Niagara™ PSA Nitrogen Generators

Reduce Costs, increase Profits!

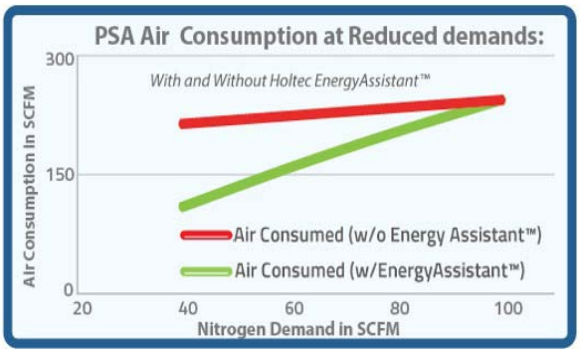
Using an in-house nitrogen generator to supply your nitrogen gas demand is the easiest way to reduce nitrogen related costs, and thus increase profits. The Niagara™ Series of Pressure-Swing Adsorption (PSA) nitrogen generators has been designed to be the most efficient, reliable, and durable nitrogen generator available. With a rich list of features and available HoltecConnect™ communications and troubleshooting portal, Niagara™ is the workhorse of the Pressure-Swing Adsorption world.

Major Features:

- **Industry leading purity options, from 95 - 99.9995% (5% residual O_2 - 5 ppm residual O_2)**
- **Low power consumption - lowest compressed air consumption reduces compressor horsepower, reducing customer electrical costs**
- **Modbus TCP/IP standard for connection to customer controls**
- **HoltecConnect™ and EnergyAssistant™ compatible**
- **New! - Holtec Prevue™ technology allows fast observation of average product purity**
- **Molecular Sieve - "The active ingredient" lasts 10+ years with proper maintenance**
- **Adsorbers designed for 20+ years life**
- **Durable mechanical valves - 2 ½" and below rated for 5 million cycles (10+ years), 3" and above rated for 3 million cycles (6+ years)**
- **O2 analyzer with zirconia sensor - Long sensor life, does not need calibration**
- **Tamper resistant controls and password protected screens**

Energy Assistant™ - Savings tailored to the customer need

A Holtec PSA consumes the least amount of compressed air (and therefore the least amount of electricity). This is because we use only the highest quality, most efficient carbon molecular sieve in our PSAs. The PSA will also detect when you are not using any nitrogen and stop, using no electricity at all.



But what about when you are using something in between? Traditional PSAs systems will consume nearly the same amount of compressed air whenever they are running, regardless of the customer's actual demand.

EnergyAssistant™, built into every Niagara™ PSA, adjusts on the fly so the compressed air demand decreases at a nearly 1:1 rate with your nitrogen usage between 40%-100%. Even below 40% of full capacity you will experience significant energy savings. With EnergyAssistant™, customers whose demands vary will now maximize their energy savings in all usage profiles.

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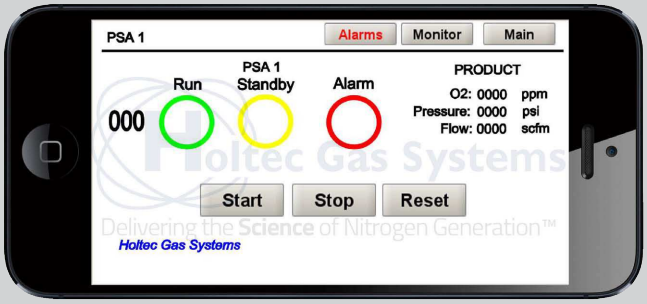
Niagara™ PSA Nitrogen Generators

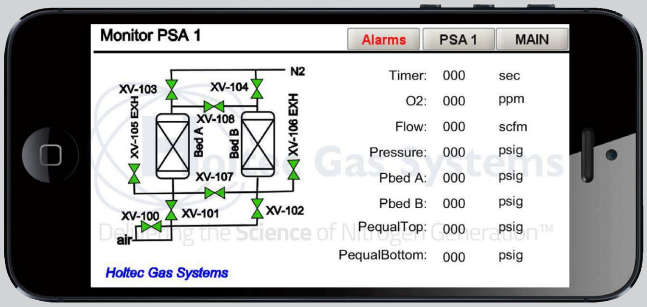
HoltecConnect™ - Remote gateway for monitoring and factory support

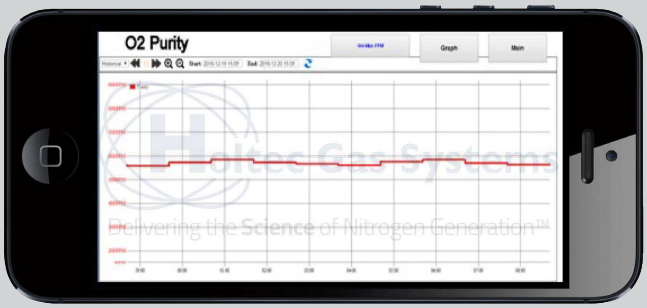
HoltecConnect™, available on any Niagara™ PSA system, allows any user with security clearance to access the nitrogen generator vital statistics through a secure connection from a web browser any where an internet connection is available.

Your authorized Holtec dealer can use this powerful tool to continuously monitor the nitrogen generator for you, averting downtimes and freeing up your manpower to concentrate on your primary business.

Easily disabled for added security, HoltecConnect™ is not just for monitoring. With additional sensors throughout the nitrogen generator, this gateway gives factory personnel the ability to diagnose many issues without the delay and expense of a field visit. Many corrections can be made remotely, and when on-site visits are required, technicians are better able to assess which parts to bring in order to reduce follow up visits.





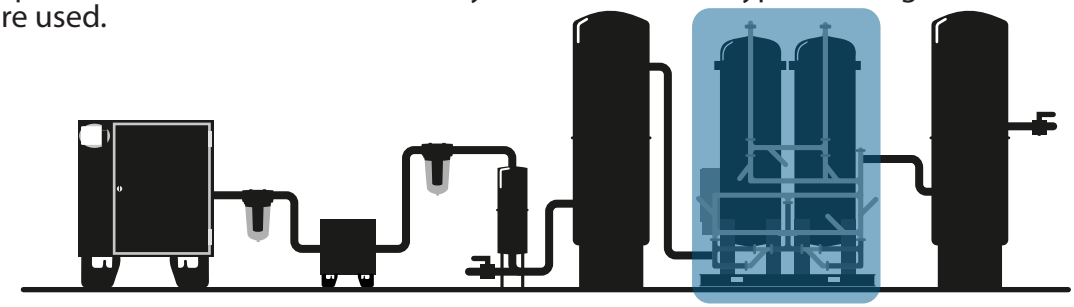


Other Capabilities include:

- Email alerts and warnings
- Text messages directly to mobile phone or tablet (without the need for a cellular modem)
- Real-time display of nitrogen purity, pressure, and flow
- Nitrogen generator START/STOP functionality
- Change process parameters
- View/Graph system performance (real-time and historical)

Niagara™ General Specifications

- 100 - 230V - 1ph - 50/60 Hz- max 120W
- Standard systems for Indoor use only (Outdoor option under sun/rain shelter available with control panel heater).
- Note that a fork lift is typically required at the destination unless otherwise noted. If a crane is needed at the origin or destination for larger systems, this is at the buyer's expense. Some systems are shipped horizontally and partially disassembled; fork lift or crane may be required to re-orient and re-assemble.
- Clean, dry, oil-free compressed air (ISO 8573 Class 1.4.1 or better and an activated carbon adsorber tower must be used if the compressor is not of the oil-free variety). See below for a typical arrangement when lubricated screw compressors are used.



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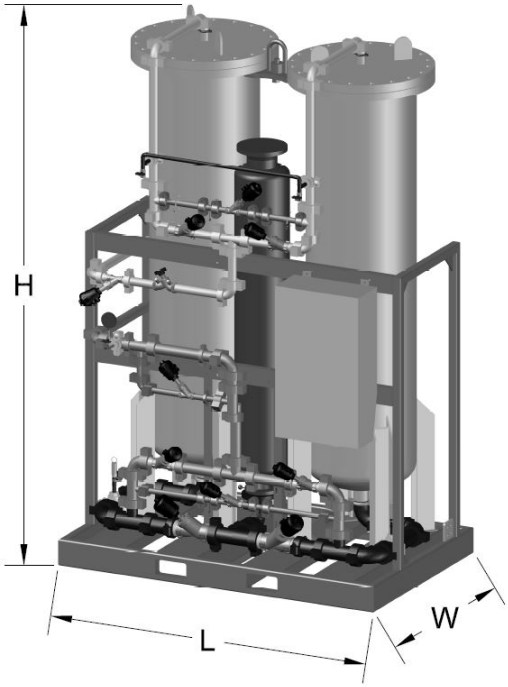
Holtec Gas Systems

Niagara™ PSA Nitrogen Generators

Niagara™ Physical Characteristics *(Dimensions in inches, weight in pounds)*



Model Number	Max N2 pressure (psig)*	Inlet (in.)	Outlet (in.)	L(in.)	W(in.)	H(in.)	Weight (lb.)
HNS-295	125	2	1.5	76	48	110	4,330
HNS-325	125	2	1.5	76	48	117	4,520
HNS-360	125	2	1.5	76	48	126	4,750
HNS-395	125	2	1.5	76	48	135	4,990
HNS-440	125	2	1.5	76	48	146	5,280
HNS-485	110	2	1.5	76	48	119	6,120
HNS-535	110	2	1.5	76	48	128	6,430
HNS-590	110	2	1.5	76	48	137	6,760
HNS-650	110	2	1.5	76	48	147	7,120
HNS-710	110	2	1.5	76	48	148	7,480
HNS-775	110	3	2	95	53	121	8,030
HNS-855	110	3	2	95	53	131	8,510
HNS-935	110	3	2	95	53	139	8,990
HNS-1030	110	3	2	95	53	149	9,550
HNS-1135	110	3	2	95	53	160	10,170
HNS-1250	110	3	2	95	53	173	10,870
HNS-1375	125	4	3	111	60	146	14,090
HNS-1520	125	4	3	111	60	157	15,010
HNS-1670	125	4	3	111	60	169	15,980
HNS-1820	125	4	3	111	60	180	16,910
HNS-2000	105	4	3	120	66	158	17,430
HNS-2220	105	4	3	120	66	170	19,200
HNS-2445	105	4	3	120	66	183	20,540
HNS-2700	105	4	3	120	66	197	22,030
HNS-3000	110	4	3	120	66	213	23,760
HNS-3280	110	6	3	125	76	190	28,620
HNS-3620	110	6	3	125	76	204	30,650
HNS-4000	110	6	3	125	76	220	32,950

Scope of Supply

o ASME VIII Div 1 adsorber vessels filled with Carbon Molecular Sieve

o Relief valves

o Air actuated switching valves

o Pressure gauges

o Control panel with:

- Terminal blocks supplied for power connection (cannot be plugged into wall outlet included unless otherwise stated)
- On/Off power switch
- PLC control with touch-screen interface (HMI)
- Switching for continuous or standby operation (HMI feature)
- Operating hours recorder (displayed on HMI)
- Electrical terminal blocks and wiring
- Solenoid valves (for switching valves)
- N2 pressure sensing transducer for automatic standby operation
- Oxygen analyzer sampling system and oxygen analyzer and sensor

o Manual control valves for setting N2 flow and purity

o Manual isolation valves

o Silencer for waste gas

o Operating and maintenance Manual (digital only, unless otherwise agreed)

o Fittings, Piping, and Tubing

o N2 flow limiting device

o All above equipment to be pre-assembled and pre-tested mounted on a painted steel skid for easy site installation and quick startup

Notes:

** Maximum N2 pressure is the product pressure that is safely achievable, assumes available air pressure 25 psi higher. This will be the maximum allowable continuous working pressure. For specific applications, it is possible to purchase systems which can tolerate higher working pressure and it is also possible to reduce the pressure drop through the nitrogen generator to an amount lower than 25 psi. Please contact the factory for specifics related to your application.*

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Holtec Gas Systems

Niagara™ PSA Nitrogen Generators

Niagara™ *Performance* - 70°F* *(Flows listed in SCFM)*

Model Number	95%	96%	97%	98%	99%	99.5%	99.9%	99.95%	99.99%	99.995%	99.999%
HNS-295	139.9	126.8	116.5	97.4	78.0	68.6	51.0	44.8	33.3	28.9	21.3
HNS-325	153.3	139.0	127.6	106.8	85.5	75.1	55.8	49.1	36.5	31.7	23.3
HNS-360	170.5	154.6	141.9	118.7	95.1	83.6	62.1	54.6	40.6	35.2	25.9
HNS-395	187.7	170.2	156.2	130.7	104.7	92.0	68.4	60.1	44.7	38.8	28.5
HNS-440	208.7	189.2	173.7	145.4	116.4	102.3	76.0	66.9	49.7	43.1	31.7
HNS-485	229.2	207.8	190.8	159.6	127.8	112.3	83.5	73.4	54.6	47.3	34.9
HNS-535	254.3	230.5	211.7	177.1	141.8	124.6	92.6	81.5	60.6	52.5	38.7
HNS-590	279.4	253.3	232.6	194.6	155.8	136.9	101.7	89.5	66.5	57.7	42.5
HNS-650	307.2	278.5	255.8	214.0	171.4	150.6	111.9	98.5	73.2	63.5	46.7
HNS-710	335.1	303.8	279.0	233.4	186.9	164.2	122.0	107.4	79.8	69.2	51.0
HNS-775	367.0	332.7	305.5	255.6	204.7	179.9	133.7	117.6	87.4	75.8	55.8
HNS-855	406.7	368.7	338.6	283.3	226.9	199.3	148.1	130.3	96.9	84.0	61.9
HNS-935	446.4	404.7	371.6	310.9	249.0	218.8	162.6	143.1	106.3	92.2	67.9
HNS-1030	490.5	444.7	408.4	341.6	273.6	240.4	178.7	157.2	116.8	101.3	74.6
HNS-1135	539.1	488.7	448.8	375.4	300.7	264.2	196.3	172.8	128.4	111.3	82.0
HNS-1250	596.4	540.7	496.5	415.4	332.7	292.3	217.2	191.1	142.1	123.2	90.7
HNS-1375	652.0	591.2	542.8	454.1	363.7	319.6	237.5	209.0	155.3	134.7	99.2
HNS-1520	721.5	654.2	600.7	502.5	402.5	353.7	262.8	231.2	171.9	149.0	109.7
HNS-1670	797.3	722.9	663.8	555.3	444.8	390.8	290.4	255.5	189.9	164.7	121.3
HNS-1820	866.8	785.9	721.6	603.7	483.5	424.9	315.7	277.8	206.5	179.0	131.8
HNS-2000	952.3	863.4	792.8	663.3	531.2	466.8	346.8	305.2	226.8	196.7	144.8
HNS-2220	1056.3	957.7	879.4	735.7	589.2	517.7	384.7	338.5	251.6	218.2	160.6
HNS-2445	1169.0	1059.9	973.2	814.2	652.1	573.0	425.8	374.7	278.4	241.4	177.8
HNS-2700	1290.4	1169.9	1074.2	898.7	719.8	632.5	470.0	413.6	307.3	266.5	196.2
HNS-3000	1430.0	1296.4	1190.4	995.9	797.7	700.9	520.8	458.3	340.6	295.3	217.5
HNS-3280	1565.2	1419.1	1303.0	1090.1	873.1	767.2	570.1	501.6	372.8	323.3	238.0
HNS-3620	1723.0	1562.1	1434.4	1200.0	961.1	844.5	627.5	552.2	410.4	355.9	262.0
HNS-4000	1903.3	1725.6	1584.5	1325.6	1061.7	932.9	693.2	610.0	453.3	393.1	289.5
Air Factor	1.845	1.919	2.014	2.147	2.376	2.605	3.136	3.400	4.164	4.544	5.566

**Performance and air factor listed is for ambient temperature 70° F and inlet pressure 110 psig. Please consult Holtec for performance at other conditions. Air factor listed may vary by ±5%.*

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Niagara™ PSA Nitrogen Generators

Niagara™ Performance - 95 °F* *(Flows listed in SCFM)*

Model Number	95%	96%	97%	98%	99%	99.5%	99.9%	99.95%	99.99%	99.995%	99.999%
HNS-295	131.7	121.4	108.1	92.7	74.6	63.8	46.7	40.8	29.9	26.1	19.1
HNS-325	144.3	133.0	118.4	101.6	81.7	69.9	51.2	44.7	32.7	28.6	20.9
HNS-360	160.5	147.9	131.7	113.0	90.9	77.7	56.9	49.7	36.4	31.8	23.3
HNS-395	176.7	162.8	144.9	124.4	100.1	85.6	62.6	54.8	40.1	35.0	25.6
HNS-440	196.5	181.1	161.2	138.3	111.3	95.2	69.6	60.9	44.6	39.0	28.5
HNS-485	215.8	198.8	177.0	151.9	122.2	104.5	76.5	66.9	48.9	42.8	31.3
HNS-535	239.4	220.6	196.4	168.5	135.5	115.9	84.9	74.2	54.3	47.5	34.7
HNS-590	263.0	242.4	215.7	185.2	148.9	127.4	93.2	81.5	59.6	52.1	38.2
HNS-650	289.2	266.5	237.3	203.6	163.8	140.1	102.5	89.6	65.6	57.3	42.0
HNS-710	315.5	290.7	258.8	222.1	178.6	152.8	111.8	97.8	71.6	62.5	45.8
HNS-775	345.5	318.4	283.4	243.3	195.6	167.3	122.5	107.1	78.4	68.5	50.1
HNS-855	382.9	352.8	314.1	269.6	216.8	185.5	135.7	118.7	86.8	75.9	55.6
HNS-935	420.3	387.3	344.8	295.9	238.0	203.6	149.0	130.2	95.3	83.3	61.0
HNS-1030	461.8	425.6	378.8	325.1	261.5	223.7	163.7	143.1	104.7	91.6	67.0
HNS-1135	507.5	467.7	416.3	357.3	287.4	245.8	179.9	157.3	115.1	100.6	73.6
HNS-1250	561.5	517.4	460.6	395.3	317.9	272.0	199.0	174.0	127.3	111.3	81.5
HNS-1375	613.9	565.7	503.6	432.2	347.6	297.3	217.6	190.2	139.2	121.7	89.1
HNS-1520	679.3	626.0	557.3	478.3	384.7	329.0	240.8	210.5	154.1	134.7	98.6
HNS-1670	750.6	691.7	615.8	528.5	425.1	363.6	266.1	232.6	170.2	148.8	108.9
HNS-1820	816.1	752.0	669.5	574.6	462.1	395.3	289.3	252.9	185.1	161.8	118.4
HNS-2000	896.5	826.2	735.5	631.2	507.7	434.3	317.8	277.8	203.3	177.8	130.1
HNS-2220	994.5	916.4	815.8	700.2	563.1	481.7	352.5	308.2	225.5	197.2	144.3
HNS-2445	1100.5	1014.2	902.8	774.9	623.2	533.1	390.1	341.1	249.6	218.2	159.7
HNS-2700	1214.8	1119.5	996.6	855.3	687.9	588.4	430.6	376.5	275.5	240.9	176.3
HNS-3000	1346.2	1240.6	1104.4	947.8	762.3	652.1	477.2	417.2	305.3	266.9	195.3
HNS-3280	1473.5	1357.9	1208.8	1037.5	834.4	713.7	522.4	456.6	334.2	292.2	213.8
HNS-3620	1622.1	1494.8	1330.7	1142.1	918.5	785.7	575.0	502.7	367.9	321.6	235.4
HNS-4000	1791.9	1651.2	1470.0	1261.6	1014.7	867.9	635.2	555.3	406.4	355.3	260.0
Air Factor	2.003	2.085	2.191	2.340	2.594	2.848	3.439	3.778	4.709	5.179	6.456

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