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%
	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
N2-20P	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
	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
N2-25P	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
NO OFF	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
N2-35P	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
NO 45D	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
N2-45P	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
	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
N2-55P	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
	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
N2-60P	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
No ced	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
N2-65P	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
NO 75D	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
N2-75P	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
NO SOD	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
N2-80P	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
Outlet	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"

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)

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,
- (4) The dryer is fed directly from the generator supply.

Packed Weights and Dimensions

	Heig	ht (H)	Wid	th (W)	Den	oth (D)	Weight		
Model	Model mm ins		mm	ins	mm	ins	Kg	lbs	
N2-20P			1994	78.5	1090	42.9	398.4	878.3	
N2-25P	725.5	28.6			1260	49.6	495.4	1092.1	
N2-35P	725.5	20.0			1430	56.3	580.4	1279.6	
N2-45P					1600	63.0	686.4	1513.3	
N2-55P	825.5	32.5			1770	69.7	782.4	1724.9	
N2-60P	020.0				1935	76.2	897.4	1978.4	
N2-65P	828.5	32.6			2100	82.7	997.4	2198.9	
N2-75P	831.5	32.7			2275	89.6	1093.4	2410.5	
N2-80P		32.1			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

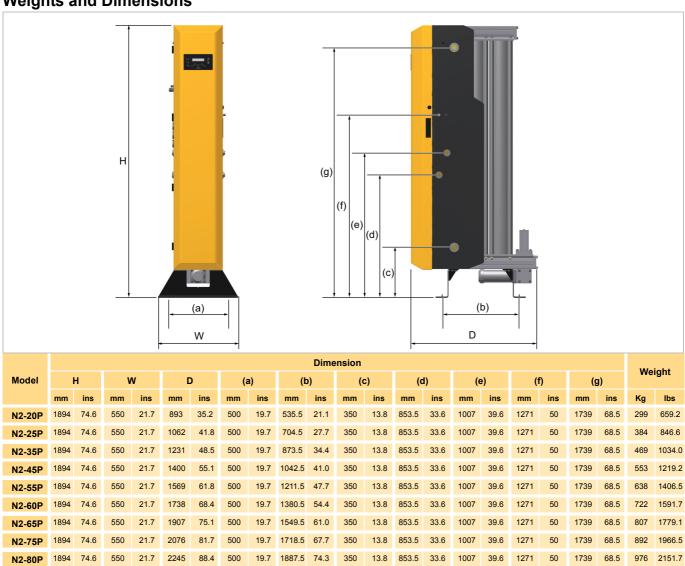
Genera

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



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					