GAS GENERATION SYSTEMS

MNG-PRO SERIES PSA NITROGEN GENERATORS

Pressure Swing Adsorption (PSA) type Nitrogen Generation System that is used to separate and enrich nitrogen from oxygen employs CMS (Carbon Molecular Sieve) as adsorbent.

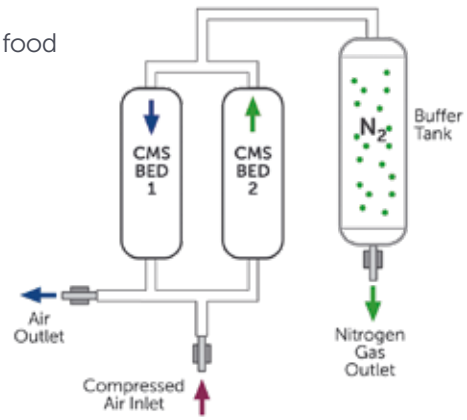
CMS adsorbs oxygen and water vapor molecules under a certain pressure while allowing nitrogen to pass through in the line.

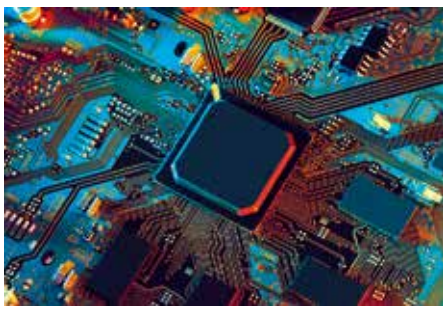
The Nitrogen Generator is a Two-Bed Adsorber System

The Nitrogen Generator consists of two adsorber vessels filled with CMS. Clean and dry air is directed to one of the adsorber beds where oxygen and water vapor are adsorbed faster than nitrogen in the pore structure of the CMS, resulting in increased nitrogen purity of the product gas stream to the desired level (95-99.999% as required by customer).

Applications

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





FEATURES

Standard

- Nitrogen Tanks
- Silencer
- Mini PLC
- Tank Manometers
- Pressure Transmitter
- ECO Mode
- T Filter
- Piston Valves
- Valve Control Regulator

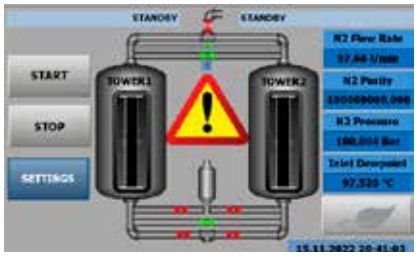
Optional

- Dew Point Sensor Kit
- Flowmeter Kit
- Carbolescer
- Oxygen Analyzer Kit
- Proportional Valve
- 3-Way By-Pass Valve Kit
- HMI Color Touch Screen PLC
- Buffer Tank
- Oil Indicator

Advantages

- Simple structure, compact design, full automated operation
- Replaces manifold usage (see pic. 1)
- PLC Controllers for monitoring and controlling the complete system (see pics. 2 & 3)
- 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
- Durable piston valves for long-life operation (see pic. 6)
- On-demand production with low costs
- 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
- Lower air-to-nitrogen (A/N) ratios and energy consumption
- Superior air distribution for the high-quality nitrogen gas production
- High-sensitive sensor technologies (see pic. 4)
- Effective Integrated Filtration (see pic. 5)


Replaces Manifold Usage - Pic. 1



HMI Color Touch Screen PLC - Pic. 2

Mini PLC - Pic. 3


Dew Point Sensor - Pic. 4


Air Filter - Pic. 5


Long Life Piston Valve - Pic. 6

Reference Conditions

Pressure Drop	Inlet Compressed Air Pressure	Outlet Nitrogen Pressure	Ambient Temperature	Inlet Air Dew Point
1.5 bar	7.5 bar	6 bar	25°C	≤3°C

Technical Specifications

Mikropor Model	Air Demand @ Following Purity Level (m^3/h)									
	95%	97%	98%	99%	99.50%	99.90%	99.95%	99.99%	99.995%	99.999%
MNG-PRO-140	51.3	48.1	46.7	37.1	34.3	30.7	29.9	27.2	22.8	22.5
MNG-PRO-185	68.5	64.3	62.3	49.5	45.9	41.0	40.0	36.3	30.5	30.0
MNG-PRO-225	83.9	78.7	76.3	60.6	56.1	50.2	48.9	44.4	37.3	36.7
MNG-PRO-360	133.4	125.1	121.4	96.4	89.3	79.8	77.8	70.7	59.4	58.4
MNG-PRO-475	176.6	165.6	160.6	127.6	118.2	105.6	103.0	93.5	78.5	77.3
MNG-PRO-640	238.7	223.9	217.1	172.5	159.7	142.8	139.2	126.4	106.2	104.5
MNG-PRO-700	273.4	256.4	248.7	197.6	183.0	163.5	159.4	144.8	121.6	119.7
MNG-PRO-810	303.6	284.8	276.2	219.4	203.2	181.6	177.0	160.8	135.1	133.0
MNG-PRO-1065	397.4	372.7	361.5	287.2	266.0	237.7	231.7	210.4	176.8	174.1
MNG-PRO-1300	486.1	455.9	442.2	351.3	325.3	290.8	283.5	257.4	216.2	212.9
MNG-PRO-1580	591.0	554.3	537.6	427.1	395.5	353.5	344.6	313.0	262.9	258.8
MNG-PRO-1750	651.9	611.4	593.1	471.1	436.3	390.0	380.1	345.2	290.0	285.5
MNG-PRO-1940	722.4	677.5	657.2	522.0	483.5	432.1	421.2	382.5	321.3	316.4
MNG-PRO-2610	976.7	916.1	888.6	705.8	653.7	584.2	569.5	517.2	434.5	427.8
MNG-PRO-3050	1139.1	1068.3	1036.2	823.2	762.2	681.2	664.6	603.3	506.8	499.1
MNG-PRO-3660	1365.5	1280.7	1242.2	986.8	913.8	816.8	796.2	723.1	607.4	598.1
MNG-PRO-4500	1684.2	1579.6	1532.2	1217.1	1127.2	1007.4	982.1	891.9	749.2	737.7
MNG-PRO-5290	1973.9	1851.2	1795.7	1426.4	1321.0	1180.7	1151.0	1045.3	878.0	864.5
MNG-PRO-6100	2276.1	2134.7	2070.6	1644.9	1523.3	1361.5	1327.2	1205.3	1012.5	996.9
MNG-PRO-7340	2740.0	2569.8	2492.7	1980.1	1833.7	1638.9	1597.7	1451.0	1219.1	1200.8
MNG-PRO-9060	3382.1	3172.0	3076.8	2444.1	2263.4	2023.0	1972.1	1791.0	1504.4	1481.3
MNG-PRO-10780	4023.5	3773.6	3660.3	2907.6	2692.7	2406.7	2346.1	2130.6	1789.7	1762.2
MNG-PRO-12100	4519.4	4238.3	4111.1	3265.7	3024.3	2703.1	2635.1	2393.1	2010.2	1979.3
MNG-PRO-14780	5519.5	5176.6	5022.2	3988.7	3693.8	3301.8	3218.4	2922.8	2455.2	2417.4

Technical Specifications

Mikropor Model	Free Nitrogen Delivery @ Following Purity Level (m^3/h)									
	95%	97%	98%	99%	99.50%	99.90%	99.95%	99.99%	99.995%	99.999%
MNG-PRO-140	32.1	26.7	24.6	16.9	13.7	10.6	9.7	5.2	4.1	3.1
MNG-PRO-185	42.8	35.7	32.8	22.5	18.3	14.1	12.9	7.0	5.4	4.1
MNG-PRO-225	52.4	43.7	40.2	27.6	22.5	17.3	15.8	8.5	6.7	5.0
MNG-PRO-360	83.4	69.5	63.9	43.8	35.7	27.5	25.1	13.6	10.6	8.0
MNG-PRO-475	110.4	92.0	84.6	58.0	47.3	36.4	33.2	18.0	14.0	10.6
MNG-PRO-640	149.2	124.4	114.3	78.4	63.9	49.2	44.9	24.3	19.0	14.3
MNG-PRO-700	170.9	142.4	130.9	89.8	73.2	56.4	51.4	27.8	21.7	16.4
MNG-PRO-810	189.8	158.2	145.4	99.7	81.3	62.6	57.1	30.9	24.1	18.2
MNG-PRO-1065	248.4	207.1	190.3	130.5	106.4	82.0	74.7	40.5	31.6	23.8
MNG-PRO-1300	303.8	253.3	232.8	159.7	130.1	100.3	91.4	49.5	38.6	29.2
MNG-PRO-1580	369.4	307.9	283.0	194.1	158.2	121.9	111.2	60.2	46.9	35.5
MNG-PRO-1750	407.5	339.7	312.1	214.1	174.5	134.5	122.6	66.4	51.8	39.1
MNG-PRO-1940	451.5	376.4	345.9	237.3	193.4	149.0	135.9	73.6	57.4	43.3
MNG-PRO-2610	610.5	508.9	467.7	320.8	261.5	201.5	183.7	99.5	77.6	58.6
MNG-PRO-3050	711.9	593.5	545.4	374.2	304.9	234.9	214.4	116.0	90.5	68.4
MNG-PRO-3660	853.4	711.5	653.8	448.5	365.5	281.6	256.8	139.1	108.5	81.9
MNG-PRO-4500	1052.7	877.6	806.4	553.2	450.9	347.4	316.8	171.5	133.8	101.1
MNG-PRO-5290	1233.7	1028.5	945.1	648.4	528.4	407.1	371.3	201.0	156.8	118.4
MNG-PRO-6100	1422.6	1186.0	1089.8	747.7	609.3	469.5	428.1	231.8	180.8	136.6
MNG-PRO-7340	1712.5	1427.7	1311.9	900.0	733.5	565.2	515.4	279.0	217.7	164.5
MNG-PRO-9060	2113.8	1762.2	1619.4	1111.0	905.4	697.6	636.2	344.4	268.6	202.9
MNG-PRO-10780	2514.7	2096.4	1926.5	1321.7	1077.1	829.9	756.8	409.7	319.6	241.4
MNG-PRO-12100	2824.6	2354.6	2163.7	1484.4	1209.7	932.1	850.0	460.2	359.0	271.1
MNG-PRO-14780	3449.7	2875.9	2643.3	1813.0	1477.5	1138.5	1038.2	562.1	438.4	331.2

A/N Ratios for All MNG-PRO Models**

Purities	95%	97%	98%	99%	99.50%	99.90%	99.95%	99.99%	99.995%	99.999%
Air/N_2 Ratio	1.6	1.8	1.9	2.2	2.5	2.9	3.1	5.2	5.6	7.3

** The Air/Nitrogen ratios according to the model and purity are recommended as the value given above.

Technical Specifications

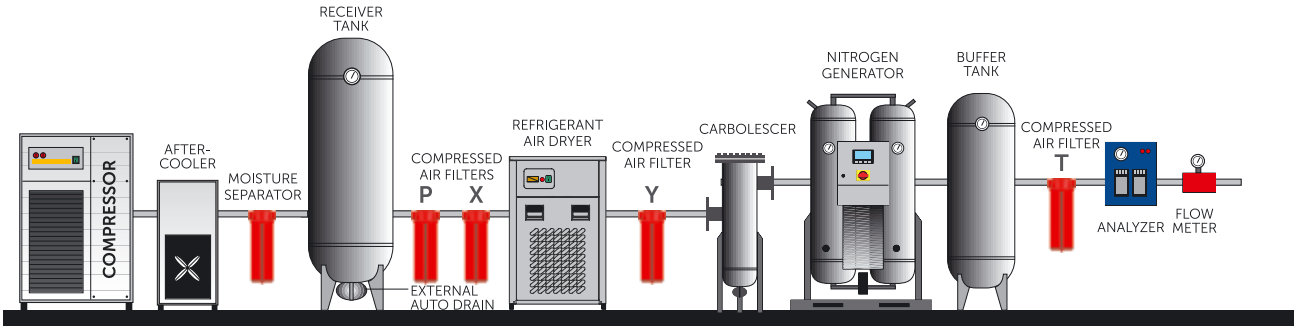
Mikropor Model	RECOMMENDED BUFFER TANK VOLUMES (LITER)									
	95%	97%	98%	99%	99.50%	99.90%	99.95%	99.99%	99.995%	99.999%
MNG-PRO-140	59	50	46	31	25	20	18	10	8	6
MNG-PRO-185	79	66	61	42	34	26	24	13	10	8
MNG-PRO-225	97	81	74	51	42	32	29	16	12	9
MNG-PRO-360	155	129	118	81	66	51	47	25	20	15
MNG-PRO-475	205	170	157	107	88	67	62	33	26	20
MNG-PRO-640	276	230	212	145	118	91	83	45	35	27
MNG-PRO-700	317	264	243	166	136	104	95	52	40	30
MNG-PRO-810	352	293	269	185	151	116	106	57	45	34
MNG-PRO-1065	460	384	353	242	197	152	139	75	58	44
MNG-PRO-1300	563	469	431	296	241	186	169	92	72	54
MNG-PRO-1580	684	571	524	360	293	226	206	112	87	66
MNG-PRO-1750	755	629	578	397	323	249	227	123	96	72
MNG-PRO-1940	837	697	641	440	358	276	252	136	106	80
MNG-PRO-2610	1131	943	867	594	484	373	340	184	144	109
MNG-PRO-3050	1319	1100	1011	693	565	435	397	215	168	127
MNG-PRO-3660	1581	1318	1211	831	677	522	476	258	201	152
MNG-PRO-4500	1950	1626	1494	1025	835	644	587	318	248	187
MNG-PRO-5290	2286	1906	1751	1201	979	754	688	372	291	219
MNG-PRO-6100	2636	2197	2019	1385	1129	870	793	429	335	253
MNG-PRO-7340	3173	2645	2431	1668	1359	1047	955	517	403	305
MNG-PRO-9060	3917	3265	3001	2059	1678	1293	1179	638	498	376
MNG-PRO-10780	4660	3885	3570	2449	1996	1538	1402	759	592	447
MNG-PRO-12100	5234	4363	4009	2751	2242	1727	1575	853	665	502
MNG-PRO-14780	6392	5329	4898	3359	2738	2110	1924	1041	812	614

Correction Factor

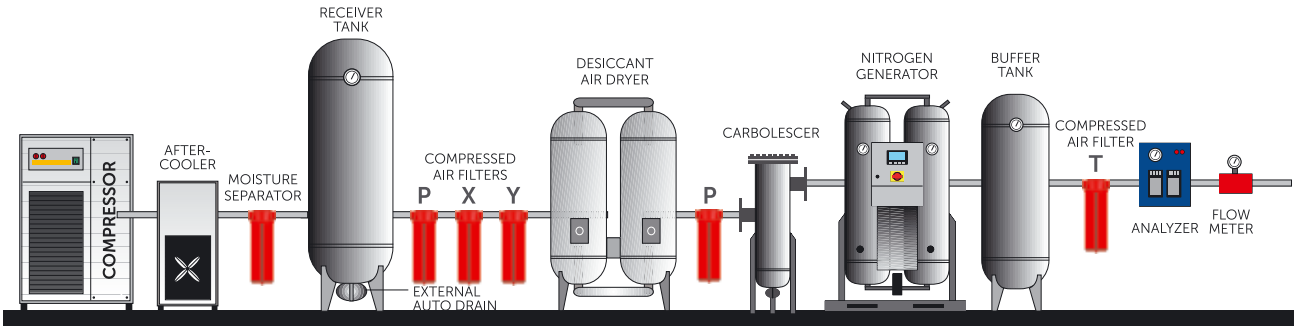
Inlet Pressure (bar)	F1	Ambient Temp. (°C)	F2
5	0.68	5	0.85
5.5	0.73	10	1
6	0.79	15	1
6.5	0.88	20	1
7	0.90	25	1
7.5	1	30	0.91
8	1.04	35	0.82
8.5	1.08	40	0.74
9	1.15	45	0.6

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

AIR LINE DESIGN



AIR LINE DESIGN



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