Mass Spectrometer Table User Manual





Model	Peak PN	AB Sciex PN
MS Table 1N	10-1016-3N	1031380

Contents

Change History	4
How to use this Manual	4
Introduction	5
Warranties and Liabilities	6
Safety Notices	7
Symbols	7
Safety Notice to Users	7
Declaration of Conformity	8
Environmental Declaration	9
Technical Specification 1B/1N/1N Hi-Flow	10
Environment	10
Inlet Conditions	10
Generator Outlets	10
Electrical Requirements	10
General	11
Technical Specification 2B/2N	11
Environment	11
Inlet Conditions	11
Generator Outlets	11
Electrical Requirements	12
General	12
Unpacking	13
Installation	14
Generator Environment	14
General Dimensions	14
Unit Controls	15
Rear Connections	16
Drain Connection – MS Table–1N/1N Hi- Flow/2N only	16

Water Bottle Mount Installation	17
Infinity 1031 Installation	17
Levelling Feet	18
Electrical Connection	19
Air Connection	19
Fan power LED - 2B/2N Only	20
Safe Operation of Pump Tray	21
Connecting to the Application	22
Tubing Lengths	22
IMPORTANT DOCUMENTS	23
Normal Operation	24
Relocation of MS Table	24
Service Requirements	25
Service Schedule	25
Service Plans	25
Cleaning	25
Trouble Shooting	26

Change History

Rev.	Comment	Name	Date
1	Initial Release	Chris Pugh	18/05/07
2	Notes Added for Indoor Use Only and Altitude	Tracy Grierson	10/09/07
3	Nemko Comments Added	Jack Aitkinson	20/09/07
4	Final Feedback Included	Gavin Logan	03/10/07
5	Added Page 22 Showing Explanation of Symbols	Jack Aitkinson	23/10/07
6	Updated to New Format	Liam Couttie	16/01/12
7	Power Supply Change	Liam Couttie	12/11/12
8	Change to Technical Specification Layout	Liam Couttie	12/03/13
9	Technical Specifications Amended	Liam Couttie	22/07/13
10	Voltage Amendment	Liam Couttie	30/08/13
11	Fuse Characteristics	Liam Couttie	06/09/13
12	Voltage Amendment	Liam Couttie	24/10/13
13	Added Hi-Flow Information	Liam Couttie	25/10/13
14	Content Update	Liam Couttie	29/10/13
15	Brand Colour Change and VAVE Updates	Liam Couttie	13/02/14
16	Relocation Information	Liam Couttie	26/02/14
17	Declaration of Conformity	Liam Couttie	07/08/14

How to use this Manual

This manual is intended for end users and has been written so that it can either be read as a step by step guide to installation and usage or as a reference document where you can skip to the relevant information.

Users of a hard copy version can refer to the contents page to find the relevant information. Users of the soft copy version can use the hyperlinks from the contents page as well as the hyperlinks between sections.

Please review each of the following sections carefully.

Thank you for selecting Peak Scientific to meet your Gas Generation needs, and should you require any further assistance or support please do not hesitate to contact Peak Scientific or Peak Partner from which you purchased your Generator.

Introduction

The MS Table 1B/2B and 1N/1N Hi-Flow/2N (with integrated Nitrogen Generator) is a transportable table designed specifically to locate a Mass Spectrometer.

On the inside of the table is a sliding tray to support and house the Mass Spectrometer Vacuum Pumps.

Heat removal from the inside of the table is facilitated by a range of extraction fans located at the front and rear panels of the unit,

The MS Table 1N/1N Hi-Flow/2N, specifically, also contains an integrated Nitrogen Generator providing a source of High Purity Nitrogen with two independent outlets of clean Zero Grade Air.

To ensure this Generator model meets our high expectations with regards to reliability and performance, we have tested this new model extensively at our manufacturing plant and with end users around the world to ensure reliability and longevity of the system.

Warranties and Liabilities

- 1. The Company warrants that it has title to the Goods.
- 2. Subject to the provisions of this clause the Company warrants that the Goods shall comply in all material respects with any specification referred to in the Order Confirmation (as the same may be amended) and shall, subject thereto, be free from defects in material and workmanship for the lesser of a period of twelve months from the date of delivery or thirteen months from the date of dispatch from the factory.
- 3. Save as provided in this clause and except where the Goods are sold to a person dealing as a consumer (within the meaning of the Unfair Contract Terms Act 1977) all warranties, conditions or other terms implied by statute or common law are hereby expressly excluded save to the extent they may not be lawfully excluded. When the Goods are sold to a consumer within the meaning of the Unfair Contract Terms Act 1977 their statutory rights are not affected by the provisions of this clause.
- 4. In the event of the Customer making a claim in respect of any defect in terms of clause 2 hereof the Customer must.
 - Reasonably satisfy the Company that the Goods have been properly installed, commissioned, stored, serviced and used and without prejudice to the generality of the foregoing that any defect is not the direct or indirect result of lack of repair and/or servicing, incorrect repair and/or servicing, use of wrong materials and/or incorrect spare parts
 - 2. Allow the company to inspect the Goods and/or any installation and any relevant packaging as and when reasonably required by the Company.
- 5. Subject to the Company being notified of any defect as is referred to in sub-clause 2 hereof within a reasonable time of it becoming apparent and subject always to the terms of sub-clause 4 hereof, the Company shall, in its option, replace or repair the defective Goods or refund a proportionate part of the Price. The Company shall have no further liability to the Customer (save as mentioned in sub-clause 6 hereof).
- 6. The Company shall be liable to indemnify the Customer in respect of any claim for death or personal injury to any person in so far as such is attributable to the negligence or breach of duty of the Company or any failure by the Company to comply with the provisions of sub-clause 2 hereof.
- 7. Save as provided in sub-clause 2 hereof the Company shall not be liable in respect of any claim by the Customer for costs, damages, loss or expenses (whether direct, indirect, consequential or otherwise) or indemnity in any respect howsoever arising including, but not by way of limitation, liability arising in negligence (other than pursuant to clause 6 above) that may be suffered by the Customer or any third party.

Safety Notices

Symbols

This manual uses the following symbols to highlight specific areas important to the safe and proper use of the Generator

WARNING	A WARNING notice denotes a hazard. It calls attention to an operating procedure, process or similar, which if not correctly performed or adhered to, could cause personal injury or in the worst case death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood or met.
	A CAUTION notice denotes a hazard. It calls attention to an operating procedure, process or similar, which if not correctly performed or adhered to, could cause damage to the Generator or the Application. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood or met.
4	Caution, risk of electric shock. Ensure power to the Generator has been removed before proceeding.

Safety Notice to Users



These instructions must be read thoroughly and understood before installation and operation of your Peak MS Table Generator. Use of the Generator in a manner not specified by Peak Scientific MAY impair the SAFETY provided by the equipment.



When handling, operating or carrying out any maintenance, personnel must employ safe engineering practices and observe all relevant local health and safety requirements and regulations. The attention of UK users is drawn to the Health and Safety at Work Act 1974, and the Institute of Electrical Engineers regulations.

Declaration of Conformity

We Peak Scientific Instruments Ltd.

of Fountain Crescent, Inchinnan. Renfrewshire PA4 9RE declare that:

Equipment Nitrogen Gas Generator

Model MS Table

To which this declaration relates, is in conformity with the applicable EC Directives, harmonized standards, and other normative requirements.

• Low Voltage Directive 2006/95/EC EN 61010-1: 2010 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.

CAN/CSA-C22.2 No.61010-1-04 Safety requirements for Electrical Equipment for Measurement, Control and Laboratory use, Part 1: General requirement.

• Electromagnetic Compatibility Directive 2004/108/EC EN 61326-1: 2006 Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements.

• FCC 47 CFR Part 15 class B Unintentional radiators; Conducted and Radiated emissions limits.

All evaluation, testing and certification issued by:

Nemko Canada Inc. 303 River Road Ottawa Ontario Canada K1V 1H2

Certh

TUV Product Service Ltd. Octagon House, Concorde Way Segenworth North, Fareham Hampshire England PO15 5RL

Signed By: Name:

lame: Chris Pugh

Position: Engineering Director

Done at: Peak Scientific Instruments Ltd, Inchinnan, Scotland.

Date: 20th of July 2014



Environmental Declaration

We Peak Scientific Instruments Ltd.

of Fountain Crescent, Inchinnan. Renfrewshire PA4 9RE declare that:

Equipment Nitrogen Gas Generator

Model MS Table

Is fully compliant with the following Directives:

2002/96/EC WEEE (Waste of Electrical and Electronic Equipment)

2002/95/EC RoHS (Restriction of Hazardous Substances)

Peak Scientific Instruments Ltd fully complies with its obligations towards the European WEEE (Waste of Electrical and Electronic Equipment) Directive 2002/96/EC. These obligations are being met within the B2B compliance group.

Peak Scientific Instruments Ltd has developed all reasonable 'due diligence' controls to ensure that our products comply with the principles and requirements of the European RoHS (Restriction of Hazardous Substances) Directive 2002/95/EC. Similar directives in the United States and China, for example, have also been captured within this program.

Where a specific certificate of compliance is required, this can be requested, on a product serial number basis, directly from Peak Scientific Instruments Ltd, by contacting us through our website on <u>www.peakscientific.com</u>

Signed By:

Certh

Name: Chris Pugh Position: Engineering Director Done at: Peak Scientific Instruments Ltd, Inchinnan, Scotland. Date: 16th January 2012



Technical Specification 1B/1N/1N Hi-Flow

Environment

Min/Max Operating Ambient Temperature	5°C (41°F) / 30°C (86°F)	
Maximum Relative Humidity	70% Non-Condensing	
Maximum Altitude	2000 meters	
Min/Max Storage Temperature*	-20°C (-4°F) / 60°C (140°F)	

*NOTE – When taken out of storage the Generator should be allowed to acclimatize at room temperature for a minimum of 3 hours before operation.

Inlet Conditions

	1B	1N	1N Hi-Flow		
Min/Max Air Inlet Pressure	N/A	8.3-10 bar / 120-145 psi			
Minimum Air inlet Flow	N/A	115 l/min			

Generator Outlets

	1B	1N	1N Hi-Flow
Curtain Max Flow	N/A	12 L/min (0.42 cfm)	10 L/min (0.35 cfm)
Curtain Max Pressure	N/A	5.50 bar (80 psi)	5.5 bar (80 psi)
Source Max Flow	N/A	26 L/min (0.91 cfm)	22 L/min (0.77 cfm)
Source Max Pressure	N/A	7.50 bar (110 psi)	7.5 bar (110 psi)
Exhaust Max Flow	N/A	8 L/min (0.28 cfm)	10 L/min (0.35 cfm)
Exhaust Max Pressure	N/A	4.1 bar (60 psi)	4.1 bar (60 psi)
Dew Point	N/A	-11°C / 12°F	
Purity	N/A	≥95	
Particles	N/A	<0.01µm	
Phthalates	N/A	NONE	
Suspended Liquids	N/A	NONE	
Gas Outlets	N/A	3 x ¼" BSPP	
Drain Outlet	N/A	1 x ¼" BSPP	
Pressure Gauges	N/A	3	
Start-Up Time For Purity	N/A	30 minutes	

Electrical Requirements

Voltage	110-240 VAC
Frequency	50/60 Hz
Current	1 Amp
Input Connection	C14
Fuse	T1.6A
Power Cord Type	C13
Pollution Degree	2
Installation Category	
5	

General

Dimensions in cm (") W x D x H		100 x 83 x 80.4 (39.4 x 32.6 x 31.6)				
Weight	1B	100 kg	1N	103.5 kg	1N Hi-Flow	103.5 kg
Shipping weight	1B	132.5 kg	1N	135 kg	1N Hi-Flow	135 kg
Noise level	54 dBA @1m					
Heat Output	820 BTU / Hr					

Technical Specification 2B/2N

Environment

Min/Max Operating Ambient Temperature	5°C (41°F) / 30°C (86°F)		
Maximum Relative Humidity	70% Non-Condensing		
Maximum Altitude	2000 meters		
Min/Max Storage Temperature*	-20°C (-4°F) / 60°C (140°F)		

*NOTE - When taken out of storage the Generator should be allowed to acclimatize at room temperature for a minimum of 3 hours before operation.

Inlet Conditions

	2B	2N
Min/Max Air Inlet Pressure	N/A	8.3-10 bar / 120-145 psi
Minimum Air inlet Flow	N/A	115 l/min

Generator Outlets

	2B	2N	
Curtain Max Flow	N/A	18 L/min (0.63 cfm)	
Curtain Max Pressure	N/A	5.50 bar (80 psi)	
Source Max Flow	N/A	26 L/min (0.91 cfm)	
Source Max Pressure	N/A	7.50 bar (110 psi)	
Exhaust Max Flow	N/A	25 L/min (0.88 cfm)	
Exhaust Max Pressure	N/A	4.86 bar (70 psi)	
Dew Point	N/A	-11°C / 12°F	
Purity	N/A	≥95	
Particles	N/A	<0.01µm	
Phthalates	N/A	NONE	
Suspended liquids	N/A	NONE	
Gas outlets	N/A	3 x ¼" BSPP	
Drain outlet	N/A	1 x ¼" BSPP	
Pressure gauges	N/A	3	
Start-Up Time For Purity	N/A	30 minutes	

Electrical Requirements

Voltage	110-240 VAC		
Frequency	50/60 Hz		
Current	1 Amp		
Input Connection	C14 Plug		
Fuse	T1.6A		
Power Cord Type	C13 socket to local connection (13A minimum)		
Pollution Degree	2		
Installation Category	II		

General

Dimensions in cm (inches) W x D x H	100 x 83 x 80.4 (39.4 x 32.6 x 31.6)			
Weight	2B	105 kg	2N	108.5 kg
Shipping Weight	2B	137.5 kg	2N	140 kg
Noise Level	54 dBA @1m			
Heat Output	820 BTU / Hr			

Unpacking

Although Peak Scientific takes every precaution with safe transit and packaging, it is advisable to fully inspect the unit for any sign of transit damage.

Check 'SHOCKWATCH' label for signs of rough handling prior to un-packing -



Any damage should be reported immediately to the carrier and Peak Scientific or the Peak Partner from where the unit was purchased.

Follow the unpacking instructions posted on the side of the crate. It will require two people to remove the unit from the shipping crate and to manoeuvre the Generator onto the floor.

Please save the product packaging for storage or future shipment of the Generator.

Note: Included with the Generator is a "Fittings Kit" containing mains power leads for UK, EU and US also all the required fittings. Be careful not to discard these with the packaging.

Installation

Generator Environment



The Generator is designed for indoor use only. It should be installed adjacent to the application it is supplying. If this is not convenient then the unit can be sited elsewhere, however, consideration should be made of the lengths of pipe runs as pressure drops can result from extended runs of pipe. Please see the <u>Tubing lengths</u> section for further details.



Performance of the Generator (like all sophisticated equipment) is affected by ambient conditions. Note should also be taken to the proximity of Air Conditioning outlets. These can sometimes give rise to "pockets" of air with high relative humidity. Operation of the unit within such a pocket could adversely affect its performance. Consideration should also be given to the air flow around the unit. It is recommended that an air gap of 75mm (3") should be maintained down both sides, at the rear and across the top of the unit. Please refer to the drawing below for the general dimensions of the unit.

Maximum Ambient Conditions: 30°C (dry bulb) 70%RH (Max) Non-Condensing



General Dimensions

Figure 1: General dimensions



The Generator must always be placed on a level surface. Failure to do so will affect the performance of the Generator.

Unit Controls



Figure 2: Unit controls

Rear Connections

Supplied in the Fittings Kit are all the fittings required to connect the MS Table Generator to the application. The contents of the Fittings Kit are as follows:



*MS Table-1N/1N Hi-Flow/2N Only.

Drain Connection - MS Table-1N/1N Hi-Flow/2N only

Use the ¼" tubing (item 9 from fittings kit) to connect the drain outlet to a suitable drain connection. It should be noted that the Generator can expel a considerable amount of water from this (dependent on ambient humidity).



If a container is used it should be emptied at regular intervals. The container must NOT have an air tight seal as water and air are expelled at pressure.

Water Bottle Mount Installation

The MS Table is supplied with a water bottle mount, which can be attached to the left hand side of the unit.

Locate the two mounting holes, as shown in the left image below.



Figure 4: Bottle Mount

Then, as shown in the right image above, attach the mount to the side of the unit using two of the M5 plain, and spring washers and M5 pozi pan head screws contained in the fittings kit.

Infinity 1031 Installation

The MS Table-1N/1N Hi Flow/2N specifically contains an integrated Nitrogen Generator providing a source of High Purity Nitrogen with 2 independent additional outlets of clean dry Zero Grade air.

The MS Table-1B/2B does not have an integrated Nitrogen Generator, but does have the facility to bolt-on to the side of the table a Peak Scientific Instruments Wall Mounted Infinity 1031 Nitrogen Generator.



Figure 5: Infinity 1031 Mount

Using the remaining M5 fittings from the fittings kit, mount the Infinity 1031 to the side of the MS Table-2B. Note the front panel of the Infinity 1031 will need to be removed in order to attach the fittings.

Levelling Feet

Once the MS Table has been located in its final position, the levelling feet located at each corner of the unit can be lowered to aid stabilisation. The TABLE is transported with the feet in a retracted position.

1. Using a 17mm spanner, slacken off the top nut.



Figure 6: Loosening Top Nut

2. Then using a 14mm spanner unscrew the foot until it reaches the floor.



 Unscrew a further 1 full turn before tightening the locking nut to lock the foot in place.



Figure 8: Lock Foot In Place

4. Repeat this on all four feet, ensuring the unit is level and stable when finished.

The castors are designed to support the weight of the generator and the mass spectrometer.

The support feet must be used in conjunction to ensure the MS Table doesn't move in operation.

The castors have been tested and proven to support a maximum weight of 250KG

Electrical Connection

Connect the Generator to a 110-240 VAC volt single-phase supply using the power cord provided. If the appropriate power cord is not supplied; a new plug, rated to at least 13 amps, can be fitted by a qualified electrician.



This unit is classified as SAFETY CLASS 1. THIS UNIT MUST BE EARTHED. Before connecting the unit to the mains supply, please check the information on the serial plate. The mains supply must be of the stated AC voltage and frequency.

EARTH/GROUND (E):-	Green & Yellow	or	Green
LIVE (L):-	Brown	or	Black
Neutral (N):-	Blue	or	White



Do not touch anything inside the Generator whilst the side panels are removed and the mains power is connected to the unit

Air Connection

The Table-1N/1N Hi Flow/2N Generator should be connected to a clean, dry, OIL - FREE source of compressed air. A minimum inlet pressure of 120 psig (8.3 barg) is required. Any doubts as to the suitability of your compressed air supply should be referred to Peak Scientific or any of their authorised partners.

The Compressed Air supply should be connected to the inlet located at the rear of the unit as shown in the Rear Connections section of this manual.

Fan power LED - 2B/2N Only

The LED on the front panel should be illuminated when the Generator is supplied with power.



Figure 9: Fan Power LED

This is indication that the fans attached to the front panel are being supplied with power, and are running correctly.

The front panel should be connected to the power supply as shown below.



Figure 10: Fan Power Connection

Safe Operation of Pump Tray

For safe installation or removal of roughing pumps, we recommend use of the sliding function of the pump tray, as shown below.



Figure 11: Pump Tray Removal

Remove the front panel, ensuring that the fan power and earth cables are disconnected.

Remove earth straps by pulling it off the spade connector on the front panel.

Depress both yellow tabs simultaneously and pull tray outwards until it clicks into position.

Once pumps have been installed, ensure correct reconnection of earth straps and fan power lead.

Connecting to the Application

MS Table-1N/1N Hi Flow/2N only - Using the $\frac{1}{4}$ " tubing supplied, connect the outlet of the Generator to the inlet on the application.

If you require more tubing than is supplied please refer to the <u>Tubing Lengths</u> section.



Once the tubing is connected to the application, please ensure that it is thoroughly checked for being leak-tight. Even the slightest leak in the gas supply between the Generator and the application can lead to a reduction in efficiency.

Tubing Lengths



The diameter of the tubing which will be connected to the gas outlet is important and is determined by the length of tubing required. Failure to follow these recommendations could lead to accelerated compressor wear.

< 10 meters:	Use 6/4 (6mm O/D, 4mm I/D) P.T.F.E. tubing.
> 10 - 40 meters:	Use 10/8 (10mm O/D, 8mm I/D). Tubing and fittings not
	supplied in the fittings kit.
> 40 metres:	Please contact Peak Scientific with the relevant distance
	and we will calculate the flow resistance and the tubing
	size required.

A combination of 6/4 and 10/8 tubing may be used to ensure that there is no large diameter tubing within the lab (i.e. for the first 20 meters from the Generator use 10/8 and the final 10 meters to the application use 6/4 tubing). Keep the connections and bends to a minimum.

The imperial equivalents are: 6/4 = 1/4" O/D, 3/16" I/D. 10/8 = 3/8" O/D, 5/16" I/D.

IMPORTANT DOCUMENTS Warranty Entitlement

To register your generator for your warranty entitlement, send the completed form to Peak Scientific by:

- Email <u>warranty@peakscientific.com</u>
- Online <u>http://www.peakscientific.com/service-and-support/warranty_registration</u>
- Phone +44 (0)141 530 4185
- Fax +44 (0)141 812 8200

PRODUCT WARRANTY REGISTRATION		
COMPANY:	CONTACT NAME:	
ADDRESS:		
	EMAIL ADDRESS:	
CITY/TOWN:	GENERATOR SERIAL NUMBER:	
POSTCODE:		
COUNTRY:	MODEL TYPE:	
TELEPHONE:	INSTALLATION DATE (DD/MM/YYYY):	

Important Please Note:

You have 1 month to register your Peak Scientific product from the date of shipment.

If you wish to defer installation of your generator you must notify Peak Scientific within 1 month of the shipment date. This can be done by emailing <u>warranty@peakscientific.com</u> Once registered the warranty will be honoured for a period of 12 months after the installation date.

For any generators that remain unregistered the warranty will begin from date of shipment.

Thank you on behalf of Peak Scientific.

Page 23 2014 © Peak Scientific - Rev. 17 - 07/08/14

Normal Operation

The MS Table Gas Generator is designed specifically to minimize operator involvement. Given that the system is installed as described in earlier sections and is serviced in accordance with the specified maintenance recommendations (see <u>Service Requirements</u>), then it should simply be a matter of turning the Generator on when it is required.

The Generator will automatically produce the factory set flow and pressure as detailed in the <u>Technical Specifications</u>.

Relocation of MS Table

- 1. Turn off and disconnect power to the generator.
- 2. Disconnect the Air Connection to the generator.
- 3. Remove the MS Instrument from on top of the table
- 4. Disengage the leveling feet.

Once the MS Table has been safely moved to its new location, the MS Table can then be installed as per the Installation Guide.

Service Requirements

Service Schedule

MS Table - 1N/1N Hi Flow/2N Only

Service Interval	Component	Part No.	Qty.
	Coalescing filter element	00-4424	1
12 months	Element active Carbon	00-4427	1
	RAC filter element	00-4425	2

Table 1: Service schedule

As an alternative to purchasing the 12 month service items individually an Annual Service Kit is available as one part number. This contains all the filters required for this Generator and offers a costs saving over buying the components separately.

Purchase Interval	Component	Part No.	Qty.
12 months	MS Table Annual Service Kit	08-4631	1

Table 2: Annual Service Kit

Service Plans

Peak Scientific offer two service plans. The Complete Service Plan, specifically designed for Generators operated in critical environments, also includes full breakdown cover, guaranteed response times and Generator upgrades if available. Our Standard Service Plan, covering the basic needs of our Generators, features special deals on spare parts and breakdowns.

If you want to know more about our Service Plan options and how we ensure that your instrument can run with the maximum uptime and performance, please contact us at <u>maintenance@peakscientific.com</u>

Cleaning

Clean the outside of the Generator only using warm soapy water and a clean damp cloth. Ensure the cloth is thoroughly rung out to remove excess fluid prior to use.



Cleaning should only be undertaken with the power switched off and the power cord removed from the rear of the Generator.



Under no circumstances should any solvents or abrasive cleaning solutions be used as these can contain fumes that could be harmful to the Generator.

Trouble Shooting

Problem	Possible Solution	
The mass spec is reporting	 Check pressure gauges are showing <u>normal pressure</u>. 	
low pressure.	Contact your service provider.	
Green LED on front panel is not illuminated when power to Generator is on.	 Switch off Generator and check power cable is connected to the connection point on the front panel. (Page 18) Check the fuse in the power cord plug. Disconnect power cord from the rear of the Generator. Replace the fuse at the rear of the unit, if necessary. Reconnect power cord. 	
	Contact your service provider.	
The unit is switched on but the fans are not turning and the LED is not lit.	 Ensure power cord is plugged into the Generator and that the power socket is turned on. Check the fuse in the power cord plug. Disconnect power cord from the rear of the Generator. Replace the fuse at the rear of the unit, if necessary. Reconnect power cord. 	
	 Lontact your service provider. 	

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