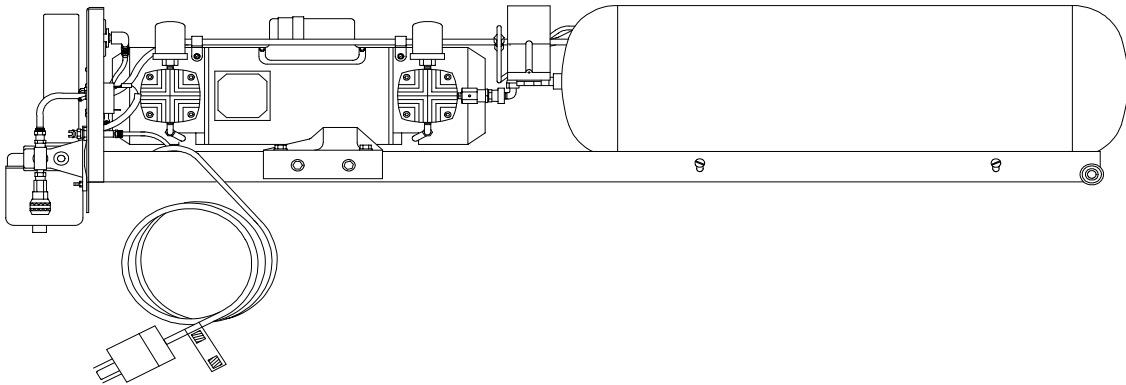


OPERATING INSTRUCTIONS AND PARTS LIST FOR

P05860-H2 (heatless) Nitrogen Bottle Replacement Unit



www.AltecAIR.com
226A Commerce Street, Broomfield, CO. 80020

sales@AltecAIR.com
Tel: 800-521-5351

Made in USA

P09317F1 rev D

PREFACE

This instruction manual is for the benefit of our customers. It is intended to provide the basic information that will enable our customers to install, maintain and service ALTEC AIR air dryers economically, capably, and with minimum delay. Careful observation of the instructions and maintenance procedures will ensure maximum life and efficiency of the unit.

This manual should be read thoroughly before installing operating, or servicing the air dryer to familiarize the technician with the unit and the proper operating procedures. This will minimize the possibility of damage to the unit due to improper operation and handling or disassembly.

Please direct all inquiries to:
ALTEC AIR Service Department
226A Commerce Street
Broomfield, CO 80020
1-800-521-5351 or (303) 427-3700



WARNING:

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer/birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

LIMITED WARRANTY AGREEMENT

Altec AIR Air Dryers carry a one-year warranty against defective workmanship and material. This period starts at the date of shipment. Not included are the components subject to normal replacement during a year's operating time.

On refrigeration type air dryers, the basic refrigeration circuit carries a five-year warranty. This warranty covers the refrigeration compressor, refrigeration tubing and coils but NOT the thermostat, thermometer, or fan motor.

Liquid ring compressors, heatless dryers and circuit boards carry a two-year warranty.

No claims for labor in replacing defective parts or for consequential damages will be allowed. Replacement parts will be invoiced in the regular way, with invoices subject to adjustment after the parts claimed defective are examined at our factory. In addition, no material or parts will be accepted at our factory for in-warranty repairs or credit without previous authorization from Altec AIR.

Responsibility for damages incurred in transit will be borne by the user and the user in turn should file any damage claim against the carrier. All warranty items are F.O.B. our plant. Freight charges are the responsibility of the user.

This warranty shall not apply to any air dryer which shall have been repaired or altered in any way by anyone other than Altec AIR so as to affect, in our judgment, its proper functioning or reliability, neither will it apply to a dryer which has been subject to misuse, negligence or accident.

**THE INSTALLING OF PARTS PURCHASED FROM OTHER THAN ALTEC AIR
WILL VOID THE WARRANTY ON OUR AIR DRYERS.**

**ALTEC AIR INSTRUCTION MANUAL
MODEL P05860H2**

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ALTEC AIR INSTRUCTION MANUAL

MODEL P05860H2

NITROGEN BOTTLE REPLACEMENT MODULE

SECTION 1 -GENERAL

This instruction manual covers the description, installation, operation, maintenance and, service part identification for the P05860H2 Nitrogen Bottle Replacement Modules (NBRM). The P05860H2 is a self-contained, assembled and tested unit, designed to effectively replace the nitrogen bottle for dry air buffering and pneumatic tool applications. The P05860H2 model can be installed in a nitrogen bottle rack in a truck.

The purpose of the unit is to supply an outlet flow of 3100 SCFD of dry air at a regulated pressure between 0 and 30 PSIG under continuous feed of pressurized cables, waveguides, or other devices requiring dry air. The unit will deliver a maximum of 5227 SCFD of dry air under emergency conditions. The unit will also deliver up to 5.1 SCFM of pressurized air (80-110 PSIG) for pneumatic tool applications.

The ratings, characteristics and features for the Nitrogen Bottle Replacement Module are specified below.

NITROGEN BOTTLE REPLACEMENT

<u>Specifications</u>	
SIZE:	12" wide x 17.5" high x 66.8"long
NET WEIGHT:	140 lbs. (63.5 kg)
ELECTRICAL:	230 VAC, 1 PH, 60 Hz, 10.6 amps
DEWPOINT:	-40 °F at atmospheric pressure
DESICCANT:	capable of drying 5227 standard cubic feet of saturated air at 70 °F to an effluent output dewpoint of below -40 °F.
AIR COMPRESSOR:	four cylinder, oilless type, 1.5 hp, output capacity of 5.1 SCFM at 80 PSIG
OPERATING PRESSURE:	80-110 PSIG Dry Air: 0-30 PSIG adjustable

Figure 1
MODULE SPECIFICATIONS

SECTION 2 - INSPECTION AND INSTALLATION

2.1 Initial Inspection

Before installing unit, carefully inspect for shipping damage.

NOTE:

Shipping damage must be brought to the immediate attention of the carrier.

2.2 Installation

The module must be installed inside the vehicle compartment to prevent weather damage. The optimum operating temperature range is between 40 to 95 °F. Although the unit will operate at higher temperatures, the operating life of the compressor decreases dramatically. The following steps should be followed when initially placing the NBRM into service :

1. Release the adjustment locking mechanism on the dry air outlet pressure regulator and turn the adjustment knob counterclockwise to initially cut off outlet flow for testing.
2. Apply power to the unit and allow the tank pressure to build up to 110 PSIG, as read on the front panel tank pressure gauge.
3. Soap test for air leaks created from shipment at all pneumatic connection points.
4. Turn the dry air outlet pressure regulator knob clockwise until air leaks from the outlet fitting. The outlet flow should be low enough to allow the compressor to fill the air storage tank from 80-100 PSIG in 60-90 seconds.
5. Allow the air to purge for approximately 5 minutes to remove moisture from the air lines.
6. Turn the adjustment knob of the outlet air pressure regulator counterclockwise until air is no longer bleeding from the dry air outlet.

CAUTION!!!

Condensation in the storage tank must be drained to prevent freezing.

2.3 Electrical Requirements

Refer to Chart 1 for product specific electrical requirements. The recommended generator size is 4.0 kW. Refer to Figure 2 for electrical hookup.

NOTE:

Adequate power is required for ALL equipment being used when using a portable generator.

NOTE:

Never operate system with the safety relief valve removed from the tank. DO NOT make adjustments to this valve. This is an A.S.M.E. requirement and MUST NOT be tampered with.

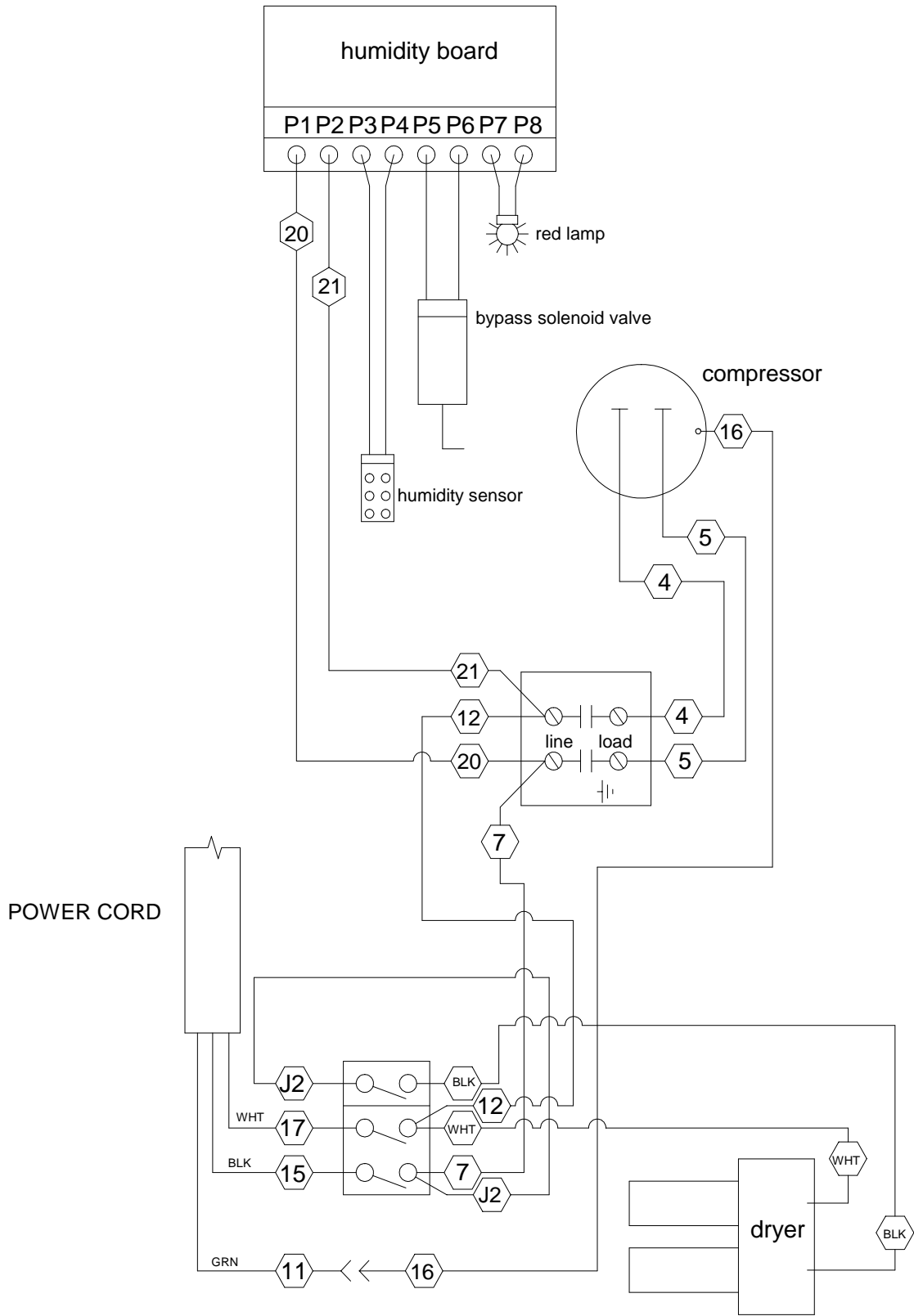


Figure 2
WIRING DIAGRAM

SECTION 3 - PRINCIPLES OF OPERATION

3.1 Air System

The air flows from the air compressor to the storage tank and then to the heatless dryer. Refer to Figure 4 for air flow schematic.

3.2 Air Compressor

Ambient air is drawn through the intake filters of the air compressor and is compressed to approximately 80-110 PSIG in the storage tank.

3.3 Pressure Switch, and Safety Relief Valve

The air pressure in the storage tank is controlled by the ON/OFF unloader pressure switch. The ON/OFF pressure switch starts the air compressor at 80 PSIG and stops it at 110 PSIG. This unloader pressure switch releases the static air from the air compressor discharge line, allowing for easy start-up. The inline check valve prevents the air from flowing out of the tank back through the compressor after the compressor has shut off. The tank pressure safety relief valve is factory preset to prevent pressure building above 165 PSIG.

3.4 Heatless Dryer

The Altec AIR heatless dryer, which is located downstream from the air compressor, consists of two desiccant-filled towers, a manifold, a solid state timer and two solenoid valves. It is arranged and cycled so one tower delivers dry air while the desiccant in the other tower is purged and dried by a small quantity of dry air supplied by the first tower, refer to Figure 3. The tower functions reverse at 30 second intervals. The operation of the towers follows below.

3.4.1 Tower #1

Air from the compressor enters the solenoid valve, which is controlled by an electrical timer and is forced upward through the desiccant tower. Moisture is removed from the air as it passes over the desiccant. The dried air is then forced down through the air tube in the center of the desiccant tower, out through an open ball check valve and is finally delivered through the capacity control valve to the air storage tank.

3.4.2 Tower #2

Simultaneously with the operation of Tower 1, as described above, the solenoid valve of Tower 2 is opened to the atmosphere. The main dry air supply from Tower 1 is prevented from entering Tower 2 by automatic closure of the ball check valve. However, a small quantity of the dry air is forced through an orifice into the air tube, then down through the desiccant bed absorbing the moisture previously collected while Tower 2 was furnishing dry air, as Tower 1 is doing at this time, and finally expelled to the atmosphere through the solenoid valve. The desiccant in Tower 2 is thus dried and made ready for the next cycle reversal. Tower 1 and Tower 2 reverse functions: Tower 2 takes over the air drying operation, while the desiccant in Tower 1 is being dried.

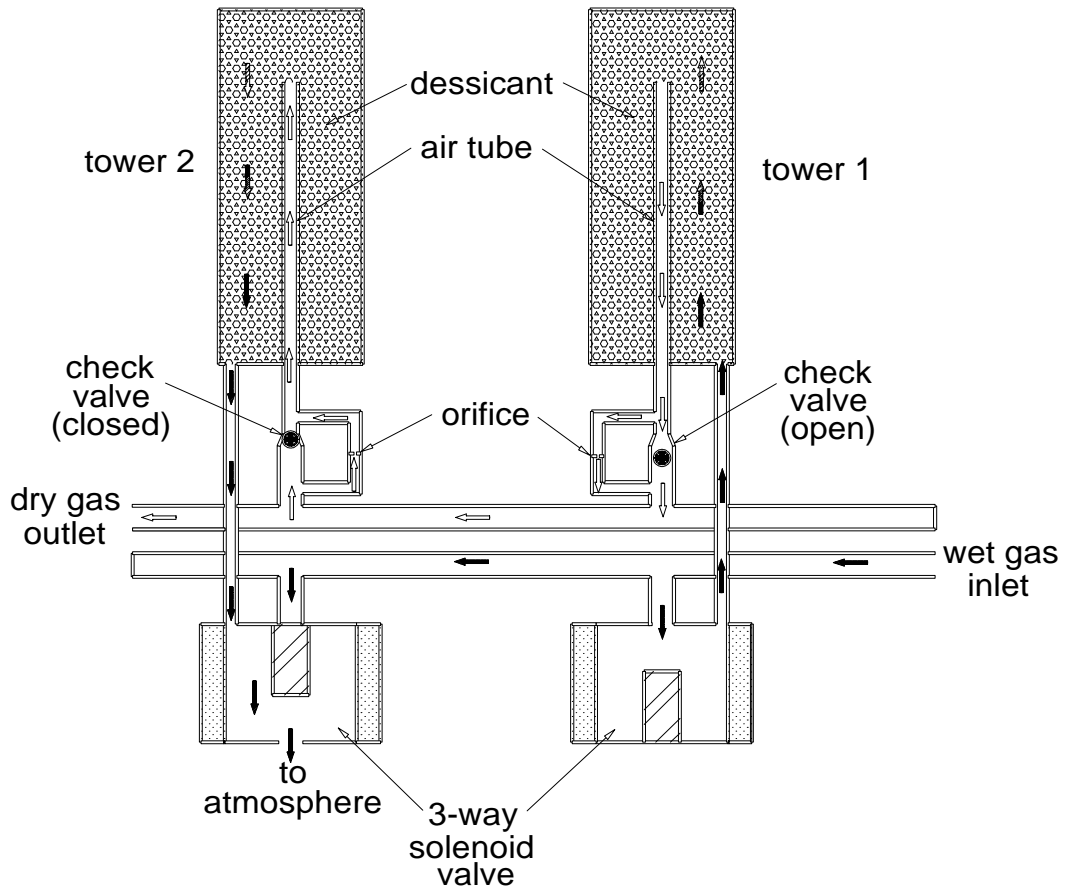


Figure 3
ALTEC AIR Heatless Dryer

3.5 Manual Drain Valve

The manual drain provides a means of draining water from the storage tank. The water should be drained each day after the unit has been in service.

3.6 Water Drain Instructions

With at least 20 PSIG pressure in the storage tank, slowly open the water drain valve allowing water to drain from tank; close the water drain valve when all moisture or water has drained. Repeat Procedure as needed. Refer to Figure 9.

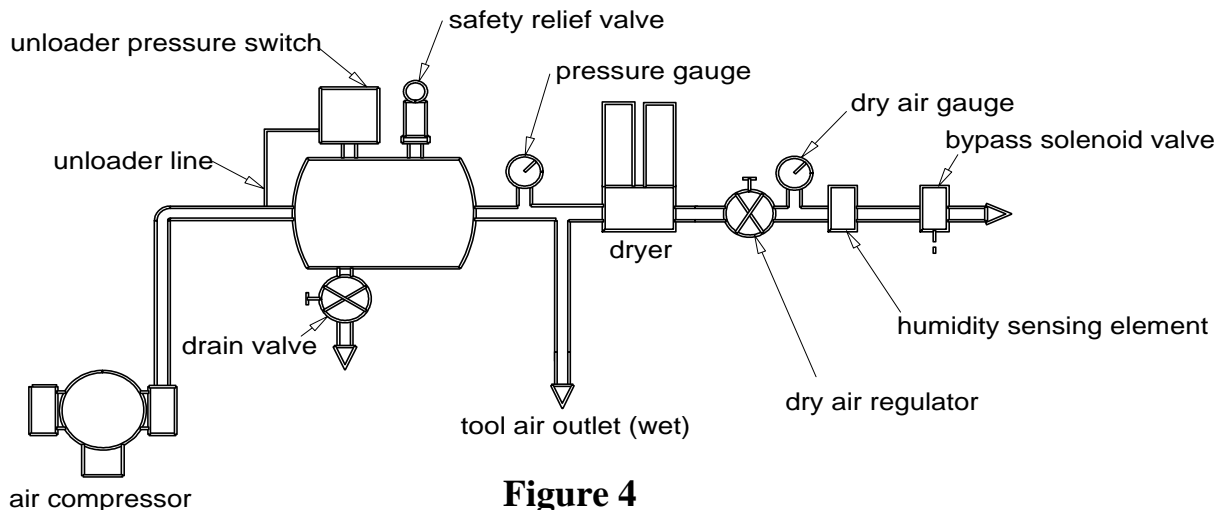


Figure 4
FLOW DIAGRAM

SECTION 4 - GENERAL MAINTENANCE

4.1 Nitrogen Bottle Replacement Module

CAUTION!!!
DISCONNECT POWER When working around energized circuits,
extreme caution should be taken to prevent injury to
personnel and damage to equipment.

The Nitrogen Bottle Replacement Module requires minimal maintenance. The following paragraphs provide procedures for routine maintenance of various parts. If further assistance is required, contact Altec AIR Technical Service Department at 1-800-521-5351 or (303) 427-3700.

The tank pressure **MUST BE RELEASED** before attempting to service any components. Use the drain valve on the front panel, refer to Figure 9.

CAUTION!!!
Release all tank pressure using the drain valve prior to servicing any components.

Check the following:

- ✓ Safety valve - Refer to Paragraph 4.2.
- ✓ Pressure Switch - Refer to Paragraph 4.3.
- ✓ Install compressor maintenance kit (P07102) - Refer to Paragraph 4.5.
- ✓ Check all wire connections.
- ✓ Soap test all pressure fittings.

CAUTION!!!
It is very important that routine maintenance be performed on the compressor each year, or every 4,000 hours.

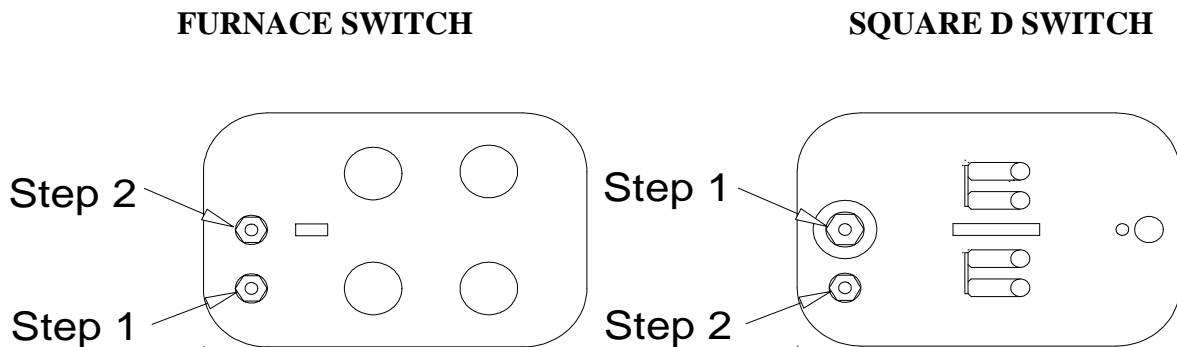
4.2 Air Compressor Safety Valve

The air compressor safety valve, located on the head of the air compressor, is factory preset to prevent the air compressor from delivering air over 115 PSIG (+/- 2 PSIG). Check for proper operation. If adjustment is required, use the following procedure while the compressor is operating.

- A. Adjust pressure switch cut out to 115 PSIG. Refer to Figure 5.
- B. Referring to Figure 6, loosen the safety valve lock nut and adjust the nut until the maintained pressure is 115 PSIG and the relief valve is releasing air.
- C. Allow the compressor to cycle through the cycling pressure range several times and soap test to insure the safety valve is tight and does not leak.
- D. If the safety valve is defective and requires changing, always check replacement valve for proper adjustment.
- E. Readjust air compressor pressure switch cut out to 110 PSIG.

4.3 Air Compressor Pressure Switch

The ON/OFF pressure switch is factory set to stop and start the air compressor and maintain the pressure in the air storage tank. The pressure in the air storage tank will cycle between 80 PSIG (+/- 2 PSIG) and 110 PSIG (+/- 2 PSIG) as noted on the tank pressure gauge. There are two pressure switch models that may be in use. To adjust the ON/OFF pressure switch, refer to Figure 5 below.



Step 1: Range adjustment- Turn down (clockwise) for higher cut-in pressure, or up for lower cut-in

Step 2: Differential adjustment- Turn down for higher cut-out, or up for lower cut-out

Figure 5
Air Compressor Pressure Switch

4.4 Air Compressor Troubleshooting Chart

REASON	COMPLAINT			
	Low Pressure	Overheating or Excessive AMP Draw	Excessive Noise	Won't Start Under Load
worn piston rings	X			
worn rider rings	X		piston hitting cylinder	
dirty valves	X			
bent valves	X			
blown head gasket	X		air blowing out intake filter	
dirty filters	X			
low voltage		X		X
cylinder mis-adjustment		piston hitting intake valve	piston hitting intake valve	X
leaky connections	X			
relief valve set too high		X		
relief valve set too low	X			
wrong voltage hook-up		X	X	X
dirt or liquid in top of piston	X	X	X	X

Figure 6
Air Compressor Troubleshooting Chart

4.5 Air Compressor Maintenance

The P07102 maintenance kit contains parts necessary for scheduled routine maintenance on the nitrogen bottle replacement module when operated under normal conditions. Refer to Figure 7. The contents of the maintenance kit are as follows:

Part Number	Description	QTY/Kit
P3861	piston seal	8
P3862	piston ring	8
P3864	manifold sleeve	5
P3866	head gasket	4
P3867	outlet valve	4
P3868	inlet valve	4
P3869	cylinder gasket	4
P3870	valve plate	4
P3981	rider ring	4
P3986	filter felt	4

If the air compressor shows evidence of overheating or excessive noise, stop immediately for repairs.

Regular inspection may prevent expensive repairs. The rider ring thickness can indicate when the air compressor needs maintenance. If a rider ring measures .055 inches or less in thickness, the maintenance kit, P07102 should be installed. The thickness of a new rider ring is .060 inches.

The wear of the air compressor rings are affected by ambient conditions. At 80 °F. maximum ambient temperature and relative humidity 40% maximum average, it is suggested the compressor life between maintenance be approximately 4,000 hours of run time.

NOTE:

At higher ambient temperatures, maintenance must be performed more frequently.

The air compressor is oilless and requires no lubrication. It is recommended the piston rings, piston seals, rider rings, inlet valves, valve plates and gaskets be replaced at 4,000 hours of run time.

4.6 Air Compressor Disassembly

- A. Remove or loosen the four screws which secure the fan shroud to the motor and slide the shroud off. Remove the four cylinder head bolts and separate them from the cylinder bolts. Remove the air manifold tube and the cylinder head with the valve components.
- B. Remove the two cylinder bolts at the motor and lift the cylinder off the piston.
- C. Remove the piston rings, seals and rider rings.

NOTE:

Clean all components with a non-flammable, non-toxic cleaning solvent. DO NOT FLOOD THE PISTON WRIST PIN, OR CONNECTING ROD MAIN BEARING WITH SOLVENT OR THE PERMANENT LUBRICANT WILL BE WASHED AWAY.

- D. The head gaskets may have become firmly attached to the flat surfaces of cylinder heads or cylinders. Remove the old gasket material. Use No. 240 grit emery cloth (or wet/dry abrasive material) to flat sand the cylinder surfaces. Follow with No. 400 grit emery cloth (or wet/dry) to dress these flat surfaces before reassembly with new gaskets.

4.7 Air Compressor Assembly

- A. Install the new piston springs, rings and rider rings on the piston. Locate the piston ring joints approximately opposite each other.
- B. Attach cylinder to motor with cylinder bolts and lock washer and finger tighten bolts. Move the piston to the top dead center position and adjust the cylinder flush with the top of the piston.

NOTE:

Top dead center can be checked by using a straight edge across the cylinder hear and then moving the piston flush with the straight edge. Move the piston up and down to insure there is no binding in the cylinder and tighten the cylinder bolts.

- C. Install valve components, gaskets and valve plates by lining them up as outlined in Figure 7. Valves are pre-lined in the maintenance kit; however, they should be checked. The leaves of the intake and discharge valves have been pre-bent and do not require adjusting.
- D. Install the head assembly using the four heat bolts and finger tighten.

NOTE:

The ends of the two fins on the cylinder head have been omitted. They are always on the exhaust port.

4.7 Air Compressor Assembly (continued)

- E. Install new manifold seals on the manifold and assemble to the elbow fitting on the head assembly. **DO NOT TIGHTEN.**
- F. Install the second head assembly and assemble the manifold. Tighten all head bolts and manifold nuts.
- G. Install maintenance kit on remaining half of air compressor.
- H. Soap test all fittings with compressor running.

4.8 Heatless Dryer

The heatless dryer does not require maintenance. After 8000 hours of operation, it is recommended that a maintenance kit (P200499S) be installed. A 10" adjustable wrench, phillips head, and flat head screwdrivers are needed to change out the parts within the kit.

4.9 Recommended Spare Parts List

Quantities listed are recommended spare parts for one or more nitrogen bottle replacement units. Refer to Figure 9.

Call Altec AIR Service Department at 1-800-521-5351 for ordering information.

Description	Part No.
circuit breaker - 0.5 amp	P09313
circuit breaker - 15 amp	P06136
tank pressure gauge 0-200 PSIG	P010167
heatless dryer	PHF2C209034
dry air gauge 0-100 PSIG	P3197
dry air regulator	P08147
dry air quick connect	P010406
tool air quick connect	P010405
humidity alarm board	P010137F2
humidity cable	P010164
humidity sensing element	P5000647D
bypass solenoid valve	P010173
air compressor	P010408
pressure switch	P010163
air storage tank	P05814P
compressor maintenance kit	P07102
heatless dryer maintenance kit	P200499S

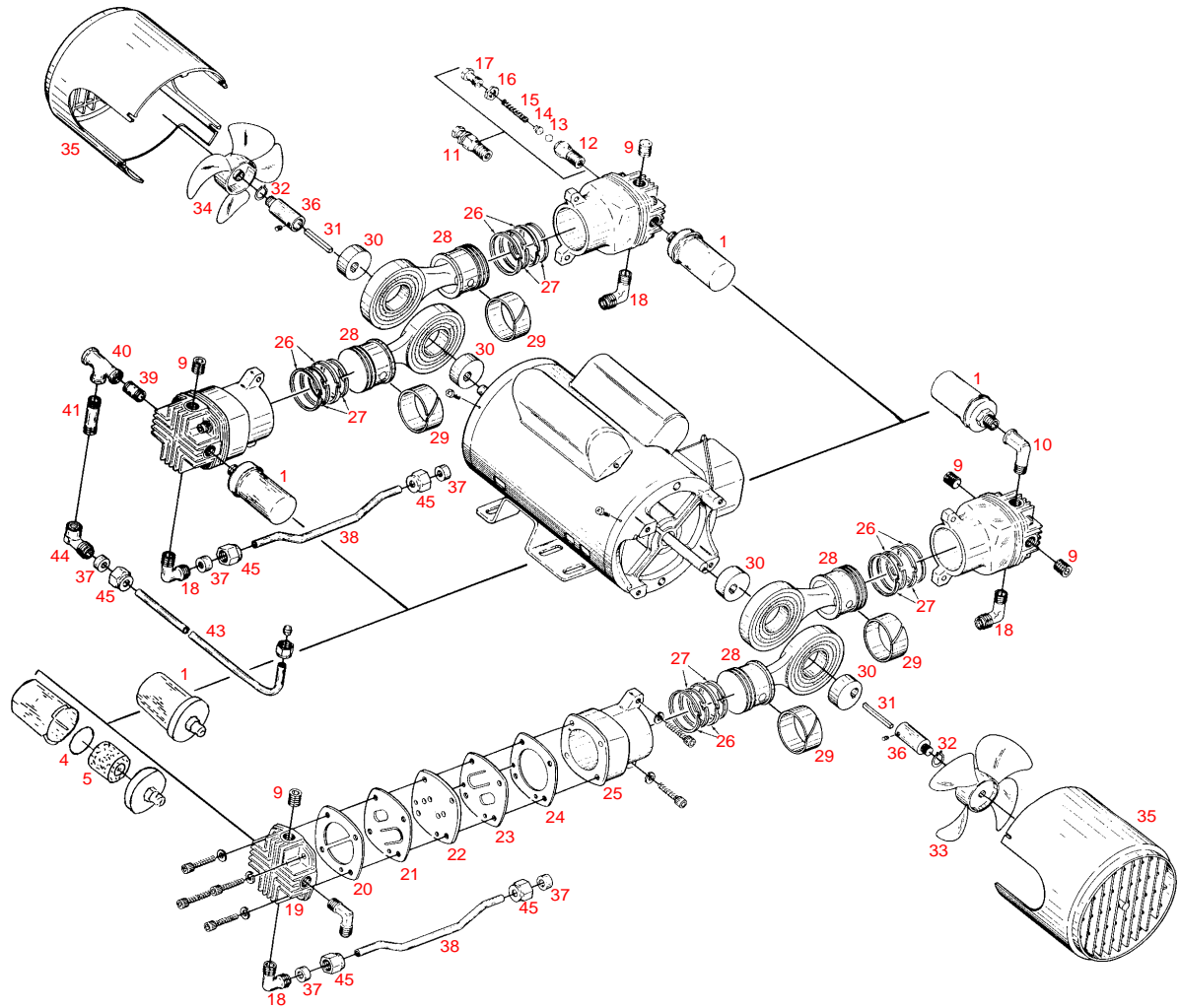
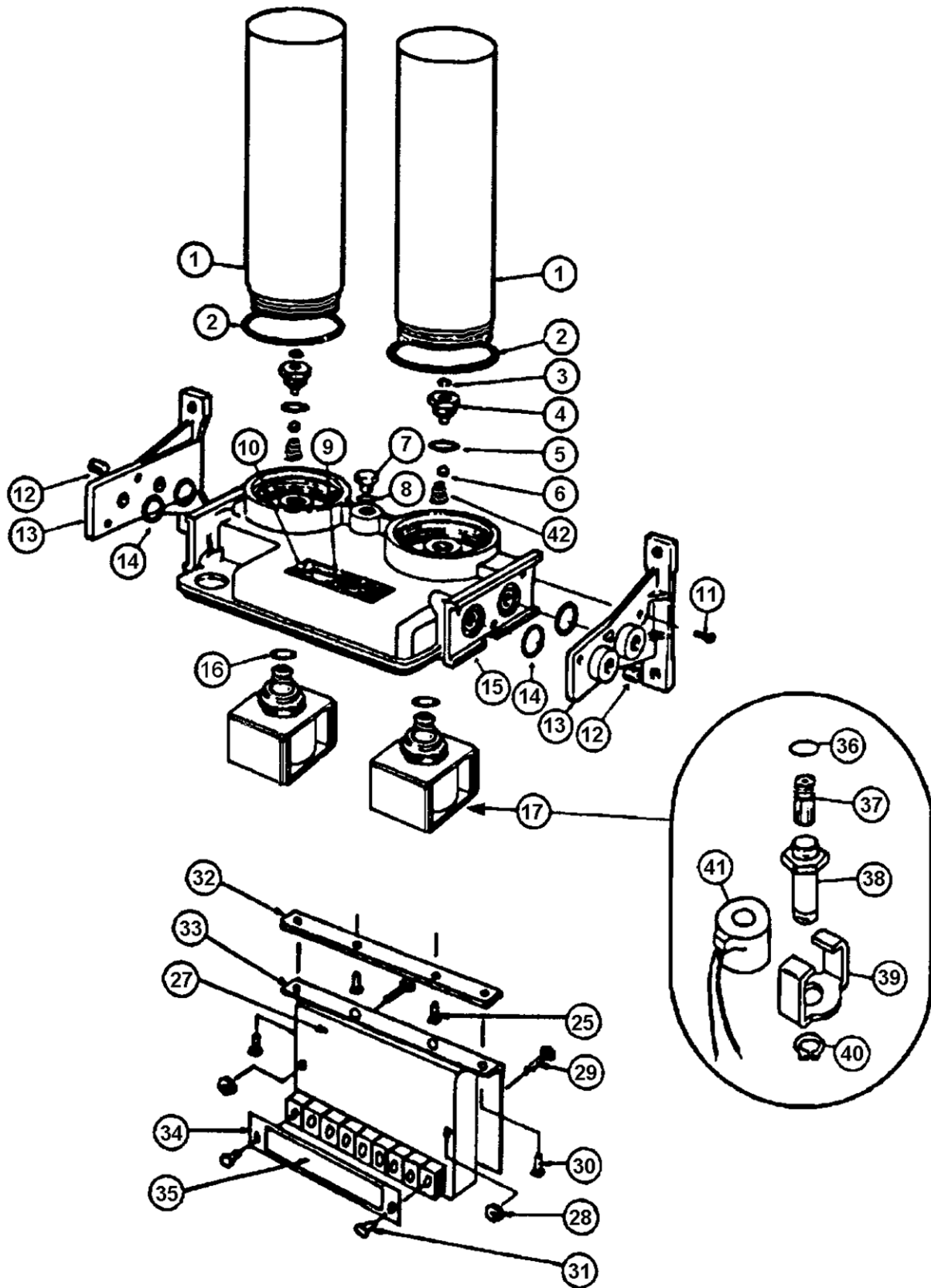


Figure 7
Exploded View of Compressor and Motor Assembly

Ref. No.	Part No.	Description	QTY	Ref. No.	Part No.	Description	QTY
1	P02619	air intake filter	4	26	P3862	piston ring	8
5	P3986	felt filter	4	27	P3861	piston seal	8
9	P3998	pipe plug	4	28	P3872	piston rod assy.	4
10	ref	elbow, 1/4"	1	29	P3981	rider ring	4
11	P02209	safety valve	1	30	P03069	eccentric	4
12	ref	(included in #11)	1	31	ref	square key	2
13	ref	(included in #11)	1	32	ref	retaining ring	2
14	ref	(included in #11)	1	33	P02210	fan, CW	1
15	ref	(included in #11)	1	34	P02211	fan, CCW	1
16	ref	(included in #11)	1	35	P02212	fan shroud	2
17	ref	(included in #11)	1	36	ref	shaft adapter	2
18	P4024	manifold elbow	4	37	P02213	manifold sleeve	4
19	P3875	cylinder head	4	38	P02214	manifold	2
20	P3866	head gasket	4	45	P4043	manifold nut	4
21	P3867	outlet valve	4		P3979	cylinder screw	8
22	P3870	valve plate	4		P4025	head screw	16
23	P3868	inlet valve	4		P4026	lock washer	24
24	P3869	cylinder gasket	4		P4033	fan shroud screw	8
25	P3874	cylinder	4				



Heatless dryer maintenance kit P200499S includes items 2,3,5,6, and 17.
 Solenoid maintenance kit P200498S includes item 17 which consists of items 36 to 41.

FIGURE 8
AIR DRYER

Air Dryer Parts List
(refer to figure 8)

Reference Number	Part Number	Description	QTY
1	P2003059	desiccant chamber assembly, 9 in	2
2	P400312924	o-ring (included in above)	2
3	P400313110	o-ring	2
4	P20040441	purge orifice	2
5	P400312908	o-ring	2
6	P400375	check valve ball	2
7	P4003074	hex plug	2
8	P400312904	o-ring	1
9	P300737	nameplate	1
10	P4003221	drive screw #4,3/16"	2
11	P4003612	screw #10/24,5/8"	2
12	P07559	pipe plug, 1/4" - 18 socket	2
13	P300497P	mounting bracket	2
14	P400313209	o-ring	4
15	P300495P	air manifold	1
16	P400313018	oring	2
17	P400589DC2	solenoid valve assy, 106 VDC	2
25	P4003611	screw #6/32, 3/8"	2
27	P010530F2	solid state timer, 220V, 50/60 Hz	1
28	HNK01-OHC-04	keps nut #8/32	2
29	HSB83-OHC-10	screw #8/32, 1"	2
30	HSB83-OFC-04	screw #6/32, 1/2"	2
32	P06496	ss timer adapter plate	1
33	P06497	ss timer mounting bracket	1
34	P06499	terminal cover	1
35	-----	terminal cover decal	1
42	P300507	check valve spring	2

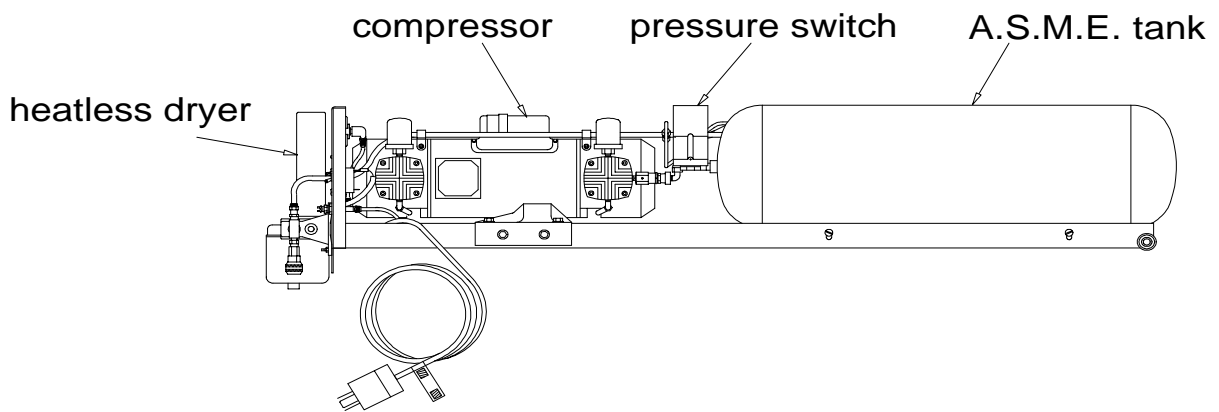
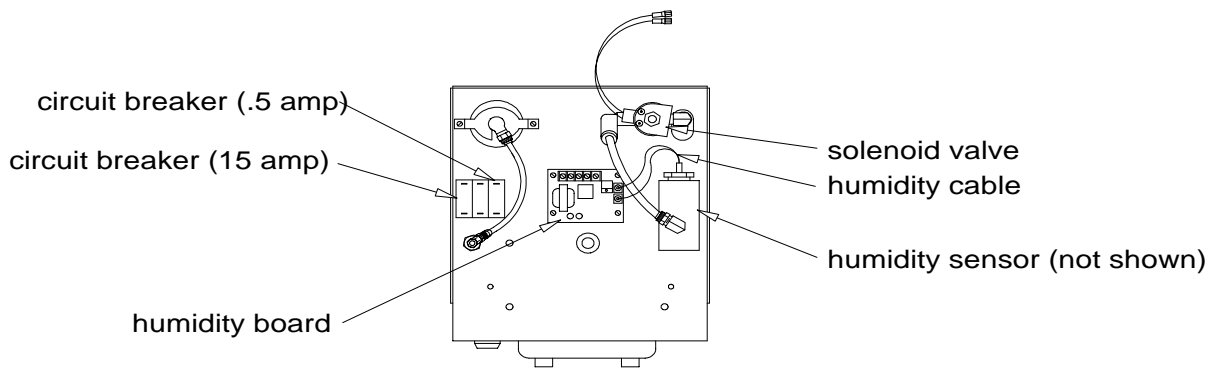
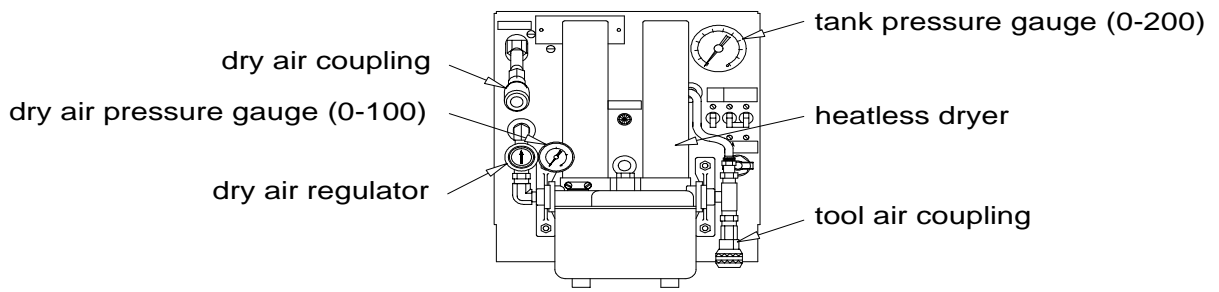


Figure 9
NBRM PARTS IDENTIFICATION

SECTION 5 – TROUBLESHOOTING INFORMATION GUIDE

This troubleshooting guide is set in a columnar format to simplify the isolation of problems, possible causes, areas to check and corrective action required to restore the air dryer to normal operation. It is further divided into system headings for easy referral. Where possible, the most likely causes have been listed first. Otherwise, the causes start with the simplest and progress to more complicated possibilities. The steps should be followed in sequence to expedite service. It is further suggested that once the problem has been isolated, the corresponding text in the Maintenance Section be reviewed to provide additional information.

This guide will require a volt ohmmeter (VOM), and will specify DC (direct current) or AC (alternating current) setting.

The troubleshooting information guide can by no means cover every possible cause of malfunction, but will help solve most problems. If the problem persists after thoroughly consulting the troubleshooting section, contact

Altec AIR Technical Service Department at 1-800-521-5351 extension 213, or (303) 657-2156.

WARNING !!!

This section requires access to components inside the cabinet of the air dryer. In most cases, an energized and operating air dryer is necessary to conduct a test and make adjustments. Extreme care should be exercised to avoid contact with live electrical or moving parts.

TROUBLESHOOTING GUIDE

Problem 1. Air Compressor Will Not Operate

<u>Possible Cause:</u>	<u>Check:</u>	<u>Corrective Action:</u>
power has been interrupted to the module	external power supply	restore power supply
a faulty electrical connection on the module	disconnect electrical power at the supply source and carefully inspect all wire connections	replace wire connections as necessary. restore power to the unit

Problem 2. Air Compressor Will Not Build Up Pressure

<u>Possible Cause:</u>	<u>Check:</u>	<u>Corrective Action:</u>
air leak in the system	inspect all tube and air connections on the module	repair or replace defective component
defective safety relief valve	check for proper adjustment and function. Refer to Section 4	replace defective component
air compressor rings and valves are worn	check for worn rings and valves. Refer to Section 4	install maintenance kit, P07102

Problem 3. Air Compressor Will Not Turn On

<u>Possible Cause:</u>	<u>Check:</u>	<u>Corrective Action:</u>
defective ON/OFF pressure switch	check for proper function. Refer to Section 4	replace defective component
defective unloader operation	check for proper function. Refer to Section 4	replace defective component
defective compressor centrifugal switch	check centrifugal switch	replace defective component

Problem 4. Unit is Running, But Has No Outlet Air

<u>Possible Cause:</u>	<u>Check:</u>	<u>Corrective Action:</u>
the system has a leak	check all electrical connections and soap test all fittings	tighten loose connections or fittings
dryer is in humidity alarm	disconnect the humidity sensing cord. If alarm does not clear, proceed to the next step. If the alarm does clear, the dryer may be considered wet.	replace heatless dryer if necessary
defective sensing element	if after following the above steps the unit will not operate, there is a defective sensing element	replace sensing element