



***UA Series
Refrigerated Air Dryer***

Operator's Manual

Introduction

This manual contains information and recommendations for installing, operating, and servicing the Numatics Refrigerated Dryer. Numatics Refrigerated Dryers are the highest quality dryers available. We back this claim with one of the longest warranties available in the industry. All units are totally self-contained and have been fully tested and inspected by Numatics before shipment from the factory.

The information, specifications, and illustrations in this manual are in accordance with the information in effect at the time of printing. Numatics reserves the right to change design and specifications without notice and without incurring obligation.

Please read this manual carefully before locating and installing your dryer. Any questions or problems not covered herein may be directed to your Numatics or Ultra-Air distributor or to Numatics Air Preparation Group, 3309 John Conley Drive, Lapeer, MI 48446, or by phone at (810)667-3900 or fax at (810)667-3902. Before calling, be sure to have the model and serial numbers available. The manufacturer will not be responsible for parts returned without proper authorization.

Warnings

Only persons experienced and licensed to work on electrical, refrigeration, and compressed air systems should install or operate this equipment.

This entire manual should be read and understood before starting installation or operation of this dryer. Before starting, installing, or performing maintenance procedures, the main power must be turned off and the dryer must be depressurized to 0 PSIG.

Do not remove, repair, or replace any item on this dryer while it is under pressure and/or the power is turned on. This dryer contains refrigerant R134A or R22. Service personnel must be certified to handle R134A and R22 and comply to all local, state, and federal regulations concerning refrigerant when performing maintenance or service on this dryer. Never operate this dryer above the maximum rated operating conditions. Operating above specified conditions will result in inferior performance and could damage the unit and/or cause personal injury.

Numatics, Inc. will not be held responsible for removal, reinstallation, down time costs, or consequential damages caused by the refrigerated air dryer even if the possibility of such incidental or consequential damages has been made known to Numatics, Inc.

Receiving and Inspection

Upon arrival, remove all packaging materials and inspect dryer carefully. Inspect cabinets for dents, inlet and outlet connections for damage, and skid for any oil due to refrigerant leaks. Inspect refrigerant gauges; they should read at least 40 PSIG and not be damaged. If they do not read at least 40 PSIG, do not start the dryer, instead, contact the factory immediately. If any damage is found, report it to the freight company immediately.

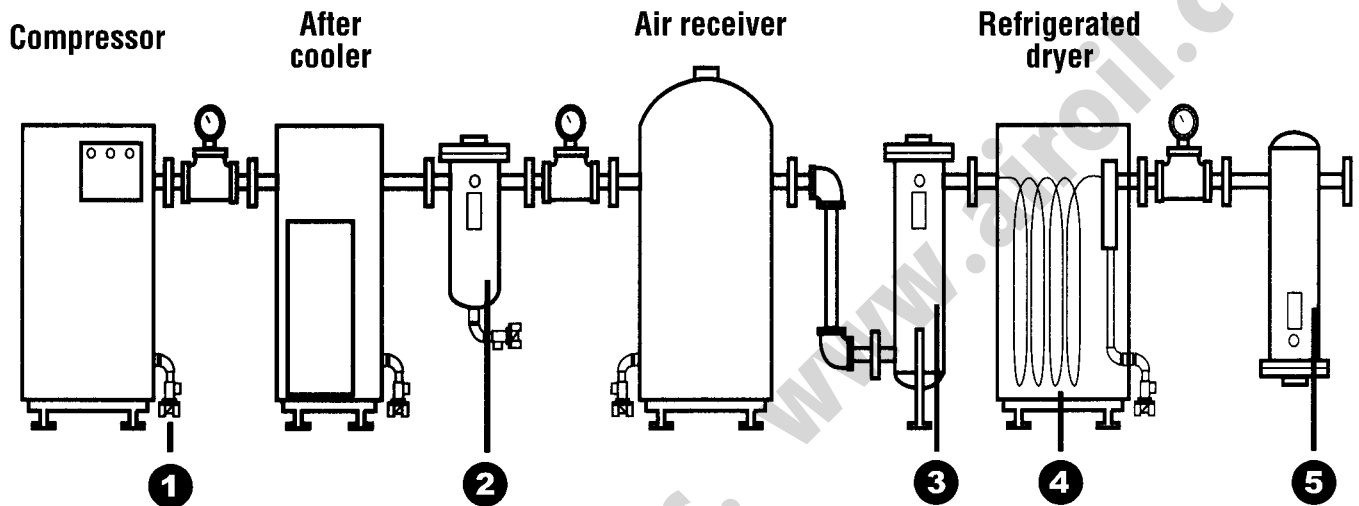
Installation

Allow three (3) feet on all sides of the dryer for service and proper air flow. The dryer should be installed in ambients where temperatures do not drop below 40°F or rise above 110°F. Dryers are normally installed downstream of the receiver tank to prevent undue surging. Unit should be sitting level. Always select an installation site where ample with ventilation, particularly for air-cooled condenser units. An adequate supply of outside air may be made available by using an exhaust system to avoid recirculation of room air. An area with a high ambient temperature will affect the efficiency of an air-cooled (continued)

Installation (continued)

condenser with a resulting increase in workload on the refrigeration compressor. This can conceivably reduce the life of the equipment and hinder its operation. Dryers operating in ambients lower than 40°F ambient must be ordered with a low ambient control option.

Recommended Installation



- 1) **Drain valve:** automatically expels water on timed sequence, eliminating the potential of water buildup.
- 2) **Water separator:** uses centrifugal action to spin large volumes of liquid out of the system. Use with drain valve is highly recommended.
- 3) **Heavy duty coalescer (1.0 micron):** removes bulk amounts of oil aerosols through impingement separation. Should have drain valve to prevent moisture collection. Protects refrigerated dryer from oil coating on interior walls, as oil acts as an insulator and reduces the efficiency of the dryer.
- 4) **UA Series refrigerated air dryer:** Lowers compressed air dewpoint.
- 5) **Heavy duty coalescer (1.0 micron)**

Drain Connections

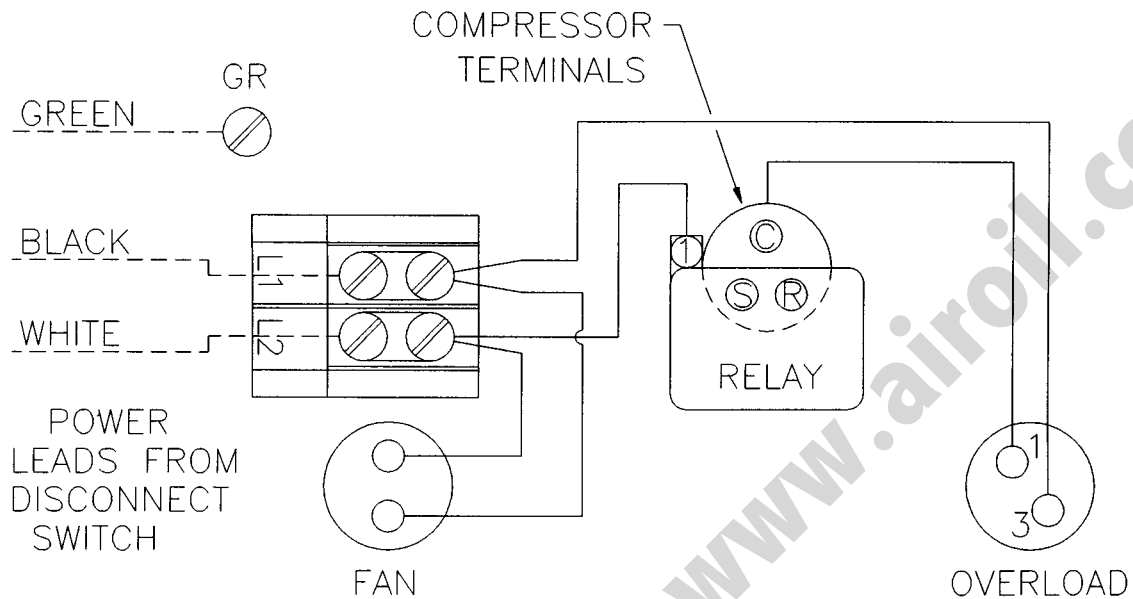
Models UA10 through UA75 come standard with automatic float drains. Models UA100 through UA2000 are equipped with a solid state timer actuated solenoid valve drain system. The drain line from the dryer should be sloped and emptied into a floor drain or connector that is lower than the bottom of the separator in the dryer so the condensate that is removed by the dryer can be drained by gravity.

Electrical Requirements

The nameplate on the instrument panel on each unit identifies the power supply requirements. A suitable wall-mounted disconnect switch in accordance with national and local code requirements is recommended.

Electrical Schematic

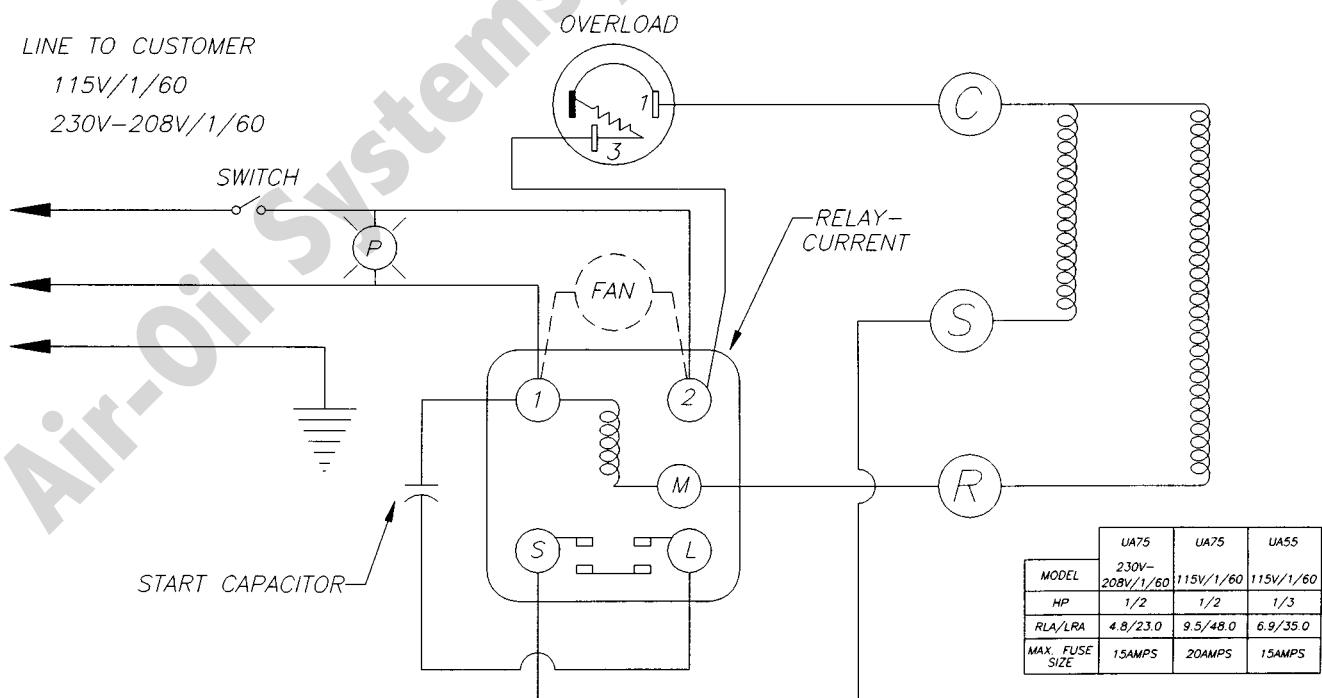
Models UA10AC through UA45AC, 115V-1PH-60Hz



NOTES:

1. VOLTAGE: 115-60-1, RANGE: 103.5-126.5

Models UA55AC through UA75AC, 115V through 230V-1PH-60Hz



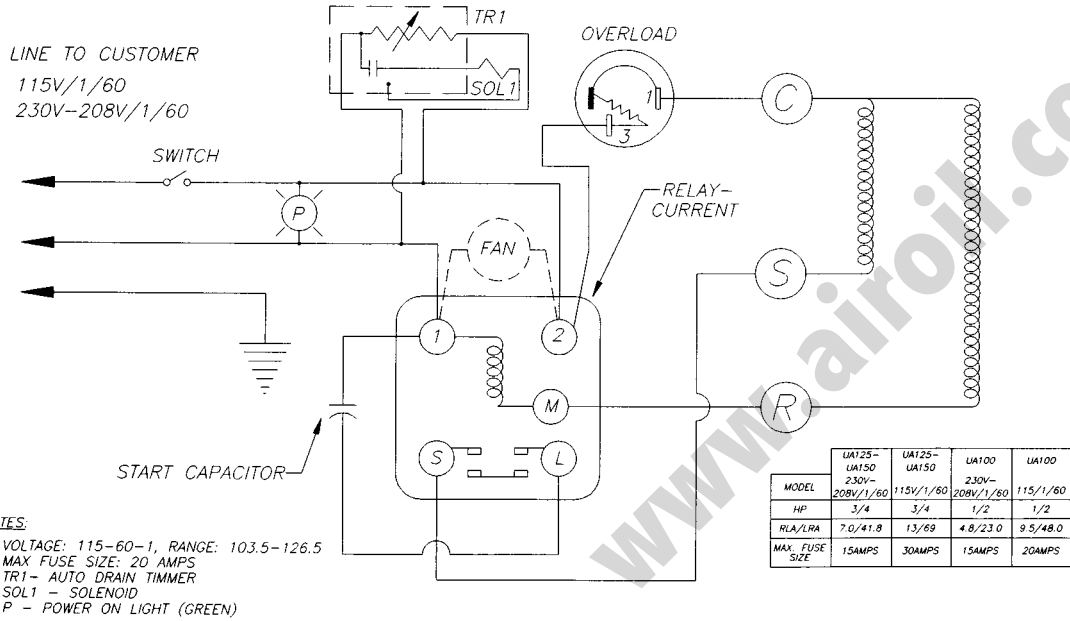
	UA75 230V- 208V/1/60	UA75 115V/1/60	UA55 115V/1/60
MODEL			
HP	1/2	1/2	1/3
RLA/LRA	4.8/23.0	9.5/48.0	6.9/35.0
MAX. FUSE SIZE	15AMPS	20AMPS	15AMPS

NOTES:

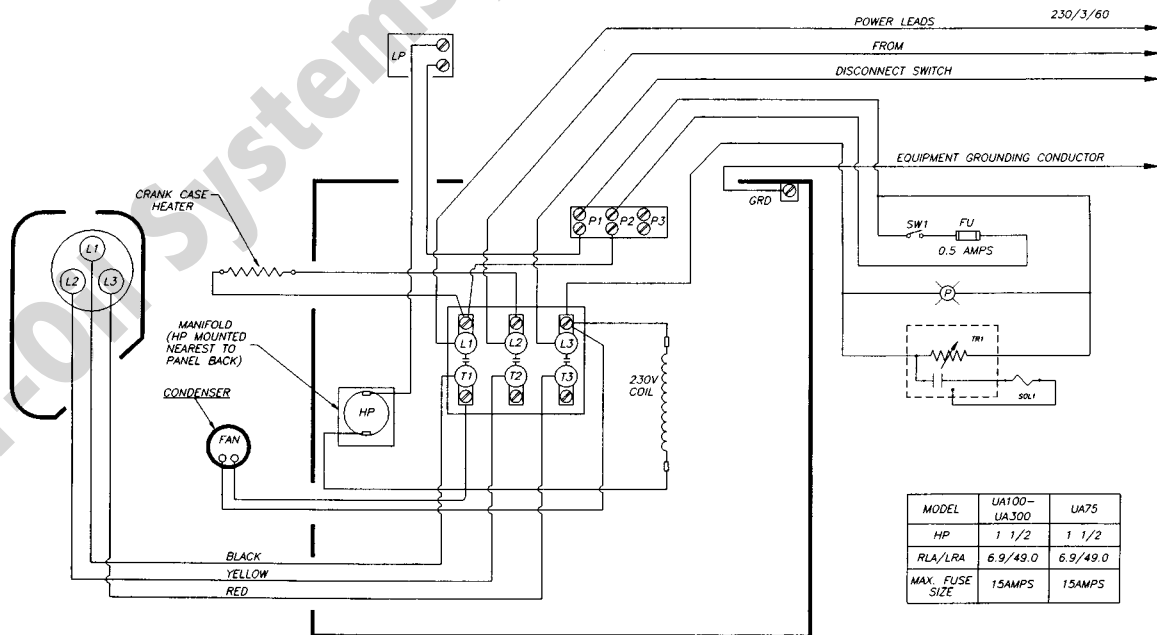
1. VOLTAGE: 115-60-1, RANGE: 103.5-126.5

Electrical Schematic (continued)

Models UA100AC through UA150AC, 115V through 230V-1PH-60Hz



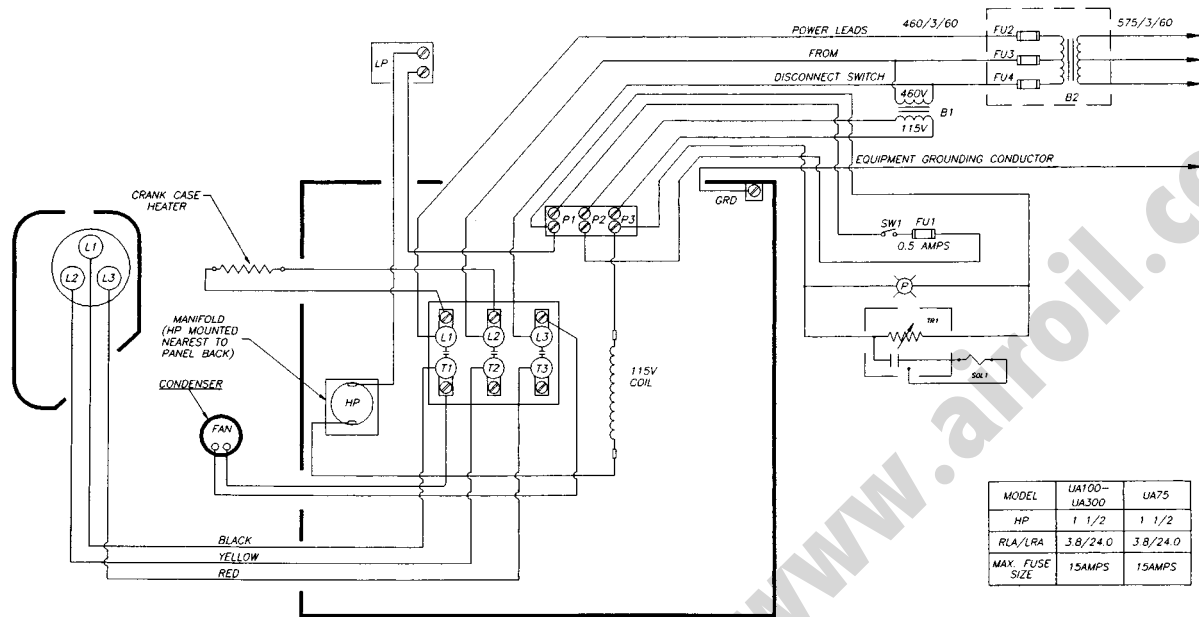
Models UA75AC through UA300AC, 230V-3PH-60Hz



- SW1 - COMPRESSOR ON/OFF
 FU - FUSE
 TR1 - AUTO DRAIN TIMER
 P - POWER ON LIGHT (GREEN)
 HP - HIGH PRESSURE SWITCH
 LP - LOW PRESSURE SWITCH
 SOL1 - SOLENOID VALVE
- NOTES:**
 1. COMPRESSOR EQUIPPED WITH AN INTERNAL OVERLOAD PROTECTOR.
 ALLOW TIME FOR RESET
 2. VOLTAGE 230/208 -60-3, RANGE: 187-253

Electrical Schematic (continued)

Models UA75AC through UA300AC, 460V through 575V-3PH-60Hz

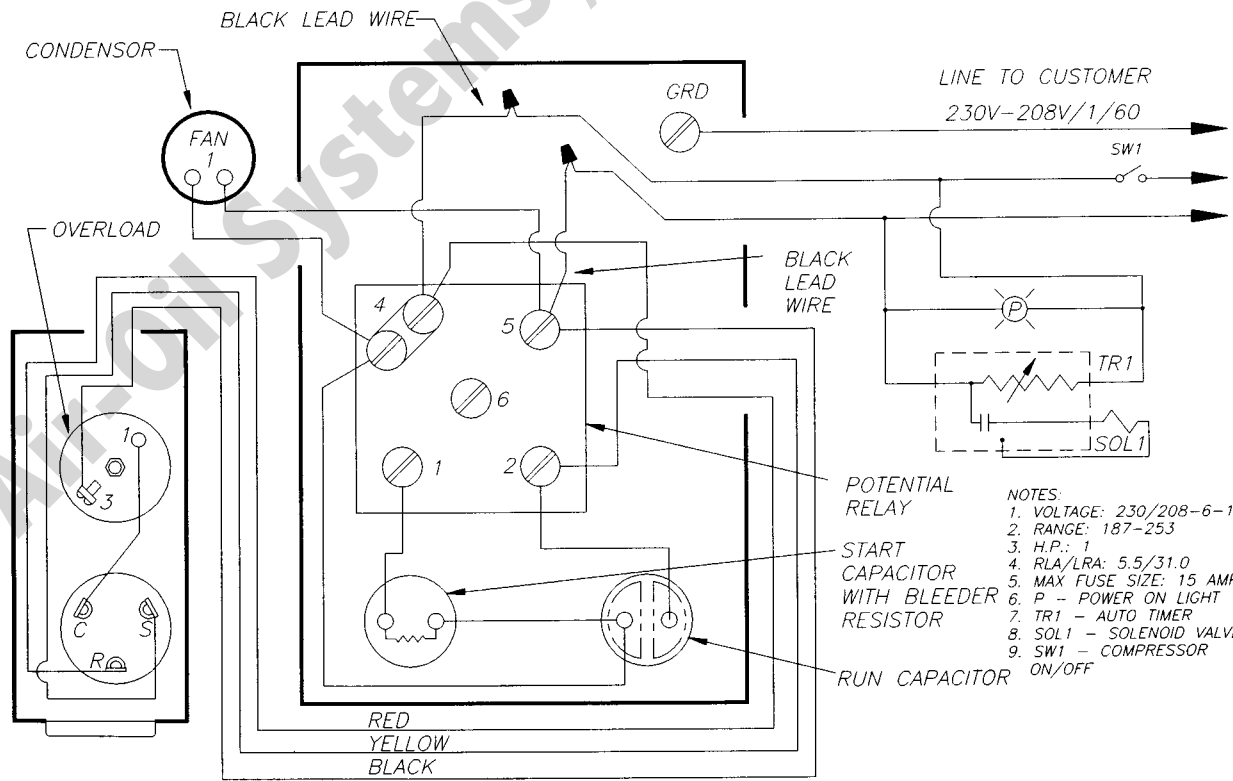


MODEL	UA100- UA300	UA75
HP	1 1/2	1 1/2
RLA/LRA	3.8/24.0	3.8/24.0
MAX. FUSE SIZE	15AMPS	15AMPS

- SW1 - COMPRESSOR ON/OFF
- FU1 - FUSE: 0.5 AMPS
- TR1 - AUTO DRAIN TIMER
- P - POWER ON LIGHT (GREEN)
- TR1 - AUTO DRAIN TIMER
- SOL1 - SOLENOID VALVE
- HP - HIGH PRESSURE SWITCH
- LP - LOW PRESSURE SWITCH
- B1-2 - TRANSFORMER
- FU2-4 - FUSE: 15 AMPS

- NOTES:
1. COMPRESSOR EQUIPPED WITH AN INTERNAL OVERLOAD PROTECTOR ALLOW TIME FOR RESET
 2. VOLTAGE: 460-60-3, RANGE: 414-506

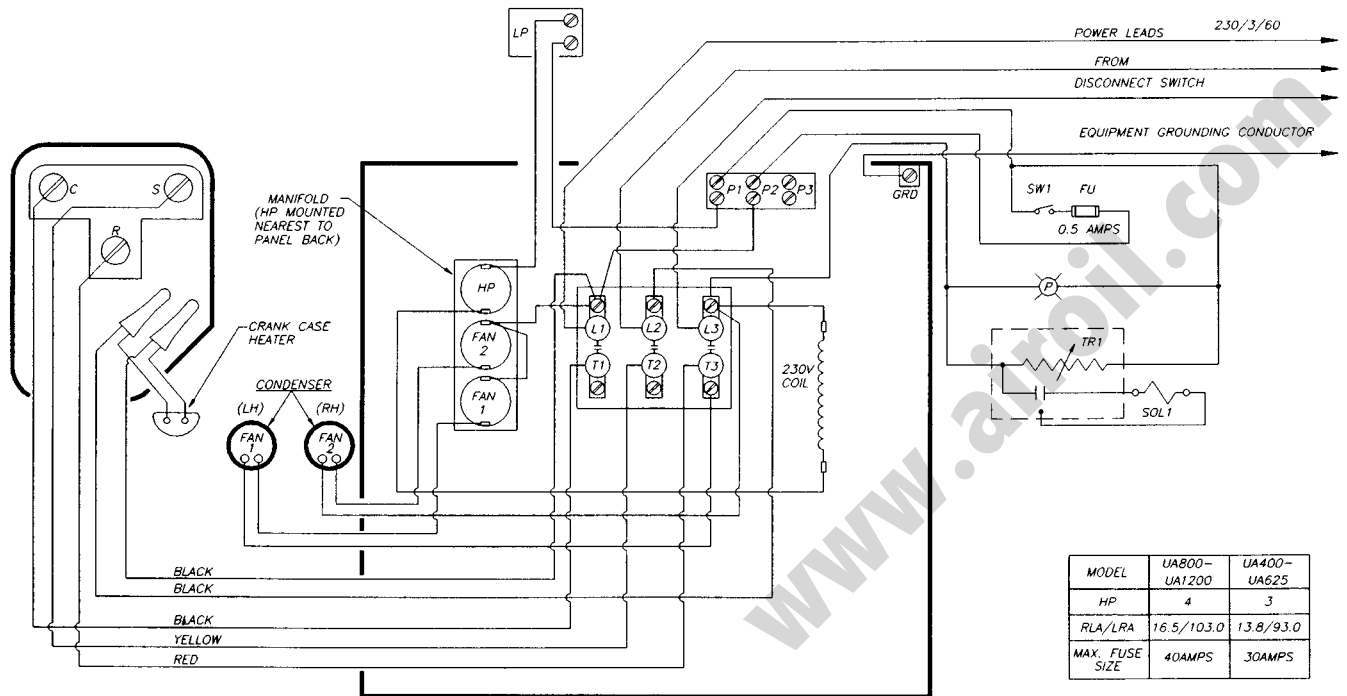
Models UA200AC, 230V-1PH-60Hz



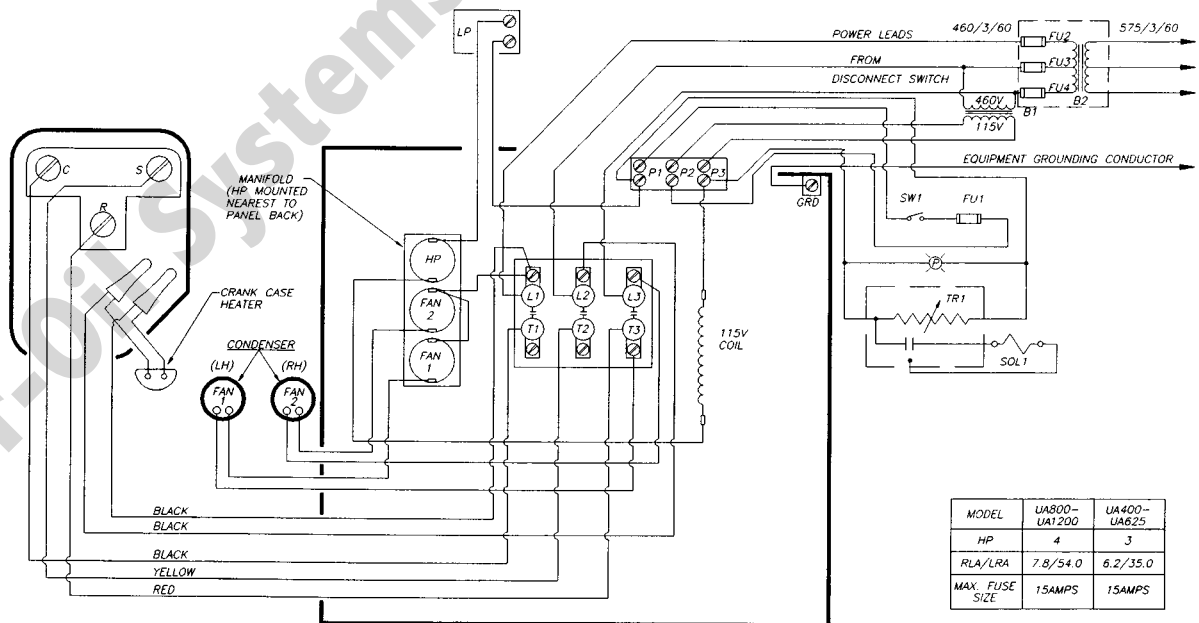
- NOTES:
1. VOLTAGE: 230/208-6-1
 2. RANGE: 187-253
 3. H.P.: 1
 4. RLA/LRA: 5.5/31.0
 5. MAX FUSE SIZE: 15 AMPS
 6. P - POWER ON LIGHT
 7. TR1 - AUTO TIMER
 8. SOL1 - SOLENOID VALVE
 9. SW1 - COMPRESSOR ON/OFF

Electrical Schematic (continued)

Models UA400AC through UA1200AC, 230V-3PH-60Hz



Models UA400AC through UA1200AC, 460V through 575V-3PH-60Hz



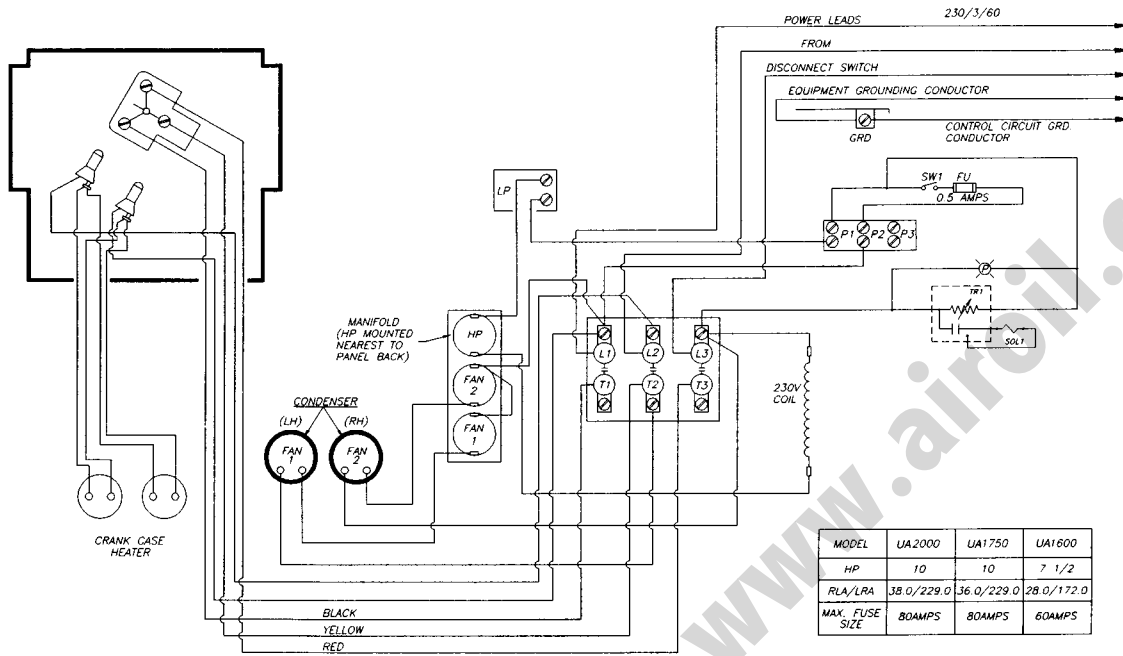
SW1 - COMPRESSOR ON/OFF
SOL1 - SOLENOID VALVE
FU1 - FUSE: 0.5 AMPS
B1-2 - TRANSFORMER
FU2-4 - FUSE: 15 AMPS

P - POWER ON LIGHT (GREEN)
HP - HIGH PRESSURE SWITCH
LP - LOW PRESSURE SWITCH
TR1 - AUTO DRAIN TIMER

NOTES:
1. COMPRESSOR EQUIPPED WITH AN INTERNAL OVERLOAD PROTECTOR. ALLOW TIME FOR RESET
2. VOLTAGE: 460-60-3, RANGE: 414-506

Electrical Schematic (continued)

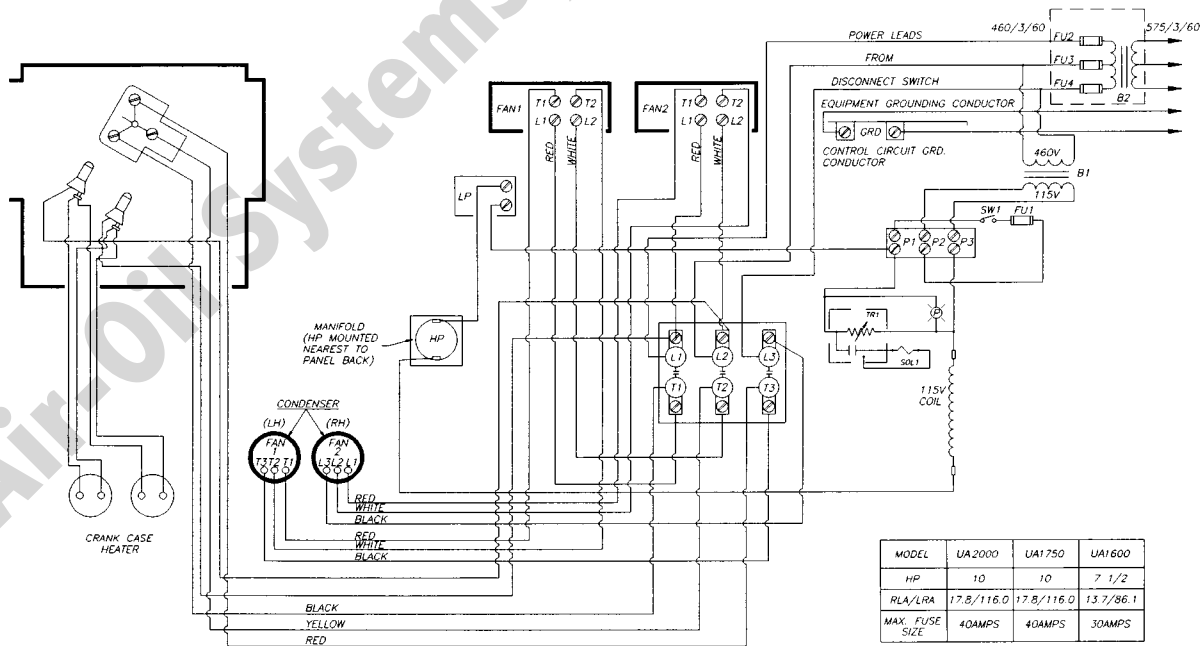
Models UA1600AC through UA2000AC, 230V-3PH-60Hz



SW1 - POWER ON/OFF
 FU - FUSE
 SOL1 - SOLENOID VALVE
 HP - HIGH PRESSURE SWITCH
 P - POWER ON LIGHT
 TR1 - AUTO DRAIN TIMER
 LP - LOW PRESSURE SWITCH

NOTES:
 1. COMPRESSOR EQUIPPED WITH AN INTERNAL OVERLOAD PROTECTOR. ALLOW TIME FOR RESET.
 2. VOLTAGE: 230/208-60-3, RANGE: 180-253

Models UA1600AC through UA2000AC, 575V-3PH-60Hz



SW1 - POWER ON/OFF
 FU1 - FUSE: 0.5 AMPS
 B1-2 - TRANSFORMER
 HP - HIGH PRESSURE SWITCH
 FU2-4 - FUSE: 40 AMPS
 P - POWER ON LIGHT
 TR1 - AUTO DRAIN TIMER
 SOL1 - SOLENOID VALVE
 LP - LOW PRESSURE SWITCH

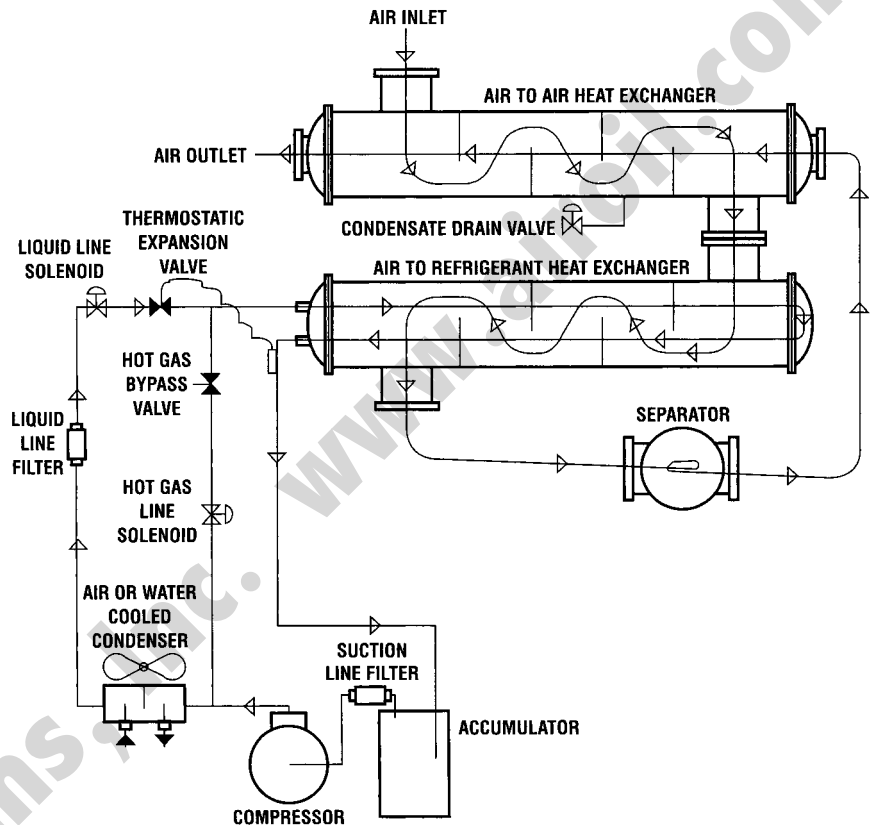
NOTES:
 1. COMPRESSOR EQUIPPED WITH AN INTERNAL OVERLOAD PROTECTOR. ALLOW TIME FOR RESET.
 2. VOLTAGE: 460-80-3, RANGE: 414-506

Refrigeration Circuit Flow Diagram

There are two (2) basic sections, commonly referred to as the high and low pressure sections, in a refrigeration circuit. The high side begins at the refrigerant compressor discharge port and ends at the expansion valve. The circuit leaving the expansion valve through the air to refrigerant heat exchanger and up to the compressor suction port is known as the low pressure circuit.

The compressor takes in low pressure refrigerant gas and compresses it to a high pressure or high temperature gas. The high temperature gas passes into the refrigerant condenser where it is cooled and liquefied. The refrigerant then passes through the filter dryer where moisture and any foreign particles are removed.

The refrigerant then passes through an expansion valve where the liquid refrigerant is throttled and a temperature drop will occur as part of the liquid turns into gas. The cold refrigerant gas and liquid then enters the refrigerant-to-air heat exchanger where it absorbs the heat from the compressed air as it evaporates. The low pressure refrigerant gas returns to the compressor for repetition of the process.



Load Control

The expansion of the refrigerant is controlled by a thermal expansion valve. The expansion valve responds to the suction temperature; As the suction line temperature increases, the expansion valve is opened to allow more liquid refrigerant to feed into the evaporator. This increased volume of liquid causes a greater cooling effect. The suction temperature drops and the valve throttles back. In addition, the circuit incorporates a hot gas bypass valve. This valve feeds a small amount of high temperature gas from the high side directly into the air refrigerant heat exchanger to enable easier control of the dryer at light or no load conditions. As the load increases, the evaporator temperature and pressure begin to rise. The increase of temperature causes the expansion to open and let more refrigerant into the evaporator. As this occurs, the increased pressure causes the hot gas valve to close. This will continue until the dryer is operating at full load at which time the expansion valve has full control and the hot gas valve is closed.

General Information

The Numatics refrigerated air dryer is a constantly running, non-cycling type with a hermetic type refrigeration compressor and is available with a water cooled or air cooled condenser.

The following are the five phases that take place in the drying process:

Phase 1 - Precooling

Air enters the precooler traveling in the opposite direction as the outgoing refrigerated air. The tubes that contain the incoming air are surrounded by the colder, outgoing air.

Phase 2 - Preseparation

As the air is precooled, some of the moisture condenses. During this phase, all condensed moisture and oil is separated from the compressed air.

Phase 3 - Chiller

The air then enters the chiller shell where it passes over the refrigeration tubes. The air stream is cooled to 35-39°F (1.6-3.8°C), reducing its dewpoint to the same temperature.

Phase 4 - Separation

As the air is cooled in the chiller, the moisture condenses into a liquid. At this point, all liquid and oil is separated from the air and drained away with an automatic draining device.

Phase 5 - Reheating

The cold air enters the reheater shell at 35-39°F (1.6-3.8°C) where it passes over the tubes containing incoming hot air. The cold air is reheated to within 20 to 25°F (-6.6 to -3.8°C) of the inlet air temperature.

Controls

A. High-low refrigerant cut-out switch

High side setting: R22 - 350 cut-out, Low side setting: R22 - 50 cut-out

Cut out switch senses high and low refrigerant pressure at refrigerant compressor inlet and outlet ports.

B. Dryer/filter

Filters refrigerant of moisture and any foreign particles. Must be replaced if refrigerant system has maintenance performed on it.

C. Sight glass

Located in the liquid line, indicating liquid refrigerant levels and moisture content.

D. Expansion valve

Senses "low side" (or suction) pressure (temperature). Meters refrigerant flow in the evaporator.

E. Water-regulating valve (water cooled units only)

Senses compressor discharge pressure, regulates water flow to maintain an average 105°F (40.5°C) condensing temperature. Setting is reflected.

F. Electronic drain valve

An electrically controlled solenoid valve is programmed to open and close to automatically drain away condensate.

G. Crank case heater

A safety device which prevents refrigerant migration back to the compressor during shutdown.

H. Hot gas bypass valve

Passes high side gas to low side to maintain a constant suction pressure after first and second step unloading.

Panel Mounted Gauges

A. Refrigerant suction pressure

Indicates pressure on low side of refrigerant compressor. R134a units normally indicate between 30-32 PSIG (2-2.2 bar). R22 units normally indicate between 60-64 PSIG (4.1-4.4 bar). Range of gauge 30" vac/150 PSIG (10.3 bar).

B. Refrigerant discharge pressure

Indicates pressure on the high side of the refrigerant compressor. R22 water cooled units normally indicate 210-245 PSIG (14.4-16.8 bar). Air cooled units normally indicate 225-265 PSIG (15.5-18.2 bar). R134a air cooled units indicate 115 PSIG (8 bar).

Indicating Lights

See electronic control panel on page 12.

Water Cooled Models

Cooling water is required for water cooled shell and tube refrigerant condensers. The user is responsible for piping the water to and from the condenser. Water connections are shown in Figures 1a and 1b. Piping to these connections depends on cooling water temperature. If city water (generally lower in temperature) is used, plug the center connections and connect piping as in Figure 1a. If tower water (generally higher in temperature) is used, connect piping as in Figure 1b, using both city-water connections as inlets and the center connection as the outlet. When cooling water is connected this way, water flow is divided through the tubes, reducing water velocity and pressure drop for more effective cooling.

Water connections for city

For city water (open system) high pressure applications, the tower connection is plugged.

Water connections for tower

For tower usage and low pressure applications, both normal water connections will be used as inlets and the tower connection as an outlet.

The required water flow depends on the water temperature (refer to Table 2). A valve supplied with the dryer automatically adjusts the flow to compensate for variations in water temperature, water pressure, and dryer air load.

Cooling water pressures below or temperatures above those listed in Table 2 may reduce drying capacity. The refrigerant discharge pressure control will shut down the refrigerant compressor if cooling is inadequate.

If the cooling water is dirty, install a strainer ahead of the condenser inlet. Install shut-off valves so that the strainer can be drained and cleaned at regular intervals.

Figure 1a

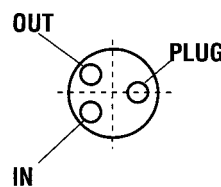


Figure 1b

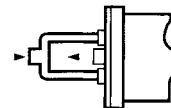
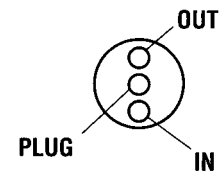


Table 2

Model	H.P.	Water connect.	Water reg., GPM	
			City (75°F)	Tower (85°F)
200	1	3/8 FPT	3.2	6.3
250	1 1/2	3/8 FPT	5.4	11
300	1 1/2	3/8 FPT	5.4	11
400	2	1/2 FPT	11	22
500	3	1/2 FPT	11	22
625	3	1/2 FPT	11	22
800	4	3/4 FPT	16	33
1000	6	3/4 FPT	16	33
1200	6	3/4 FPT	16	33
1600	7 1/2	1 FPT	20	40
1750	10	1 FPT	24	40
2000	10	1 FPT	24	40

Air cooled models

Cooling air flows from the front to the back of the dryer. Air must be drawn from a clean source in order to reduce dust and dirt accumulation on the condenser coils. Air temperature should not exceed 100°F (38°C).

Fan motor rotation check (this check applies only to air cooled models)

Locate the rotation decals. These may be on each motor or on the condenser. Observe the refrigerant compressor cooling fans. Rotation should be in accordance with the fan rotation shown on the decals. Cooling air should exhaust through the condenser coils away from the fan motors. If the motor rotation is not correct, turn off the power switch and put the main power supply disconnect in the **off** position; lock and tag. Check the wiring and correct the wire lead locations. Recheck for correct rotation.

WARNING

Disconnect electrical services from the unit whenever it is necessary to make adjustments on timers or when servicing drain valves.

Initial Startup Procedures

The following procedure must be followed. Failure to do so could damage your dryer and invalidate the warranty. Before starting...

1. Be sure dryer 'on/off' switch is in the 'off' position or the dryer is unplugged.
2. If refrigerant gauges read below 40 PSIG (2.75 bar), do not start the dryer. Contact your Numatics or Ultra Air distributor or the factory directly.
3. Make sure the air inlet and outlet piping is piped correctly and piping is supported correctly. Do not use the dryer in and out connections as supports.
4. Make sure condensate lines are run properly and to the correct locations.
5. Set drain 'on' and 'off' times. During periods of high humidity it is recommended that 'off' time is decreased and 'on' time is increased. During periods of low humidity, increase 'off' time and decrease 'on' time.
6. Check that there is adequate ventilation on all air cooled units.
7. Make sure cooling water is being supplied to the unit.
8. Confirm proper inlet air pressure, temperature, and flow to the dryer.
9. Turn on disconnect. This will energize crankcase heater(s). Allow the unit to stand for 24 hours before continuing.
10. Check lights. The 'power on' lights should be lit.
11. Pressurize the unit by opening the air inlet valve with the bypass valve open and the air outlet valve closed.
12. Press the 'on' button (colored black). The 'compressor on' light will illuminate and the compressor will start. Shortly after startup, the suction press gauge will read 58-68 PSIG on R22 units or 30-32 PSIG for R134a units.
13. Open the air outlet valve to pass through dryer and close the bypass valve.

Shutdown Procedures

1. Press the red 'off' button.
2. 10-15 units after the unit shuts down, cooling water can be shut down.
3. Turn off main disconnect if necessary.

Air Cooled Condenser Maintenance Procedures

Air cooled condensers may be cleaned by blowing clean with a compressed air blow gun or by steam cleaning. Steam cleaning may be necessary for heavy deposits. Do not use wire brushes as they may bend the fins, causing leaks. Straighten bent fins and fan blades.

Recommended service interval is 1000 hours of operation. More frequent service may be required if dryer is located in a dusty or dirty area.

Ambient air filters are required for dryers located in an excessively dusty or dirty environment.

Water Cooled Condenser Maintenance Procedures

The tube and shell condensers used on all Numatics water cooled dryers are designed for easy cleaning. Both end caps are removable to give direct access to water tubes. Calgon Corporation, a division of Merck & Company, manufactures a scale disolver which can be pumped through the water tubes. As this acid dissolves, the scale bubbles. Once the bubbling stops, scale has been removed. It may be necessary to use a combination of acid and scale disolver with a brush.

A rifle or shotgun brush is ideal when a brush is needed. In such cases, it is recommended that the scale disolver be pumped through the water side and followed with a brush cleaning.

For optimal performance, it is important that the water cooled condenser be cleaned regularly, ideally every 2000 hours of operation.

WARNING

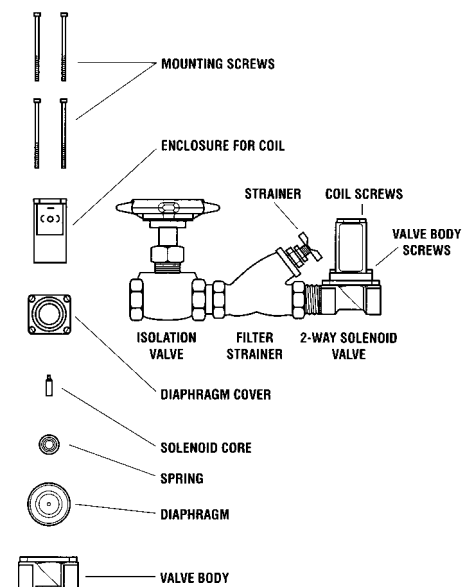
Dryer failure resulting from a dirty condenser is not covered under warranty.

Auto Drain Information

All UA Series high capacity dryers are equipped with two electronic auto drain valves. One is located on the air-to-air heat exchanger and drains condensate in the precooling phase. The other is located under the separator and drains condensate removed by the separator. The open and close time on the drains can be adjusted using the drain open and closed buttons on the electronic control panel (see 'Electronic Control Panel' section on page 15 for instructions).

Maintaining the auto drain

1. Turn dryer on/off switch to 'off' position
2. Disconnect power supply to the dryer
3. Lockout and tag power supply in accordance with OSHA regulations
4. Close isolation valve
5. Remove filter strainer and clean
6. Remove coil screws and coil
7. Remove valve body screws and valve body
8. Remove debris in the valve body
9. Remove diaphragm and inspect for damage or contaminant
10. Remove debris under diaphragm
11. Clean all parts, replacing if necessary
12. Check electrical continuity across coil
13. Reassemble valve and test, using the test button on the electronic control panel



Troubleshooting

Problem: Liquid moisture downstream of dryer

<i>Symptom</i>	<i>Possible cause</i>	<i>Solution</i>
Inlet air temperature too high	1. Aftercooler failure 2. Aftercooler outlet temperature above 120°F (49°C)	1. Clean/repair aftercooler 2. Check size and capacity against actual conditions
Drain not draining condensate	1. Drain valve not opening	1. Check drain electrical connections, make sure timer is working properly and if valve is receiving signal, check valve for clogging 2. Clean valve, replace timer, replace valve if needed
High air flow through dryer	1. Undersized dryer	1. Reduce airflow 2. Replace with larger dryer
High pressure drop across dryer	1. Too much air flowing through dryer 2. Air freezing in air-to-refrigerant heat	1. Reduce airflow 2. Replace with larger dryer 3. Adjust hot gas bypass valve
Refrigerant compressor off from high refrigerant discharge pressure	1. Condenser coils clogged or flattened 2. Fan motor failure 3. Aftercooler air discharge blowing on condenser 4. Inlet compressed air temp. too high 5. Air in refrigerant system 6. Ambient temp. too high for aircooled condenser	1. Clean coils and straighten fins 2. Replace fan motor 3. Change aftercooler air flow 4. Reduce dryer inlet temp. to 120°F (49°C) max. 5. Contact certified refrigeration mechanic to repair leak 6. Improve ventilation in compressor room
Compressor cuts out; short cycles on internal overload	1. Refrigeration leak 2. Refrigeration control valves need adjusting 3. improper ventilation for aircooled condenser 4. Improper cooling water flow or temp. to condenser 5. Low voltage	1. Contact certified refrigeration mechanic to repair leak 2. Contact certified refrigeration mechanic to repair leak 3. Improve ventilation and/or clean condenser. Compressor should restart automatically 4. Improve and ensure proper water flow and temp. 5. Contact electrician for repair.
Compressor will not start	1. Compressor windings opened or shortened 2. Compressor burned out 3. Internal mechanical failure	1. Contact certified refrigeration mechanic for repair 2. Replace compressor 3. Contact certified refrigeration mechanic for repair
High evaporator temperature light on; refrigerant suction gauge on "0" PSIG	1. Refrigeration leak 2. Hot gas bypass valve out of adjustment	1. Contact certified refrigeration mechanic to repair leak 2. Adjust hot gas bypass valve by turning clockwise 1/2 turn until suction pressure is between 31-37 PSIG (R134a reference)
Refrigeration suction temp. above 65°F (18°C)	1. Inlet air temp. higher than 120°F (49°C) 2. Hot gas bypass valve out of adjustment 3. Refrigerant leak	1. Check aftercooler operation 2. Adjust hot gas bypass valve by turning clockwise 1/2 turn until suction temp. lowers to 28°F (-2°C) 3. Contact certified refrigeration mechanic to repair leak
Refrigeration discharge temp. lower than 145°F (63°C)	1. Dryer located in a low ambient 2. Refrigerant leak	1. Contact your Numatics distributor 2. Contact certified refrigeration mechanic to repair leak
Refrigerant discharge temp above 250°F (121°C)	1. Dryer located in a high ambient 2. Inlet air temperature too high 3. Fan motor failure 4. Fan motor not running	1. Contact your Numatics distributor 2. Reduce temp. to design conditions 3. Contact certified refrigeration mechanic for repair 4. Check fan cycling switches

Problem: Drain valve not discharging moisture

<i>Symptom</i>	<i>Possible cause</i>	<i>Solution</i>
Valve continuously purges compressed air	1. Clogged valve 2. Timer board failure 3. Solenoid valve failure	1. Clean valve 2. Replace timer board 3. Replace solenoid valve
Valve not opening	1. No power 2. Timer board failure 3. Solenoid valve failure	1. Check power supply and connections 2. Replace timer board 3. Replace solenoid valve

Problem: Drain valve not discharging moisture (continued)

<i>Symptom</i>	<i>Possible cause</i>	<i>Solution</i>
No response to drain test button	1. No electrical power 2. Timer board malfunction	1. Check power supply and connections 2. Replace timer board

Problem: Float drain will not seal

<i>Symptom</i>	<i>Possible cause</i>	<i>Solution</i>
Constant air flow through drain tube	1. Clogged or defective float	1. Clean or replace float

Problem: Dryer blows fuses

<i>Symptom</i>	<i>Possible cause</i>	<i>Solution</i>
Fuses blow at startup	1. Loose or defective wiring	1. Contact electrician to inspect and repair

Problem: Digital readout not working

<i>Symptom</i>	<i>Possible cause</i>	<i>Solution</i>
Readout shows "ERR" for temperature reading	1. Corresponding temperature probe is opened or shorted	1. Check probe connections or replace probe
Display blank or erratic	1. No power to board or blown T-630 mA fuse 2. Defective control board	1. Check power supply to control board and replace fuse if needed 2. Replace control board

NOTE: In case of internal freezing, the pressure regulator or hot gas bypass may need adjusting. To do this, remove the dryer top panel and turn the adjuster screw counterclockwise in half-turn increments. If water is present, turn the adjuster screw counterclockwise in half turn increments. Allow 15 minutes between adjustments to permit system to stabilize. Adjusting this valve lowers or raises the suction temperature. See panel mounted gauge section to determine what readings should be.

Warranty

Initial Warranty All Refrigerated Air Dryers manufactured by Numatics Inc. are warranted to be free from defective materials and workmanship for a period of two (2) years from the date of shipment provided the equipment has been properly maintained and used in accordance with instructions found in this manual.

Numatics liability is limited to repair of, refund of purchase price paid for, or replacement in kind at the sole discretion of Numatics Inc. In no event shall Numatics Inc. be held liable or responsible for incidental or consequential damages, even if the possibility of such damages have been made know to Numatics Inc.

The following procedure supplements the above stated warranty:

1. When larger models require warranty service, contact the factory, describing the malfunction. The factory will then provide a service technician or authorize procurement of the services of a competent local refrigeration outlet. Unauthorized service claims will be disallowed.
2. Customer responsibility includes the following routine preventative maintenance:

A. Keeping condenser clean	E. Maintaining proper volume and pressure (and temperature with water cooled condensers)
B. Keeping heat exchanger clean	F. Maintaining proper electrical requirements
C. Providing proper ventilation in the area	G. Removal or corrosive elements from the compressed air and atmosphere
D. Keeping automatic drain clean	

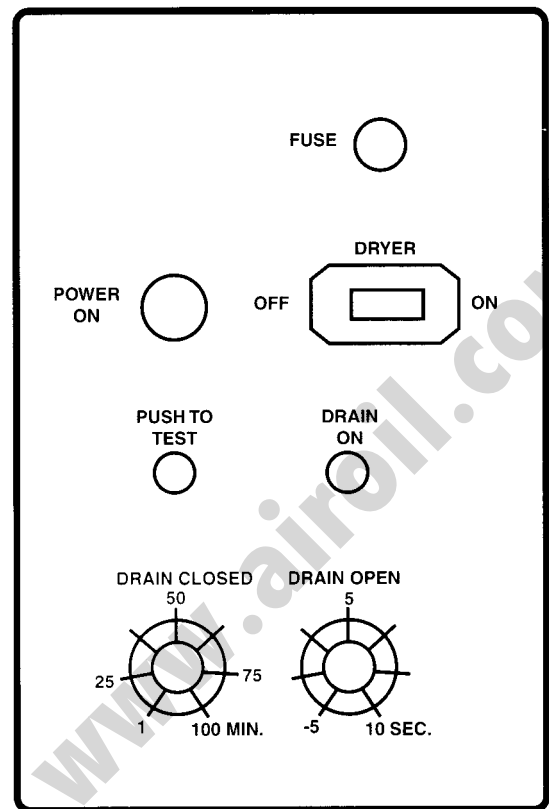
NOTE: When a factory technician is requested for service due to one or more of the above, the customer will be invoiced on a non-warranty service call basis

Standard Control Panel

UA Dryers come standard with a control panel that allows you to control the following operations and gives the following indications:

1. Dryer on/off
2. Power on light
3. Compressor on light
4. Drain open light
5. Drain push to test button
6. Drain closed adj. time 1-100 minutes
7. Drain closed adj. time .5-10 minutes
8. Control circuit fuse

The optional electronic control panel provides additional temperature readouts and adjustments (see below).



Electronic Control Panel

The dryer monitor panel displays one of four temperatures, times the drain valve, and controls the on/off operation at the compressor. The supply voltage to the control panel is 10 V AC and comes from a step down isolation transformer which is separate from the monitor panel.

The displayable temperatures are evaporator temp., refrigeration suction temp., and inlet air temp. The displayed temperature is selected using the select switch, causing the corresponding indicator light to light up. The refrigerant suction temp., ambient temp., and inlet air temp. can be selected and displayed continuously, in degrees Fahrenheit or degrees Celsius (a Celsius readout is achieved by turning on switch 1, located on the back of the panel; a Fahrenheit readout is achieved by turning it off). The evaporator temperature is only displayed for 18 seconds at a time. Additionally, the panel also monitors the evaporator temperature and activates an alarm if it exceeds 70°F (21°C) or if the evaporator temperature is not being displayed, at which point the alarm light flashes. When the evaporator temperature is displayed, the indicator light will be on continuously, regardless of whether or not the evaporator alarm temperature is exceeded. When a sensor becomes defective (open or shorted) or a temperature is out of range (lower than -67°F/-55°C or higher than 302°F/150°C), the corresponding display for that temperature will read "Err".

Each temperature can be calibrated individually. When switch 2 (located on the back of the board) is turned on, it puts the dryer in calibrate mode, causing the temperature display to flicker. The mode select switch is used to select the temperature to be calibrated, using the up and down arrows to select the designated temperature. After calibration is complete, turn off switch 2. The select switch is then used to select the drain open set time, between .5 and 20 seconds. The drain open select time is displayed for 18 second at a time after the time has been selected or after the up or down switch is released.

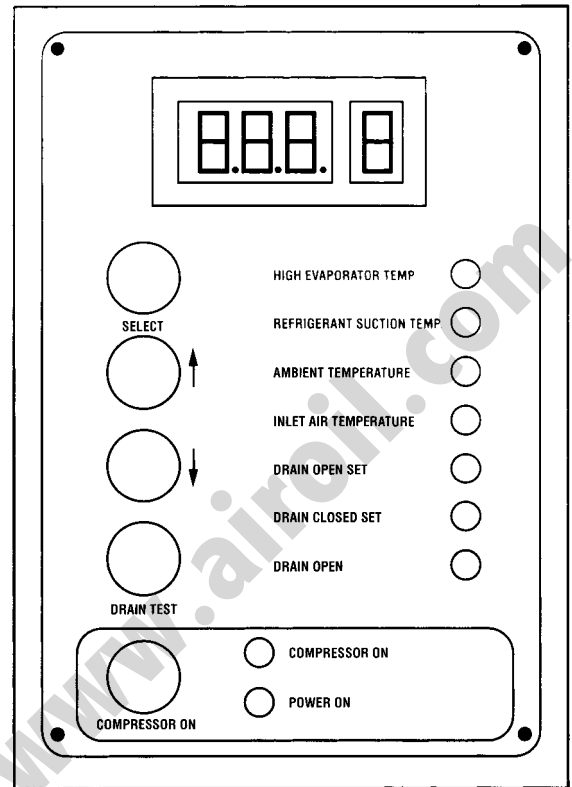
Numatics Refrigerated Dryers

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Use the select switch to select the drain closed set time. The time can be set from 1 minute to 2 hours using the up and down buttons. The drain closed select time can only be displayed for 18 seconds at a time after the time has been selected or after the up and down switch has been released.

The compressor on switch is used to turn the compressor on and off. The compressor light turns on and the compressor relay activates when the compressor turns on. When the compressor is turned off, the compressor light turns off and the compressor relay is deactivated.

The drain test switch activates the drain relay for the drain open set period. The drain open light turns on when the drain relay is activated.



Notes

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