



**GHRN Series High Pressure  
Refrigeration Dryers**

## 5 - Year Product Warranty

Great Lakes Air Products has produced high quality refrigeration dryers since it's founding. In an effort to express this quality standard, as well as distinguish it's products in the marketplace, it initiated an industry leading 5-Year product warranty on standard refrigerated air dryers. The warranty requires no additional purchases or contracts and covers the entire dryer for 5-Years, and excludes only maintenance items through a simple purchase.

Great Lakes Air has supported it's 5-Year Warranty since 1983 while many other industry warranties have been implemented and revoked, others cover only select components, or prorates charges for components at the time of replacement.

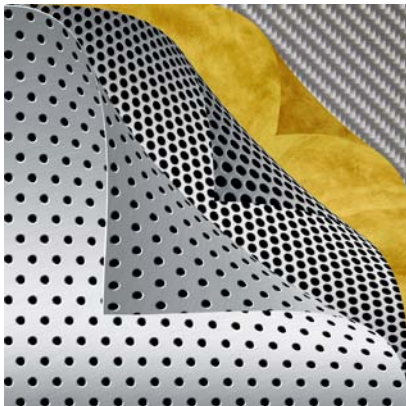
With continuous improvement in engineering and quality standards, that are a product of current technology, you can be assured that Great Lakes Air Products will provide you with a quality product for years of uninterrupted service.



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

## High Efficiency Moisture Separation System

Condensate separation in high pressure systems is inherently difficult due to pulsation and velocity changes in the compressed air stream. To achieve effective and efficient separation while avoiding condensate re-entrainment to the process stream a multistage separation system is employed.



### Stages of Separation

1st & 2nd	
Parallel perforated plates with non-linear orifices reducing velocities and pulsations	
Direct Impingement 2µm and larger	
3rd	
Coalescing utilizing borosilicate glass	
Interception 0.2 to 2 µm	Diffusion 0.001 to 0.2 µm
4th & 5th	
Drain layer of hydrophobic fibers used to shed coalesced liquid, working with a centrifugal separator housing.	

## Made with Pride in the USA

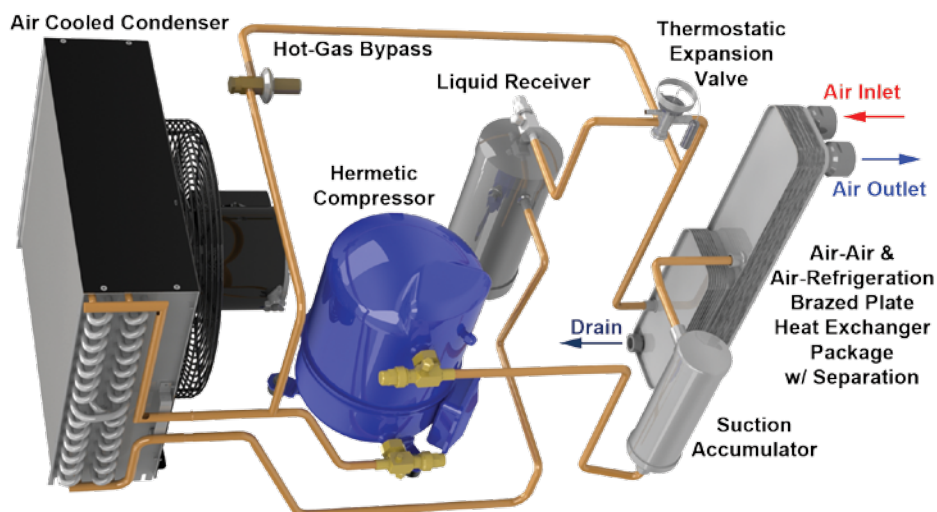
Great Lakes Air Products manufactures all of its compressed air dryers in southeastern Michigan which has a long and rich history in manufacturing. We offer our customers a steady stream of value driven, high quality, industrial grade products with decades of proven performance. Readily available replacement 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.



## GHRN Series Air Dryer Operation

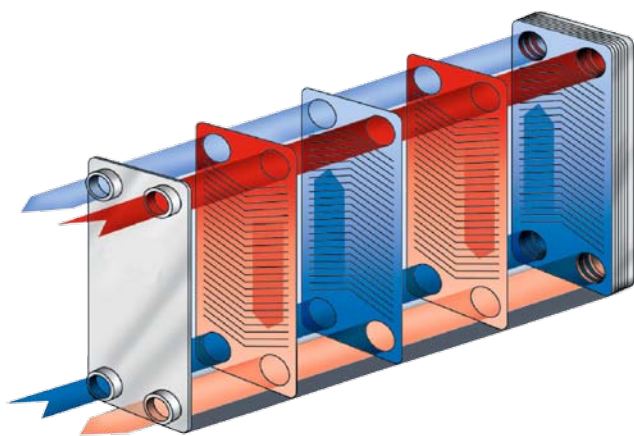
The GHRN Series air dryer takes hot saturated compressed air and cools it in a two stage heat exchange process. The first stage is a high efficiency Air-Air heat exchanger where the compressed air is cooled by air discharged from the stage two Air-Refrigeration exchanger. The second stage of cooling is accomplished in the Air-Refrigerant heat exchanger where the refrigeration system cools the process gas to a specified Dewpoint. The moisture condensed from the drop in temperature is separated and removed from the system. The cold and dry air is then becomes the cooling medium for the first stage as well as reheated prior to discharge from the dryer.

The refrigeration system is comprised of a compressor that boosts the refrigeration gas pressure. As the pressure is boosted the temperature is increased through heat of compression. The heat is removed and the Freon gas is condensed to a liquid by an air or water cooled heat exchanger. The high pressure liquid is collected in a receiver then feed to the expansion valve where it is expanded at a regulated volume.



The expansion of the liquid causes the Freon to cool which is the equal and opposite reaction to the heat generated by compression. The cold Freon adsorbs the heat of the compressed air stream and evaporates to a gas. Any residual liquid is collected and evaporated in a suction accumulator prior to reentering the compressor before the process repeats.

## High Pressure SS Plate Heat Exchanger



GHRN series heat exchangers are designed specifically to process high pressure compressed air with two primary design characteristics, physical structure, and operational efficiency

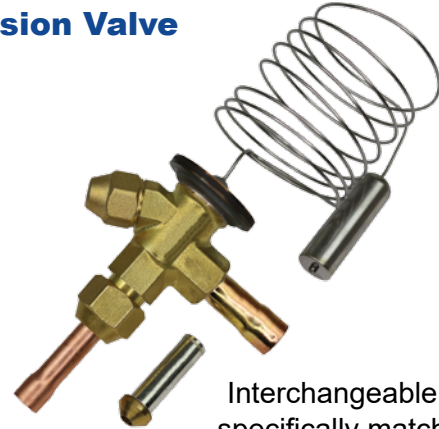
The robust physical design of the high-pressure heat exchanger counters the stresses of pulsation generally present when high duty piston type compressors are employed.

The high efficiency of the stainless-steel heat exchanger is a balance of chevron design for low pressure drop and the overall heat transfer coefficient delivering close approach temperatures and superior dewpoint suppression

# Quality Products start with Quality Components

## Thermostatic Expansion Valve

Thermostatic expansion valve that modulates refrigerant flow to match system requirements in fluctuating ambient temperatures and compressed air load. Low cost capillary tube systems used by other manufacturers will increase or decrease refrigerant flow based upon ambient conditions with no regard to system load. High ambient temperatures or slightly clogged condensers will increase refrigerant flow without a load to balance the system. Operation under these conditions can cause premature compressor failure.



Interchangeable orifices specifically match system design to refrigeration load.

## High Quality Gauges



Stainless steel panel mounted gauges with brazed connections and coiled vibration eliminator removes the possibility of a refrigerant leak from a common leak point in competitors dryers.

## Heavy Duty Piston Refrigeration Compressor with Rotolock Service ports

Heavy duty, industrial service piston type refrigeration compressor with proven durability that is designed to handle the fluctuating loads of a compressed air refrigeration dryer.



Rotolock service valves allow isolation as well as access to the refrigeration system that aids in the long term service and maintenance of a refrigeration dryer.

## Refrigerant Pressure Switches & Fan Cycle Control

Fan Cycle pressure switch controls allow a stable and precise refrigerant operating band in various or changing ambient conditions.



## Hot-Gas Bypass Valve

Heavy duty hot-gas bypass valves are specifically designed for the high pressure applications required with modern refrigerants.

High / Low pressure switches will protect the refrigeration system from out of range operation that could cause compressor failure. The high limit requires manual reset in the event of an overpressure condition which prevents the refrigeration system from short cycling in the event of condenser cooling medium loss, high ambient conditions, or dirty/clogged air cooled condensers.

\*Individual components apply to the GRN series as a whole, not all components apply to each GRN model.\*

## Features & Benefits

Description	GHRN 75-235	GHRN 350	GHRN 500-1600	GHRN 2600-3300
	Single Phase		Three Phase	
<b>Power &amp; Instrumentation</b>				
Refrigeration Suction Gauge	●	●	●	●
Refrigeration Discharge Gauge	-	-	-	●
Air Outlet Pressure Gauge	-	-	-	-
On/Off Power Switch	●	●	●	●
Corded Service Feed	●	-	-	-
Junction Service Feed	-	●	●	●
<b>Refrigeration System</b>				
Piston Refrigeration Compressor	●	●	●	●
Thermostatic Expansion Valve	-	●	●	●
Automatic Expansion Valve	●	-	-	-
Hot Gas Bypass Capacity Control	-	●	●	●
Relay/Contactor	●	●	●	●
Overload Protection	●	●	●	●
Oil Sight Glass	-	●	●	●
Crankcase Heater	-	●	●	●
Fan Cycle Control	-	●	●	●
High Pressure Shutdown	●	-	-	-
High/Low Press Shutdown	-	●	●	●
Rotolock Isolation & Service Valves	-	●	●	●
<b>Condensate Drain</b>				
Strainer with Isolation Valve	●	●	●	●
Smart Design Solenoid Drain	●	●	●	●

## Non Standard Condition Capacity Correction

Inlet Temperature °F		90			100			110			120		
Ambient Temperature °F		90	100	110	90	100	110	90	100	110	90	100	110
<b>Inlet Pressure</b>	650 psig	1.57	1.44	1.22	1.18	1.08	0.92	0.90	0.82	0.70	0.69	0.63	0.54
	600 psig	1.45	1.33	1.13	1.09	<b>1.00</b>	0.85	0.83	0.76	0.65	0.64	0.59	0.50
	550 psig	1.33	1.22	1.04	1.00	0.92	0.78	0.76	0.70	0.59	0.59	0.54	0.46
	500 psig	1.21	1.11	0.95	0.91	0.84	0.71	0.69	0.64	0.54	0.53	0.49	0.42
	400 psig	0.98	0.90	0.76	0.74	0.67	0.57	0.56	0.51	0.44	0.43	0.39	0.34
	300 psig	0.74	0.68	0.58	0.56	0.51	0.44	0.42	0.39	0.33	0.33	0.30	0.25
	200 psig	0.51	0.47	0.40	0.38	0.35	0.30	0.29	0.27	0.23	0.22	0.20	0.17

To obtain flow capacities at conditions other than standard (**SCFM @ 600 PSIG, 100°F Inlet & 100°F Ambient**), 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.

## Design and Specification Information

GHRN-75 / 3300											
Model Number	Capacity SCFM @ 600 PSIG	Refrigeration System			Available Voltages	In / Out Ports	Max. Inlet Pressure	Dimensions			Weight
	35°F PDP	HP	Watts	Freon				H	W	D	
GHRN-75A-◆	75	1/4	410	134a	115-1-60	1/2"	650 PSIG	23	18	23	210
GHRN-160A-◆	160	1/2	828	134a	115-1-60 208/230-1-60	3/4"		23	18	23	225
GHRN-235A-◆	235	5/8	1,011	134a		3/4"		35	19	23	285
GHRN-350A-◆	350	1	1,450	134a		1"		41	22	29	390
GHRN-500A-◆	500	2	2,593	404a	460-3-60 208/230-3-60 575-3-60	1-1/2"		41	22	29	534
GHRN-1100A-◆	1100	3	4,882	404a		2"		49	28	41	970
GHRN-1600A-◆	1600	4	5,642	404a		2"		60	37	62	1560
GHRN-2600A-◆	2600	7	9,843	404a		2-1/2"		60	37	62	2035
GHRN-3300A-◆	3300	9	11,240	404a		2-1/2"		69	43	68	2712

### GHRN Series Notes:

1. Capacity reflects a maximum 100°F inlet temperature and 100°F ambient
2. The symbol "◆" represents a missing voltage designation see table for appropriate designation
3. Dryer voltage must be specified, motors are not dual voltage
4. Inlet/Outlet connections are NPT unless otherwise specified
5. Watts specified assume 35°F evaporator and 100°F Ambient
6. Dimensions are in inches with a +/- 0.5" Tolerance, complete drawings available at [www.glair.com](http://www.glair.com)
7. Equipment weight is in pounds
8. Dimensions and specifications are subject to change without notice

## Design and Specification Information

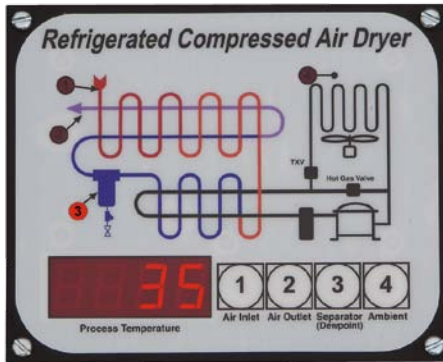
### High Pressure Dryer Heat Rejection & Cooling Requirements

<b>Air-Cooled Units:</b>	
35 BTU/H per rated SCFM of dryer capacity to ambient	
<b>Water-Cooled Units:</b>	
32.6 BTU/H per SCFM of dryer capacity to cooling fluid	
4.8 BTU/H per SCFM of dryer capacity to ambient	
Fluid Requirements	0.0023 GPM per SCFM of dryer capacity @ 50°F Fluid
	0.0029 GPM per SCFM of dryer capacity @ 60°F Fluid
	0.0038 GPM per SCFM of dryer capacity @ 70°F Fluid
	0.0058 GPM per SCFM of dryer capacity @ 80°F Fluid
	0.0087 GPM per SCFM of dryer capacity @ 90°F Fluid

### Voltage Designations

115/120-1-60	116
208/240-1-60	216
208/240-3-60	236
440/480-3-60	436
575-3-60	536

## Optional Digital System Monitor



GHRN series model 250 and larger are available with an optional digital system monitor. The electronic module monitors:

**Air Inlet Temperature**  
**Ambient Temperature**

**Air Outlet Temperature**  
**Dewpoint Temperature**

The unit has a 4-20 mA output for data logging or remote system monitoring. The monitor is not a controller and is not integrated into the dryer operation. The monitor's independence eliminates the possibility of a dryer shutdown, due to electronic failure.

## Optional High Pressure Zero Loss Drain



A fully automatic pneumatic zero loss drain designed specifically for high pressure. Reduces high pressure air loss and provides reliable condensate removal.

- Stainless Steel Reservoir
- Stainless Steel Full Port Drain Valve
- Stainless Steel Float and Seat

## Optional Water Cooled Condenser



Water-cooled condensers for the GHRN series are available in multiple design configurations.

- Standard water cooled models use a high efficiency stainless steel braided plate condenser for city water or well-maintained closed loop cooling systems.
- Shell and tube condenser with removable heads designed for (water side) straight through tube cleaning. This design is ideal for cooling systems that require regular maintenance of components.
- For aggressive water applications cupero-nickel shell and tube condensers are also available as an option.



## Other Products from Great Lakes Air Products



**GTX Series Cycling  
Air Dryer**



**GMTX Series High Capacity  
Cycling Air Dryer**



**Regenerative  
Desiccant Air Dryers**



**Compressed Air  
Filtration**



**Nitrogen  
Generators**

**Distributed By:**

**Great Lakes Air Products, Inc.**  
1515 S. Newburgh Road  
Westland, MI 48186 USA  
Ph: 734-326-7080  
[www.glair.com](http://www.glair.com)