

Low and Mid Flow Nitrogen Generators

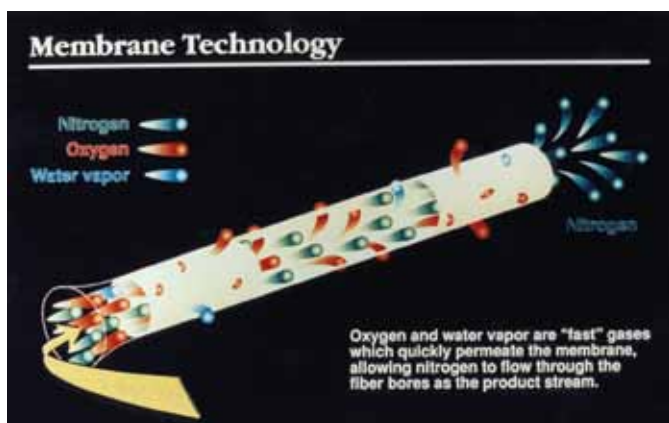
- Recommended and used by all major LC/MS manufacturers
- Eliminates the need for costly, dangerous, inconvenient nitrogen cylinders in the laboratory
- Models N2-04, N2-14, N2-22, N2-35 require no electricity
- Compact design frees up valuable laboratory floor space
- Phthalate-free, no organic vapors
- Unlike PSA technology, membrane will not suppress corona needle discharge.



Model N2-22 Mid Flow Membrane Nitrogen Generator

Parker Balston® Low Flow Nitrogen Generators include models N2-04, N2-14, N2-14A that produce up to 61 SLPM of compressed nitrogen, on-site. The Parker Balston® Mid-Flow Nitrogen Generators include models N2-22, N2-22ANA, N2-35, and N2-35ANA that produce 132 SLPM of compressed nitrogen, on-site. The purity level of the nitrogen stream is defined by the user, for the application, and may range from 95% to 99.5%.

Low Flow Model N2-14ANA and Mid Flow Models N2-22ANA and N2-35ANA Nitrogen Generators include an oxygen analyzer which monitors the oxygen concentration of the nitrogen stream. An audible alarm signals high or low oxygen concentrations. Parker Balston Nitrogen Generators are complete systems engineered



to transform standard compressed air into nitrogen at safe, regulated pressures, on demand, without the need for operator attention. The systems eliminate the need for costly, dangerous dewars and cylinders in the laboratory.

Nitrogen is produced by utilizing a combination of filtration and membrane separation technologies.

A high efficiency prefiltration system pretreats the compressed air to remove all contaminants down to 0.01 micron. Hollow fiber membranes subsequently separate the clean air into a concentrated nitrogen output stream and an oxygen enriched permeate stream, which is vented from the system. The combination of these technologies produces a continuous on demand supply of pure nitrogen.



This Technology Features Advanced HiFluxx Fiber!

Typical applications include: LC/MS, nebulizer gas, chemical and solvent evaporation, instrument purge and supply, evaporative light scattering detector use (ELSD), and sparging.

Nitrogen Purity / Flow Chart

Flow measured in SLPM at indicated Operating Pressure, psig. Flows for Model N2-04 printed in black, flows for Models N2-14 and N2-14A in red.

	145		125		110		100		90		80		70		60	
99.5	-	11	-	10	-	9	-	8	-	7	-	6	-	5	-	4
99	6	18	5	16	5	15	4	13	4	11	3	10	3	8	2	7
98	11	29	10	25	9	25	8	20	7	18	6	16	5	13	4	11
97	15	40	13	34	13	33	10	27	9	25	8	21	7	18	6	15
96	20	50	17	43	16	42	13	34	12	31	10	26	9	22	7	19
95	24	60	21	52	20	51	17	42	15	37	13	32	11	28	9	24

Nitrogen Purity / Flow Chart

Flow measured in SLPM at indicated Operating Pressure, psig. Flows for Model N2-22, N2-22A printed in black, flows for Models N2-35, N2-35A in red.

	145		125		110		100		90		80		70		60	
99.5	19	29	16	25	14	22	13	20	12	18	10	16	9	13	17	11
99	29	44	25	37	22	33	20	30	18	27	15	23	13	20	11	17
98	44	66	38	57	34	51	30	46	27	41	24	36	20	30	17	26
97	59	83	50	74	45	65	40	57	36	52	31	46	26	40	23	35
96	73	109	63	94	56	84	50	75	45	67	39	59	32	50	27	42
95	88	131	177	114	69	102	61	90	55	81	48	71	41	60	35	52

Principal Specifications

Models	N2-04, N2-14, N2-14ANA, N2-22, N2-22ANA, N2-35 and N2-35ANA	
Nitrogen Purity	95.0% - 99.5%	
Atmospheric Dewpoint	-58°F (-50°C)	
Suspended Liquids	None	
Particles > 0.01µm	None	
Commercially Sterile	Yes	
Phthalate-free	Yes	
Hydrocarbon-free	Yes	
Min./Max. Operating Pressure	60/145 psig	
Max. Press. Drop @ 99% N ₂ Purity, 125 psig	10 psig	
Recommended Ambient Operating Temperature	68°F (20°C)	
Max. Inlet Air Temperature	110°F (43°C)	
Inlet/Outlet Ports	1/4" NPT	
Electrical Requirements	N2-04, N2-14, N2-22, N2-35 N2-14ANA, N2-22ANA, N2-35ANA	None 120 VAC/60 Hz/25 Watts
Shipping Weight	N2-04 N2-14 N2-14ANA, N2-22, N2-22ANA N2-35, N2-35ANA	42.5 lbs (19 kg) 75 lbs (34 kg) 80 lbs (36 kg) 90 lbs (41 kg)
Oxygen Analyzer	Included with Model N2-14ANA, N2-22ANA, N2-35ANA	
Dimensions, N2-04	16.1" h x 10.7" w x 13.4" d (40.9cm x 27.2cm x 34cm)	
Dimensions, N2-14, N2-14ANA, N2-22, N2-22ANA, N2-35, N2-35ANA	51.5" h x 18" w x 16.2" d (130.8cm x 45.7cm x 41.1cm)	

Ordering Information for assistance, call 800-343-4048, 8 to 5 Eastern Standard Time

Description	Galvanic Cell	Annual Maintenance Kit	Installation Kit	Preventive Maintenance Plan	Extended Support with 24 Month Warranty
N2-04	N/A	MK7840	IK7572	N2-04 -PM	N2-04-DN2
N2-14	N/A	MK7572C	IK7572	N2-14-PM	N2-14-DN2
N2-14ANA	72695A	MK7572C	IK7572	N2-14A-PM	N2-14A-DN2
N2-22, N2-35	N/A	MK7572C	IK7572	N2-22-PM, N2-35-PM	N2-22-DN2, N2-35-DN2
N2-22ANA, N2-35ANA	72695A	MK7572C	IK7572	N2-22A-PM, N2-35A-PM	N2-22A-DN2, N2-35A-DN2

High Flow Nitrogen Generators

- Recommended and used by all major LC/MS manufacturers
- Eliminates the need for costly, dangerous, inconvenient nitrogen cylinders in the laboratory
- Models N2-45, N2-80, and N2-135 require no electricity
- Compact design frees up valuable laboratory floor space
- Phthalate-free, no organic vapors
- Unlike PSA technology, membrane will not suppress corona needle discharge.

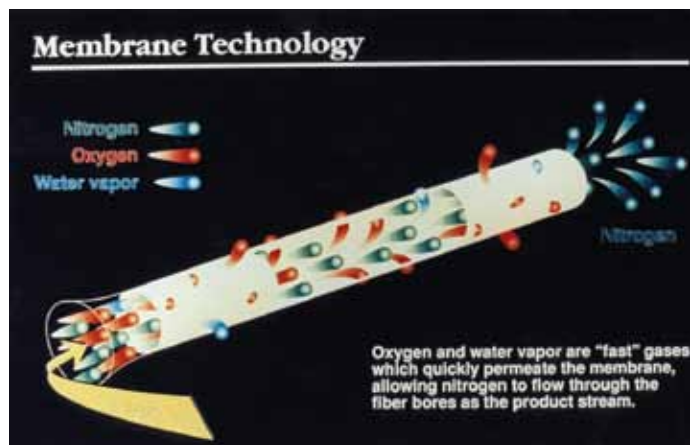


Model N2-135 High Flow Membrane Nitrogen Generator

Parker Balston® High Flow Nitrogen Generators include models N2-45, N2-80, N2-135 that produce up to 467 SLPM of compressed nitrogen, on-site. The purity level of the nitrogen stream is defined by the user, for the application, and may range from 95% to 99.5%.

High Flow Model N2-45ANA, N2-80ANA, and N2 135ANA Nitrogen Generators include an oxygen analyzer which monitors the oxygen concentration of the nitrogen stream. An audible alarm signals high or low oxygen concentrations. Parker Balston Nitrogen Generators are complete systems engineered to transform standard compressed air into nitrogen at safe, regulated pressures, on demand, without the need for operator attention. The systems eliminate the need for costly, dangerous dewars and cylinders in the laboratory.

Nitrogen is produced by utilizing a combination of filtration and membrane separation technologies. A high efficiency prefiltration system pretreats the compressed air to remove all contaminants down to 0.01 micron. Hollow fiber membranes subsequently separate the clean air into a concentrated nitrogen



output stream and an oxygen enriched permeate stream, which is vented from the system. The combination of these technologies produces a continuous on demand supply of pure nitrogen.

Typical applications include: LC/MS, nebulizer gas, chemical and solvent evaporation, instrument purge and supply, evaporative light scattering detector use (ELSD), and sparging.

High Flow Nitrogen Generators

Nitrogen Purity / Flow Chart

Flow LPM (liters per minute), at 68°F (25°C) inlet air temperature and operating pressure, PSIG.

Flows printed in black are for Models N2-45 and N2-45A

Flows printed in red are for Models N2-80 and N2-80A

Flows printed in green are for Models N2-135 and N2-135A

	145			125			110			100			90			80		
99.5	67	100	133	55	83	110	47	71	94	39	59	78	33	50	66	27	41	54
99	92	138	183	74	112	149	63	95	127	53	79	106	44	66	89	35	53	71
98	129	194	258	106	159	212	89	134	179	73	110	147	62	93	124	50	75	101
97	163	244	325	132	198	264	113	169	226	94	141	187	79	119	159	65	97	130
96	200	300	400	160	240	320	137	205	274	114	171	228	97	145	194	80	119	159
95	233	350	467	187	281	374	160	241	321	134	201	268	111	167	222	90	135	180

Principal Specifications

Model	N2-45, N2-80, N2-135, N2-45ANA, N2-80ANA, and N2-135ANA	
Nitrogen Purity	95.0% - 99.5%	
Atmospheric Dewpoint	-58°F (-50°C)	
Suspended Liquids	None	
Particles > 0.01µm	None	
Commercially Sterile	Yes	
Phthalate-free	Yes	
Hydrocarbon-free	Yes	
Min./Max. Operating Pressure	60/145 psig	
Max. Press. Drop @ 99% N ₂ Purity, 125 psig	10 psig	
Recommended Ambient Operating Temperature	72°F (22°C)	
Max. Inlet Air Temperature	110°F (43°C)	
Inlet/Outlet Ports	1/2" NPT	
Electrical Requirements	N2-45, N2-80, N2-135	None
	N2-45ANA, N2-80ANA, N2-135ANA	120 VAC/60 Hz/25 Watts
Shipping Weight	N2-45, N2-80, N2-135	250 lbs (114 kg)
	N2-45ANA, N2-80ANA, N2-135ANA	250 lbs (114 kg)
Oxygen Analyzer	Included with Model N2-45ANA, N2-80ANA, N2-135ANA	
Dimensions	67"h x 24"w x 20"d (140cm x 61cm x 50cm)	

Ordering Information for assistance, call 800-343-4048, 8 to 5 Eastern Time

Description	Galvanic Cell	Carbon Tower	Maintenance Kit	Installation Kit	Preventive Maintenance Plan	Extended Support with 24 Month Warranty
N2-45	N/A	75344	75478	IK75880	N2-45-PM	N2-45-DN2
N2-45ANA	72695A	75344	75478	IK75880	N2-45A-PM	N2-45A-DN2
N2-80	N/A	75344	75478	IK75880	N2-80-PM	N2-80-DN2
N2-80ANA	72695A	75344	75478	IK75880	N2-80A-PM	N2-80A-DN2
N2-135	N/A	75344	75478	IK75880	N2-135-PM	N2-135-DN2
N2-135ANA	72695A	75344	75478	IK75880	N2-135A-PM	N2-135A-DN2

High Flow Nitrogen Generators

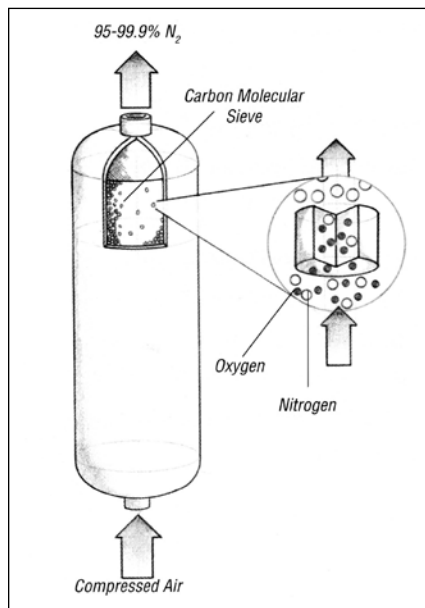
- Lower cost...eliminates the need for costly gas cylinders
- Complete package with prefilters, final filters, and receiving tank
- Compact - frees up valuable floor space
- Eliminates unexpected shutdowns due to a "bad" or empty cylinder
- Hassle-free, easy to install, easy to operate
- Safe and reliable



Parker Balston
Dual Bed Nitrogen Generators

Parker Balston® Monobed Nitrogen Generators produce up to 99.95% pure, compressed nitrogen at dew-points to -70°F (-21°C) from nearly any compressed air supply. The generators are designed to continually transform standard compressed air into nitrogen at safe, regulated pressures without operator attention.

Parker Balston PSA Nitrogen Generators utilize a combination of filtration and pressure swing adsorption technologies. High efficiency prefiltration pretreats the compressed air to remove all contaminants down to 0.1 micron. Air entering the generator consists of 21% oxygen and 78% nitrogen. The gas separation process preferentially adsorbs oxygen over nitrogen using carbon molecular sieve (CMS). At high pressures the CMS has a greater affinity for oxygen, carbon dioxide, and water vapor



than it does at low pressures. By raising and lowering the pressure within the CMS bed, all contaminants are captured and released, leaving the CMS unchanged. This process allows the nitrogen to pass through as a product gas at pres-

sure. The depressurization phase of the CMS releases the absorbed oxygen and other contaminant gases to the atmosphere.

The Parker Balston PSA Nitrogen Generators completely eliminate the inconvenience and the high costs of nitrogen Dewars and cylinders. There is no need to depend on outside vendors for your nitrogen gas supplies. The hassles of changing dangerous, high pressure cylinders, and interruption of gas supplies are completely eliminated. The Balston PSA Nitrogen Generators offer long term cost stability eliminating uncontrollable vendor price increases, contract negotiations, long term commitments, and tank rentals. Once the generator is installed, a continuous nitrogen supply of consistent purity is available within minutes from start-up.

High Flow Nitrogen Generators

Installation consists of simply connecting a standard compressed air line to the inlet and connecting the outlet to a nitrogen line. Plug the electrical cord into a wall outlet, and the unit is ready for trouble-free operation. This system is designed to operate 24 hours per day, 7 days per week.

Once the system is operating, it requires little monitoring. The only maintenance involves changing the coalescing prefilter cartridges and final sterile air filter periodically. The PSA towers do not require any maintenance.

An oxygen monitor to measure the oxygen concentration of the nitrogen stream is available as an option. An audible alarm signals high or low oxygen concentrations (determined by the application). The oxygen analyzer is supplied with alarm relay outputs which may be used to signal a remote alarm, open a backup supply or the process stream, or close the process flow for protection of downstream equipment or processes.

Principal Specifications

Model	AGS200, AGS400	
Nominal Conditions		
Feed Pressure	140 psig	
Temperature	80°F	
Ambient Pressure	1 Atm.	
Compressed Air Specifications		
Maximum Pressure	140 psig	
Temperature Range	60°F - 105°F	
Dewpoint	40°F pressure dewpoint or better	
Residual Oil Content	Trace	
Particles	<.01 micron	
Ambient Conditions		
Temperature	45°F-90°F	
Ambient Pressure	Atmospheric	
Air Quality	Clean air without contaminants	
Dimensions	28.5"L x 32.25"D x 76.25"H	
Weight	AGS200	520 lbs (236 kg)
	AGS400	738 lbs (335 kg)
Inlet	1/2" NPT	
Outlet	1/2" NPT	

Nitrogen Purity Flow Chart

Model	Models AGS200 and AGS400	
	Flow Rate (SCFH)	Flow Rate (SCFH)
	99.9%, 140 psig	99.99%, 140 psig
AGS200	235	47
AGS400	470	94

High Flow Nitrogen Generators

- Lower cost...eliminates the need for costly gas cylinders
- Complete package with prefilters, carbon filter, and membrane filter
- Compact - frees up valuable floor space
- Eliminates unexpected shutdowns due to a “bad” or empty cylinder
- Hassle-free, easy to install, easy to operate
- Safe and reliable
- Expandable modular design



Parker Balston N2-300
Nitrosorce Nitrogen Generator

Parker Balston® High Flow Nitrosorce Nitrogen Generators produce up to 99.5% pure, commercially sterile nitrogen at dewpoints to -58°F (-50°C) from a compressed air supply. All Membrane Nitrogen Generators include a 0.01 micron membrane filter which ensures the nitrogen is completely free of suspended impurities.

Parker Balston High Flow Nitrosorce Nitrogen Generators are one of the most efficient membrane systems available with higher recovery rates and lower operating costs than many other membrane systems.

The generators utilize proprietary membrane separation technology. The membrane divides the air into two separate streams: one is 95%-99.5% pure nitrogen, and the other is oxygen rich with carbon dioxide and other trace gases.

The generator separates air into its component gases by pass-

ing inexpensive, conventional compressed air through bundles of individual hollow fiber, semi-permeable membranes. Each fiber has a perfectly circular cross section and a uniform bore through its center. Because the fibers are so small, a great many can be packed into a limited space, providing an extremely large membrane surface area that can produce a relatively high volume product stream.

Compressed air is introduced to the center of the fibers at one end of the module and contacts the membrane as it flows through the fiber bores. While oxygen, water vapor and other trace gases permeate the membrane fiber and are discharged through a permeate port, the nitrogen is contained within the hollow fiber membrane, and flows through the outlet port of the module.

Water vapor also permeates through the membrane; therefore, the nitrogen product gas is very dry.

Applications

High thru-put LC/MS contract labs
Sample concentrators
Nitrogen supply to analytical lab

Custom Systems Available

Flow rates to 2,265 lpm
Delivery pressures to customer's specifications
Skid mounted systems with compressor, receiving tank and controls are available

High Flow Nitrogen Generators

The Parker Balston Nitrosorce Nitrogen Generators completely eliminate and inconvenient and the high costs of nitrogen Dewars and cylinders. There is no need to depend on outside vendors for nitrogen gas supplies. The hassles of changing dangerous, high pressure cylinders and interruption of gas supplies are completely eliminated. The Balston Systems offer long term cost stability by eliminating uncontrollable vendor price increases, contract negotiation, long term commitments and tank rentals. Once the generator is installed, a continuous nitrogen supply of consistent purity is available within minutes from start-up.

The Parker Balston Nitrosorce Nitrogen Generators are complete systems ready to operate as delivered with carefully matched components engineered for easy installation, operation and long term reliability.

The generators are free-standing and housed in an attractive cabinet. Standard features include: high efficiency coalescing prefilters with automatic drains, an activated carbon filter, and a 0.01 micron membrane final filter. Installation consists of simply connecting a standard compressed air line to the inlet and connecting the outlet to a nitrogen line.

There is no complicated operating procedure to learn or labor intensive monitoring involved. Simply select the purity your process requires, set the flow and pressure, and within minutes high purity, dry nitrogen is available for use!

Once the system is operating, it requires little monitoring. The only maintenance involves changing the coalescing filter cartridges and activated carbon filter periodically. This is a simple ten minute procedure.

All models also include an oxygen monitor which offers LCD read-outs and remote alarm or chart recorder capabilities. An audible alarm signals high or low oxygen concentrations (determined by the application). The oxygen monitor is supplied with alarm relay outputs which may be used to signal a remote alarm, open a backup supply or the process stream, or close the process flow.

Flow Rates (lpm) @ 100 psig, 68°F

Model	99.5%	99%	98%	97%	96%	95%
N2-300	200	311	538	736	935	1133
N2-460	297	467	807	1104	1402	1699
N2-600	396	623	1076	1473	1869	2266

Principal Specifications - Nitrosorce Series

Model	N2-300	N2-460	N2-600
Atmospheric Dewpoint	-58°F (-50°C)	-58°F (-50°C)	-58°F (-50°C)
Commercially Sterile	Yes	Yes	Yes
Particles >0.01 micron	None	None	None
Suspended Liquids	None	None	None
Min/Max Operating Pressure	60 psig/145 psig	60 psig/145 psig	60 psig/145 psig
Max Pressure Drop (at 95% N2, 125 psig)	15 psig	15 psig	15 psig
Operating Temperature	70°F (21°C)	70°F (21°C)	70°F (21°C)
Min/Max Inlet Air Temp.	50°F /104°F (10°F /40°F)	50°F /104°F (10°F /40°F)	50°F /104°F (10°F /40°F)
Recommended Inlet Air Temp.	70°F (21°C)	70°F (21°C)	70°F (21°C)
Electrical Requirements	90-250 VAC 50-60 Hz	90-250 VAC 50-60 Hz	90-250 VAC 50-60 Hz
Dimensions	29"W x 31"D x 76"H (74cm x 51cm x 193cm)	29"W x 42"D x 76"H (74cm x 79cm x 193cm)	29"W x 53"D x 76"H (74cm x 107cm x 193cm)
Shipping Weight	660 lbs. (300 kg)	870 lbs. (395 kg)	1,290 lbs. (586 kg)