

Nitrogen Gas Generator

NITROSource N2-20P - N2-80P

Engineering Data Sheet



Description

The NITROSource PSA range of nitrogen generators operate on the Pressure Swing Adsorption (PSA) principle to produce a continuous stream of nitrogen gas from clean dry compressed air.

Pairs of dual chamber extruded aluminium columns, filled with Carbon Molecular Sieve (CMS), are joined via an upper and lower manifold to produce a two bed system. Whilst one bed is online and removing oxygen from the process air the other is regenerated.

Clean, dry particulate free compressed air enters the bottom of the online bed and flows up through the CMS. Oxygen and other trace gases are preferentially adsorbed by the CMS, allowing nitrogen to pass through. At the end of this adsorption phase the inlet, outlet and exhaust valves close on both beds. The upper and lower equalisation valves open, allowing the pressure to equalise between the beds. This equalisation phase is designed to reduce energy consumption and enhance the overall performance of the generator.

Once equalised the bed entering regeneration is depressurised. The oxygen adsorbed during the adsorption phase is vented to atmosphere via an exhaust valve and silencer. A small proportion of the outlet nitrogen gas is also expanded into this bed to help the desorption of oxygen from the CMS.

The bed entering the adsorption phase is pressurised using a controlled flow of nitrogen gas from the nitrogen buffer vessel (Back Fill) and a controlled flow of clean, dry, particulate free compressed air (Front Fill).

The CMS beds alternate between adsorption and regeneration modes to ensure continuous and uninterrupted nitrogen production.

Technical Specification

Product Selection

NITROSource PSA Performance @ 20 °C (68 °F) Ambient Air Temperature & 7 barg (101.5 psi g) Air inlet pressure															
Model		5 ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.10%	0.40%	0.50%	1%	2%	3%	4%	5%
N2-20P	m3/hr	3.5	4.5	6.7	8.0	9.7	11.1	12.4	16.7	17.7	21.3	25.3	29.8	30.9	33.7
	CFM	2.1	2.6	3.9	4.7	5.7	6.5	7.3	9.8	10.4	12.5	14.9	17.5	18.2	19.8
N2-25P	m3/hr	5.3	6.8	10.1	12.0	14.6	16.7	18.6	25.1	26.6	32.0	38.0	44.7	46.4	50.6
	CFM	3.1	4.0	5.9	7.1	8.6	9.8	10.9	14.8	15.7	18.8	22.4	26.3	27.3	29.8
N2-35P	m3/hr	7.0	9.0	13.4	16.0	19.4	22.2	24.8	33.4	35.4	42.6	50.6	59.6	61.8	67.4
	CFM	4.1	5.3	7.9	9.4	11.4	13.1	14.6	19.7	20.8	25.1	29.8	35.1	36.4	39.7
N2-45P	m3/hr	8.8	11.3	16.8	20.0	24.3	27.8	31.0	41.8	44.3	53.3	63.3	74.5	77.3	84.3
	CFM	5.2	6.7	9.9	11.8	14.3	16.4	18.2	24.6	26.1	31.4	37.3	43.8	45.5	49.6
N2-55P	m3/hr	10.5	13.5	20.1	24.0	29.1	33.3	37.2	50.1	53.1	63.9	75.9	89.4	92.7	101.1
	CFM	6.2	7.9	11.8	14.1	17.1	19.6	21.9	29.5	31.3	37.6	44.7	52.6	54.6	59.5
N2-60P	m3/hr	11.6	15.0	22.3	26.6	32.3	36.9	41.2	55.5	58.9	70.8	84.1	99.1	102.7	112.1
	CFM	6.8	8.8	13.1	15.7	19.0	21.7	24.2	32.7	34.7	41.7	49.5	58.3	60.4	66.0
N2-65P	m3/hr	13.3	17.1	25.5	30.4	36.9	42.2	47.1	63.5	67.3	80.9	96.1	113.2	117.4	128.1
	CFM	7.8	10.1	15.0	17.9	21.7	24.8	27.7	37.4	39.6	47.6	56.6	66.6	69.1	75.4
N2-75P	m3/hr	14.5	18.6	27.7	33.1	40.2	46.0	51.3	69.1	73.3	88.2	104.7	123.4	127.9	139.5
	CFM	8.5	10.9	16.3	19.5	23.7	27.1	30.2	40.7	43.1	51.9	61.6	72.6	75.3	82.1
N2-80P	m3/hr	16.1	20.7	30.8	36.8	44.6	51.1	57.0	76.8	81.4	98.0	116.4	137.1	142.1	155.0
	CFM	9.5	12.2	18.1	21.7	26.3	30.1	33.5	45.2	47.9	57.7	68.5	80.7	83.6	91.2

NITROSource PSA Performance @ 20 °C (68 °F) Ambient Air Temperature & 7 barg (101.5 psi g) Air inlet pressure															
Air : N2 (N2-20 - N2-55)	9.3	7.2	5.1	4.6	4.1	3.7	3.4	2.9	2.8	2.6	2.3	2.2	2.2	2.1	
Air : N2 (N2-60 - N2-65)	9.8	7.6	5.3	4.9	4.3	3.9	3.5	3.0	2.9	2.7	2.5	2.3	2.3	2.2	
Air : N2 (N2-75 - N2-80)	10.1	7.8	5.5	5.0	4.4	4.0	3.7	3.1	3.0	2.8	2.5	2.4	2.4	2.3	
Outlet	Bar g	6.0	6.0	6.0	6.0	5.9	5.9	5.8	5.8	5.7	5.7	5.6	5.5	5.4	5.4
	Psi g	87.0	87.0	87.0	87.0	85.6	85.6	84.1	84.1	82.7	82.7	81.2	79.8	78.3	78.3

Inlet Parameters

Air Quality	ISO 8573-1: 2010 Class 2.2.2 (2.2.1 with high oil vapour content)
Pressure	5 –13 bar g (72.5 - 188.5) psi g
Temperature	5 – 50 °C (41 – 122 °F)
Purity	20.948% (wrt O2) 0.0314% (wrt CO2)

Port Connections

Air Inlet	G1"
N ₂ Outlet to Buffer	G1"
N ₂ Inlet from Buffer	G1/2"
N ₂ Outlet	G1/2"

Electrical Parameters

Generator Supply ⁽¹⁾	100 - 240 +/- 10% Vac 50/60Hz
Generator Power ⁽²⁾	55 W
Fuse ⁽³⁾	3.15 A
Max Dryer Power ⁽⁴⁾	100W

- (1) The generator does not require adjustment when connecting to 115v and 230v electrical supplies.
(2) The power rating specified is for the generator alone and does not take in to account any pre-treatment dryer connected to the dryer supply terminals of the generator.
(3) (Anti Surge (T), 250v, 5 x 20mm HBC, Breaking Capacity 1500A @ 250v, IEC 60127, UL R/C Fuse).
(4) The dryer is fed directly from the generator supply.

Environmental Parameters

Ambient Temperature	5 – 50 °C (41 – 122 °F)
Humidity	50% @ 40°C (80% @ MAX ≤ 31°C)
IP Rating	IP20 / NEMA 1
Pollution Degree	2
Installation Category	II
Altitude	< 2000 m (6562 ft)
Noise	<80 dB (A)

Packed Weights and Dimensions

Model	Height (H)		Width (W)		Depth (D)		Weight	
	mm	ins	mm	ins	mm	ins	Kg	lbs
N2-20P	725.5	28.6	1994	78.5	1090	42.9	398.4	878.3
N2-25P					1260	49.6	495.4	1092.1
N2-35P					1430	56.3	580.4	1279.6
N2-45P					1600	63.0	686.4	1513.3
N2-55P	825.5	32.5	1994	78.5	1770	69.7	782.4	1724.9
N2-60P					1935	76.2	897.4	1978.4
N2-65P	828.5	32.6	1994	78.5	2100	82.7	997.4	2198.9
N2-75P					2275	89.6	1093.4	2410.5
N2-80P					2445	96.3	1186.4	2615.6

Approvals and Compliance

Approvals

Directives

97/23/EC: Pressure Equipment Directive

2004/108/EC: Electromagnetic Compatibility Directive

2006/95/EC: Low Voltage Directive

Safety and Electromagnetic Compatibility Standards

This equipment has been tested and complies with the following European Standards:

EN 61326-1:2013 EMC - Electrical equipment for measurement, control and laboratory use. EMC requirements. (Equipment tested to: Emissions - Light, Immunity - Heavy)

BS EN 61000-3-2:2006+A2:2009 Electromagnetic compatibility (EMC). Limits for harmonic current emissions (equipment input current = 16 A per phase)

BS EN 61000-3-3:2013 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current = 16 A per phase and not subject to conditional connection.

BS EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

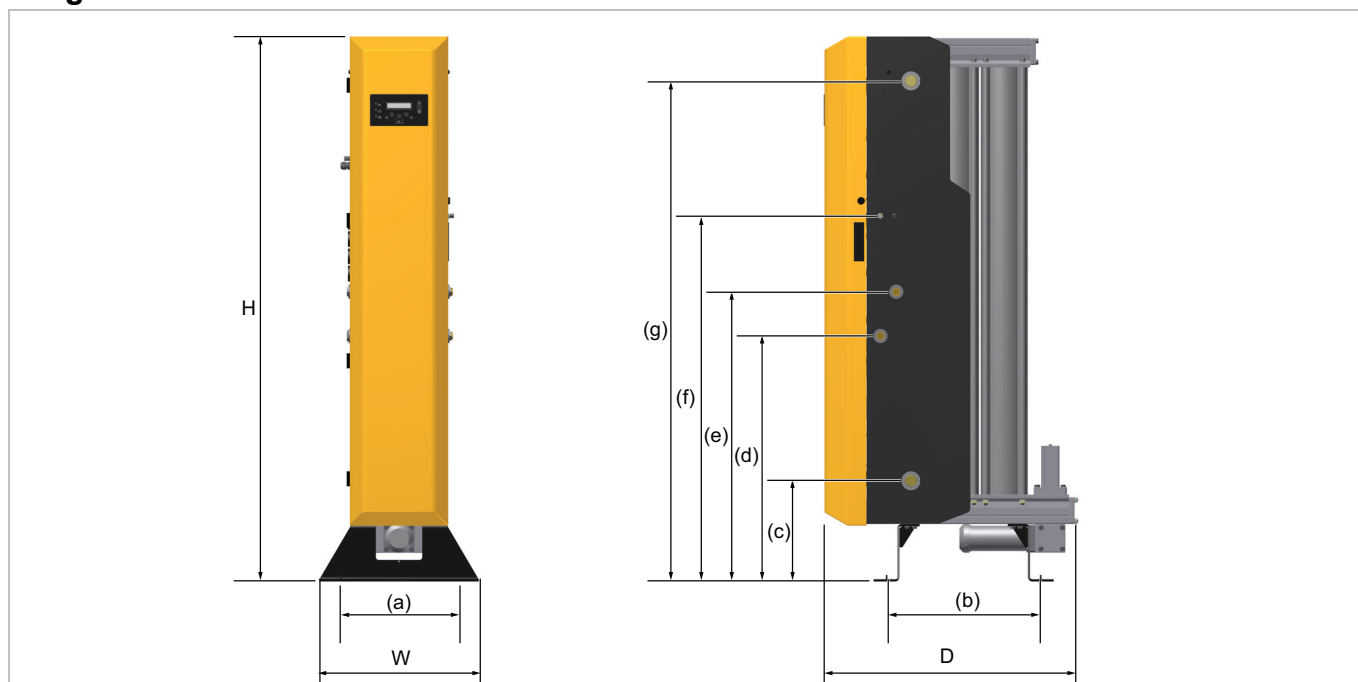
General

Designed generally in accordance with ASME VIII DIVISION 1: EDITION 2010 2011a Addenda

Compliance

This gas generator is compliant with FDA and European Pharmacopeia Regulations for use as a medical gas generator.

Weights and Dimensions



Model	Dimension																				Weight	
	H		W		D		(a)		(b)		(c)		(d)		(e)		(f)		(g)		Kg	lbs
	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins		
N2-20P	1894	74.6	550	21.7	893	35.2	500	19.7	535.5	21.1	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	299	659.2
N2-25P	1894	74.6	550	21.7	1062	41.8	500	19.7	704.5	27.7	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	384	846.6
N2-35P	1894	74.6	550	21.7	1231	48.5	500	19.7	873.5	34.4	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	469	1034.0
N2-45P	1894	74.6	550	21.7	1400	55.1	500	19.7	1042.5	41.0	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	553	1219.2
N2-55P	1894	74.6	550	21.7	1569	61.8	500	19.7	1211.5	47.7	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	638	1406.5
N2-60P	1894	74.6	550	21.7	1738	68.4	500	19.7	1380.5	54.4	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	722	1591.7
N2-65P	1894	74.6	550	21.7	1907	75.1	500	19.7	1549.5	61.0	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	807	1779.1
N2-75P	1894	74.6	550	21.7	2076	81.7	500	19.7	1718.5	67.7	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	892	1966.5
N2-80P	1894	74.6	550	21.7	2245	88.4	500	19.7	1887.5	74.3	350	13.8	853.5	33.6	1007	39.6	1271	50	1739	68.5	976	2151.7

Materials of Construction

Silencer Baffle and End Cap	Aluminium
Columns, Manifolds and Exhaust Manifolds	Aluminium Extrusion EN AW-6063 T6
Manifold and Purge End Plates	Cast Machined EN AW-6082 T6
Inlet, Outlet and Equalisation Valve Plates	Machined EN AC-44100-F
Inlet and Exhaust Cylinders	Aluminium Alloy
Generator Feet	8MM Steel Plate
Dust Filter	Aluminium Housing
Fittings	Nickel Plated Brass and Nickle Plated Mild Steel
Pressure Gauges	Steel casing and dial, brass connector and movement
Adsorbant	Carbon Molecular Sieve (CMS)
Seal Materials	Nitrile, Viton, EPDM, PTFE (tape)
Paint	Epoxy coated