

## ▶ PSA NITROGEN GENERATOR

Pressure Swing Adsorption (PSA) type Nitrogen Generation system that 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 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 from the top of the adsorber bed, through the valve and into the product receiver at a pressure slightly below the feed air pressure.



### Applications

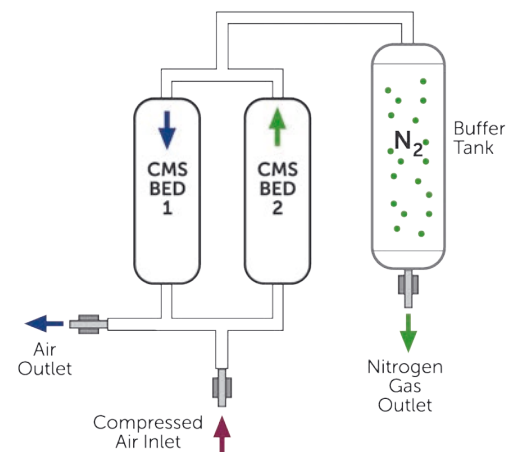
- Metal industry
- Chemical industry
- Purge
- Plastic industry
- Charge nitrogen gas in tires
- Production process and storage of food

### Optional

- Dew Point Sensor (pic.3 see next page)

### Standard

- Oxygen Analyzer / Nitrogen purity sensor
- Flow Meter
- Activated Carbon Tower
- Compressed air filters (P grade) after carbon tower and after buffer tank
- Nitrogen Generator / Silencer
- Basic Logo or Crouzet mini PLC for modular type
- Siemens HMI color touch screen PLC for twin towers
- Buffer Tank

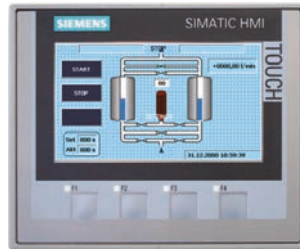


### Features

- Simple structure, compact design, full automated operation
- Replaces manifold usage (see pic .1)
- Touch Screen PLC for controlling the complete system (see pic. 2)
- PLC Screen for monitoring and visualizing the progress
- Rapid start-up and safety system
- Superior silencer design gives low noise levels during depressurization and purge (see pic. 4)
- Durable piston valves for long-life operation (see pic. 5)
- On demand production, low cost
- High performance
  - \*The purity and capacity of nitrogen gas is designed to meet customer requirements (Nitrogen Purity 95%~99.999% is available)
- Minimum maintenance cost.
  - \*Replace filter element periodically only and service your compressor as normal



Replaces Manifold Usage - Pic. 1



Touch Screen PLC - Pic. 2



Dew Point Sensor - Pic. 3



Pic. 4



Long Life Piston Valve - Pic. 5



Air Filter

### Technical Specifications

| Model     | Air Demand @ Following Purity Level (m <sup>3</sup> /h) |        |        |        |        |        |        |        |         |            |
|-----------|---|--------|--------|--------|--------|--------|--------|--------|---------|------------|
|           | 95%   | 97%    | 98%    | 99%    | 99.50% | 99.90% | 99.95% | 99.99% | 99.999% |            |
| DNG-10    | 6,3   | 5,6    | 5,1    | 4,5    | 4,1    | 3,5    | 3,1    | 2,8    | 2,2     | Modular    |
| DNG-20    | 10,1  | 9,0    | 8,2    | 7,2    | 7,0    | 5,6    | 5,1    | 4,4    | 3,6     |            |
| DNG-35    | 18,6  | 16,6   | 15,1   | 13,2   | 12,1   | 10,3   | 9,3    | 8,2    | 6,7     |            |
| DNG-60    | 31,0  | 27,6   | 25,1   | 22,0   | 20,2   | 17,1   | 15,5   | 13,6   | 11,1    |            |
| DNG-95    | 53,4  | 47,6   | 43,3   | 37,9   | 34,7   | 29,5   | 26,7   | 23,5   | 19,1    |            |
| DNG-120   | 71,3  | 63,6   | 57,8   | 50,6   | 46,4   | 39,4   | 35,6   | 31,4   | 25,5    |            |
| DNG-150   | 87,2  | 77,8   | 70,7   | 62,0   | 56,8   | 48,2   | 43,6   | 38,4   | 31,3    |            |
| DNG-250   | 138,8   | 123,8  | 112,5  | 98,6   | 90,3   | 76,7   | 69,4   | 61,1   | 49,7    |            |
| DNG-330   | 183,7   | 163,8  | 148,9  | 130,5  | 119,5  | 101,5  | 91,8   | 80,8   | 65,8    |            |
| DNG-450   | 248,2   | 221,4  | 201,2  | 176,3  | 161,5  | 137,2  | 124,1  | 109,2  | 89,0    |            |
| DNG-510   | 284,3   | 253,6  | 230,5  | 202,0  | 185,0  | 157,1  | 142,1  | 125,1  | 101,9   | Twin Tower |
| DNG-570   | 315,8   | 281,6  | 256,0  | 224,3  | 205,5  | 174,5  | 157,8  | 139,0  | 113,2   |            |
| DNG-730   | 413,3   | 368,6  | 335,1  | 293,6  | 268,9  | 228,4  | 206,6  | 181,9  | 148,2   |            |
| DNG-910   | 505,6   | 450,9  | 409,9  | 359,1  | 329,0  | 279,4  | 252,7  | 222,5  | 181,2   |            |
| DNG-1110  | 614,6   | 548,2  | 498,3  | 436,6  | 399,9  | 339,7  | 307,2  | 270,5  | 220,3   |            |
| DNG-1230  | 678,0   | 604,7  | 549,7  | 481,6  | 441,2  | 374,7  | 338,9  | 298,4  | 243,1   |            |
| DNG-1370  | 751,3   | 670,1  | 609,1  | 533,7  | 488,9  | 415,2  | 375,5  | 330,6  | 269,3   |            |
| DNG-1820  | 1015,8  | 906,0  | 823,5  | 721,6  | 661,0  | 561,3  | 507,8  | 447,0  | 364,2   |            |
| DNG-2050  | 1185,0  | 1056,5 | 960,3  | 841,5  | 770,8  | 654,6  | 592,1  | 521,3  | 424,7   |            |
| DNG-2550  | 1420,1  | 1266,6 | 1151,3 | 1008,8 | 924,1  | 784,8  | 709,8  | 625,0  | 509,1   |            |
| DNG-2950  | 1751,6  | 1562,3 | 1420,0 | 1244,3 | 1139,8 | 968,0  | 875,6  | 770,9  | 627,9   |            |
| DNG-3540  | 2052,8  | 1830,9 | 1664,2 | 1458,2 | 1335,8 | 1134,4 | 1026,1 | 903,4  | 735,9   |            |
| DNG-4160  | 2367,2  | 2111,2 | 1919,0 | 1681,5 | 1540,3 | 1308,1 | 1183,2 | 1041,7 | 848,6   |            |
| DNG-5560  | 2849,7  | 2541,5 | 2310,1 | 2024,4 | 1854,0 | 1610,0 | 1424,2 | 1253,9 | 1022,2  |            |
| DNG-9170  | 4700,2  | 4191,7 | 3810,0 | 3338,5 | 3057,0 | 2655,5 | 2349,4 | 2068,1 | 1685,2  |            |
| DNG-11200 | 5740,3  | 5119,6 | 4654,5 | 4077,6 | 3734,0 | 3243,6 | 2869,4 | 2526,3 | 2057,5  |            |

### Technical Specifications

| Model     | Free Nitrogen Delivery @ Following Purity Level (m³/h) |        |        |        |        |        |        |        |         |            |
|-----------|--|--------|--------|--------|--------|--------|--------|--------|---------|------------|
|           | 95%  | 97%    | 98%    | 99%    | 99.50% | 99.90% | 99.95% | 99.99% | 99.999% |            |
| DNG-10    | 2,7  | 2,2    | 1,9    | 1,5    | 1      | 0,8    | 0,7    | 0,5    | 0,2     | Modular    |
| DNG-20    | 4,4  | 3,5    | 3,1    | 2,4    | 2      | 1,3    | 1,1    | 0,8    | 0,4     |            |
| DNG-35    | 8,1  | 6,5    | 5,6    | 4,4    | 3,5    | 2,3    | 2,0    | 1,4    | 0,7     |            |
| DNG-60    | 13,5   | 10,8   | 9,4    | 7,3    | 6      | 3,8    | 3,4    | 2,4    | 1,2     |            |
| DNG-95    | 23,3   | 18,6   | 16,2   | 12,6   | 10,4   | 6,6    | 5,9    | 4,1    | 2,0     |            |
| DNG-120   | 31,0   | 24,8   | 21,6   | 16,8   | 13,9   | 8,8    | 7,8    | 5,5    | 2,7     | Twin Tower |
| DNG-150   | 38,0   | 30,4   | 26,4   | 20,6   | 17,0   | 10,8   | 9,6    | 6,7    | 3,3     |            |
| DNG-250   | 60,5   | 48,3   | 42,1   | 32,7   | 27,1   | 17,2   | 15,2   | 10,6   | 5,3     |            |
| DNG-330   | 80,0   | 63,9   | 55,7   | 43,3   | 35,8   | 22,8   | 20,1   | 14,1   | 7,0     |            |
| DNG-450   | 108,2  | 86,4   | 75,2   | 58,5   | 48,4   | 30,8   | 27,2   | 19,0   | 9,5     |            |
| DNG-510   | 123,9  | 99,0   | 86,2   | 67,1   | 55,5   | 35,3   | 31,2   | 21,8   | 10,9    |            |
| DNG-570   | 137,6  | 109,9  | 95,7   | 74,5   | 61,6   | 39,2   | 34,6   | 24,2   | 12,1    |            |
| DNG-730   | 180,1  | 143,9  | 125,3  | 97,5   | 80,6   | 51,3   | 45,3   | 31,6   | 15,8    |            |
| DNG-910   | 220,3  | 176,0  | 153,2  | 119,2  | 98,6   | 62,7   | 55,5   | 38,7   | 19,3    |            |
| DNG-1110  | 267,8  | 214,0  | 186,3  | 145,0  | 119,9  | 76,2   | 67,4   | 47,0   | 23,5    |            |
| DNG-1230  | 295,4  | 236,0  | 205,5  | 159,9  | 132,3  | 84,1   | 74,4   | 51,9   | 25,9    |            |
| DNG-1370  | 327,4  | 261,5  | 227,7  | 177,2  | 146,6  | 93,2   | 82,4   | 57,5   | 28,7    |            |
| DNG-1820  | 442,6  | 353,6  | 307,9  | 239,6  | 198,2  | 126,0  | 111,4  | 77,8   | 38,8    |            |
| DNG-2050  | 516,2  | 412,4  | 359,0  | 279,4  | 231,1  | 146,9  | 130,0  | 90,7   | 45,3    |            |
| DNG-2550  | 618,8  | 494,4  | 430,4  | 334,9  | 277,1  | 176,1  | 155,8  | 108,7  | 54,3    |            |
| DNG-2950  | 763,2  | 609,8  | 530,9  | 413,1  | 341,8  | 217,2  | 192,1  | 134,1  | 67,0    |            |
| DNG-3540  | 894,5  | 714,6  | 622,1  | 484,1  | 400,5  | 254,6  | 225,1  | 157,1  | 78,5    |            |
| DNG-4160  | 1031,4   | 824,1  | 717,4  | 558,3  | 461,9  | 293,6  | 259,6  | 181,2  | 90,5    |            |
| DNG-5560  | 1241,7   | 992,0  | 863,6  | 672,1  | 556,0  | 353,4  | 312,5  | 218,1  | 109,0   |            |
| DNG-9170  | 2048,0   | 1636,1 | 1424,3 | 1108,4 | 917,0  | 582,9  | 515,5  | 359,7  | 179,7   |            |
| DNG-11200 | 2501,2   | 1998,3 | 1740,0 | 1353,8 | 1120,0 | 712,0  | 629,6  | 439,4  | 219,4   |            |

### Reference Conditions

| Inlet Compressed Air Pressure | Outlet Nitrogen Pressure | Ambient Temperature | Inlet Air Dew Point  |  |
|-------------------------------|--------------------------|---------------------|--|--|
| 7.5 bar                       | 6 bar                    | 25°C                | 3°C (Under or equal 99.5% purity)                              | -40°C (Above 99.5% purity)                               |
|                               |                          |                     | Refrigerant air dryer and activated carbon filter are required | Desiccant dryer and activated carbon filter are required |

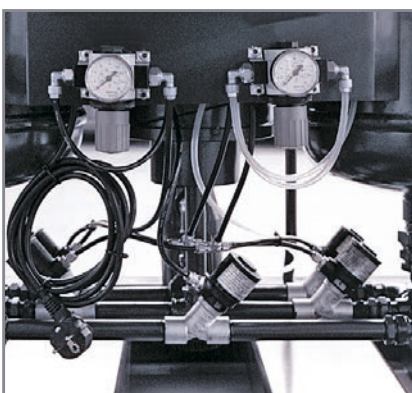
\* For purity levels under 99.5% required air quality is class 1.4.1 as per ISO8573

\* For purity levels above 99.5% required air quality is class 1.2.1 as per ISO8573

### N<sub>2</sub> NITROGEN

| Model     | Buffer Tank          | Connections |                 | Dimensions (mm) |        |        |
|-----------|----------------------|-------------|-----------------|-----------------|--------|--------|
|           |                      | Air Inlet   | Nitrogen Outlet | Width           | Length | Height |
| DNG-10    | 26L                  | 1/2"        | 1/2"            | 610             | 1120   | 1090   |
| DNG-20    | 35 L                 | 1/2"        | 1/2"            | 560             | 1081   | 1284   |
| DNG-35    | 52 L                 | 1/2"        | 1/2"            | 736             | 1179   | 1787   |
| DNG-60    | 70 L                 | 1/2"        | 1/2"            | 932,5           | 1115,5 | 1485   |
| DNG-95    | 97 L                 | 1"          | 1/2"            | 760             | 1659   | 1485   |
| DNG-120   | 126 L                | 1"          | 1/2"            | 890             | 1634   | 1442   |
| DNG-150   | 151 L                | 1"          | 1/2"            | 890             | 1634   | 1639   |
| DNG-250   | 280 L                | 1"          | 1/2"            | 892             | 1760   | 1975   |
| DNG-330   | 408 L                | 1"          | 1/2"            | 950             | 1910   | 2025   |
| DNG-450   | 464 L                | 1"          | 1/2"            | 1010            | 2218   | 2134   |
| DNG-510   | 515 L                | 1 1/2"      | 3/4"            | 1010            | 2208   | 2028   |
| DNG-570   | 573 L                | 1 1/2"      | 3/4"            | 1010            | 2208   | 2226   |
| DNG-730   | 712 L                | 1 1/2"      | 3/4"            | 1110            | 2685   | 2084   |
| DNG-910   | 1,042 m <sup>3</sup> | 1 1/2"      | 1"              | 1220            | 2727   | 2485   |
| DNG-1110  | 1,290 m <sup>3</sup> | 1 1/2"      | 1"              | 1322            | 2896   | 2521   |
| DNG-1230  | 1,402m <sup>3</sup>  | 2"          | 1"              | 1322            | 2898   | 2724   |
| DNG-1370  | 1,498 m <sup>3</sup> | 2"          | 1 1/4"          | 1355            | 2895   | 2941   |
| DNG-1820  | 2,019 m <sup>3</sup> | 2"          | 1 1/2"          | 1793            | 3599   | 2634   |
| DNG-2050  | 2,336 m <sup>3</sup> | DN80        | 1 1/2"          | 1964            | 3390   | 3124   |
| DNG-2550  | 2,336 m <sup>3</sup> | DN80        | 2"              | 2139            | 3666   | 3194   |
| DNG-2950  | 2,336 m <sup>3</sup> | DN80        | 2"              | 2245            | 4074   | 2787   |
| DNG-3540  | 2,336 m <sup>3</sup> | DN80        | 2"              | 2375            | 4024   | 3054   |
| DNG-4160  | 2,336 m <sup>3</sup> | DN80        | 2"              | 2376            | 4020   | 3361   |
| DNG-5560  | 2,336 m <sup>3</sup> | DN100       | 2 1/2"          | 2425            | 4125   | 3890   |
| DNG-9170  | 2,336 m <sup>3</sup> | DN150       | DN80            | 2986            | 4502   | 4364   |
| DNG-11200 | 2,336 m <sup>3</sup> | DN150       | DN100           | 4672            | 3081   | 4728   |

**Note:** Drytec supplies buffer tank volumes for 99,5% and higher Nitrogen purities. For purities lower than 99,5%, it may be necessary to use an additional tank.



### Correction Factor

| Inlet Pressure (bar) | F1   | Ambient Temp. (°C) | F2   |
|----------------------|------|--------------------|------|
| 6                    | 0,82 | 5                  | 0,85 |
| 6,5                  | 0,88 | 10                 | 1    |
| 7                    | 0,94 | 15                 | 1    |
| 7,5                  | 1    | 20                 | 1    |
| 8                    | 1,05 | 25                 | 1    |
| 8,5                  | 1,1  | 30                 | 0,91 |
| 9                    | 1,14 | 35                 | 0,82 |
| 9,5                  | 1,2  | 40                 | 0,74 |
| 10                   | 1,21 | 45                 | 0,6  |

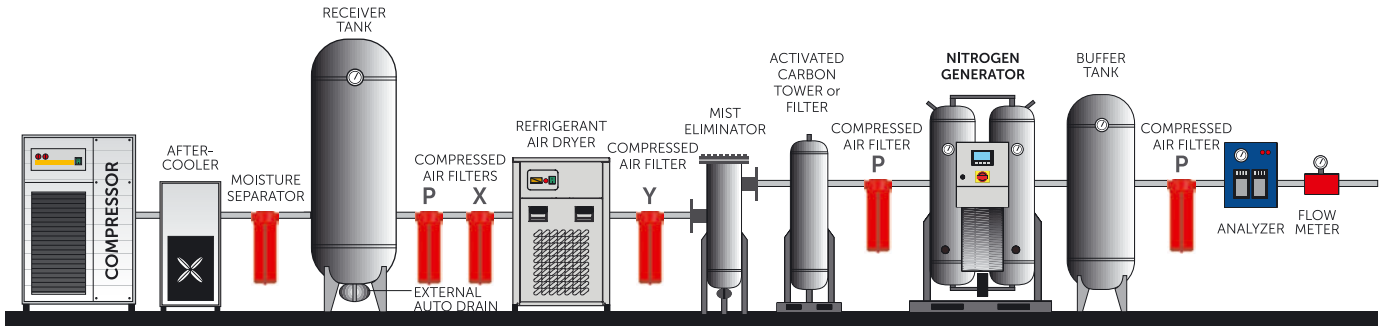
To determine the nitrogen generator model in the reference conditions divide the nitrogen flow rate to the factors mentioned above.

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# GAS TREATMENT AND GAS GENERATION ◀

"Drytec reserves the right to change the design and/or dimensions and/or weight of his products at any time without any notice or liability."

AIR LINE DESIGN (Under or equal 99.5% purity)



AIR LINE DESIGN (Above 99.5% purity)

