



SWISSGAS

NitroGen series

NG SIRIO: **1500**
 3000
 5000

Operating manual

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V3

LNI Swissgas



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1 General information

Important warnings



Before using the appliance, users must read and understand the contents of every section of this manual.

1.1 General warnings

- The descriptions, drawings and photographs contained in this manual are purely indicative and in some cases may not reflect the actual appliance purchased
- The transfer to third parties and reproduction of all or part of this manual is prohibited without the written authorisation of the manufacturer and/or the reseller
- The manufacturer and/or the reseller accepts no liability for injuries, production downtime or other expenses due to errors or omissions in this manual
- This manual is an integral part of the appliance; consequently, it must be kept throughout the life of the appliance in a safe place that is accessible and known to all users of the appliance
- The manufacturer reserves the right to make any modifications that it considers useful for the improvement of its products at any time
- Failure to heed the warnings given in this manual may cause severe personal injuries and material damage
- Contact the manufacturer and/or the reseller if you find a problem that you cannot solve with this manual. For further details, see the last chapter of this manual.

1.2 Safety information

- Do not use the appliance until the safety information and instructions in this manual have been read and understood.
- Using the appliance in a manner not specified in this document may compromise the protection provided by the generator and could lead to an unexpected release of pressure, which may cause serious personal injury or damage
- When handling, installing or operating this appliance, personnel should adopt correct procedures and comply with all local health and safety regulations and legal safety requirements
- Only competent and suitably trained people may carry out the commissioning, maintenance and repair of the appliance
- Ensure equipment is electrically isolated and has cooled down before performing any routine maintenance specified inside this user manual. Most accidents that occur during the operation and maintenance of machines are the result of failure to comply with basic safety procedures.
- Care must be taken as burns can occur from touching hot parts.
- Do not operate equipment with a damaged cord or if the equipment has been dropped or damaged until it has been examined by a qualified service technician.
- Let the equipment cool completely before moving it or packing it in a box
- To reduce the risk of fire, do not operate equipment in the vicinity of open containers of flammable liquids.



It is impossible to anticipate every possible circumstance that may constitute a potential danger. The warnings in this manual cover the most known potential dangers.

1.3 Intended use

The Nitrogen generator is designed to produce a source of nitrogen for laboratory use. The appliance must only be used for this purpose, in compliance with the specifications and instructions described in this manual. In particular, special attention must be paid to the following warnings:

- Do not use the appliance outdoors
- Do not use the appliance in temperature and humidity conditions outside of the limits specified for operation (see par. 2.3)
- Inlet air quality must always meet the values indicated in the technical specifications
- Make sure that the room where the appliance will be installed has suitable ventilation
- Unplug the appliance from the mains power supply before accessing the inside of the appliance
- Only use the original spare parts specified in this manual.

1.4 Improper use

- Improper use of the appliance is considered as the failure to observe the data on the rating plate, the technical and safety specifications indicated in this manual, and the general standards in force
- Improper use of the appliance may involve risks for the user
- The appliance must only be repaired or serviced by the manufacturer and/or reseller's Technical Service
- The appliance must under no circumstances be modified or tampered with, to avoid creating situations of danger, in which case the manufacturer declines all liability for any resulting damage
- The manufacturer and/or reseller are in no way liable for any damage due to improper use of the appliance.

1.5 Reference directives

The requirements of the following directives and technical standards have been applied during the design and construction of the appliance described in this manual:

- Directive 2014/35/UE (Low voltage directive);
- Directive 2014/30/UE (Electromagnetic compatibility);
- Directive 2011/65/CEE (RoHS);
- Directive 2012/19/UE on waste disposal (Waste Electrical and Electronic Equipment – WEEE);

1.6 Disposal

In relation to European Directive 2012/19/UE (WEEE), disposal of the appliance is regulated by the following requirements:

- Waste Electrical and Electronic Equipment (WEEE) cannot be disposed of as municipal waste. Public or private waste collection systems must be used, in accordance with local regulations
- The appliance can be returned to the reseller at the end of its working life when buying a new appliance
- The appliance may contain dangerous substances: improper use or incorrect disposal of such substances may cause damage to human health and the environment
- In the event of illegal disposal of waste electrical and electronic equipment, the penalties are defined by local waste disposal regulations.

2 Description of the appliance

2.1 Operating principle

Nitrogen generators replace the use of inconvenient cumbersome high pressure gas cylinders as a source of hydrocarbon-free air. Eliminating the use of gas cylinders reduces annual operating costs and the risk of possible injury to workers.

NG-SIRIO could be equipped with the optional **6912.01.000**, an CH₄ scrubber oven option that will remove HC pollutants to less than 0.1 ppm. This system is engineered to be easy to install, requires only minimal annual maintenance and can be used in laboratories and/or light industrial environments.

2.2 Identification of the models

This manual refers to the following models of appliances:

NG SIRIO 1500

NG SIRIO 3000

NG SIRIO 5000

Some parts of this manual refer to just one or some of these models. The model is identified on the product label applied to the rear of the appliance, as shown in the figures below:

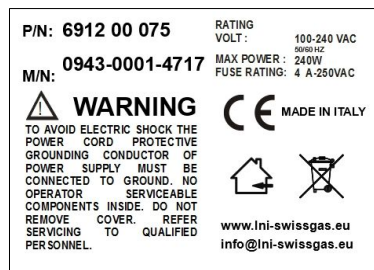


Figure 1: Product identification label

If the unit NG-SIRIO is equipped with the option **6912.01.000** (CH₄ scrubber for HC removal) it will be present also the following label:

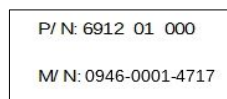


Figure 2: **6912.01.000** option label

2.3 Technical specification NG SIRIO

Models: NG SIRIO		1500	3000	5000
N2 outlet				
Flow rate (Max)		1500 cc/min	3000 cc/min	5000 cc/min
Outlet pressure (Max)		5 bar (72.5 psi)		
Nitrogen purity		> 99.9995%	> 99.999%	> 99%
Outlet Dew-point		<-60°C (-76°F)		
Outlet particulate		0.01 micron		
Hydrocarbon content		<0.1 ppm (with option 6912.01.000)		
Communication				
RS485		Standard		
RS232		Standard		
General data				
Supply rating		100-115 Vac 50/60Hz or 220-240Vac 50/60Hz		
Connection type		IEC320-C13		
Installation power (max)		1000W		
Fuse rating (5x20mm)		6.3A		
Net weight		<70 kg		
Dimensions (W x D x H)		430 x 580 x 630 mm		
Pneumatic connections				
Outlet port		1/8" female BSPP		
Operating/storage conditions				
Working Temperature		5-35°C (41-95°F)		
Storage Temperature		1-50°C (34-122°F)		
Humidity (max, non condensing)		70%		
Noise		< 58 dB(A)		
IP rating		IP20		
Pollution degree rating		2 (with no aromatic compounds)		
Altitude		< 2000m		

Table 1: Technical specifications, NG SIRIO.

2.4 Dimensions

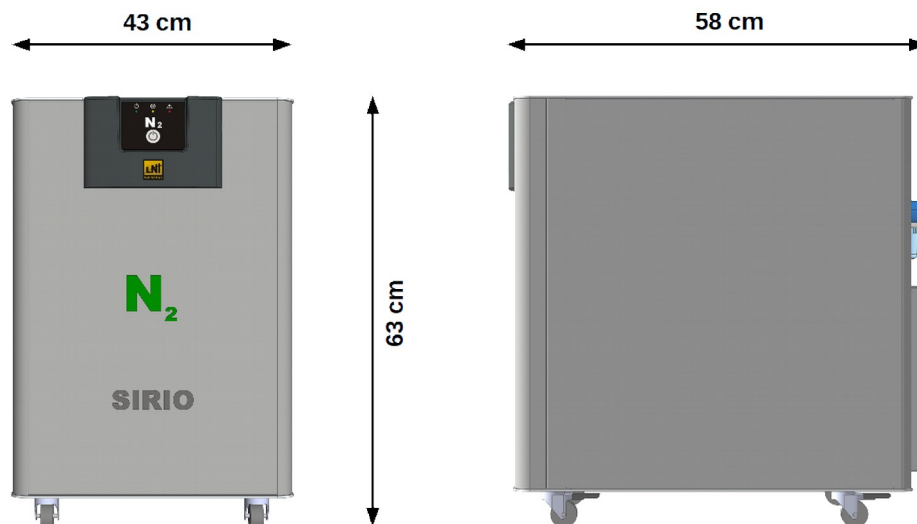


Figure 3: Dimensions of the appliance

Width	43 cm	16.9"
Deep	58 cm	22.8"
Height	63 cm	24.8"

2.5 Overview of the appliance

All connections, electric and air, are made at the back panel. Refer to the figure below.

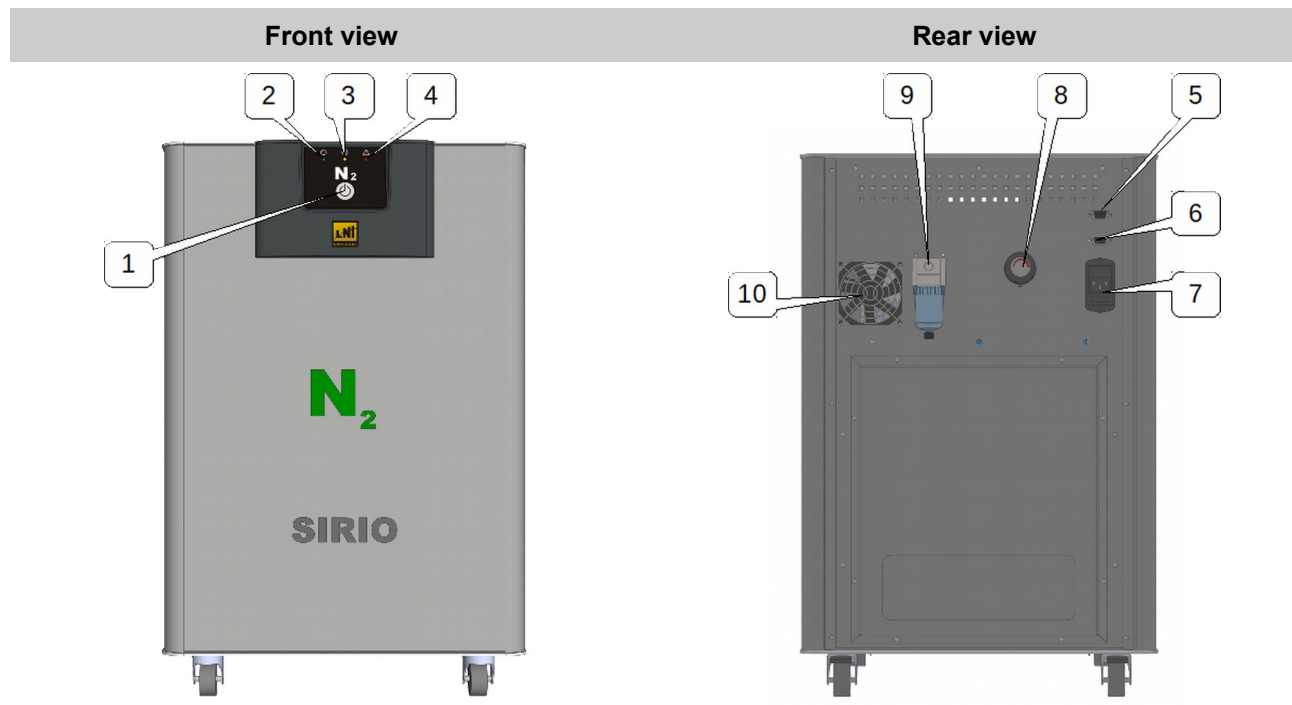


Figure 4: Overview of the appliance

#		Description
1	Front panel	START/STOP button
2		ON/OFF LED
3		Status LED
4		Alarm LED
5	Rear panel	RS485
6		RS 232
7		Power connector, fuse and switch
8		Outlet pressure regulator with integrated manometer
9		N2 Outlet
10		Cooling air fan

Table 2: Connections on the appliance

3 Receiving the appliance

On receiving the appliance, carefully check all the parts to ensure that no damage has occurred during transport. Any damage found must be reported to the carrier, specifying the type of damage on the delivery documents. Any claims must be received in writing within eight (8) days from the date of receipt of the goods.

3.1 Packing list

NG SIRIO generator is shipped together with the following material:

1 power supply cable



IMPORTANT: Keep the original packaging used to deliver the generator. This may be useful if needing to transport the appliance at a later date (e.g. return for service).

4 Installation

4.1 Warnings

- The generator should be positioned on a flat surface that is not exposed to vibrations and able to withstand a weight greater than 90 kg
- Do not position the generator near naked flames or other sources of heat
- Always leave sufficient clearance for the air circulation around the appliance, above all at the rear, where the ventilation air intake is located
- Do not use the generator in a sealed environment or without suitable ventilation
- Do not use the appliance in temperature and humidity conditions outside of the limits specified for operation (see *par. 2.3*)

4.2 Electrical connections



- Make sure the characteristics of the mains power supply are adequate for the power ratings indicated in the table of technical specifications
- Power to the appliance must be turned on only after installation work has been completed
- The power line should be fitted upstream with a suitable device to protect against short-circuits and earth leakage and isolate the appliance from other equipment
- Use cables with double insulation, in accordance with the standards in force in the country concerned
- The appliance must be earthed
- The manufacturer is not liable for any damage caused by failure to earth the appliance.

5 Commissioning

5.1 Starting the appliance the first time

Before operating the zero air generator the first time, proceed as follows, with reference to the figures below:

- Remove the cap from the N2 outlet (9)
- Connect the N2 outlet to the application (9)
- Connect the power cable to the power socket and turn on the power switch (7)
- Start the unit pressing START/STOP button (1)

5.2 Shutting down

List of operations to be performed before powering off the generator:

- Press the Start / Stop button (1) to switch off the internal oven
- Turn off the power switch and disconnect the power cable (7)

5.3 Returning the appliance for service and/or repairs

List of operations to be performed before packaging the appliance and sending it to service:

- Press the Start / Stop button (1) to switch off the production
- Wait until the green LED is on steady (2)
- Turn off the power switch and unplug the power cable (7)
- Disconnect the air line (9)
- Place the generator in its original packaging



**The generator contains hot elements.
Make sure it has fully cooled down before packing and sending it.**

6 Operation

6.1 User interface



Figure 5: User interface

The front panel has three LEDs: GREEN (2), YELLOW (3), RED(4) and one button (1)
Press the START/STOP button (1) to turn ON/OFF the heat oven catalyst.

The following table shows the link between LED status and unit status.

Status	Green LED (1)	Yellow LED (2)	Red LED (3)
POWER ON	FLASHING	FLASHING	FLASHING
STOP	ON	OFF or ON + the red LED flashing, when a pre-alarm occurring	*
CHARGE	ON	ON	*
DISCHARGE	ON	ON	*
STAND-BY	FLASHING	FLASHING	*
ALARM	ON	OFF	FLASHING

Table 3: Unit status signals

**In case of pre-alarm the RED led (4) flashes, identify the type of error in the table Pre-alarm signal*

6.2 Alarm and pre-alarm signals

During normal operation the red LED (4) is OFF and the system carries out several automatic checks.

In the event of minor anomalies or services request the yellow LED is ON when the red LED flashes to signal a **pre-alarm** message (*the flashes number of red LED identifies the type of founded problem*) in these cases the unit does not stop the N2 production.

In the case of serious anomalies, the red LED flashes to signal an **alarm** message (*the flashes number identifies the type of founded problem*) and nitrogen production stops immediately.

The difference between pre-alarm and alarm signal is shown as follows:

Pre-alarm → yellow LED on steady when the red LED flashes.

Alarm → yellow LED off and red LED flashing.

6.2.1 Pre-alarm

When a pre-alarm is activated, the green LED is On steady, the yellow LED is On steady when the red LED comes on in the following sequence:

Flashes (*to indicate the pre-alarm*) – Off – On for 4 seconds.

The signal depends on the number of flashes, as shown in the table below:

N. of flashes	Description	Pre-alarm
2	Column charged	x
3	Charging time under the threshold	x
4	Column discharged	x
5	N2 pressure too low	x
6	Service 1 required	x
7	Service 2 required	x
8	Service 3 required	x
9	Internal temperature	x

Table 4: Pre-alarm signal

6.2.2 Alarm

When an alarm is activated, the green LED is On steady, the yellow LED is OFF and the red LED comes on in the following sequence:

Flashes (*to indicate the alarm*) – Off – On for 4 seconds.

The signal depends on the number of flashes, as shown in the table below:

N. of flashes	Description	Alarm
2	Compressor pressure sensor damage	x
3	N2 pressure sensor damage	x
4	Over pressure	x
5	Internal column pressure too high	x
6	Memory error	x
7	Memory damage	x

Table 5: Alarm signal

7 Maintenance

All maintenance procedures should be performed by suitable personnel using reasonable care.

Prior to servicing the unit, turn off the power supplies to the generator, and ensure that the system is de-pressurised.

To ensure consistent product performance and reliability use only genuine replacement parts and filter cartridges.

The primary maintenance tasks required are:

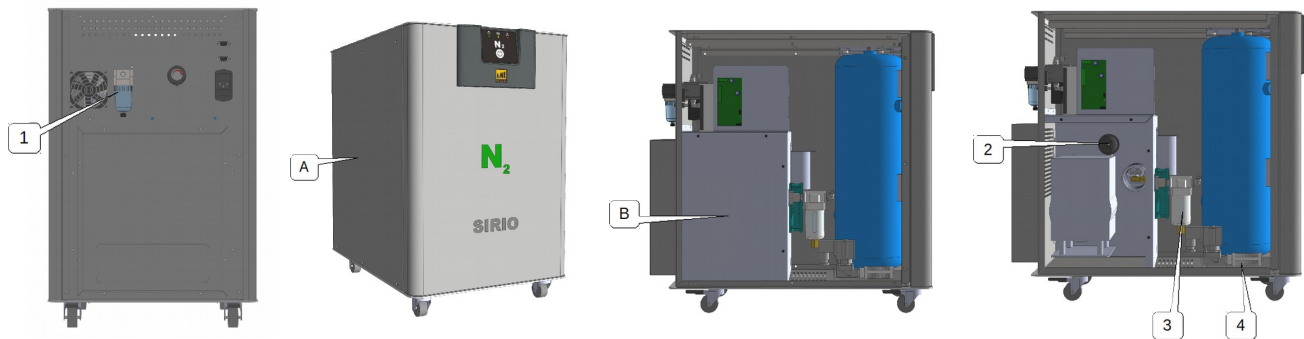
Operation	Description	Interval	KIT part number
Check	Check for abnormal noise and vibration	-	-
Maintenance Service 1	After the first 400 hours check the air intake filter and clean it if necessary. Change the compressor inlet filter cartridge. Change the internal air filter cartridge. Change the OUTLET filter cartridge. Change the discharge silencer.	Every 4000 hours / 1 year	6930.00.165
Maintenance Service 2	Change the compressor's elastic bands.	Every 8000 hours	6930.00.166
Maintenance Service 3	Change the internal compressor	Every 16000 hours	6930.00.167
Maintenance	Change the CH4 scrubber oven. <i>(only in unit with CH4 option)</i>	Every 24000 hours	6930.00.300

7.1 Perform maintenance operations (Service 1)



All the maintenance operations that involve handling parts into the unit, must only be carried out by suitably trained personnel and in full compliance with all safety standards.
Moreover, these operations must only be performed with the unit turned off, unplugged and electrically isolated.

Contact service to perform every operation that involve internal parts of the appliance and to perform the relative service reset.



To change elements contained in kit **6930.00.165**:

External element (Air outlet filter cartridge (1)):

- Unscrew the filter bowl and pull it outwards (1)
- Remove and replace the filter element
- Secure again the filter bowl

For other internal elements:

- Remove the side panel (A)
- Remove the protection metal sheet (B)
- Change the compressor inlet filter cartridge (2)
- Change the internal air filter cartridge (3)
- Change the discharge silencer (4)

After the service operations, reassemble all parts in reverse order (protection meta sheet, side panel etc.).



All the maintenance operations that involve handling parts into the unit, must only be carried out by suitably trained personnel and in full compliance with all safety standards.
Moreover, these operations must only be performed with the unit turned off, unplugged and electrically isolated.

Contact service to perform every operation that involve internal parts of the appliance and to perform the relative service reset.

8 How to request service

To request service and/or for any further information on operation of the appliance, please contact your local reseller.