



### **COMPRESSED AIR SYSTEMS & REFRIGERATED AIR DRYERS**

ITEM NUMBER \_\_\_\_\_

JOB NAME / NUMBER \_\_\_\_\_



### **COMPRESSED AIR SYSTEMS**

#### **Cleveland Standard Features**

- Air Compressor mounted on A.S.M.E. rated Receiver Tank
- Baldor high efficiency Motor
- Magnetic Starter with Thermal Overloads, completely wired and mounted
- Balanced Pump, external and internal
- Cast Iron Cylinders
- Forged Crankshaft and Pistons
- High quality cast iron Piston Rings
- Cast aluminum Finned Inner Coolers
- Inner Cooler Safety Valve
- Manual Drain for Air Receiver Tank
- Automatic Start and Stop Control
- 14 gauge Belt Guard
- 1/2" Combination Filter/Pressure Regulator/Guage
- 80 gallon Receiver Tank for CAS-5 & CAS-7.5
- 120 gallon Receiver Tank for CAS-10

#### **Options & Accessories**

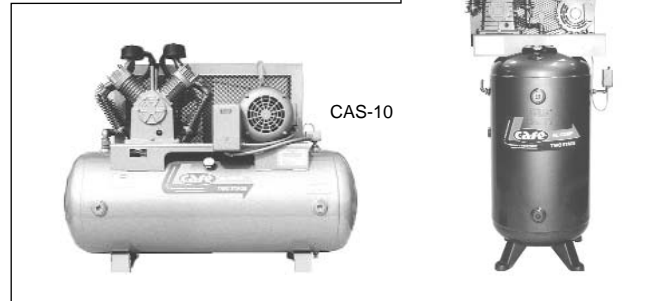
- Vibration Isolation Pads (set of four)
- 3/4" Diameter Stainless Steel Flex Hose
- Refrigerated Air Dryer with 37°F Dew Point
- Programmable, Automatic Drain Valve for Receiver Tank

### **REFRIGERATED AIR DRYERS**

#### **Cleveland Standard Features**

- Non-Cycling Dryer with double pass flooded Evaporator
- Rated at 37°F (+20°F) Pressure Dew Point
- High efficiency Shell and Tube designed Heat Exchangers for Compact Unit size and weight
- Low and High Refrigerant protection with Automatic Shut-Down Device
- Internal Thermal Overload Protection
- Float operated Drain Valve
- Power "on/off" Switch with Control Light
- Low ambient Fan Control
- Air cooled, compact design, cabinet type
- Electrical Supply Cord
- Designed for wallmounting

- MODELS:**  CAS-5 (VERTICAL)  
 CAS-7.5 (VERTICAL)  
 CAS-10 (HORIZONTAL)



#### **Short Form Specifications**

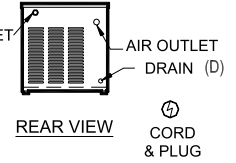
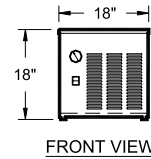
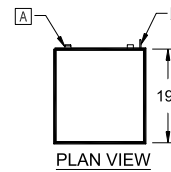
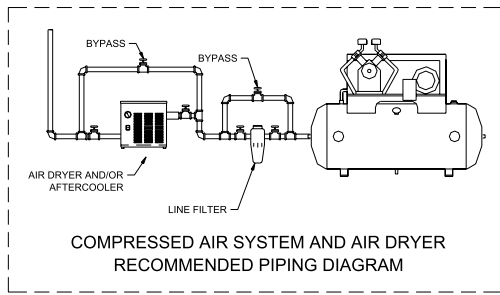
Shall be CLEVELAND Model CAS-\_\_\_\_, COMPRESSED AIR SYSTEM, consisting of Air Compressor & Receiver Tank, \_\_\_ H.P. (horse power); High efficiency Baldor Motor with magnetic Starter, Automatic Start and Stop Control; balanced External and Internal Pump; 14 gauge Steel; Belt Guard; 1/2" combination Filter / Pressure Regulator; \_\_\_ gallon Receiver Tank.

- MODELS:**  CAS-AD-25  
 CAS-ADA-40

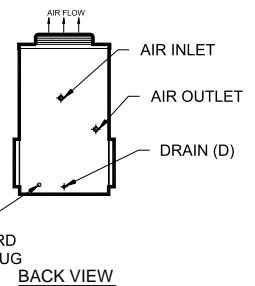
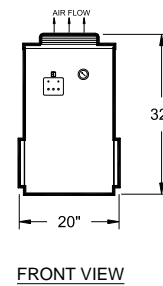
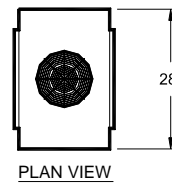


#### **Short Form Specifications**

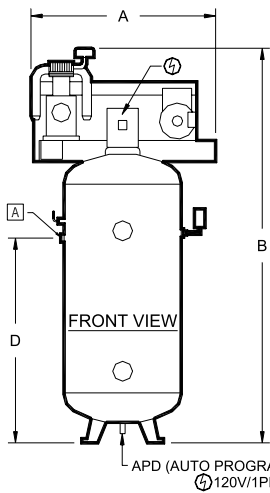
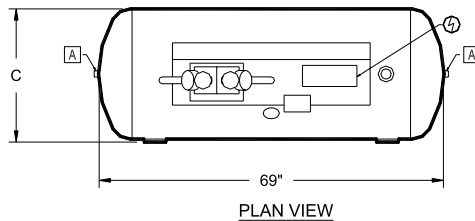
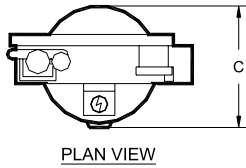
Shall be CLEVELAND Model CAS-AD\_\_\_\_, REFRIGERATED AIR DRYER for Series "CAS" Compressed Air Systems. Rated at 37°F (+20°F) Pressure Dew Point; Air cooled cabinet type; compact design with Shell and Tube Heat Exchanger; Automatic High and Low Pressure Shut-Down device; Thermal Overload Protection; Non-Cycling Dryer with double pass flooded Evaporator; low ambient Fan Control; Float operated Drain Valve.



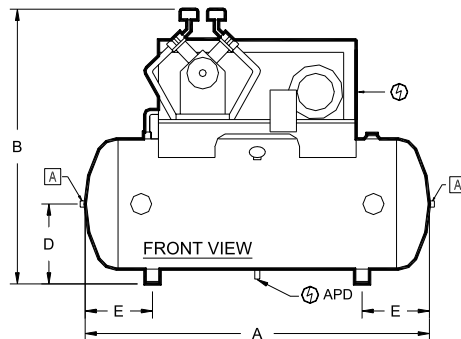
AD-25  
(for CAS-5)



ADA-40  
(for CAS-7.5 & CAS-10)



CAS-5 & CAS-7.5



CAS-10

## DIMENSIONS

### AIR COMPRESSOR

MODELS	A	B	C	D	E	CAPACITY AT 100 PSIG	AIR OUTLET	DRAIN	208/3PH ELECTRICAL
							A	D	⚡
CAS-5	37"	74"	26"	40 1/2"	-	19 CFM	2" NPT	1" NPT	15 AMPS
CAS-7.5	37"	79"	26"	40 1/2"	-	26 CFM	2" NPT	1" NPT	22 AMPS
CAS-10	69"	55"	30"	16"	13 1/2"	40 CFM	2" NPT	1" NPT	28.5 AMPS

## DIMENSIONS

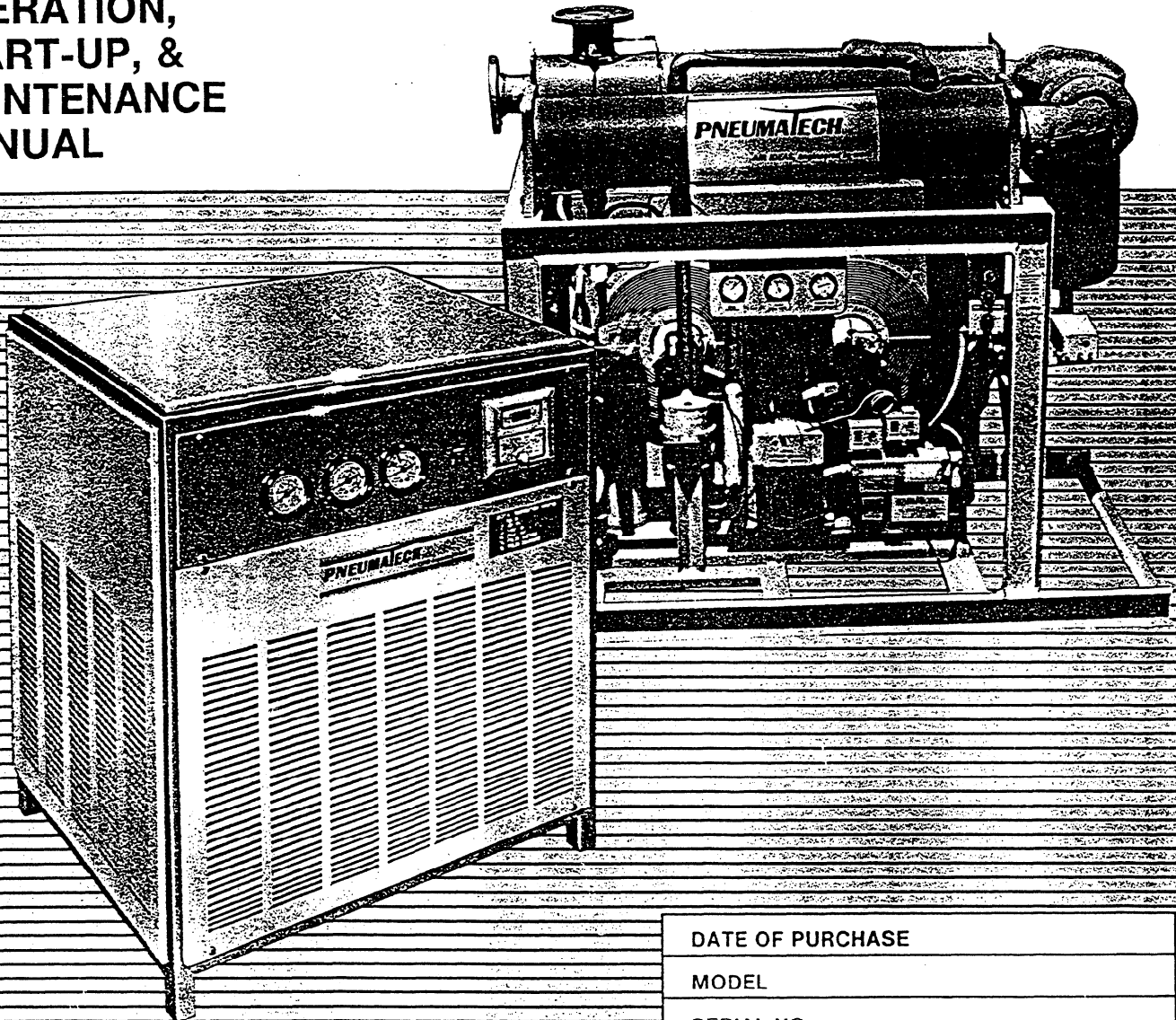
### REFRIGERATED AIR DRYER

MODELS	AIR	DRAIN	120/1PH ELECTRICAL CORD & PLUG
	A	D	⚡
AD-25 (for CAS-5)	2"	1/4"	1/4 HP – 10 AMPS
ADA-40 (for CAS-7.5 & CAS-10)	1/2"	1/4"	1/4 HP – 7.5 AMPS



# PNEUMATECH INC.

## NON-CYCLING REFRIGERATED AIR/GAS DRYERS INSTALLATION, OPERATION, START-UP, & MAINTENANCE MANUAL



DATE OF PURCHASE

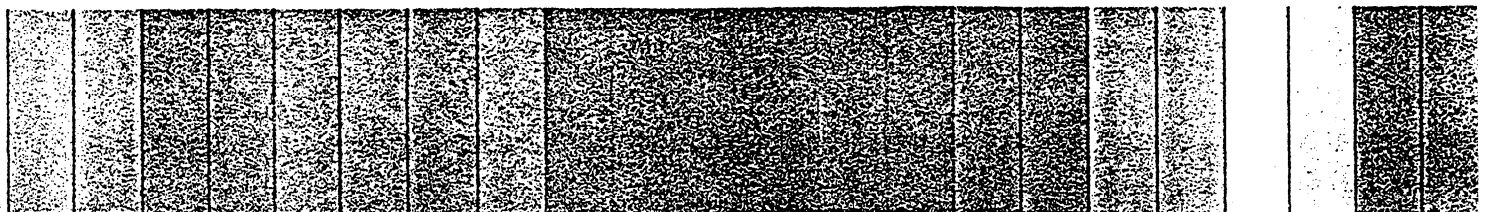
MODEL

SERIAL NO.

Record above information from name plate.  
Retain this information for future reference.  
Replacement Price \$25.00.

**PNEUMATECH**  
*air ideas*  
**ENGINEERED**  
TO WORK

**AD-25 TO 50**



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## GENERAL INFORMATION

The Pneumatech Air Drying System is designed to cool and remove moisture from compressed air.

When properly installed, the unit requires little maintenance or adjustment.

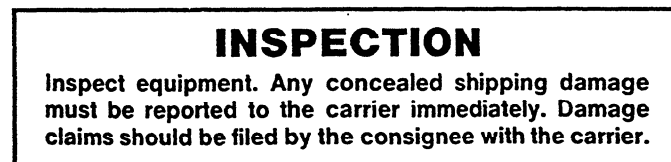
A list of service parts is provided on the next page.



This manual contains important safety information. Read THOROUGHLY and follow the Safety Instructions provided in this manual and posted on the unit. Keep this manual near the unit and in a safe place. Replace this manual if it becomes torn or dirty and cannot be properly used.

Please read the Installation and Operation Sections of this manual before attempting to operate the unit.

Please read the Maintenance and Adjustments, and the Trouble Shooting sections of this manual before beginning any maintenance or service work on this unit.



## SAFETY INSTRUCTIONS

When using air compressors and compressed air accessories, basic safety rules and precautions must always be followed, including the following:

### 1. READ ALL INSTRUCTIONS FULLY.

### 2. WIRING & BREAKERS

Wiring, breakers and other electrical equipment must conform to local and national electrical codes. Do not operate this unit with damaged wiring or after the unit or air handling parts have been dropped or damaged in any manner. Notify authorized service facility for examination, repair or other adjustments.

### 3. USE SUITABLE PARTS & ACCESSORIES

Do not use air pressurized accessories or parts in the air system not suitable for the maximum air pressure used. Be sure maximum pressure specified by the accessory manufacturer is well above the working pressure of your compressor.

### 4. RELEASE AIR PRESSURE SLOWLY

Fast moving air will stir up dust and debris, which may be harmful. Release air pressure slowly when depressurizing your system to avoid bodily injury.

### 5. SECURE DRAIN LINES

Fasten drain lines to floor or drain. Pressurized air may periodically pass through drain lines, which will cause an unsecured line to whip and may cause bodily injury.



To provide safe, breathable air, compressor must be capable of producing at least Grade D breathing air as described in Compressed Gas Association Commodity Specification G7.1-1966. Special filtering, purifying and associated alarm equipment must be used to convert compressed air to "Breathing Air." Other special precautions must also be taken.

Refer to OSHA 29 CFR 1910.134.

## DISCLAIMER OF WARRANTY

If this unit is used to produce breathing air, the special equipment and precautions expressed in OSHA 29 CFR 1910.134 for specifications of the necessary equipment and special precautions to make Breathing Air MUST BE used or any warranties are VOID and manufacturer disclaims any liability whatsoever for loss, personal injury or damage.

# INSTALLATION INSTRUCTIONS

A. Install the dryer in an area where the ambient temperature will be above 55°F and below 100°F. Temperatures below 55°F and above 100°F may cause erratic operation of the air dryer.

Aircooled dryers must be installed in a location with proper ventilation which will maintain ambient temperatures as specified above.

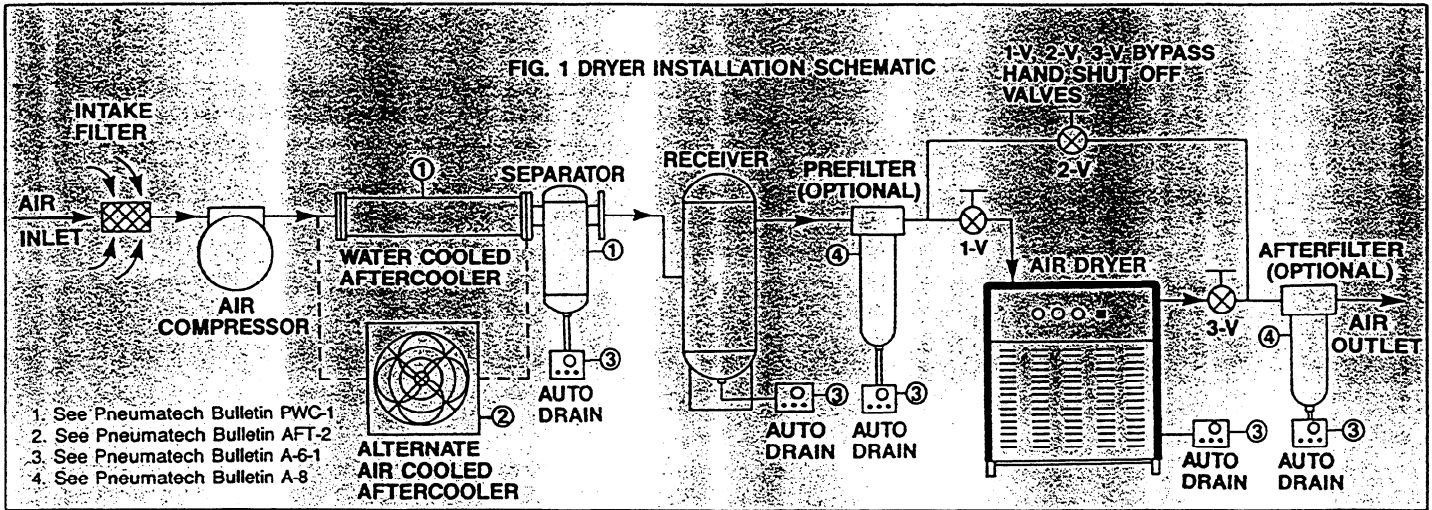
B. Position the dryer to permit free circulation of cooling air through the condenser. Keep two feet minimum clearance space around the dryer, and also on the top for servicing.

Lack of ventilation can build up the room temperature by recirculating the same cooling air through the condenser over and over again. This will eventually shut down the refrigerant compressor on high head pressure and/or on internal overload.

**WARNING**  
 Drain outlet tubing will periodically contain pressurized air. An unsecured drain tube will whip around potentially causing bodily injury.

**CAUTION:** Do not combine any two or more drain inlet lines through one single automatic drain valve. This type of installation leads to the pressure differential from the point of drainage and will cause closed loop compressed air flow. This will reduce or eliminate the proper drainage through the automatic drain valve.

D. Make sure when piping is in place that no undue stress is placed on dryer connections. Union joints or flexible connections are recommended to relieve stress. Also, properly support the pipes as needed with hangers or brackets. Air piping must be installed by an experienced pipefitter.



C. Connect the compressed air receiver to the dryer inlet. Connect the plant compressed air line to the dryer outlet. A three-valve by pass around the dryer is recommended for dryer service. See Fig. 1. A coalescing afterfilter is recommended for oil-flooded air compressor systems.

An aftercooler (aircooled or watercooled) must be installed between the air compressor and the dryer. Installing the dryer without the proper aftercooler will bring high inlet temperature compressed air to the air dryer which will cause premature failures. Aftercoolers must be followed by a separator and an automatic drain to remove the condensed moisture before the compressed air reaches the air dryer.

If the condensed water is not removed at the aftercooler separator drain, it will reduce the cooling capacity of the air dryer. Aftercoolers will condense approximately 2½ to 3 times more water than that of the air dryer.

Automatic drains are installed in air dryer Models AD-10 through AD-50. For Models AD-75 through AD-175 air dryers, float type automatic drains are packed inside the unit to be customer-installed on the drain outlet connection outside the cabinet. Refer to the drain installation manual for details. The AD-250 to AD-1200 air dryers are supplied with electronic timer automatic drains (Model 4484) to be customer-installed outside the cabinet. Power supply for these drains also is installed on the side of the air dryer.

AD-1500 to AD-2500 air dryers are shipped with Model 4484 automatic drains including the electrical hook-up installed. All drain outlets may be combined for condensate disposal and secured to an open floor drain.

E. For water cooled air dryers, connect cooling water lines to the water cooled condenser from the city water supply or the cooling tower as specified on the dryer specifications. Dryers are specifically piped for each application as ordered. Field conversions are possible from one to the other.

Do not connect city water to a condenser which is piped for tower water or vice versa. Strainers are recommended at the water inlet to the condenser. Proper chemical treatment is recommended for cooling tower water to avoid scaling and sludge inside the condenser.

**CAUTION:** Do not reduce pipe sizes connected to air, water and drain lines. They should be the same or larger than sizes supplied on the dryer to avoid excess pressure loss.

F. Connect electric power, according to nameplate power requirements, to the electrical terminals. The refrigerated dryer is designed to run continuously; therefore, it must be wired separately from the air compressor cycling switch. The dryer must not cycle with the air compressor. All units are prewired internally.

Follow the recommendation on the electrical drawing for the fuse size and the incoming power details. Connect the power to the air dryer only through a properly fused disconnect switch.

**WARNING**  
 Wiring to the dryer must meet the national (NEC) and local code requirements. Check the voltage specified on the nameplate to the electrical power connecting to the dryer. Electrical connections must be made by an electrician.

# START-UP AND OPERATION

The non-cycling design of the refrigerated dryer assures proper dew point control at all load conditions. The refrigerant compressor and condenser fan run continuously when the dryer is "on". Dryers with multiple fans are installed with fan cycling switches. These fans will cycle with respect to the load changes, ambient temperature fluctuations, and the cleanliness of the condenser. Standard units are designed to operate under the following conditions:

- Entering air temperature — 100°F Maximum
- Entering air pressure — 150 PSIG Maximum  
100 PSIG Minimum
- Ambient air temperature — 55°F to 100°F

**⚠ CAUTION —  
CRANKCASE HEATER**

Air dryers with three phase power supply are equipped with a compressor crankcase heater. This heater must be energized by closing the disconnect switch a minimum of 6 to 10 hours before start-up. Power to the air dryer can be left on to energize the crankcase heater for off-cycle during evening or weekend shutdowns.

**CAUTION: STARTING THE DRYER WITHOUT ENERGIZING THE CRANKCASE HEATER WILL CAUSE PREMATURE FAILURES OF THE REFRIGERANT COMPRESSOR. Failure to comply with procedure of energizing crankcase heater before start-up may void warranty.**

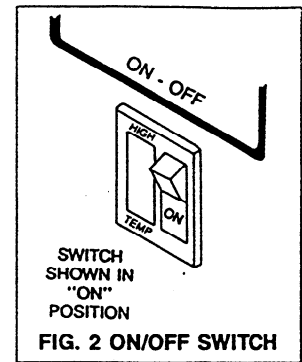
Check the temperature on the crankcase of the compressor to make sure the crankcase heater is working before starting the dryer. Check the individual data sheet and the wiring diagram to identify the dryers with crankcase heater. Generally single phase dryers do not have crankcase heaters installed.

## REFRIGERANT SUCTION and DISCHARGE PRESSURE RANGES

Suction Pressure	Discharge Pressure
Refrigerant-12 28-36 PSIG (yellow color on gauge)	70 to 150 PSIG aircooled unit without fan cycling 75 to 170 PSIG aircooled unit with fan cycling. 90 to 120 PSIG watercooled unit
Refrigerant-22 53-60 PSIG (green color on gauge)	155 to 260 PSIG aircooled unit without fan cycling 135 to 275 PSIG aircooled unit with fan cycling 190 to 220 PSIG watercooled unit
Refrigerant-134a 25-33 PSIG (blue color on gauge)	70 to 150 PSIG aircooled unit without fan cycling 75 to 170 PSIG aircooled unit with fan cycling 90 to 120 PSIG watercooled unit

## START-UP

Start the dryer by turning the on/off switch to the "on" position (see Fig. 2). The amber light will glow. The suction pressure will gradually come down to the yellow or green range depending on the type of refrigerant used in the air dryer. For initial start-up, it may take several minutes before the suction and discharge pressures reach the proper operating ranges. If the suction pressure gauge reads zero, refrigerant loss has occurred. Call factory for service.



To load the air dryer with compressed air, open the air inlet (1-V) and discharge valves (3-V). Close bypass valve (2-V) Fig. 1, Page 3.

**NOTE:** The high temperature light will glow red when the refrigerant compressor is not running. The reasons can be:

- Low suction pressure
- High discharge pressure
- Electrical problems
- Loss of refrigerant
- Dirty condenser
- Leaking evaporator, etc.

Refer to Trouble Shooting Guide, pages 6 & 7, for problem analysis and remedy. Call the factory if further assistance is required.

**⚠ CAUTION**

Contact factory before authorizing any warranty refrigeration service on the air dryer. Identify the dryer by model and serial numbers when calling factory.

## OPERATING CONDITIONS

### ENTERING AIR TEMPERATURE

Units are designed for entering air temperature of 100°F. If the temperature of entering air is to be greater than 100°F, the factory should be consulted to determine the maximum possible air flow through the unit.

**⚠ CAUTION:**

The increased heat content of higher temperature air requires the dryer to be oversized to prevent overloading of the refrigerant compressor.

### ENTERING AIR PRESSURE

Standard units are designed for operating air pressure 100 PSIG (150 PSIG MAX.). Operating below 100 PSIG will reduce system capacity.

### AMBIENT AIR TEMPERATURE

The allowable ambient temperature range is 55°F to 100°F. At temperatures below 55°F, frost or icing may develop and at temperatures above 100°F, refrigeration capacity will decrease.

# AIR DRYER MAINTENANCE

The dryer is factory tested before shipping. All controls are calibrated for automatic operation. If the dryer is installed in clean surroundings, within the temperature limits of the specified ambient, the dryer will run trouble-free for a very long time. Routine maintenance procedures recommended are the following:

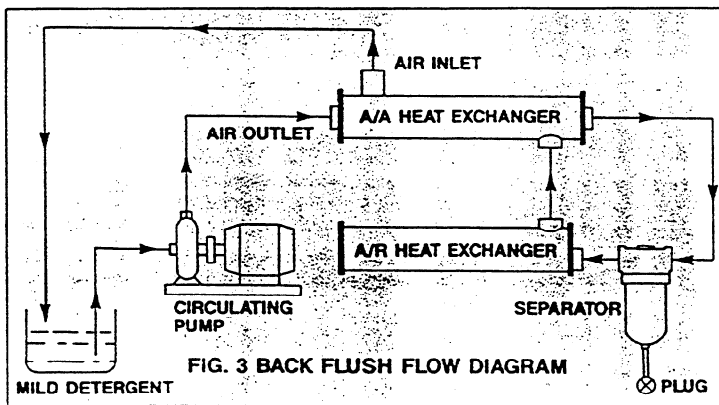
1. Check the fan motor(s) for proper operation to maintain the cooling air to be drawn through the condenser and blown over the refrigerant compressor. If the dryer is equipped with condenser ambient filters, check, clean or replace as needed to maintain the proper air flow through the condenser.

Dirty ambient filters will reduce the air flow through the condenser, and trip the compressor "off" at the overload control.

2. For dryers without ambient filters, clean the condenser periodically to maintain the proper heat transfer on the condenser coil. Dirty condenser will raise the head pressure of the refrigeration system and trip the compressor "off" at the overload control.

Running the compressor on high head pressures may cause premature failures. Check the ambient temperature limits to be maintained at the installation.

3. Check and clean watercooled condensers for dirt, scale and sludge build-up every year or as needed. Cooling tower water condensers may need cleaning more often if the water is not properly treated.
4. Check the suction pressure gauge. Reading should be within the specified range after a few minutes of start-up. Suction pressure below the range will cause freeze-up inside the air system, increasing the pressure drop across the air dryer. Suction pressures above the range will reduce the refrigeration cooling capacity.
5. Check the pressure drop across the air dryer at full capacity flow. If it is higher than specified value (normally 5 PSI or less), consult factory. If pressure drop increases over years of operation, it may be due to particulate build up from air compressor intake. In that event, back-flush the dryer with any **MILD DETERGENT**. See Fig. 3.



To back-flush, disconnect air dryer, plug the drain line and fill the air system with the detergent water solution. Hold it for 4-6 hours. Circulate the detergent from air outlet to air inlet with a pump. Flush the system with warm water. If pressure-drop still exists, contact factory.

## AUTOMATIC DRAINS

Periodically check the automatic drains for proper drainage. If the drains are not functioning, the condensed moisture will be re-entrained downstream of the air dryer. Float operated automatic drains need periodic cleaning with soap and water to remove solids from the valve seat. If the valve is stuck open, clean with soap and water and then use compressed air to clean the valve seat. Electronic solenoid operated drains may be manually tested periodically for proper operation. Refer to drain installation manual for clean-up procedure.

## COMPRESSOR

Refrigerant compressors normally do not need any maintenance. The compressor will unload or adjust for different load conditions with the refrigeration controls. Any time power is applied to the compressor, and the suction pressure is higher than the specified readings, the compressor is either not pumping or failed electrically, or tripped "off" at the overload protection. If the compressor does not automatically reset within a few minutes, it requires servicing. Service must be performed by a qualified refrigeration technician.

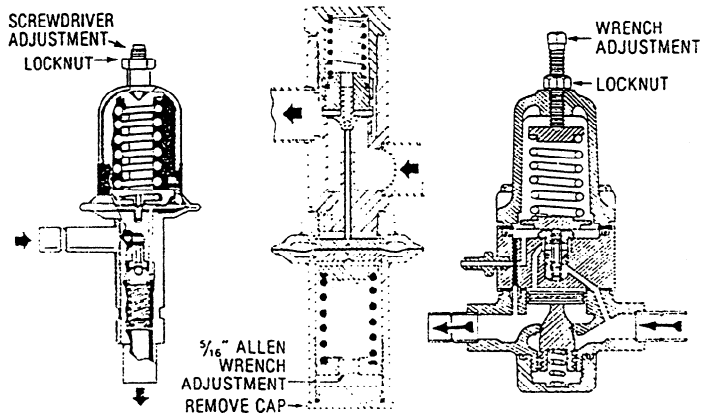
## EXPANSION VALVES

Air dryers up to AD-250 come equipped with an automatic expansion valve. These valves are factory adjusted for proper cooling. The valve adjusting stem is secured with a lock nut at the factory to maintain proper setting. Larger units are equipped with a thermostatic expansion valve, factory set to maintain a superheat of 8 to 10°F. These valves do not need adjustment in normal operation. Generally, superheat adjustments are needed only at the time of valve replacement. Expansion valve service must be performed by a qualified refrigeration technician.

## HOT GAS BYPASS VALVE

AD-50 Model and larger air dryers come equipped with modulating hot gas bypass valves. This valve maintains the refrigerant suction pressure in varying load conditions. The dryer will run from no load to full load conditions without freeze-up. The operation of this valve is automatic. If the valve needs adjustment, turn the adjusting stem clockwise to raise the suction pressure, and counter clockwise to lower the suction pressure. When the adjustment is made, turn one quarter of a turn at a time, and wait 3 to 5 minutes between adjustments. Once the adjustment is complete, secure the adjusting stem with the locknut that is provided. Check the suction pressure gauge with a calibrated manifold gauge at the time of hot gas bypass valve adjustment. Careful adjustment of this valve is necessary for normal operation of the air dryer. Hot gas bypass valve adjustment may be made by maintenance personnel. (See below.)

### HOT GAS BYPASS VALVE ADJUSTMENTS



**THE FOLLOWING CONDITIONS CAN CAUSE ABNORMAL OPERATION OR MALFUNCTION OF THE AIR DRYER**

- High inlet air temperatures
- High cooling water inlet temperatures
- Untreated cooling water
- Dirty condenser
- Low ambient temperatures
- Malfunctioning automatic drains at aftercooler or dryer
- Refrigerant over charge
- Leaky evaporator
- Electrical power supply more than  $\pm 10\%$  of the rated voltage
- Low inlet air pressures

- Contaminated cooling water
- Condenser water pressure below 35 PSIG
- High ambient temperatures
- Compressed air flow greater than rated capacity
- Undersized fuses
- Refrigerant under charge
- Clogged air compressor air intake filter

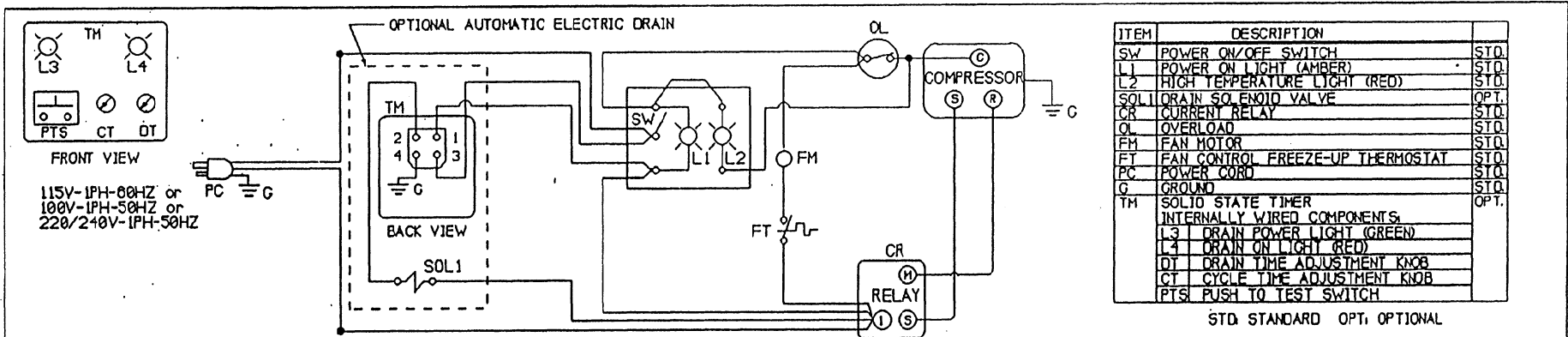
If any of these symptoms are noticed, refer to Trouble Shooting Guide.

**TROUBLE SHOOTING GUIDE FOR REFRIGERATED DRYERS**

SYMPTOMS	CAUSE	REMEDY
<b>A. Unit does not run</b>	<ol style="list-style-type: none"> <li>1. Motor line open.</li> <li>2. Fuse blown.</li> <li>3. Tripped overload.</li> <li>4. Safety controls open.</li> <li>5. Air switch open. (Dead end control)</li> <li>6. Frozen (locked) compressor.</li> <li>7. Wiring improper or loose.</li> </ol>	<ol style="list-style-type: none"> <li>1. Close disconnect switch, to start.</li> <li>2. Replace fuse.</li> <li>3. Turn switch off, wait 15 minutes, check for overload condition.</li> <li>4. Repair or replace.</li> <li>5. Check air pressure. Adjust air and/or switch. If defective repair or replace.</li> <li>6. Repair or replace.</li> <li>7. Check wiring against diagram.</li> </ol>
<b>B. Unit short cycles.</b>	<ol style="list-style-type: none"> <li>1. Motor compressor overload cutting out.</li> <li>2. Shortage of refrigerant.</li> <li>3. Suction pressure low.</li> <li>4. Sticking expansion valve.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for high head pressure, clogged condenser, high ambient, or air overload. Check high pressure cutout, repair or replace.</li> <li>2. Repair lead and recharge.</li> <li>3. Check hot gas bypass adjust, repair or replace.</li> <li>4. Repair or replace.</li> </ol>
<b>C. Compressor will not start - hums.</b>	<ol style="list-style-type: none"> <li>1. Improperly wired.</li> <li>2. Low line voltage.</li> <li>3. Starting capacitor defective.</li> <li>4. Relay or contactor not closing.</li> <li>5. Starting winding open.</li> <li>6. Single phasing.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check wiring against diagram.</li> <li>2. Check voltage - correct.</li> <li>3. Replace.</li> <li>4. Check for reason - repair or replace.</li> <li>5. Check leads, if leads OK replace motor.</li> <li>6. Check fuses.</li> </ol>
<b>D. Compressor starts and runs - short cycles on overload.</b>	<ol style="list-style-type: none"> <li>1. Low voltage, or phase unbalance.</li> <li>2. Additional current going thru overload.</li> <li>3. Overload protectors defective.</li> <li>4. Run capacitor weak.</li> <li>5. High discharge pressure.</li> <li>6. Short in winding.</li> <li>7. Current relay sticking.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check voltage to be within <math>\pm 10\%</math> of voltage listed on name plate.</li> <li>2. Check wiring diagram, check for added electrical devices connected thru protector.</li> <li>3. Check current, replace.</li> <li>4. Check capacitance, replace.</li> <li>5. Refer to G 1-8.</li> <li>6. Check resistance, replace compressor.</li> <li>7. Check floor level, tap &amp; release.</li> </ol>
<b>E. Relay burned out.</b>	<ol style="list-style-type: none"> <li>1. Low or high line voltage.</li> <li>2. Incorrect running capacitor.</li> <li>3. Short cycling.</li> <li>4. Wrong relay.</li> <li>5. Incorrect mounting.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check voltage to be within <math>\pm 10\%</math> of voltage listed on name plate.</li> <li>2. Replace with proper capacitance.</li> <li>3. Refer to B and C.</li> <li>4. Replace with proper relay.</li> <li>5. Mount in correct, rigid position.</li> </ol>
<b>F. Capacitors burn out.</b>	<ol style="list-style-type: none"> <li>1. Improper capacitor</li> <li>2. High line voltage.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace with proper capacitor.</li> <li>2. Lower voltage to not more than 10% above rating.</li> </ol>
<b>G. Head pressure too high.</b>	<ol style="list-style-type: none"> <li>1. Refrigerant overcharge.</li> <li>2. Air in system.</li> <li>3. Dirty condenser.</li> <li>4. Location too hot.</li> <li>5. Defective condenser pressure switch.</li> <li>6. Defective fan motor.</li> <li>7. Fan operating in wrong direction.</li> <li>8. Defective water regulating valve.</li> </ol>	<ol style="list-style-type: none"> <li>1. Purge or vacuum and recharge.</li> <li>2. Check for reason, repair.</li> <li>3. Blow clean with compressed air.</li> <li>4. Cool ambient, relocate unit, add ventilation.</li> <li>5. Repair or replace.</li> <li>6. Replace.</li> <li>7. Switch two wires at disconnect.</li> <li>8. Adjust, repair or replace.</li> </ol>
<b>H. Head pressure too low.</b>	<ol style="list-style-type: none"> <li>1. Refrigerant shortage.</li> <li>2. Compressor suction or discharge valves inefficient.</li> <li>3. Defective condenser pressure switch.</li> <li>4. Defective water regulating valve.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair leak and recharge.</li> <li>2. Repair or replace.</li> <li>3. Repair or replace.</li> <li>4. Adjust, repair or replace.</li> </ol>

# TROUBLE SHOOTING GUIDE FOR REFRIGERATED DRYERS

SYMPTOMS	CAUSE	REMEDY
<b>J. Noisy unit.</b>	<ol style="list-style-type: none"> <li>1. Mountings loose.</li> <li>2. Bent fan blade.</li> <li>3. Fan motor bearing worn.</li> <li>4. Refrigerant flooding back.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten mounting, etc.</li> <li>2. Straighten or replace blade.</li> <li>3. Replace.</li> <li>4. Check expansion valve, adjust, repair or replace. Check crankcase heater.</li> </ol>
<b>K. Frosted liquid line.</b>	<ol style="list-style-type: none"> <li>1. High side service valve partially closed or restricted.</li> <li>2. Restricted filter/dryer.</li> </ol>	<ol style="list-style-type: none"> <li>1. Open valve or remove restriction.</li> <li>2. Replace.</li> </ol>
<b>L. Frosted suction line.</b>	<ol style="list-style-type: none"> <li>1. Expansion valve and/or hot gas bypass out of adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjusted evaporator suction minimum setting 30° F no-load. Refer to installation and maintenance instructions.</li> </ol>
<b>M. Top condenser coils cool when unit in operation.</b>	<ol style="list-style-type: none"> <li>1. Refrigerant shortage.</li> <li>2. Compressor inefficient.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair leak and recharge.</li> <li>2. Repair or replace.</li> </ol>
<b>N. Unit runs but air temperature is high.</b>  <i>NOTE: Outlet air temperature gauge may read higher than actual temperatures at low air flow conditions.</i>	<ol style="list-style-type: none"> <li>1. Refrigerant leak.</li> <li>2. Evaporator controls set too high.</li> <li>3. Filter/dryer clogged.</li> <li>4. Refrigerant shortage.</li> <li>5. Dirty condenser.</li> <li>6. Air in system.</li> <li>7. Compressor inefficient.</li> <li>8. Evaporator control(s) stuck.</li> <li>9. Defective insulation.</li> <li>10. Air overload.</li> <li>11. Unit too small.</li> <li>12. High ambient.</li> <li>13. Entering air temperature too high.</li> </ol>	<ol style="list-style-type: none"> <li>1. Locate with leak detector. Repair or replace defective part.</li> <li>2. Refer to L-above.</li> <li>3. Replace.</li> <li>4. Repair leak and recharge.</li> <li>5. Clean condenser.</li> <li>6. Check reason, repair, vacuum, recharge.</li> <li>7. Repair or replace.</li> <li>8. Repair as required, adjust.</li> <li>9. Repair.</li> <li>10. Reduce load.</li> <li>11. Add unit or replace.</li> <li>12. Reduce or change location.</li> <li>13. Lower entering air temperature.</li> </ol>
<b>P. Unit runs but low air pressure.</b>	<ol style="list-style-type: none"> <li>1. System pressure low.</li> <li>2. Precooler and/or evaporator clogged.</li> <li>3. Incorrect piping.</li> <li>4. Air overload.</li> <li>5. Unit too small.</li> <li>6. Excess water in unit.</li> <li>7. Evaporator freeze-up.</li> <li>8. Clogged air compressor intake filter.</li> <li>9. Dirty air system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase pressure.</li> <li>2. Back flush using mild detergent, Fig. 3, Page 5.</li> <li>3. Increase line size and/or correct piping as required.</li> <li>4. Reduce overload.</li> <li>5. Add another unit or replace with larger unit.</li> <li>6. Check drain, repair or replace if needed.</li> <li>7. Adjust hot gas bypass valve.</li> <li>8. Clean or replace air intake filter.</li> <li>9. Back flush as described in Fig. 3, Page 5.</li> </ol>
<b>Q. Unit runs, but air flow erratic or zero.</b>	<ol style="list-style-type: none"> <li>1. Freeze-up.</li> <li>2. Precooler and/or evaporator clogged.</li> <li>3. Restriction in piping upstream from unit.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check suction temperature at evaporator outlet or turn off unit and allow it to thaw to determine if this is problem. Adjust controls at no-load if freezing is occurring.</li> <li>2. Refer to P-2 above.</li> <li>3. Correct as required.</li> </ol>
<b>R. Evaporator freeze-up.</b>	<ol style="list-style-type: none"> <li>1. Hot gas bypass valve out of adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust suction pressure. Adjust hot gas bypass valve.</li> </ol>
<b>S. Condenser fan blows outward.</b>	<ol style="list-style-type: none"> <li>1. Improper wiring at disconnect (3 phase only)</li> </ol>	<ol style="list-style-type: none"> <li>1. Reverse two wires.</li> </ol>

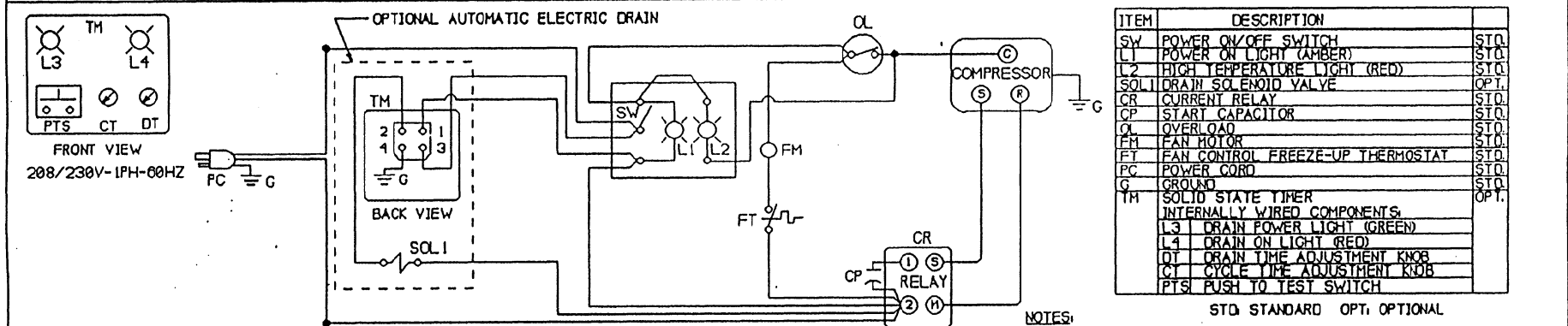


NEMA CLASS: 1

POWER SUPPLY	REFRIGERANT	REFRIGERATION COMPRESSOR			FAN MOTOR		MAXIMUM DISCONNECT FUSE	MINIMUM CIRCUIT AMPACITY
		HP	RLA	LRA	HP	RLA		
115V-1PH-60HZ 100V-1PH-50HZ	R-134a	1/3	6.9	35.0	6 WATT	0.40	15 AMP.	9.0
220/240V-1PH-50HZ	R-134a	1/3	3.2	16.0	6 WATT	0.19	15 AMP.	4.2

NOTES:

- CAUTION ELECTRIC SHOCK HAZARD, DISCONNECT THE REMOTE ELECTRIC POWER SUPPLY OR SUPPLIES BEFORE SERVICING.
- CONNECT POWER SUPPLY THROUGH A FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER.
- CAUTION USE TIME DELAY FUSES.
- USE COPPER, 60° C. WIRE INSULATION FOR FIELD WIRING.
- CUSTOMER POWER SUPPLY MUST MATCH DRYER NAMEPLATE VOLTAGE.



NEMA CLASS: 1

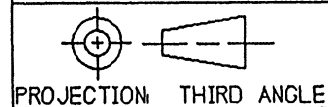
POWER SUPPLY	REFRIGERANT	REFRIGERATION COMPRESSOR			FAN MOTOR		MAXIMUM DISCONNECT FUSE	MINIMUM CIRCUIT AMPACITY
		HP	RLA	LRA	HP	RLA		
208/230V-1PH-60HZ	R-134a	1/3	3.6	16.8	6 WATT	0.19	15 AMP.	4.7

NOTES:

- CAUTION ELECTRIC SHOCK HAZARD, DISCONNECT THE REMOTE ELECTRIC POWER SUPPLY OR SUPPLIES BEFORE SERVICING.
- CONNECT POWER SUPPLY THROUGH A FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER.
- CAUTION USE TIME DELAY FUSES.
- USE COPPER, 60° C. WIRE INSULATION FOR FIELD WIRING.
- CUSTOMER POWER SUPPLY MUST MATCH DRYER NAMEPLATE VOLTAGE.

UNLESS OTHERWISE SPECIFIED TOLERANCES

DIMENSIONS ... +/- 1/4in  
... +/- 6.4mm  
ANGLE ... +/- 1°



REV	DESCRIPTION	BY	DATE
01	REF COMP HP FROM 1/4 TO 1/3	H.F.	9-13-93

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AD-35 AIR COOLED REFRIGERATED AIR DRYER WIRING DIAGRAM (R-134a)

**PNEUMATECH** INC.

SCALE: -	APRVD BY: Z.D.	DRAWING NO. SRE-1075	REV. 01
DATE: 7-20-93	DRAWN BY: H.F.		

MODEL	CAPACITY	HP	ELECTRIC POWER SUPPLY	CONN	WEIGHT	
					LBS.	KG.
AD-10	10 SCFM (17.0 NM3/HR)	1/6	115V-IPH-60HZ or 220/240V-IPH-50HZ or 220/240V-IPH-60HZ	1/2"	65	29
AD-15	15 SCFM (25.5 NM3/HR)	1/6	115V-IPH-60HZ or 220/240V-IPH-50HZ or 220/240V-IPH-60HZ	1/2"	69	31
AD-25	25 SCFM (42.5 NM3/HR)	1/4	115V-IPH-60HZ or 208/230V-IPH-60HZ or 220/240V-IPH-50HZ	1/2"	80	36
AD-35	35 SCFM (59.5 NM3/HR)	1/3	115V-IPH-60HZ or 208/230V-IPH-60HZ or 220/240V-IPH-50HZ	3/4"	85	39
AD-50	50 SCFM (85.0 NM3/HR)	1/2	115V-IPH-60HZ or 208/230V-IPH-60HZ or 220/240V-IPH-50HZ	3/4"	95	43

#### STANDARD ACCESSORIES

- 1 - POWER ON / OFF SWITCH
- POWER ON LIGHT
- HIGH TEMPERATURE LIGHT
- 2 - REFRIGERANT SUCTION PR.
- 3 - ELECTRICAL SUPPLY CORD -  
18' (457mm)
- 4 - (4) RUBBER MOUNTS
- 5 - (4) WALL MOUNTING HOLES
- 6 - 1/4" O.D. VINYL DRAIN TUBING

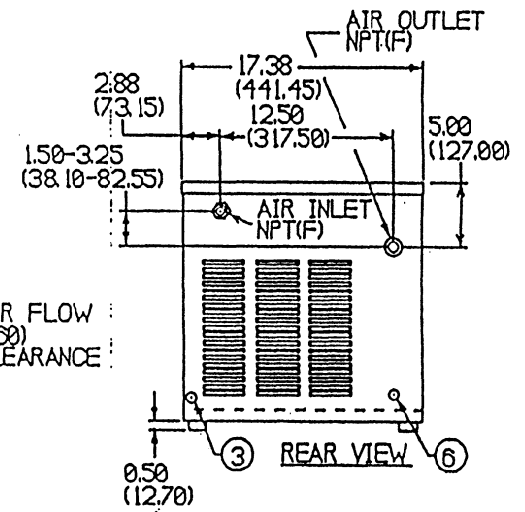
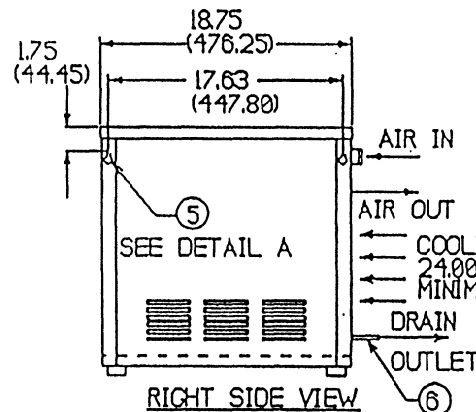
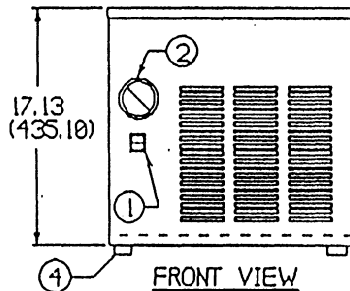
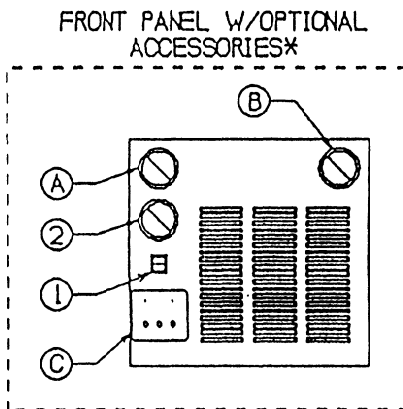
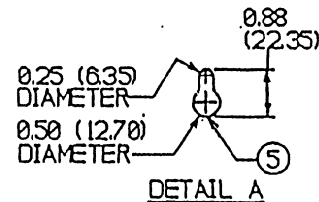
#### OPTIONAL ACCESSORIES

- A - AIR IN PRESSURE GAUGE
- B - AIR OUT PRESSURE GAUGE
- C - ELECTRONIC DRAIN VALVE TIMER
- D - AMBIENT FILTERS
- E - 200 PSIG MAX. WORKING PRESSURE

#### OPERATING CONDITIONS

INLET TEMPERATURE: 100 DEG F (38 DEG C)  
 MAX. AMBIENT TEMPERATURE: 100 DEG F (38 DEG C)  
 DESIGN PRESSURE: 100 PSIG (7.03 KG/SQ.CM)  
 MAX. OPERATING PRESSURE: 150 PSIG (10.155 KG/SQ.CM)  
 PRESSURE DEW POINT: 37 +/- 2 DEG F (3 +/- 1 DEG C)  
 REFRIGERANT: R-134a  
 NEMA CLASS: 1  
 CABINET COLOR: CHARCOAL GRAY

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS)  
 GENERAL TOLERANCE: 1/4" (6.4mm)



\* LOCATION OF THE GAUGES WILL VARY DEPENDING ON THE NUMBER OF OPTIONAL ACCESSORIES ORDERED.

AD-10 TO AD-50 AIR COOLED  
 REFRIGERATED AIR DRYER (R134a)

**PNEUMATECH** INC.

DRAWING NO.	APPV.	DATE	REV.
DF-1044	MR	3-4-94	05