

# Great Lakes Air



ELECTRONIC DRAIN  
5 - YEAR WARRANTY  
35-39°F PRESSURE DEWPOINT  
SS EXPANSION VALVE  
STANDARD ELECTRONIC DRAIN  
5 - YEAR WARRANTY

## **GRF Series Non-Cycling Refrigeration Dryers**

## Why Dry Compressed Air

Compressed air is a clean, convenient and versatile energy resource ideal for many industrial, commercial and instrument applications. To optimize a compressed air system the moisture and contaminants naturally concentrated in the compression cycle must be removed to avoid costly equipment failure, product contamination, and distribution system breakdown.

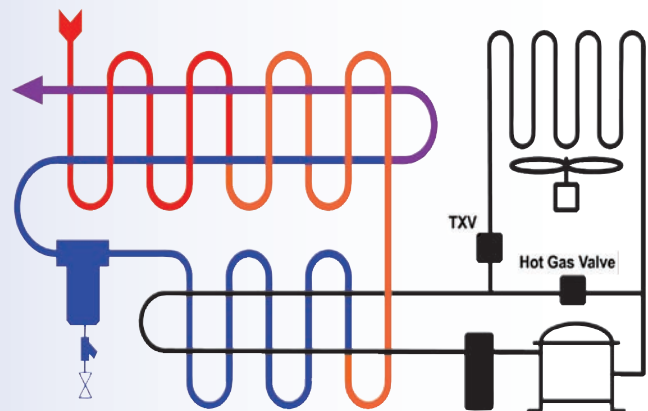
In the compression cycle ambient air is drawn into the compressor where the gas volume is reduced to increase pressure. Any solids, vapors or aerosols introduced into the compression cycle are concentrated in a direct correlation to the discharge pressure of the system. This concentration process produces saturated compressed air with particulate contaminants and excess liquid at the compressor discharge. Filtration can remove the liquid water and contamination but the moisture (humidity) needs to be removed with a compressed air dryer.

A compressed air dryer suppresses the dewpoint (temperature at which liquid moisture will condense) enabling separation to remove the liquid from the system. By removing the moisture with the dryer reliability, efficiency and productivity can be added to a compressed air system.

- Dry compressed air keeps lubricants from being washed away from air tools, cylinders, air motors, and valves extending product life and reducing maintenance requirements.
- Dry compressed air reduces product contamination in applications like, mixing, conveying, agitation, cooling, or product blow down.
- Dry compressed air reduces distribution system corrosion that will increase pressure drop and operational costs, generate pipe scale, cause leaks, and require premature replacement.

## GRF Series Air Dryer Operation

The GRF Series air dryer takes hot saturated compressed air into an air cooled heat exchanger, which cools the air, and a gross water separator removes the condensed liquid. The air then enters the Air-Air exchanger where it is pre-cooled by the air discharged from the Air-Refrigeration exchanger. The final cooling is accomplished in the Air-Refrigerant exchanger where it is further cooled to the specified dewpoint, and additional condensed moisture is separated from the air stream. The cool dry air enters the Air-Air exchanger where it acts as the cooling medium for the previous pre-cooling stage. It also reheats the discharge air to increase volume and prevent the compressed air piping from sweating.



## Features and Benefits

# 5-Year Product Warranty

The Great Lakes GRF series refrigerated air dryer is manufactured to the highest quality standards. In an effort to express this quality standard and distinguish our products from competitors, we standardized on the Great Lakes Air industry leading 5-Year product warranty. The Great Lakes warranty covers the entire dryer for 5-Years and excludes only drain maintenance. Many competitive warranties cover only select components and or prorates a charge for replacement. With continuous improvement of quality standards, along with engineering improvements that are moving with current technology, you can be assured that Great Lakes Air Products will provide you with a quality product for years of uninterrupted service.

For detailed warranty coverage and requirements consult GRF warranty publication.

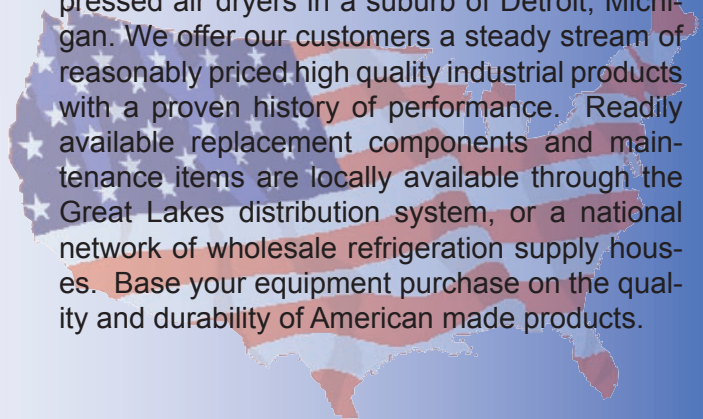
### Environmental Refrigerants

Great Lakes Air utilizes only environmentally friendly EPA approved refrigerants, the GRF series dryers with fractional HP refrigeration compressors utilize HFC (R134A) refrigerant. The larger systems utilize HCFC (R22) refrigerant which be commercially available until 2020. Optional refrigerant types are available consult your representative for details.



### Made With Pride in the U.S.A.

Great Lakes Air manufacturers all of its compressed air dryers in a suburb of Detroit, Michigan. We offer our customers a steady stream of reasonably priced high quality industrial products with a proven history of performance. Readily available replacement components and maintenance items are locally available through the Great Lakes distribution system, or a national network of wholesale refrigeration supply houses. Base your equipment purchase on the quality and durability of American made products.



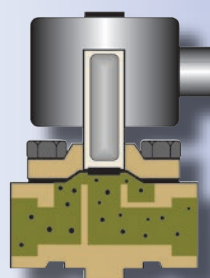
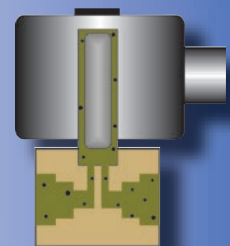
### Low Pressure Drops

The GRF series compressed air dryers manufactured by Great Lakes Air are designed for ultra low pressure drops that range from 1.2 to 3.2 PSID. Competitive products can deliver pressure drops as high as 6.5 PSID. Additional pressure drop can substantially increase the operating cost of your dryer, each pound (PSI) raises the required compressor horsepower by 0.5%. If a facility is required to raise discharge pressure by 3 PSI to overcome component restriction (Pressure Drop), 1.5% additional compressor HP is required.

Assuming a facility operates a 25 HP compressor and has an average electricity cost of \$0.06 kw/H. Adding 3 PSI of pressure drop would needlessly increase annual electrical cost by approximately \$147.00.

### Smart Design Solenoid Drain

Great Lakes Air uses only diaphragm type solenoid valves for it's electronic timed condensate drains. Diaphragm valves keep the main stream of contaminant laden condensate away from the internal moveable piston. If particulate contaminant in the condensate stream fouls and restricts movement of the piston, the valve will fail.



Diaphragm valves have much larger orifices and flow paths than the industry standard direct acting valves. A larger orifice in conjunction with a strainer virtually eliminates the possibility of clogging a condensate drain valve.



**At Great lakes our quality starts with an industrial design, then integrates the highest quality components, and is finally manufactured under the strictest guidelines to the highest standards. Then the entire package is backed up by the original 5-Year Warranty**

**A**



SS Thermostatic expansion valve that modulates refrigerant flow to match system requirements in fluctuating ambient temperatures and compressed air loads. Capillary tube systems used by other manufacturers will increase or decrease refrigerant flow on 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 SS orifices to specifically matches system design to refrigeration load.

**B**

GRF series dryers utilize electronic timed solenoid drains with an isolation valve and strainer. This simplifies maintenance while protects the drain system form contaminant failure. This is in addition to the superior design of the diaphragm solenoid valve described in the features and benefits of this brochure.



**C**



GRF series dryers are equipped with full service refrigeration valves on both the suction and discharge systems. These valves simplify field maintenance or service as well as reducing refrigerant loss.

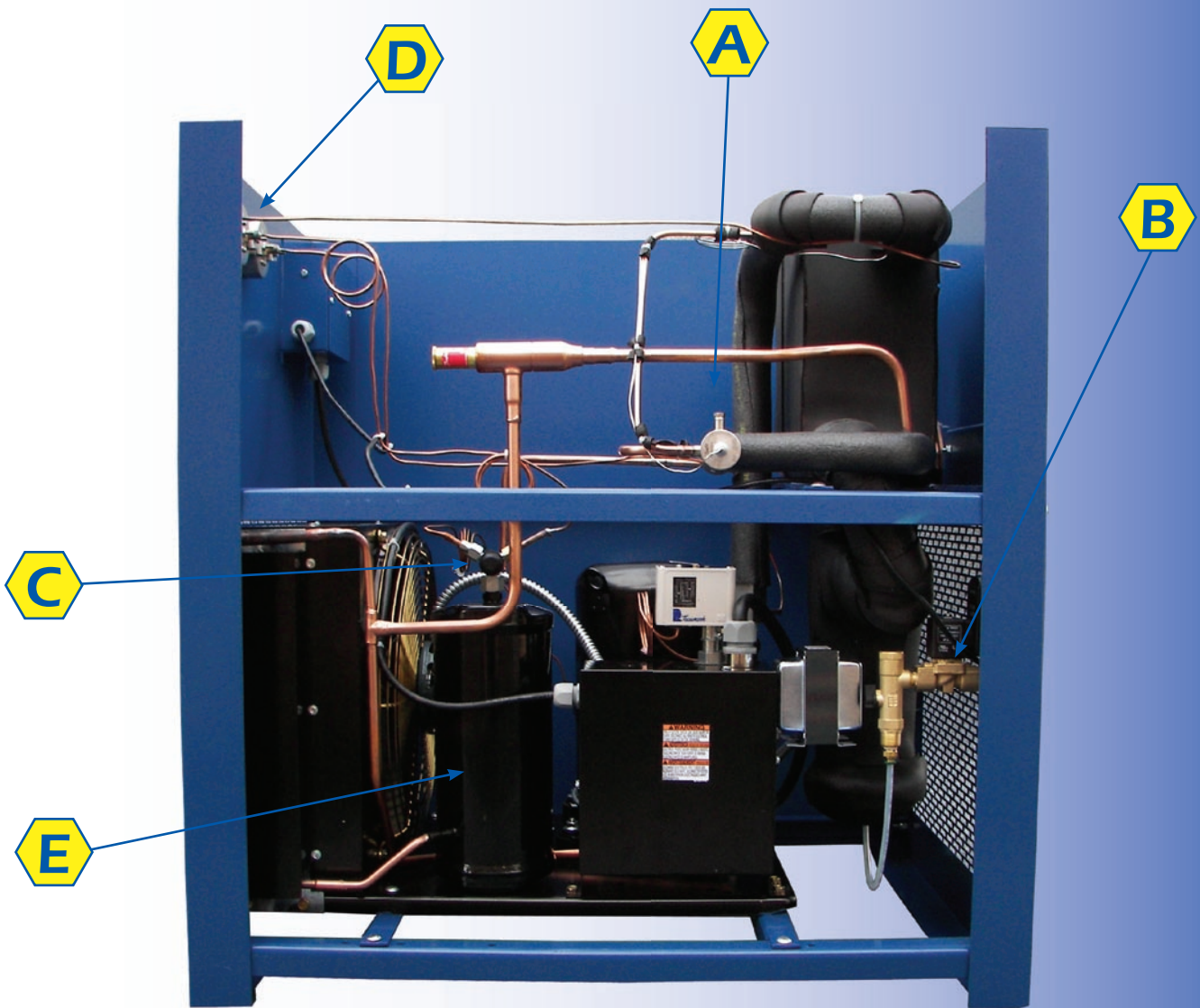
**D**

SS panel mounted gauges with braised connections and coiled vibration eliminators removes the possibility of a refrigerant leak from a common leak point in competitive dryers.

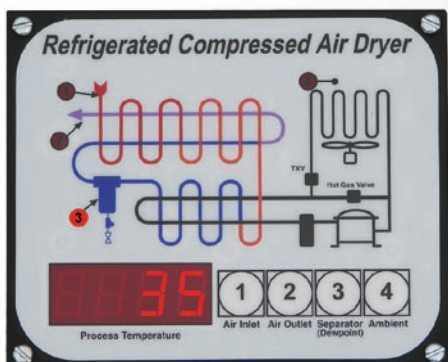


**E**

Great Lakes Air uses suction accumulators to further remove any possibility of refrigerant liquid return to the compressor that could cause premature compressor failure



## Optional Digital System Monitor



GRF series dryers model 75 and up are available with an optional digital system monitor. This electronic module monitors air inlet temperature, air outlet temperature, ambient temperature, and separation (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.

# 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
Inlet Air Pressure	70 psig	1.00	0.92	0.84	0.80	0.73	0.67	0.66	0.60	0.55	0.50	0.45	0.41
	80 psig	1.12	1.03	0.94	0.90	0.82	0.75	0.73	0.67	0.61	0.55	0.51	0.46
	90 psig	1.24	1.14	1.04	0.99	0.91	0.83	0.81	0.75	0.68	0.61	0.56	0.51
	100 psig	1.36	1.25	1.13	1.09	1	0.91	0.89	0.82	0.74	0.67	0.62	0.56
	110 psig	1.48	1.36	1.23	1.18	1.08	0.99	0.97	0.89	0.81	0.73	0.67	0.61
	120 psig	1.60	1.46	1.33	1.28	1.17	1.06	1.04	0.96	0.87	0.79	0.72	0.66
	130 psig	1.72	1.57	1.43	1.37	1.26	1.14	1.12	1.03	0.94	0.85	0.78	0.71
	140 psig	1.83	1.68	1.53	1.47	1.35	1.22	1.20	1.10	1.00	0.91	0.83	0.76
	150 psig	1.95	1.79	1.63	1.56	1.43	1.30	1.28	1.17	1.07	0.97	0.89	0.81

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

## Standard and Optional Features

Features		GRF Series Model Suffix					
		10/25	40/75	100/200	250/300	400/650	800/2250
Power & Instrument	Refrigerant Suction Gauge	Standard					
	Refrigerant Discharge Gauge	Optional				Standard	
	Air Outlet Pressure Gauge	N/A	Optional				Standard
	Power Cord (15A)	Standard	N/A				
	Illuminated Power On Switch	Optional	Standard				
Refrigeration	Compressor Relay/Contactor	Standard					
	Compressor Overload Protection	Standard					
	Compressor High Pressure Shutdown	N/A	Optional	Standard			
	Compressor Low Pressure Shutdown	N/A	Optional		Standard		
	Compressor Crankcase Heater	N/A			Standard		
	SS Thermostatic Expansion Valve	N/A		Standard			
	Adjustable Hot Gas By-pass Valve	N/A		Standard			
	Suction Accumulator	N/A		Standard			
	Liquid Receiver	N/A		Standard			
	Water Cooled Condenser	N/A	Optional				
Drain	Condensate Strainer with Isolation Valve	N/A	Standard				
	Diaphragm Timed Solenoid Drain Valve	N/A	Standard				
	Automatic Float Drain	Standard	N/A				



# Specifications & Dimensions

Model Number	Capacity in SCFM @100 PSIG &		Refrigeration System		Available Voltages	In / Out Ports	Max. Inlet Pressure	Dimensions Inches			Shipping Weight	
	35°F PDP	50°F PDP	HP	Watts				H	W	D		
GRF-10A-116	10	14	1/6	280	115/120-1-60 100-1-50	N/A	N/A	3/8 OD	10	15	13	59
GRF-20A-116	20	22	1/5	385				1/2"	19	21	15	105
GRF-25A-116	25	30	1/4	465				1/2"	19	21	15	118
GRF-40A-116	40	48	1/4	465				3/4"	19	18	24	123
GRF-50A-116	50	60	1/3	600				3/4"	19	18	24	165
GRF-75A-◆	75	90	1/2	815				3/4"	19	18	24	170
GRF-100A-◆	100	120	5/8	1080	208/230-1-60 200-1-50	N/A	230 PSIG	1"	34	26	33	237
GRF-125A-◆	125	150	3/4	1180				1"	34	26	33	270
GRF-150A-◆	150	180	3/4	1180				1-1/2"	34	26	33	302
GRF-200A-◆	200	240	1	1450				1-1/2"	34	26	33	326
GRF-250A-◆	250	300	1-1/2	2107				1-1/2"	34	26	33	334
GRF-300A-◆	300	360	1-1/2	2107				1-1/2"	34	26	33	344
GRF-400A-◆	400	480	2	2587	208/230-3-60 ~ 440/480-3-60 200-3-50 ~ 575-3-60	N/A	150 PSIG	2"	46	32	45	621
GRF-500A-◆	500	600	3	4286				2"	46	32	45	678
GRF-650A-◆	650	780	3	4286				2"	46	32	45	686
GRF-800A-◆	800	960	4	5375				3"	46	32	45	1110
GRF-1000A-◆	1000	1200	5-1/2	7145				3"	46	32	45	1178
GRF-1200A-◆	1200	1440	5-1/2	7145				3"	46	32	45	2015
GRF-1500A-◆	1500	1800	9	10525	N/A	N/A	150 PSIG	4" Flg.	80	57	62	2520
GRF-1750A-◆	1750	2100	10.5	13550				4" Flg.	80	57	62	2800
GRF-2000A-◆	2000	2400	10.5	13350				4" Flg.	80	57	62	3000
GRF-2250A-◆	2250	2700	12	14770				4" Flg.	80	57	62	3200

- 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. Inlet/Outlet connections are NPT unless otherwise specified
  4. Watts specified assume 35°F evaporator and 100°F Ambient
  5. Dimensions are in inches, complete drawings available at [www.glair.com](http://www.glair.com)
  6. Shipping weight is in pounds and applies to single phase units in the 100-300 SCFM range
  7. Dimensions and specifications are subject to change without notice

## Dryer Heat Rejection & Cooling Requirements

<b>Air-Cooled Units:</b>	
60 BTU/H per rated SCFM of dryer capacity to ambient	
<b>Water-Cooled Units:</b>	
55.2 BTU/H per SCFM of dryer capacity to cooling fluid	
4.8 BTU/H per SCFM of dryer capacity to ambient	
Fluid Requirements	0.0040 GPM per SCFM of dryer capacity @ 50°F Fluid
	0.0050 GPM per SCFM of dryer capacity @ 60°F Fluid
	0.0065 GPM per SCFM of dryer capacity @ 70°F Fluid
	0.0100 GPM per SCFM of dryer capacity @ 80°F Fluid
	0.0150 GPM per SCFM of dryer capacity @ 90°F Fluid

## Voltage Designations

115/120-1-60	116
100-1-50	115
208/240-1-60	216
200-1-50	215
208/240-3-60	236
200-3-50	235
440/480-3-60	436
575-3-60	535

## Other Products from Great Lakes Air Products



**EDR Series High Inlet Temperature Air Dryer**



**GTX Series Cycling Type Air Dryer**



**GUF Series High Capacity Air Dryer**



**Regenerative Type Desiccant Air Dryers**



**Compressed Air Filtration**



**Condensate Drain Systems**

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