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BUILDING THE FUTURE

hertz® KOMPRESSOREN

HNG NITROGEN GENERATOR

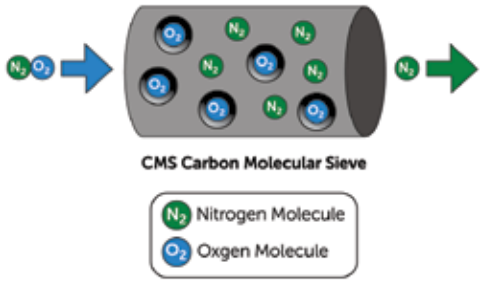
> HNG SERIES

(Capacity 0,2Nm³/h – 2500Nm³/h; Purity 95 % - 99,999 %)

> HOW IT WORKS ?

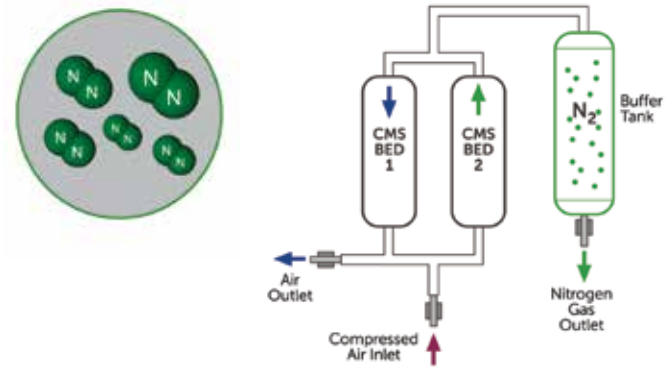
Pressure Swing Adsorption (PSA) type Nitrogen Generation system is used to separate and enrich Nitrogen from Oxygen employs CMS (Carbon Molecular Sieve) for adsorbent. Carbon Molecular Sieve (CMS) adsorbs Oxygen and Water Vapor molecules under certain pressure - while allowing Nitrogen to pass through.

The nitrogen molecules (4.3 Angstrom in size) passes through the column, but the oxygen molecules (3.9 Angstrom in size) are adsorbed on the carbon molecular sieve (4 Angstrom opening).



> THE NITROGEN GENERATOR IS A TWO-BED ADSORBER SYSTEM

The Nitrogen Generator consists of two adsorber vessels filled with CMS, a valve assembly, air filters, main pressure regulator, and a product receiver tank. Clean and dry air is directed to one of the adsorber beds where oxygen and water vapor is adsorbed faster than nitrogen in the pore structure of the CMS, thus increasing the nitrogen purity of the product gas stream to the desired level (95 – 99.999 % as required by customer). This product flows out of the top of the adsorber bed, through the valve, and into the product receiver at a pressures lightly below the feed air pressure.



> THE CYCLE IS COMPOSED OF FOLLOWING STEPS

PSA PROCESS

A. Pressurization Step:
Process to increase adsorption pressure in adsorption tower under selected operation condition.

B. Adsorption Step:
Nitrogen gas is generated under constant pressure.

C. Blow Down Step:
Restoring in the adsorption tower.

D. Purge Step:
Stage to restore the adsorption tower completely.

E. Pressure Equalization Step:
Stage in where loss can be reduced by using a part of energy to be lost.

> APPLICATIONS

METAL INDUSTRY

- Annealing of ferrous and non-ferrous metal (Inert circumstance)
- Metallurgical heat treatment (Carbonizing)
- Soldering / Brazing
- Plasma sheet metal cutters
- Inert gas in welding process
- Sintering of metal powder

CHEMICAL INDUSTRY

- Transportation of raw material in storage tank
- Container ventilation and prevention of explosion in reaction tank
- Sealing of nitrogen in storage tank
- Cleaning tank and container
- Pressure testing of pipe

PRODUCTION PROCESS AND STORAGE OF FOOD

- Storage of low oxygen CA or super low oxygen
- Charge of nitrogen gas in packing and transportation of coffee, snack or dry nut

PURGE

- Diluting or transposing gas or vapor to eliminate dangerous gas and oxidized substance

PLASTIC

- Ejecting high pressure gas (Sustaining vacuum, shortening cooling time in Ejection)
- Suppressing gas generation in ejection

CHARGE NITROGEN GAS IN TIRE

- Reducing noise reduction, improving fuel efficiency, reducing tire unbalance and improving driving comport

> FEATURES

Hertz Provides Necessary Nitrogen Buffer Tank As Standard!

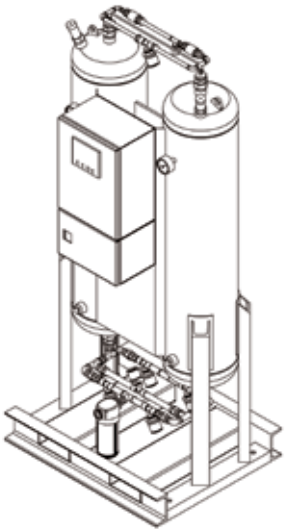
- Simple structure, compact design, full automated operation
- **7/24** Nitrogen production in your own place
- **Touch Screen PLC** for controlling the complete system
- PLC Screen for Monitoring and visualization the progress
- Rapid start-up
- Safety system
- Due to well design of silencer, low noise levels during depressurization and purge
- Durable piston valves for **long-life** operation
- On demand production, **low cost**
- High performance. Design the purity and capacity of nitrogen gas meeting to customer's requirements.

(Nitrogen Purity 95 %~99.999 % is available)

- Minimum maintenance cost replace filter element periodically only and get normal service for the compressor

OPTIONAL

- Oxygen Analyzer
- Flow Meter
- Dew Point Sensor
- Nitrogen purity can be seen on screen



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Reference Conditions

Inlet Compressed Air Pressure	Outlet Nitrogen Pressure	Ambient Temperature	Inlet air dewpoint	
			3 °C (under 99.5 % purity)	-40 °C (above 99.5 % purity)
7,5 Bar (g)	6 Bar (g)	25 °C	Refrigerant air dryer and activated carbon filter is required	Desiccant air dryer and activated carbon filter is required

SPECIFICATIONS

MODEL	Free Nitrogen Delivery @ following purity level (Nm^3/h)									
	95%	97%	98%	99%	99.5%	99.90%	99.95%	99.99%	99.999%	
HNG 10	2,7	2,2	1,9	1,5	1	0,8	0,7	0,5	0,2	Modular
HNG 20	4,4	3,5	3,1	2,4	2	1,3	1,1	0,8	0,4	
HNG 35	8,1	6,5	5,6	4,4	3,5	2,3	2,0	1,4	0,7	
HNG 60	13,5	10,8	9,4	7,3	6	3,8	3,4	2,4	1,2	
HNG 95	21,2	17,0	14,8	11,5	9,5	6,0	5,3	3,7	1,9	Twin Tower
HNG 120	28,2	22,5	19,6	15,3	12	8,0	7,1	5,0	2,5	
HNG 150	35,1	28,1	24,4	19,0	15	10,0	8,8	6,2	3,1	
HNG 250	57,0	45,5	39,6	30,8	25	16,2	14,3	10,0	5,0	
HNG 330	75,1	60,0	52,2	40,6	33	21,4	19,0	13,2	6,6	
HNG 450	101,4	81,0	70,5	54,9	45	28,9	25,5	17,8	8,9	
HNG 510	114,4	91,4	79,6	62,0	51	32,6	28,8	20,1	10,0	
HNG 570	128,1	102,4	89,1	69,3	57	36,5	32,2	22,5	11,2	
HNG 730	163,8	130,9	114,0	88,7	73	46,6	41,2	28,8	14,4	
HNG 910	204,1	163,1	142,0	110,5	91	58,1	51,4	36,0	18,0	
HNG 1110	248,2	198,3	172,6	134,3	111	70,7	62,5	43,6	21,8	
HNG 1230	275,7	220,3	191,8	149,2	123	78,5	69,4	48,4	24,2	
HNG 1370	307,5	245,6	213,8	166,4	137	87,5	77,4	54,0	27,0	
HNG 1820	406,6	324,8	282,8	220,1	182	115,7	102,3	71,4	35,7	
HNG 2050	458,5	366,3	318,9	248,2	205	130,5	115,4	80,5	40,2	
HNG 2950	660,6	527,8	459,5	357,6	295	188,0	166,3	116,0	58,0	
HNG 3540	792,0	632,8	550,9	428,7	354	225,4	199,4	139,1	69,5	
HNG 4160	931,0	743,7	647,4	503,8	416	265,0	234,3	163,5	81,7	
HNG 5560	1241,7	992,0	863,6	672,1	556,0	353,4	312,5	218,1	109,0	
HNG 9170	2048,0	1636,1	1424,3	1108,4	917,0	582,9	515,5	359,7	179,7	
HNG 11200	2501,2	1998,3	1740,0	1353,8	1120,0	712,0	629,6	439,4	219,4	

SPECIFICATIONS

MODEL	Buffer Tank (L)	Connections		Dimensions mm			Weight kg
		Air Inlet	Nitrogen Outlet	Length	Width	Height	
HNG 10	20	1/4"	1/4"	350	370	1108	40
HNG 20	30	1/4"	1/4"	495	410	1250	67
HNG 35	50	1/4"	1/4"	495	410	1750	86
HNG 60	80	1/4"	1/4"	622	430	1450	124
HNG 95	120	1/4"	1/4"	760	772	1580	184
HNG 120	150	3/8"	1/4"	690	900	1558	228
HNG 150	190	3/8"	1/4"	698	900	1759	313
HNG 250	310	3/4"	1/4"	680	960	2216	491
HNG 330	410	3/4"	1/4"	857	1016	2277	692
HNG 450	550	3/4"	3/8"	1010	1075	2386	677
HNG 510	630	1"	3/8"	1100	1294	2413	912
HNG 570	700	1"	3/8"	1010	1300	2547	951
HNG 730	900	1 1/4"	1/2"	1110	1513	2479	1091
HNG 910	1200	1 1/4"	1/2"	1110	1460	2793	1395
HNG 1110	1360	1 1/4"	3/4"	1252	1533	2831	1704
HNG 1230	1510	1 1/4"	3/4"	1212	1653	3054	2031
HNG 1370	1680	1 1/2"	3/4"	1210	1653	3268	2096
HNG 1820	2300	2"	1"	1535	1905	2910	2686
HNG 2050	2300	2"	1"	1693	2114	3328	3009
HNG 2950	2300	21/2"	1 1/4"	1795	2518	3047	3065
HNG 3540	2300	21/2"	1 1/4"	1795	2518	3341	3214
HNG 4160	2300	21/2"	1 1/4"	1875	2583	3747	3466
HNG 5560	2300	DN80	1 1/4"	1754	2105	4080	4144
HNG 9170	2300	DN100	1 1/4"	1904	2285	4428	5298
HNG 11200	2300	DN125	1 1/4"	1968	2361	4576	5846

Note: Hertz supplies buffer tank volumes for 99,5 % and higher Nitrogen purities. For purities lower than 99,5 %, it may be necessary to use additional tank. "Hertz reserves the right to change the design and /or dimensions and /or weight of his products at any time without any notice or liability."

CORRECTION FACTOR

CMS Temperature (°C)	Correction Factor (Kt)
5	0.85
10	1
15	1
20	1
25	1
30	0.91
35	0.82
40	0.74
45	0.6

Inlet Pressure (Barg)	Correction Factor (Kp)
6	0.82
6.5	0.88
7	0.94
7.5	1
8	1.05
8.5	1.1
9	1.14
9.5	1.2
10	1.21

Purity (%)	Air / Nitrogen Ratio
95	2.30
97	2.56
98	2.68
99	3.01
99.5	3.34
99.9	4.46
99.95	4.56
99.99	5.75
99.999	9.38

EXAMPLE:

If nitrogen requirement of the plant is 20 Nm^3/h at 99,5 % purity while air pressure is 7 barg and ambient temperature is 40 °C,

Calculation of HNG model as follows: For 40 °C ambient, Kt = 0,74
For 7 barg inlet, Kp = 0,94

HNG Model Flow = (Required N2 Flow) / (Kt x Kp) = (20Nm^3/h) / (0,74 x 0,94) = 28,7 Nm^3/h

Therefore the correct N2 Generator will be **HNG-330**

For required air flow to Nitrogen generator is; Air / Nitrogen Ratio = 3,34 (99,5 % purity)
Air flow = 28,7Nm^3/h x 3,34 =95,85 Nm^3/h

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