



Liquid Gas Generator LN20AC-COMPACT

QUALITY/RELIABILITY/SAFETY/SERVICE

OPERATION MANUAL

YOUR RELIABLE PARTNER IN LIQUID GAS HANDLING



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MUNRO. 5.23

YOUR RELIABLE PARTNER IN LIQUID GAS HANDLING

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CONTACT DETAILS

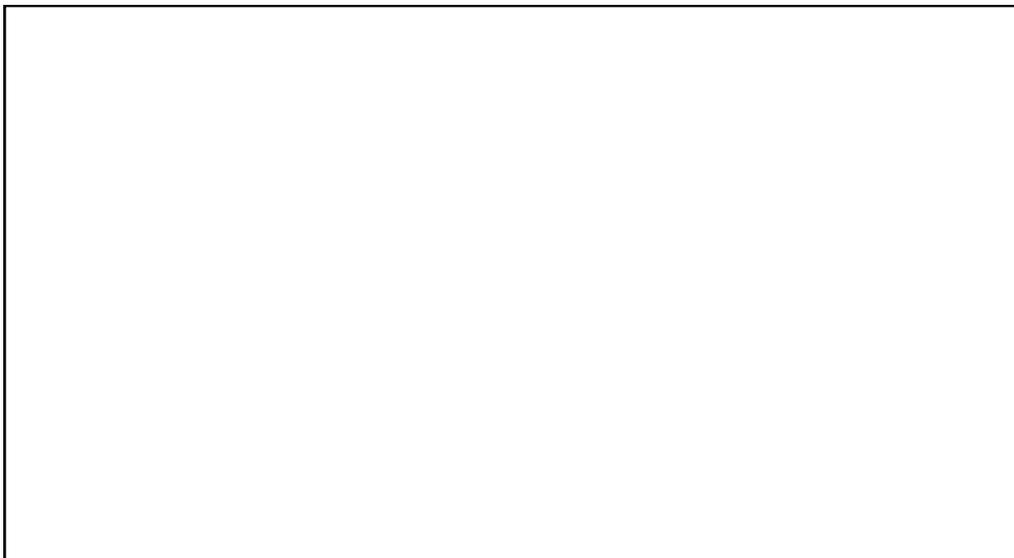
MUNRO LTD

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MUNRO
(Head Office)

Your Authorised Distributor is



YOUR RELIABLE PARTNER IN LIQUID GAS HANDLING

SPECIFICATION

TECHNICAL SPECIFICATION						
MODELS	L/DAY	L/HR	STORAGE CAPACITY	ELECTRICAL SUPPLY	POWER (KW)	COOLING WATER (Kw of cooling)
LN20AC compact	20	0.83	35 L	230V	3.0	AIR COOLED

Ambient temperature: between +5°C and +32°C (optimum)

Ambient humidity: 20 – 95%

LN20AC-COMPACT Dimensions: 0.8m(L) x 0.6m (W) x 1.8 m (H)

LN20AC-COMPACT weight 380 kg (on wheels)

Standard Features

- ◆ HMI touch screen
- ◆ Continuous Process display
- ◆ Oxygen display and alarm
- ◆ Liquid level indicator
- ◆ Auto-stop when dewar full
- ◆ RS232 signal output— Ethernet optional
- ◆ Each system has it own IP address for remote access via internet connection



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PRODUCT DESCRIPTION

The MUNRO Liquid Nitrogen Generator LN Range is designed to supply a volume of pure, clean liquid nitrogen at a pre-determined flow rate per day. The Generator is designed for 24 hour use and is powered from a mains supply of 220v 50/60Hz and a maximum running power of 3kw. Other voltages found inside the enclosure are single phase 230v and 24v d.c. for instruments

The rated voltage of the Generator is marked clearly on the serial plate which can be found on the outside of the enclosure next to the mains inlet socket.

The Liquid system incorporates a PSA Nitrogen Gas Generator which uses the Pressure Swing Adsorption technique which utilises an activated Carbon sieve to trap oxygen, and allows the dry nitrogen to pass through its pores. At the end of a pre-determined period the oxygen is released from the sieve and then pressurisation period can re-start to generate once again. The process is totally equalising, this means that although nitrogen flows from the outlet, oxygen vents to atmosphere preventing the risk of an oxygen depleted atmosphere.

Once the nitrogen gas is at the correct purity and -60°C dew-point the cold-head will switch on and start to produce liquid nitrogen which is then stored inside the internal dewar. This liquid nitrogen can then be dispensed into other dewars using the vacuum insulated dispensing hose supplied.

A small amount of Liquid nitrogen may vent from the internal storage dewar in gas form, but it is a very small flow and will equalise in a ventilated room. If in doubt a wall mounted oxygen depletion monitor and alarm can be fitted in the room—ask MUNRO for more details.

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SAFETY WARNING



MUNRO Liquid Nitrogen Generators are designed to replace normal delivered liquid supplies from outside gas companies. The maximum internal pressure found within the Generator is 8 barg (116 psi g), and the regulated outlet pressure can be up to 5 barg (72.5 psi g). Liquid nitrogen is at -196°C and therefore extremely dangerous, all relevant health and safety guidelines must be followed when handling LN2—see **separate documentation on liquid nitrogen handling**

WARNING

Do not operate the generator until this instruction manual has been read and understood by all personnel concerned

The electrical connection from the mains supply to the generator must be suitably rated and protected for the power consumption (see rating plate and information on page 4) and carried out by a qualified electrician

It is essential that personnel employ safe working practices and observe all related regulations, and legal requirements for safety when operating this equipment. When handling, operating or carrying out maintenance, personnel must employ safe engineering practices and observe all relevant local health and safety requirements and regulations

The System is designed to be located Indoors in a well ventilated room protected from Direct sunlight and excessive moisture

DISPENSING LIQUID NITROGEN

LIQUID NITROGEN IS DANGEROUS—PLEASE SEE SEPERATE DOCUMENT ON SAFE HANDLING OF LIQUID NITROGEN

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INSTALLATION (LN20-compact)

Although MUNRO takes every precaution to ensure safe transit, it is advisable, after carefully removing the generator from its packaging material, to carry out a thorough visual examination for any signs of transit damage

Any damage should be reported immediately to the carrier and MUNRO and/or the distributor from where it was purchased

After unpacking and inspection, the MUNRO generator should come with the following items

1. This instruction manual.
2. Suitable mains plug to be wired by electrician.

The generator comprising of a free standing enclosure should be Positioned on a solid level base as close to the application as possible and secured to the floor using the wheel locking mechanisms as shown below:-

UNLOCKED



LOCKED



The ambient conditions for optimum performance should be between +5 and +32°C. Higher temperatures may effect gas purity and reliability of internal parts. The Generator should be installed in a well ventilated room, free from dirt and away from heat sources such as radiators and fan heaters.

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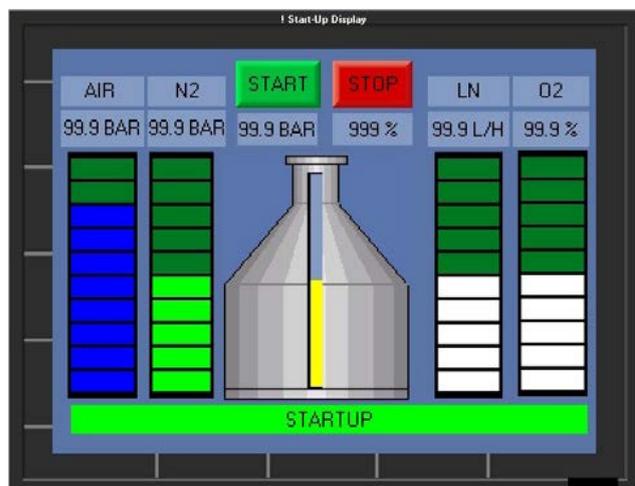
COMMISSIONING

STEP 1

With the Generator situated in its correct location remove the BLUE electrical plug from the socket. A qualified electrician should wire the correct size of mains cable, 1x LIVE, NEUTRAL and EARTH suitable for 16 amps (3kw). Connect the BLUE plug back into the socket and switch the power ON.



MAINS SOCKET
ON RH SIDE



COLOUR SCREEN

When the power is switched on the screen on the front of the generator should appear the same as the above picture.

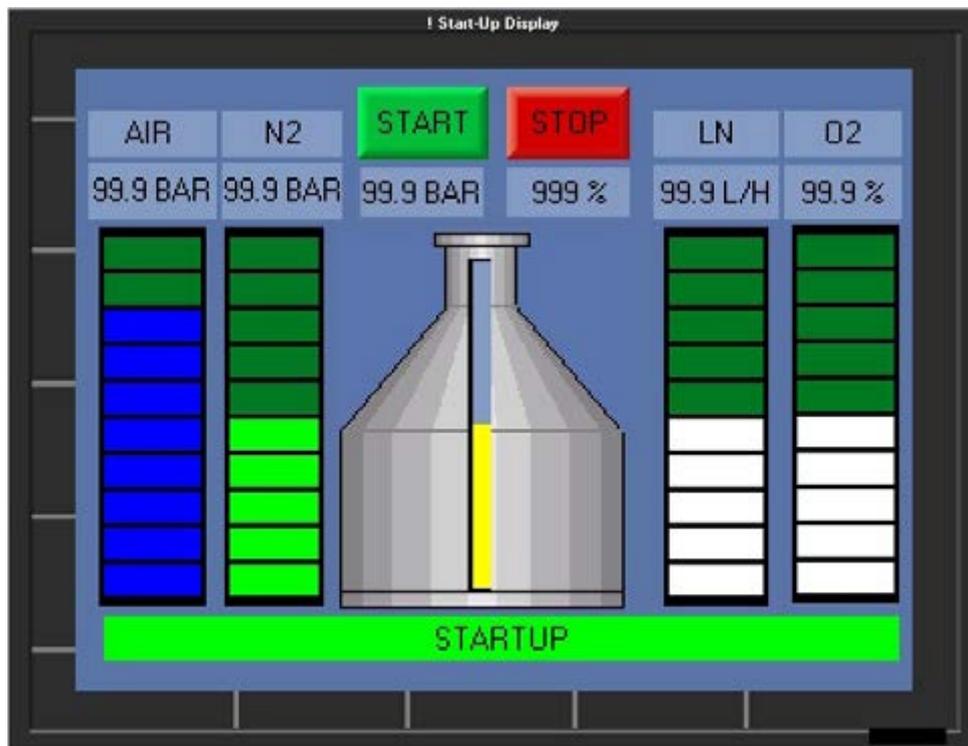
YOUR RELIABLE PARTNER IN LIQUID GAS HANDLING

OPERATION

Once the LN20AC Generator is installed and commissioned there is no user intervention required to use the Generator. As long as it has mains power the system will operate in automatic mode, producing liquid nitrogen until the internal dewar is completely filled. Then the LN20AC system will go into STOPPED until the dewar level drops to a pre-determined level, in which case production will automatically re-start.

With the mains supply on, the front display screen will power up. Note: In the event of a power interruption the screen and PLC will power back up in the mode it was in when powered down, stop, start or economy modes.

On initial start-up the system will enter start-up mode, this will flush the system until the oxygen content in the nitrogen gas is less than 2.0%.

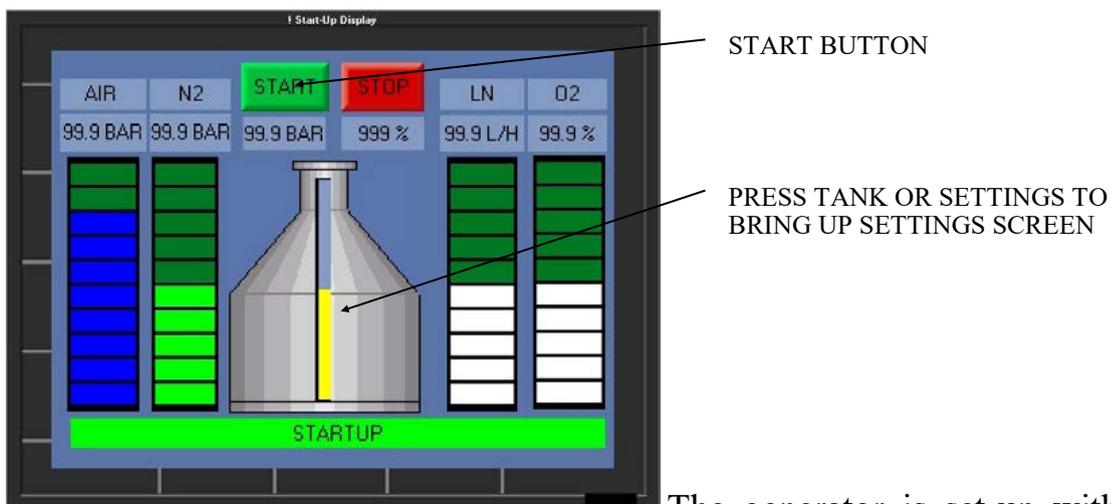


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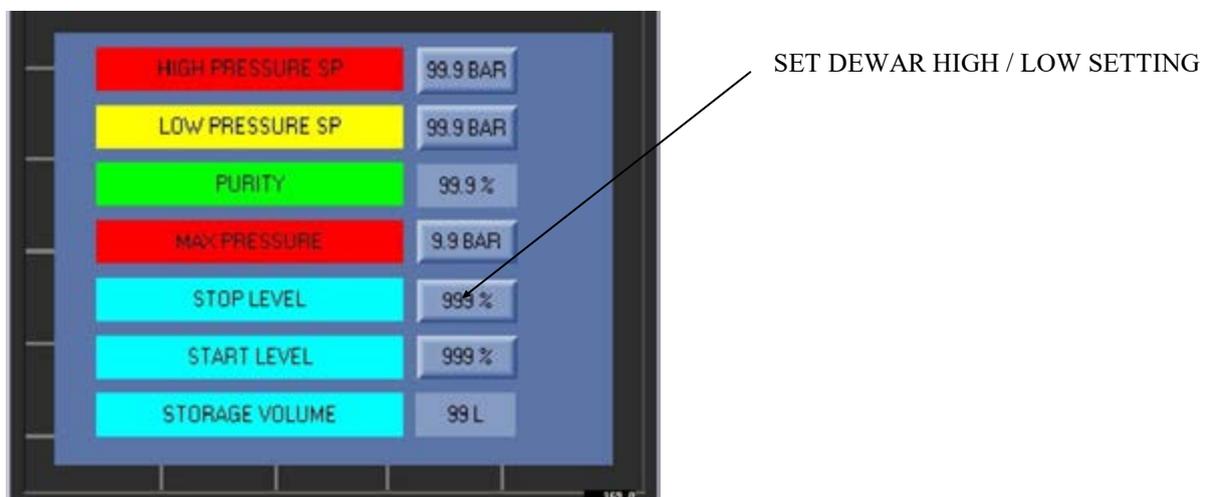
OPERATION

START-UP

Press the START BUTTON as shown below:-



The generator is set-up with **FACTORY SETTINGS**, these can be changed by going to the settings screen as below to adjust high / low dewar setting.



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OPERATION

START-UP

The Generator will now run automatically and approximately 4 hours after first start-up the first liquid nitrogen will be produced.



LEVEL DISPLAY, IS ALSO SHOWN ON THE MAIN HMI SCREEN.

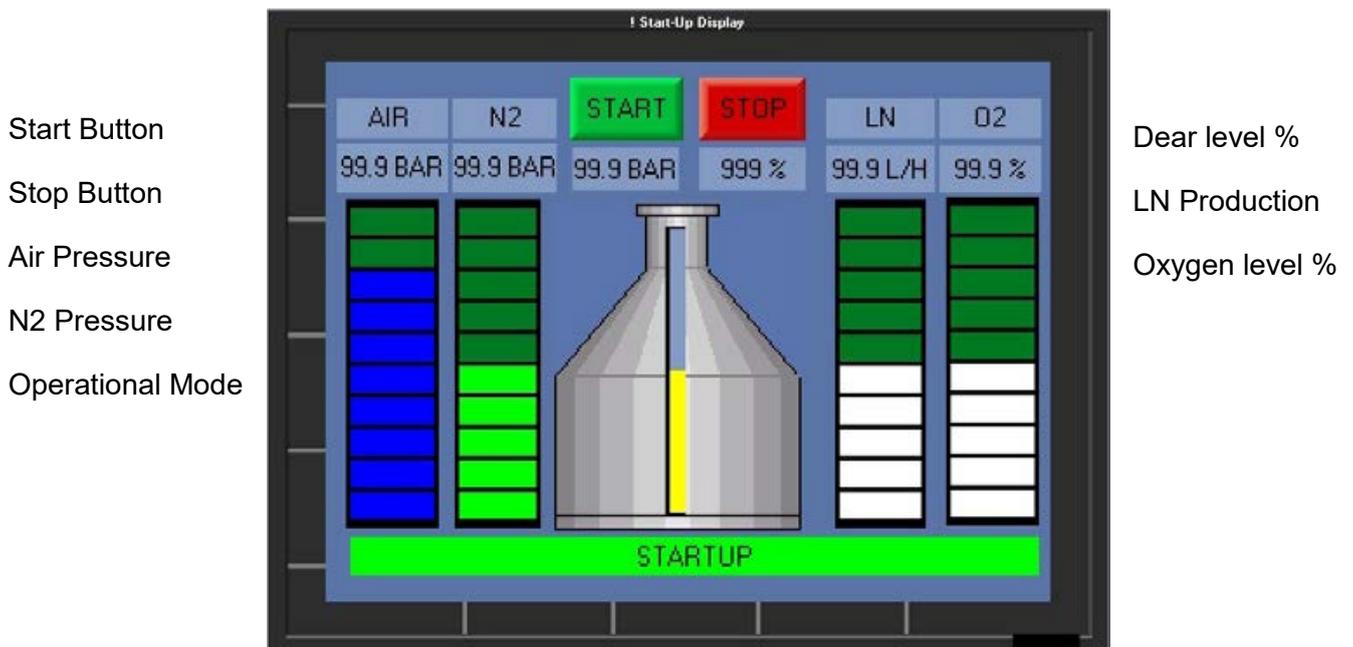
TO CHANGE HIGH AND LOW LEVEL SETTING GO TO SETTINGS SCREEN—PASSWORD 1234 AND ENTER VALUES REQUIRED.

By opening the enclosure door you will see the liquid level indicator as shown above. This is shown as a %, the highest level set is 90% for the economy setting and the lowest is the RE-START value which is factory set at 50%. These have been factory set to the optimum levels to ensure you have a 2-3 days supply of liquid nitrogen stored in the dewar.

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OPERATION

Display Functions



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DISPENSING LIQUID NITROGEN

BEFORE DISPENSING ANY LIQUID NITROGEN
PLEASE READ THE SAFE HANDLING BOOKLET AT
THE BACK OF THIS MANUAL

TURN TO OPEN / CLOSE



Open the enclosure door and locate the liquid nitrogen isolation valve. Using gloves and eye protection slowly open the valve while holding the dispensing hose.

Initially gas will be vented until the hose has been cooled, then liquid nitrogen can be dispensed into a container.

Ensure the valve is closed fully before replacing the hose.

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SHUT-DOWN PROCEDURE

SHUT DOWN

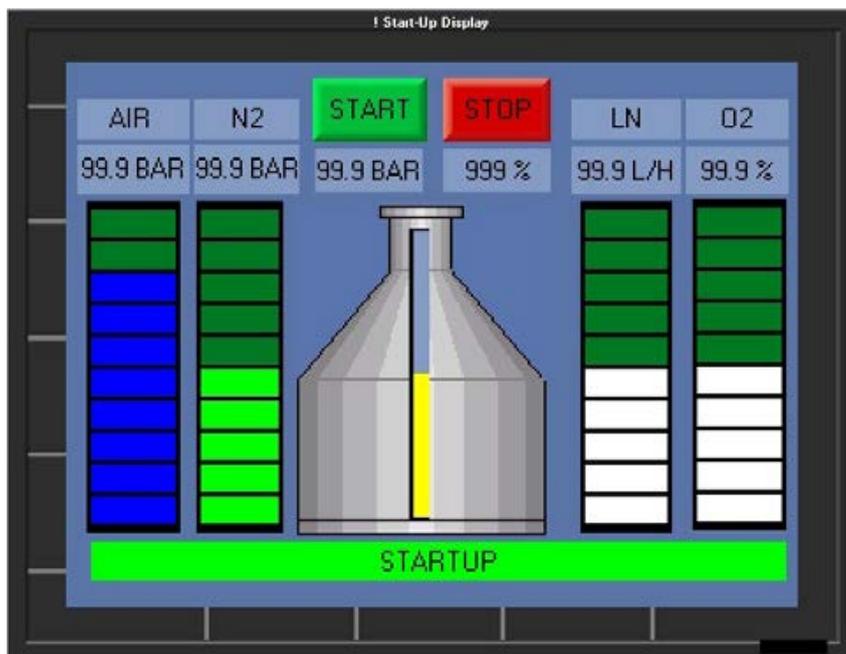
To stop the generator from producing liquid nitrogen manually press the red STOP button the front screen.

Note: Internal parts will still be hot until left to cool and the system remains pressurised.

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MODES OF OPERATION

OPERATION MODE



MODES

- STOPPED
- START-UP
- RUNNING LN TANK CHARGED
- RUNNING LN TANK CHARGING
- LEVEL STOP (DEAR FULL)

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SERVICE SCHEDULE

The Service Schedule for the LN range of liquid nitrogen systems is as follows and must be followed in order to maintain the reliability of the Generator and also to ensure the validity of any outstanding Warranty. Original approved parts are available from MUNRO Products, using any other type, or non-approved parts may damage the system and invalidate any warranty.

4,000 Operating Hours (or year 1 & 2) Service

- Air inlet filter element x 2
- Sterile filter element x 1
- Exhaust silencer x 2
- 230v Electrical relay set x 1
- 24v Electrical relays set x 1



24,000 Operating Hours (or 3 years) Service

- 4,000 hour service (as above)
- Solenoid Valve kit x 2
- Compressor service kit x 1

CONTACT MUNRO FOR 24,000 HOURS SERVICE MANUAL

Service manual is available—make a request to MUNRO or Distributor

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Hours	Date	Completed by	Comments
4,000			
8,000			
12,000			
16,000			
20,000			
24,000			
28,000			
32,000			
36,000			
40,000			
44,000			
48,000			

Comments:

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PRODUCT WARRANTY

This warranty applies to Gas Generators and associated parts (the equipment) manufactured and supplied by MUNRO Ltd

Use of the Gas generator without the recommended inlet air quality or genuine spare parts will expressly invalidate the warranty

Should the equipment be defective as to materials or workmanship, MUNRO Ltd warrants that it will remedy such a defect. Where the equipment is a Liquid Nitrogen Generator the warranty period will be 12 months from date of commissioning or 18 months from date of dispatch, whichever is earlier, provided such commissioning is carried out in the way described within the instruction manual. Should any defect occur during the warranty period and be notified in writing to MUNRO or its authorised distributor within the said period, MUNRO 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 the equipment, and has been stored, installed, commissioned, operated and maintained in accordance with such instruction and with good practice. MUNRO shall not be under any liability whatsoever under the warranty if, before giving notification in writing to MUNRO as aforesaid, the customer or any third party meddles, interferes, tampers with or carries out any work whatsoever (apart from normal maintenance as specified in the said instructions) in relation to the equipment or any part thereof. MUNRO will hold no liability for any damage to third party equipment, processes, goods or materials caused by a defect in a MUNRO gas generator

Any accessories, parts and equipment supplied by MUNRO but not manufactured by MUNRO shall carry whatever warranty the manufacturer has given MUNRO provided it is possible for MUNRO 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 operators handbook

Where the equipment is sold outside the UK mainland direct to the end user the warranty will cover parts only replacement, however if claiming a warranty repair the Generator must be returned to MUNRO UK for inspection / repair

Any substitution of parts not manufactured, supplied or approved by MUNRO will invalidate the warranty

MUNRO Ltd has a continuous policy of product development and although the company reserves the right to change specifications, it attempts to keep customers informed of any alteration. This publication is for general information only and customers are requested to contact our sales department for detailed information and advice on a product's suitability for a specified application. All products are sold subject to the company's standard conditions of sale

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DECLARATION OF CONFORMITY

Models: LN20AC-COMPACT
2006/95/EC 2006/42/EC 2004/108/EC 97/23/EC

Name of Manufacturer or Supplier: **MUNRO Automation Ltd**

Full postal address including country of origin
Burnt Mill | Elizabeth Way | Harlow 44-45
Essex | CM20 2HU | United Kingdom
Telephone: +44 (0) 20 8551 7000
Website: www.munroinstruments.com

Place of Issue: **Gateshead, Tyne & Wear**

Description of Product: **MUNRO Liquid Nitrogen Generator**

Name, type or model: **LN20AC**

Directives used:
2006/95/EC 2006/42/EC 2004/108/EC 97/23/EC

PED Conformity Assessment Route: (PIPE) - **SEP**

Name of authorised representative
Duncan Bradley

Position of authorised representative
Director

Full Postal address if different from above
As above

Declaration

I declare that as the authorised representative, the above information in relation to the supply / manufacture of this product, is in conformity with the standards and other documents following the provisions of the above Directives.

Signature of authorised representative

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