



**domnick hunter  
Scientific**

**Hydrogen Gas Generator  
20H-MD / 40H-MD / 60H-MD**



**USER GUIDE**



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# 1 Safety Information

Important: Do not operate this equipment until the safety information and instructions in this user guide have been read and understood by all personnel concerned.

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

Use of the equipment in a manner not specified within this user guide may result in an unplanned release of pressure, which may cause serious personal injury or damage.

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

This product is designed and built in compliance with the ATEX Directive. It is not suitable for use in any Hazardous, Flammable or Explosive environments.

Hydrogen is a highly flammable gas. Keep the generator away from excessive heat and naked flames.

The accumulation of hydrogen can displace oxygen, thereby creating an asphyxiation hazard.

Always ensure that the generator is operated in a well ventilated area.

All of the vent ports on the rear of the generator must be kept clear and free from blockages.

Ensure that the equipment is depressurised and electrically isolated, prior to carrying out any of the scheduled maintenance instructions specified within this user guide.

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 can not be all-inclusive. If the 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 equipment will not be damaged or become hazardous to persons or property.

Note: Any interference with the calibration warning labels will invalidate the gas generator's warranty and may incur costs for the re-calibration of the gas generator.

Should you require an extended warranty, tailored service contracts or training on this equipment, or any other equipment within the **domnick hunter** range, please contact your local **domnick hunter** office.

Details of your nearest **domnick hunter** sales office can be found at [www.domnickhunter.com](http://www.domnickhunter.com)

Retain this user guide for future reference.

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## 1.1 Markings and symbols

The following markings and international symbols are used on the equipment and within this user guide:



Caution, Read the User Guide.



Risk of electric shock.



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.



When disposing of old parts always follow local waste disposal regulations.



Naked Flame



Purge Outlet DO NOT CONNECT



When disposing of electrical parts always follow local waste disposal regulations.



Conformité Européenne

## 2 Description

The gas generator will produce a constant stream of hydrogen at a pre-determined flow rate when connected to a suitable power supply and fed with a suitable quality of deionised water. These units are suitable for use in laboratories and light industrial environments and are non-hazardous for transportation purposes.

**It should be noted that the Hydrogen generator must be installed and running within three months of despatch from domnick hunter limited, to ensure the optimum efficiency of the PEM cell. Failure to do this will invalidate the warranty.**

### 2.1 Technical Specification

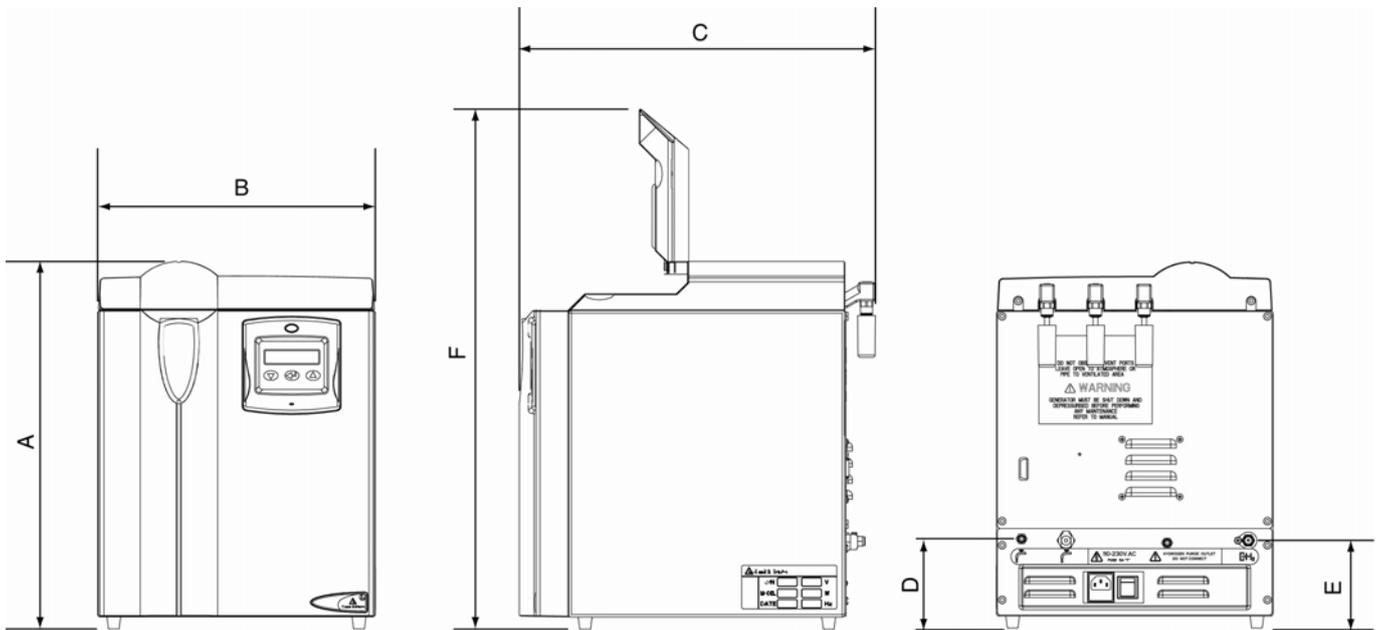
This specification is valid when the equipment is located, installed, operated, and maintained as specified within this user guide.

	Units	20H-MD	40H-MD	60H-MD
<b>Water</b>				
Water Quality		Deionised, ASTM II, >1 MOhm - cm		
Consumption (Approximate) *	L/Week	1.25	2	4
<b>High Purity Hydrogen (H<sub>2</sub>)</b>				
Outlet flow	cc/min	160	250	500
Outlet pressure	barg (psi g)	0.7 – 7 ± 0.07 (10 – 100 ± 1)		
Purity	%	>99.9999%		
<b>Mechanical connections</b>				
Hydrogen Outlet		1/8" Compression Fitting		
Water Drain		Quick Release Push in Fitting		
Spillage Drain				
Purge Outlet		 <b>DO NOT CONNECT</b>		
<b>Electrical data</b>				
Connection Type		IEC320		
Supply Voltage Range	V ac	110 – 230v 50/60Hz		
Power Consumption	W	180	210	300
Fuse	A (Anti Surge, 250v, 5 x 20mm)	5AT	5AT	5AT

Notes: \* Based on full flow with 24 hour 7 day operation at 22<sup>0</sup>C (71.6 F) Ambient

<b>Environmental data</b>		
Temperature	°C (°F)	5 – 40 41 - 104
Humidity		50% @ 40°C (80% MAX ≤ 31°C)
IP Rating		IP20 / NEMA 1
Pollution Degree		2
Installation Category		II
Altitude	m (ft)	< 2000 (6562)
Noise	dB(A)	<60

## 2.1.1 Dimensions



Dimension	Units	20H-MD	40H-MD	60H-MD
A	mm (ins)		456 (17.95)	
B			342 (13.46)	
C			437 (17.20)	
D			108 (4.25)	
E			109 (4.29)	
F			645 (25.4)	

Weight	Units	20H-MD	40H-MD	60H-MD
Empty	Kg (lbs)		20 (44.1)	
Full of Water			28 (61.74)	

## 2.2 Unpacking the equipment

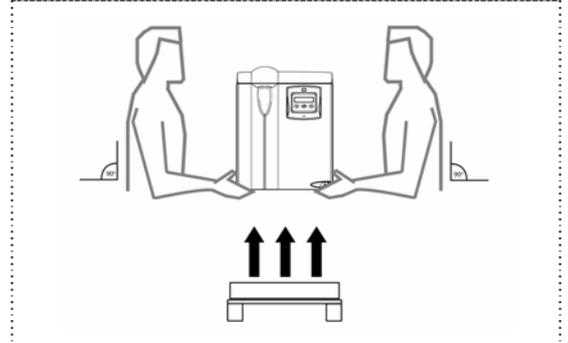


This generator is heavy and should be carried by a minimum of two persons.

Remove the equipment from its packaging as shown and check that it has not been damaged in transit.

The following items have been included with your equipment:

Description	Qty
Water Drain Tube	1
De-ioniser Cartridge	1
Mains supply cable	3



If any items are missing or damaged please contact your local domnick hunter office.



## 2.3 Overview of the equipment

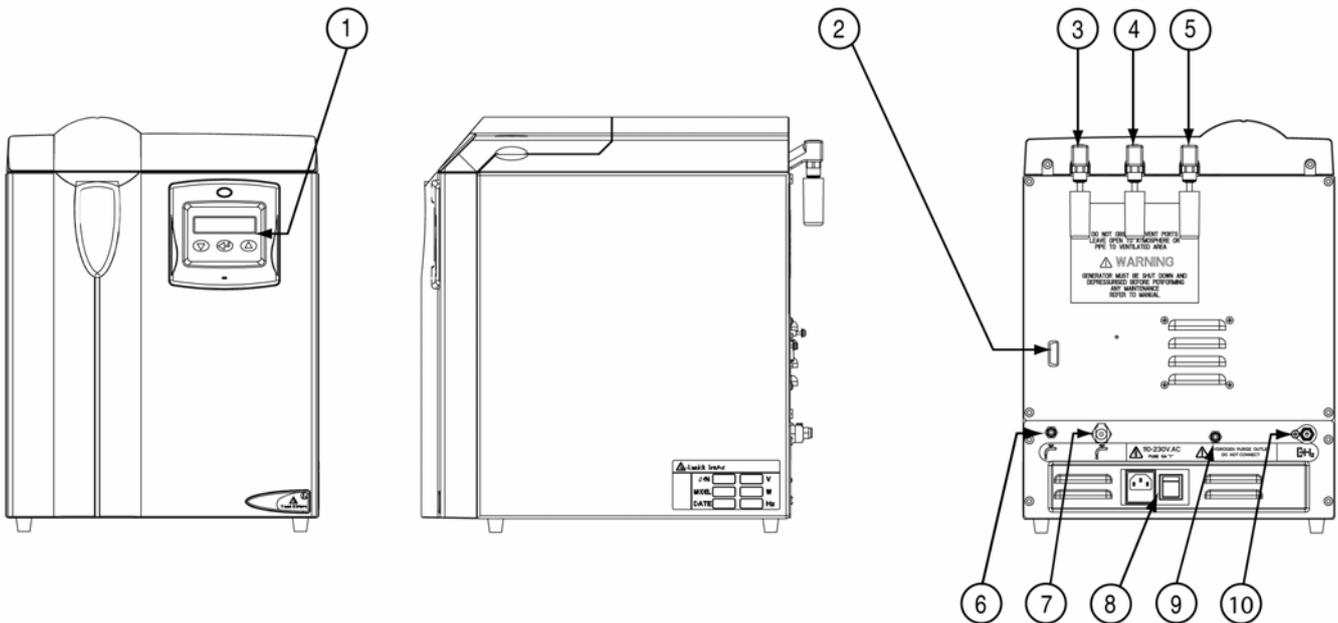


Figure 2.3

No	Description	No	Description
1	Controller	6	Spillage Drain
2	Options board connection port	7	Water Drain
3	O <sub>2</sub> Vent ( < 250 cc/min )	8	Power inlet and ON / OFF Switch
4	Excess H <sub>2</sub> Vent ( MAX < 1 cc/min )	9	Hydrogen Purge Outlet
5	Water Bottle Vent	10	Hydrogen Outlet

### 3 Installation & Commissioning



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

#### 3.1 Recommended system layout

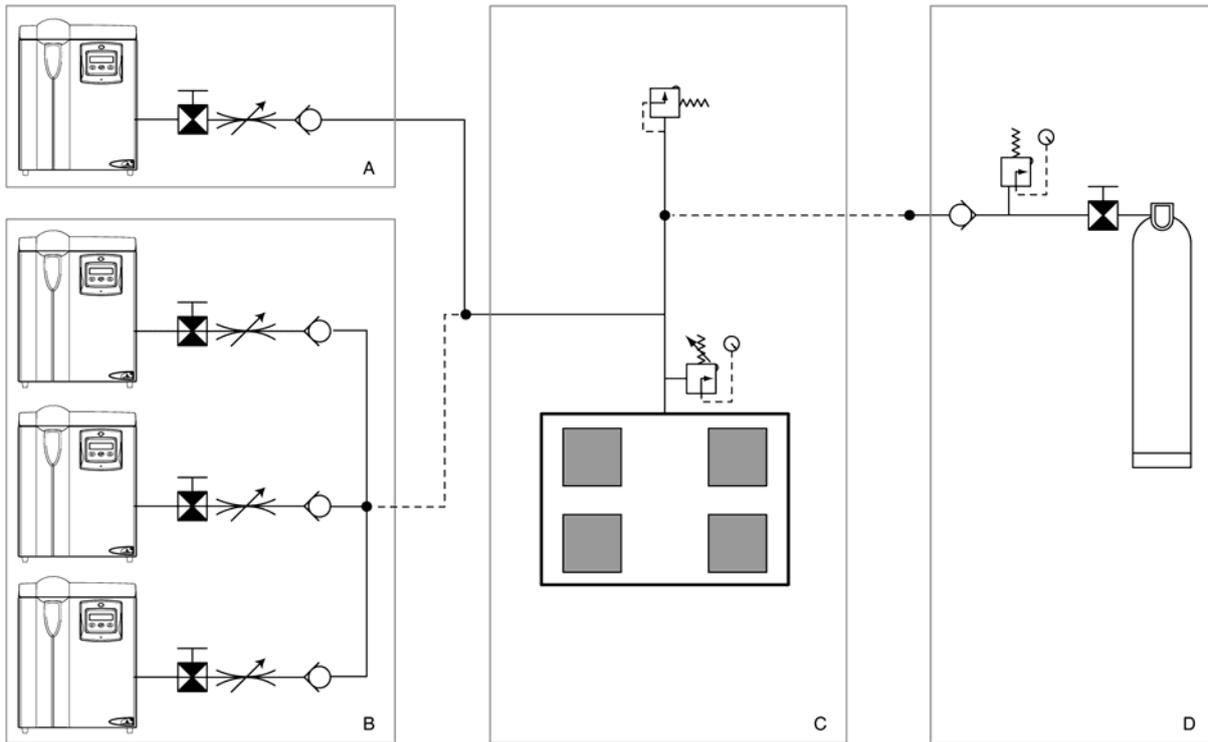


Figure 3.1

#### Installation Kits:

ID	Description	Dh Kit Number	
		1/8" Tube	1/4" Tube
1	Isolation valve	604970700	604970713
2	Flow controller 0-300cc/min	604970701*	
	Flow controller 0-600cc/min	604970702*	
	Flow controller 0-1200cc/min	604970703*	
3	Non-return valve	604970704	604970714
4	Male connector	604970705	604970715
5	T-piece	604970706	604970716
6	Pressure relief valve	604970707	604970717
7	Port Reducing connector	604970708	
8	Standard regulator	604970709*	
9	2m s/s tubing	604970710	604970718
10	Bottle regulator	604970711*	
11	Bottle connection	604970712*	
use Swagelok or suitable alternative fittings			

#### Key:

- A Single Generator
- B Multiple Generator
- C Applications
- D Back up Supply

-  Isolation Valve
-  Flow controller
-  Non return valve
-  Pressure relief valve
-  Pressure regulator

## 3.2 Locating the equipment

Identify a suitable location for the equipment taking into consideration the minimum space required for ventilation purposes as shown. DO NOT position the generator so that it is difficult to operate or disconnect the device.



**This product is designed and built in compliance with the ATEX Directive. It is not suitable for use in any Hazardous, Flammable or Explosive environments.**

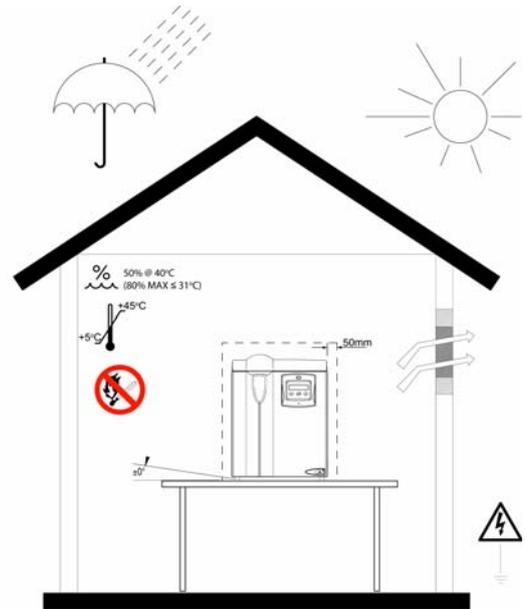


Figure 3.2

## 3.3 Mechanical Installation

Remove the fitting cover from the hydrogen outlet port and the three transit plugs from the O<sub>2</sub> vent, excess H<sub>2</sub> vent and the water bottle vent as shown in figure 3.3 (a).

Referring to figure 3.1 connect the Hydrogen outlet port of the generator to the application piping, see figure 3.3 (b).



**Do not connect the application piping at this stage. The application piping will require purging for at least 15 minutes to remove any trapped oxygen.**

Ensure that all piping materials are suitable for the application, clean and debris free. All outlet piping must be solid and non-porous. The diameter of the pipes must be sufficient to allow unrestricted outlet gas to the application. When routing the pipes ensure that they are adequately supported to prevent damage and leaks in the system.

All components used within the system must be rated to at least the maximum operating pressure of the equipment. It is recommended that the system be protected with suitably rated pressure relief valves.

Fill the water bottle using de-ionised water, to a level 15mm below the upper lip of the neck of the bottle as shown in figure 3.3 (c). An audible and visual indication will be given by the generator when the correct level is reached.



**The use any water other than de-ionised water (Deionised, ASTM II, >1 MOhm – cm) within this generator will reduce the life time of the hydrogen cell.**

Remove the De-ioniser cartridge, located in the well of the water bottle, from its packaging and insert into the water bottle as shown in figure 3.3 (d). Ensure that the cap is securely fixed in place.

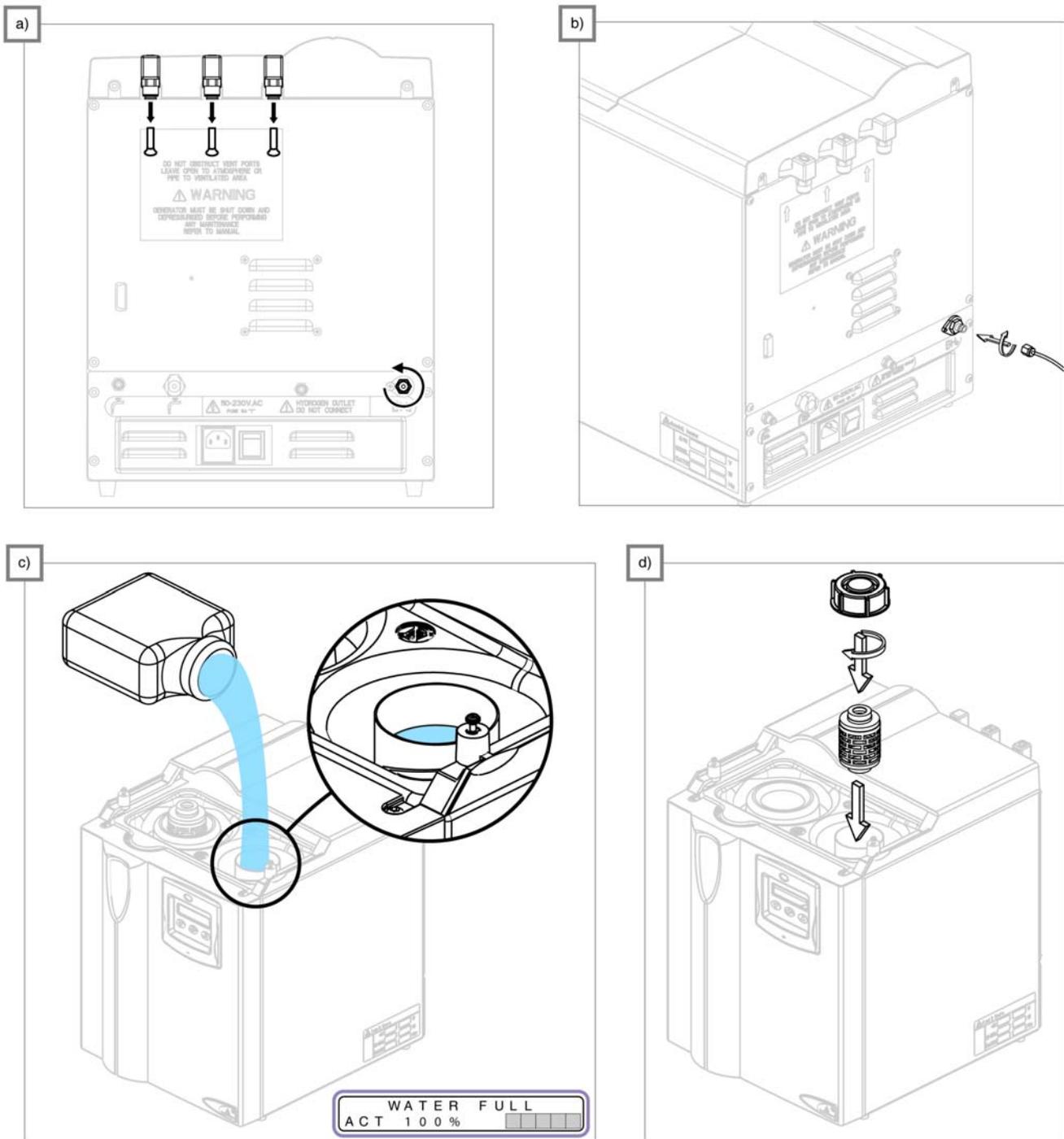


Figure 3.3

### 3.4 Electrical Installation

Attach the mains supply cable provided to the IEC 320 socket located on the rear of the generator and connect to the electrical supply.

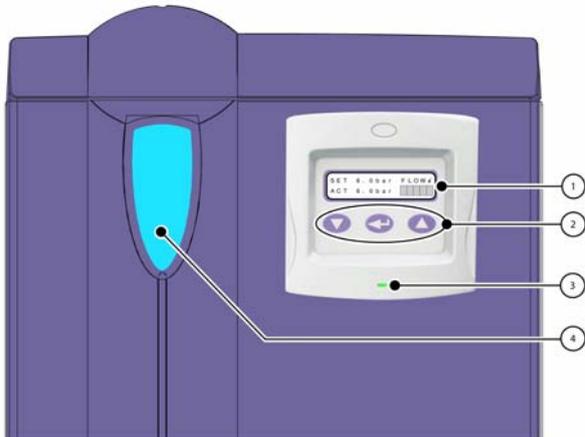
If a cordset, other than the one provided, is used to connect the equipment to the electrical supply ensure that it is suitably rated for the application and in accordance with local and national code regulations.



**The equipment must be bonded to earth through the cordset.**

## 4 Operating the equipment

### 4.1 Overview of Controls



1. 16x2 line menus display.
2. Control key pad used for menu navigation and generator operation.
3. Tri coloured System Check Indicator.

Indicator	Generator Status
Flashing Green	- Start Up Initialisation
Solid Green	- On-line
Flashing Red	- Non Critical Errors
Red	- Critical Errors (System Locked)
Amber	- On-line, Service Required
Flashing Amber	- Dryer Conditioning

4. Water bottle Indicator illuminates blue when water meets the required specification. Gradually turns to red as the water specification degrades. Purple indicates that the water is at the mid point.

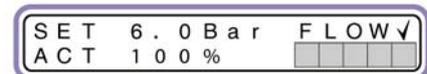
### 4.2 Starting the equipment

Switch the generator on using the ON/OFF switch located on the rear panel.

The generator will perform a system check during which time:

- the water bottle indicators will illuminate blue then red.
- the system check LED will flash.
- the software version number, generator serial number and the domnick hunter banner will be displayed on the LCD.

On completion of the system check the generator will revert to the default menu as shown.



The internal pressure ("ACT" pressure) of the generator will build up to the required operating pressure ("SET" pressure). Once the required pressure is maintained the outlet valve of the generator will be opened, as indicated by "FLOW ✓" on the display, and hydrogen will be supplied to the application.

*Note: If the generator has not been powered up for a period of 90 days or more, it will automatically perform an initialisation sequence on power up.*

*This sequence will guarantee the correct hydration of the cell and operation of the micro-dryer and takes approximately 480 minutes (8 hours) to complete.*

**Note:** This sequence cannot be aborted.

On completion press [↩] to revert to the default menu and start the generator.



During start-up, the generator may automatically revert to the last error mode it experienced. If this happens press [↩]. When the error is cleared the generator will continue with the start up procedure.

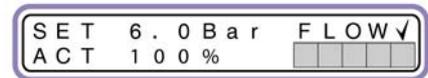
**Note:** If the error cannot be cleared by this method follow the fault finding procedure in section 6 of this user guide.

## 4.3 Operating Menus

There are 8 menus used by the generator to display and access operational parameters and data. These can be accessed from the default menu (1) by sequentially pressing [←] on the controller.

(1)		Default
(2)		Conductivity (water Quality)
(3)		Pressure – Units of measurement
(4)		Run Time Data
(5)		Flow
(6)		Dryer Status
(7)		Error Log
(8)		Generator Self Test

### 4.3.1 Default Menu



The default menu displays the following data:

**SET** – The outlet pressure required by the application.

The required outlet pressure can be adjusted up and down using the [▼] and [▲] keys respectively.

**ACT** – The actual internal / outlet pressure of the generator as a percentage of the **SET** pressure.

**FLOW X / ✓** - Indicates the status of the generator outlet valve: “X” - Outlet is closed, “✓” – Outlet is open.

 100% - The shaded blocks indicate the rate of hydrogen production. Each block represents 20% of the rated capacity of the generator.

During initial start up or after a massive pressure drop all five blocks will be shaded indicating that the generator is building up pressure and not currently on line.

When the generator is on-line and delivering gas to the application, the number of blocks shaded will depend upon the flow required by the application.

## Standby Mode

The flow of hydrogen to the application can be interrupted by switching the generator into standby mode.

Press and hold [↔] to select standby. The default menu will change to the standby menu as shown to indicate that hydrogen is no longer being supplied to the application.

**Note:** If the generator is left in standby for more than 30 minutes, the hydrogen purge outlet valve will open and slowly de-pressurise the generator.

To return to normal operation, press [↔].

Note: The generator will run through a start up sequence before hydrogen is supplied to the application, as indicated by the system check LED being continually illuminated green.



## 4.3.2 Conductivity

The conductivity (Water Quality) menu gives a graphical indication of the water quality. When all 10 blocks are shaded the water quality is to specification.

When the number of shaded blocks drops to four, the "Change Water" error message will be displayed. The water bottle indicator will flash red and an intermittent alarm will sound. Hydrogen will continue to be delivered to the application.



**The water bottle should be drained and refilled with de-ionised water ASTM II, >1 MOhm – cm at the earliest convenient time.**

If the water quality degrades to the point at which none of the blocks are shaded the outlet valve of the generator will be closed and a conductivity error generated. The water bottle indicator will illuminate red and a continuous alarm will sound.

Press [↔] to advance to the next menu.



## 4.3.3 Pressure Measurement

The units of pressure measurement may be changed between bar, psi and Mpa.

Press [↕] or [↖] to change the units of measurement.

When the desired units have been selected, press [↔] to advance to the next menu.



### 4.3.4 Run Time Data

The Run Time Data Menu displays the following data:

**HOURS RUN** – Time in hours that the generator has been producing hydrogen.

**SERVICE IN** – The time in hours that the generator can produce hydrogen before a service is required.

```
HOURS RUN   XXXXX
SERVICE IN  XXXXX
```

### 4.3.5 Flow

The Flow menu displays the current flow and the total amount of hydrogen produced by the generator when on-line.

The units of measurement may be change between ml / MIN.

Press [▼] and [▲] together to change the units of measurement.

When the desired units have been selected, press [→] to advance to the next menu.

```
FLOW ml / MIN   0 0 0
LITRES          0 0 0
```

### 4.3.6 Dryer Status

The dryer status menu is used for diagnostic purposes. When displayed press and hold [▼] and [▲].

The menu will change to display the following:

**HEAT A(B) OFF (ON)** – The operating status of Heater A and Heater B.

**XXX C** – The operating temperature of Heaters A and B.

Press [→]

The menu will change to display the following:

**STATUS A(B) mm : ss** – Indicates the length of time the operating column (A or B) has been on-line.

**CYC TIME** – Indicates the total on-line cycle time of the column.

Press [→]

If the purity of the hydrogen degrades, it will be necessary to regenerate the columns of the micro dryer. This can be done by performing the conditioning sequence.

Press and hold [▼] and [▲].

The generator will start the conditioning of the dryer. This process takes approximately 2 hours to complete after which the generator will automatically go to standby mode.

To abort the conditioning process press [→]. The generator will go into standby mode.

To return to normal operation, press [→].

```
DRYER STATUS
HOLD ▼ & ▲
```

```
HEAT A OFF  XXX °C
HEAT B ON   XXX °C
```

```
STATUS A   mmm : ss
CYC TIME   XXX MIN
```

```
CONDITION DRYER
HOLD ▼ & ▲
```

```
CONDITIONING
XXX : XX EXIT ←
```

### 4.3.7 Error Log

The Error Log menu allows the user to access the 10 most recent error messages.

To access the errors press and hold [▼] and [▲].

The menu will display the most recent error message along with the date and time of when the error occurred.

Press [▼] or [▲] to scroll forwards or backwards through the remaining error messages.

Press [←] to return to the error log menu.



### 4.3.8 Generator Self Test

This menu is used for diagnostic purposes to allow the user to verify that the generator is operating correctly.

From the Self Test Menu press and hold [▼] and [▲].

The menus will change automatically as the generator runs through the self test:

The hydrogen purge valve will open and dump all of the pressure from the system. This may take up to 20 minutes.

Refer to section 4.4 of this guide for details on depressurising the generator quickly.

The hydrogen generation section of the generator starts to pressurise up to a maximum operating pressure of 100PSI (6.9bar / 0.69Mpa). The time taken to reach this pressure is monitored by the generator.

The pressure is held for 30 seconds and monitored for decay.

The dryer section of the generator starts to pressurise up to a maximum operating pressure of 100PSI (6.9bar / 0.69Mpa). The time taken to reach this pressure is monitored by the generator.

The pressure is held for 30 seconds and monitored for decay.

The entire generator starts to pressurise up to a maximum operating pressure of 100PSI (6.9bar / 0.69Mpa). The time taken to reach this pressure is monitored by the generator.

The pressure is held for 30 seconds and monitored for decay.

The hydrogen purge valve will open and dump all of the pressure from the system.

The generator will switch to "STANDBY".

Press [←] to return to the default menu.



## 4.3 Hard Reset

If an overpressure, H<sub>2</sub> or O<sub>2</sub> vent blocked error occurs, the generator will need to be hard reset once the problem has been resolved. This will also be the case if the same error is reset 3 times consecutively.

Before a hard reset is performed the initial fault must be rectified, refer to section 6 of this user guide for troubleshooting guidance.

When the faults are rectified, switch the generator off at the mains switch.

Press and hold [↩] and at the same time re-apply the power to the generator.

When the generator has powered up, press [↩] again. The generator will reset all errors then continue with the normal start up procedure.

## 4.4 Stopping the equipment and depressurising



**The generator contains pressurised hydrogen gas. Ensure that the generator is fully depressurised prior to shipment or servicing.**

1. Ensure that the application instrumentation no longer requires hydrogen.
2. Carefully disconnect the piping from the hydrogen outlet.



**Hydrogen gas will escape under pressure when the piping is disconnected.**

3. From the default menu press and hold [↩] to select standby mode. The default menu will change to the standby menu as shown to indicate that hydrogen is no longer being supplied to the application.
4. Press and hold [⏮] and [⏭] to open the H<sub>2</sub> purge valve and depressurise the generator.  
  
The menus will alternate as shown. "XXX" denotes the current pressure.  
  
Note: If the [⏭] button is pressed during depressurisation, the H<sub>2</sub> outlet valve will open therefore increasing the rate of depressurisation. Pressing the [⏮] will close the H<sub>2</sub> outlet valve.
5. Once the generator is completely de-pressurised the display will change as shown.  
  
The system will then become sealed to prevent contamination.
6. Switch the generator off at the mains switch and disconnect it from the electrical supply.

```
SET 6.0 Bar FLOW ✓
ACT 100%
```

```
* * STANDBY * *
DEPRESSURISING
```

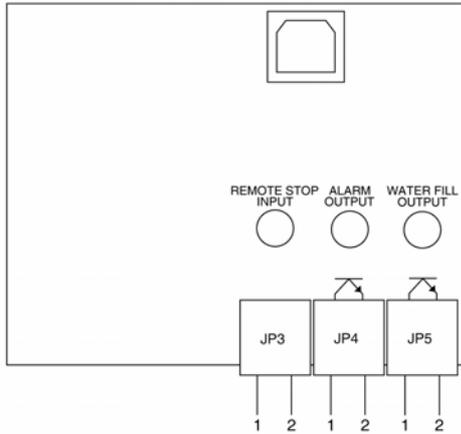
```
* * STANDBY * *
XXX Bar
```

```
* * STANDBY * *
DEPRESSURISED
```

The generator is now shut down. If the generator is to be transported, re-fit the hydrogen outlet port cover and the three transit plugs to the O<sub>2</sub> vent, excess H<sub>2</sub> vent and the water bottle vent.

## 4.5 Options Board

The options board is an accessory for the Hydrogen MD range of generators that allows direct communication with a PC via the USB port as well as connection of water monitoring, remote alarm, and remote stop circuits.



JP3_1	Remote Stop
JP3_2	
JP4_1	Alarm Output
JP4_2	Alarm Output Common
JP5_1	Water Full Output
JP5_2	Water Full Output Common

### Remote Stop

The remote stop function allows the generator to be connected to an external stop circuit.

The terminals on JP3 should be volt free under normal operating conditions.

To stop the generator remotely apply a 9- 12v dc to terminal 1 of “JP3”. (Terminal 2 is common). The LCD menu will change as shown.



Press [⏪] to reset the generator.

**Note:** The generator can be re-configured for remote Stop / Start operation using the remote software.

### Output Connection

There are two sets of open collector output terminals provided on the options board for those users wishing to connect remote monitoring equipment.

	<p><b>For connection to SELV (Safe Extra Low Voltage) systems only: Maximum 12vdc 50mA.</b></p>
--	---

#### Alarm Output

The alarm output is designed for remote alarm indication. When an error occurs on the generator, the output switching circuit is activated causing the remote circuit to be complete.

The remote alarm circuit will be reset when the generator error has been reset.

#### Water Fill Output

The water fill output allows for remote monitoring of the water bottle level. When the water level drops below the mid-point in the water bottle the output switching circuit is activated. The circuit will only be de-energised when the water bottle is filled to its upper limit.

# 5 Servicing



The recommended service procedures identified in table 5.2 along with all other repair and calibration work should be undertaken by a domnick hunter approved engineer.

## 5.1 Cleaning

Clean the equipment with a damp cloth only and avoid excessive moisture around any electrical sockets.

If required you may use a mild detergent, however do not use abrasives or solvents as they may damage the warning labels on the equipment.

## 5.2 Service Intervals

Description Of Maintenance Required		Recommended Maintenance Interval				
Component	Operation	Daily	Weekly	6 Months 4000 Hrs	12 Months 8000 Hrs	24 Months 16000 Hrs
Generator	Check the Power ON indicator is illuminated					
Generator	Check STATUS / FAULT Indicators located on the controller					
Generator	Check Water Level					
Generator	Check Water Conductivity					
Generator	Check for leaks					
Generator	Condition Dryer Columns					
Generator	6 Month Service Kit					
Generator	24 Month Service Kit					

**KEY:**



Check

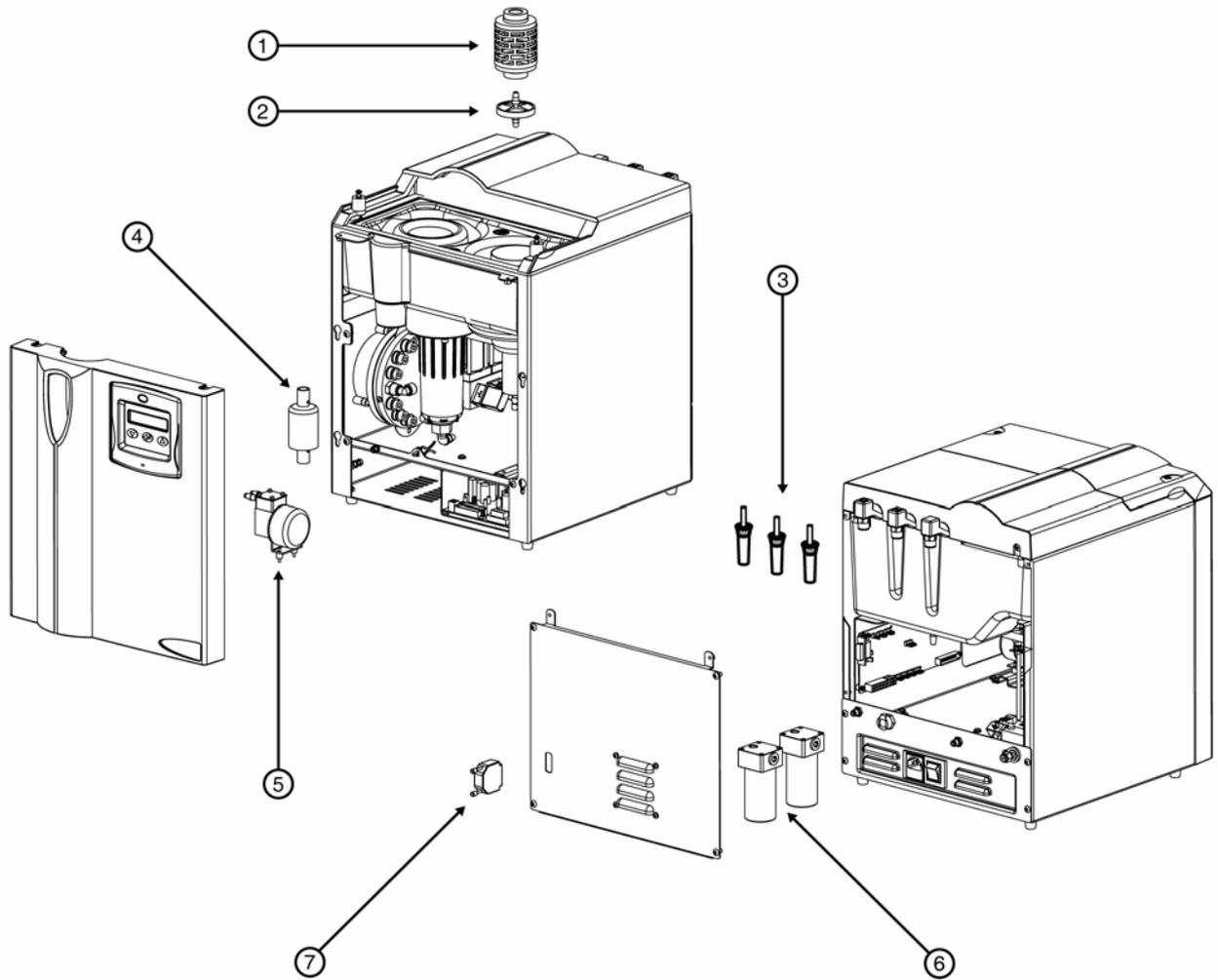


Recommended Process



Essential Procedure

### 5.3 Service Kits



Service Kit	Interval	Description	Kit No	Description
A	6 Month PM	Filter Service	604970600	Kit Includes: (1) De-ioniser Cartridge (2) Water Filter (3) 3 Environmental Filters (x 3)
B	24 Month	Complete Service	604970720	Kit Includes: (1) De-ioniser Cartridge (2) Water Filter (3) Environmental Filters (x3) (4) Float (5) Water Pump (6) Dryer Columns (x2) (7) Service Dongle

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## 5.4 Operational Procedures

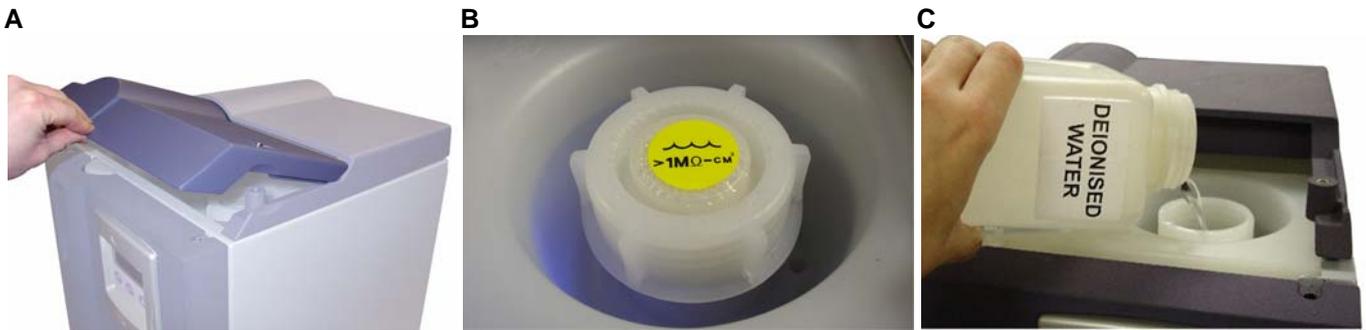
### 5.4.1) Re-Filling the Water Bottle

- 1 Remove the top front cover (A) and the water bottle cap (B).
- 2 Fill the water bottle using de-ionised water. An audible and visual indication will be given by the generator when the correct level is reached.

The LCD will display "Water Full" message.

- 3 Replace the water bottle cap and top front cover.

Any spillages in the well surrounding the filler cap may be drained through the spillage drain on the rear of the generator.



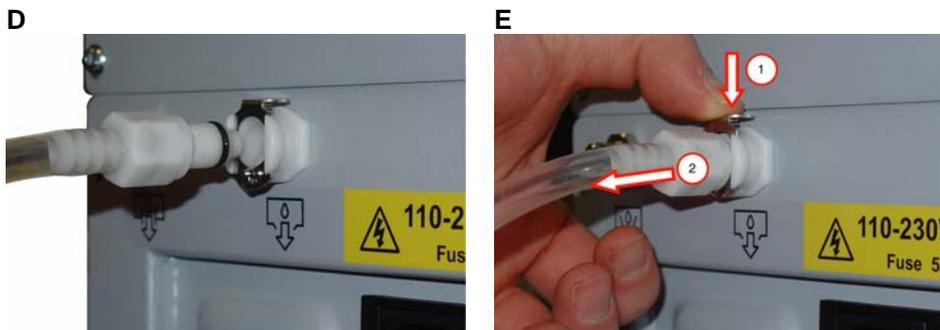
**Note:** If water has been changed due to high conductivity, the de-ioniser cartridge must also be changed.

### 5.4.2) Water Drain Procedure

- 1 Locate drain port at rear of generator and insert the drain line (D).
- 2 Allow the water bottle to drain completely into a suitable container.
- 3 Once drained remove the drain line by pressing the lock downwards and removing the tube (E).



**DO NOT RE-USE OLD WATER!**



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### 5.4.3) Replacing the Water Filter

- 1 Switch the generator into Standby mode.
- 2 Remove the top front cover (A), water bottle cap (B).
- 3 Remove the de-ioniser cartridge (F) and store in a clean area for re-use later.
- 4 Drain the water bottle.
- 5 Using the tool supplied in the Filter Removal/Fitting kit, locate it over the centre of the filter and engage the tool in to the centre of the filter until sufficient hold is attained in order to remove the filter.



**Take care when using tool as not to pierce the Water reservoir wall during this operation**

- 6 Locate the open end of the removal/fitting tool over the barbed inlet/outlet connection of the filter and push down until the new filter is fully located in position in the recess at the bottom of the water reservoir.
- 7 Re Fill the water bottle using de-ionised water. An audible and visual indication will be given by the generator when the correct level is reached.

The LCD will display "Water Full" message.

- 8 Replace the water bottle cap and top front cover.



**Always change the deioniser cartridge if the generator was indicating bad conductivity levels prior to starting this procedure or if it has become contaminated in any way.**



### 5.4.4) Replacing De-ioniser Cartridge

- 1 Switch the generator into Standby mode.
- 2 Remove the top front cover (A), water bottle cap (B).
- 3 Remove the de-ioniser cartridge (F).
- 4 Remove the new cartridge from its packaging and place into the generator.



**Care should be taken to avoid contamination from handling.**

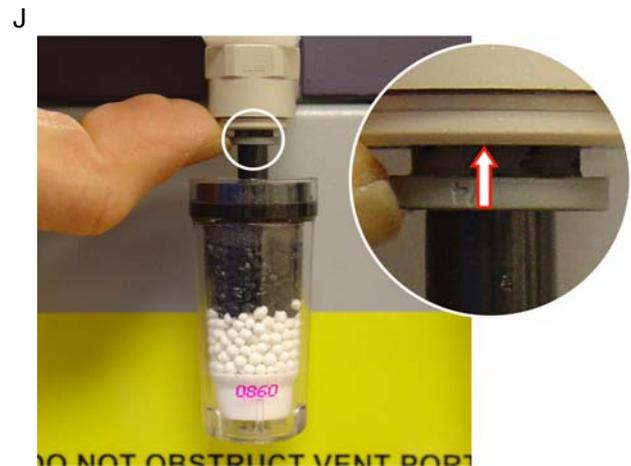


- 5 Replace the water bottle cap (B) and top front cover (A).

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## 5.4.5) Environmental Filter Change Procedure

- 1 Locate the O2 Vent, Excess H2 Vent and Water bottle vent on the rear of the generator as shown.
- 2 Push the outside of the gland upwards to release the filters and remove.
- 3 Fit the New Environmental Filters as supplied in the H2 Filter Kit.



**Note:** Environmental filters should be changed every six months; there is no visual indication of exhausted filters.



## 5.5 Service Record

Date of Commissioning	
-----------------------	--

Service (Hours)	Date	Serviced By		Comments / Observations
		Print	Initials	
4,000				
8,000				
12,000				
16,000				
20,000				
24,000				
28,000				
32,000				
36,000				
40,000				
44,000				
48,000				
52,000				
56,000				
60,000				
64,000				
68,000				
72,000				

## 6 Troubleshooting guide

In the unlikely event that a problem occurs on the equipment, this troubleshooting guide can be used to identify the probable cause and remedy.



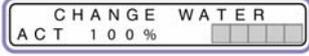
**Troubleshooting should only be attempted by competent personnel. All major repair, and calibration work should be undertaken by a domnick hunter trained approved engineer.**

When an error occurs the LCD will cycle between the default menu and the error message. In addition to the error messages the generator will provide a visual and audible indication using the System Check LED, Water Bottle Indicator and its integral sounder. The operating status of each indicator is dependent upon the error as shown in the table below.

Error Type	System Check LED	Water Bottle Indicator	Audible Indicator
Critical Error	Red	Not Illuminated	Continuous
Non Critical 1 <sup>+</sup>	Red (Flashing)	Red	Continuous
Non Critical 2 <sup>+</sup>	Red (Flashing)	Red	Continuous
Auto Non Critical	Red	Red / Normal Conductivity State*	Continuous
Pre-Alarm	Red / Green	Red / Normal Conductivity State*	Intermittent

**Note:** \* Normal Conductivity is the status of the water bottle indicator prior to the error.  
+ If the same Critical Error occurs three times consecutively, the system will Lock and require Hard reset.

### Water Level and Quality

Error Message	Hydrogen Production	Remedy
 The water has dropped below the mid-point.	Yes	Fill with >1MΩm water
 Water has dropped below minimum point.	No	
 Water conductivity is high.	Yes	Drain water and refill with >1MΩm water
 Water conductivity is unacceptably high.	No	

### Internal Electrical Faults

Error Message	Hydrogen Production	Remedy
 The hydrogen cell voltage is too high.	No	Contact domnick hunter for advice.
 The hydrogen cell voltage is too low.		Reset and/or Hard reset the generator.
 The hydrogen cell current is too high.		If the problem persists contact domnick hunter.
 The hydrogen cell current is too low.		Contact domnick hunter for advice.

## Dryer Faults

Error Message	Hydrogen Production	Remedy
	No (System Locked)	Contact domnick hunter for advice.
	No	
	Yes	Check outlet piping and connections.  If problem persists contact domnick hunter for advice.

## Pressure Errors

Error Message	Hydrogen Production	Remedy
	No	Contact domnick hunter for advice.
	No	Check outlet piping and connections.  If problem persists contact domnick hunter for advice.
	No	Contact domnick hunter for advice.
	No (System Locked)	

## Sensor Faults

Error Message	Hydrogen Production	Remedy
There is a fault with the conductivity transducer.	No (System Locked)	Contact domnick hunter for advice.
Water Pump fault.	No	
The calibration file is out of date.		
Internal software time out.		

## Other Faults

Error Message	Hydrogen Production	Remedy
Water separator chamber error	No (System Locked)	Contact domnick hunter for advice.
Service Required	Yes	Fit Service Kit
The oxygen vent is blocked.	No (System Locked)	Remove the blockage and perform hard reset.
The hydrogen vent is blocked.		If the problem persists contact domnick hunter for advice
The generator is locked due to a critical error or three consecutive occurrences of the same error.		Resolve the initial fault and perform a hard reset.
The power supply fan has failed.	No	Contact domnick hunter for advice.
Connection / wiring fault on the level float.		
The generator fan has failed.		
Terminals on JP3 of the options board are short circuit.	No	Press  when required to reset the generator.
Fault on valves 2 and 4 during system check.		

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## 7 Warranty

This warranty applies to the generator and associated parts (the Equipment) manufactured and supplied by **domnick hunter**.

Use of the generator without the recommended water quality or genuine parts will expressly invalidate the warranty.

It should be noted that the generator must be installed and running within three months of despatch from **domnick hunter** to ensure the optimum efficiency of the SPE cell. If this is not adhered to the warranty will be invalid.

Should the Equipment be defective as to materials or workmanship, **domnick hunter** warrants that it will remedy such defect. Where the Equipment is the generator, the warranty period will be 12 months from date of commissioning or 18 months from date of manufacture, whichever is the earlier. Where the equipment is the PEM CELL, the warranty period will be 24 months from date of commissioning. In the case of Equipment other than the generator, the warranty period shall commence from the date of despatch. 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 instruction and with good 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 continually 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.

# Declaration of Conformity

EN

**domnick hunter**  
Dukesway, TVTE, Gateshead, Tyne & Wear, NE11 0PZ. UK

## Laboratory Hydrogen Generator

**20H-MD, 40H-MD, 60H-MD**

**Directives**

98/37/EC,  
73/23/EEC,  
89/336/EEC  
93/68/EEC, 92/31/EEC

**Standards used**

EN ISO 12100-1 : 2003, EN ISO 12100-2 : 2003,  
EN 61326 : 1998  
EN 50366 : 2003  
EN 61010-1 : 2003

**Authorised Representative**

Barry Wade  
Business Systems Improvement Manager  
domnick hunter ltd

### 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 related documents following the provisions of the above Directives.

**Signature:**



**Date:** 3/10/2006

**Declaration Number:** 0027/100306



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[www.domnickhunter.com](http://www.domnickhunter.com)

a member of the domnick hunter group plc



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