Illuminated	Fuse Blown	Replace Fuse
	26 Way Connector Disconnected	Check & Rectify
	Power Disconnected	Reconnect Power
No/Low Gas Output Pressure	Service Overdue	Service Unit
	Internal Gas Leak	Check & Rectify
	External Gas leak	Check & Rectify
	Compressor Fault	Contact Sales Outlet
	Low Inlet Pressure	Ensure Pressure Meets Required Specification

11. Warranty

This warranty applies to NITROGEN GENERATORS and associated parts (the equipment) manufactured and supplied by **domnick hunter Ltd (domnick hunter)**.

Use of the NITROGEN GENERATOR without the recommended inlet air quality or genuine parts will expressly invalidate the warranty.

Should the equipment be defective as to materials or workmanship, **domnick hunter** warrants that it will remedy such defect. Where the equipment is a NITROGEN GENERATOR the warranty period will be 18 months from date of commissioning or 24 months from date of manufacture, whichever is the earlier. In the case of equipment other than a NITROGEN GENERATOR the warranty period shall commence from the date of dispatch. Should any defect occur during the warranty period and be notified in writing to **domnick hunter** or its authorised distributor within the said period, **domnick hunter** will, as its sole option, remedy such defect by repair or provision of a replacement part, provided that the equipment has been used strictly in accordance with the instructions provided with each item of equipment and has been stored, installed, commissioned, operated and maintained in accordance with such instructions and with good working practice. **domnick hunter** shall not be under any liability whatsoever under the warranty, if, before giving notification in writing to **domnick hunter** as aforesaid, the customer or any third party meddles, interferes, tampers with or carries out work whatsoever (apart from normal maintenance as specified in the said instructions) in relation to the equipment or any part thereof.

Any accessories, parts and equipment supplied by **domnick hunter** but not manufactured by **domnick hunter** shall carry whatever warranty the manufacturer has given **domnick hunter** providing it is possible for **domnick hunter** to pass on such warranty to the customer.

To claim under the warranty, the goods must have been installed and continuously maintained in the manner specified in the User Guide. Our product support engineers are qualified and equipped to assist you in this respect. They are also available to make repairs that may become necessary in which event they will require an official order before carrying out the work. If such work is to be the subject of a warranty claim, the order should be endorsed for consideration under warranty.

Where equipment is sold outside the UK mainland direct to the end user the warranty will cover parts only. Any substitution of parts not manufactured or approved by **domnick hunter** will expressly invalidate the warranty.

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