www.hanaplant.co.kr

HANA PLANT

" Small But Strong Company "

HANA PLANT

The world is changed by the one who runs ahead.

www.hanaplant.co.kr

Industrial Strength
AIR DRYERS
for
Multiple Industries

INDEX

PRODUCTS LINE	04
COMPRESSED AIR	06
GAS GENERATION	17
GAS & LIQUID DEHYDRATION	21
ACCESSORY	23
TECHNICAL DATA	26
CERTIFICATION	30

PRODUCTS LINE

AIR DRYERS

- **Compressed air Heater Non Purge Type - CHNP Series**
  - 1800 to 28,000 SCMH (1,120 to 16,480 SCFM)
  - Pressure Dew Point -40℃ to -100℃ (-40 to -148℉)
  - ISO Compressed Air Purity Class 0 ~ 2

- **Blower Heater Purge Type - BHP Series**
  - 1,000 to 20,000 SCMH (588 to 11,771 SCFM)
  - Pressure Dew Point -40℃ to -100℃ (-40 to -148℉)
  - ISO Compressed Air Purity Class 0 ~ 2

- **Compressed Air Heater Purge Type - CHP Series**
  - 500 to 10,000 SCMH (294 to 5,885 SCFM)
  - Pressure Dew Point under -100℃ (-148℉)
  - ISO Compressed Air Purity Class 0 ~ 2

- **Pressure Swing Heatless Type - PSH Series**
  - 230 to 6,000 SCMH (135 to 3,532 SCFM)
  - Pressure Dew Point -40℃ to -100℃ (-40 to -148℉)
  - ISO Compressed Air Purity Class 0 ~ 2

- **Refrigeration Chiller Direct Expansion Type - RCD Series**
  - 2,000 to 30,000 SCMH (1,177 to 17,657 SCFM)
  - Pressure Dew Point over 4℃ (39.2℉)
  - ISO Compressed Air Purity Class 4

- **Refrigeration Water Chiller Type - RCI Series**
  - 2,000 to 30,000 SCMH (1,177 to 17,657 SCFM)
  - Pressure Dew Point over 4℃ (39.2℉)
  - ISO Compressed Air Purity Class 4

GAS GENERATORS

- **Pressure Swing Adsorption Type Nitrogen Generator - HRK/HY Series**
  - 20 to 600 SCMH (12 to 353 SCFM)
  - Purity : 99% to 99.99%

- **Vacuum Pressure Swing Adsorption Type Nitrogen Generator- HVN Series**
  - VPSA Type Nitrogen generator can be supplied by customer's requirement

- **Vacuum Pressure Swing Adsorption Type Oxygen Generator - HVN Series**
  - 1460 SCMH (859 SCFM)
  - Purity : Over 90%

GAS DEHYDRATORS

■ **H_2 Gas Dehydrator**
- 100 SCMH (59 SCFM)
- Pressure Dew point -40℃ (-40℉)

■ **CO_2 Gas Dehydrator**
- 9,000 SCMH (5,297 SCFM)
- Dew point -72℃ at ATM (-97.6℉)

■ **Natural Gas Dehydrator**
- 2,435 SCMH (1,422 SCFM)
- Pressure Dew point -80℃ (-112℉)

■ **H_2S Gas Dehydrator**
- 210 SCMH (124 SCFM)
- Pressure dew point -40℃ (-40℃)

■ **Off-Gas Dehydrator**
- 50 to 500 CMH (29 to 294 SCFM)
- Purity : 99.999~99.9999 %

LIQUID DEHYDRATORS

■ **IPA Dehydrator**
- 5,000 SCMH (2,943 SCFM)
- Purity 30 ppm (wt.)

AIR FILTER : Pre - Filter & After - Filter

- 100 to 45,000 SCMH (59 to 26,486 SCFM)
- Maximum number of Particles per ㎥
  [100 to 1,000,000 (0.1 ~ 0.5 micron)]
- Total oil : 0.01 to 0.1 ㎎/㎥
- ISO Compressed air purity class : 1~ 2

AIR COOLER (Include Heat Exchanger)

- 250 bar (3,626 psi)
- Max. 1,000 kW (3,414,425 BTU/hr)

AIR HEATER (Include Heat Exchanger)

- 250 bar (3,626 psi)
- Max. 1,000 kW (3,414,425 BTU/hr)

The Best Quality is The Best Service with Innovated Energy Saving

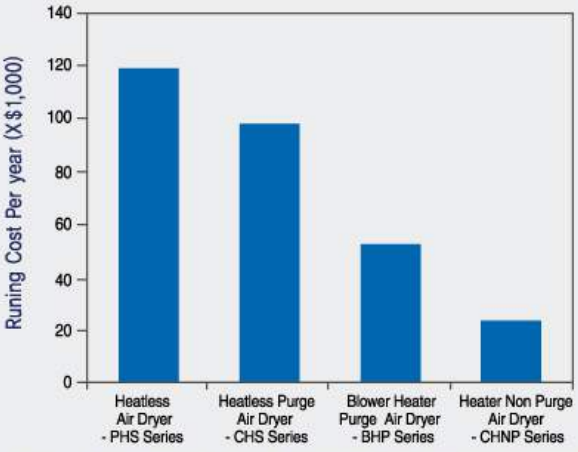
Air

COMPRESSED AIR DRYER

Industrial Products

Share TECHNOLOGY with ECO Technology

- Air dryer is a dehydrating unit for supplying high-quality air by getting rid of oil, moisture and various contaminating materials from the ambient air.
- The heater non-purge with compressed heat air dryer is especially developed for **reducing electric heater power** consumption during regeneration process.
- With **closed-loop** regeneration line, it **realizes air loss zero** and minimizes the differential pressure drop.



Energy Cost Based On The Operation of 10,000 SCMH (5885.7 SCFM)

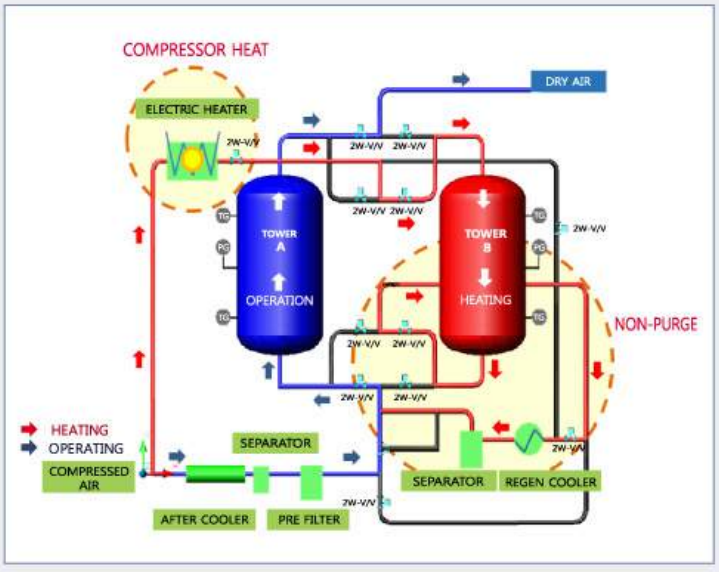
Using Waste Heat from Air Compressor
Decreasing the capacity of electric Heater : Unnecessary for blower

Low Temperature Adsorption agent
Decreasing the capacity of electric heater
Extending the Life Time of Adsorbent

Energy Cost Down
70%
Collecting Investment money with in 1 year in replacing PURGE type

Air Loss 0%
Close Loop : Energy Loss 0
Noise minimization : Removing Purge Noise

D.P.O.S. Type Operation
High efficiency and regeneration energy savings



Description of NON-PURGE Type AIR DRYER System

- The electric heater is not required or its capacity is greatly decreased.
- Regeneration is made using compressed heat and close circuit is configured. Purge air loss ZERO.
- Regeneration cooler minimizes the loss of pressure difference with Shell and tube type.
- Minimizing the loss of pressure difference not by full stream but by split stream.

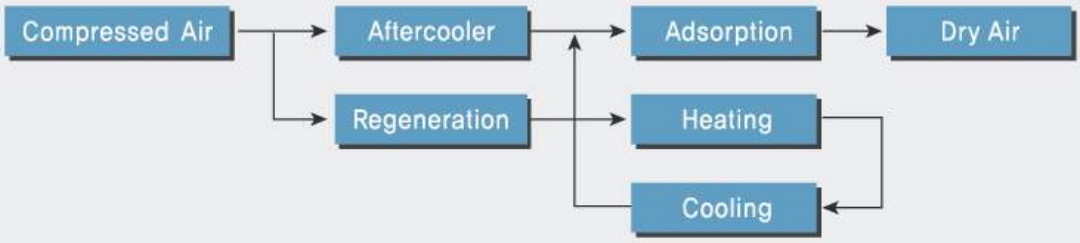
CHNP Series - COMPRESSED AIR HEATER NON-PURGE TYPE

Regeneration is made from compressed heat
Reduce energy consumption by using the heat from the compressor.

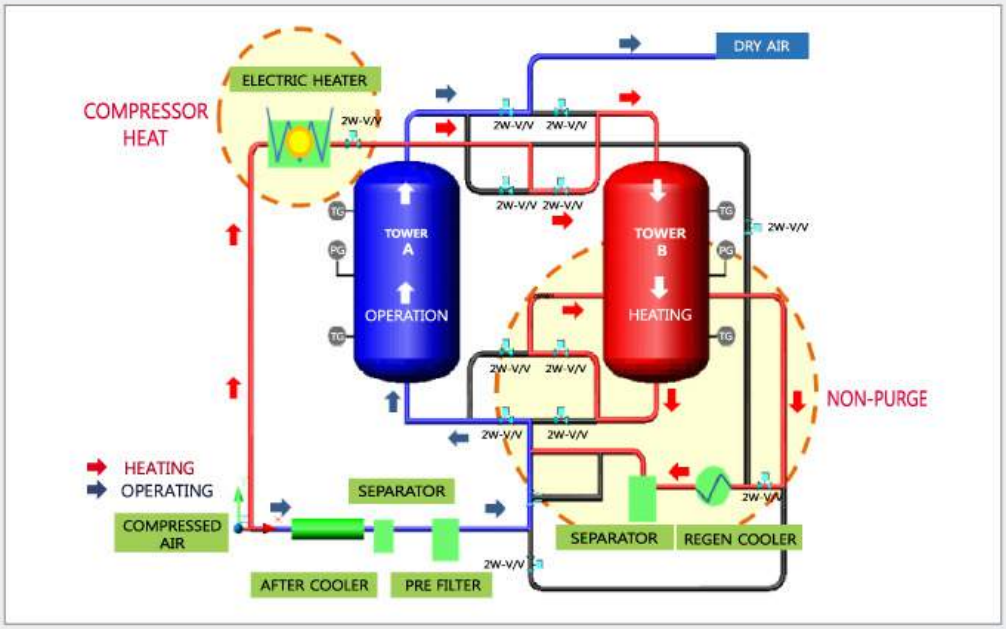
Innovative energy reduction
Reduces energy by Max. 70% by using an efficient, non-purge design.

The initial investment cost is comparatively high
Energy savings pay for the dryer in 12 month.

Outlet Dew Point -100℃
Guaranteeing definite dew point from -40℃ to -100℃ according to customer specifications.



- 1,800 to 28,000 SCMH (1,120 to 16,480 SCFM)
- Pressure Dew Point -40℃ to -100℃ (-40 to -148℉)
- ISO Compressed Air Purity Class 0 ~ 2



Operating Diagrams of CHNP type

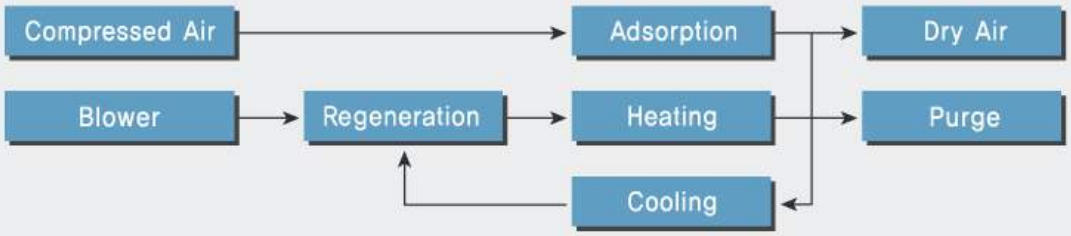
BHP Series - BLOWER HEATER PURGE TYPE

Regeneration is evaporation by heating
Moisture is evaporated from absorbents in saturation by hot air that was heated by electric heater absorbing after the suction of outer air by blower.

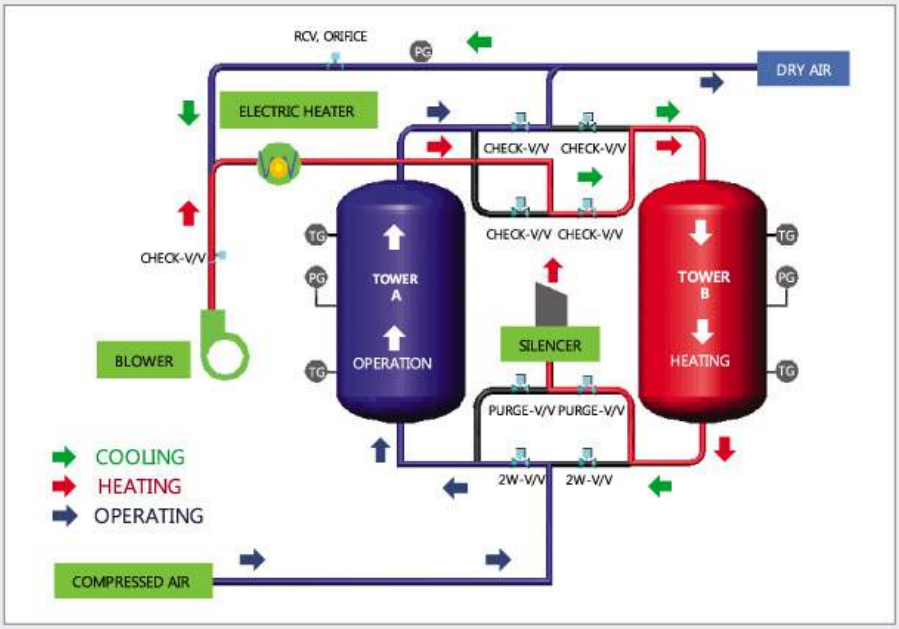
Minimization of exhaust amount of regeneration air
Little purge air loss is generated because of regenerating by ambient air PURGE AIR LOSS ~ 4%.

There is regenerated air consumption
Exhaust of regenerated air in approx, 4% even if it is Regenerated using outer air.

Outlet Dew Point -100℃
Guaranteeing definite pressure dew point from -40℃ to -100℃ according to the site requirement condition.



- 1,000 to 28,000 SCMH (588 to 11,771 SCFM)
- Pressure Dew Point -40℃ to -100℃ (-40 to -148℉)
- ISO Compressed Air Purity Class 0 ~ 2



Operating Diagrams of BHP type

CHP Series - COMPRESSED AIR HEATER PURGE TYPE

Heating temperature and the difference of moisture amount

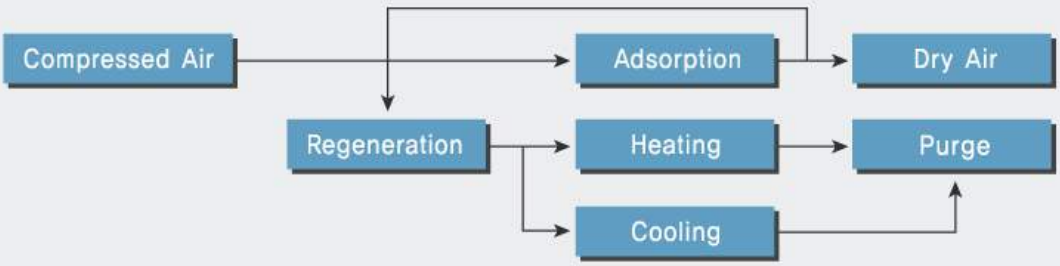
The highest regeneration effect can be obtained by decreasing pressure and expanding dry air at the outlet and heating electric heater.

Available for low dew point (Under -100℃)

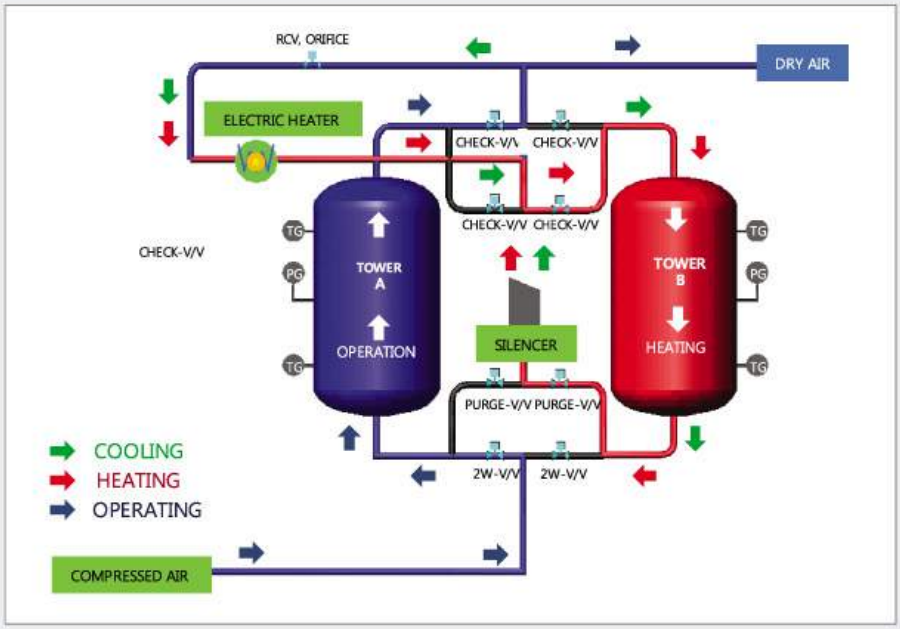
The adsorption capability of adsorbents is maximized and low dew point is available since there is little remaining moisture by regenerating adsorbent almost perfect.

There is regenerated air exhaust (8%)

As the difference of relative humidity between adsorbents and dry air is used so much dry air is necessary for the regeneration of adsorbents, but it is smaller than PSH.



- 500 to 1,000 SCMH (294 to 5,885 SCFM)
- Pressure Dew Point under -100℃ (-148℉)
- ISO Compressed Air Purity Class 0 ~ 2



Operating Diagrams of CHP type

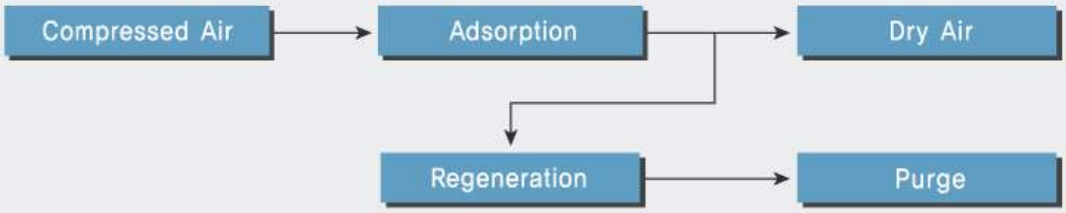
PSH Series - PRESSURE SWING HEATERLESS TYPE

Regeneration is the difference of moisture amount
PSH type uses the difference of moisture amount between compressed air and adsorbents.

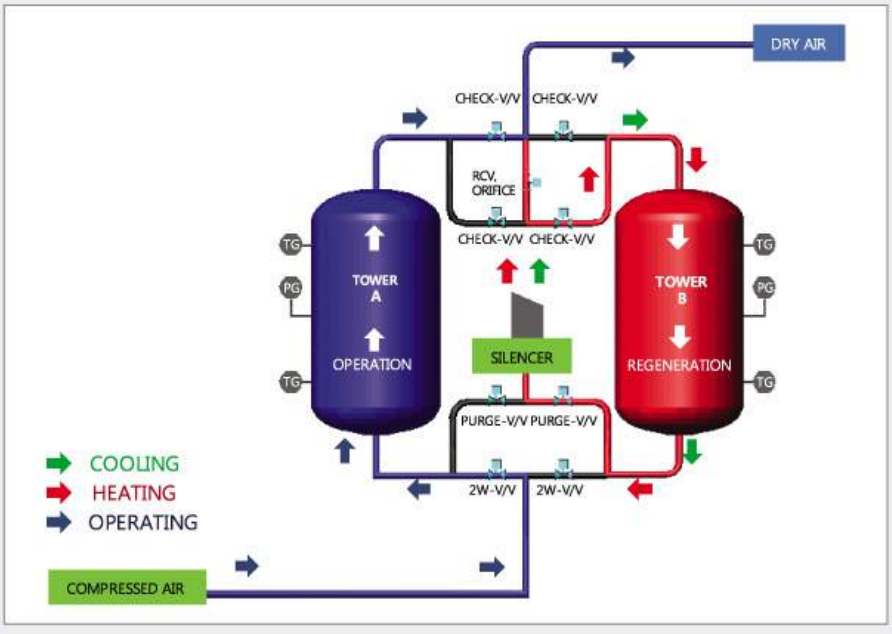
Fixed outlet temperature
Outlet temperature is fixed in changing adsorption tower due to no regeneration source such as electric / steam heater, and the life of adsorbent is extended.

Simple structure
It has small installation area with simple structure and less initial investment cost, and is easy for maintenance.

Basic Dew Point : -40℃
Guaranteeing definite dew point from -40℃ ~ -100℃ according to the site requirement condition.



- 230 to 6,000 SCMH (135 to 3,532 SCFM)
- Pressure Dew Point -40℃ to -100℃ (-40 to -148℉)
- ISO Compressed Air Purity Class 0 ~ 2



Operating Diagrams of PSH type

COMPRESSED AIR DRYER TABLES

CHNP Series AIR DRYER Specifications

MODEL NUMBER	FLOW RATE		IN / OUT CONNECTIONS		DESICCANT		ELECTRIC HEATER	COOLING WATER	OVERALL DIMENTIONS						TOTAL WEIGHT	
									LENGTH		WIDTH		HEIGHT			
	SCMH	SCFM	(mm)	(in)	(kg/Tower)	(ib/Tower)	(kW)	SCMH	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(ib)
CNHP-1800	1,800	1,059	80A	3	410	904	11	5	2,540	100	2,006	79	2,750	108	2,800	6,171
CNHP-2000	2,000	1,177	80A	3	450	992	11	5	2,540	100	2,006	79	2,750	108	2,845	6,270
CNHP-2500	2,500	1,471	100A	4	530	1,168	12	6	2,800	110	2,006	79	2,750	108	2,920	6,436
CNHP-3100	3,100	1,825	100A	4	730	1,609	13	7	2,800	110	2,100	83	2,750	108	3,000	6,612
CNHP-3500	3,500	2,060	100A	4	830	1,829	15	8	3,000	118	2,200	87	2,750	108	3,500	7,714
CNHP-4600	4,600	2,707	125A	5	1,090	2,402	20.5	10	3,500	138	2,600	102	2,800	110	4,800	10,579
CNHP-5000	5,000	2,943	125A	5	1,180	2,601	22	11	3,600	142	2,600	102	2,800	110	5,200	11,461
CNHP-5700	5,700	3,355	150A	6	1,350	2,975	25	13	4,000	157	2,900	114	2,900	114	6,500	14,326
CNHP-6300	6,300	3,708	150A	6	1,490	3,284	28	14	4,200	165	3,000	118	2,950	116	7,000	15,428
CNHP-6900	6,900	4,061	150A	6	1,640	3,615	30	15	4,200	165	3,000	118	3,000	118	7,500	16,530
CNHP-7800	7,800	4,591	200A	8	1,850	4,077	35	17	4,700	185	3,400	134	3,050	120	8,500	18,734
CNHP-8200	8,200	4,826	200A	8	1,950	4,298	35	18	4,800	189	3,500	138	3,100	122	9,000	19,836
CNHP-9000	9,000	5,297	200A	8	2,140	4,717	40	20	4,800	189	3,500	138	3,350	132	10,700	23,583
CNHP-10200	10,200	6,003	200A	8	2,420	5,334	50	23	5,000	197	3,650	144	3,400	134	12,000	26,448
CNHP-12000	12,000	7,063	200A	8	2,850	6,281	60	27	5,200	205	3,800	150	3,450	136	14,200	31,297
CNHP-12600	12,600	7,416	250A	10	2,990	6,590	65	28	5,500	217	4,000	157	3,500	138	15,500	34,162
CNHP-13500	13,500	7,946	250A	10	3,210	7,075	70	30	5,700	224	4,000	157	3,550	140	16,000	35,264
CNHP-15300	15,300	9,005	250A	10	3,630	8,001	75	34	6,000	236	4,200	165	3,600	142	17,400	38,350
CNHP-20000	20,000	11,772	250A	10	2,200(3)	4,849	80	36	6,000	236	3,800	150	3,600	142	18,000	39,672
CNHP-24000	24,000	14,126	300A	12	2,340(4)	5,157	125	65	7,900	311	3,400	134	3,695	145	28,000	61,712
CNHP-28000	28,000	16,480	300A	12	2,695(4)	5,940	135	70	8,120	320	3,600	142	3,425	135	28,000	61,712

BHP Series AIR DRYER Specifications

MODEL NUMBER	FLOW RATE		IN / OUT CONNECTIONS		DESICCANT		ELECTRIC HEATER	BLOWER MOTOR	OVERALL DIMENTIONS						TOTAL WEIGHT	
									LENGTH		WIDTH		HEIGHT			
	SCMH	SCFM	(mm)	(in)	(kg/Tower)	(ib/Tower)	(kW)	(kW)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(ib)
BHP-1000	1,000	589	65A	3	200	441	13	3.73	2,000	79	1,200	47	2,550	100	800	1,763
BHP-1250	1,250	736	65A	3	250	551	15	3.73	2,000	79	1,200	47	2,600	102	950	2,094
BHP-1400	1,400	824	65A	3	280	617	17.5	3.73	2,000	79	1,200	47	2,600	102	1,050	2,314
BHP-1750	1,750	1,030	80A	3	360	793	22	5.595	2,200	87	1,400	55	2,650	104	1,300	2,865
BHP-2000	2,000	1,177	80A	3	410	904	25	5.595	2,200	87	1,400	55	2,650	104	1,450	3,196
BHP-2300	2,300	1,354	100A	4	470	1,036	28	5.595	2,600	102	1,600	63	2,700	106	1,850	4,077
BHP-2700	2,700	1,589	100A	4	550	1,212	33	7.46	2,600	102	1,600	63	2,700	106	2,350	5,179
BHP-3100	3,100	1,825	100A	4	640	1,411	40	7.46	2,800	110	1,800	71	2,700	106	2,600	5,730
BHP-3500	3,500	2,060	100A	4	720	1,587	45	7.46	3,000	118	2,000	79	2,700	106	2,850	6,281
BHP-4600	4,600	2,707	125A	5	950	2,094	60	11.19	3,200	126	2,200	87	2,750	108	3,800	8,375
BHP-5000	5,000	2,943	125A	5	1,030	2,270	66	11.19	3,200	126	2,200	87	2,750	108	4,200	9,257
BHP-5700	5,700	3,355	150A	6	1,170	2,579	70	11.19	3,600	142	2,400	94	2,850	112	4,680	10,315
BHP-6300	6,300	3,708	150A	6	1,300	2,865	80	11.19	3,800	150	2,700	106	2,900	114	5,000	11,020
BHP-6900	6,900	4,061	150A	6	1,420	3,130	90	14.92	3,800	150	2,700	106	2,950	116	5,250	11,571
BHP-7800	7,800	4,591	200A	8	1,610	3,548	100	14.92	4,200	165	2,900	114	2,950	116	7,000	15,428
BHP-8200	8,200	4,826	200A	8	1,690	3,725	100	14.92	4,200	165	2,900	114	3,000	118	7,300	16,089
BHP-9000	9,000	5,297	200A	8	1,860	4,099	120	14.92	4,300	169	3,000	118	3,200	126	8,000	17,632
BHP-10200	10,200	6,003	200A	8	2,100	4,628	120	22.38	4,500	177	3,000	118	3,200	126	10,000	22,040
BHP-12000	12,000	7,063	200A	8	2,480	5,466	150	22.38	4,500	177	3,000	118	3,500	138	11,400	25,126
BHP-12600	12,600	7,416	250A	10	2,600	5,730	150	22.38	4,500	177	3,200	126	3,500	138	12,000	26,448
BHP-13500	13,500	7,946	250A	10	2,790	6,149	180	29.84	4,600	181	3,300	130	3,500	138	12,500	27,550
BHP-15300	15,300	9,005	250A	10	3,160	6,965	200	29.84	4,800	189	3,400	134	3,550	140	13,000	28,652

■ NOTE

- For more conditions, please contact us
- Dimensions are subject to the change. Please contact us for the certified drawings.
- The applied code is KS/JIS or ANSI with Flange at 10K (ANSI 150LB)
- Total weight includes desiccants

COMPRESSED AIR DRYER TABLES

CHP Series AIR DRYER Specifications

MODEL NUMBER	FLOW RATE		IN / OUT CONNECTIONS		DESICCANT		ELECTRIC HEATER	OVERALL DIMENTIONS						TOTAL WEIGHT	
								LENGTH		WIDTH		HEIGHT			
	SCMH	SCFM	(mm)	(in)	(kg/Tower)	(ib/Tower)	(kW)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(ib)
CHP-500	500	294	40A	2	90	198	5	1,700	67	1,000	39	2,200	87	380	838
CHP-650	650	383	50A	2	120	264	6	1,900	75	1,000	39	2,250	89	480	1,058
CHP-780	780	459	50A	2	150	331	8	1,900	75	1,000	39	2,300	91	590	1,300
CHP-900	900	530	50A	2	170	375	8	1,900	75	1,000	39	2,300	91	660	1,455
CHP-1000	1,000	589	65A	3	190	419	10	2,000	79	1,100	43	2,450	96	850	1,873
CHP-1250	1,250	736	65A	3	240	529	11.5	2,000	79	1,100	43	2,600	102	1,000	2,204
CHP-1400	1,400	824	65A	3	270	595	13	2,200	87	1,100	43	2,600	102	1,100	2,424
CHP-1750	1,750	1,030	80A	3	340	749	17.5	2,400	94	1,200	47	2,650	104	1,400	3,086
CHP-2000	2,000	1,177	80A	3	390	860	20.5	2,500	98	1,400	55	2,700	106	1,600	3,526
CHP-2300	2,300	1,354	100A	4	450	992	22	2,650	104	1,600	63	2,700	106	1,850	4,077
CHP-2500	2,500	1,471	100A	4	490	1,080	25	2,700	106	1,600	63	2,700	106	2,000	4,408
CHP-2700	2,700	1,589	100A	4	530	1,168	28	2,800	110	1,600	63	2,700	106	2,200	4,849
CHP-3000	3,000	1,766	100A	4	590	1,300	30	2,900	114	1,600	63	2,750	108	2,400	5,290
CHP-3200	3,200	1,883	100A	4	630	1,389	33	3,000	118	1,700	67	2,750	108	2,550	5,620
CHP-3500	3,500	2,060	100A	4	690	1,521	35	3,100	122	1,700	67	2,750	108	2,750	6,061
CHP-4000	4,000	2,354	125A	5	790	1,741	40	3,200	126	1,900	75	2,850	112	3,000	6,612
CHP-4500	4,500	2,649	125A	5	890	1,962	45	3,350	132	1,900	75	2,900	114	3,300	7,273
CHP-5000	5,000	2,943	125A	5	990	2,182	50	3,450	136	1,900	75	2,900	114	3,650	8,045
CHP-5400	5,400	3,178	150A	6	1,070	2,358	55	3,500	138	2,000	79	2,950	116	4,000	8,816
CHP-6000	6,000	3,531	150A	6	1,180	2,601	60	3,500	138	2,000	79	2,950	116	4,350	9,587
CHP-6500	6,500	3,826	150A	6	1,280	2,821	66	3,600	142	2,000	79	3,000	118	4,700	10,359
CHP-7000	7,000	4,120	150A	6	1,380	3,042	70	3,600	142	2,000	79	3,000	118	5,000	11,020
CHP-7800	7,800	4,591	200A	8	1,540	3,394	80	3,900	154	2,000	79	3,200	126	5,800	12,783

PSH Series AIR DRYER Specifications

MODEL NUMBER	FLOW RATE		IN / OUT CONNECTIONS		DESICCANT		OVERALL DIMENTIONS						TOTAL WEIGHT	
							LENGTH		WIDTH		HEIGHT			
	SCMH	SCFM	(mm)	(in)	(kg/Tower)	(ib/Tower)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(ib)
PSH-230	230	135	25A	1	40	88	1,000	39	500	20	1,900	75	200	441
PSH-280	280	165	40A	2	50	110	1,150	45	640	25	2,000	79	240	529
PSH-340	340	200	40A	2	60	132	1,250	49	680	27	2,250	89	280	617
PSH-420	420	247	40A	2	70	154	1,250	49	680	27	2,250	89	310	683
PSH-500	500	294	40A	2	85	187	1,300	51	740	29	2,250	89	350	771
PSH-650	650	383	50A	2	110	242	1,400	55	820	32	2,250	89	450	992
PSH-780	780	459	50A	2	130	287	1,400	55	820	32	2,400	94	500	1,102
PSH-870	870	512	50A	2	150	331	1,400	55	870	34	2,400	94	560	1,234
PSH-1,000	1,000	589	65A	3	170	375	1,600	63	900	35	2,500	98	650	1,433
PSH-1,250	1,250	736	65A	3	210	463	1,600	63	900	35	2,500	98	780	1,719
PSH-1,400	1,400	824	65A	3	240	529	1,600	63	900	35	2,600	102	900	1,984
PSH-1,750	1,750	1,030	80A	3	300	661	1,800	71	1,150	45	2,750	108	1,200	2,645
PSH-2,000	2,000	1,177	80A	3	340	749	1,800	71	1,150	45	2,750	108	1,340	2,953
PSH-2,300	2,300	1,354	100A	4	390	860	2,000	79	1,250	49	2,750	108	1,540	3,394
PSH-2,500	2,500	1,471	100A	4	425	937	2,200	87	1,250	49	2,750	108	1,650	3,637
PSH-2,700	2,700	1,589	100A	4	460	1,014	2,400	94	1,250	49	2,800	110	1,700	3,747
PSH-3,000	3,000	1,766	100A	4	510	1,124	2,600	102	1,300	51	2,850	112	1,900	4,188
PSH-3,200	3,200	1,883	100A	4	540	1,190	2,600	102	1,300	51	2,850	112	2,200	4,849
PSH-3,500	3,500	2,060	100A	4	590	1,300	2,900	114	1,300	51	2,850	112	2,400	5,290
PSH-4,000	4,000	2,354	125A	5	680	1,499	3,200	126	1,400	55	2,900	114	2,800	6,171
PSH-5,000	5,000	2,943	125A	5	850	1,873	3,400	134	1,500	59	2,950	116	3,000	6,612
PSH-6,000	6,000	3,531	150A	6	1020	2,248	3,400	134	1,600	63	3,050	120	3,800	8,375

■ NOTE

- For more conditions, please contact us
- Dimensions are subject to the change. Please contact us for the certified drawings.
- The applied code is KS/JIS or ANSI with Flange at 10K (ANSI 150LB)
- Total weight includes desiccants

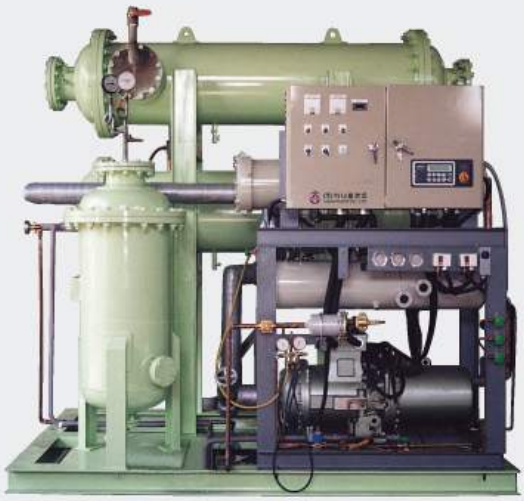
RCD Series - REFRIGERATION CHILLER DIRECT EXPANSION

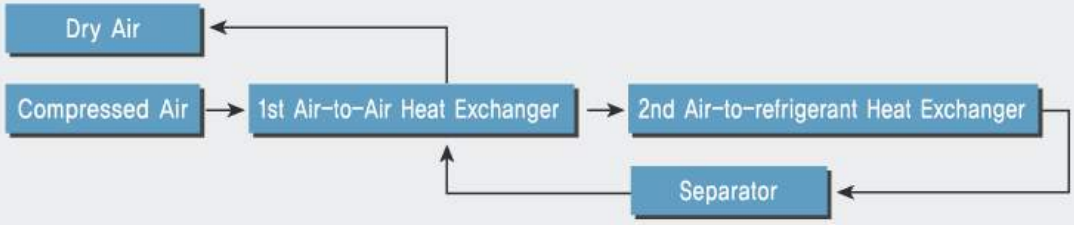
Dew point drop using freezing cycle
Direct heat exchanging makes it more efficient, which is why heat efficiency is 5~10% higher.

Most economical
The initial investment cost is low as the number of component parts are relatively small.

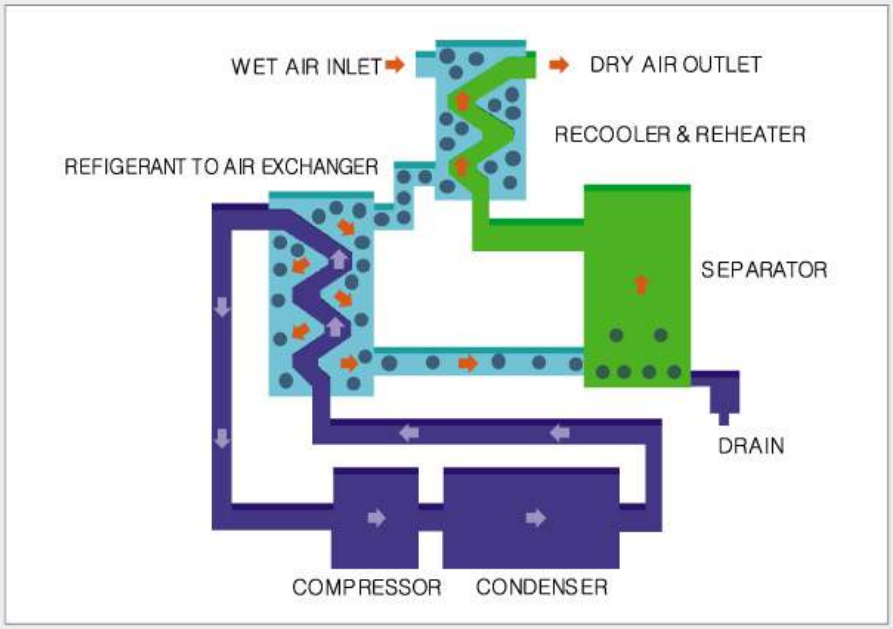
Ensures low dew point at all times
As expansion valve combiness with hot gas by-pass valve to cope with load variations.

Separator
It separates condensed water in 100% by generating the centrifugal force in the use of aerodynamic vane in min. 5 steps and enlarging the inner volume.





- 2,000 to 30,000 SCMH (1,177 to 17,657 SCFM)
- Pressure Dew Point over 4℃ (39.2℉)
- ISO Compressed Air Purity Class 4



Operating Diagrams of RCD type

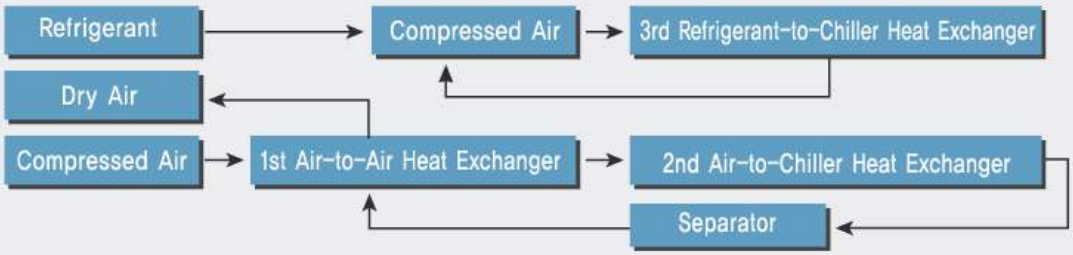
RCI Series - REFRIGERATION WATER CHILLER TYPE

Dew point drop using freezing cycle
RCI type declines the temperature of compressed air by exchanging heat between chiller that was exchanged in heat with evaporator of freezer and compressed air

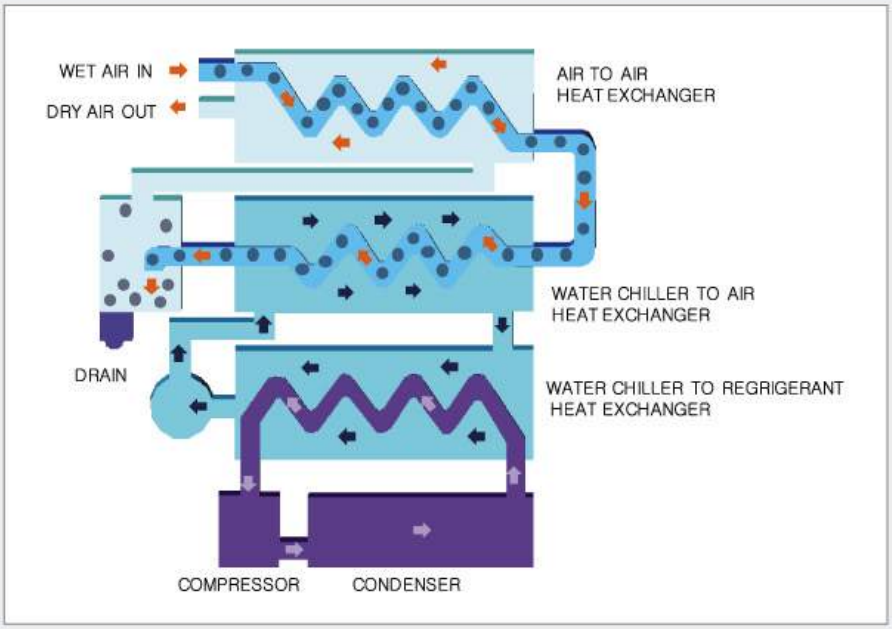
It is strong to load variation
Stable operation is available since freezer is indirectly affected by flux variation (Load variation) by exchanging heat between chiller and compressed air

Dew point : 4℃ at pressure
Dew point under 4° at pressure cannot be obtained due to condensed water freezing since the temperature of compressed air is declined using freezing cycle

Separator
It separates condensed water in 100% by generating the centrifugal force in the use of aerodynamic vane in min. 5 steps and enlarging the inner volume



- 2,000 to 30,000 SCMH (1,177 to 17,657 SCFM)
- Pressure Dew Point over 4℃ (39.2℉)
- ISO Compressed Air Purity Class 4



Operating Diagrams of RCI type

RCD/RCI Series - REFRIGERATION WATER CHILLER TYPE SPECIFICATIONS

RCD Series AIR DRYER Specifications

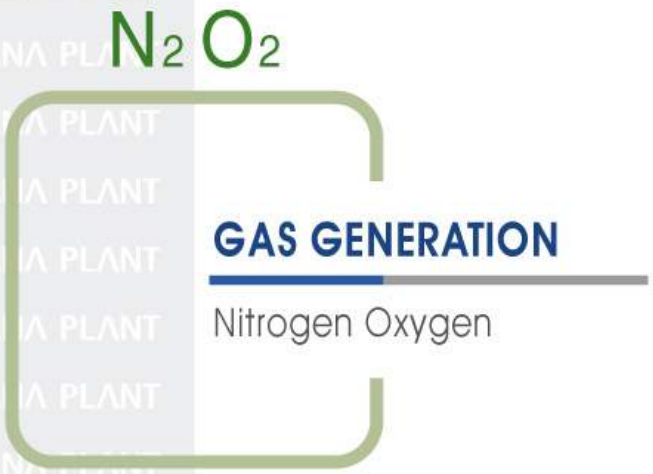
MODEL NUMBER	FLOW RATE		IN / OUT CONNECTIONS		DESICCANT		COOLING WATER		OVERALL DIMENTIONS						TOTAL WEIGHT	
									LENGTH		WIDTH		HEIGHT			
	SCMH	SCFM	(mm)	(in)	(kg/Tower)	(lb/Tower)	SCMH	SCFM	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
RCD-2000	2,000	1,177	80A	3	7.5	17	5	3	1,270	50	670	26	1,160	46	450	992
RCD-2500	2,500	1,471	100A	4	7.5	17	5	3	1,270	50	670	26	1,160	46	600	1,322
RCD-3000	3,000	1,766	100A	4	15	33	8	5	1,600	63	1,150	45	1,700	67	650	1,433
RCD-3500	3,500	2,060	100A	4	15	33	8	5	1,600	63	1,150	45	1,700	67	750	1,653
RCD-3800	3,800	2,237	125A	5	15	33	8	5	1,600	63	1,150	45	1,700	67	750	1,653
RCD-4400	4,400	2,590	125A	5	15	33	8	5	1,600	63	1,150	45	1,700	67	780	1,719
RCD-4800	4,800	2,825	125A	5	15	33	8	5	1,800	71	1,400	55	1,750	69	950	2,094
RCD-5500	5,500	3,237	150A	6	20	44	10	6	2,600	102	1,400	55	2,400	94	1,500	3,306
RCD-6900	6,900	4,061	150A	6	30	66	17	10	2,700	106	1,400	55	2,600	102	2,200	4,849
RCD-7500	7,500	4,414	150A	6	30	66	17	10	2,700	106	1,400	55	2,600	102	2,350	5,179
RCD-8700	8,700	5,121	200A	8	30	66	17	10	2,800	110	1,400	55	2,650	104	2,700	5,951
RCD-10800	10,800	6,357	200A	8	30	66	22	13	2,800	110	1,400	55	2,650	104	2,900	6,392
RCD-13000	13,000	7,652	200A	8	30	66	22	13	3,000	118	1,600	63	2,950	116	3,200	7,053
RCD-15000	15,000	8,829	250A	10	40	88	28	16	3,200	126	1,700	67	3,000	118	3,600	7,934
RCD-17000	17,000	10,006	250A	10	40	88	28	16	3,200	126	1,700	67	3,000	118	4,200	9,257
RCD-22000	22,000	12,949	300A	12	60	132	41	24	3,600	142	2,000	79	3,000	118	5,800	12,783
RCD-25000	25,000	14,714	300A	12	60	132	41	24	4,000	157	2,200	87	3,000	118	6,200	13,665
RCD-30000	30,000	17,657	300A	12	80	176	56	33	4,500	177	2,400	94	3,000	118	8,500	18,734

RCI Series AIR DRYER Specifications

MODEL NUMBER	FLOW RATE		IN / OUT CONNECTIONS		DESICCANT		CHILLING WATER		COOLING WATER		OVERALL DIMENTIONS						TOTAL WEIGHT	
											LENGTH		WIDTH		HEIGHT			
	SCMH	SCFM	(mm)	(in)	(kg/Tower)	(lb/Tower)	SCMH	SCFM	SCMH	SCFM	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
RCI-2000	2,000	1,177	80A	3	7.5	17	4	2	5	3	1,500	59	950	37	1,350	53	600	1,322
RCI-2500	2,500	1,471	100A	4	10	22	4	2	5	3	1,500	59	950	37	1,350	53	780	1,719
RCI-3000	3,000	1,766	100A	4	15	33	7	4	8	5	1,800	71	1,350	53	1,900	75	900	1,984
RCI-3500	3,500	2,060	100A	4	15	33	7	4	8	5	1,800	71	1,350	53	1,900	75	1,000	2,204
RCI-3800	3,800	2,237	125A	5	15	33	7	4	8	5	1,800	71	1,350	53	1,900	75	1,000	2,204
RCI-4400	4,400	2,590	125A	5	15	33	7	4	8	5	1,800	71	1,400	55	1,900	75	1,180	2,601
RCI-4800	4,800	2,825	125A	5	20	44	8	5	10	6	1,800	71	1,600	63	1,950	77	1,450	3,196
RCI-5500	5,500	3,237	150A	6	30	66	14	8	17	10	2,000	79	1,700	67	2,650	104	2,000	4,408
RCI-6900	6,900	4,061	150A	6	30	66	14	8	17	10	2,900	114	1,800	71	2,800	110	2,600	5,730
RCI-7500	7,500	4,414	150A	6	30	66	14	8	17	10	3,000	118	1,800	71	2,800	110	2,850	6,281
RCI-8700	8,700	5,121	200A	8	30	66	14	8	17	10	3,000	118	1,800	71	2,800	110	3,200	7,053
RCI-10800	10,800	6,357	200A	8	30	66	19	11	22	13	3,200	126	1,800	71	2,800	110	3,500	7,714
RCI-13000	13,000	7,652	200A	8	40	88	24	14	28	16	3,500	138	2,000	79	3,000	118	4,000	8,816
RCI-15000	15,000	8,829	250A	10	40	88	24	14	28	16	3,700	146	2,400	94	3,100	122	5,000	11,020
RCI-17000	17,000	10,006	250A	10	50	110	29	17	35	21	4,000	157	2,400	94	3,100	122	6,000	13,224
RCI-22000	22,000	12,949	300A	12	60	132	34	20	41	24	4,200	165	2,600	102	3,200	126	7,400	16,310
RCI-25000	25,000	14,714	300A	12	80	176	37	22	56	33	4,500	177	2,800	110	3,200	126	8,600	18,954
RCI-30000	30,000	17,657	350A	14	80	176	37	22	56	33	5,000	197	3,000	118	3,200	126	10,000	22,040

■ NOTE

- For more conditions, please contact us
- Dimensions are subject to the change. Please contact us for the certified drawings.
- The applied code is KS/JIS or ANSI with Flange at 10K (ANSI 150LB)
- Total weight includes desiccants

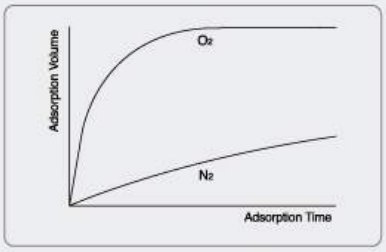

N_2 O_2
GAS GENERATION
Nitrogen Oxygen

HRK/HY/HVN Series PSA -PRESSURE SWING ADSORPTION TYPE

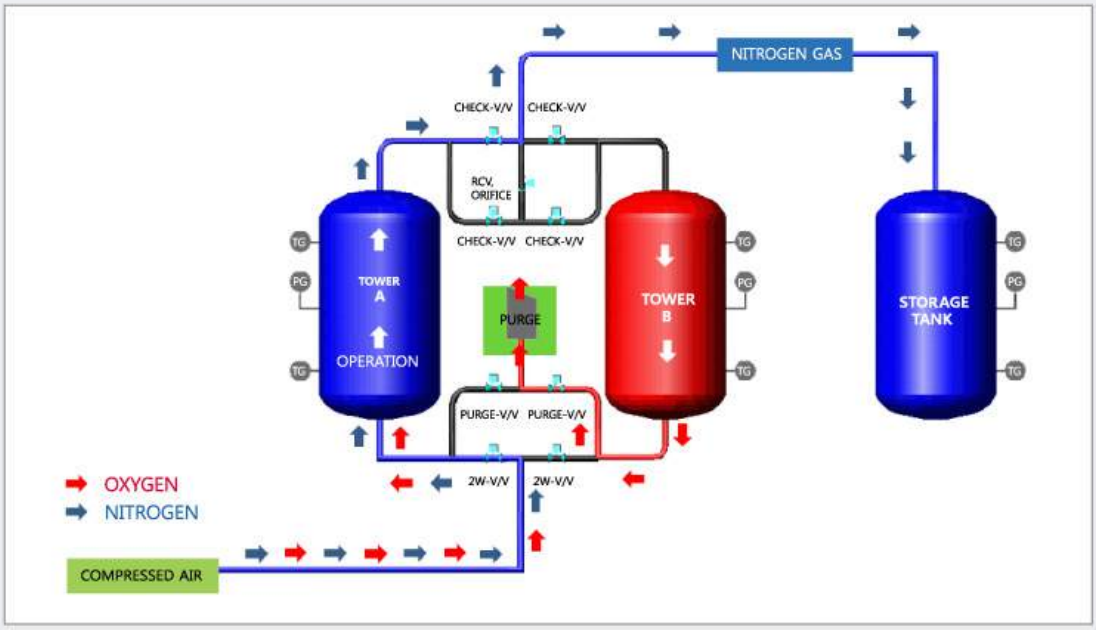
Best Suit Your Needs

Nitrogen generators based on adsorption technology offer a most effective alternative to other modes of supply. HANAPLANT is the leading manufacturer of PSA (Pressure Pressure Swing Adsorption)type of Nitrogen generator in Korea and have developed from the technical agreement in Korea market with Kuraray Chemical Japan. The intensive research and development efforts have made possible the high purity nitrogen gas separation directly from the air.

Carbon Molecular Sieve



Characteristic of CMS



Operating Diagrams of Nitrogen Gas Generation

The Principle of PSA

CMS(Carbon Molecular Sieve) is a main stream adsorbent for PSA system nitrogen generators. It is a differential diffusion rate system based on the fact that the oxygen molecular is smaller than the nitrogen molecule. A special CMS adsorbs oxygen gas, carbon dioxide gas, moisture and so on in compressed air in a shot period of time and compressed nitrogen gas is obtained at the outlet.

When the pressure is decreased to the atmospheric or vacuum level, CMS, which has adsorbed oxygen gas and others, easily desorbs them and is regenerated.

When the above, two operations are done alternately between two adsortion columns, nitrogen gas can be separated continuously from the air.

HRK/HY/HVN Series PSA -PRESSURE SWING ADSORPTION TYPE

■ Features of Nitrogen Generator

On-Site Self - Nitrogen generation

Producing nitrogen in high degree of purity by simple operation without purchasing liquid nitrogen in high price and manufacture container.

Reducing energy expenses using CMS in high degree of purity

Available for selecting the high degree of purity and capacity of nitrogen to meet customer's specification. Also system can be self-operated.

Applications of Nitrogen

- **Chemical Process :** Cleaning of tank and container, pressure testing of piping, inactive atmosphere in storage tank and container.
- **Heat Treatment :** Inactive atmosphere in het treatment, annealing of iron and non-metal.
- **Process of food package and the storage :** Process of food packaging, fruit transportation, CA storage.
- **Paint and Coating :** Chemical reaction (polymerization) prevention, packaging.
- **Rubber :** Packaging , preservation, and production of the fire.
- **Medical supplies :** Product container charging, packaging, chemical products carrying.
- **Handling of raw materials and the storage :** Prevention of explosion due to dust in silo and warehouse.

HRY Series Nitrogen Generator Specifications

MODEL NUMBER	FLOW RATE		POWER			OVERALL DIMENTIONS						TOTAL WEIGHT	
			AIR COM.P	AIR DRYER	PSA UNIT	LENGTH		WIDTH		HEIGHT			
	SCMH	SCFM	(kW)	(kW)	(kW)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
HRY-15	20	12	15	0.72	0.5	2,270	89	850	33	2,135	84	1,600	3,526
HRY-22	30	18	22	0.88	0.5	2,900	114	1,050	41	2,335	92	1,900	4,188
HRY-30	40	24	30	1.30	0.5	2,900	114	1,050	41	2,335	92	2,200	4,849
HRY-37	50	29	37	1.60	0.5	3,125	123	1,200	47	2,500	98	2,500	5,510

HY Series Nitrogen Generator Specifications

MODEL NUMBER	FLOW RATE		POWER			OVERALL DIMENTIONS						TOTAL WEIGHT	
			AIR COM.P	AIR DRYER	PSA UNIT	LENGTH		WIDTH		HEIGHT			
	SCMH	SCFM	(kW)	(kW)	(kW)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
HY-60 P	60	35	45	2.1	0.5	3,000	118	1,600	63	2,450	96	2,500	5,510
HY-75 P	75	44	55	2.1	0.5	3,700	146	1,900	75	2,650	104	3,100	6,832
HY-100 P	100	59	75	2.3	0.5	4,000	157	2,100	83	3,100	122	4,200	9,257
HY-150 P	150	88	110	3.0	0.5	4,500	177	2,300	91	3,820	150	6,300	13,885
HY-200 P	200	118	150	5.1	0.5	5,200	205	2,600	102	3,900	154	8,400	18,514
HY-250 P	250	147	185	8.5	0.5	5,400	213	2,600	102	4,100	161	10,500	23,142
HY-300 P	300	177	225	8.5	0.5	5,600	220	2,710	107	4,210	166	12,600	27,770
HY-350 P	350	206	260	8.5	0.5	5,800	228	3,100	122	4,450	175	14,700	32,399
HY-400 P	400	235	300	9.6	0.5	6,100	240	3,300	130	4,700	185	16,800	37,027
HY-500 P	500	294	375	16.0	0.5	6,400	252	3,400	134	4,900	193	21,000	46,284
HY-600 P	600	353	450	16.0	0.5	6,700	264	3,500	138	5,100	201	25,000	55,100

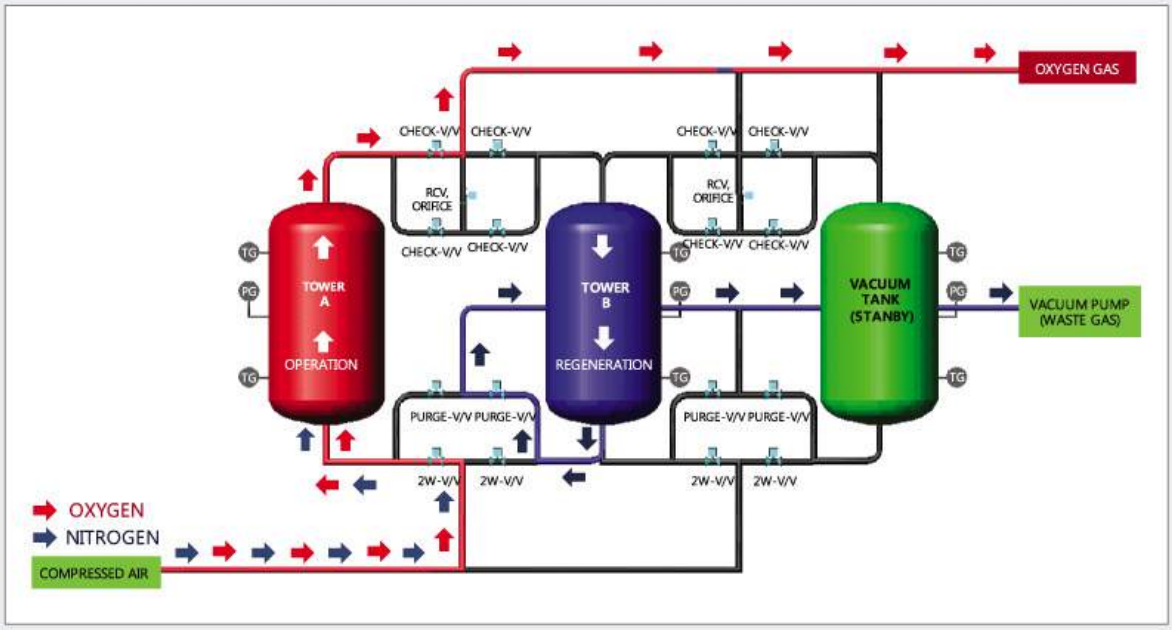
■ NOTE

- For more conditions, please contact us
- Dimensions are subject to the change. Please contact us for the certified drawings.
- The applied code is KS/JIS or ANSI with Flange at 10K (ANSI 150LB)
- Total weight includes desiccants

HVO Series VPSA -VACUUM PRESSURE SWING ADSORPTION TYPE

Best Suit Your Needs

Oxygen generators based on adsorption technology offer a most effective alternative to other modes of supply. HANAPLANT is the leading manufacturer of VPSA (Vacuum Pressure Swing Adsorption)type of Oxygen generator.
The intensive research and development efforts have made possible the oxygen gas separation directly from the air.



Operating Diagrams of Oxygen gas generation

OXYGEN GENERATOR (VACUUM PRESSURE SWING ADSORPTION)

- Oxygen Generator system can be supplied by customer's requirement
- It is possible up to 1,200 SCMH (706.3 SCFM)
- Purity : Over 90%

HVO Series AIR DRYER Specifications

O_2 PURITY	PRODUCTIVITY		PRESSURE		BLOWER MOTOR	VACUUM PUMP	OVERALL DIMENTIONS					
							LENGTH		WIDTH		HEIGHT	
%	SCMH	SCFM	bar	psi	(kW)	(kW)	(mm)	(in)	(mm)	(in)	(mm)	(in)
90	146	86	0.1~0.3	1.5~4.4	59	61	2,270	89	850	33	2,135	84
	292	172	0.1~0.3	1.5~4.4	88	122	2,900	114	1,050	41	2,335	92
	583	343	0.1~0.3	1.5~4.4	176	244	2,900	114	1,050	41	2,335	92
	875	515	0.1~0.3	1.5~4.4	294	366	3,125	123	1,200	47	2,500	98

■ NOTE

- For more conditions, please contact us
- Dimensions are subject to the change. Please contact us for the certified drawings.
- The applied code is KS/JIS or ANSI with Flange at 10K (ANSI 150LB)
- Total weight includes desiccants

Gas Liquid

GAS & LIQUID DEHYDRATION

Natural Gas
Chemical Gas
Chemical Liquid

GAS & LIQUID DEHYDRATOR

Best Suit Your Needs

Gas & Liquid Dehydrator remove the moisture from gas and liquid that is based on adsorption technology and used PSA or VPSA system.
HANAPLANT is the front-running manufacturer of TSA/PSA/VPSA type of dehydrator.
The intensive research and development efforts have made possible the high degree of dehydrator system from customers needs and variable environment.

■ Gas Dehydrator

H_2 Gas Dehydrator
- 100 SCMH (58.9 SCFM)
- Pressure Dew point -40℃ (-40℉)

CO_2 Gas Dehydrator
- 9,000 SCMH (5,297.2 SCFM)
- Dew point -72℃ at ATM (-97.6℉)

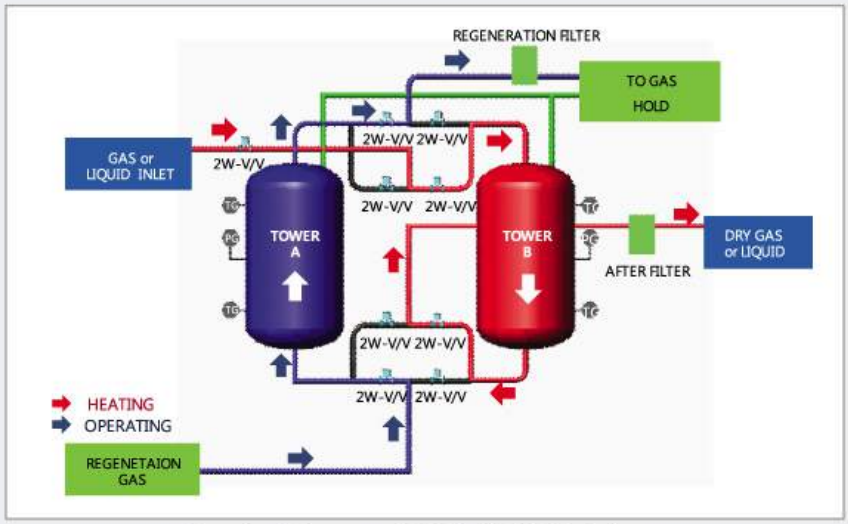
Natural Gas Dehydrator
- 2,435 SCMH (1,422.2 SCFM)
- Pressure Dew point -80℃ (-112℉)

H_2S Gas Dehydrator
- 600 SCMH (353 SCFM)
- Pressure dew point -40℃ (-40℉)

Off-gas Dehydrator
- 275,000 CMH (29.4 to 294.3 SCFM)
- Purity : 99.999~99.9999 %

■ Liquid Dehydrator

IPA Dehydrator
- 5,000 SCMH (2,942.9 SCFM)
- Purity 30 ppm (wt.)



Operating Diagrams of GAS & LIQUID Dehydrator

※ All of Gas & Liquid Dehydrator can be supplied by customer's requirement

Accessory

ACCESSORY

Cooler / Heater
Filter / Desiccant

COOLER

Regeneration Cooler

Regeneration cooler based on shell and tube heat exchanger. It is built of round tubes mounted in large cylindrical shells with the tube axis parallel to that of the shell. Also it is widely used as gas cooler, condenser and chemical process.

Regeneration Cooler Specifications

- 250 bar (3,626 psi)
- Max. 1,000 kW (3,414,425 BTU/hr)

HEATER

Heater

Air Heater converts electrical energy into heat. The heating element consist of electrical resister and work on the principle of Joule heating.
It's shape and basic operation is similar to that of most shell and tube heat exchanger.

Heater Specifications

- 250 bar (3,626 psi)
- Max. 1,000 kW (3,414,425 BTU/hr)

FILTER / SEPARATOR

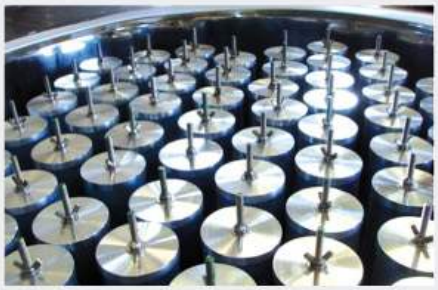
Filter

- Pre Filter

It filters out moisture, particles and substances from after cooler and/ or separator to prevent contamination of desiccant.

- After Filter

It filters out particles from desiccant and substances in the product line



Separator

It separates condensed water in 100% by generating the centrifugal force in the use of aerodynamic vane in Min. 5 steps and enlarging the inner volume.

Pre - Filter & After - Filter Specifications

- 100 to 45,000 SCMH (59 to 26,486 SCFM)
- Maximum number of Particles per ㎥
  [100 to 1,000,000 (0.1 ~ 0.5 micron)]
- Total oil : 0.01 to 0.1 ㎎/㎥
- ISO Compressed air purity class : 1 ~ 2

Silica-Gel

- In case of low inlet temperature and high degree of relative humidity increase adsorption capacity.
- Lower energy usage for regeneration
- Regeneration temperature range : 100 ~ 200℃
- Dew point : -70℃

ITEM	PROPERTIES
Component	SiO_2 (97%) : Al_2O_3 (3%)
Color/Shape	Yellow / Bead
Pore Diameter	25 Å
Total Pore Volume	400~500 ㎡/kg
Size	Ø 3.5 ~ 4.5
Crush Strength	13 kgs
Bulk Density	700 kg/㎥
Surface Area	650 ㎡/g
Critical Temp.	250 ℃

Activated Alumina

- The material have good pore distribution and high surface area
- That have a good compressive strength, when water contact
- Regeneration temperature range : 150 ~ 250℃
- Dew point : -70℃

ITEM	PROPERTIES
Component	Al_2O_3(93.1%) SiO_2(0.02%)
Color/Shape	White / Bead
Pore Diameter	20 Å
Total Pore Volume	400~500 ㎡/kg
Size	Ø 4.8
Crush Strength	25 kgs
Bulk Density	770 kg/㎥
Surface Area	355 ㎡/g
Critical Temp.	650 ℃

Molecular Sieve

- The material of MS have high adsorption capacity without reference to relative humidity
- The adsorption capacity lightly decrease when the inlet temperature is high
- Regeneration temperature range : 200 ~ 300℃
- Dew point : -80℃

ITEM	PROPERTIES
Component	$Na_{12}[(AlO_2)_{12}(Sio_2)_{12}](27\sim30)H_2O$
Color/Shape	Yellow / Bead
Pore Diameter	4 ~10 Å
Total Pore Volume	㎡/kg
Size	Ø 3.6
Crush Strength	9 kgs
Bulk Density	670 ~ 720 kg/㎥
Surface Area	480 ㎡/g
Critical Temp.	600 ℃

Adsorption Model No. List

APPLICATION	AIR DRYER		GAS & LIQUID DRYER		N_2 PSA GENERATOR
	AIR DRYER	HMD			
Model No.	HNA-200 HNA-200	HNS-205	HNM-03Z HNM-03C HNM-03U	HNM-04Z HNM-04C HNM-04U	HNG-15H HNG-220

Technical Data

TECHNICAL DATA

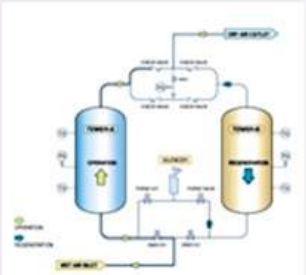
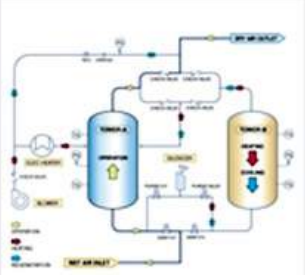
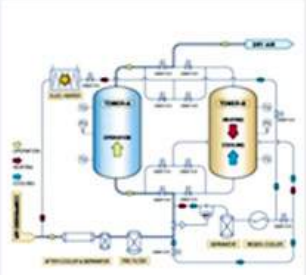
AIR DRYER
Compare & Selection

COMPARISON OF ADSOPTION TYPE AIR DRYER

Comparison Table of AIR DRYER in Adsorption type and Freezing type

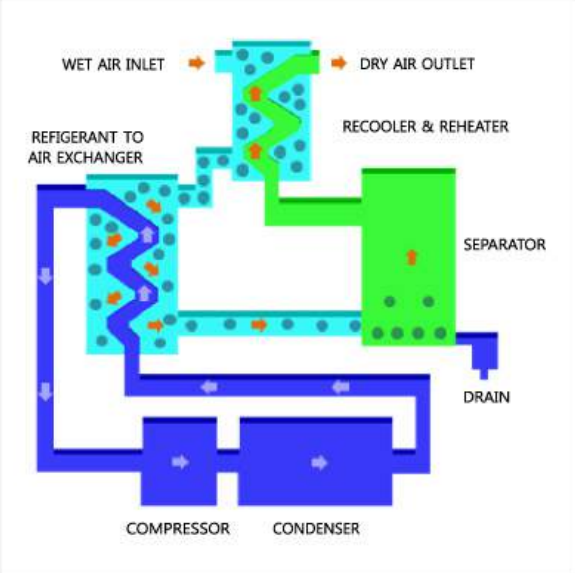
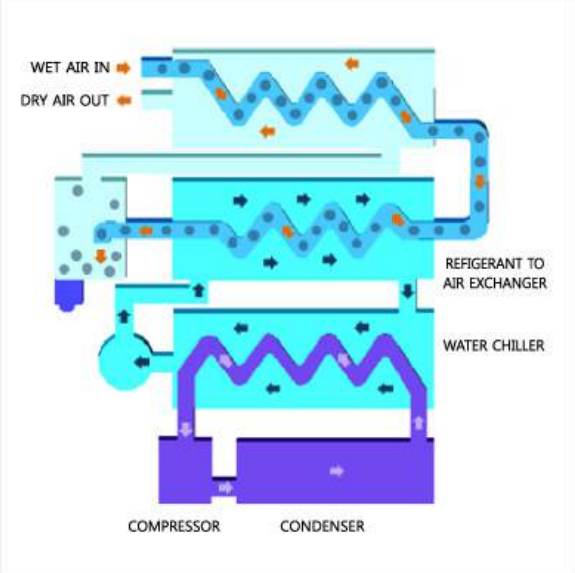
	DESICCANT TYPE AIR DRYER	COMPARISON TABLE AIR DRYER
Operation principal	Moisture adsorption by affinity of adsorptions	Moisture condensation due to temperature decrease of compressed air
Operation steps	A- tower adsorption, B-tower regeneration tower change B-tower adsorption, A-tower regeneration	Primary cooling at the primary heat exchanger Cooling by freezer at the secondary heat exchanger Reheating at the primary heat exchanger
Outlet dew point	-20℃ to -80℃ at pressure (@ 7.0 bar)	+4℃ (@ 7 bar)
Outlet temperature pressure loss	Inlet temperature +Max. 10 ℃	Inlet temperature x 1/2 ℃
	0.3 bar	0.3 bar
Unit structure	Simple	Complicated (Freeze)
Merit	Low outlet dew point (Small operation expenses)	Small initial investment cost
Demerit	Comparably high investment cost (Comparatively high operation expenses)	High outlet dew point

Comparison Table of AIR DRYER with in Adsorption type

	HEATLESS	HEATER PURGE	BLOWER HEATER PURGE	HEATER NON-PURGE W/COMPRESSED AIR
FLOWDIAGRAM				
MERIT	- Suitable for small capacity (1000 SCMH). - Suitable for the place where operation and stopping(loading variation) are frequent. - Small installation area due to small size. - Simple installation without heat source and cooling water.	- Supplying air in good quality with low dew point. - Usable for the most capacity Favorable for dew point and operation expenses compared to heatless type.	- Dry air is not necessary for heating since it is replaced with blower in the use of ambient air (Dry air is necessary for cooling). - Lower operation expenses than heater purge.	- The lowest driving expenses. - Uses much smaller heater with using compressed heat from compressor. - No air loss with the closed circuit of air flow Suitable for middle and large capacity. - Simple control than the other types and less fault factor in several sections.
DEMERIT	- Higher driving expense due to lots of air loss. - Air loss is Approx. 12%	- Structure is much or less complicated than heatless type and heat source(Electricity, steam) is needed. - Air loss Approx. 8%	- There is a possible trouble of moving parts in the blower than heater purge type. - Installation area more or less big. Air loss Approx. 4% - Taking an action in breakdown is - difficult since it is complicated in control system.	- Cooling water needed compared to the other types.

COMPARISON OF REFRIGERATION TYPE AIR DRYER

Comparison Table of Air Dryer with in Refrigeration type

	RCD (DIRECT EXPANSION TYPE)	RCI (WATER CHILLER TYPE)
		
MERIT	- Heat efficiency is higher over 5~10%, it is slightly high since heat transmission is directly made to air by the expansion of refrigerant. - Manufacture cost is lower about 30%, it is lower since the configuration parts is less. - Installation area is small	- Setting dew point final cooling temperature never get worse as the temperature of chiller can be maintained in the fixed degree in no relation to load variation for the fixed dew point maintenance. - It is suitable for middle and capacity (10,000 Nm^3/hr). There is no problem in the capability of heat exchange of Air to Water even if heat exchanger is bigger.
DEMERIT	- It cannot be used at the place where big load variation exists. - Refrigerant is not frozen only if refrigerant must be phase changed from liquid to gas in air to refrigerant heat exchanger. - In case of small load, therefore, freezing phenomenon occurs since refrigerant is not changed to gas and remained liquid by not being exchanged in heat so it may damaged freezing compressor because oil is not circulated due to that reason. - Of course there is Hot Gas Bypass V/V to prevent such phenomenon by mixing liquid and gas in a part being followed by load variation in preparation for such case, but it cannot be relied 100% - It is not suitable for middle and large capacity (10,000Nm^3/hr) Heat exchanger is bigger in middle and large capacity, so appropriate load variation becomes more difficult. In the event, the possible of refrigerant freezing is heightened.	- Heat efficiency is higher over 5~10% cooling efficiency is slightly lower as refrigerant is not exchanged in heat with Air and Chiller circulation circuit is added. - Manufacture cost is higher about 30%, total manufacture cost is higher since the manufacture section of chiller circulation circuit is added - Installation area is completely high since chiller circulation circuit is added.

COMPARISON CHART

CAPA	OPERATING PRESS.	OPERATING HOURS		COMP' FLOWRATE/HP	
8711 scmh	114 psi	24 hrs/day	365 days/year	4.21	Scfm

ELECTRICITY	AIR	COOLING WATER	△P	COMP' R-RATE	COMP' EXCESS
0.065 $/kW	0.013 $/ft³	0.105 $/ft³	0.99561 psi	75 %	7.11 %

		HEATLESS	HEATER PURGE	BLOWER HEATER PURGE	HEATER NON PURGE W/COMP' HEAT
Design Condition	Capacity	8,711 Scfm	8,711 Scfm	8,711 Scfm	8,711 Scfm
	Operating Pressure	113.8 psi	113.8 psi	113.8 psi	113.8 psi
	Dew Point	-148 ℉@atm	-148 ℉@atm	-148 ℉@atm	-148 ℉@atm
	Operation Time Per Year	8,760 hrs	8,760 hrs	8,760 hrs	8,760 hrs
	Hot Air Temp.	0.0 ℃	0.0 ℃	0.0 ℃	110.0 ℃
Time Condition	Cycle Time	10.0 min	8.0 hrs	8.0 hrs	8.0 hrs
	Drying Time	5.0 min	4.0 hrs	4.0 hrs	4.0 hrs
	Heating Time	4.5 min	2.0 hrs	2.0 hrs	2.0 hrs
	Cooling Time	0.5 min	2.0 hrs	2.0 hrs	2.0 hrs
	Compressor	1,400.0 kW	1,400.0 kW	1,400.0 kW	1,400.0 kW
Desiccants	Weight(kg/2-Towers)	12,761 lb	17,015 lb	17,015 lb	17,015 lb
	Kind of Desiccant	AL or NS-10 or MS	AL or NS-10 or MS	AL or NS-10 or MS	AL or NS-10 or MS
	Life Time	4 years	4 years	4 years	4 years
Energy Use	Air Loss	20 %	12 %	6 %	0 %
	Air Loss	1,742 Scfm	1,045 Scfm	523 Scfm	0 Scfm
	Electric Heater Capa.	0.0 kW	180.0 kW	250.0 kW	180.0 kW
	Cooling Compressor	0.0 kW	0.0 kW	0.0 kW	0.0 kW
	Blower	0.0 kW	0.0 kW	37.0 kW	0.0 kW
	Pressure Drop	0.0207 psi	0.0207 psi	0.0207 psi	0.0276 psi
	Cooling Water	0.0 ㎥/hr	0.0 ㎥/hr	0.0 ㎥/hr	25.0 ㎥/hr
Operation Fee	Air Loss	198,401	119,040	59,520	0
	Electric Heater	0	51,246	71,175	51,246
	Cooling Compressor	0	0	0	0
	Blower	0	0	10,534	0
	Pressure Drop	1,308	1,308	1,308	1,744
	Cooling Water	0	0	0	22,995
	Running Cost	**199,709**	**171,594**	**142,537**	**75,985**
	Cost Saving vs Heatless		**28,114**	**57,172**	**123,724**
Investment Cost	Dryer Price				250,000
	Compressor option				1,200
Additional Cost	Hot air piping				5,000
	CW piping				10,000
	Maintenance				30,000
Total Cost					296,200

CERTIFICATION

REFERENCE

S-OIL N_2 RE-FINERY SYSTEM

LG INNOTECH N_2 GENERATOR

TUPRAS AIR DRYER

HYUNDAI POWERTECH AIR DRYER

RAS LAFFAN AIR DRYER

SK CHEMICAL N_2 DRYER

SONGWON INDUSTRY IBL SYSTEM

DOOSAN INDUSTRY H_2 PURIFY

SAMSUNG TECHWIN AIR DRYER

DAELIM Air Dryer

ISU CHEMICAL IPA DRYER

HANA PLANT

HANA PLANT

#609-15, Yodang-ri, Yanggam-myun, Hwasung-City,
Kyunggi-do, KOREA
Tel : 82-31-354-3193~7 Fax : 82-31-354-3198
E-mail : handry@dryair.co.kr
www.hanaplant.co.kr

www.hanaplant.co.kr

BHNP Air Dryer

THE ULTIMATE IN ENERGY SAVING

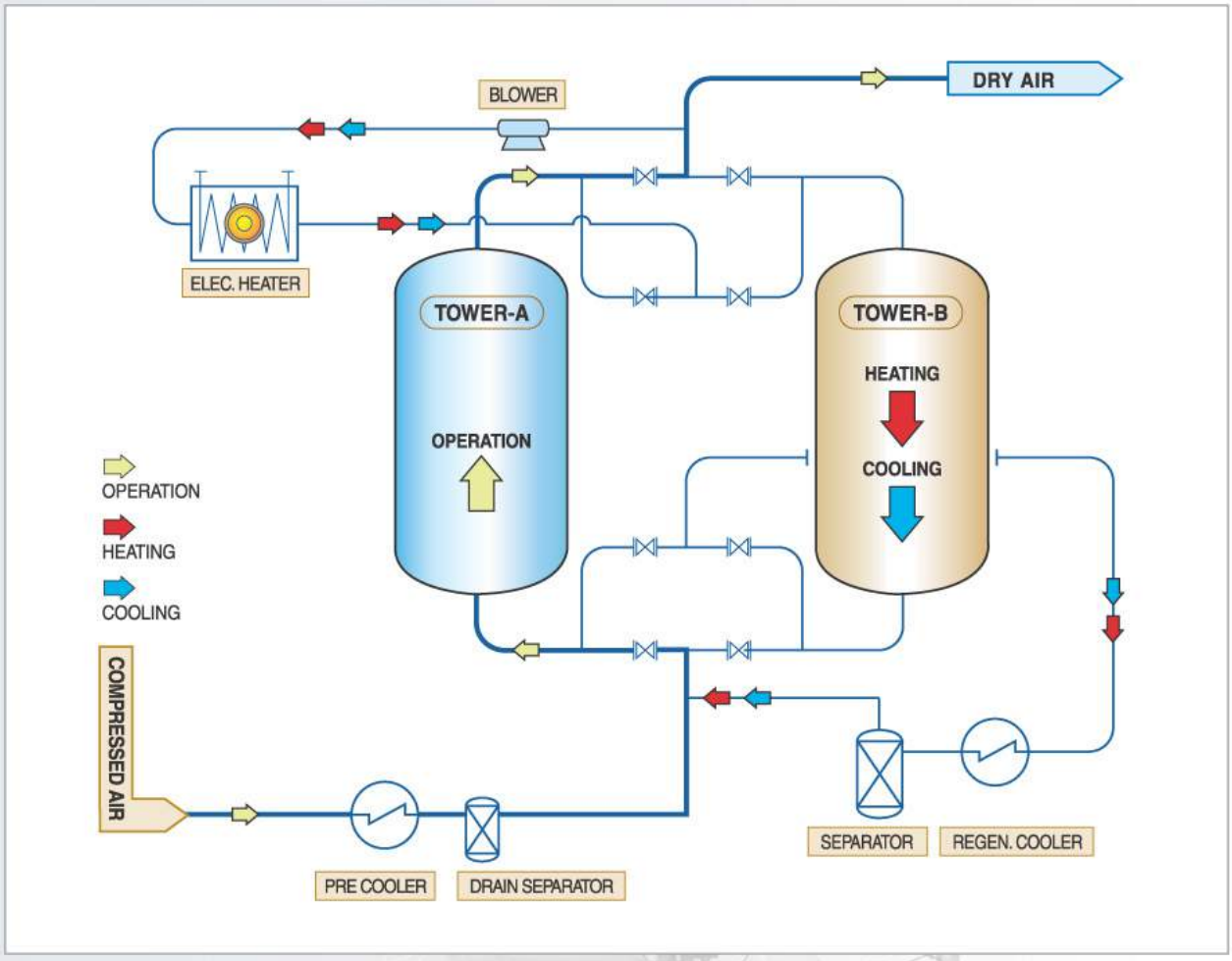
HANA PLANT

113-15, Seohae-ro, Yanggam-myun,
Hwaseong-si, Gyeonggi-do, 445-935, KOREA
Tel : +82-31-354-3193 Fax : +82-31-354-3198

BHNP SERIES

BOOSTER BLOWER HEATER NON PURGE TYPE WITH “0%” PURGE LOSS

Flow Diagram



BHNP - Features

- High turn down ratio (0~100%)
- Low pressure drop boosted by booster blower
- No dew point spike system
- Achievable dew point as low as -110℃ for high purity application, such as the, semiconductor industry
- The most energy efficient design with zero purge loss

We always try to be the best!

HANA PLANT

BHNP SERIES

BOOSTER BLOWER HEATER NON PURGE TYPE WITH "0%" PURGE LOSS

Comparison Table of Operation Cost

		HEATLESS	HEATER PURGE	BLOWER HEATER PURGE	BLOWER HEATER NON PURGE
Design Condition	Capacity	15,000CMH	15,000CMH	15,000CMH	15,000CMH
	Operating Pressure	8kg/cm²	8kg/cm²	8kg/cm²	8kg/cm²
	Dew Point	-40℃~-70℃	-40℃~-110℃	-40℃~-100℃	-40℃~-110℃
	Operation Time Per Year	8,760hrs	8,760hrs	8,760hrs	8,760hrs
Desiccants	Weight(kg/2-Towers)	6000kg	6000kg	6000kg	6000kg
	Kind of Desiccant	AL or NS-10 or MS	AL or NS-10 or MS	AL or NS-10 or MS	AL or NS-10 or MS
	Life Time	4years	4years	4years	4years
Operation	Air Loss	15%	10%	5%	0%
	Electric Heater(kW/year)	0	105kW	200kW	105kW
	Blower(kW)	0	0	37.5kW	11kW
	Pressire Drop	0.3	0.3	0.3	0.3
	Cooling Water	0	0	0	22x8760x25=4,818,000
	Running Cost	197,100,000	171,641,250	115,659,340	51,804,450
	Cost Saving vs Heatless	-	25,458,750/year	81,440,660/year	145,295,550/year

BHNP Series General Specifications

Model No.	Flow Rate		In/Out Connection		Desiccant		Blower 유량		재생 유량	Electric Heater		Cooling Water
	CMH	CFM	mm	Inch	kg/Tower	lb/Tower	CMH	kW	Nm³/Hr	Max. Temp	kW	SCMH
BHNP-3500	3500	2060	100A	4	722 / 180	1591 / 397	118 / 31	5.5 / 3.7	926 / 242	150~180℃	37 /12	6
BHNP-5500	5500	3237	150A	6	1134 / 283	2500 / 624	183 / 38	7.5 / 5.5	1442 / 329	150~180℃	58 / 16	7
BHNP-7000	7000	4120	150A	6	1443 / 360	3181 / 794	233 / 54	11 / 5.5	1833 / 416	150~180℃	73 / 20	10
BHNP-10000	10000	5886	200A	8	2062 / 514	4546 / 1133	331 / 81	11 / 5.5	2610 / 588	150~180℃	104 / 29	14
BHNP-12000	12000	7063	200A	8	2474 / 617	5454 / 1360	397 / 98	15 / 5.5	3129 / 705	150~180℃	125 / 35	18
BHNP-15000	15000	8829	250A	10	3093 / 772	6819 / 1702	497 / 109	18.5 / 5.5	3913 / 884	150~180℃	156 / 43	22
BHNP-18000	18000	10595	250A	10	3712 / 926	8184 / 2041	597 / 136	22 / 7.5	4700 / 1064	150~180℃	187 / 52	24
BHNP-20000	20000	11772	250A	10	4124 / 1029	9092 / 2269	663 / 164	22 / 7.5	5224 / 1184	150~180℃	208 / 58	30
BHNP-25000	25000	14715	300A	12	5155 / 1286	11365 / 2835	829 / 183	30 / 7.5	6531 / 1486	150~180℃	260 / 73	35
BHNP-30000	30000	17658	300A	12	6186 / 1543	13638 / 3402	996 / 219	30 / 11	7844 / 1791	150~180℃	313 / 88	40
BHNP-35000	35000	20600	350A	14	7217 / 1801	15911 / 3970	1158 / 233	30 / 11	9122 / 2084	150~180℃	364 / 102	50
BHNP-40000	40000	23543	350A	14	8248 / 2058	18184 / 4537	1325 / 331	37 / 11	10440 / 2394	150~180℃	416 / 117	60

※ Model No. Indicates CMH capacity at 40℃ / 15℃, 8kg/cm², inlet condition other specifications, contact us

Certificates

We always try to be the best!

"Best quality is best service"

"Share TECHNOLOGY with ECO Friendly"

HANA PLANT

HANA PLANT
113-15, Seohae-ro, Yanggam-myun, Hwaseong-si, Gyeonggi-do, 445-935, KOREA
Tel : +82-31-354-3193 Fax : +82-31-354-3198 **http://www.hanaplant.co.kr**

www.hanaplant.co.kr

CNG DRYER

CNG Purification System

ECO Friendly
HANA PLANT

113-15, Seohae-ro, Yanggam-myun,
Hwaseong-si, Gyeonggi-do, 445-935, KOREA
Tel : +82-31-354-3193 Fax : +82-31-354-3198

CNG Dryer

The collected gas from natural gas fields was compressed by compressor and its pressure was increased and sent to each station. But its gas is including impurities(moisture). So breakage of compressor, nozzle clogging, and corrosion of tubes etc. are caused by impurities(moisture) in processing of re-compressed from gas stations Then cleaned gas can be supplied by using the CNG Dryer.

Operating at the gas inlet of the compressor, CNG Series are fully automatic, heat reactivated, booster blower non purge desiccant dryers. They use molecular sieve adsorbents to dry CNG down to a pressure dew point as low as -70℃. Depending on the inlet conditions, some of the inlet flow is withdrawn from the gas outlet to be used as the regeneration gas.

CNG - Features

- Designed and engineered for low to high flows and continuous duty cycles
- Fully automatic and maximized desiccant regeneration, dew point performance and energy efficiency
- Simple and easy operation system by touch screen,
- So it is possible to efficient working
- Touch screen shows dryer status and alarms at all times
- Custom designed to meet all levels of specifications

Actual running picture of dew point meter

The dew point is very low, it means that weight of moisture is under 0.114mg/m^3

CNG Series Specifications

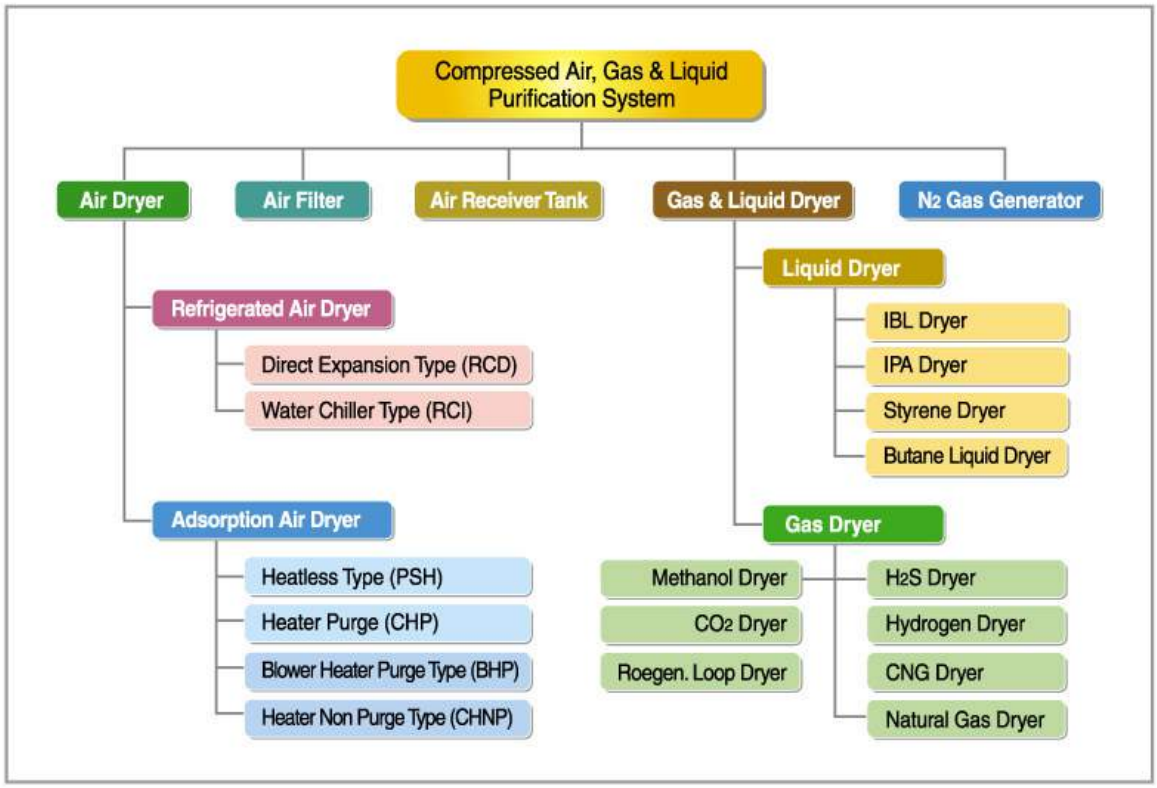
Model No.	Flow Rate	Dimensions	Approximate Weight
	Nm^3/hr	L x W x H(mm)	kg
CNG-1000	1000	2700x2250x2250	2800
CNG-1500	1500	3000x2250x2500	3600
CNG-2000	2000	3200x2250x2500	4100
CNG-3000	3000	3600x2250x2500	6200
CNG-5000	5000	4800x2250x2500	9000

Certificates

We always try to be the best!

CNG PURIFICATION SYSTEMS

Our Products Tree



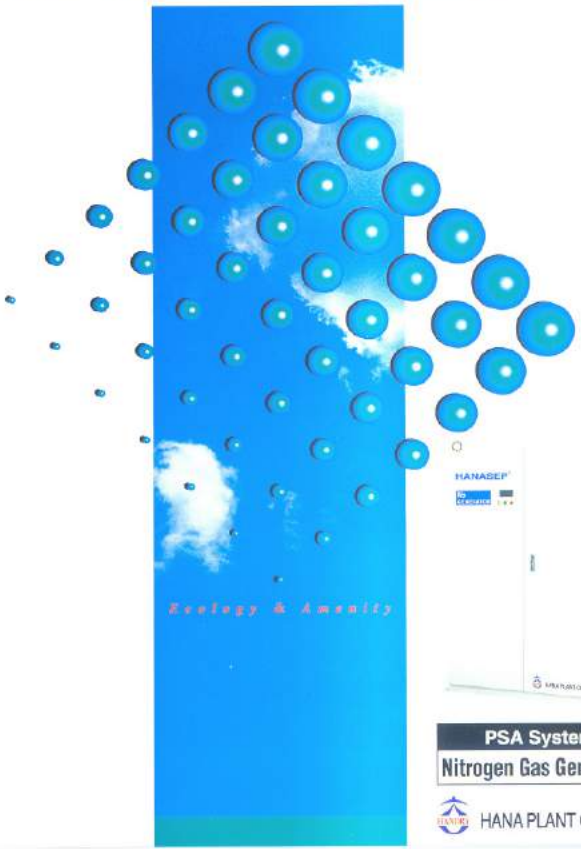
"Best quality is best service"

"Share TECHNOLOGY with ECO Friendly"

ECO Friendly
HANA PLANT

Distributor : CORE ENGINEERING LLC
NO.2, 69, CENTER-5, YUNUSOBOD REGION,
TASHKENT CITY, REPUBLIC OF UZBEKISTAN
Tel : +998 95 144 0485 Fax : +998 71 234 0485
http://www.hanaplant.co.kr

HANASEP®



PSA System

Nitrogen Gas Generator

HANA PLANT CO., LTD.

Cabinet Type Specification

HMA series 99.99%, 99.9%, 99%

Model	Capacity(Nm³/Hr)			№ Pressure (MPa)	Air Compressor			PSA Unit	
	99.99%	99.9%	99%		Motor Power (kw)	Dimensions : W × D × H(mm)	Weight(kg)	Dimensions : W × D × H(mm)	Weight(kg)
HMA-1.5	1	1.7	2.6	0.5	1.5	831 × 594 × 943	123	500 × 580 × 1,350	130
HMA-2.2	1.6	2.8	4.4		2.2	831 × 644 × 943	139	500 × 580 × 1,350	150
HMA-3.7	2.8	4.6	7.2		3.7	917 × 720 × 999	188	560 × 700 × 1,550	200

HRK series 99.99%, 99.9%

Model	Capacity(Nm³/Hr)		№ Pressure (MPa)	Air Compressor			PSA Unit	
	99.99%	99.9%		Motor Power (kw)	Dimensions : W × D × H(mm)	Weight(kg)	Dimensions : W × D × H(mm)	Weight(kg)
HRK-5.5	5	8	0.5	5.5	755 × 600 × 805	205	1,660 × 700 × 2,000	700
HRK-7.5	8	10		7.5	995 × 670 × 1,080	295	1,660 × 700 × 2,000	800
HRK-11	13	18		11	995 × 670 × 1,080	330	1,680 × 700 × 2,000	1,200
HRK-15	18	22		15	995 × 750 × 1,080	345	2,130 × 800 × 2,000	1,500
HRK-22	27	36		22	1,200 × 850 × 1,350	770	2,350 × 880 × 2,000	2,000
HRK-37	40	54		37	1,650 × 790 × 1,400	1,040	2,700 × 1,020 × 2,000	3,000

HRK series 99%

Model	Capacity(Nm³/Hr)	№ Pressure (MPa)	Air Compressor			PSA Unit	
			Motor Power (kw)	Dimensions : W × D × H(mm)	Weight(kg)	Dimensions : W × D × H(mm)	Weight(kg)
HRK-5.5	15	0.5	7.5	995 × 670 × 1,080	295	1,660 × 700 × 2,000	700
HRK-7.5	22		11	995 × 670 × 1,080	330	1,660 × 700 × 2,000	800
HRK-11	35		15	995 × 750 × 1,080	345	1,680 × 700 × 2,000	1,200
HRK-15	45		22	1,200 × 850 × 1,350	770	2,130 × 800 × 2,000	1,500
HRK-22	70		37	1,650 × 790 × 1,400	1,040	2,350 × 880 × 2,000	2,000
HRK-37	100		55	2,480 × 1,200 × 1,450	1,480	2,700 × 1,020 × 2,000	3,000

※ Product Purity Values are N₂+Ar.

Mount Type Specification

HC series 99%

Model	Capacity (N_2㎥/Hr)	N_2 Pressure (MPa)	Air Compressor (kw)	Air Dryer (kw)	Cooling water Consumption (㎥/Hr)	Approx. Size of installation Space W×D(m)
HC-170	170	0.45	55	3.5	-	4.2×2.3
HC-230	230		75	4.1	-	4.7×2.3
HC-360	360		100	6.0	7.8	6.7×2.7
HC-540	540		150	8.2	13.8	7.3×3.0
HC-645	645		180	9.9	16.7	8.0×3.0
HC-790	790		220	10.0	27.8	9.0×3.0
HC-880	880		255	10.0	31.2	13.0×3.0
HC-1100	1100		330	10.0	39.3	14.0×3.3
HC-1200	1200		370	10.0	42.9	14.5×3.3

HY series 99.9%

Model	Capacity (N_2㎥/Hr)	N_2 Pressure (MPa)	Air Compressor (kw)	Air Dryer (kw)	Cooling water Consumption (㎥/Hr)	Approx. Size of installation Space W×D(m)
HY-115	115	0.45	55	3.5	-	4.2×2.3
HY-160	160		75	4.1	-	4.7×2.3
HY-260	260		100	6.0	7.8	6.7×2.7
HY-385	385		150	8.2	13.8	7.3×3.0
HY-465	465		180	9.9	16.7	8.0×3.0
HY-570	570		220	10.0	27.8	9.0×3.0
HY-640	640		255	10.0	31.2	13.0×3.0
HY-800	800		330	10.0	39.3	14.0×3.3
HY-880	880		370	10.0	42.9	14.5×3.3

HY-P series 99.99%

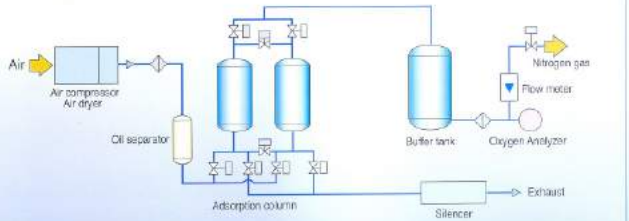
Model	Capacity (N_2㎥/Hr)	N_2 Pressure (MPa)	Air Compressor (kw)	Air Dryer (kw)	Cooling water Consumption (㎥/Hr)	Approx. Size of installation Space W×D(m)
HY-90P	90	0.45	55	3.5	-	4.2×3.0
HY-115P	115		75	4.1	-	4.7×3.0
HY-185P	185		100	6.0	7.8	6.7×3.0
HY-285P	285		150	8.2	13.8	7.3×3.0
HY-340P	340		180	9.9	16.7	8.0×3.0
HY-420P	420		220	10.0	27.8	9.0×3.0
HY-470P	470		255	10.0	31.2	13.0×3.0
HY-590P	590		330	10.0	39.3	14.0×3.3
HY-640P	640		370	10.0	42.9	14.5×3.3

※ Installation space dose not include air compressor.
※ Product Purity Values are N_2+Ar

Cabinet Type

Mount Type

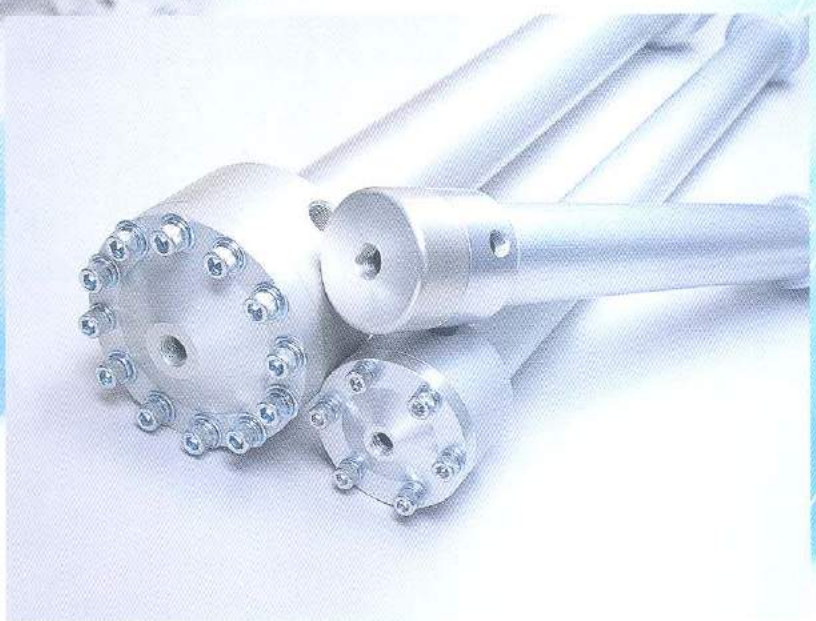
HANASEP Flow Diagram



UBE

Nitrogen Separation Membrane

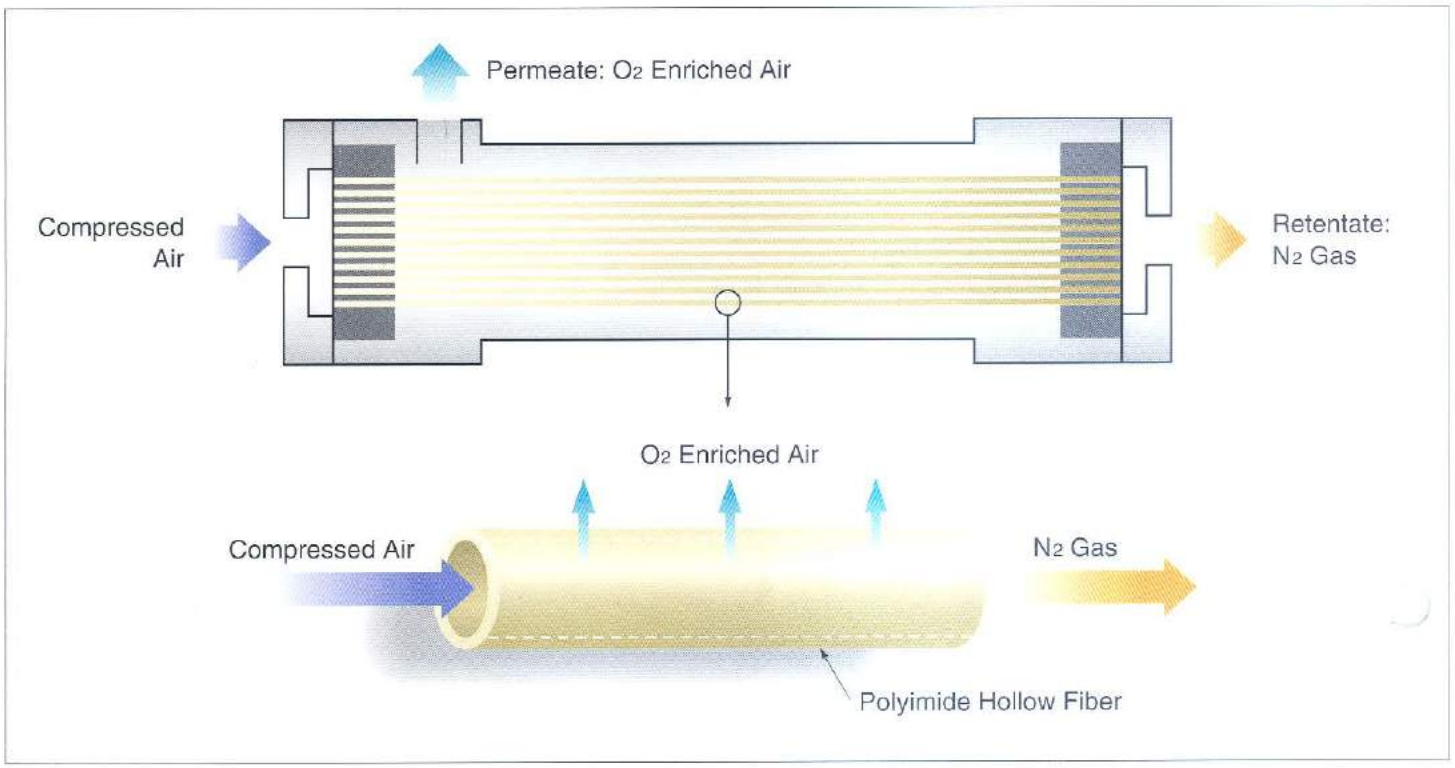
UBE N_2 SEPARATOR



UBE INDUSTRIES,LTD.

Principle

Polyimide hollow fiber membranes, developed by UBE Industries, Ltd., permeate oxygen more easily than nitrogen. While compressed air flows along the inside of the hollow fiber, oxygen selectively permeates through the membrane and, as a result, nitrogen-rich gas is obtained at the outlet of the hollow fiber membrane.



Features

- ◆N_2 gas can be obtained simply from compressed air.
- ◆No absorption / regeneration cycle switching so no noise or dust is generated.
- ◆Simple and compact design.
- ◆Flexibility in positioning - vertical or horizontal.

Application

- ◆Oil and Gas Well Injection
- ◆Blanketing for Tanks
- ◆Prevention of Explosions in Pneumatic Systems
- ◆Nitrogen Fill for Automobile and other Tires
- ◆Fire Protection
- ◆Alternative to CO_2 for Beer Injection
- ◆Prevention of Oxidation for Food
- ◆Laser Cutting Machinery for Stainless Steel
- ◆Relaxation Room (Using Enriched O_2 gas)

Product Specifications

Hollow Fiber	Polyimide Resin
Housing	Aluminum (A-type)
	Carbon Steel (NM-615, 815)
Feed Compressed Air	Max. 1.0 MPaG or 1.4 MPaG
Feed Air Temperature	5～60℃
Ambient Temperature	Max. 80℃

N_2 Gas Generating Capacities

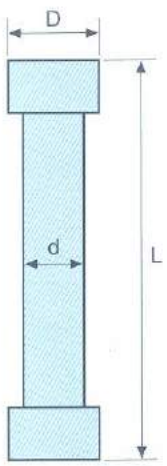
(Pressure: 0.7MPaG, Temperature: 25℃)

Model	N_2 Gas Purity (%) and Volume (Nm^3/H)					
	99.9	99	98	97	96	95
NM-B01A	0.025	0.071	0.10	0.14	0.17	0.19
NM-B02A	0.060	0.15	0.21	0.27	0.33	0.40
NM-B05A	0.12	0.34	0.49	0.63	0.77	0.92
NM-B10A	0.24	0.66	0.95	1.2	1.5	1.8
NM-C05A	0.26	0.74	1.1	1.4	1.7	2.1
NM-C10A	0.57	1.6	2.4	3.1	3.8	4.5
NM-410A	1.2	3.6	5.2	6.8	8.3	10
NM-615	3.7	12	17	22	27	32
NM-815	4.8	21	31	41	51	62

External Dimensions and Connections

Model	Dimensions (mm)			Connection (Rc)			Weight (kg)
	L	D	d	Feed Inlet	Retentate Outlet	Permeate Outlet	
NM-B01A	235	55	50	3/8B	3/8B	3/8B*	0.8
NM-B02A	360	55	50	3/8B	3/8B	3/8B*	1.0
NM-B05A	610	55	50	3/8B	3/8B	3/8B*	1.5
NM-B10A	1,110	55	50	3/8B	3/8B	3/8B*	2.5
NM-C05A	634	90	70	3/8B	3/8B	3/8B	3.0
NM-C10A	1,110	110	70	3/8B	3/8B	1/2B	5.2
NM-410A	1,160	165	100	1/2B	1/2B	3/4B	12
NM-615	1,545	279	165	1B	1B	1 1/2B	100
NM-815	1,554	343	216	1 1/2B	1 1/2B	2B	150

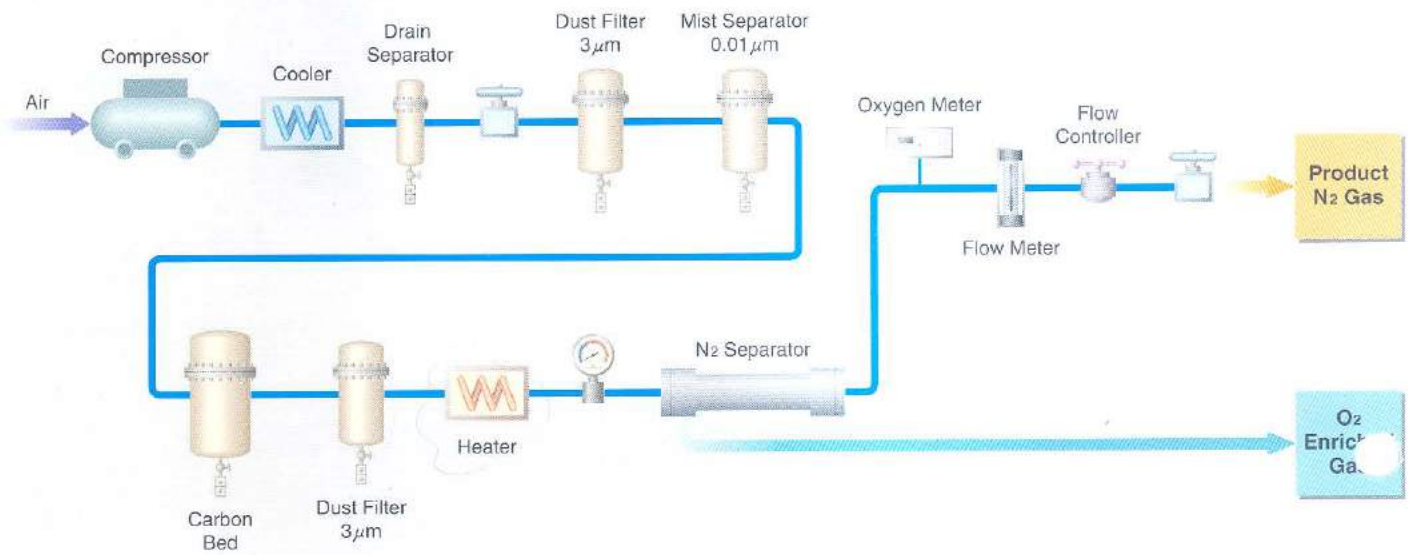
*Note: The nozzle is an option



Other Notes

Purity of N_2 shown means concentration of other gas to O_2. Feed air contains Ar (Argon), CO_2 (Carbon Dioxide), and H_2O (Water Vapor), therefore Ar non-permeable gas shall be approximately 1% at N_2 product side, while permeable CO_2 is 10–30ppm and H_2O is less than –40°C dew point converted at atmospheric pressure, at N_2 product side.

N_2 Generator / Ideal System Connection



* Please note that the specifications and equipment in this brochure are subject to change without notice.

UBE INDUSTRIES,LTD.

Membrane Group

Specialty Products Division

Seavans North Bldg., 1-2-1 Shibaura, Minato-ku, Tokyo, 105-8449 Japan

Phone: +81(3)5419-6185 Facsimile: +81(3)5419-6262

<URL> http://www.ube.co.jp

Printed in Japan. 2001-10 2,000YP