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HIGH TEMPERATURE REFRIGERATION AIR DRYER *EDR SERIES OWNER / OPERATOR MANUAL*



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DEFINITION OF THE SIGNS USED IN THIS MANUAL



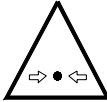
Before attempting any installation or maintenance on the dryer, read carefully the instructions reported in this manual.



General warning sign. Risk of danger or possibility of damage to the machine. Read carefully the text related to this sign.



Electrical hazard. The relevant text outlines conditions, which could result fatal. The related instructions must be strictly respected.



Danger hazard. Part or system under pressure.



Danger hazard. Its absolutely forbidden breathing the air treated with this apparatus.

INTRODUCTION

This manual contains information and recommendations for installing, and operating, standard non-cycling Refrigeration Air Dryers.

Direct any question to the nearest equipment distributor. Always specify the **model number, serial number, refrigerant type, and gauge readings during operation.**

Parts must be ordered from your nearest equipment distributor. If local distributor is unknown, contact Great Lakes Air Products @ 734-326-7080 for your local distributor.

Service authorization numbers must be obtained from the Accessory Service Department before any warranty work is performed. Always specify the **model number, serial number, refrigerant type, and gauge readings during operation.** Failure to obtain service authorization number will void equipment warranty.

The information, specifications in this manual are in accord with the information in effect at the time of printing. The manufacturer reserves the right to make changes without notice or incurring obligation.

GENERAL SAFETY WARNINGS



Compressed air is a highly hazardous energy source. Never work on the dryer with parts under pressure. Never point the compressed air or the condensate drain jet towards anybody. The user is responsible for the installation of the dryer, which must be executed on the basis of this manual. Otherwise, the warranty will be voided and dangerous situations for the personnel and/or damages to the machine could occur.



Only qualified personnel can use and service electrically powered devices. Before attempting any maintenance action, the following conditions must be satisfied:

- Be sure that the voltage is disconnected before any work is performed.
- Be sure that any part of the dryer under pressure cannot be connected to the compressed air system.



Any change to the machine or to the relevant operating parameters not previously authorized by the manufacture, creates the possibility of dangerous conditions, and will void the warranty.

PROPER USE OF THE DRYER

This dryer has been designed, manufactured and tested to separate the humidity normally contained in compressed air **only**. Any other use has to be considered improper. The manufacturer will void the warranty and not be held responsible for any problem arising from improper use. The correct use requires adherence to installation conditions specified in this manual.

This dryer is supplied tested and fully assembled. The only operation left to the user is the connection to the plant in compliance with the instructions given in the following chapters.



The purpose of the machine is the separation of water and eventual oil particles present in compressed air. The dried air cannot be used for respiration purposes or for operations leading to direct contact with foodstuff.

THIS EQUIPMENT IS NOT DESIGNED FOR RESIDENTIAL USE.

RECEIVING EQUIPMENT

Immediately upon receipt of equipment, remove all crating and packaging around equipment. Examine machinery for any damages either external or internal that may have occurred in transit.

If there is any physical damage or a refrigerant leak, **(suction/analyzer gauge reads zero)** please note all damages on bill of lading during delivery or file claim immediately with shipper if damage is detected after delivery. Ask for a local terminal phone number to report all damages to the Transportation Company. The carrier is legally responsible for any damages, since the unit is shipped F.O.B.

INSTALLATION LOCATION AND PIPING



Particular care is required in selecting the installation site, as an improper location could jeopardize the proper operation of the dryer. This unit is not suitable to be used in an explosive atmosphere, or where the risk of fire could be present.

The unit should be installed in an area that is clean and dry, allowing sufficient space on all sides for routine maintenance and service. It should be located on a level floor or shelf free from vibrations and sufficient to support the total weight of the machinery. Although the dryer package is a freestanding unit, it may be secured by bolting the base to the floor but is not required. **This standard dryer is designed for indoor installation.** Contact distributor if installing unit outdoors.

Installations at altitudes above 4000 feet (1219 meters) may require adjustments. The unit has been factory adjusted to operate up to 4000 feet (1219 meters), and if installation is above this altitude, contact the factory service department for correct refrigerant settings.

Position the unit to permit free circulation of cooling air to the dryer. All the free air vents on the dryer must be two feet, minimum from obstructions preventing flow to and from the unit. The unit should be shielded from direct sunlight, weather elements, and hot discharge air from other air-cooled equipment. The ambient temperature around the dryer must not exceed 100°F (37.7°C) or be less than 50°F (10°C).

Ambient temperatures below 50°F (10°C) require optional equipment specified below.

Sufficient ventilation must be provided to maintain acceptable ambient for efficient operation. Consider heat rejection when locating dryer.

RECOMENDED SYSTEM DESIGN

A healthy and long-term trouble free compressed air supply design should be approached as a complete system, not individual components.

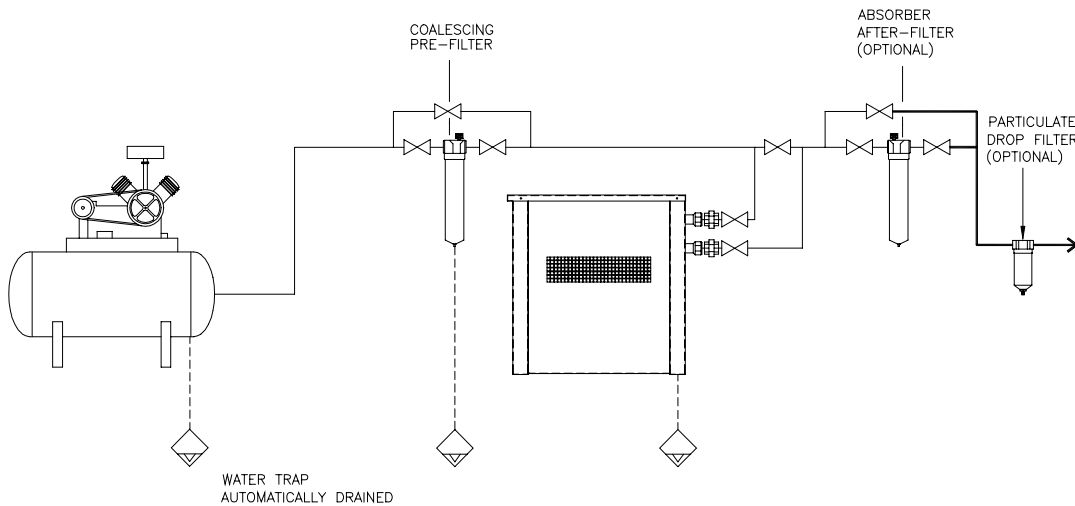
The air compressor Intake location is vital to the system health. Locate it to supply clean fresh air that is free from possible containments (e.g. ammonia). Any containment entering the compressor intake will be concentrated by a factor of 8X in a typical compressed air system.

As inlet and ambient temperatures deviate from the design conditions, the moisture holding capacity of compressed air can change dramatically. The following table represents the correction to load and dryer capacity at alternate inlet and ambient temperatures. Design Inlet temperature 180°F (82.2°C), Design Ambient Temperature 100°F (43.3°C)

Capacity Correction		Inlet Temperature			
		125°F (37.7°C)	150°F (40.5°C)	180°F (43.3°C)	200°F (46.1°C)
Ambient Temperatures	100°F (37.7°C)	1.18	1.10	1.00	0.90
	105°F (40.5°C)	1.07	1.00	0.91	0.82
	110°F (43.3°C)	0.97	0.90	0.82	0.73

Inlet air pressure also has an impact on dryer capacity the following table will correct capacity for operating pressures other than the designed 100 PSIG.

Inlet Pressure (PSIG)	80	100	150	200
Capacity Correction	0.80	1.0	1.15	1.20



The pipe connection to the dryer should match the standard connection ports provided. The chart below is provided as a basic guide to size branch and header piping. It is recommended that shut-off valves with unions be installed at each port, with a valve bypass to permit isolation of the unit for servicing without interruption of plant air supply.

Maximum Recommended Compressed Air flow										
Pipe Size	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6"
Flow (SCFM)	40	100	150	200	250	600	900	1500	2500	5000

Schedule 40 pipe @ 85 to 115 PSIG

CONDENSATE DRAINS

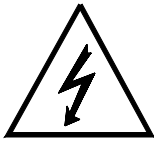


The condensate system is at line pressure and can cause personal injury or equipment damage when discharging. Securely anchor the drain tubes prior to dryer operation.

This refrigerated dryer comes standard with two condensate drains. The first is an automatic float that removes condensate after the inlet precooler. The second is an electronic timer solenoid condensate drain system that removes condensation generated by the refrigeration system. The drain timer is factory preset to 4 seconds of “on time” and 10 minutes of “off time”. This factory setting is applicable for virtually all-industrial applications. If adjustment is required contact Great Lakes Air Products, Inc. for alternate settings and procedure.

Condensate discharged from the dryer may contain oil/lubricants. Verify and follow local regulations regarding disposal.

ELECTRICAL CONNECTION



The Nameplate/Data Plate located on each unit identifies the power supply requirements. Units supplied with cord and plug requires the installation of a receptacle rated for 15 amps.

Units supplied with electrical junctions, require a suitable fused disconnect in compliance with the National and Local Electrical Code requirements. Maximum fuse specification can be located on the Nameplate/Data Plate.

The wiring of all functional electrical components has been completed and tested at the factory in accordance with the electrical wiring schematic provided with this manual.

STARTUP PROCEDURE

Energize the refrigeration compressor by placing the “on/off” dryer switch with indicating light to the “on (I)” position. The refrigerant compressor and fan motor(s) will begin to operate. The suction/analyzer gauge will fall to a range of 28-34 PSIG. If the suction/analyzer gauge is not in the specified range, contact a qualified refrigeration service technician or the Accessory Service Department.

SHUT DOWN PROCEDURE

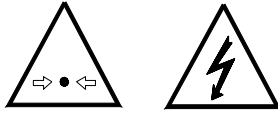
Switch the dryer off by placing the “on/off” dryer switch with indicating light to the “OFF (0)” position, if compressed air is not being used.

TROUBLESHOOTING

Sec	Symptom	Possible Cause(s)	Corrective Action
A	Water downstream of dryer.	1. Residual free moisture remaining in downstream piping	Drain low spots in system and purge with dry air
		2. Air By-pass system is open	Verify valve positions and correct valve positions
		3. Ambient temperature surrounding downstream piping is below the dryer's dewpoint.	Insulate and/or heat trace piping exposed to low ambient temperatures or dry air to a lower dewpoint.
		4. Free water (liquid) is entering the dryer	Dryers are designed to handle saturated air not condensed liquid. Install a separator and coalescing filter upstream of dryer.
		5. Condensate is not being drained	See section B
		6. Dryer is overloaded resulting in high dewpoint	See capacity charts to determine correct load
		7. Refrigeration system is not functioning.	See section E
		8. Suction pressure not in operating range	Contact Service Department for authorized technician to perform adjustments.
		9. Precooler Fan not functioning or cooler is clogged	Clean cooler coils and/or replace fan motor
B	Drain System Failure with no condensate discharge on test initiation.	1. Drain strainer is clogged	Depressurize dryer and replace or clean drain strainer.
		2. Solenoid valve or electronic timer failure	Replace drain solenoid and or timer assembly
C	Drain System Failure with continuous condensate or air discharge.	1. Solenoid valve diaphragm rupture or orifice path blocked open	Clean or replace internal diaphragm assembly.
D	High pressure drop across dryer	1. Inlet flow exceeds maximum capacity	Check inlet flow vs. rated capacity
		2. Freezing of moisture in evaporator is restricting inlet air flow	If refrigerant suction pressure is out of standard operating range, contact a qualified refrigeration service technician or the manufacturers service department.
E Refrigeration System Fault			
E1	Power on indicator does not illuminate	1. Power failure, Line fuses blown, or disconnect open.	Have an electrician check electrical feed and connection integrity.
E2	Refrigeration compressor cycles on and off	1. Ambient Conditions are above or below minimum or maximum ranges.	Verify range and rectify ambient conditions.
		2. Air-Cooled Units, Dirty condenser	Clean condenser as per required maintenance.
		3. Water-Cooled Units, High fluid temperature or low fluid flow.	Check fluid temperature, bring in range and check for free fluid flow through condenser. If problem persists contact a qualified refrigeration service technician or the manufacturers service department.

REQUIRED MAINTENANCE

Inspection	Frequency
Verify operation of the solenoid drain system. The drain system will cycle and discharge some fluid and air from the clear condensate drain tube for approximately 4 seconds every 10 minutes. If no discharge is attained proceed to the drain service section of required maintenance.	Weekly or As required.



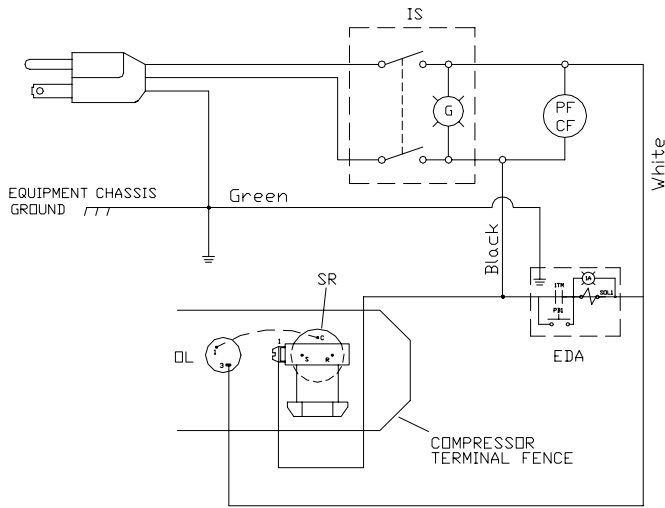
Disconnect and lockout dryer power as well as compressed air supply and depressurize prior to performing the following maintenance items.

General Maintenance	Frequency
Clean refrigeration condenser coil by blowing dust and dirt from the inside of the cabinet out. (Opposite from normal fan air flow)	Monthly
Clean Precooler coil by blowing dust and dirt from the inside of the cabinet up and out. (Opposite from normal fan air flow)	Monthly
Isolate the valve prior to the Solenoid drain system and remove and clean the strainer screen	Monthly
Model series B & C have 5-micron separation elements located in the separator after the precooler, replace the element as required.	6 Months or High differential
Replace filter element of inline filters.	6 Months or High differential

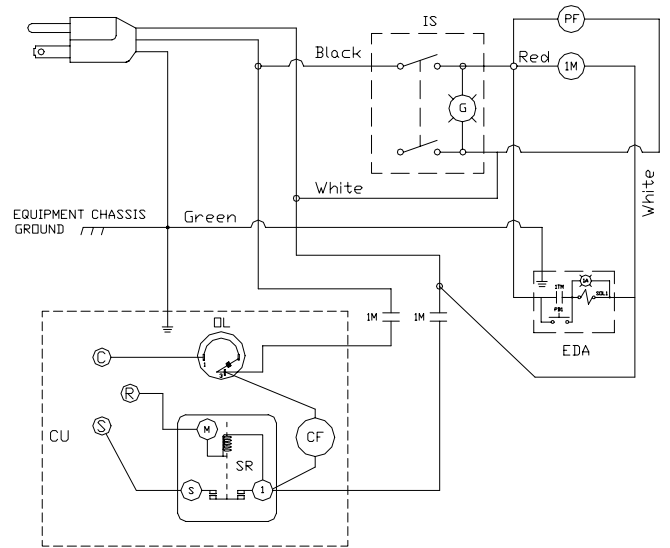
Drain Service	Frequency
If the drain system is not discharging condensate, and the strainer is clean, try cleaning debris from diaphragm, or replacing the solenoid or timer.	As Required
If the drain system is continually discharging condensate and air from the drain tube, try replacing the solenoid valve diaphragm, or the complete drain valve.	As Required

ENGINEERING DATA	Refrigerated Air Dryer Model# EDR							
	A1	A2	B1	B2	C1	C2		
SCFM @ 50°F PDP & 120 PSIG	28	36	50	80	102	155		
SCFM @ 50°F PDP & 100 PSIG	24	30	43	67	86	132		
SCFM @ 39°F PDP & 120 PSIG	23	30	42	66	85	129		
SCFM @ 39°F PDP & 120 PSIG	20	25	36	56	72	110		
Min. / Max. Inlet Pressure	30 PSIG (2.1 kgf/cm ²) / 230 PSIG (16.2 kgf/cm ²)							
Max. Inlet Temperature	200°F (48.8°C)							
Min. / Max. Ambient Temperature	50°F (10°C) / 110°F (43.3°C)							
Inlet / Outlet Connections (NPT)	3/4"	3/4"	3/4"	3/4"	1"	1-1/2"		
Delta Pressure / ΔP (PSID) @ Std. Rated Conditions	1.7	1.7	1.7	1.9	2.7	3.0		
Shipping Weight (Lbs.)	117	120	175	185	275	288		
Refrigeration Compressor Type	Non Cycling, Hermetic Type							
Refrigeration Compressor Horsepower	1/5	1/4	1/3	1/2	5/8	3/4		
Ref. Compressor BTU/H @ 35°F Evaporator & 100°F Ambient	1780	2160	2780	4430	5400	6120		
Watts @ 35°F Evap. & 100°F Amb.	385	465	600	815	1080	1180		
Refrigerant Suction Pressure	28-34 PSIG							
Refrigerant Type	R-134a							
Refrigerant Charge	8oz	10oz	12oz	13 oz	3 Lbs.	4 Lbs.		
Nominal Voltage (Min-Max Range)	115-1-60 (103-126)					230/208-1-60 (187-253)		
Min. Circuit Ampacity	6.6	7.9	10.1	13.4	17.1	19.3	8.6	10.3
Maximum Fuse Size (Amps)	15	15	15	15	20	20	15	15
(Comp) RLA: Run Load Amps	4.86	5.4	6.9	10.3	12.7	14.4	6.4	7.7
(Comp) LRA: Locked Rotor Amps	24.0	28.0	35.0	48.0	58.8	69.0	27.4	41.8
Precooler Fan Motor (Watts/FLA)	N/A	N/A	16/1.0	16/1.0	34/1.6	34/1.6	17/0.8	17/0.8
Overload	External "Klixon" Thermal and Current (Auto Reset)							

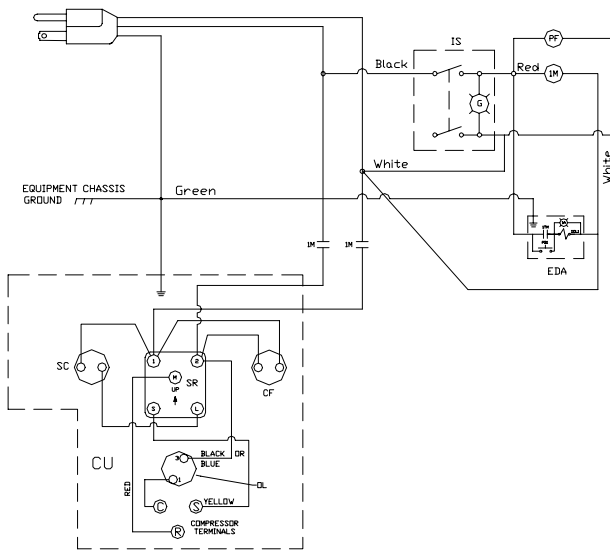
Model Series A1 & A2



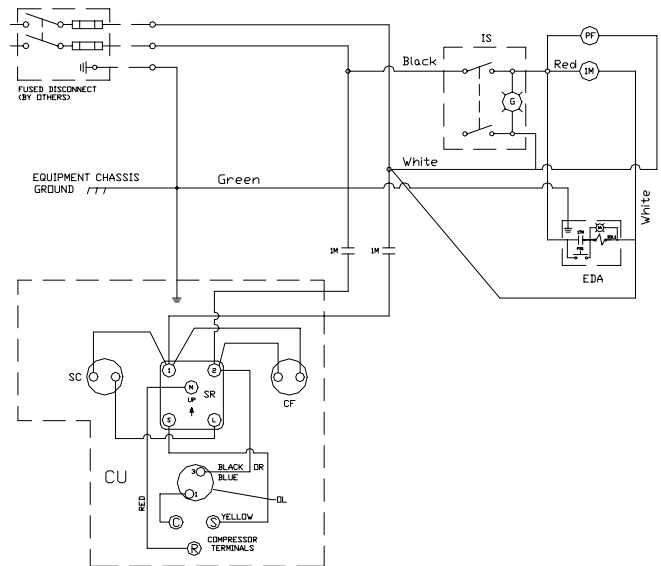
Model Series B1



Model Series B2



Model Series C1 & C2



LEGEND

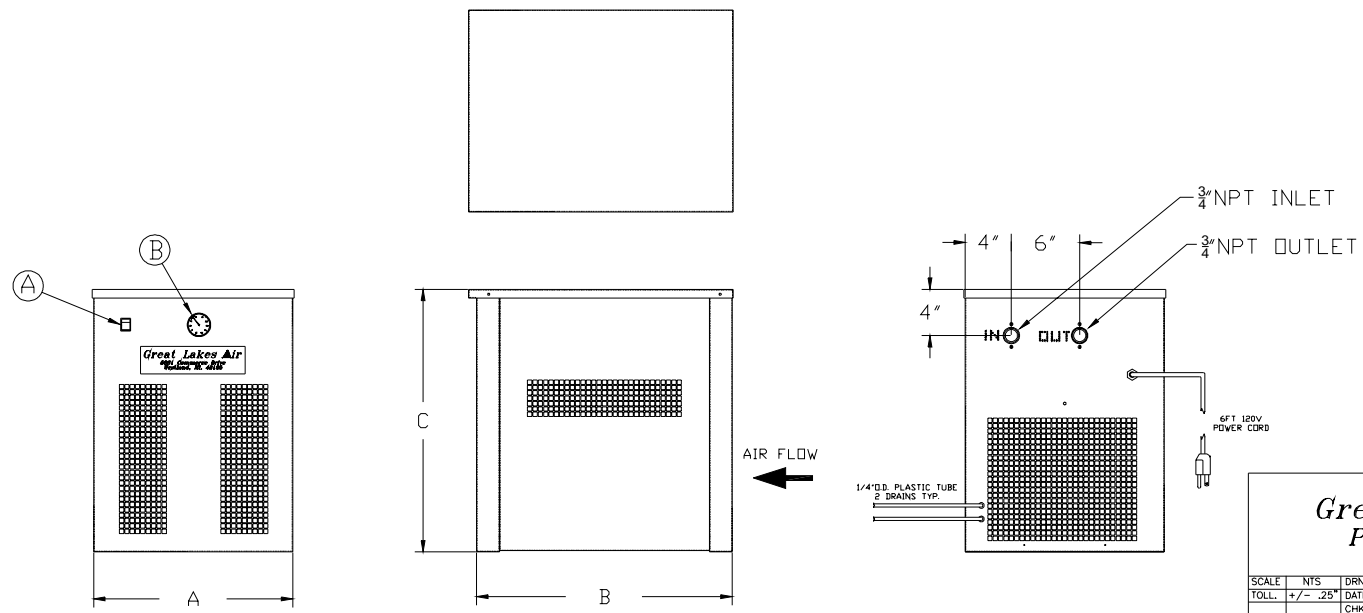
CU – Condensing Unit	SC– Start Capacitor
IS – Illuminated Manual Switch (Dryer On)	OL – Thermal Overload
CF – Condensing Unit Fan Motor	SR – Start Relay
PF – Precooler Fan Motor	C – Compressor Common Connection
EDA – Electronic Timed Solenoid Drain	S – Compressor Start Connection
1M– Refrigeration Contactor	R – Compressor Run Connection

GREAT LAKES MODEL #	CAPACITY IN SCFM @				Ref. H.P.	VOLTAGES	WATTS	FULL LOAD AMPS	MAX WORKING PRESS.	SHIPPING WEIGHT (LBS.)
	50°F PDP 120 PSI	39°F PDP 120 PSI	50°F PDP 100 PSI	39°F PDP 100 PSI						
EDR-A1-116	28	23	24	20	1/5	120-1-60	376	5.4	230PSIG	117
EDR-A2-116	36	30	30	25	1/4	120-1-60	451	5.7	230PSIG	120

ITEM	QTY.	DESCRIPTION
A	1	DRYER OFF/ON SWITCH
B	1	REFRIG. SUCTION GAUGE

MAXIMUM INLET PRESSURE 230 PSIG
 MAXIMUM INLET TEMPERATURE 180°F
 MAXIMUM AMBIENT TEMPERATURE 100°F

DIMENSIONS		
A	B	C
18"	23"	23"



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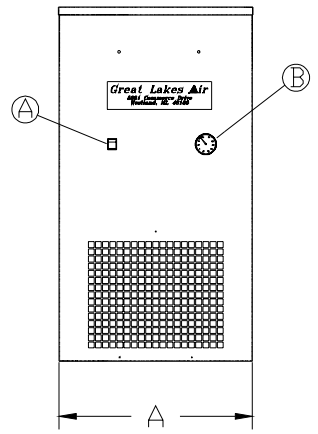
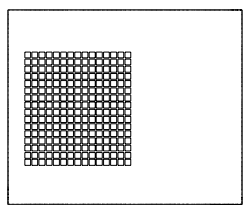
SCALE	NTS	DRN.	<i>K. Kowalski</i>	TITLE	EDRA1-A2-116 HIGH TEMP. REFRIG. DRYERS
TOLL.	±/- .25"	DATE	9/9/04		
PLOT	1" = 1"	CHK'D	<i>B. Lomon</i>	DATE	
This drawing is the property of: GREAT LAKES AIR PROD. 5861 COMMERCE DRIVE WESTLAND, MI 48185 Written authorization required CAD FILE NO.					
DRAWING NO.					91225
PROJECT:					STANDARD

GREAT LAKES MODEL #	CAPACITY IN SCFM @				Ref. HP.	VOLTAGES	WATTS	FULL LOAD AMPS	MAX WORKING PRESS.	SHIPPING WEIGHT (LBS.)
	50°F PDP 120 PSI	39°F PDP 120 PSI	50°F PDP 100 PSI	39°F PDP 100 PSI						
EDR-B1-116	50	42	43	36	1/3	120-1-60	576	7.2	230PSIG	175
EDR-B2-116	80	66	67	56	1/2	120-1-60	776	10	230PSIG	185

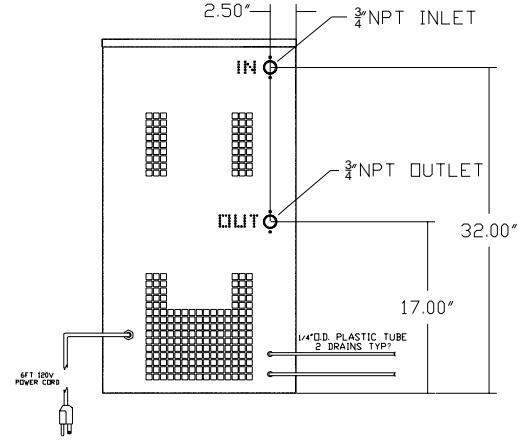
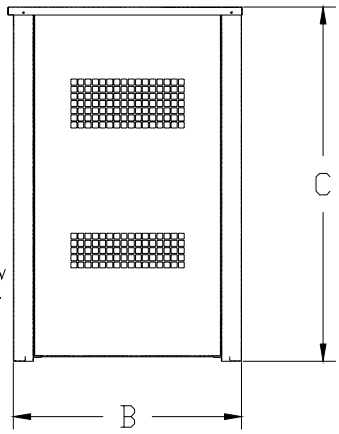
MAXIMUM	INLET	PRESSURE	230 PSIG
MAXIMUM	INLET	TEMPERATURE	180°F
MAXIMUM	AMBIENT	TEMPERATURE	100°F

DIMENSIONS		
A	B	C
19"	23"	35"

ITEM	QTY.	DESCRIPTION
A	1	DRYER OFF/ON SWITCH
B	1	REFRIG. SUCTION GAUGE



AIR FLOW →



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Products Inc.**

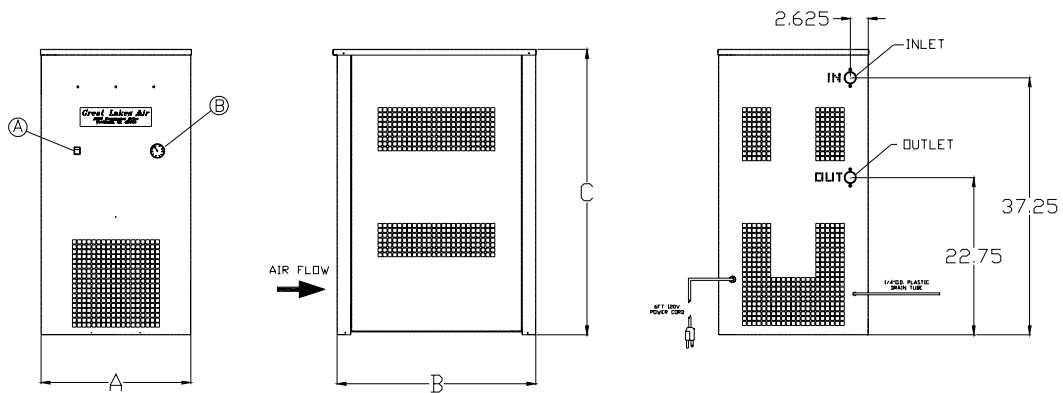
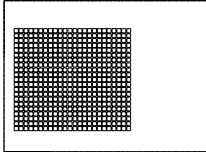
SCALE	NTS	DRN.	<i>H. Kowalski</i>	TITLE	EDRB1-B2-116 HIGH TEMP. REFRIG. DRYERS
TOLL.	+/- .25"	DATE	9/9/04	CHK'D	
PLOT	1" = 1"	DATE	9/9/04	DRAWING NO. 91226	
This drawing is the property of: GREAT LAKES AIR PROD. 5861 COMMERCE DRIVE WESTLAND, MI 48185 Written authorization required				PROJECT:	STANDARD
CAD FILE NO. C:\ACAD\MV\EDRMEC\EDRB1-B2-116 STANDARD					

GREAT LAKES MODEL #	IN/OUT PORTS	CAPACITY IN SCFM @				Ref. H.P.	VOLTAGES	WATTS	FULL LOAD AMPS	MAX WORKING PRESS.	SHIPPING WEIGHT (L.B.S.)
		50°F PDP 120 PSI	39°F PDP 120 PSI	50°F PDP 100 PSI	39°F PDP 100 PSI						
EDR-C1-116	1"	102	85	86	72	5/8	120-1-60	1045	13	230PSIG	275
EDR-C2-116	1-1/2"	155	129	132	110	3/4	120-1-60	1135	16	230PSIG	288

MAXIMUM INLET PRESSURE	230 PSIG
MAXIMUM INLET TEMPERATURE	180°F
MAXIMUM AMBIENT TEMPERATURE	100°F

DIMENSIONS		
A	B	C
22"	29"	42"

ITEM	QTY.	DESCRIPTION
A	1	DRYER OFF/ON SWITCH
B	1	REFRIG. SUCTION GAUGE



Great Lakes Air Products Inc.

SCALE	NTS	DRN.	<i>R. Kowledge</i>	TITLE	EDRC1-C2-116 HIGH TEMP. REFRIG. DRYERS			
TOLL.	+/- .25"	DATE	9/9/04	CHK'D		<i>B. Johnson</i>		
PLOT	1" = 1"	DATE	3/9/04	DATE		3/9/04		
This drawing is the property of: GREAT LAKES AIR PROD. 5861 COMMERCE DRIVE WESTLAND, MI 48185					DRAWING NO.	91227	REV.	
Written authorization required					CAD FILE NO.	PROJECT: STANDARD		



EDR SERIES	A-1	A-2	B-1	B-2	C-1	C-2
Compressor	210041131	210021131	210031131	210051131	210061131	210071131
C/U Fan Motor	221161612	221161612	220021111	220051111	220071111	220071111
C/U Fan Blade	24016	24016	24005	24003	24001	24001
A/C Exchanger	EDR00116	EDR00116	EDR00121	EDR00121	EDR00123	EDR00123
A/C Fan Motor	<i>See Notes</i>	<i>See Notes</i>	221161612	221161612	221341612	221341612
A/C Fan Blade	<i>See Notes</i>	<i>See Notes</i>	24016	24016	24034	24034
A/C Fan Guard	24032	24032	24032	24032	24033	24033
Overload	23004	23004	23008	23011	23039	23025
Relay	23003	23005	23007	23010	23010	23023
Start Capacitor	N/A	N/A	23009	23012	23024	23024
Filter Dryer	27200510503					
Electronic Drain	2841019	2841019	2841019	2841019	2841019	2841019
Valve & Coil	28Z1019	28Z1019	28Z1019	28Z1019	28Z1019	28Z1019
Timer Only	2814059	2814059	2814059	2814059	2814059	2814059
Strainer	28A0019	28A0019	28A0019	28A0019	28A0019	28A0019
External Separator	14703814	14703814	14107514	14107514	14107514	14715014
Separator Element	N/A	N/A	EST-75	EST-75	EST-75	EST-300
Auto Float	GFO-ADL	GFO-ADL	GFO-ADL	GFO-ADL	GFO-ADL	GFO-ADL
Expansion Valve	2610294122		261119331	261119331	261119331	261119331
Orifice	N/A	N/A	261102001	261103001	261103001	261104001
Hot Gas Valve	N/A	N/A	2610294112			
On / Off Switch	4309131	4309131	4309131	4309131	4309131	4309131
2" Gauge	29200133	29200133	29200133	29200133	29200133	29200133

The EDR "A1" & "A2" models utilize a dual circuit aftercooler / condensing unit. Each unit has one (1) fan motor, fan blade, fan guard, and heat exchanger.