

5-2-1 Product Warranty

Industry Leading Warranty

Great Lakes Air Products has produced high quality regenerative dryers since its founding in 1983. In an effort to express these quality standards utilized in both the design & manufacture, of desiccant air dryers. Great Lakes Air has standardized on an industry leading regenerative equipment Warranty.

as well as distinguish their products in the marketplace

- 5 Year coverage for any heating element
- 2 Years coverage for equipment components
- 1 Year labor this quality standard



Detailed warranty coverage and requirements can be referenced in the GBS warranty publication.

UL 508A Control Panels

The UL 508A standard defines guidelines of industrial control panel construction inclusive of component selection and wiring methodology to attain a product that is built for safety, function, and longevity in the industrial work environment.

The UL Listing mark demonstrates:

- The industrial control panel and components are third-party certified.
- Includes wiring, motor and induction protection,
- Meets environmental and regulatory requirements.
- Includes the required safety markings.
- The panel meets both the National Electric Code (NEC) & the Canadian Electric Code (CEC)

The UL listing mark requires regular inspections throughout the year to verify that control panels are constructed in accordance with approved design. UL Listed panels apply to standard design products. The addition of optional accessories or custom designs may remove the UL Panel Listing.

Made with Pride in the USA

Great Lakes Air Products manufactures all of its compressed air dryers in southeastern Michigan which has a long and rich history in manufacturing. We offer our customers a steady stream of value driven, high quality, industrial grade products with decades of proven performance. Readily available replacement components and maintenance items are locally available through the Great Lakes distribution network. Base your equipment purchase on the quality and durability of American made products.



GBS Series Air Dryer Operation

Compressed air enters the dryer and is directed to a tower by the inlet valves. It then proceeds up through the tower, gives up its moisture, then exits through the outlet check valve. A regenerative blower creates a purge stream that is heated by a circulation heater increasing it's moisture holding capacity while transferring heat to the desiccant bed. The moisture is picked up by the heated purge air, and exits to the atmosphere through the purge exhaust valve and muffler. The drying and regenerating cycles occur simultaneously for 4 hours. The regeneration cycle begins with 2.5 hours of heating and 1.4 hours of cooling, then the tower repressurizes before the inlet valves invert and the process starts again. Blower Purge dryers use wet ambient air for regeneration that can cause dewpoint to fluctuate with seasonal ambient conditions. The standard Tri-Mode operating feature allows the GBS dryer to overcome seasonal dewpoint spikes

Blower Only Mode: Standard operating with dewpoint fluctuations by season.

Blower Polishing Mode: Uses 2.6% compressed air purge during the cooling cycle and produces a stable -40 dewpoint.

External Heated Mode: Uses 7.0% compressed air purge and produces a stable -40 dewpoint. This mode is ideal performing blower maintenance.





Optional Air Dryer Operation

Dewpoint Demand Controller



The Dewpoint Demand System eliminates wasted energy from dryer system with fluctuating or low load conditions. The dewpoint system senses the discharge dewpoint of the on-line desiccant bed and determines the maximum allowable drying cycle. If a dryer was sized for continuous full load conditions, the desiccant would reach the end of its useful cycle in four hours for heat type dryers, or ten minutes for heatless dryers. If a system were completely loaded, the on-line tower would reach the end of its useful adsorption cycle just as the off line tower was completing its regeneration. In low load conditions the Dewpoint Demand Controller holds the on-line tower in the drying position, and allows the other fully regenerated tower to hold in a standby mode consuming no energy until it is required, as the on-line tower reaches the end of its useful adsorption cycle. In low load conditions, heated dryer systems can continue to dry a facilities compressed air for days while expending no purge air or energy at all.

Design Features & Benefits



Solenoid Control Valves

Great Lakes Air regenerative dryers use one of two spool and sleeve directional control valves based on pilot air requirements. Each is equipped with Polyurethane dual seals in a packed bore construction that offers improved performance in rigorous applications, shrugging off contaminants or desiccant dust that would destroy ordinary valves.





The Great Lakes Air desiccant support screens are fabricated from heavy gauge perforated stainless steel. The perforation pattern is designed to retain the desiccant bed while allowing small particles to pass, this prevents particle buildup and high pressure drops. Screens with tighter perforations or wire mesh covers run a high probability of damage from pressure drop. The screens are 100% welded construction, with no epoxy bonding.

Desiccant Support Screens

Process Check Valves

Great Lakes Air desiccant dryers use all stainless steel poppet type check valves for process lines 1/2" through 1-1/2". The valve has a high flow design for low pressure drop. The all stainless steel construction produces extraordinary service life.





Process lines 2" and larger use a wafer type check valve which has all stainless steel internals and a vulcanized sealing seat. The seat is located on the trailing edge of the process flow protecting it from the damaging desiccant dust.

Over time all valve seals experience wear. If a valve design uses the sealing medium as a hinge or sealing surface, failure can occur depressurizing the entire system. The Great Lakes Air wafer style check valve utilizes the soft seat only to ensure a bubble tight seal, the primary sealing surface is metal to metal thus removing the probability of a catastrophic failure.

Process Automated Valves

Process valves for inlet control, depressurization, and purge exhaust specific valves are selected by line size and process application

External Piston Process Valve

High flow angle valve with external aluminum alloy actuator 304 SS body and PTFE process seals



Internal Piston Process Valve High flow angle valve with internal actuator hycar process seals and viton diaphragm



High Performance Butterfly Valve

316 SS Disc and stem w/ replaceable RPTFE Seals rack & pinion actuator



Design Features & Benefits

Regenerative Blowers

Blower Purge desiccant dryers utilize a regenerative blower (Side Channel) that creates a purge stream that is heated by a circulation heater increasing its moisture holding capacity while transferring heat to the desiccant bed. The operational energy savings of a blower purge are primarily derived from the high efficiency impeller that produces extremely high power-to-performance ratios.

- TEFC Premium efficiency motors.
- Virtually maintenance free design.
- Smooth operation that is pulsation and oil free
- Aluminum alloy with corrosion resistance, & excellent heat dissipation.
- Patented impeller design has superior tonal quality & lower perceived noise.



PLC Control System w/ HMI

The PLC control system is a stackable brick compact form factor design capable of multiple configurations, allowing for flexibility, reliability, ease of maintenance. With their fast response times, precise control, and scalability, they are an essential component of modern compressed air dryer control systems.



• **Standard PLC** units have two RS-232 (RJ12) serial communications ports - one programming port and one for HMI interconnection.

• **Optional Ethernet PLC** units have one RS-232 (RJ12) serial communication port - for HMI interconnection and one 10/100 Mbps (RJ45) ethernet communication port that supports Modbus TCP Client/Server and Ethernet/IP protocol.

Both units are controlled with intuitive programming environment which is available as an open source software.



The human machine interface (HMI) is a resistive analog LCD touch screen capable of 16.7M colors, with WQVGA screen resolution and an 800 MHz CPU. It allows users to monitor, control, and manipulate various aspects of the compressed air dryer through graphical representations.

- Ethernet 10/100 Base-T port (programing/communication)
- Serial PLC interface (RS-232C/422/485)
- One built-in SD memory card slot
- USB port A (USB device options)

- Data logging
- NEMA 4/4X, IP65
- USB port B (program/download)

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Features & Benefits

Description	100/650 100/650 800/1400		800/1400 1600/5000		1600/5000				
Description	Standard	Analog	Standard	Analog	Standard	Analog			
System Design & Components									
Tri-Mode Operating System	٠	٠	٠	٠	٠	•			
NEMA 12 Electrical	٠	٠	٠	٠	٠	•			
UL Listed Industrial Control Panel	•	•	•	•		•			
5-Year Heater Warranty						•			
Low Watt Density Incoloy Heater	•	•	•	•	•	•			
Insulated Heater & Purge Piping	• • • •				•	•			
Regenerative Blower	•	• • • •				•			
Silencing Blower Intake Filter	٠	•	٠	•	٠	•			
ASME Relief Valves	٠	٠	۲	۲	٠	٠			
OSHA Approved Mufflers	٠	٠	٠	۲	٠	٠			
Desiccant Fill & Drain Ports	٠	٠	٠	٠	٠	٠			
Control Air Filter	٠	٠	۲	٠	٠	٠			
Adjustable Purge Flow w/ Indicator	٠	٠	٠	٠	٠	۲			
External Piston Process Valve	* *	◆ ▲◆	▲ �	▲ �	*	٠.			
Internal Piston Process Valve	X	X	•	•	X	Х			
High Performance Butterfly Valve	X	X	X	X	*	*			
Control & Instrumentation									
PLC Control w/ HMI	•	•	•	•	•	•			
Ethernet PLC Control w/HMI									
Dewpoint Demand Controller									
Blower Thermal Overload	•	•	•	•	•	•			
Tower Pressure Gauges	•	•		•	•	•			
Heater over-temp hi-limit system	•	•		•	•	•			
Stainless Steel Control Tubing									
Alarm Systems									
Heater Overtemp Alarm	•	•	•	•	•	•			
Low Purge Temperature Alarm	•	•	•	•	•	•			
Fail to Shift Alarm		•				•			
Blower Failure Alarm									
High Dewpoint Alarm									
Standard Feature	Opt	ional Feature	e 🗖	Not Available X					
Process Valves 🔶	P	urge Valves 🖌		Depressurization Valves 💠					

Features & Benefits

Engineered Packages

Custom packages designed to meet submitted engineering specifications for the most demanding applications.

Cold Weather Packages

Upgrades a standard package to operate in ambient conditions below freezing.

Electrical Systems

Great Lakes Air regenerative dryers have a standard electrical rating of NEMA 12. The following electrical classifications are available:

NEMA 4Watertight,NEMA 4XWatertight aHazardous LocationClass 1 DivHazardous LocationClass 1 Div

Watertight, Watertight & Corrosion Resistant Class 1 Div. 1 Class 1 Div. 2 (Z-Purge Package)

Non Standard Condition Capacity Correction

To obtain flow capacities at conditions other than standard (SCFM @ 100 PSIG, 100°F Inlet), locate the multiplier at the interception of actual operating conditions. Multiply the standard rated capacity of the dryer by the selected multiplier. The result is the flow capacity of that dryer under corrected conditions. Flow rates in excess of design due to capacity correction can result in increased pressure drop.

Inlet Temperature °F		80	90	100	105	110	115	120
r Pressure	60 psig	1.17	0.87	0.65	0.57	0.49	0.43	0.38
	70 psig	1.33	0.99	0.74	0.64	0.56	0.49	0.43
	80 psig	1.49	1.10	0.83	0.72	0.63	0.55	0.48
	90 psig	1.65	1.21	0.91	0.79	0.69	0.61	0.53
	100 psig	1.80	1.33	1.00	0.87	0.76	0.66	0.58
	110 psig	1.96	1.45	1.09	0.95	0.82	0.72	0.63
Ai Ai	I15 psig	2.04	1.51	1.13	0.98	0.86	0.75	0.66
ulet	120 psig	2.12	1.57	1.17	1.02	0.89	0.78	0.68
=	125 psig	2.19	1.62	1.22	1.06	0.92	0.81	0.71
	130 psig	2.27	1.68	1.26	1.10	0.96	0.84	0.73
	140 psig	2.43	1.80	1.35	1.17	1.02	0.90	0.79

Example Calculation							
	650 SCFM						
Dryer Inlet:	110°F						
	115 PSIG						
Correction Factor:	0.86						
Corrected Flow:	0.86 x 650 = 559						
A standard drye	r with the rated						

A standard dryer with the rated capacity of 650 SCFM has a corrected capacity of 559 SCFM at the specified operating conditions of 110°F and 115 PSIG inlet conditions.

Design and Specification Information

Model Number	Capacity	Voltage	In / Out	Desiccant Weight	Blower HP	Heater Kw	Avg. Heater Kw/H	Dimensions		
								Height	Width	Depth
GBS-100-♦	100		1"	150	1.0	4	1.62	70	64	32
GBS-125-♦	125		1"	200	1.0	4	1.62	70	64	32
GBS-175-♦	175		1-1/2"	300	1.0	4	1.62	73	74	38
GBS-250-♦	250		1-1/2"	400	3.0	10	3.98	73	74	41
GBS-350-♦	350		1-1/2"	550	3.0	10	3.98	80	74	41
GBS-500-♦	500		2"	750	3.0	12	3.98	86	87	42
GBS-650-♦	650		2"	1000	4.0	16	6.78	86	94	45
GBS-800-♦	800		3"	1200	4.0	16	6.78	89	98	45
GBS-1000-♦	1000	200	3"	1500	5.5	24	9.80	89	110	52
GBS-1250-♦	1250		3"	1900	5.5	24	9.80	92	110	55
GBS-1400-♦	1400	38, 36, 20	3"	2100	7.5	30	13.50	100	110	58
GBS-1600-♦	1600	000	4" Flg.	2400	7.5	30	13.50	110	120	62
GBS-1800-♦	1800		4" Flg.	2700	7.5	30	13.50	110	126	62
GBS-2000-♦	2000	39.60	4" Flg.	2800	10	44	18.09	114	128	66
GBS-2250-♦	2250	7 4	4" Flg.	3150	10	44	18.09	117	128	66
GBS-2500-♦	2500		6" Flg.	3500	15	56	22.90	126	132	78
GBS-2750-♦	2750		6" Flg.	3850	15	56	22.90	126	132	80
GBS-3000-♦	3000		6" Flg.	4200	15	67	27.44	126	136	80
GBS-3500-♦	3500		6" Flg.	4900	15	67	27.44	135	146	87
GBS-4000-♦	4000		6" Flg.	5600	20	77	32.54	135	155	87
GBS-5000-♦	5000		6" Flg.	7000	25	100	45.75	C/F	C/F	C/F
GBS-6000-♦	6000		8" Flg.	8400	25	120	53.65	C/F	C/F	C/F

Notes: Capacity =SCFM @ 100°F inlet,100°F ambient & 100 PSIG

Average kW/H heater ratings incorporate actual heating load, and heating cycle time factors. Purge & kW rates reflect 100% loaded systems and or systems without Dewpoint Demand Control Dimensions and specifications are subject to change without notice.

Connections are NPT unless otherwise noted.

Custom design configurations available

** Symbol reflects missing voltage designation

Other Products from Great Lakes Air Products



GRN Series Refrigerated Air Dryer

GMNX Series High Capacity Cycling Air Dryer



Nitrogen Generators



Compressed Air Filtration



Condensate Drain Systems

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