

## Technical data of Nitrogen Generation Membrane Module

### Model : MN2-11000

#### 1. Product : Hollow fiber membrane type module

#### 2. Use : Nitrogen generation

#### 3. Dimensions and Weight

Length	Diameter	Weight
1580 mm	200 mm	26 kg

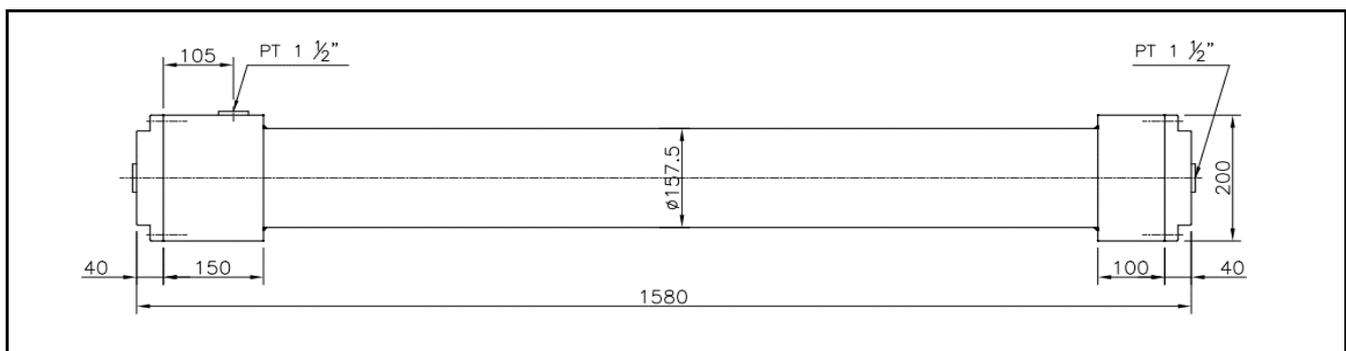
#### 4. Fittings

Air inlet	N2 product outlet	O2 enriched air outlet
Rc1.5" (PT)	Rc1.5" (PT)	Rc1.5" (PT)

#### 5. Components

Cap / Casing	Hollow fiber	Potting materials	Sealing O-Ring
Aluminium	Polysulfone	Epoxy	NBR

#### 6. Module Configuration



#### 7. Operating Conditions

Item	Unit	Condition
Operation Pressure	barg	Max. 20
Temperature(Min/Max)	°C	5 / 55
Relative humidity	%	Less than 60 (at Operating pressure and temperature, Remove moisture with air drier)
Particles		Less than 0.1 (Remove particles with 3 $\mu$ m gas filter and 0.01 $\mu$ m mist separator)
Residual oil	mg/m <sup>3</sup> (0 °C, 101.3 kPa)	Less than 0.01 (Remove oil with 3 $\mu$ m gas filter and 0.01 $\mu$ m mist separator)
Hydrocarbons		Less than 0.01 (Remove hydrocarbons with activated carbon if necessary)

## 8. Performance

Operating Temperature : 25 °C

Pressure	MN2-11000	Nitrogen product flow rate and Air feed required ( Nm3/hr )					
	Oxygen density (%)	0.5	1	2	3	4	5
5 barg	Nitrogen	4.5	6.3	9.3	12.2	15.4	18.5
	Air	25.3	27.8	31.2	34.5	38.5	42.5
7 barg	Nitrogen	7.9	11.0	16.0	21.1	26.3	31.6
	Air	39.6	43.0	49.3	55.6	60.9	66.1
9 barg	Nitrogen	11.0	15.6	22.7	29.9	37.3	44.7
	Air	49.3	55.6	67.4	73.7	81.7	89.7
11 barg	Nitrogen	14.5	20.2	29.5	38.8	48.2	57.7
	Air	64.9	70.8	84.3	93.9	103.6	115.0
13 barg	Nitrogen	17.9	24.9	36.2	47.6	59.2	70.8
	Air	79.2	85.9	101.1	113.7	126.6	139.6
15 barg	Nitrogen	21.2	29.5	43.0	56.4	70.1	83.8
	Air	92.7	101.5	118.8	134.0	148.3	164.3
17 barg	Nitrogen	24.5	34.1	49.7	65.3	81.1	96.9
	Air	106.2	117.1	136.5	154.6	170.6	189.6
19 barg	Nitrogen	27.8	38.8	56.4	74.1	92.0	109.9
	Air	119.6	132.7	154.6	175.2	193.8	215.3
20 barg	Nitrogen	29.5	41.1	59.8	78.6	97.5	119.2
	Air	126.8	140.7	163.9	185.8	204.7	233.0

Operating Temperature : 35 °C

Pressure	MN2-11000	Nitrogen product flow rate and Air feed required ( Nm3/hr )					
	Oxygen density (%)	0.5	1	2	3	4	5
5 barg	Nitrogen	4.8	6.7	9.8	12.9	16.3	19.6
	Air	27.8	30.6	34.3	38.0	42.4	46.8
7 barg	Nitrogen	8.4	11.6	17.0	22.3	27.9	33.5
	Air	43.6	47.3	54.2	61.2	67.0	72.8
9 barg	Nitrogen	11.6	16.5	24.1	31.7	39.5	47.3
	Air	54.2	61.2	74.1	81.1	89.9	98.7
11 barg	Nitrogen	15.4	21.4	31.3	41.1	51.1	61.2
	Air	71.4	77.8	92.7	103.3	114.0	126.5
13 barg	Nitrogen	18.9	26.3	38.4	50.5	62.7	75.0
	Air	87.1	94.5	111.2	125.1	139.2	153.6
15 barg	Nitrogen	22.5	31.3	45.5	59.8	74.3	88.9
	Air	101.9	111.7	130.7	147.4	163.1	180.7
17 barg	Nitrogen	26.0	36.2	52.7	69.2	86.0	102.7
	Air	116.8	128.8	150.1	170.1	187.7	208.5
19 barg	Nitrogen	29.5	41.1	59.8	78.6	97.6	116.5
	Air	131.6	146.0	170.1	192.8	213.2	236.8
20 barg	Nitrogen	31.3	43.5	63.4	83.3	103.4	126.4
	Air	139.5	154.8	180.3	204.4	225.2	256.2

Operating Temperature : 45 °C

Pressure	MN2-11000	Nitrogen product flow rate and Air feed required ( Nm3/hr )					
	Oxygen density (%)	0.5	1	2	3	4	5
5 barg	Nitrogen	5.5	7.6	11.1	14.7	18.5	22.2
	Air	32.4	35.6	39.9	44.2	49.3	54.5
7 barg	Nitrogen	9.5	13.1	19.2	25.3	31.6	37.9
	Air	50.7	55.0	63.1	71.2	77.9	84.7
9 barg	Nitrogen	13.1	18.7	27.3	35.9	44.7	53.6
	Air	63.1	71.2	86.3	94.4	104.6	114.9
11 barg	Nitrogen	17.4	24.3	35.4	46.5	57.9	69.3
	Air	83.0	90.6	107.8	120.2	132.6	147.2
13 barg	Nitrogen	21.4	29.8	43.5	57.1	71.0	84.9
	Air	101.4	110.0	129.4	145.6	162.0	178.7
15 barg	Nitrogen	25.4	35.4	51.6	67.7	84.2	100.6
	Air	118.6	129.9	152.1	171.5	189.8	210.3
17 barg	Nitrogen	29.4	40.9	59.6	78.4	97.3	116.3
	Air	135.9	149.9	174.7	197.9	218.4	242.6
19 barg	Nitrogen	33.4	46.5	67.7	89.0	110.5	131.9
	Air	153.1	169.8	197.9	224.3	248.0	275.5
20 barg	Nitrogen	35.4	49.3	71.8	94.3	117.0	143.1
	Air	162.3	180.1	209.8	237.8	262.1	298.2

Operating Temperature : 55 °C

Pressure	MN2-11000	Nitrogen product flow rate and Air feed required ( Nm3/hr )					
	Oxygen density (%)	0.5	1	2	3	4	5
5 barg	Nitrogen	5.9	8.1	11.9	15.6	19.8	23.8
	Air	35.6	39.1	43.8	48.6	54.2	59.8
7 barg	Nitrogen	10.1	14.1	20.6	27.1	33.9	40.7
	Air	55.7	60.4	69.3	78.2	85.6	93.0
9 barg	Nitrogen	14.1	20.1	29.3	38.5	48.0	57.5
	Air	69.3	78.2	94.8	103.7	115.0	126.2
11 barg	Nitrogen	18.7	26.0	37.9	49.9	62.1	74.3
	Air	93.5	100.1	118.6	131.2	144.3	161.4
13 barg	Nitrogen	23.0	32.0	46.6	61.2	76.2	91.1
	Air	114.9	123.0	141.3	161.2	177.1	193.7
15 barg	Nitrogen	27.3	37.9	55.3	72.6	90.2	107.9
	Air	130.4	142.8	167.1	188.4	208.6	231.1
17 barg	Nitrogen	31.5	43.9	64.0	84.0	104.3	124.7
	Air	149.3	164.7	192.0	217.5	240.0	266.7
19 barg	Nitrogen	35.8	49.9	72.6	95.4	118.4	141.5
	Air	170.6	191.8	220.1	244.6	269.2	301.0
20 barg	Nitrogen	38.0	52.8	77.0	101.1	125.5	153.4
	Air	180.8	203.3	233.2	259.2	285.2	326.4