THE LINDE GROUP

User manual.

Hydrogen Generator

Models NMH_2 Series
NMH_2 100, NMH_2 160, NMH_2 250, NMH_2 300,
NMH_2 500, NMH_2 600, NMH_2 1L

Date June 18, 2008

HiQ®

Table of contents.

Introduction.

Scope of the manual

This manual provides operation and maintenance instructions for the Hydrogen Generator models NMH_2 100, NMH_2 160, NMH_2 250, NMH_2 300, NMH_2 500, NMH_2 600 and NMH_2 1L.

Specifications

Specifications of the different Hydrogen Generator models			HiQ® code
Hydrogen flow rate STP: Standard temperature and pressure (20 °C, 1 bar)	Model NMH_2 100	0–100 ml/min at STP	5500
	Model NMH_2 160	0–160 ml/min at STP	5501
	Model NMH_2 250	0–250 ml/min at STP	5502
	Model NMH_2 300	0–300 ml/min at STP	5995
	Model NMH_2 500	0–500 ml/min at STP	5503
	Model NMH_2 600	0–600 ml/min at STP	5996
	Model NMH_2 1L	0–1000 ml/min at STP	5989
Max. outlet pressure	10.5 bar (155 psi)		
Purity	99.9999 % +		
Weight (dry)	Models NMH_2 100, 160, 250, 300	17.5 kg	
	Model NMH_2 500, 600	19 kg	
	Model NMH_2 1L	20 kg	
Power consumption	Model NMH_2 100	90 VA	
	Model NMH_2 160	115 VA	
	Model NMH_2 250	160 VA	
	Model NMH_2 300	200 VA	
	Model NMH_2 500	300 VA	
	Model NMH_2 600	340 VA	
	Model NMH_2 1L	480 VA	
Input voltage	120–240 V/50–60 Hz		
Fuse	4 A (5x20)		
Pressure accuracy	0.1 bar (± 0.5 %)		
Microprocessor-controlled display	Graphic display, 128 x 64 pixels		
Index of protection	IP2x		
Operating conditions: → Temperature → Relative humidity	 +15 °C to +40 °C 0-80 %, non-condensing		
Over voltage category	II		
Pollution degree	2		
Sound pressure level	46 dB(A)		
Case dimensions	230 x 355 x 410 mm (W x D x H)		

Notes on FCC compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio-frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- → Reorient or relocate the receiving antenna.
- → Increase the separation between the equipment and the receiver.
- → Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- → Consult the dealer or an experienced radio/TV technician for help.

Warning

Any changes or modifications to this equipment not expressly approved by the manufacturer may void the user's authority to operate the equipment.

Correct use

The Hydrogen Generator is designed to produce hydrogen for laboratory use. The unit must only be operated for this purpose, according to the specifications and instructions provided in this manual. In particular, the following warnings must be observed at all times:

- → Indoor use only.
- → Never operate the unit at below-zero temperatures. This will cause irreversible damage to the electrolysis cell.
- → Only use pure water (see "Filling the water tank")
- → Only operate the unit in a room with sufficient ventilation (see "Placing the generator").
- → Always unplug the unit from the mains power supply before accessing the internal components for replacement.
- → Only the parts described in the "Spare parts list" can be replaced by the user.

Packing list

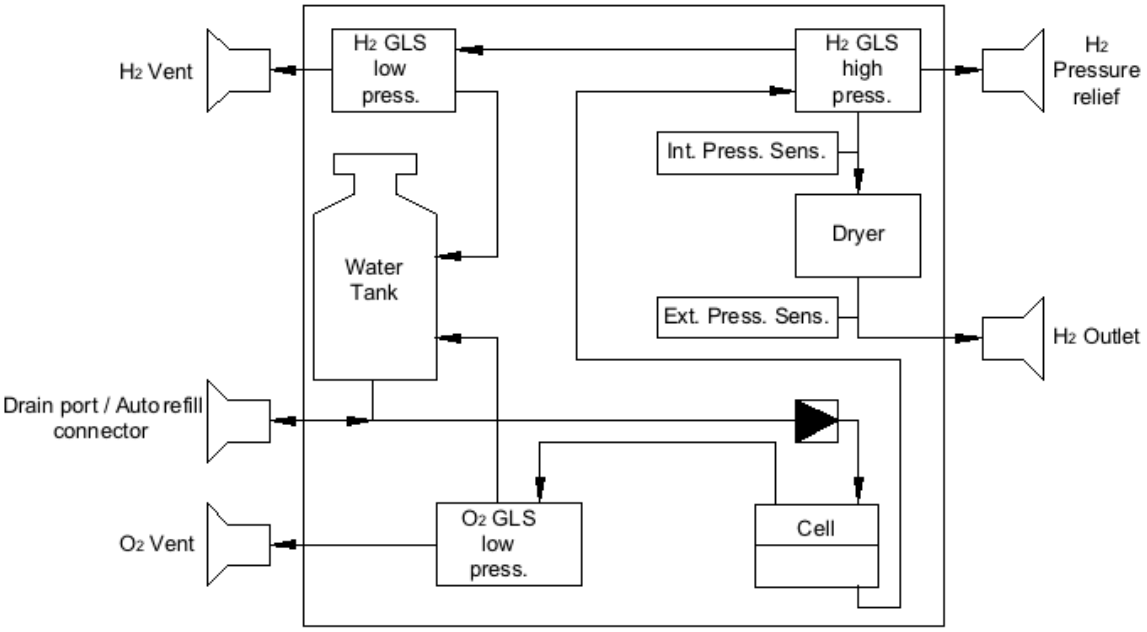
List of items included in the shipment

Quantity	Description
1	Hydrogen Generator
1	Instruction manual
1	Deioniser triangle bag
1	Water drain with flexible tubing
1	Power cable

Description.

The Hydrogen Generator produces pure hydrogen (and oxygen as a by-product) through the electrolysis of water. The key element of the generator is an electrochemical cell assembly which contains a solid polymer electrolyte. No free acids or alkalines are used. Deionised or pure, distilled water is the only liquid which may come into contact with the cell. As the water is consumed, it must be refilled from time to time as required.

The generated hydrogen is accumulated in the hydrogen/water separator and the desiccant housing. The internal pressure is controlled by a pressure transducer. The outlet pressure is controlled by a proportional valve. The hydrogen is dried by passing through the automatic dryer. The hydrogen then passes through the outlet port at the rear.



Installation.

Receiving the generator

All units have been carefully inspected before transport. Visual checks for damage and functional tests should be performed upon receipt. Any damage must be immediately noted and reported. The generator must only be returned according to the shipping instructions provided.

Placing the generator

The Hydrogen Generator must be placed on a flat, level, vibration-free, shock-free surface. Do not place the generator over a source of heat, as this may cause the device to overheat. The unit should not be in contact with any other objects on any side and the air inlet must not be blocked. Leave at least 30 cm of free space at the rear for ventilation. Do not operate the generator in a sealed or unventilated room, or in close proximity to an open flame or other sources of ignition. Do not operate the generator at below-freezing temperatures. Operation is guaranteed at operating temperatures between +15 and +40 °C.

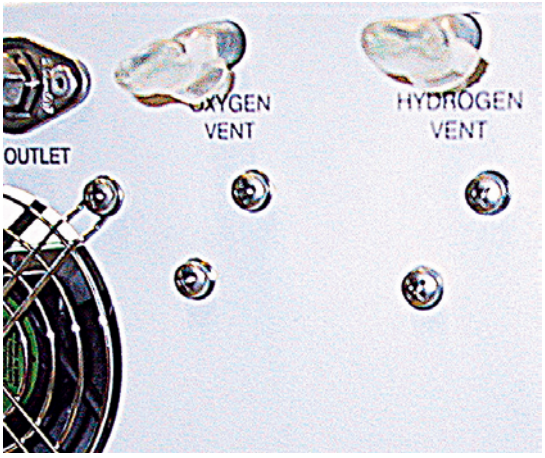
Warning

Normal precautions for any hydrogen supply should be taken when using the generator.
Do not use in sealed or unventilated rooms.
Do not use in close proximity of open flames or other sources of ignition.

Symbols used on the generator

Earth symbol

This symbol marks the earth connections to the chassis of the Hydrogen Generator.



Gas connections

Pure dry hydrogen at regulated pressure is available at the hydrogen outlet port at the rear of the generator. This port must be connected to the 1/8" tubing using a stainless-steel or copper Swagelok connector. Teflon connectors are not suitable. The pressure at this port is adjusted and shown on the display. The hydrogen relief port at the rear of the unit can be connected to an exhaust hood or another vent system.

Warning

The line from the relief port should never be connected in such a way that back pressure can develop.

Important

Remove the plugs from the oxygen vent and hydrogen vent before operating the unit. Keep these plugs for transporting the unit.

Electrical connections

Check the setting of the voltage selector on the rear of the unit. The set voltage is indicated by the white arrow. To change the voltage, proceed as follows:

→ Using a small screwdriver, remove the voltage selector insert.
→ Replace the voltage selector insert so that the white arrow points to the correct voltage.

Remote connections (optional)

The Hydrogen Generators are fitted with an optional remote control feature, which allows the user to check the status of the machine from a remote position, and to start/stop the production of hydrogen.

The contacts used in the remote control are potential-free relay contacts. The contacts can be configured via software as “Normally open” or “Normally closed” (see the “Operation” section). The maximum voltage and current ratings for the contacts are 1 A/48 V. The pin configuration of the remote connector is shown in the table below.

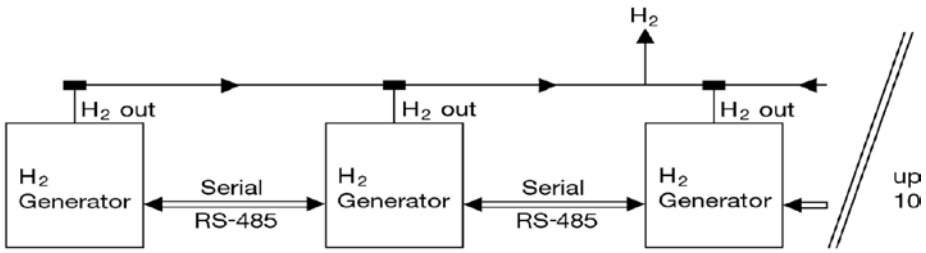
Remote connector pin configuration

Pin	Description
1+2	Start (12–30 VDC, polarity not important)
3+4	Standby (system not OK)
5+6	Reaching normal pressure (overproduction)
7+8	Refill water (low water)
9+10	Low water level (water level too low)
11+12	Bad water
13+14	Change water (bad water warning)

Cascading (optional)

The RS-485 interface allows up to 10 generators to be operated in parallel mode. One unit has to be defined as the master, while the others operate in “slave” mode. All the slaves need to be configured with individual ID numbers. Communication between the generators requires a standard D-sub 9 pin serial cable. The serial ports are connected as follows:

Master RS-485 port 1 → Slave 1 RS-485 port 1 - Slave 1 RS-485 port 2 → Slave 2 RS-485 port 2 ...



Configuration

For operation in cascading mode, all generators must have an ID number. Each ID number is unique. The master unit must also have an ID number.

Configuring the master

1. Go into the “Configure” menu and set the master to “YES”.
2. Go into the “Number of slaves” menu and set the number of units connected to the master.
3. Go into the “Configure” menu and set the master to “NO”.
4. Go into slave “ID number” and set to “1”.
5. Go back to master and set the value to “YES”.

Configuring the slaves

1. Go into the “Configure” menu and set the master to “NO”.
2. Go into slave “ID number” and set to “2, 3, 4, ...”

The configuration is now complete.

Operating in master-slave mode

If the configuration and the serial connection is correct, the slaves will show “Slave mode“ when powered up.

Connect the gas outlets of all the generators to the same line.

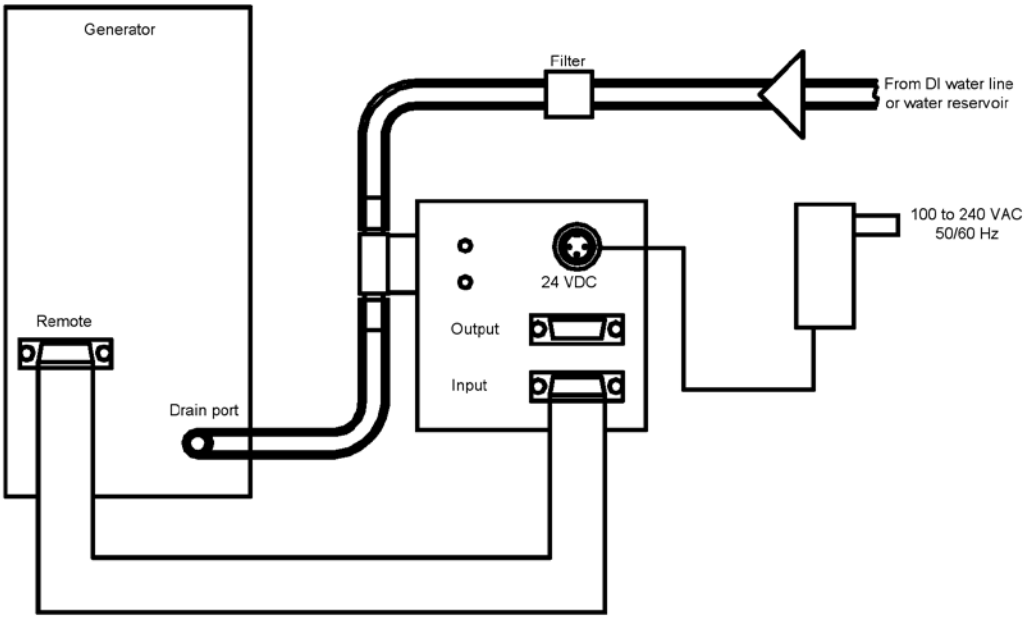
Important

The cascading function will only work properly if the gas outlets on all the generators are connected to the same gas line.

Auto refill (optional)

Description

The auto refill option gives you the possibility to refill the water tank of the generator automatically from an external water source. You can either use a DI water line or a water reservoir. The correct refill time depends on the pressure of the water source.
A higher pressure results in a shorter refill time. Max. pressure is 60 psig. If you are using a water reservoir, make sure the minimum water level in the reservoir is 2-3 feet higher than the top of the generator.



Installation steps

1. Connect the water tubes and the electric wires as shown in the diagram above.
2. Configure the generator as follows:
   - → Set the generator to standby.
   - → Set the auto refill function to "ON".
   - → Adjust the auto refill time to "8 s".
3. Test the auto refill time as follows:
   - → Empty the water tank.
   - → Start the generator.
   - → Obtain the refilling level (should be approx. 30 to 50 % of the max. level).
   - → If the refill level is too low, increase the auto refill time.
   - → Repeat these steps until you have a correct refilling volume.
   - → Note: every time you go into the "Auto refill" menu, you have to put the generator to standby and start it again.

Warning
If the refill time is too long, the water tank of the generator can overflow and damage the unit.

Initial start-up.

Filling the water tank

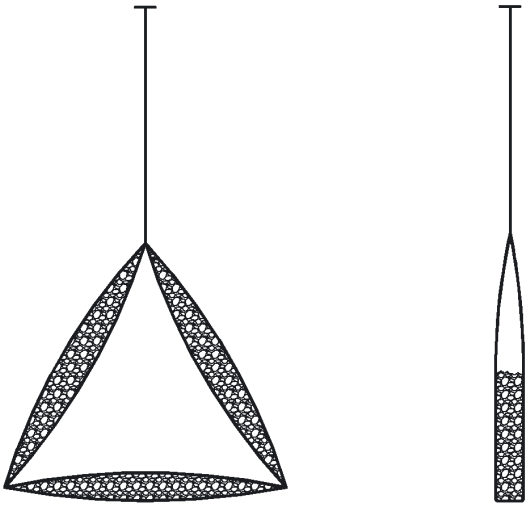
In order to fill the generator with water, remove the cap under the slider on the water tank. Carefully fill the tank with distilled or deionised water. The conductivity of the water used in the generator must not exceed 2 µS. Fill the tank to the maximum level indicator. Close the slider cap.

Warning
Do not fill the water tank higher than the marked level.

Caution
To prevent contamination of the cell assembly, it is important to use only deionised or distilled water in the generator. Water containing metallic impurities will contaminate or damage the cell and will void the warranty.

Installing the deioniser bag

The new triangle deioniser bag has been designed for a higher water purifying capacity. It is recommendable to use this bag for new generators during the first 4 to 6 months of operation. After this time, you can use the standard deioniser bag (see “Spare parts list”).

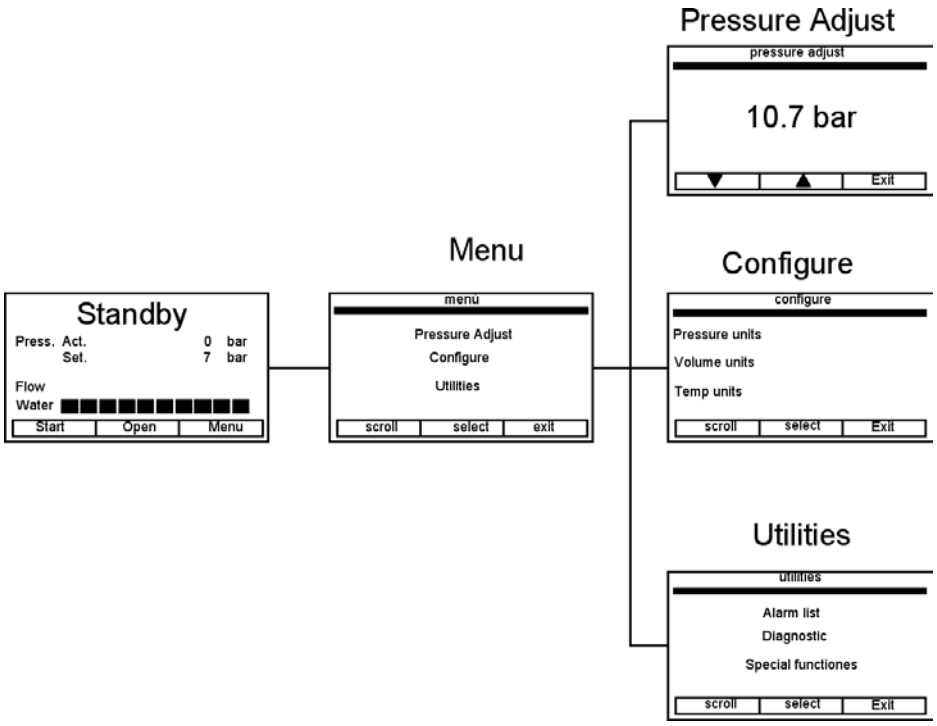


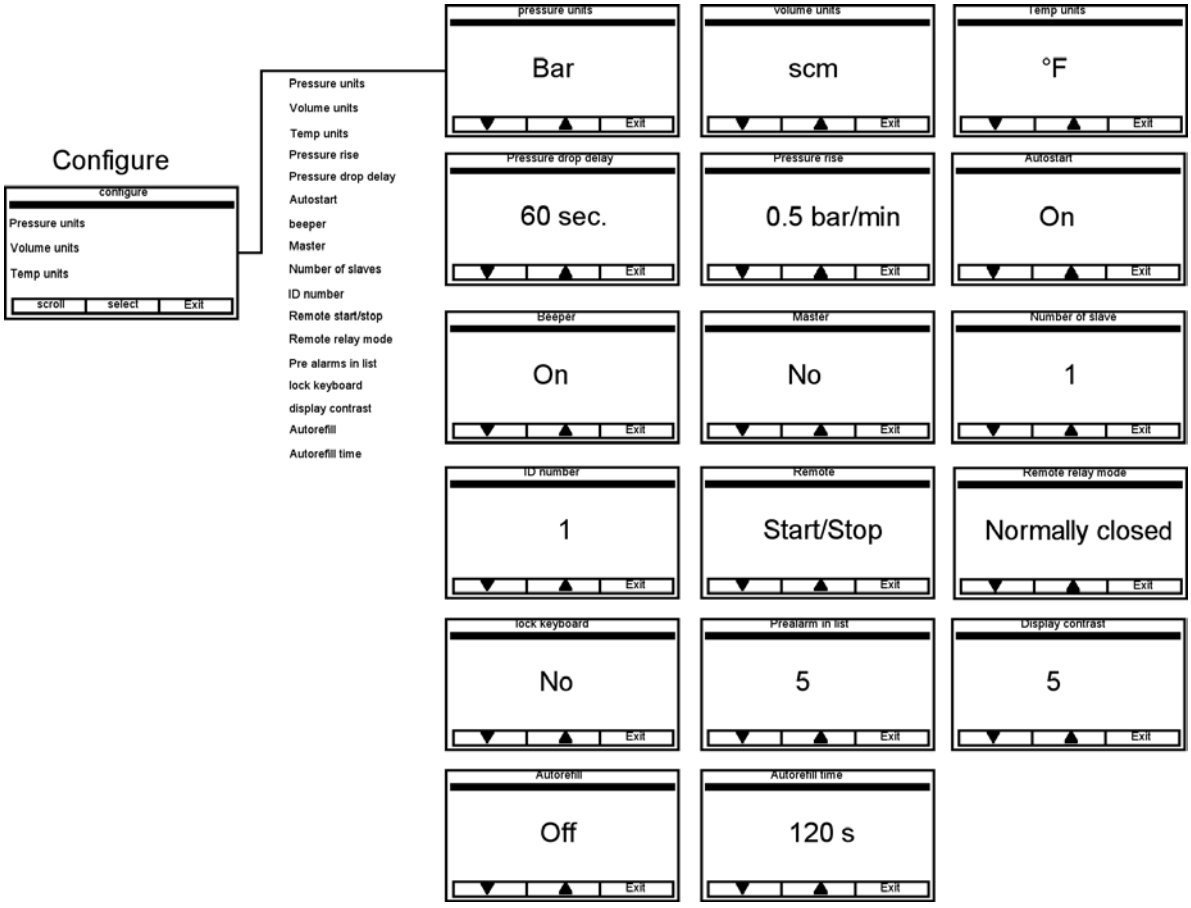
After having filled the tank with water, the triangle deioniser bag (supplied) must be placed in the tank. Inspect the bag thoroughly for holes or tears, indicated by loose deioniser beads on the outer surface. If the bag is damaged in any way, discard and replace it with a new one. Only use original parts (see “Spare parts list”). Wash the deioniser bag in deionised water before proceeding.

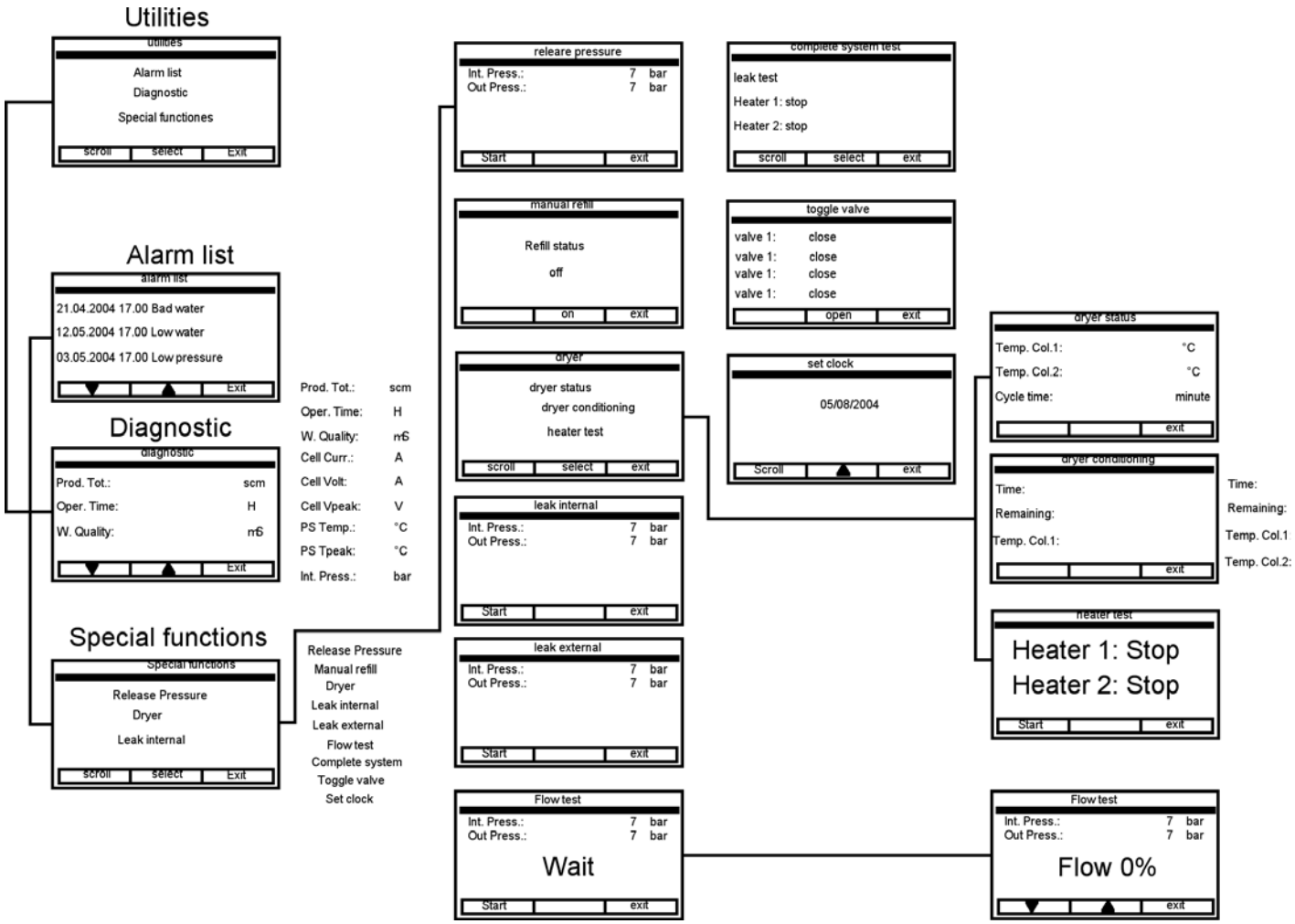
Insert the free end of the “T” fastener through the hole in the centre of the holder until it is securely fastened. The bag should not block the outlet at the bottom of the tank. Once in place, the bag should not be allowed to dry out.

Operation

The operating status of the unit is shown on the main screen on the graphic display. The main screen has three options at the bottom, corresponding to the three buttons on the unit, which are used to run the various functions and provide access to the configuration and diagnostics of the unit, following the tree structure shown in the figure below.




Configure
configure
Pressure units
Volume units
Temp units
scroll
select
Exit
Pressure units
Volume units
Temp units
Pressure rise
Pressure drop delay
Autostart
beeper
Master
Number of slaves
ID number
Remote start/stop
Remote relay mode
Pre alarms in list
lock keyboard
display contrast
Autorefill
Autorefill time
pressure units
Bar
Exit
volume units
scm
Exit
Temp units
°F
Exit
Pressure drop delay
60 sec.
Exit
Pressure rise
0.5 bar/min
Exit
Autostart
On
Exit
Beeper
On
Exit
Master
No
Exit
Number of slave
1
Exit
ID number
1
Exit
Remote
Start/Stop
Exit
Remote relay mode
Normally closed
Exit
lock keyboard
No
Exit
Prealarm in list
5
Exit
Display contrast
5
Exit
Autorefill
Off
Exit
Autorefill time
120 s
Exit


Utilities
utilities
Alarm list
Diagnostic
Special functiones
scroll
select
Exit
Alarm list
alarm list
21.04.2004 17.00 Bad water
12.05.2004 17.00 Low water
03.05.2004 17.00 Low pressure
Exit
Diagnostic
diagnostic
Prod. Tot.: scm
Oper. Time: H
W. Quality: m6
Exit
Special functions
Special functions
Release Pressure
Dryer
Leak internal
scroll
select
Exit
Prod. Tot.: scm
Oper. Time: H
W. Quality: m6
Cell Curr.: A
Cell Volt: A
Cell Vpeak: V
PS Temp.: °C
PS Tpeak: °C
Int. Press.: bar
Release Pressure
Manual refill
Dryer
Leak internal
Leak external
Flow test
Complete system
Toggle valve
Set clock
releare pressure
Int. Press.: 7 bar
Out Press.: 7 bar
Start
exit
manual refill
Refill status
off
on
exit
dryer
dryer status
dryer conditioning
heater test
scroll
select
exit
leak internal
Int. Press.: 7 bar
Out Press.: 7 bar
Start
exit
leak external
Int. Press.: 7 bar
Out Press.: 7 bar
Start
exit
Flow test
Int. Press.: 7 bar
Out Press.: 7 bar
Wait
Start
exit
complete system test
leak test
Heater 1: stop
Heater 2: stop
scroll
select
exit
toggle valve
valve 1: close
valve 1: close
valve 1: close
valve 1: close
open
exit
set clock
05/08/2004
Scroll
exit
dryer status
Temp. Col.1: °C
Temp. Col.2: °C
Cycle time: minute
exit
dryer conditioning
Time:
Remaining:
Temp. Col.1:
exit
Time:
Remaining:
Temp. Col.1
Temp. Col.2:
heater test
Heater 1: Stop
Heater 2: Stop
Start
exit
Flow test
Int. Press.: 7 bar
Out Press.: 7 bar
Flow 0%
exit

Configuration parameters

Item	Description	Options/Range	Default
Pressure units	Sets the desired unit of measure for the pressure.	bar/psi/kPa	bar
Volume units	Sets the desired unit of measure for the volume.	scm (standard cubic meters) scf (standard cubic feet)	scm
Temp. units	Sets the desired unit of measure for the temperature.	°C and °F	°C
Pressure rise	Sets how fast the pressure has to increase. If the pressure increases at a slower rate, a low pressure alarm is activated.	0.1–6.8 bar/min 1.4–100 psi/min	0.3 1.5
Pressure drop delay	Sets a delay in seconds to ignore a pressure drop (overrides the low pressure alarm).	2–10 min	2
Auto start	Sets whether the unit automatically starts production when the power is switched on.	YES/NO	NO
Beeper	Sets whether the audible signal is activated in the event of an alarm.	ON/OFF	ON
Master	Configures the unit as the master for cascading operation.	YES/NO	NO
Number of slaves	Enter the number of slaves connected to the master.	0–32	0
ID number	Sets the ID number.	0–32	0
Remote start/stop mode	Configures the remote START/STOP function.	START/STOP, START only, direct control	START/STOP
Remote relay mode	Configures the remote relay contacts.	Normally open (NO) Normally closed (NC)	NC
Warnings (pre-alarms) in alarm log	If set to “YES”, the warnings (pre-alarms) are also shown in the alarm log.	YES/NO	NO
Lock keyboard	If set to “YES”, the keyboard will be locked automatically after the generator is in the main window for more than 20 s. To unlock the keyboard, press the unlock button and hold for 5 s.	YES/NO	NO
Display contrast	Adjusts the contrast of the display.	0–10	5
Auto refill	If set to “ON”, the pre-level water alarm is used to trigger an external pump or valve to refill the water tank.	ON/OFF	OFF
Auto refill time	Sets the duration of water refilling after the pump or valve has been triggered.	0–60 s	0

Diagnostic display

Item	Description	Max.
Production tot.	Total hydrogen production	99.999 scf 4000.00 scm
Operating time (h)	Total number of hours of unit operation	99,999 hours
Wat. quality (µS)	Actual water conductivity	38 µS
Cell current (A)	Actual cell current	–
Cell voltage (V)	Actual cell voltage	–
Cell voltage peak (V)	Maximum cell voltage in the life of the cell	–
PS. temp.	Actual temperature of the power supply	–
PS. temp. peak	Maximum temperature of the power supply	–
Int. press.	Actual internal pressure of the unit	–

Special functions

Item	Description
Release pressure	This function is used to depressurise the unit completely (works only in standby mode; the gas line has to be removed).
Dryer	Accesses the dryer functions (see below).
Dryer status	Shows the temperatures of the drying columns and the position of the cycle.
Conditioning	When the conditioning cycle is started, the dryer performs 4 fast cycles. During this time the output valve is closed.
Heater test	The heater has to show a reaction of 10 °C to pass the test.
Leak internal	The outlet valve is closed, the pressure is set to the max., when the pressure reaches the max., production is stopped and the pressure drop is measured for 1 minute. If the pressure drop is below the preset value, the test is passed. Important: the leak test will only work if the generator is in standby mode.
Leak external	Works similar to the leak internal except the outlet valve is open. This function can be used to test the external gas lines. Important: the leak external will only work if the generator is in standby mode.
Complete system test	Combination of leak internal and heater test.
Flow test	This function sets the outlet valve to provide a certain flow. Important: this function will only work if the generator is in standby mode. Adjustable from 0 to 100 % of maximum flow.
Toggle valve	Used to switch the valves manually (for advanced diagnostics only). Important: after exiting this window, the valves will return to the status prior to entering the window.

Maintenance.

With proper care and maintenance, your Hydrogen Generator should provide you with years of trouble-free operation. There are no adjustments to be made to the generator. The only routine service operations are those described below.

Nevertheless, the generator should be inspected approximately every 2 years. Contact your supplier.

Routine maintenance

The following section describes the maintenance operations required for the correct operation of the Hydrogen Generator.

Cleaning

The internal components of the Hydrogen Generator do not need to be cleaned and should not be accessed by the user for cleaning. To clean the outside of the unit, only use a damp cloth (no detergents, acids or aggressive or abrasive substances).

Water refilling

The tank must be refilled when the water level approaches the lower level, and the "Refill water" warning message appears.

Deioniser bag replacement

Rinse the water tank and replace the deionizer bag approximately every six months, or whenever the "Change water" message appears.

Installing the new deioniser bag

See page 10 ("Installing the deioniser bag").

Returning the unit

In the event of any faults or damage, first notify the agent or distributor who supplied the unit. Please also provide full details of the problem, plus the model and serial number. Instructions will then be provided for the service or the return of the unit. If the one-year warranty has expired or the fault is due to misuse of the unit, all repair and shipping costs are to be paid by the customer. All other costs are borne by the customer, except as otherwise expressly agreed upon.

Warning

If the unit has to be transported, make sure that the water tank is completely empty and place the plug (supplied with the unit) on the oxygen vent at the rear of the unit. Close the small hole in the cap on the water tank with a strip of adhesive tape. Use suitable packaging.
The unit should be transported in an upright position; this warning should be visible on the outside of the packaging.

Spare parts list.

The table below provides a list and descriptions of the spare parts for the Hydrogen Generator. Please also refer to the corresponding figures.

List of spare parts – NMH_2 100

p/n	Description
H200-031	Deioniser bag
H200-030	New deioniser triangle bag
NM200-001	Cover
NM200-002	Water tank
NM200-003	Deioniser bag holder
NM200-004	Display membrane
NM200-005	Display
NM200-006	NM O_2 separator
NM200-007	NM H_2 separator
H200-007	G/L separator
NM200-009	High-pressure dryer
NM200-010	Pressure release valve
NM200-011	Toroidal transformer 230 VA 50/60 Hz
H210000-001	Complete cell
H200-006	Non-return valve for cell inlet
NM200-015	Rear intake fan
NM200-016	Internal circulation fan
NM200-017	START button 240/120 V 50/60 Hz
NM201-018	Mainboard
NM200-019	Cables
NM200-020	Mainframe
NM200-021	Water tubing
NM200-023	Water tank cap
NM200-024	Outlet fitting
H200-005	Water drain outlet + tube
NM200-026	Base support
H210000-004	Cell service (on old cell)

List of spare parts – NMH_2 160

p/n	Description
H200-031	Deioniser bag
H200-030	New deioniser triangle bag
NM200-001	Cover
NM200-002	Water tank
NM200-003	Deioniser bag holder
NM200-004	Display membrane
NM200-005	Display
NM200-006	NM O_2 separator
NM200-007	NM H_2 separator
H200-007	G/L separator
NM200-009	High-pressure dryer
NM200-010	Pressure release valve
NM200-011	Toroidal transformer 230 VA 50/60 Hz
H216000-001	Complete cell
H200-006	Non-return valve for cell inlet
NM200-015	Rear intake fan
NM200-016	Internal circulation fan
NM200-017	START button 240/120 V 50/60 Hz
NM202-018	Mainboard
NM200-019	Cables
NM200-020	Mainframe
NM200-021	Water tubing
NM200-023	Water tank cap
NM200-024	Outlet fitting
H200-005	Water drain outlet + tube
NM200-026	Base support
H216000-004	Cell service (on old cell)

List of spare parts – NMH_2 250

p/n	Description
H200-031	Deioniser bag
H200-030	New deioniser triangle bag
NM200-001	Cover
NM200-002	Water tank
NM200-003	Deioniser bag holder
NM200-004	Display membrane
NM200-005	Display
NM200-006	NM O_2 separator
NM200-007	NM H_2 separator
H200-007	G/L separator
NM200-009	High-pressure dryer
NM200-010	Pressure release valve
NM200-011	Toroidal transformer 230 VA 50/60 Hz
H225000-001	Complete cell
H200-006	Non-return valve for cell inlet
NM200-015	Rear intake fan
NM200-016	Internal circulation fan
NM200-017	START button 240/120 V 50/60 Hz
NM203-018	Mainboard
NM200-019	Cables
NM200-020	Mainframe
NM200-021	Water tubing
NM200-023	Water tank cap
NM200-024	Outlet fitting
H200-005	Water drain outlet + tube
NM200-026	Base support
H225000-004	Cell service (on old cell)

List of spare parts – NMH_2 300

p/n	Description
H200-031	Deioniser bag
H200-030	New deioniser triangle bag
NM200-001	Cover
NM200-002	Water tank
NM200-003	Deioniser bag holder
NM200-004	Display membrane
NM200-005	Display
NM200-006	NM O_2 separator
NM200-007	NM H_2 separator
H200-007	G/L separator
NM200-009	High-pressure dryer
NM200-010	Pressure release valve
NM200-011	Toroidal transformer 230 VA 50/60 Hz
H210000-001NM	Complete cell
H200-006	Non-return valve for cell inlet
NM200-015	Rear intake fan
NM200-016	Internal circulation fan
NM200-017	START button 240/120 V 50/60 Hz
NM203-018	Mainboard
NM200-019	Cables
NM200-020	Mainframe
NM200-021	Water tubing
NM200-023	Water tank cap
NM200-024	Outlet fitting
H200-005	Water drain outlet + tube
NM200-026	Base support
H210000-004NM	Cell service (on old cell)

List of spare parts – NMH_2 500

p/n	Description
H200-031	Deioniser bag
H200-030	New deioniser triangle bag
NM200-001	Cover
NM200-002	Water tank
NM200-003	Deioniser bag holder
NM200-004	Display membrane
NM200-005	Display
NM200-006	NM O_2 separator
NM200-007	NM H_2 separator
H200-007	G/L separator
NM200-009	High-pressure dryer
NM200-010	Pressure release valve
NM200-011	Toroidal transformer 230 VA 50/60 Hz
H250000-001	Complete cell
H200-006	Non-return valve for cell inlet
NM200-015	Rear intake fan
NM200-016	Internal circulation fan
NM200-017	START button 240/120 V 50/60 Hz
NM204-018	Mainboard
NM200-019	Cables
NM200-020	Mainframe
NM200-021	Water tubing
NM200-023	Water tank cap
NM200-024	Outlet fitting
H200-005	Water drain outlet + tube
NM200-026	Base support
H250000-004	Cell service (on old cell)

List of spare parts – NMH_2 600

p/n	Description
H200-031	Deioniser bag
H200-030	New deioniser triangle bag
NM200-001	Cover
NM200-002	Water tank
NM200-003	Deioniser bag holder
NM200-004	Display membrane
NM200-005	Display
NM200-006	NM O_2 separator
NM200-007	NM H_2 separator
H200-007	G/L separator
NM200-009	High-pressure dryer
NM200-010	Pressure release valve
NM200-011	Toroidal transformer 230 VA 50/60 Hz
H250000-001NM	Complete cell
H200-006	Non-return valve for cell inlet
NM200-015	Rear intake fan
NM200-016	Internal circulation fan
NM200-017	START button 240/120 V 50/60 Hz
NM204-018	Mainboard
NM200-019	Cables
NM200-020	Mainframe
NM200-021	Water tubing
NM200-023	Water tank cap
NM200-024	Outlet fitting
H200-005	Water drain outlet + tube
NM200-026	Base support
H250000-004NM	Cell service (on old cell)

List of spare parts – NMH_2 1L

p/n	Description
H200-031	Deioniser bag
H200-030	New deioniser triangle bag
NM200-001	Cover
NM200-002	Water tank
NM200-003	Deioniser bag holder
NM200-004	Display membrane
NM200-005	Display
NM200-006	NM O_2 separator
NM200-007	NM H_2 separator
H200-007	G/L separator
NM200-009	High-pressure dryer
NM200-010	Pressure release valve
NM200-011	Toroidal transformer 230 VA 50/60 Hz
H2-1L-001	Complete cell
H200-006	Non-return valve for cell inlet
NM200-015	Rear intake fan
NM200-016	Internal circulation fan
NM200-017	START button 240/120 V 50/60 Hz
NM205-018	Mainboard
NM200-019	Cables
NM200-020	Mainframe
NM200-021	Water tubing
NM200-023	Water tank cap
NM200-024	Outlet fitting
H200-005	Water drain outlet + tube
NM200-026	Base support
H2-1L-004	Cell service (on old cell)

Important
The manufacturer reserves the right to change or modify his products without prior notice.

Getting ahead through innovation.

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages, and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardised as well as customised solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimisation, and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – ideas become solutions.

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0608 – 1.0 L&P Subject to change.