Desiccant Regenerative Dryers

3-10,000 scfm



- Desiccant Modular
- Desiccant Heatless
- Desiccant Externally Heated
- Desiccant Blower Purge



Sullair Capabilities

Sullair Leadership

Since 1965, Sullair has been recognized around the world as an



innovator and a leader in rotary screw compression and vacuum technology. For more than 40 years, Sullair

has designed and manufactured its own rotors and air end assemblies at the corporate headquarters in Michigan City, Indiana.

The award-winning rotary screw design sets the industry standards and delivers the quality and reliability one expects from a leader.



Sullair Technology

Utilizing the most modern technologies, equipment and advanced manufacturing techniques, Sullair designs, manufactures, assembles, and tests the most innovative compressed air and vacuum products in the industry. Sullair products are known around the world for their universally applicable design, outstanding craftsmanship and superior quality.

Sullair's Statistical Process Control

Sullair's Statistical Process Control (SPC) system monitors rotor quality standards to assure consistent compressor and vacuum performance.

Sullair's Commitment to Innovation

Underlying Sullair's leadership is a dedication to excellence and a commitment to innovation. Sullair is constantly exploring new ideas and seeking new ways to meet industry's need for increasingly energy efficient compressed air and vacuum solutions.



The Importance of Clean, Dry Compressed Air

How much water is too much? Any amount of water is too much.

Water jeopardizes everything you want your compressed air system to do. It ruins product and fouls processes.

- Relative humidity is the amount of water vapor in air relative to what it could hold at a given temperature
- Moisture in compressed air remains in a vapor state through the compression cycle, so it is not a problem until it leaves the compressor
- Air discharged from a compressor is approximately 150°F to 450°F
- At 75°F and 75% relative humidity, a 75 hp compressor takes in 46 gallons of water vapor in 24 hours. When this air is cooled to approximately 35°F at 100 psig, the water vapor condenses into 46 gallons of liquid!



Liquid remaining after the aftercooler: 14.7 gallons (32%)

Liquid remaining after a desiccant dryer: .14 gallon (0.3%)

Desiccant Regenerative Dryers

Sullair offers these configurations of desiccant regenerative dryers

- DMD Desiccant Modular Dryer 3 to 240 scfm
- DHL Desiccant Heatless Dryer 80 to 5,000 scfm
- DEX Desiccant Externally Heated Dryer 200 to 3,500 scfm
- DBP Desiccant Blower Purge Dryer 500 to 10,000 scfm

Desiccant Dryer Features

The Sullair desiccant regenerative dryer family is ideal for outdoor compressed air piping and operations that require an extremely low dew point to -40°F (-4°F or -100°F optional).

By combining the proven benefits of desiccant drying with the most advanced designs, Sullair offers a reliable system to clean and dry compressed air for the most critical applications.



Features of the Sullair Desiccant Dryers



DHL Series Standard Features (80-5,000 scfm)

- Pre- and after-filter pre-piped and mounted
- Field adjustable drying cycle time
- Pilot air filter
- Easy front access control panel
- -40°F pressure dew point
- Fully automatic self contained dryer
- Adjustable purge valves
- High quality valves
- Purge flow indicator
- ASME/CRN code welded pressure vessels
- UL/CUL electrical certified
- Separate drain and fill port
- Robust steel frame with floor stand
- Separate safety pressure relief valve for each tank
- Stainless steel inlet/outlet diffusers

DEX and DBP Series Standard Features (200-10,000 scfm)

- Same high quality standard features as DHL
- Pre piped and mounted filters are not standard on the DEX and DBP dryers
- Insulated heater housing and piping
- High outlet temperature shut off and alarm
- User-friendly diagnostic control display
- Safety back-up contactors
- PLC control and display
- Thermostatically controlled heating
- Safety heater thermostat
- Low-watt density heater

- Tower pressure gauges
- Fail safe design in case of power failure

DHL Series Options

- Demand Cycle Controller
- NEMA 4, 4x enclosure
- High pressure up to 500 psig
- Failure to shift alarm
- Pneumatic control timer
- Optional voltage
- High dew point alarm
- Dew point monitoring system
- -4°F and -100°F pressure dew point
- 3 Valve and 9 valve bypass options
- Visual moisture indicator
- Low ambient package
- Sub zero ambient package

DEX and DBP Series Options

- Demand Cycle Control
- Pre-piped filter and bypass packages
- Low bed temperature shut off with light and contact
- High heater remote temperature alarm
- NEMA 4, 4x enclosures
- Visual moisture indicator
- 3 Valve and 9 valve bypass options
- Optional voltage
- Failure to shift alarm
- -4°F pressure dew point
- Purge flow meter
- Dew point monitoring system
- Low ambient package
- Microprocessor based controls/Modbus
- Sub zero ambient package



Bypasses allow maintenance of the dryer and/or filters without shutting down the entire air system. Other arrangements available on request.



Principle of Operation for Sullair's Desiccant Dryers

Desiccant Heatless



- 2 Angle body purge exhaust
 - 7 Pressure gauge 8 Outlet check valve
 - 9 Purge adjustment valve
- 3 Purge pilot valve 4 Pressure relief valve

valve

DBP Heated



Principle of Operation for Desiccant Heatless Dryers

The dual tower design allows for continuous absorption of water from compressed air by using a hygroscopic high crush strength desiccant. Drying is accomplished by passing compressed air through the desiccant bed absorbing moisture while the other is being simultaneously regenerated with the expanded purge air.

Regeneration of the desiccant is accomplished without the use of heat. The wet bed is dried by diverting a small amount of dry air from the outlet at near atmospheric pressure. The purge flow rate is adjustable to suit the desired dew point. The dry air flows in a counter direction through the wet bed, sweeping all the water vapor previously absorbed by the desiccant.

Sullair ensures pressure equalization in the dual tower prior to switching. This prevents line surge and minimizes desiccant attrition. The tower being reactivated will be gradually re-pressurized at the end of its reactivation cycle before switchover takes place. Purge flow and de-pressurization are in downward direction, counter flow to the drying air flow.

Principle of Operation for the Desiccant Externally Heated (DEX) and Desiccant Blower Purge (DBP)

With the DEX Dryer series, a small portion of the dry air is purged into a high quality, low watt density heater and heated to approximately 400°F. The DBP Dryer series uses a centrifugal blower to pull ambient air and pass it through the same high quality low density heater (drawing shown). In both cases the heated air has a greater affinity to absorb moisture and when passed through the regenerating tower at near ambient pressure, strips the moisture from the desiccant bed. The advanced controls monitor the dew point and adjust the heating and regeneration accordingly, therefore providing valuable energy savings.

DBP heated drawing description:

- Purge air thermocouple
- 2 Swing check valve
- 3 Repressurization metering valve
- 4 Purge check valve
- 5 Blower pressure relief valve 6 Tower pressure relief valve
- 7 Control air filter
- 8 Inlet valve

- 11 Blower safety pressure switch 12 Blower intake filter silencer
- 13 Blower purge adjustment globe valve
- 14 Blower flex connector
- 15 Repressurization ball valve

9 Purge exhaust valve

10 Purge exhaust muffler

- 16 Pressure diff. indicator
- 17 Pressure diff. indicator

Advantages of Sullair's Heated Desiccant Dryers

Advanced PLC Controller

A programmable PLC controller with back lit display is standard on all DHL series dryers. The controller is simple to use and comes standard with these great features:

- PLC Read Out
- Adjustable Cycle Time
- Filter Change Alarm
- Failure to Switch Contact
- Dew Point Monitoring Contacts
- Red Light Alarm Indicator

Optional Demand Cycle Controller - Dew Point Meter

The dew point transmitters are reliable, compact and provide continuous monitoring of the dryer performance. With available options, the monitors can be used as indicators, alarm units or controllers. Its simple but powerful interface permits the user to choose between multiple units, output data to a PC using the serial interface, set alarm levels and do field calibration of the sensor.

Desiccant Absorption

Sullair uses a high quality activated alumina desiccant for all desiccant dryer applications. The desiccant has high crush strength media with a very high surface / volume ratio.

To achieve alternative dew point the Sullair dryer uses a mixture of absorption media "Molecular Sieve" or "Silica gel application."





Butterfly Valve

These versatile valves provide precision control and bubble tight shut off. The digitally controlled actuators have easy PLC interface and feature fast response times. The tongue-and-groove seat design ensures complete isolation of the flowing media from the body and stem. Rugged and reliable, these valves are designed to provide years of trouble free service. The butterfly valve is carbon steel with stainless steel disc and staff.



(800 scfm and above)

High Efficiency Blower

The centrifugal blower is sized optimally to provide continuous air stream to the heater for regeneration.

- The blower is equipped with:
- Intake filter
- Muffler for quieter operation
- Safety belt guard and check
- Relief valves for high-pressure safety

Angle Body Piston Valve

The high performance two-way direct acting valves are designed for reliability and durability. The valve uses a profiled disc in conjunction with a high-resolution compact positioned and linear feedback potentiometer to provide precise proportional flow. The stainless steel internals and a tough fiber composite actuator body, along with the use of oversized bearing and Viton seals makes it possible to consistently provide smooth piston movement for an extended time period.



Sullair's Heatless Desiccant Modular Dryers

Desiccant Modular Dryer (DMD) Standard Features

- Completely automatic
- Compact design
- -40°F pressure dew point
- Adjustable wall mounted
- Quick and easy connection
- Long lasting high quality components

Desiccant Modular Dryer (DMD) Options

- Pre- and after-filter (shipped loose)
- Mounted filters with three valve bypass
- Visual Moisture Indicator
- Energy efficient Demand Cycle Control with dew point monitor
- Dew point monitor
- -4°F or -100°F pressure dew point







Specifications: Desiccant Modular Dryer

Model	oofm	Inlet-Outlet	Width	Depth	Height	Weight	Floatrical	Dro Eiltor	After Filter
woder	scim	Connection	In	In	IN	IDS	Electrical	Pre-Filler	Aller-Filler
DMD-3	3	1/2" NPT	13	10	22	32	115 - 230 / 1 / 50 & 60 Hz	FXH-25	FXFR-25
DMD-5	5	1/2" NPT	13	10	25	36	115 - 230 / 1 / 50 & 60 Hz	FXH-25	FXFR-25
DMD-10	10	1/2" NPT	13	10	36	52	115 - 230 / 1 / 50 & 60 Hz	FXH-25	FXFR-25
DMD-15	15	1/2" NPT	15	10	32	57	115 - 230 / 1 / 50 & 60 Hz	FXH-25	FXFR-25
DMD-20	20	1/2" NPT	15	10	44	79	115 - 230 / 1 / 50 & 60 Hz	FXH-25	FXFR-25
DMD-25	25	1/2" NPT	15	10	50	90	115 - 230 / 1 / 50 & 60 Hz	FXH-25	FXFR-25
DMD-30	30	1/2" NPT	15	10	59	107	115 - 230 / 1 / 50 & 60 Hz	FXH-45	FXFR-45
DMD-40	40	1-1/2" NPT	16	17	49	156	115 - 230 / 1 / 50 & 60 Hz	FXH-45	FXFR-45
DMD-50	50	1-1/2" NPT	16	17	55	172	115 - 230 / 1 / 50 & 60 Hz	FXH-65	FXFR-65
DMD-60	60	1-1/2" NPT	16	17	69	202	115 - 230 / 1 / 50 & 60 Hz	FXH-65	FXFR-65
DMD-75	75	1-1/2" NPT	16	23	51	257	115 - 230 / 1 / 50 & 60 Hz	FXH-130	FXFR-130
DMD-100	0 100	1-1/2" NPT	16	23	57	286	115 - 230 / 1 / 50 & 60 Hz	FXH-130	FXFR-130
DMD-120) 120	1-1/2" NPT	16	23	69	334	115 - 230 / 1 / 50 & 60 Hz	FXH-130	FXFR-130
DMD-180) 180	1-1/2" NPT	16	28	59	407	115 - 230 / 1 / 50 & 60 Hz	FXH-240	FXFR-240
DMD-240	240	1-1/2" NPT	16	33	59	519	115 - 230 / 1 / 50 & 60 Hz	FXH-240	FXFR-240

Specifications: Desiccant Heatless Dryer

		Inlet-Outlet	Width	Depth	Height	Weight			
Model	scfm	Connection	in	in	in	lbs	Electrical	Pre-Filter	After-Filter
DHL-80	80	3/4" NPT	24	31	84	450	115-1-60	FXH-130	FXFR-130
DHL-100	100	1" NPT	24	31	84	550	115-1-60	FXH-130	FXFR-130
DHL-125	125	1" NPT	24	31	84	600	115-1-60	FXH-130	FXFR-130
DHL-150	150	1" NPT	24	33	84	650	115-1-60	FXH-240	FXFR-240
DHL-200	200	1" NPT	24	33	84	880	115-1-60	FXH-240	FXFR-240
DHL-250	250	1-1/2" NPT	24	39	87	1250	115-1-60	FXH-350	FXFR-350
DHL-300	300	1-1/2" NPT	24	39	87	1350	115-1-60	FXH-350	FXFR-350
DHL-400	400	2" NPT	26	45	89	1900	115-1-60	FXH-475	FXFR-475
DHL-500	500	2" NPT	26	45	89	2200	115-1-60	FXH-700	FXFR-700
DHL-600	600	2" NPT	26	45	89	2500	115-1-60	FXH-700	FXFR-700
DHL-800	800	3" FLG	40	66	93	2800	115-1-60	FXH-1350	FXFR-1350
DHL-1000	1000	3" FLG	40	66	93	4150	115-1-60	FXH-1350	FXFR-1350
DHL-1250	1250	3" FLG	40	70	93	4400	115-1-60	FXH-1350	FXFR-1350
DHL-1500	1500	3" FLG	40	70	93	4700	115-1-60	FXH-1600	FXFR-1600
DHL-2000	2000	3" FLG	40	76	97	4900	115-1-60	FWH-2500	FWFR-2500
DHL-2500	2500	4" FLG	50	93	109	5600	115-1-60	FWH-2500	FWFR-2500
DHL-3000	3000	4" FLG	50	93	109	8100	115-1-60	FWH-3800	FWFR-3800
DHL-3500	3500	6" FLG	64	118	117	8300	115-1-60	FWH-3800	FWFR-3800
DHL-4000	4000	6" FLG	64	118	117	10500	115-1-60	FWH-5000	FWFR-5000
DHL-4500	4500	6" FLG	64	120	122	11800	115-1-60	FWH-5000	FWFR-5000
DHL-5000	5000	6" FLG	64	120	122	14500	115-1-60	FWH-5000	FWFR-5000

Capacity Correction Factors

(for all Sullair Desiccant Dryers)

Correction factor for Inlet Air Pressure (F1)

Inlet Pressure	psig	50	60	70	80	90	100	110	120	130	140	150	175	200	225	250
	bar	3.5	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	9.7	10.3	12.1	13.8	15.5	17.3
Factor Pressure: F1		0.56	0.65	0.74	0.83	0.91	1.00	1.04	1.08	1.12	1.16	1.20	1.29	1.37	1.45	1.52

Correction factor for Inlet Air Temperature (F2)

		-			,			
°F	70	80	90	100	105	110	115	120
0°	21	27	32	38	40	43	46	49
Factor: F2	1.12	1.10	1.06	1.00	0.93	0.86	0.80	0.75

Air flow capacity = Nominal capacity of the dryer x Factor F1 x Factor F2.

Specifications: Desiccant Externally Heated Dryer

		Inlet-Outlet	Width	Depth	Height	Weight				
Model	scfm	Connection	in	in	in	lbs	Electrical	kW	Pre-Filter	After-Filter
DEX-200	200	1" NPT	34	35	92	950	460-3-60	3	FXH-240	FXRHT-240
DEX-250	250	1-1/2" NPT	34	36	92	1100	460-3-60	3	FXH-350	FXRHT-350
DEX-300	300	1-1/2" NPT	34	36	92	1250	460-3-60	5	FXH-350	FXRHT-350
DEX-400	400	2" NPT	45	47	92	1500	460-3-60	6	FXH-475	FXRHT-475
DEX-500	500	2" NPT	45	47	92	1600	460-3-60	7	FXH-700	FXRHT-700
DEX-600	600	2" NPT	45	47	92	2100	460-3-60	9	FXH-700	FXRHT-700
DEX-800	800	3" FLG	60	80	95	2500	460-3-60	11	FXH-925	FXRHT-925
DEX-900	900	3" FLG	60	80	95	2800	460-3-60	13	FXH-925	FXRHT-925
DEX-1000	1000	3" FLG	60	80	95	4100	460-3-60	15	FXH-1350	FXRHT-1350
DEX-1250	1250	3" FLG	60	80	110	4700	460-3-60	18	FXH-1350	FWRHT-1350
DEX-1500	1500	3" FLG	60	80	110	4900	460-3-60	20	FXH-1600	FWRHT-1600
DEX-2000	2000	3" FLG	62	80	110	5300	460-3-60	25	FWH-2500	FWRHT-2500
DEX-2500	2500	4" FLG	65	82	110	6200	460-3-60	25	FWH-2500	FWRHT-2500
DEX-3000	3000	4" FLG	65	82	110	7600	460-3-60	30	FWH-3800	FWRHT-3800
DEX-3500	3500	6" FLG	70	85	120	8300	460-3-60	38	FWH-3800	FWRHT-3800

Specifications: Desiccant Blower Purge Dryer

		Inlet–Outlet	Width	Depth	Height	Weight				
Model	scfm	Connection	in	in	in	lbs	Electrical	kW	Pre-Filter	After-Filter
DBP-500	500	2" NPT	45	71	92	2500	460-3-60	10	FXH-700	FXRHT-700
DBP-650	650	2" NPT	45	71	92	2750	460-3-60	12	FXH-700	FXRHT-700
DBP-800	800	3" FLG	60	93	95	4100	460-3-60	18	FXH-925	FXRHT-925
DBP-1000	1000	3" FLG	60	93	95	4500	460-3-60	24	FXH-1350	FXRHT-1350
DBP-1250	1250	3" FLG	60	93	95	8200	460-3-60	30	FXH-1350	FXRHT-1350
DBP-1500	1500	3" FLG	60	93	95	8200	460-3-60	36	FXH-1600	FXRHT-1600
DBP-2000	2000	4" FLG	65	106	109	9800	460-3-60	45	FWH-2500	FWFHT-2500
DBP-2500	2500	4" FLG	75	106	120	15000	460-3-60	50	FWH-2500	FWFHT-2500
DBP-3000	3000	4" FLG	75	106	120	15000	460-3-60	55	FWH-3800	FWFHT-3800
DBP-3500	3500	6" FLG	82	150	132	19000	460-3-60	60	FWH-3800	FWFHT-3800
DBP-4000	4000	6" FLG	94	160	132	19000	460-3-60	70	FWH-5000	FWFHT-5000
DBP-5000	5000	6" FLG	94	180	140	28000	460-3-60	80	FWH-5000	FWFHT-5000
DBP-6000	6000	6" FLG	CF	CF	CF	CF	460-3-60	90	FWH-6500	FWFHT-6500
DBP-7000	7000	8" FLG	CF	CF	CF	CF	460-3-60	105	FWH-8300	FWFHT-8300
DBP-7500	7500	8" FLG	CF	CF	CF	CF	460-3-60	125	FWH-8300	FWFHT-8300
DBP-9000	9000	10" FLG	CF	CF	CF	CF	460-3-60	135	FWH-10000	FWFHT-10000
DBP-10000	10000	10" FLG	CF	CF	CF	CF	460-3-60	140	FWH-10000	FXFHT-10000

Correction factor	orrection factor for Inlet Air Pressure (F1)															Corre	
Inlet Pressure	psig	50	60	70	80	90	100	110	120	130	140	150	175	200	225	250	°F
	bar	3.5	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	9.7	10.3	12.1	13.8	15.5	17.3	°C
Factor Pressure: F1		0.56	0.65	0.74	0.83	0.91	1.00	1.04	1.08	1.12	1.16	1.20	1.29	1.37	1.45	1.52	Facto

rrection factor for Inlet Air Temperature (F2)

°F	70	80	90	100	105	110	115	120	
°C	21	27	32	38	40	43	46	49	
Factor: F2	1.12	1.10	1.06	1.00	0.93	0.86	0.80	0.75	

Air flow capacity = Nominal capacity of the dryer x Factor F1 x Factor F2.

Sullair Air Quality Guarantee

Two Levels of Air Quality

Sullair recognizes that the requirements for air quality vary according to each compressed air application. For this reason, Sullair provides compressed air systems that achieve two distinct levels of air quality and a guarantee for each.

Sullair Stationary Air Power System

The Sullair Stationary Air Power System matches a Sullair compressor, a Sullair dryer and Sullair filters. Sullair assures that its System will meet specific performance levels throughout its operational life. We offer a one-year test/review period, backed by a purchase refund guarantee, to verify the performance of the Sullair System.

Select the System

Select the air quality level to meet your plant air or process requirements. You

can be assured that the quality of air from the Sullair System you specify will remain consistent for the life of the equipment. Sullair guarantees it... and that's as good as gold.

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The Sullair Oil-Free Air Quality Guarantee

The System consists of a Sullair compressor, Sullair dryer, and Sullair filters. The compressed air

from this system contains particulates no larger than .01 micron, including coalesced liquid water and lubricants.

Maximum remaining oil aerosol content is 0.01 parts per million by weight (ppm/w) @ 70°F, including oil vapor. The air from this Sullair System meets the most stringent ISO standard (ISO 8573.1, Class 1 for oil vapor and Class 1 for particulate) for air quality.

The Sullair Critical Air Quality Guarantee

The compressed air from this Sullair System exceeds the ISO standard (ISO 8573.1, Class 1 for oil vapor and Class 1 for particulate). The System includes a Sullair compressor, Sullair dryer, and Sullair filters. The odor-free compressed air from this system contains particulates no larger than 0.01 micron, including water and oil aerosol content of 0.01 parts per million by weight (ppm/w) @ 70°F. The remaining oil vapor content is less than 0.003 ppm/w.

To get more information on Sullair's Air Quality Guarantee, please contact your Sullair distributor.

These Systems are not intended to remove carbon monoxide, methyl isocyanate or other noxious, corrosive or toxic gases, vapors or fumes. The System does not provide breathing air.

The Sullair Warranty

All Inclusive "Peace of Mind" Warranty

Sullair backs our commitment to quality with an unparalleled, non-prorated 5-year warranty (*parts and labor*) on the major components. No other manufacturer offers a warranty that is as all inclusive. (Note: a Sullair pre-filter must be installed upstream of the dryer as a prerequisite for this warranty.)



ASME / CRN Approval



Air Quality Standards ISO 8573.1 Classes





Sullair's Compressed Air Products



Fundamental to Sullair's leadership is a dedication to reduce not only the amount of natural resources consumed to create energy, but to minimize environmental impact, in both the manufacture and use of all our products. We are constantly exploring new ideas and seeking new technologies to meet the ever-increasing need for high quality, energy-efficient compressed air products and environmental sustainability.



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