

High Resolution NMR

Market Application Publication



Background:

High resolution Nuclear Magnetic Resonance (NMR) Spectroscopy is a critical tool for the determination of the structure of molecules of biological interest such as proteins and nucleic acids. Ultra-dry, highly purified nitrogen is required for a number of operations involved in the use of high resolution NMR such as sample injection, sample spinning and sample lifting. While some systems employ a Dewar to supply the nitrogen gas, the use of an in-house nitrogen generator to provide the required gas can significantly increase laboratory safety and convenience. In addition, an in-house generator reduces the cost and the environmental impact of supplying the gas. An in-house nitrogen generator is completely automatic and requires a minimum of maintenance.



Contact Information:

Parker Hannifin Corporation
Industrial Gas Filtration and
Generation Division
4087 Walden Avenue
Lancaster, NY 14086

phone 716 686 6400 or 800 343 4048
fax 877 857 3800

www.labgasgenerators.com

Features and benefits:

- Generates pure nitrogen from laboratory air
- Eliminates the use of liquid nitrogen Dewars and the need for periodic refilling of liquid nitrogen
- Safe, produces only the amount of nitrogen that you need, minimizing the possibility of asphyxiation
- Compact design saves laboratory space

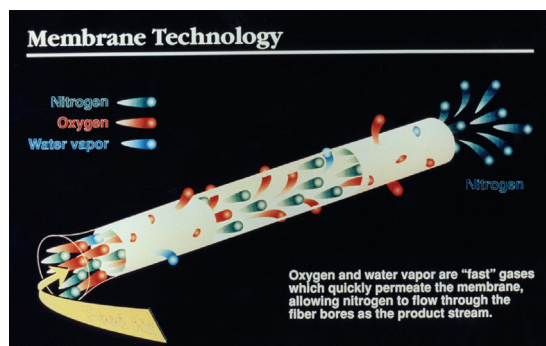
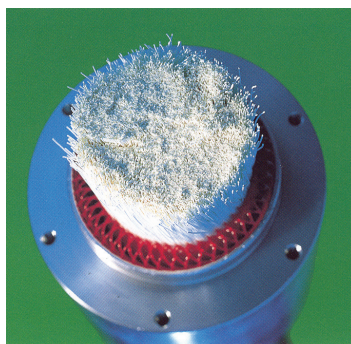
Application:

Dry, pure Nitrogen for high resolution NMR is provided by Parker Balston High Flow Nitrogen generators using a hollow fiber membrane that permits oxygen and water vapor to permeate the membrane and escape through the sweep port while the nitrogen flows through the tube to the NMR. While each individual fiber membrane has a small internal diameter, a large number of fibers are bundled together to provide an extremely large surface area for the permeation of oxygen and water.

Case Study:

The University of Guelph NMR Centre is equipped with six modern NMR spectrometers capable of a diverse array of solution and solid applications. The facility provides service to all academic communities on campus and is also available to industry. It is funded by the Canada Foundation for Innovation, the Ontario Government and industrial partners. The center uses a PSA air dryer to pre-dry air

to a dew point of -100°F and Parker Balston Nitrogen generators are used to provide super dry nitrogen to 600 MHz and 800 MHz NMR systems with cryoprobes. Valerie Robertson, NMR facility manager, reports that the system provides a consistent flow of nitrogen with a minimum of maintenance. A maximum flow of 160 lpm of nitrogen (98% pure) is readily obtained with 120 psi inlet air, which meets the stringent requirements of the facility.



Specifications:

Nitrogen Generators	
Nitrogen Purity	95.0-99.5%
Atmospheric Dewpoint	-58°F (-50°C)
Suspended Liquids	None
Particles >0.01micron	None
Commercially Sterile	Yes
Hydrocarbon, Phthalate Free	Yes
Min./Max. Operating Pressure	60/145 psig
Output Flow Rate (99.5% N2)	Model N2-45: 67 LPM Model N2-80: 100 LPM Model N2-135: 133 LPM
Maximum Pressure Drop (99% N2 Purity, 125 psig)	10 psig
Inlet/Outlet Ports	1/2" NPT
Weight	250 lbs. (114 kg)
Dimensions	67"h x 24"w x 20"d (140cm x 61cm x 50cm)

Ordering Information

Description	Model Number
High Flow Nitrogen	N2-45 N2-80 N2-135
Carbon Tower	75344
Filter Maintenance Kit	75478
Installation Kit	IK75880
Preventive Maintenance Agreement	N2-45-PM, N2-80-PM, N2-135-PM
Extended Support with 24 Month Warranty	N2-45-DN2, N2-80-DN2, N2-135-DN2

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