SPX

Desiccant
Air Dryers

SPX

Desiccant Air Dryers

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Some specifications in this bulletin may change without notice.

Bulletin C710E, Rev.D (04/14)

Jemaco

Pressure Swing Desiccant Air Dryers

HLK Series

HLK Series presents traditional heatless drying technology. Using a simple timer based controller, these are designed to deliver maximum value to applications that operate at-or-near full capacity. Automatic time controlled bed regeneration cycles offer consistent performance and economy of purchase.

Features

Consistent outlet pressure dew points Large desiccant beds produce, -40 (℃) pressure dew point

Minimum purge air usage-saving the heat of adsorption maximizes the moisture holding capacity of the purge air, minimizing the amount required

Long desiccant life-beds sized to prevent fluidization plus slow and complete regeneration prevent desiccant movement and deterioration

Heavy duty purge exhaust muffler for quiet operation

Non-lubricated, soft seated control valves

Stainless steel supportscreens and air diffusers-filters out gross contaminants, protects valves

Furnished in cabinet for easy wall mounting completely assembled, piped, and wired shipped with full charge of desiccant only hook-up of utilities is needed to operate

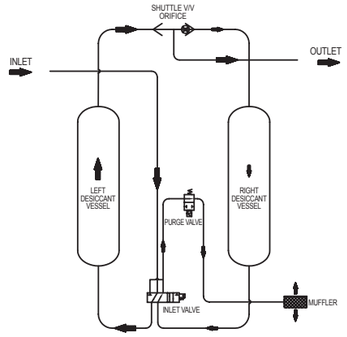
Vessels are constructed to meet the requirements of ASME code, Section Ⅷ, Division 1 and stamped (55 scfm larger)

Wall Mount Dryer-HL10K~HL35K

Shuttle Valve-HL10K~HL600K

How it works

Compressed air enters the dryer and is directed to Vessel 1 by valve(A) and then to the dryer outlet through shuttle valve(B). A portion of the dried air is throttled to near atmospheric pressure by means of orifice(C). This extremely dry, low pressure air flows through and regenerates the desiccant in Vessel 2 and is exhausted through purge/repressurization valve(D) and exhaust muffler(E) to atmosphere. After a set time, the automatic solid state timer closes purge/ repressurization valve(D) allowing Vessel 2 to repressurize slowly. At the end of 5minutes (when operating on a 10minute cycle, 2minutes on a 4minute cycle), valve (A) shifts and purge/repressurization valve(D) re-opens. The main air flow is now dried by Vessel 2 while Vessel 1 is being regenerated.



HL10K~HL35K

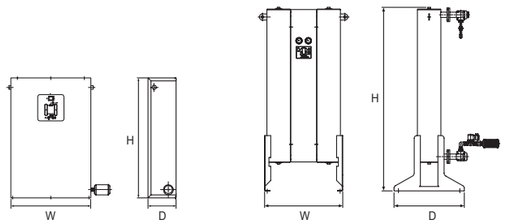
HL55K~HL600K

HLK Series Flow Diagram

Optional

Code	Option
M0	Dew Point Monitor
I2	Moisture Indicator
Other options : consult factory.	

Specifications



HL10K~HL35K　　HL55K~HL600K

Model	Flow Capacity (Nm³/min)	Dimensions(mm)			Inlet/Outlet Connecions (PT)	Weight (kg)
		H	W	D		
HL 10K	0.29	775	445	170	1/2"	25
HL 15K	0.43	775	445	170	1/2"	27
HL 20K	0.58	775	445	170	1/2"	32
HL 25K	0.72	803	619	217	1/2"	42
HL 35K	1.01	803	619	217	1/2"	45
HL 55K	1.59	1193	645	700	1"	67
HL 100K	2.89	1725	645	700	1"	130
HL 160K	4.63	1637	745	700	1"	183
HL 200K	5.79	1905	750	700	2"	251
HL 275K	7.96	1765	900	800	2"	338
HL 350K	10.13	1653	980	800	2"	466
HL 475K	13.74	1783	1050	800	2"	707
HL 600K	17.36	1745	1160	800	2"	961

*Rating condition are 38℃ inlet temperature, 6.9 barG inlet pressure, 100% relative humidity, 38℃ ambient temperature.
*Standard voltage is 220~240V/1Ph/50~60Hz.
*Maximum operating pressure is 10.3 barG, and maximum inlet temperature is 49℃.

Correction Factors

Inlet Pressure (bar)	Inlet Temperature (℃)						
	32	35	38	41	43	46	49
4.1	0.87	0.78	0.69	0.61	0.52	0.44	0.36
4.8	0.98	0.88	0.78	0.69	0.59	0.49	0.40
5.5	1.08	0.97	0.86	0.76	0.65	0.54	0.45
6.2	1.17	1.05	0.93	0.82	0.71	0.59	0.48
6.9	1.25	1.13	1.00	0.88	0.76	0.63	0.52
7.6	1.35	1.21	1.07	0.95	0.81	0.68	0.56
8.3		1.29	1.15	1.01	0.87	0.73	0.60
9.0		1.36	1.21	1.06	0.91	0.76	0.63
9.7		1.41	1.26	1.11	0.96	0.80	0.65
10.3			1.30	1.15	0.99	0.82	0.68
11.0			1.35	1.19	1.02	0.85	0.70
11.7			1.39	1.23	1.06	0.88	0.72
12.4				1.28	1.10	0.91	0.75
13.1				1.32	1.14	0.92	0.78
13.8				1.37	1.18	0.98	0.81
14.5			1.43	1.42	1.22	1.02	0.84
15.2					1.26	1.05	0.86
15.9					1.30	1.08	0.89
16.5					1.33	1.11	0.91
17.2					1.37	1.15	0.94

Pressure Swing Desiccant Air Dryers

PSK Series

This newest generation of heatless desiccant compressed air dryers are designed and built with confidence to offer the compressed air user the highest reliability in the industry. Key to reliability of the PSK Series dryer is the proprietary air flow switching valve. Based on its superior design and proven performance this shuttle valve is covered lifetime replacement warranty.

Features

Highest Reliability

- Three valves replace up to 13 separate valves used for air flow switching in other designs
- Shuttle valve life-tested to more than 500,000 cycles equivalent to 10 years of continuous operation

Minimal Maintenance

- Upflow drying minimizes effects of accidental slugging with water
- Muffler cores replace quickly and easily to prevent back pressure in purge exhaust line

Operating Economy

- Field adjustable purge flow on standard dryer
- Adjust purge rate 13% to 17% at 7 bar
- Match purge to seasonal or process needs
- Compu-purge automatic purge control is optional

Vessels are constructed to meet the requirements of ASME code, Section Ⅷ, Division 1 and stamped

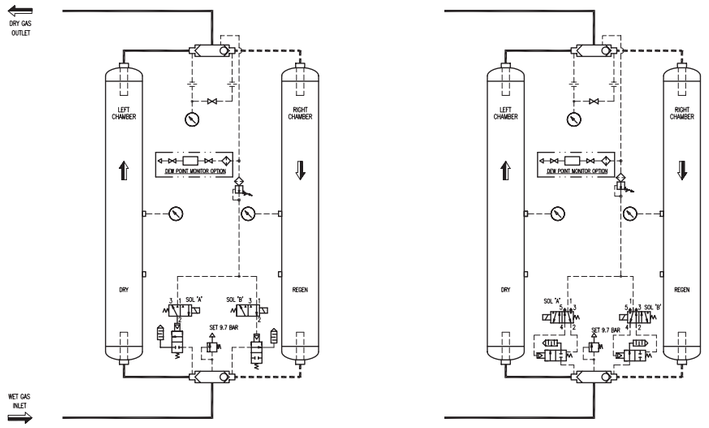
How it works

Oil, liquid water and particulate are removed from inlet air through pre-filter and filtered air passes through lower shuttle valve into on-stream valve.

Wet air flows upward through desiccant bed becomes dry air. Dry air at -40℃ PDP(standard) or -73℃ PDP(optional) exists through upper shuttle valve and splits into process air and low flow purge air.

Purge air flows into top of regenerating vessel and dry purge air flows downward through vessel removing moisture from saturated desiccant bed.

Wet purge air exists through lower purge valve into exhaust.



PS56K~PS600K

PS900K~PS4430K

PSK Series Flow Diagram

Optional

Many dryers offer some kind of computer purge control. Compu-purge is the first, truly optimize purge process.

Uses electronic sensors that continuously track air pressure and temperature at key points in the dryer system.

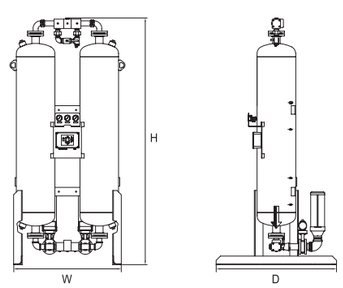
Automatically programs purge rate and duration in proportion to inlet moisture load.

Not only ensures optimum purge air usage, but also monitors dryer performance and helps diagnose dryer malfunctions.

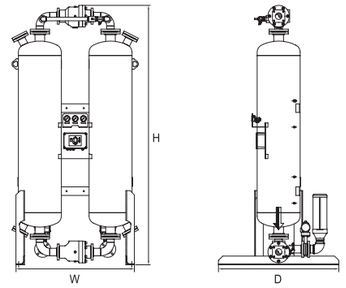
Whether your application is demanding or routine, computer controlled purging can deliver significant savings when your dryer operates

- Less than 24 hours a day
- Under less than full load
- With fluctuating conditions

Specifications



PS56K~PS900K



PS1000K~PS4430K

Model	Flow Capacity (Nm³/min)	Dimensions(mm)			Inlet/Outlet Connecions		Weight (kg)
		H	W	D	PT	FLG	
PS 56K	1.62	1677	804	610	1"		126.0
PS 100K	2.89	1864	860	712	1"		204.0
PS 160K	4.63	1956	980	712	1"		302.0
PS 200K	5.79	2433	982	914	2"		340.6
PS 275K	7.96	2433	1072	914	2"		490.0
PS 350K	10.13	2572	1100	1016	2"		768.0
PS 475K	13.74	2492	1174	1016	2"		1032.6
PS 600K	17.36	2680	1240	1100	2"		1260.4
PS 900K	26.04	3323	1765	1100	2"		1691.4
PS 1000K	28.93	3244	1822	1194		3"	1938.2
PS 1200K	34.72	3250	1862	1194		3"	2278.8
PS 1450K	41.95	3340	2031	1194		3"	2667.4
PS 1710K	49.47	3330	2090	1194		3"	2882.8
PS 2010K	58.10	3431	2138	1524		4"	3031.0
PS 2250K	65.03	3311	2195	1524		4"	3444.6
PS 2600K	75.14	3372	2232	1524		4"	3857.6
PS 3250K	93.93	3442	2332	1524		4"	5440.0
PS 4430K	128.16	3518	3110	1600		6"	6442.0

* Rating condition are 38℃ inlet temperature, 6.9 barG inlet pressure, 100% relative humidity, 38℃ ambient temperature.
* Standard voltage is 220~240V/1Ph/50~60Hz.
* Maximum operating pressure is 10.3 barG, and maximum inlet temperature is 49℃.

Correction Factors

Inlet Pressure (bar)	Inlet Temperature (℃)						
	32	35	38	41	43	46	49
4.1	0.87	0.78	0.69	0.61	0.52	0.44	0.36
4.8	0.98	0.88	0.78	0.69	0.59	0.49	0.40
5.5	1.08	0.97	0.86	0.76	0.65	0.54	0.45
6.2	1.17	1.05	0.93	0.82	0.71	0.59	0.48
6.9	1.25	1.13	1.00	0.88	0.76	0.63	0.52
7.6	1.35	1.21	1.07	0.95	0.81	0.68	0.56
8.3		1.29	1.15	1.01	0.87	0.73	0.60
9.0		1.36	1.21	1.06	0.91	0.76	0.63
9.7		1.41	1.26	1.11	0.96	0.80	0.65
10.3			1.30	1.15	0.99	0.82	0.68
11.0			1.35	1.19	1.02	0.85	0.70
11.7			1.39	1.23	1.06	0.88	0.72
12.4				1.28	1.10	0.91	0.75
13.1				1.32	1.14	0.92	0.78
13.8				1.37	1.18	0.98	0.81
14.5			1.43	1.42	1.22	1.02	0.84
15.2					1.26	1.05	0.86
15.9					1.30	1.08	0.89
16.5					1.33	1.11	0.91
17.2					1.37	1.15	0.94

Externally Heated Desiccant Air Dryers

HRE Series

The HRE Series desiccant dryers are designed and built for plant & instrument air application where the lower purge consumption is required. HRE Series dryers are using the small portion of purge air heated by external heater for regeneration.
Jemaco Flair guarantees that HRE Series dryers will produce the design −40℃PDP(standard) or −73℃ PDP(optional) while operating continuously at maximum rated flow (100% duty cycle).

Features

Heater

- HRE Series dryer is designed to use a low watt density heater with optional surface area.
  Low watt density heaters saves energy & prevents premature desiccant aging.

Valves

- High performance butterfly valves control the flow of air through the vessels. Inlet and purge exhaust valves are cast iron bodies with stainless steel internals which provide good wear resistance and minimize maintenance.

Vessels are constructed to meet the requirements of ASME code, Section Ⅷ, Division 1 and stamped

Butterrfly Switching Valve

Optional

The HRE Series dryer also has available an optional energy saving control system that senses the relative humidity of the process air as it exits the vessel. Extended drying will take place if the relative humidity is below the adjusted set point.

Code	Option	Code	Option
M0	Dew Point Monitor	N4	Nema 4 Control Box
E5	Dew Point Demand Control[1]	E7	Purge Saving Kit
C6	Modbus 485 Communication	C4	J-CON S[2]
Other options' consult factory.			

1) Including Option M0 (Dew Point Monitor).
2) New PLC Controller : consult factory for more detailed information

PLC (Programmable Logic Controller)

The HRE Series dryers are programmed on a standard 8 hours fully automatic NEMA cycle. During this continuous process, one vessel is drying the incoming wet air for 4 hours. At the same timzzze, the other vessel is being reactivated with heated air.

Display
- Alarm / Warning / Service

Temperature Display

Heater Outlet Temperature
- Regenerating Air Temperature Control, Heater Control

Left & Right Purge Line
- Regenerating Air Contrd, Energy Savings for External Heater.

Pressure Switch / Purge Pressure Gauge / Heater Over Temperature

Vessel Pressure Gauge/Vessel Temperature Gauge

High Humidity Alarms (Optional)

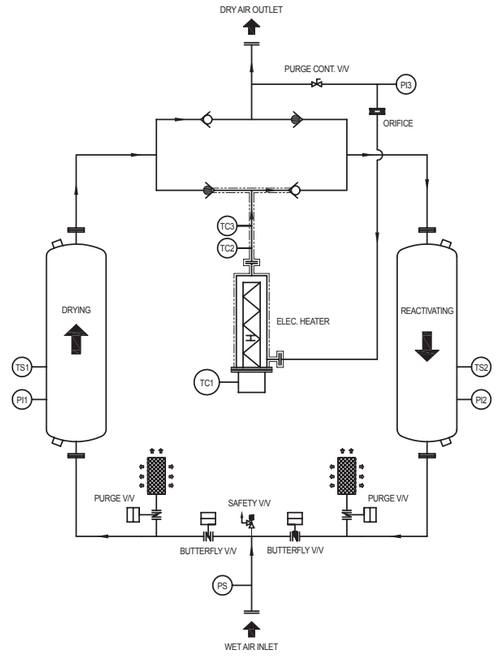
Dew Point Meter (Optional)

RS 232 Communication Port. (Optional)

Moisture Indicator (Optional)

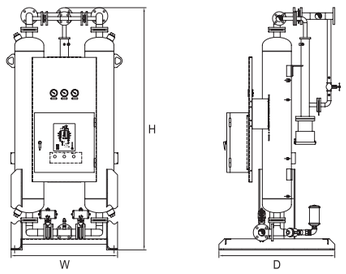
How it works

Filtered compressed air enters on-line desiccant-filled, drying vessel A through butterfly valve. Up-flow drying enabled the desiccant to strip moistures from the air stream. Clean, dry compressed air (-40℃ PDP) exits through check valve to feed the air system. Vessel 2 (shown in regeneration mode) the butterfly valve for vessel B closed and the heater turns on the small portions of purge air (3%~10%) are heated by the heater and flow downward in order to reactivate the moist-desiccant in vessel B, collecting water vapor before purge valve. This purge air is exhausted through the purge valve.
Once the desiccant is fully desorbed, or the purge air temperature reaches 80℃ and the minimum regeneration time (90 minutes) has been exceeded, the heater turns off. At a fixed time interval the butterfly valve at vessel B and vessel B will be placed on-line to the dry air stream and the butterfly valve at vessel A will close.
Operation will switch and vessel A will be regenerated.

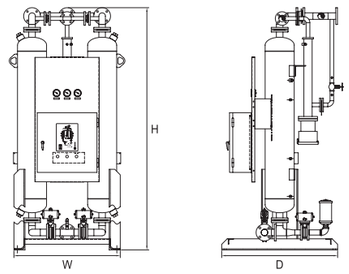


HRE Series Flow Diagram

Specifications



HRE200~HRE1710



HRE2010~HRE4430

Model	Flow Capacity (Nm³/min)	Dimensions(mm)			Inlet/Outlet Connecions (FLG)	Heater Rated Output(kW)	Full Load (average, kW)	Weight (kg)
		H	W	D				
HRE 200	5.79	2,360	1,354	914	2"	2.7	2.2	362.0
HRE 275	7.96	2,375	1,410	914	2"	3.7	3.0	518.4
HRE 350	10.13	2,502	1,330	1,016	2"	4.7	3.8	776.2
HRE 475	13.74	2,376	1,324	1,016	2"	6.4	5.1	1076.4
HRE 600	17.36	2,437	1,511	1,100	2"	8.1	6.5	1309.0
HRE 900	26.04	3,096	1,765	1,100	3"	12.1	9.7	1750.6
HRE 1000	28.93	3,082	1,822	1,194	3"	13.5	10.8	021.2
HRE 1200	34.72	3,092	1,844	1,194	3"	16.2	13.0	2353.8
HRE 1450	41.95	3,117	2,051	1,194	3"	19.5	15.6	2765.2
HRE 1710	49.47	3,152	2,090	1,194	3"	23	18.4	2993.2
HRE 2010	58.10	3,148	2,158	1,524	4"	27.1	21.7	3121.6
HRE 2250	65.03	3,120	2,175	1,524	4"	30.3	24.2	3580.6
HRE 2600	75.14	3,250	2,318	1,524	4"	35	28.0	3985.8
HRE 3250	93.93	3,587	2,332	1,524	4"	43.7	35.0	5704.2
HRE 4430	128.16	3,460	3,110	1,600	6"	59.7	47.8	6669.2

*Rating condition are 38℃ inlet temperature, 6.9 barG inlet pressure, 100% relative humidity, 38℃ ambient temperature.
*Standard voltage is 380~440V/3Ph/50~60Hz.
*Maximum operating pressure is 10.3 barG, and maximum inlet temperature is 49℃.

Correction Factors

Inlet Pressure (bar)	Inlet Temperature (℃)						
	16	21	27	32	38	43	49
4.1	1.03	1.01	0.99	0.80	0.58	0.43	0.32
4.8	1.10	1.08	1.07	0.94	0.68	0.50	0.37
5.5	1.17	1.15	1.14	1.08	0.79	0.58	0.43
6.2	1.24	1.22	1.20	1.18	0.89	0.66	0.49
6.9	1.30	1.28	1.26	1.24	1.00	0.74	0.55
7.6	1.36	1.34	1.32	1.30	1.11	0.82	0.61
8.3	1.42	1.40	1.38	1.36	1.22	0.90	0.67
9.0	1.48	1.46	1.44	1.42	1.33	0.99	0.74
9.7	1.53	1.51	1.49	1.47	1.44	1.07	0.80
10.3	1.58	1.56	1.54	1.52	1.50	1.16	0.87

Blower Purge Desiccant Air Dryers

JBP Series

As the air compressor is the most costly system component to purchase and, it uses more electrical energy than the rest of the system combined, it is wise to ensure that the smallest air compressor is installed. JBP Series dryers are 100% efficient at delivering full supply-side compressor capacity. Therefore, users benefit from the ability to purchase a less expensive air compressor and, a 20% reduction in compressor operating costs.

Features

Soft-seated check valves for tight shutoff and durability

Vessels filled with extra, industrial-grade activated alumina t deliver superior performance

Low-watt density heater saves energy and prevents prematu desiccant aging

High performance butterfly valves control the flow of a through the vessels

Low watt density heaters saves energy and prevent premature desiccant aging

High quality pressure gauges display and purge pressure

Function indicator Graphic Control Panel

Easy-view text display is visible under any condition

NEMA 4 Construction

Quiet, energy efficient, high-capacity blowers

Optional

The JBP Series dryer also has available an optional energy saving control system that senses the relative humidity of the process air as it exits the vessel. Extended drying will take place if the relative humidity is below the adjuted set point.

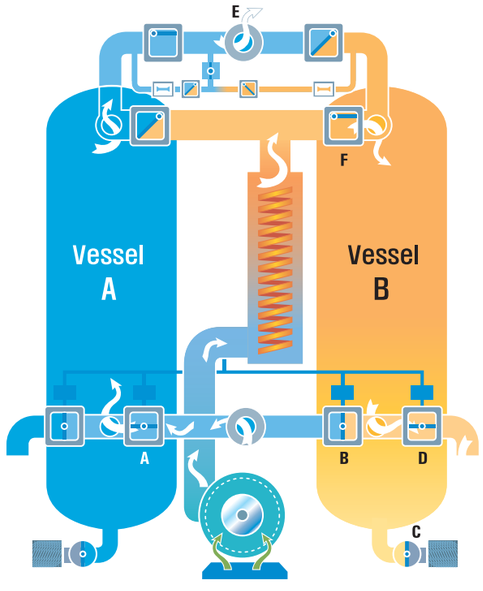
PLC (Programmable Logic Controller)

Code	Option
E0	Dew Point Demand Control (EMS)[1]
C4	J-CONS[2]
Other options: consult factory.	

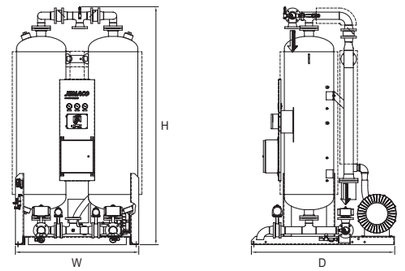
1) Including Option M0 (Dew Point Monitor).
2) J-CONS (New PLC Controller): HMI with Full color, 6 inch touch screen, 26 alarms with alarm histoy records. User friendly graphic interface.

How it works

Filtered compressed air enters on-line desiccant-filled, drying vessel A through valve(A). Up-flow drying enables the desiccant to strip moisture from the airstream. Clean, dry compressed air exits through (E) to feed the air system. Vessel B (shown in regeneration mode) valve(B) closed, depressurizes to atmosphere through muffler(C). Valves(D&F) open and the heater turns on. The high-efficiency blower draws ambient air and feeds it through the heater. The ambient airstream passes through valve(F) and flows downward through the moist desiccant in Vessel B, collecting water vapor before existing valve(D). Once the desiccant is fully desorbed, the heater turns off. Valves(F&D) close and Vessel B is repressurized. At a fixed time interval, valve(B) will open and Vessel B will be placed on-line to dry the airstream and valve(A) will close. Operations will switch and Vessel A will be regenerated.



Specifications



JBP14.1~JBP341.7

Model	Flow Capacity (Nm³/min)	Dimensions(mm)			Inlet/Outlet Connecions	Blower (kW)	Heater Rated Output(kW)	Full Load (average, kW)	Weight (kg)
		H	W	D					
JBP 14.1	14.16	2664	1346	1491	2" PT	1.75	10	10	846
JBP 16.9	16.99	2753	1397	1531	2" PT	2.55	12	12	958
JBP 21.2	21.24	2903	1524	1734	3" FLG	2.55	14	14	1114
JBP 25.4	25.49	2903	1524	1734	3" FLG	4.6	16	16	1121
JBP 29.7	29.73	3050	1495	1800	3" FLG	3.7	19	16	1352
JBP 36.8	36.81	3025	1598	1800	3" FLG	6.3	23	18	1622
JBP 42.4	42.48	3050	1648	1950	3" FLG	8.6	28	21	2431
JBP 50.9	50.97	3050	1780	1950	3" FLG	8.6	33	26	2431
JBP 62.2	62.30	3200	2004	2050	4" FLG	12.6	40	34	3637
JBP 73.6	73.62	3350	1778	2200	4" FLG	11.0	45	36	3685
JBP 90.6	90.61	3460	2250	2800	4" FLG	5.6	54	38	4233
JBP 101.9	101.94	3500	2350	2900	6" FLG	7.5	60	45	4460
JBP 121.7	121.76	3460	2350	3050	6" FLG	7.5	70	50	5602
JBP 145.0	145.08	3700	2850	3510	8" FLG	11.0	88	64	7282
JBP 184.6	184.67	3800	3150	3710	8" FLG	15.0	112	81	8883
JBP 237.6	237.60	4150	3410	3800	10" FLG	18.6	145	104	12474
JBP 263.8	263.80	4150	3410	3800	10" FLG	18.6	160	112	12476
JBP 316.6	316.60	4600	3750	3900	12" FLG	18.6	193	130	15185
JBP 341.7	341.70	4600	3750	3900	12" FLG	22.4	208	143	15185

* Rating condition are 38℃ inlet temperature, 6.9 barG inlet pressure, 100% relative humidity, 38℃ ambient temperature.
* Standard voltage is 380V/3Ph/60Hz.
* Maximum operating pressure is 10.3 barG, and maximum inlet temperature is 49℃.

Correction Factors

Inlet Pressure (bar)	Inlet Temperature (℃)						
	16	21	27	32	38	43	49
4.1	1.03	1.01	0.99	0.80	0.58	0.43	0.32
4.8	1.10	1.08	1.07	0.94	0.68	0.50	0.37
5.5	1.17	1.15	1.14	1.08	0.79	0.58	0.43
6.2	1.24	1.22	1.20	1.18	0.89	0.66	0.49
6.9	1.30	1.28	1.26	1.24	1.00	0.74	0.55
7.6	1.36	1.34	1.32	1.30	1.11	0.82	0.61
8.2	1.42	1.40	1.38	1.36	1.22	0.90	0.67
8.9	1.48	1.46	1.44	1.42	1.33	0.99	0.74
9.6	1.53	1.51	1.49	1.47	1.44	1.07	0.80
10.1	1.58	1.56	1.54	1.52	1.50	1.16	0.87

Activated Alumina Molecular Sieve

Activated Alumina

Applications

Premium grade is sifted for precise bead size and formulated for optimal moisture for critical application

Extended Life Grade is best suited for heat regenerative dryers where high heat and humidity may age industrial grades

Industrial Grade is the desiccant of choice for most air drying applications

Activated Alumina

Characteristics

High adsorption capacity over a wide range of RH provides optimal moisture removal

High crush strength and low abrasion swings in heatless air dryers to yield superior desiccant life and limit product contamination

Uniform bead size prevents clogging of manifolds and screens and minimizes bed pressure drop

Wide pore size distribution enhances desorption, an important product characteristic for heatless air dryer applications

Alumina regenerates easily at low temperatures making it well suited for heatless air dryers

Industrial grade activated alumina will hydro-thermally 'age' more rapidly when exposed to high heat at high humidity. For heated dryers use extended life grade, it is re-hydration resistant, making it thermally resistant

Typical Properties		
Typical Properties	Al2O3	93.0%
	Na2O	0.35%
	SiO2	0.015%
	LOI (1000℃)	6.0%
Physical	Total Pore Volume	0.50 cc/gm
	Surface Area	360 ㎡/gm
	Bulk Density	769 kg/㎥
	Adsorptive Capacity (R.H. 60%)	22 %
	Crush Strengt (5 mesh equiv)	32 kg
	ASTM Attrition (% Retained)	99.6 %
	Abrasion Loss	0.1 %
	Size-nominal (other sizes on request)	1/16″, 1/8″, 3/16″, 1/4″, 3, 4, 5, 6 mm

Molecular Sieve

Applications

Final polishing layer in internally heated desiccant dryers (-40℉ & -100℉)

Applications involving the exclusion of certain molecules from the adsorption surface, e.g. drying natural gas with minimal odorant removal

Superior performance when the air has been pre-dried, often used at the outlet end of the heatless dryer vessel when air must be dried to very low dew points (-100℉ range)

Molecular Sieve

Characteristics

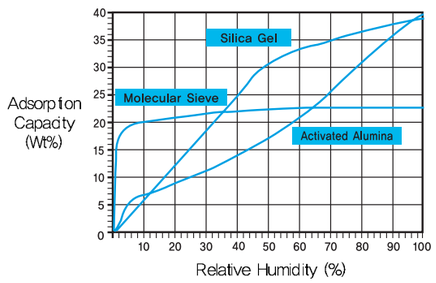
Higher adsorption capacity at lower relative humidity than either activated alumina or silica gel

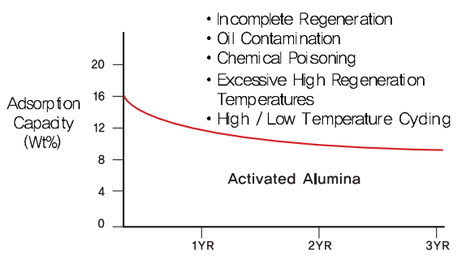
Lower adsorption capacity at high relative humidity

Requires higher temperature for regeneration than does silica gel or activated alumina

'Sieves' molecules based on size and configuration thus molecular sieves are used to adsorb specific molecular types

CNG II – Molecular Sieves designed specifically for natural gas application





Specifications

Model		Size	Container Size (kg)			
Activated Alumina	AA-60	3/16"	50	100	158	907
	AA-4	1/8"				
	AA-25	1/4"				
Molecular Sieve	4A	2.5-5mm	25	–	140	–