

*INSTRUCTION MANUAL
FOR MODELS
P-3100-STD AND P-4200-STD
OUTDOOR/POLEMOUNTED AIR DRYERS*

**P-3100-STD and P-4200-STD
OUTDOOR/POLEMOUNTED
AIR DRYERS**



**MOBILE TOOL
INTERNATIONAL, INC.**
AMERIQUIP · MOPECO · PUREGAS · TELSTA
MTI INSULATED PRODUCTS

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LIMITED WARRANTY AGREEMENT

Puregas air dryers carry a two-year warranty against defective workmanship and material. This period starts at date of shipment. Not included are components subject to normal replacement during a years operating time. These parts include, but are not limited to, electrical components, pressure switches, pressure regulators and piston-type air compressors which carry a one year warranty.

On refrigeration type 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 Puregas, Mobile Tool International.

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 Puregas, Mobile Tool International so as to affect, in our judgement, its proper functioning or reliability, neither will it apply to a dryer which has been subjected to misuse, negligence or accident.

**THE INSTALLING OF PARTS PURCHASED
FROM OTHER THAN PUREGAS/MOBILE TOOL INTERNATIONAL
WILL VOID THE WARRANTY ON OUR AIR DRYERS.**

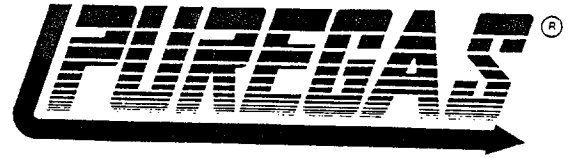
PREFACE

This instruction manual is produced for the benefit of our customers. It is intended to provide basic information which will enable our customers to install, maintain and service PUREGAS air dryers economically, capably and with minimum delay. Careful observation of these 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 and repair procedures. This will minimize the possibility of damage to the unit due to improper operation, handling or disassembly.

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MODEL 3100 and 4200 STD AIR DRYERS

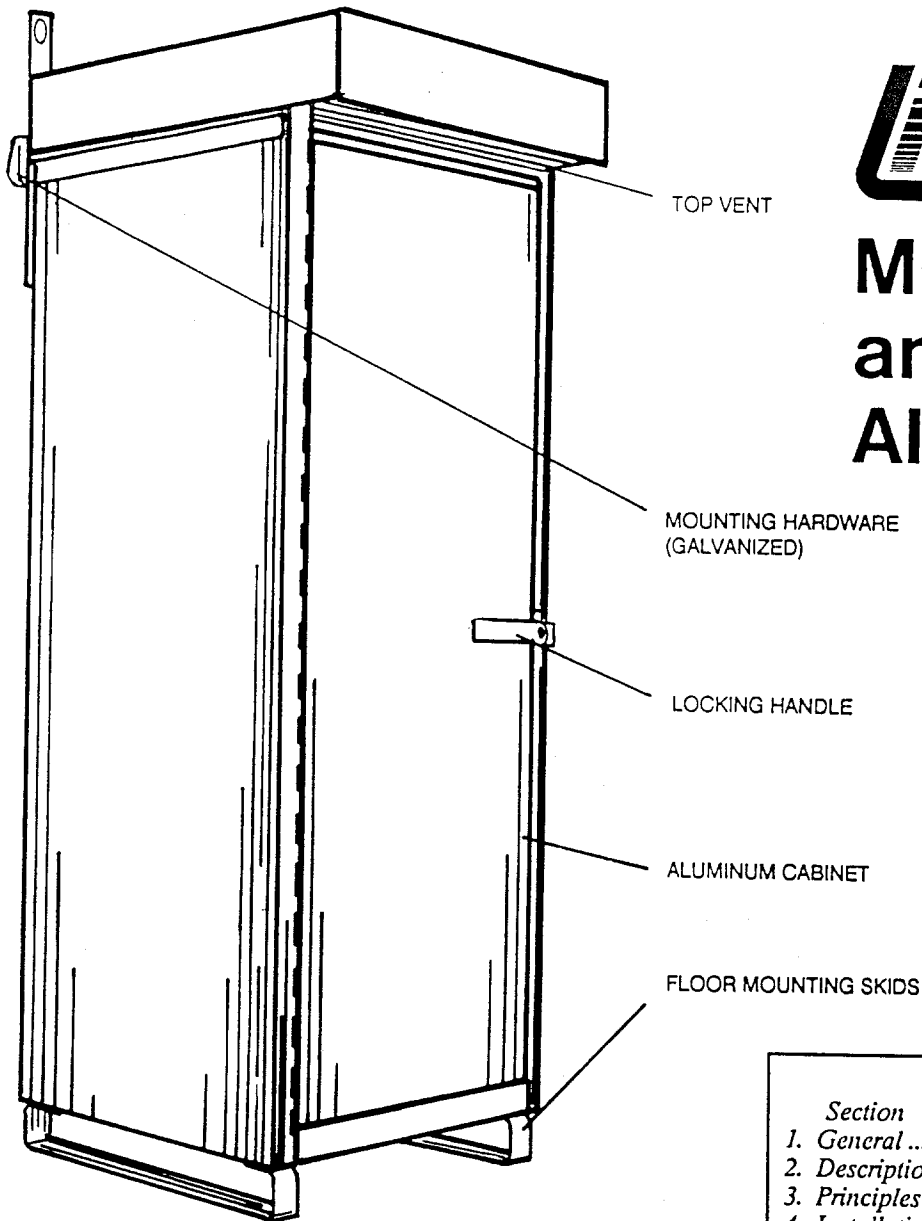


FIGURE 1

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DESCRIPTION, INSTALLATION AND MAINTENANCE

I. GENERAL

This instruction manual covers the description, installation and maintenance of the Model 3100 and 4200 STD Outdoor Air Dryers. The purpose of the air dryers is to supply a normal continuous delivery of 1800 SCFD or 2600 SCFD of dry air at pressure of 0 to 15 PSIG for continuous feed pressure cables, waveguides or other

devices requiring dry air. The Model 3100 STD Air Dryer will deliver a maximum of 3100 SCFD of dry air under emergency conditions. The Model 4200 STD Air Dryer will deliver a maximum of 4200 SCFD of dry air under emergency conditions. The Models 3100 and 4200 are designed for outdoor use and come equipped with hardware for pole mounting.

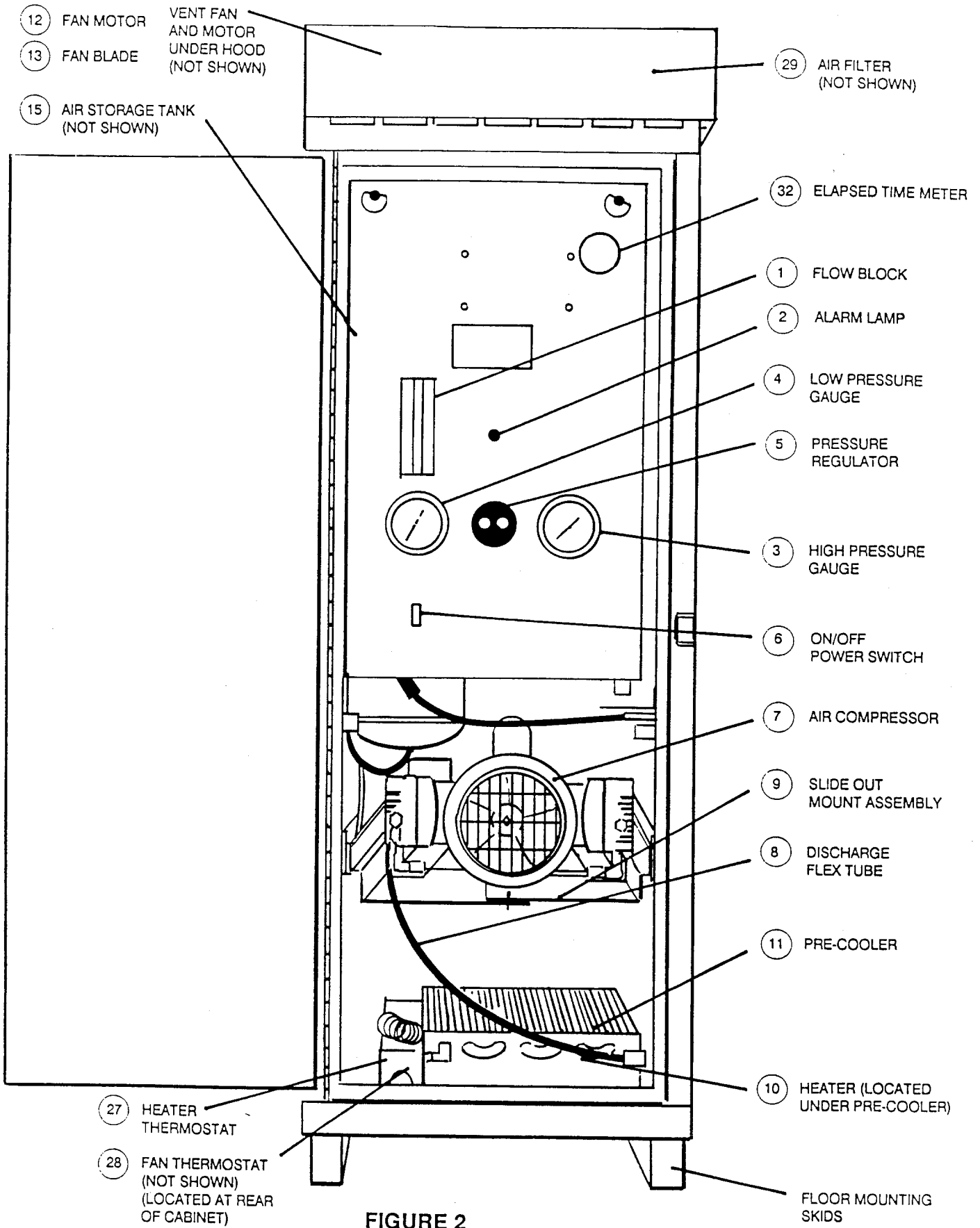


FIGURE 2

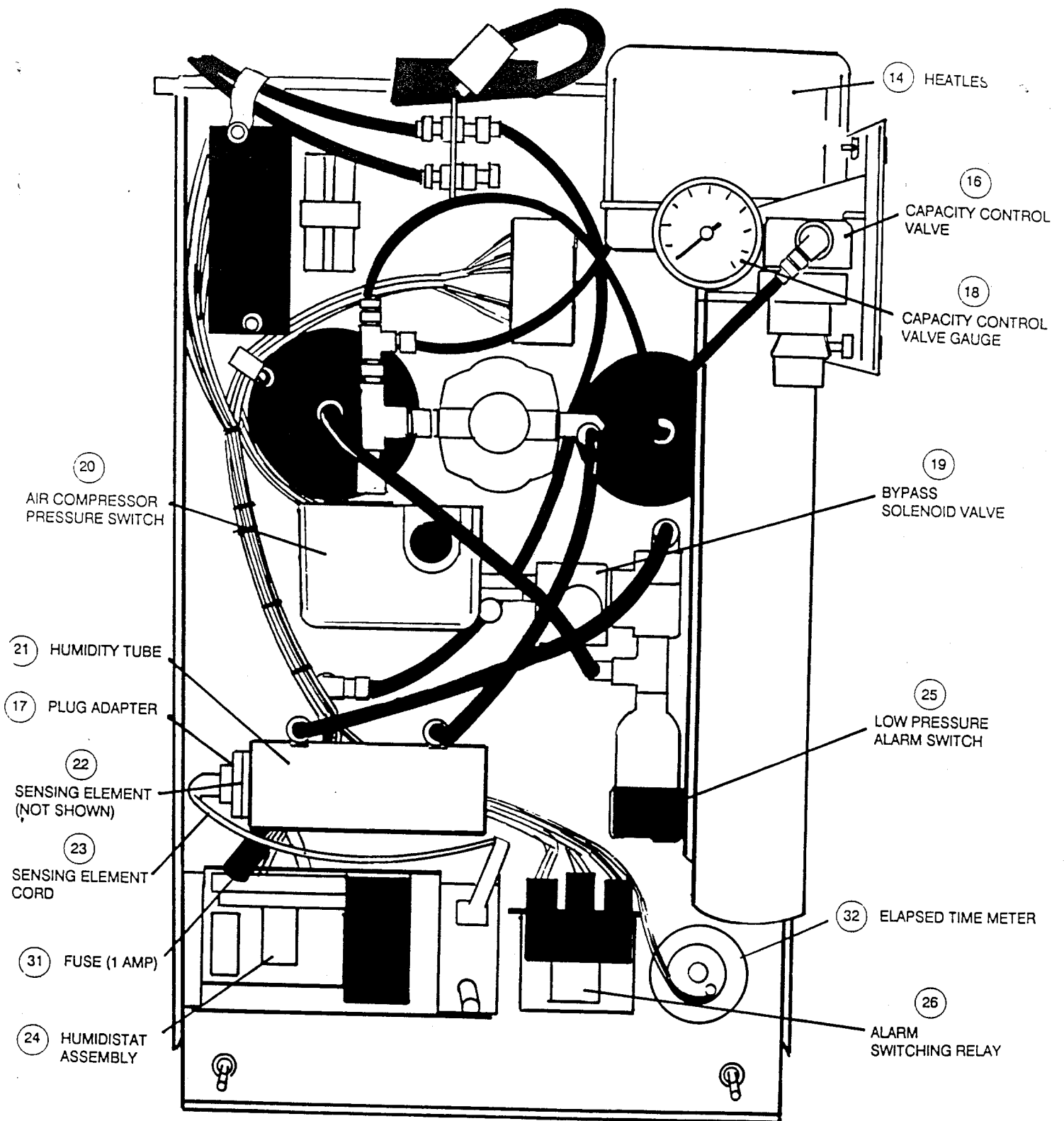


FIGURE 3

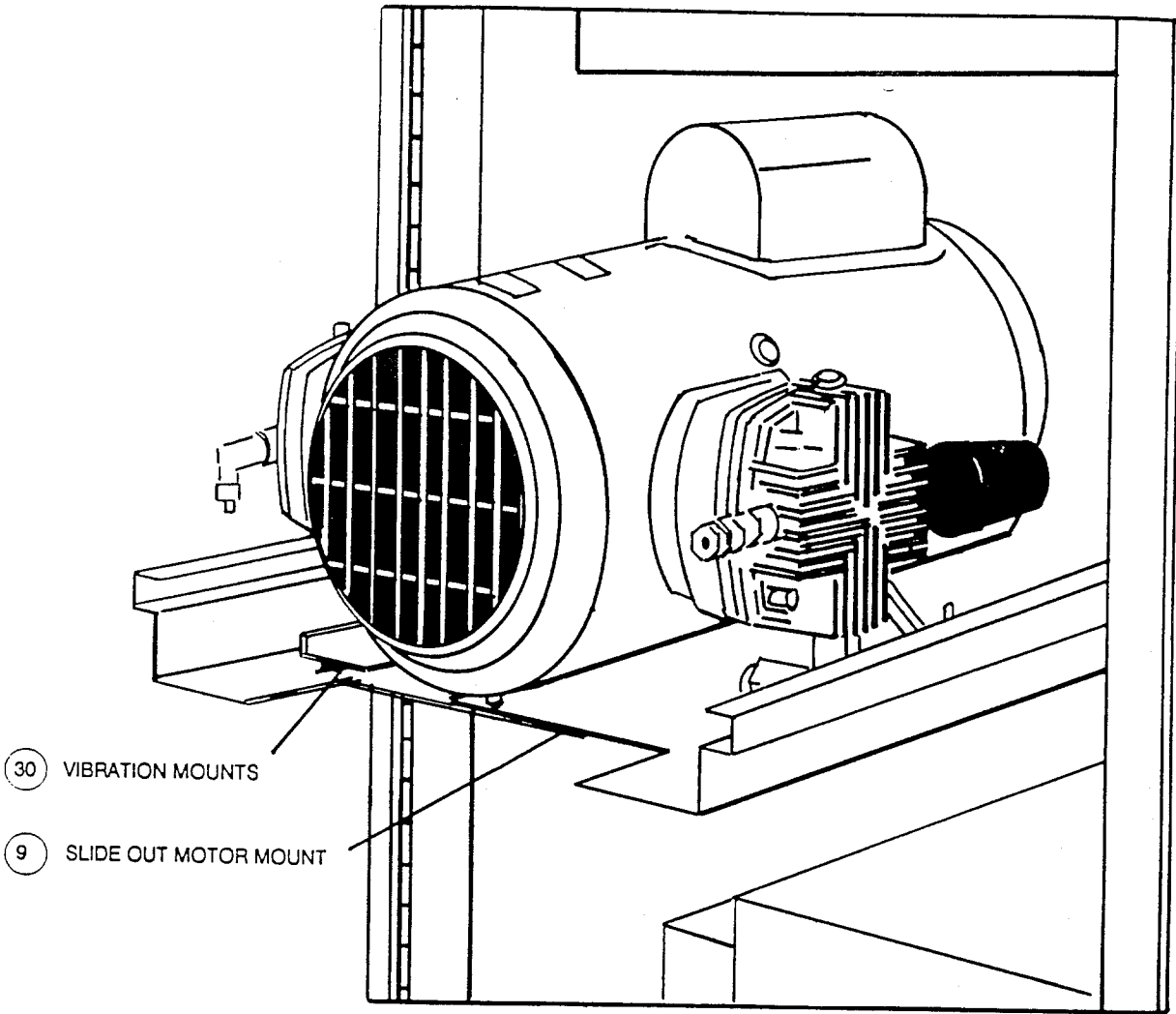


FIGURE 4

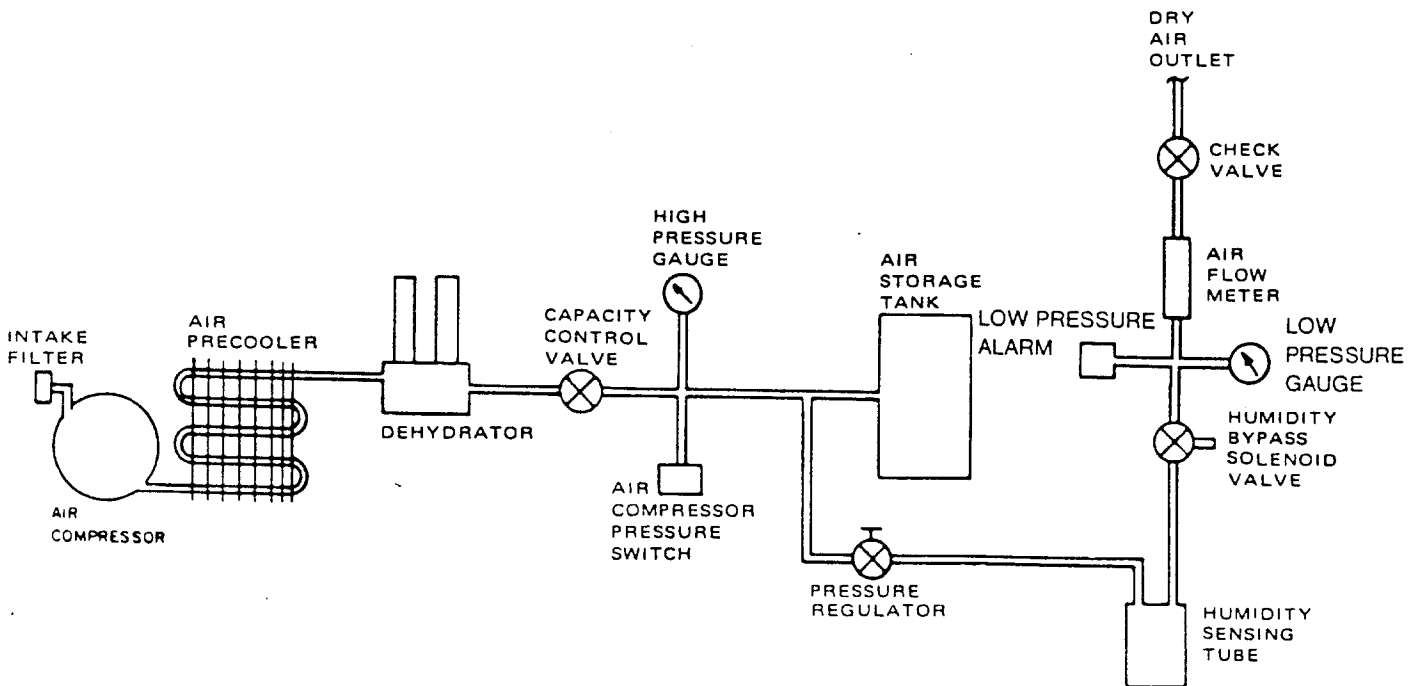


FIGURE 5 - AIR FLOW SCHEMATIC

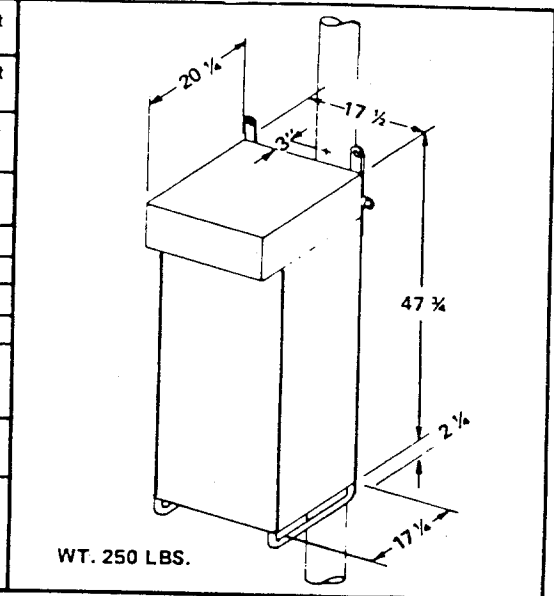
2. DESCRIPTION

The air dryers employ the principles of compression and chemical adsorption and the operation is fully automatic and relatively maintenance-free. Essentially, the unit consists of a motor driven oilless air compressor, an automatic self-reactivating dehydrator (Puregas Heatless Dryer), an air receiver and the necessary gauges and controls to ensure the delivery of dry air at proper pressure and humidity.

cable system pressure is monitored by an adjustable pressure alarm switch that will close the alarm circuit if the pressure is below a pre-established setting. A failure of the humidity bypass solenoid valve coil will close dry air delivery to the outlet. This failure will activate the low pressure alarm as outlet pressure falls.

2.1 Specifications

DELIVERED AIR	3100 STD	NORMAL CAPACITY	1800 STANDARD CU. FT. OF DRY AIR PER DAY Rated at ambient conditions of 95° F. dry bulb/80° F. wet bulb.	
		MAXIMUM EMERGENCY CAPACITY	3100 STANDARD CU. FT. OF DRY AIR PER DAY Rated at ambient conditions of 70° F. dry bulb.	
	4200 STD	NORMAL CAPACITY	2600 STANDARD CU. FT. OF DRY AIR PER DAY Rated at ambient conditions of 95° F. dry bulb/80° F. wet bulb.	
		MAXIMUM EMERGENCY CAPACITY	4200 STANDARD CU. FT. OF DRY AIR PER DAY Rated at ambient conditions of 70° F. dry bulb.	
AMBIENT TEMP. RANGE		EFFLUENT DEWPOINT	BELOW MINUS 40° F.	
		PRESSURE	0-15 PSIG ADJUSTABLE	
		MIN. OPERATING TEMP.	-40° F.	
AIR COMPRESSOR		MAX. OPERATING TEMP.	120° F.	
		INTERMITTENT OPERATION	Air compressor is equipped for start-stop operation. Intermittent operation prolongs the life of the oilless air compressor parts and increases the interval between maintenance visits.	
POWER REQUIREMENTS		OILLESS FEATURE	Bearings in both the oilless air compressor and motor are grease packed and permanently sealed. Assures outlet air which is completely free from oil.	
		VOLTAGE/HERTZ	115 Volts 60 Hertz	
	3100	AMPERES (Full Load)	12 amperes	
4200	AMPERES (Full Load)	15 amperes		



3. PRINCIPLES OF OPERATION

3.1 Air System

The air flow is shown schematically in Figure 5. The various steps involved are summarized as follows:

1. Ambient air is drawn through the intake filter on the air compressor and is delivered through a precool to the dehydrator.
2. In the Puregas Heatless Dryer (dehydrator) the moisture vapor in the compressed air is adsorbed in a desiccant chamber (see Section 3.6 and Figure 6, for detailed operation of the dryer) which is automatically reactivated every 30 seconds.
3. From the heatless dryer the dry air is delivered through a capacity control valve to the air receiver. The air compressor runs intermittently and is controlled by a pressure switch which stops the air compressor when the pressure reaches 48-50 PSIG and restarts the air compressor when the pressure falls to 20-22 PSIG. The air compressor may operate continuously under high flow conditions. The capacity control valve prevents the air dryers from delivering more than the maximum emergency capacity of dry air.
4. The air is then expanded through the pressure regulator to the required cable system pressure. A humidity alarm will close the alarm circuit if the humidity of the delivered air rises. The humidity alarm controls a humidity bypass valve which will relieve the high humidity air to atmosphere. The

3.2 Cabinet Temperature Control

The air dryer is designed to operate satisfactorily within an ambient temperature range of -40° to +120° F and is equipped with a thermostatically controlled ventilating fan for warm weather operation and a thermostatically controlled heater for cold weather operation.

1. Warm Weather Operation

The fan thermostat operates the fan when the temperature inside the cabinet exceeds approximately +80° F. The fan draws ambient air through the vent screen in the top of the unit and exhausts it through the vent screen located in the bottom section of the cabinet. A cleanable filter is located under the hinged top hood.

2. Cold Weather Operation

During extended periods when the cabinet ambient temperature falls, the fan thermostat automatically shuts off the ventilating fan at approximately 78° F. When the temperature in the cabinet falls to approximately 38° F, the cabinet heater will be energized.

NOTE: A DAMPER CAN ALSO BE PROVIDED AS OPTIONAL EQUIPMENT FOR THOSE AIR DRYERS WHICH ARE EXPECTED TO OPERATE CONTINUOUSLY AT EXTREMELY LOW TEMPERATURES. WHEN THE CABINET TEMPERATURE FALLS TO APPROXIMATELY 50° F, THE DAMPER WILL CLOSE ON THOSE DRYERS EQUIPPED WITH THIS OPTION.

3.3 Humidity Alarm System

The humidity alarm is designed to bypass wet air harmlessly to atmosphere in the event that the air leaving the air dryer rises above the humidity alarm point. The humidity alarm circuit is shown in the wiring diagram (Figure 7). The operation of the alarm system is as follows:

1. The humidity bypass valve is connected to the humidity alarm through the normally open contacts of the humidity alarm switching relay. The office alarm circuit is connected across the normally closed switching relay contacts. The alarm circuit terminates at a fuseless protector mounted in the electrical box.
2. During normal operation the humidistat relay will be energized which in turn will energize the alarm relay. The normally open contacts of the alarm relay (which are now closed) will energize the bypass solenoid, permitting dry air flow toward the low pressure outlet. The normally closed contacts of the alarm relay (which are now open) are connected across the alarm plug.
3. If the humidity of the air rises above the alarm point the humidistat relay is de-energized. This will energize the Humidity Alarm indicator and de-energize the alarm relay. The normally open contacts (which were closed) will now open, de-energize the bypass solenoid and the moist air will be directed to atmosphere.
The normally closed contacts of the alarm relay across the alarm plug (which were open) will now close thus indicating a "short" condition at the alarm plug.

3.4 Pressure Alarm System

The pressure alarm contacts are connected in parallel with the humidity alarm circuit. The pressure alarm adjustment is outlined in Section 6.1-5.

3.5 Electrical System

All electrical components operate from a 115 volt, 60 hertz power supply. To gain access to the terminal strips unfasten the control panel and lower it to the horizontal position. (See Fig. 3 Page 3.) The panel is secured by two quarter turn fasteners. The air dryer wiring diagram is shown in Figure 7.

3.6 Puregas Heatless Dryer (Dehydrator)

The Puregas Heatless Dryer, which is located downstream from the air compressor, consists of two (2) desiccant filled towers, a manifold, a timer and two (2) solenoid valves and is arranged and cycled so that as one tower delivers dry air to the cable system, the desiccant in the other tower is purged or dried by a small quantity of the dry air supplied by the first tower. (Refer to Figure 6). The tower functions reverse at 30 second intervals. The operation of the towers are as follows:

1. Tower No. 1 —

Air from the compressor enters the solenoid valve, which is controlled by an electric timer and is forced upward through the desiccant in the 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 to the heatless dryer outlet. The air then flows through the capacity control valve and is delivered to the air storage tank.

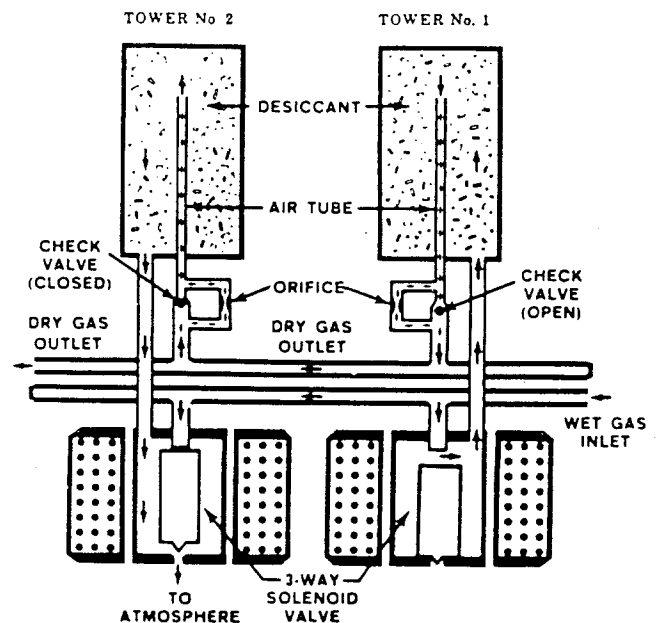


FIGURE 6 — OPERATION OF PUREGAS HEATLESS DRYER

2. Tower No. 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 controlled quantity of the dry air is forced through the bypass orifice into the air tube in the center of the tower, then down through the desiccant bed and finally expelled to the atmosphere through the solenoid valve. As the dry air passes over the desiccant bed, it picks up the moisture previously collected while Tower 2 was furnishing dry air (as Tower 1 is doing at this time) and this moisture is expelled with the air. The desiccant in Tower 2 is thus dried and made ready for the cycle reversal.

3. Tower No. 2 and Tower No. 1 reverse their functions; Tower 2 takes over the air drying operation while the desiccant in Tower 1 is being dried.

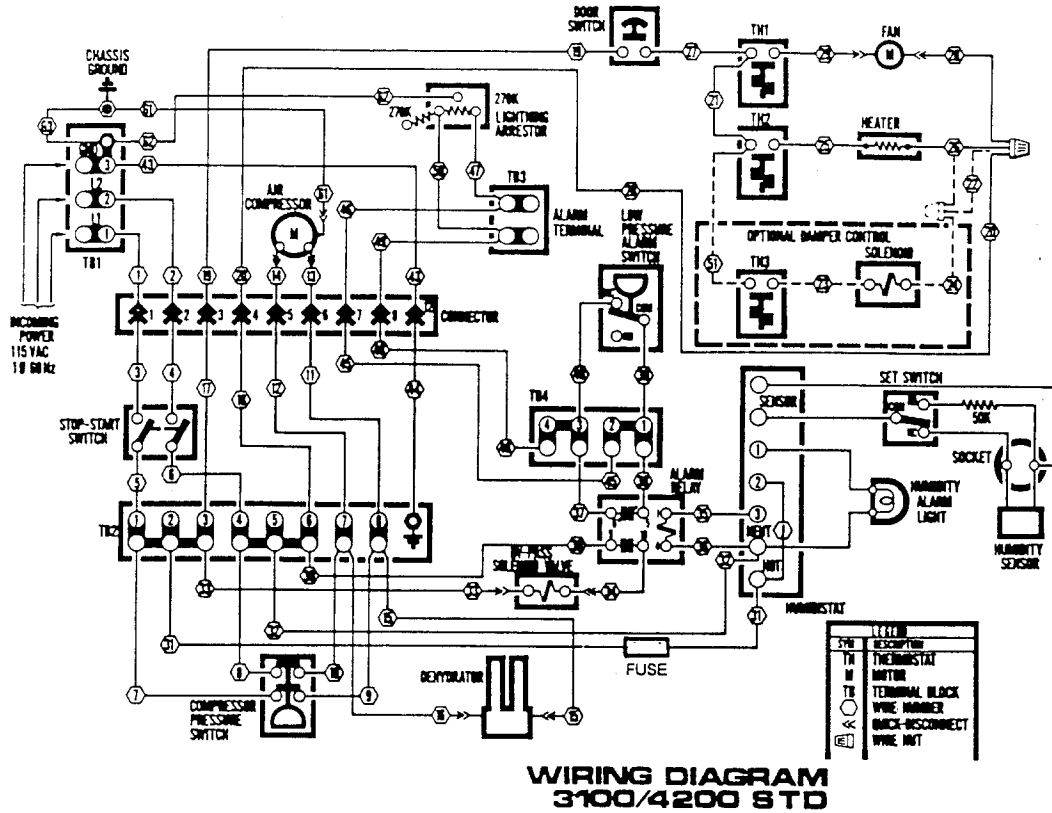


FIGURE 7 - WIRING DIAGRAM

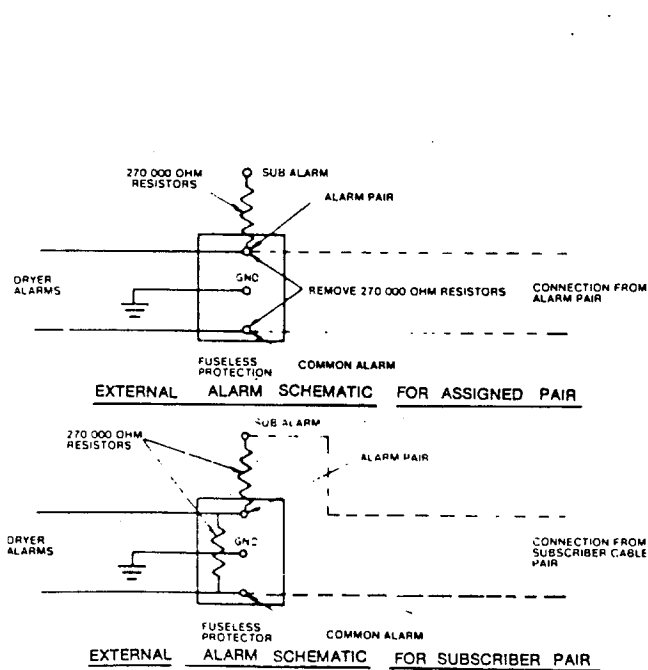


FIGURE 7A.

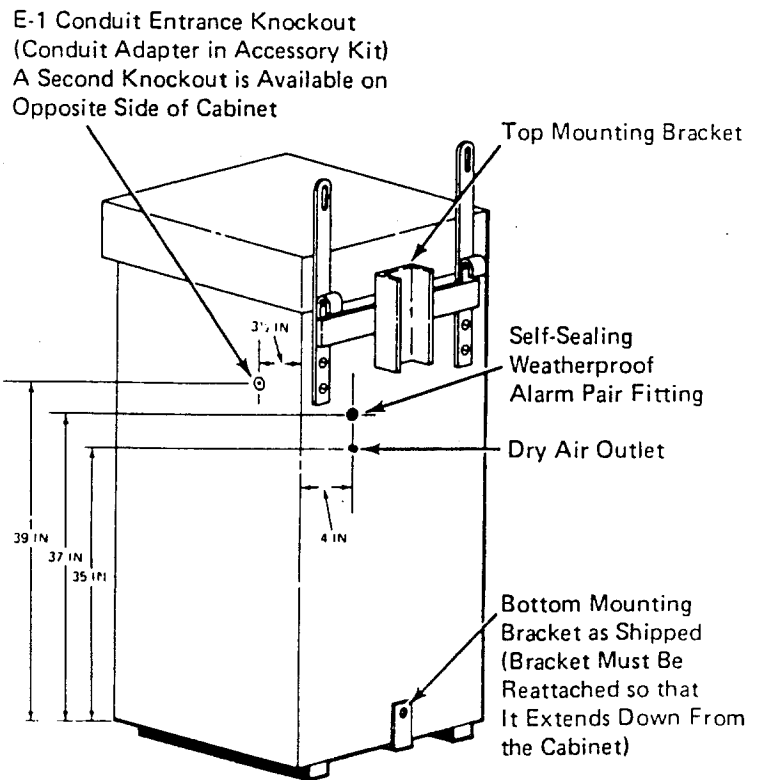


FIGURE 7B

4. INSTALLATION

4.1 CABINET MOUNTING

1. Inspect the air dryer for evidence of any exterior or interior shipping damage and immediately report to the carrier.
2. Remove the two shipping wing nuts and bolts which hold down the compressor base. Remove the two wooden spacer blocks from beneath the compressor base.
3. The air dryer may be used indoors - Floor mounting is recommended for indoor installations. Locate the unit in a well ventilated area.
4. Outdoor Installation
 - a. The necessary mounting hardware for outdoor pole mounting is included for each unit. The hardware consists of a top mounting bracket, two (2) mounting hooks, two (2) lifting lugs, two (2) spacers and a bottom mounting angle.
 - b. The air dryer may be mounted on a pole at either ground working level or at higher levels if required. If placed at ground working level, mount the unit where it will not interfere with pedestrian traffic and where it will not be vulnerable to damage by motor vehicles. If placed at a high level, the bottom of the cabinet should not be less than 10 feet above a sidewalk or 12 feet above a driveway to a residence garage.
 - c. At 3 inches below the level at which the top of the cabinet will be located, bore an 11/16-inch bolt hole through the pole.
 - d. Remove the top mounting bracket from the cabinet hanger hooks, and secure it to the pole with a crossarm bolt of suitable length. Place a 2-1/4 inch square washer under the nut and tighten the nut securely.
 - e. Remove the bottom mounting bracket and bolt.
 - f. Using the lifting lugs at the upper rear corners, raise the cabinet into place and engage the two hooks over the channel crosspiece of the top mounting bracket. Secure the cabinet in place by tightening the setscrews in each hook.
 - g. Align the cabinet so that it hangs in a vertical position when viewed from the front and from the side. Place a board or wedge between the pole and the back of the cabinet to hold the cabinet in a vertical position.
 - h. Attach the bottom mounting bracket to the underside of the cabinet, using the slotted hole in the bracket. The other leg of the bracket should extend down from the cabinet. Position the bracket so that the back surface is in contact with the pole. Tighten the bracket nut securely to the cabinet.
 - i. Fasten the bracket to the pole with a 1/2- by 4-1/2 inch drivescrew.
 - j. Remove the wedge between pole and cabinet after completing the installation.

4.2 Electrical Power Requirements

1. A 115 Volt, 60 Hertz power facility fused for 20 amps must be provided at the air dryer location.
2. A 3/4" rigid metallic conduit adapter has been provided on the side of the cabinet for power service entry. Terminate the power service on the binding posts marked "L1", "L2" and "GND" on the power terminal strip located at the top rear of the cabinet.

4.3 Alarm Connection

1. A self-sealing weatherproof fitting is located in the rear of the cabinet for bringing the alarm pair from the cabinet. Insert the end of the alarm pair into the fitting. The wire opening in the fitting contracts to provide a neoprene seal around the alarm pair when the fitting nut is turned clockwise. Terminate the alarm pair on the fuseless protector.
 - a. If the alarm is to be connected to a separate alarm pair terminate the wires on the binding posts "Common" and "Alarm". This arrangement will short circuit the line when the alarm operates.
 - b. If a subscriber line has been assigned for the alarm, terminate the pair on the "Common Alarm" and "Sub-Pair" binding posts. The fuseless protector is equipped with two (2) 270,000 ohm resistors and both resistors (total 540,000 ohms) are normally across the line thus providing a means of verifying from the test center that the dryer alarm circuit is connected to the assigned pair. When an alarm condition occurs, the resistor across the Common Alarm and Alarm Pair binding posts will be short circuited leaving a resistance of 270,000 ohms across the line.

5. INITIAL START-UP

5.1 The following steps should be performed when initially putting the air dryer into service.

1. Loosen locknut on the stem of the pressure regulator and turn the hand wheel all the way out.
2. Move the master stop-start switch to the "ON" position and allow the pressure to build up to about 50 PSIG as read on the tank pressure gauge.
3. Check all air fittings for leakage.
4. Turn the regulator handwheel clockwise until air starts to bleed either from the humidity bypass valve, if the alarm is not clear or the air outlet fitting at the rear of unit, if the alarm is clear.
5. If alarm is clear and air starts bleeding from the air outlet immediately, allow unit to run for 10 minutes to be certain all moisture is purged from dry air lines.
6. If the alarm is not clear and air bleeds from the bypass port of the humidity bypass valve, allow the unit to run until the alarm does clear and air starts bleeding from air outlet at rear of unit. The alarm should clear within 15 minutes.
7. Turn the handwheel of the air pressure regulator counterclockwise until air is no longer bleeding from the dry air outlet.
8. Connect the equipment to the cable system outlet is a 3/8" O.D. copper tubing connector.

ADJUST IN PROPER SEQUENCE

STEP NO. 1

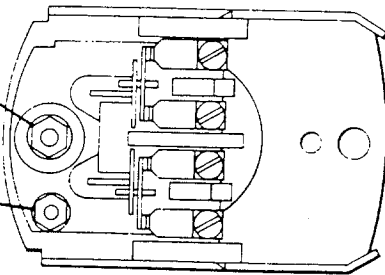
RANGE ADJUST

TURN DOWN FOR HIGHER
CUT-IN PRESSURE OR
UP FOR LOWER CUT IN

STEP NO. 2

DIFFERENTIAL ADJUST

TURN DOWN FOR HIGHER
CUT OUT OR UP FOR
LOWER CUT OUT



AIR COMPRESSOR PRESSURE SWITCH

FIGURE 8.

fitting. A length of tinned copper tubing is furnished in the accessory kit for outdoor cable connection. Install lead pipe on the pole or building from the cable system to the dryer. Make a soldered connection between the lead pipe and the copper tubing from the dryer.

9. Adjust the air pressure regulator to the required delivery pressure, as noted on the outlet pressure gauge. To do this, turn the handwheel clockwise to increase or counterclockwise to decrease the output air pressure, then tighten the lock nut securely.

NOTE: Monitor delivered air pressure frequently after initial installation until the pressure stabilizes.

10. Check the air dryer operation and all alarms as described under Section 6 "GENERAL MAINTENANCE." Paragraphs 1 thru 7.

6. GENERAL MAINTENANCE

6.1 To insure continued satisfactory operation, it is recommended that the following inspection procedures be performed at a scheduled SIX MONTH interval:

1. Flow Rate

The air dryer output can be read directly from the air flow rate meter. Insure that the delivered air output does not exceed the "normal" capacity of the air dryer.

2. Humidity Alarm

The humidity alarm has been factory preset to alarm in the event that the relative humidity of the air rises above the preset value. To check the operation of the humidity alarm, remove the sensing element from the humidity sensing tube and blow on the element. This should bring in an alarm condition at which time the dryer bypass valve will discharge the air to the atmosphere. Replace the sensing element into the humidity sensing tube and the alarm condition should clear in a short period.

3. Air Compressor Safety Valve (Item 10, Fig. 10)

The air compressor safety valve is factory preset to prevent the compressor from delivering air at over 55 PSIG. The safety valve can be adjusted as follows:

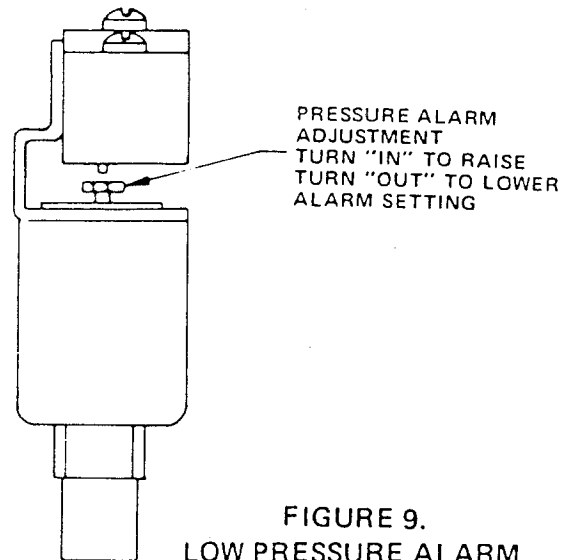


FIGURE 9.
LOW PRESSURE ALARM

- a. With the air compressor running, lift up the valve lock collar of the capacity control valve and turn the knob clockwise until 56 to 60 PSIG is read on the capacity control valve gauge.
- b. Referring to Figure 10, loosen the safety valve lock nut (Item 15) and adjust the screw (Item 16) until the maintained pressure is 55 PSIG and the relief valve is bleeding air.
- c. Tighten the lock nut (Item 15) of the relief valve.
- d. Turn the capacity control valve knob counterclockwise until 48 to 50 PSIG is read on the capacity control valve gauge. Press down the valve lock collar into the locked position.
- e. Allow the compressor to cycle through the tank pressure range several times and check to be sure the compressor safety valve has reseated properly and is not leaking.

4. Air Compressor Pressure Switch (Figure 8)

The air compressor pressure switch is factory set to stop and start the air compressor and maintain the pressure in the air receiver.

The pressure in the air receiver should cycle between 20 PSIG (± 2 PSIG) and 48 PSIG (± 2 PSIG) as noted on the high pressure gauge (Tank Pressure). To adjust this pressure switch refer to Figure 8.

5. Low Pressure Alarm (Figure 9)

The pressure switch used as low pressure alarm is a snap action, single pole switch which is not sensitive to vibration and will provide repetitive accuracy. The low pressure alarm has been factory set to operate at 6.5 ± 1.5 PSIG, and may be changed as follows.

- a. Adjust the pressure regulator to the desired alarm pressure.
- b. Turn the hexagon pressure alarm adjustment on the pressure switch clockwise (in) to raise the pressure setting or counterclockwise (out) to lower the setting. The setting should be made so that the alarm is just activated at the set pressure.

6. Air Compressor Capacity

The air compressor should be capable of delivering air within the compressor running periods, indicated in Appendix ACC, located at the end of this manual. To thoroughly check the compressor performance it will be necessary to time the compressor run time and also time the compressor off time. The timing of the compressor off time is necessary to estimate the true output airflow rate of the unit. The flow rate as indicated on the unit flow indicator may not be accurate due to variations in the actual operating pressure at the flow indicator. If the compressor running period exceeds the limits of Appendix ACC, first check for air leakage at all connections and pressurized components located between the compressor outlet and flowmeter. Note that it is necessary to check for leakage at points upstream of the capacity control valve while the compressor is running. If no leaks are found, service the compressor per Section 7 (Air Compressor Maintenance) of this manual.

7. Capacity Control Valve

The Capacity Control Valve has been factory preset to limit the air dryer from delivering more than the maximum rated capacity of the air dryer. In the event that the capacity control valve has to be reset, proceed as follows:

- a. Make sure that the air compressor is running at the time of adjustment.
- b. Pull up on the valve lock collar and adjust the valve handle clockwise until 48-50 PSIG is read on the gauge which is mounted on the heatless dryer manifold. Push the locking collar in place.

8. Verify During Warm Weather Operation That The Ventilating Fan is Operating When the Temperature In The Cabinet Exceeds Approximately +80°F.

9. Replace The Air Compressor Intake Filters

10. Clean The Air Precooler

11. Clean The Screened Vents Described In Section 3.2. Clean the air filter located under the hinged top hood.

7. AIR COMPRESSOR MAINTENANCE (Fig. 10, Page 12)

7.1 The P/N P-07584 maintenance kit is designed to provide the parts necessary for one year's maintenance on the Model 3100/4200 STD Air Dryer. The contents of the maintenance kit are as follows:

Part No.	Description	Qty.
3861	Piston Seal	(4)
3862	Piston Ring	(4)
3864	Manifold Sleeve	(2)
3866	Head Gasket	(2)
3867	Outlet Valve	(2)
3868	Inlet Valve	(2)
3869	Cylinder Gasket	(2)
3870	Valve Plate	(2)
3981	Rider Ring	(2)
3986	Filter Felt	(4)
5000-6-47D	Sensor	(1)

7.2 The air compressor is oilless and requires no lubrication. It is recommended that the piston rings, piston seals, rider rings, inlet valves, outlet valves, valve plates and gaskets be replaced at least once a year.

7.3 Dissassembly

1. Remove the four (4) screws which secure the compressor shroud and pull shroud forward and off the compressor housing.
2. Remove the four (4) cylinder head screws and lift off the cylinder head and valve components.
3. Remove the two (2) cylinder screws and two (2) lock washers and lift out the cylinder.
4. Remove the piston seals, piston rings and rider rings.
5. Clean all components with a non-flammable, non-toxic cleaning solvent. Do not flood the piston wrist pin or connecting rod main bearings with solvent as the permanent lubricant will be washed away.

7.4 Assembly

1. Install the new piston seals, piston rings and the rider rings on the piston. **Locate the ring joints approximately opposite each other.**
2. Attach cylinders to bracket with the cylinder screws and lock washers. **Tighten Screw Finger Tight.** Move the piston to the top dead center position and adjust the cylinder flush with the top of the piston and tighten the cylinder screws.
3. Install the valve components, gaskets and valve plates by stacking them as outlined in Figure 10 exploded view of air compressor. The leaves on the intake and discharge valves have been prebent and should not be adjusted in any way.
4. Install a head assembly using the lock washers and head screws. Do not tighten The Head Screws At This Time. **Caution:** On the top of each cylinder head the end of two (2) fins have been omitted. They are always in the exhaust port.
5. Install manifold nuts and seals on the manifold and assemble to the elbow fitting on the head assembly. **Do Not Tighten**
6. Install the second head assembly and assemble the manifold. Tighten all head screws and manifold nuts.
7. Soap test all fittings.

8. DEHYDRATOR MAINTENANCE (Fig. 11, Page 14)

No field adjustments are necessary on the dehydrator. No lubrication is required on the dehydrator. It is recommended, however, that at periodic intervals the unit be inspected as follows:

1. The dehydrator has a timer motor which switches from one tower to the other every 30 seconds. This can be heard as an air purge and timed. If this air purge cannot be heard, refer to the trouble shooting guide for corrective maintenance.

9. TROUBLE SHOOTING GUIDE

9.1 Air Dryer in ANY Alarm Condition

1. Adjust the output to less than 1800 SCFD for the Model 3100 STD and less than 2600 SCFD for the Model 4200 STD.
2. Check the high and capacity control pressure gauges for correct readings as indicated by this manual. Correct any incorrect reading on the capacity control gauge by adjusting (or replacing) the capacity control valve (See para 6.1-7 Page 10).

Note: An incorrect capacity control valve setting can produce a humidity alarm.

9.2 Air Dryer In HUMIDITY Alarm (Refer to Fig. 11, Page 14 for item Nos.)

1. Adjust humidistat as described on the humidistat cover plate. Replace humidity sensing element if necessary. Proceed to Step 2.
2. Listen for strong air purge every 30 ± 5 seconds. If no purge occurs proceed to Step 3. If purge occurs every 60 seconds, proceed to Step 4. If purge occurs every 30 seconds, replace the check balls (Item 6), & core assemblies (Item 18) and clean the purge orifices (Item 4) with an air gun.
3. Remove air manifold cover (Item 26) and check operation of cycle timer assembly (Item 27). The cam (Item 34) should make one rotation every 60 seconds. If the cam is rotating correctly, proceed to step 4. If the cam is not moving, tighten any loose electrical connection, tighten set screw (Item 35) or replace cycle timer motor (Item 29).
4. Using a voltmeter, verify that 115 VAC is alternately being applied from the switch (Item 36) "common" terminal to the "N. O." and "N. C." terminals. If the 115 VAC is being applied to the terminals, replace the solenoid valve assembly(s) (Item 17) which is inoperative. If the 115 VAC is not being applied, replace the switch. Proceed to Step 5.
5. If the air dryer is in humidity alarm after the above steps have been completed, contact General Cable Corporation, Apparatus Division, Customer Service Department.

9.3 Air Dryer In PRESSURE Alarm

1. Check the delivered air pressure for a reading of over 6.5 PSIG.
 - a. If the reading is within range adjust (or replace) the pressure alarm (Section 6. 1-5).

- b. If the reading is not within range, proceed to Step 2.
2. Check the tank pressure gauge for a reading between 20 and 50 PSIG.
 - a. If the reading is within range adjust (or replace) the pressure regulator for a delivered pressure of 6.5 PSIG or more and turn to Step 1. See Appendix REG for regulator parts description.
 - b. If the tank pressure is not between 20 and 50 PSIG, proceed to Step 3 if the compressor is not running or Step 4 if the compressor is running.
3. Check for 115 VAC on the lines to motor and power supply shown on Fig. 7 Page 7.
 - a. If 115 VAC is present from the power supply but not applied to the lines to motor, adjust (or replace) the air compressor pressure switch (Section 6.1-4).
 - b. If 115 VAC is not present from the power supply, check all wiring for bad connections and wall receptacle for 115 VAC.
 - c. If 115 VAC is applied to the lines to motor check wiring from switch to air compressor for bad connections and repair wiring. If the wiring is good, replace the compressor, proceed to Step 5.
4. Check the air compressor safety valve (Fig. 10. Item 10) for any leakage of air, and the compressor's wiring connections to insure that the compressor is wired for "low voltage".
 - a. If the compressor is mis-wired, connect the wires and connectors as shown on the underside of the compressor wiring cover. Proceed to Step 5.
 - b. If the safety valve is leaking air, adjust (or replace) the safety valve.
 - c. If the safety valve is not leaking air, check the compressor capacity per Section 6 of this manual. See Appendix ACC for compressor trouble shooting information.
5. If the air dryer is in high-low pressure alarm after the above steps have been completed, contact General Cable Corporation, Apparatus Division, Customer Service Department.

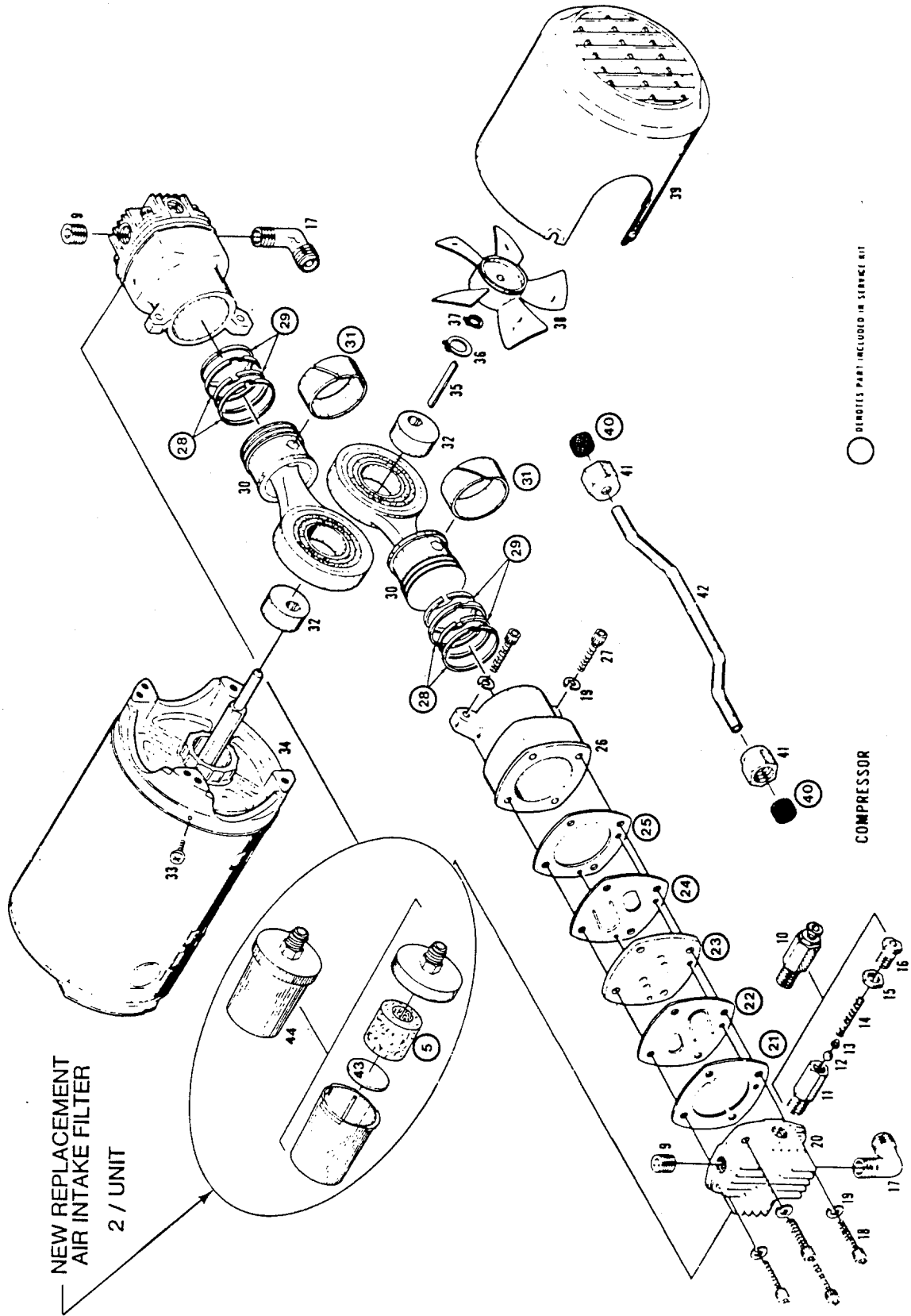


FIGURE 10. EXPLODED VIEW OF AIR COMPRESSOR AND MOTOR ASSEMBLY

10. REPLACEMENT PARTS

10.1 Air Dryer Component Parts -- See Figures 2, 3 and 4 For Reference Numbers

Ref. No.	Description	Puregas No.
1	Flow Block - 3100 STD	P-8805
	Flow Block - 4200 STD	P-02301
2	Alarm Lamp	P-3450
3	High Pressure Gauge (0-100 PSIG)	P-B-101
4	Low Pressure Gauge (0-30 PSIG)	P-02281
5	Pressure Regulator	P-01548
6	Switch, on/off	P-B-117
7	Air Compressor (Model 3100) (Model 4200)	P-02293 P-3966-3L
8	Discharge Flex Tube	P-B-431
9	Slide-out Motor Mount Assembly	P-9638
10	Heater, Cabinet	P-3175
11	Pre-cooler Assembly	P-4642
12	Motor, Fan	P-4562
13	Fan Blade	P-4561
14	Heatless Dryer (HF2C-112-034) (Mdl. 3100)	P-4644
	Heatless Dryer (HF2C-112-041) (Mdl. 4200)	P-01237
15	Air Storage Tank	P-9647
16	Capacity Control Valve	P-4634
17	Plug Adapter	P-4157
18	Heatless Dryer Gauge (0-100-PSIG)	P-3197
19	Bypass Solenoid Valve	P-5000-12-85
20	Air Compressor Pressure Switch	P-4564
21	Humidity Tube	P-4601
22	Humidity Sensing Element (not shown)	P-5000-6-47D
23	Sensing Element Cord	P-4156
24	Humidistat Assembly	P-5000-6-47AA
25	Low Pressure Alarm Switch	P-8818
26	Alarm Switching Relay Models Manufactured After Aug., 1985 (solid black) Use Models Manufactured Before Aug., 1985 (clear plastic) Use	P-4547
27	Thermostat, Heater	P-02253
28	Thermostat, Fan	P-B-118
29	Air filter, Cabinet	P-B-119
30	Vibration Mounts	P-02235
31	Fuse (Fuse Holder Assembly)	P-4582 T-1338
32	Elapsed Time Meter	P-05519 P-02358

10.2 Air Compressor Parts List - See Figure 10, Page 12, For Reference Numbers

Ref. No.	Description	Puregas No.
1		
2		
3		
4		
5	Felt/2 unit	P-3986
6		
7		
8		
9	Pipe Plug 2/unit	P-3998
10	Safety Valve	P-3996
11	Not Available	
12	Not Available	
13	Not Available	
14	Not Available	
15	Not Available	
16	Not Available	
17	Manifold Elbow 2/unit	P-4024
18	Head Screw 8/unit	P-4025
19	Lock Washer 12/unit	P-4026
20	Cylinder Head 2/unit	P-3875
21	Head Gasket 2/unit	P-3866
22	Valve Outlet 2/unit	P-3867
23	Valve Plate 2/unit	P-3870
24	Valve Inlet 2/unit	P-3868
25	Cylinder Gasket 2/unit	P-3869
26	Cylinder 2/unit	P-3874
27	Cylinder Screw 4/unit	P-4025
28	Piston Ring 4/unit	P-3862
29	Piston Seal 4/unit	P-3861
30	Piston Rod Assy. 2/unit	P-3872
31	Rider Ring 2/unit	P-3981
32	Eccentric 2/unit Model 4200 only	P-01238
	Eccentric 2/unit Model 3100 only	P-02645
33	Screw 4/unit	P-4033
34	Bracket Model 4200 only	P-01239
	Bracket Model 3100 only	P-02646
35	Square Key	P-4040
36	Not Available	
37	Retaining Ring	P-4041
38	Fan	P-3873
39	Shroud	P-3871
40	Manifold Sleeve 2/unit	P-3864
41	Manifold Nut 2/unit	P-4043
42	Manifold Model only 4200	P-01240
	Manifold Model only 3100	P-02647
43	Disc, filter hold down 2/unit	P-026
44	Filter assy, air intake, 2/unit	P-07

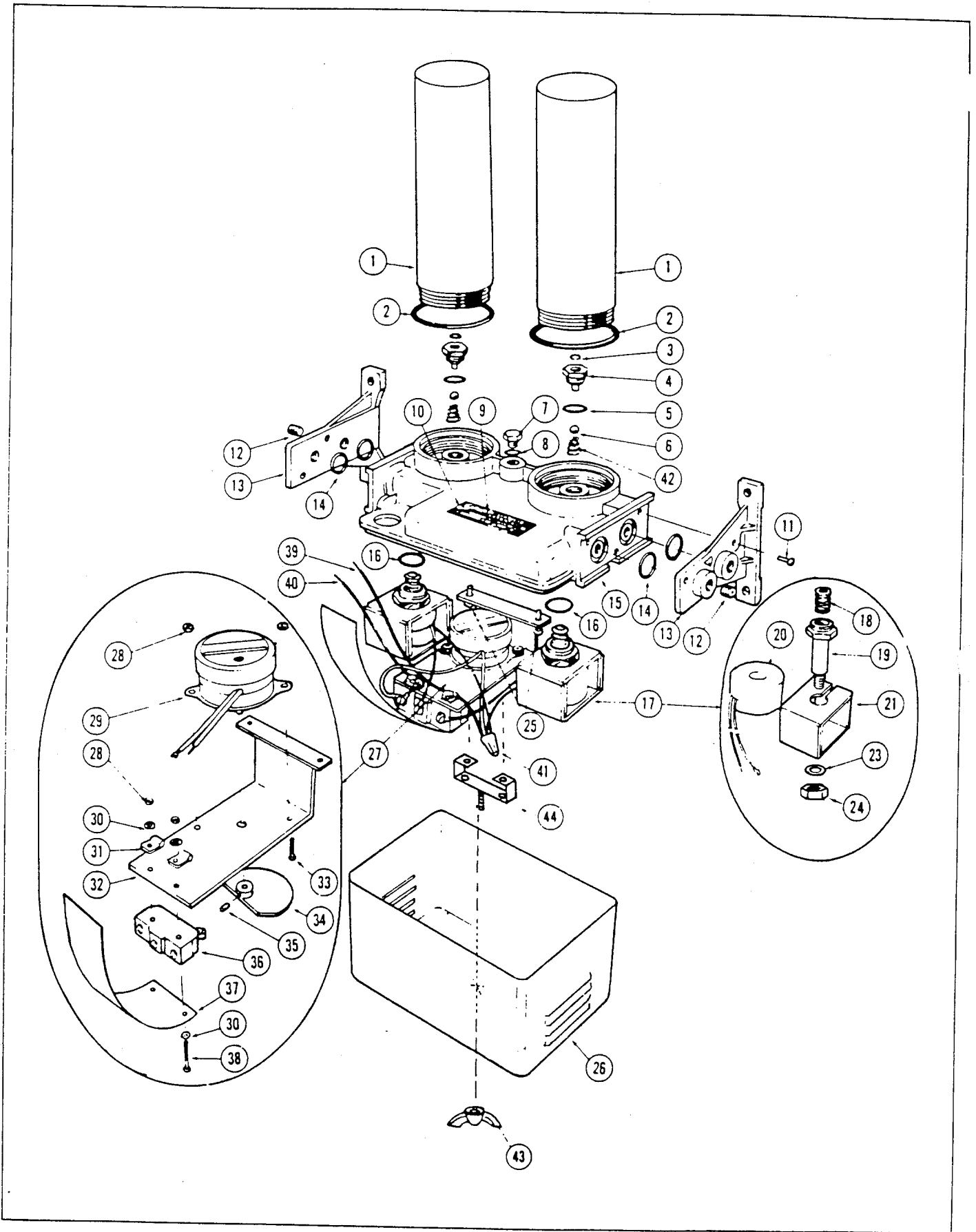
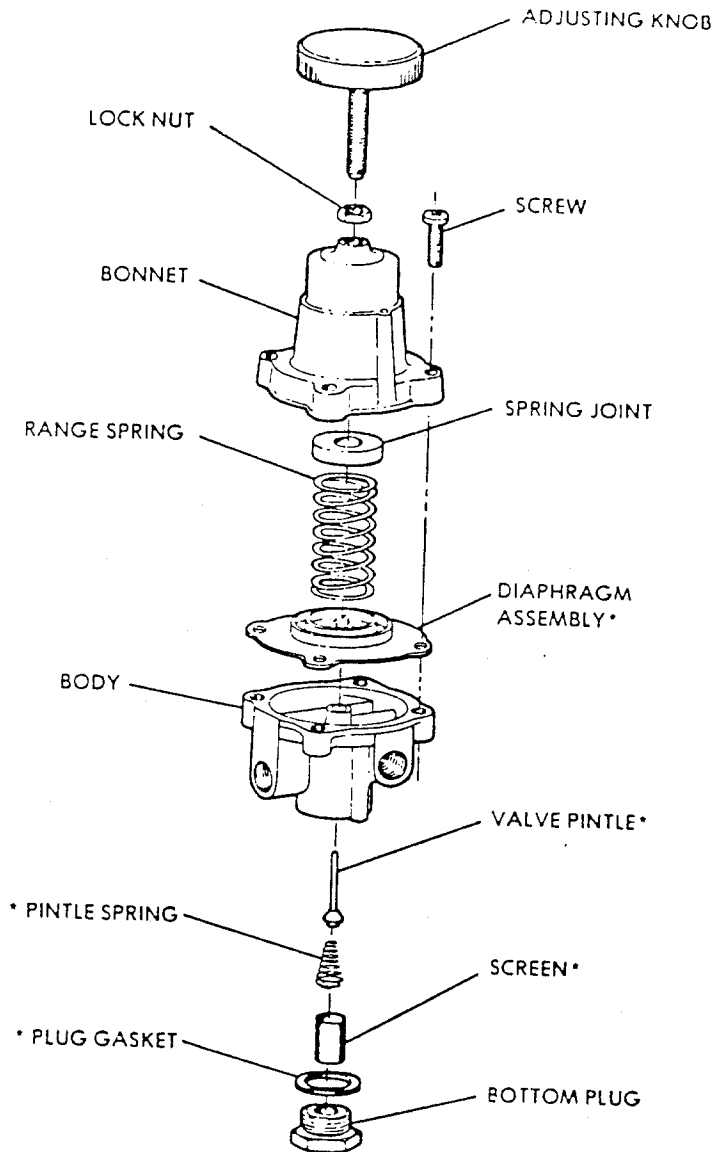


FIGURE 11. EXPLODED VIEW OF PUREGAS HEATLESS DRYER (DEHYDRATOR)

10.3 Dehydrator Parts List - See Figure 11,
Page 14 For Reference Numbers.

Ref. No.	Description	Qty	Puregas No.	Ref. No.	Description	Qty.	Puregas No.
1	Desiccant Chamber Assembly (includes item No. 2)			24	Locknut	2	P-400-308-17
	12" Chamber Length	2	P-200-403-12	25	Screw No. 6-32x3/8" pan. hd.	2	P-400-361-1
2	O-Ring	2	P-400-312-924	26	Air Manifold Cover	1	P-300-505-1
3	O-Ring	2	P-400-313-110	27	Cycle Timer Assembly: 115 V., 60 HZ.	1	P-200-306-1
4	Purge Orifice (Model 3100 Only)	2	P-200-404-34	28	Deleted		
	Purge Orifice (Model 4200 Only)	2	P-200-404-41	29	Cycle Timer Motor: 115 V., 60 HZ.	1	P-200-385-1
5	O-Ring	2	P-400-312-908	30	Washer, Flat No. 6, bronze	4	P-400-366-6
6	Ball, Check Valve	2	P-400-375	31	Cable, Clip, 1/8" nylon	2	P-400-318-1
7	Plug, Hex	1	P-400-307-4	32	Motor & Switch Bracket	1	P-300-504
8	O-Ring	1	P-400-312-904	33	Deleted		
9	Nameplate	1	P-300-737	34	Cam (includes item No. 35)	1	P-200-406
10	Drive Screw No. 4x3/16" Type U rnd, Hd. st. st.	2	P-400-322-1	35	Set Screw, No. 6-32x1/8" socket hd., st.st.	1	P-404-120-62-03
11	Screw, No. 10-24x5/8" Pan. hd.	6	P-400-361-2	36	Switch	1	P-400-311
12	Pipe Plug, 1/4"-18 socket hd.	2	P-400-320-3	37	Terminal Shield	1	P-300-565
13	Mounting Bracket	2	P-300-497	38	Screw, No. 6-32x1/8" rnd. hd., brass	2	P-400-315-3
14	O-Ring	4	P-400-313-209	39	Wire, 18 ga.	1	P-200-324-1
15	Air Manifold	1	P-300-495	40	Wire, 18 ga. with terminal	1	P-200-325-1
16	O-Ring	2	P-400-313-018	41	Connector	1	P-400-317-1
17	Solenoid Valve Assembly: 115 V-60 HZ	2	P-400-308-1	42	Spring, Check Ball	2	P-300-507
18	Core Assembly	2	P-400-308-12	43	Deleted	1	P-B-071
19	Base Assembly	2	P-400-308-13	44	Bracket, Dryer Cover	1	P-4626
20	Coil	2	P-400-308-11				
21	Frame	2	P-400-308-14				
22	Deleted						
23	Lockwasher, Rubber Insert	2	P-400-308-16				

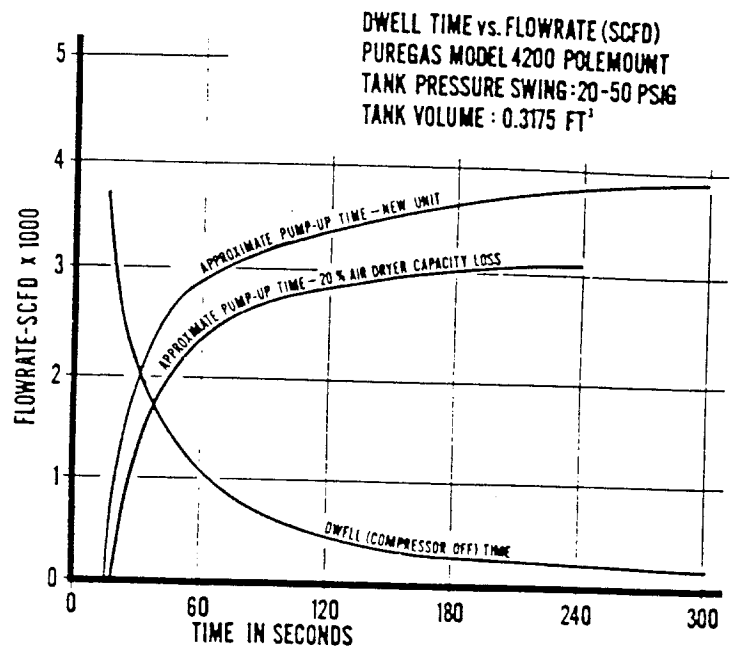
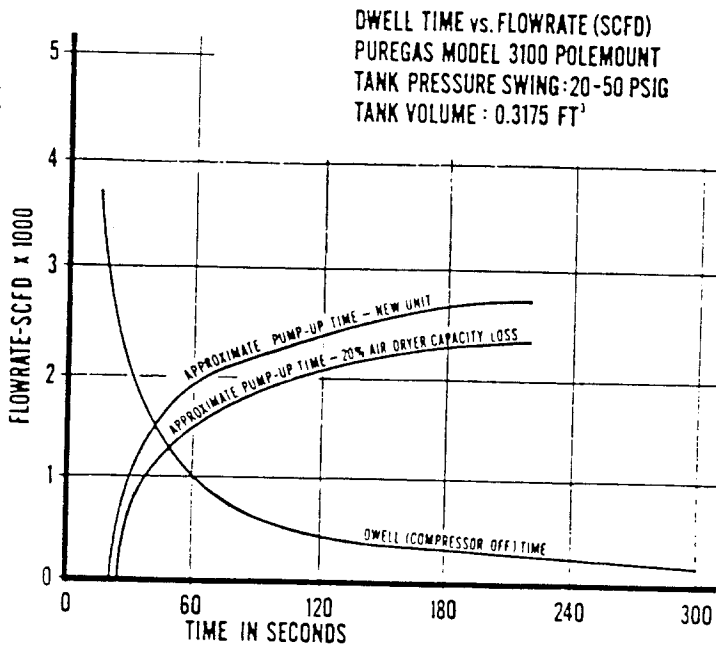
Appendix REG



* THESE PARTS INCLUDED IN P-02306
REPAIR KIT

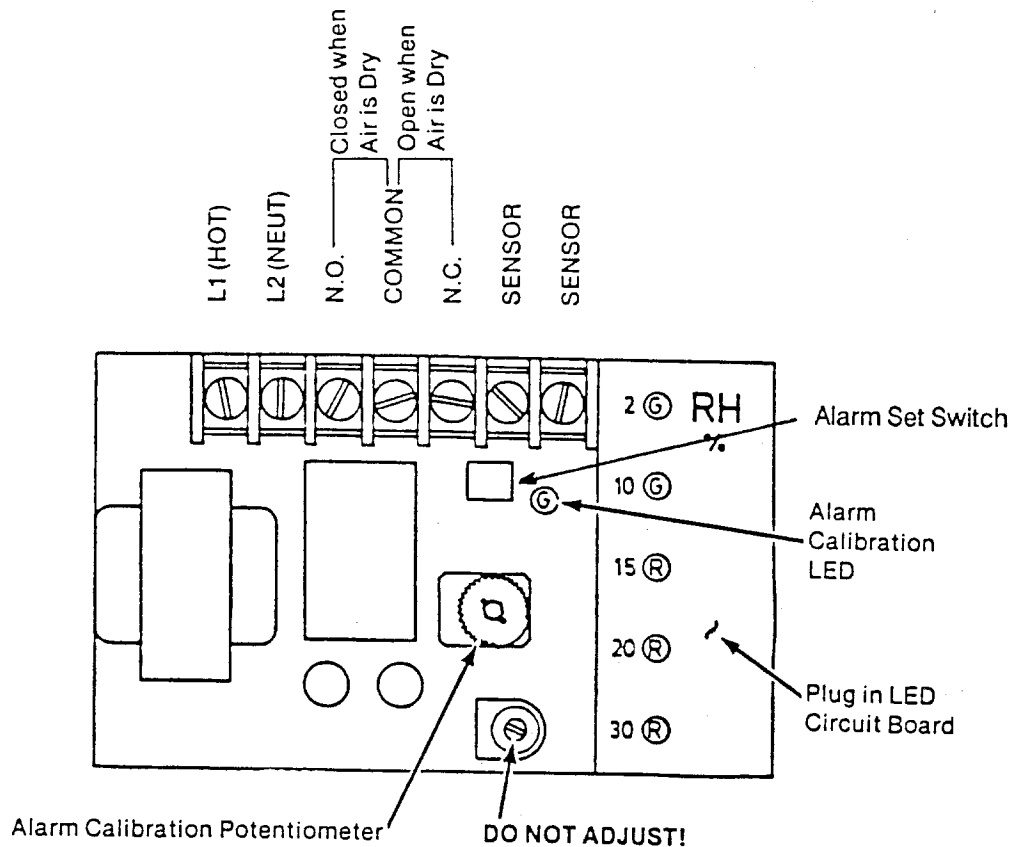
PRESSURE REGULATOR P-01548

Appendix ACC



- Step 1 - Time the compressor run-time.
- Step 2 - Time the compressor off-time.
- Step 3 - Refer to the Time vs. Flowrate Chart for the appropriate model number.
- Step 4 - From the compressor off-time, estimate the true flowrate.
- Step 5 - If the estimated true flowrate exceeds the flowrate indicator value by 20%, or more, thoroughly check all air lines and pressure parts (upstream of the flowrate indicator) for leaks. If no leaks are found, then it can be assumed that the estimated true flowrate is correct and the value on the flowrate indicator is not accurate.
- Step 6 - Apply the compressor run-time to the Chart. If the actual compressor pump-up time is longer than the 20% capacity loss pump-up time; Check all air lines and pressure parts (upstream of the capacity control valve) for leakage. These leak checks must be done while the compressor is running. There is no pressure in these lines when the compressor is not running.
- Step 7 - If no leaks are found, carefully remove the filter felts from the compressor intake filters. Do not screw out the filter housing.
- Step 8 - Time the compressor running period without the filter felts in place. If the run time shows a significant improvement, replace the filter felts with new parts.
- Step 9 - If after replacing the filter felts, the compressor run-time is still above the 20% compressor capacity loss curve, it will be necessary to service the compressor. Consult the manual for servicing instructions.

Addendum



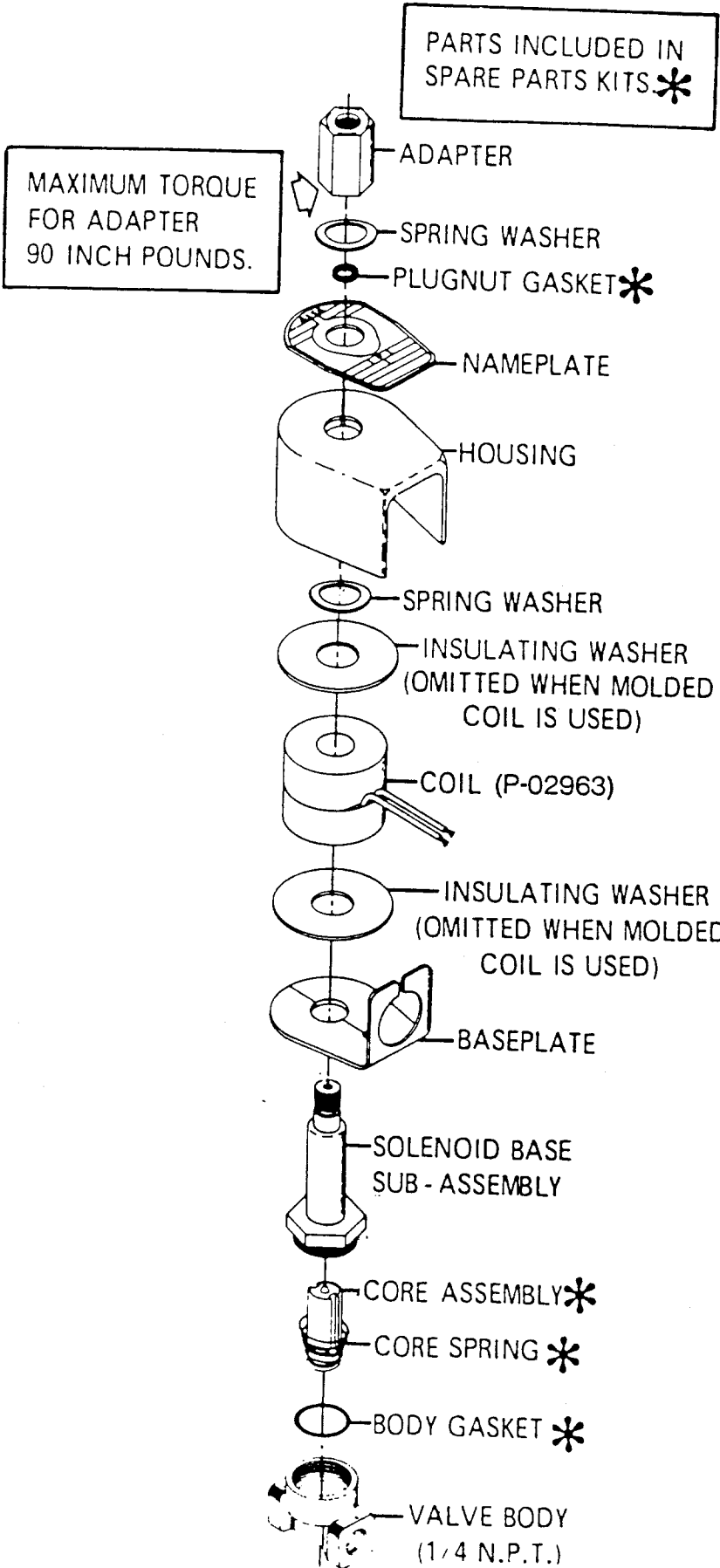
The new P-01348 HUMI-ALARM now includes a solid state L.E.D. humidity monitoring system which permits quick, visual monitoring of the percentage of relative humidity in the air being supplied to the cables or pipe panels.

The display consists of five L.E.D.'s (two green and three red) which, during normal "dry air" conditions, will always be energized. As the percentage of relative humidity in the air increases, the L.E.D.'s will de-energize.

Example: If the relative humidity increases above 2%, the "2%" indicator will go out. If the relative humidity increases above 10% (which is the alarm point), the second green L.E.D. will go out. If the percentage of relative humidity continues to increase, the red L.E.D.'s will begin to go out.

The new HUMI-ALARM is electrically wired into the air dryer in exactly the same manner as the old model.

To calibrate the HUMI-ALARM, press the "SET" button and rotate the alarm calibration potentiometer until the L.E.D. just de-energizes. Release the set button and the L.E.D. will energize. Refer to the air dryer manual for location of the "SET" button.



Bypass Solenoid Valve P-5000-12-85
 Bypass Solenoid Maintenance Kit P-02964

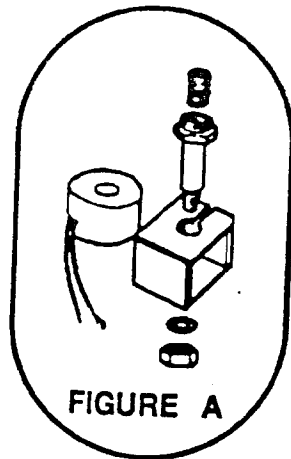


FIGURE A

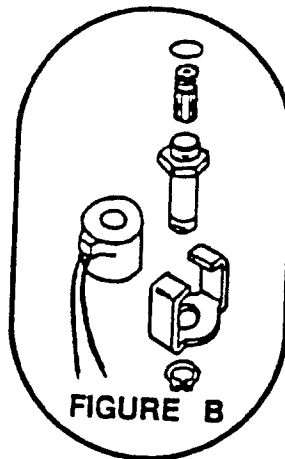


FIGURE B

MAINTENANCE INFORMATION FOR HEATLESS DRYERS

I HEATLESS DRYER MAINTENANCE KITS

The kits below apply to Models HF200 and HF2C Heatless Dryers.

1. For solenoid valve like Figure A, order P-200-499 (Heatless Dryer Maintenance Kit)
 - a) For Solenoid Maintenance Kit only, order P-200-498.
(P-200-498 is included in P-200-499)
2. For solenoid valve like Figure B, order P-200-499S (Heatless Dryer Maintenance Kit)
 - a) For Solenoid Maintenance Kit only, order P-200-498S.
(P-200-498S is included in P-200-499S)

II HEATLESS DRYER SOLENOID COIL REPLACEMENT

1. For Heatless Dryer with mechanical timer, and the solenoid valve is like Figure A, order:
 - a) P-400-308-11 for 115 VAC Models
 - b) P-400-308-21 for 230 VAC Models
2. For Heatless Dryer with solid state timer, and the solenoid valve is like Figure A, order:
 - a) P-400-308-DC11 for 115 VAC Models
 - b) P-400-308-DC21 for 230 VAC Models
3. For Heatless Dryer with mechanical timer, and the solenoid valve is like Figure B, order:
 - a) P-400-589-11 for 115 VAC Models
 - b) P-400-589-21 for 230 VAC Models
4. For Heatless Dryer with solid state timer, and the solenoid valve is like Figure B, order:
 - a) P-400-589-DC11 for 115 VAC Models
 - b) P-400-589-DC21 for 230 VAC Models

III HEATLESS DRYER COMPLETE SOLENOID VALVE ASSEMBLY

1. For Heatless Dryer with mechanical timer, order:
 - a) P-07990-AC1 for 115 VAC Models
 - b) P-07990-AC2 for 230 VAC Models
2. For Heatless Dryer with solid state timer, order:
 - a) P-07990 DC1 for 115 VAC Models
 - b) P-07990 DC2 for 230 VAC Models

NOTE: Puregas recommends the use of the P-07990 DC Series valves to eliminate possible excessive chattering; however, the P-07990 AC Series may also be used. The new solid state timer will operate either AC or DC valves or a combination of both.

Important: When connecting solenoid valves to the solid state timer, connect P-07990 AC Series valves to "AC" terminals and P-07990 DC Series valves to the "DC" terminals.



Your Partner in Telecommunication Technology

RECOMMENDED SPARE PARTS LIST

MODEL P-3100STD/P-4200STD

PUREGAS AIR DRYERS

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.*</u>
P-01348	Humidistat Board	1
P-02253	Alarm Switching Relay (Sm.)	2
P-02900	Cabinet Fan Switch	1
P-06521-F1	Solid State Cycle Timer	1
P-07584	Annual Compressor Mtce.Kit w/Sensor	1
P-200-499	Maintenance Kit-Heatless Dryer	1
P-3865	Annual Compressor Mtce.Kit w/o Sensor	1
P-400-308-1	Solenoid Valve	1
P-400-308 DC1	Solenoid Valve DC (Used with P-06521-F1 Timer)	2
P-4547	Alarm Switching Relay (Lg.)	1
P-4564	Compressor Pressure Switch	1
P-4582	Vibration Mounts	4
P-4634	Capacity Control Valve	1
P-5000-12-85	Bypass Solenoid Valve	1
P-5000-6-47D	Humidity Sensor	2
P-B-118	Thermostat - Heater	1
P-B-119	Thermostat - Fan	1

Optional Spare Parts:

P-01109	Pressure Switch Contact Kit
P-02293	1/2 HP Compressor (P-3100STD)
P-06710-G1	S/S Cycle Timer Conversion Kit (Converts mechanical timer to s/s Timer)
P-3966-3LS	3/4 HP Compressor (P-4200STD)

* Note: Quantities listed above are recommended spare parts for one or more air dryers (up to 5 units).

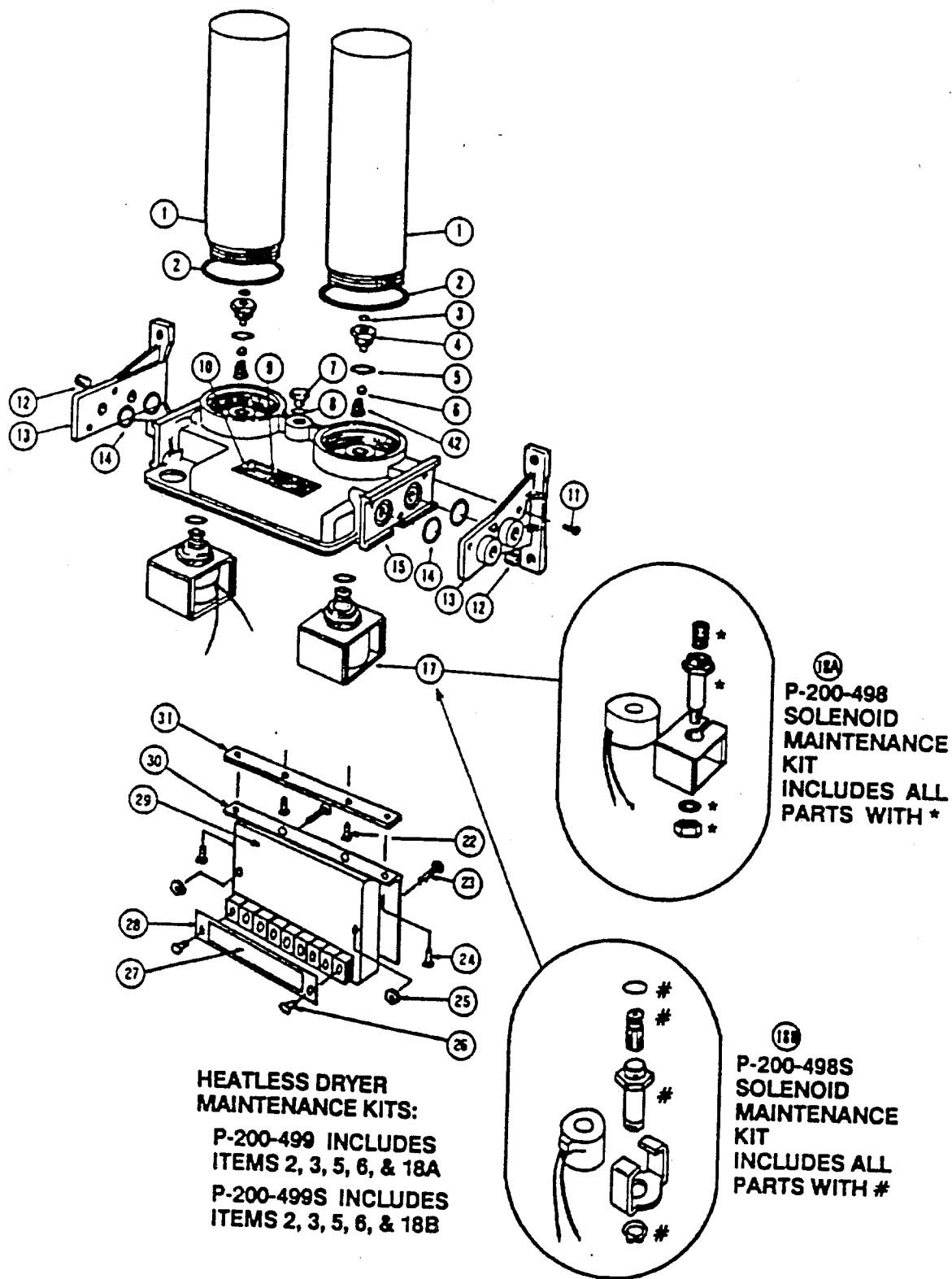
Puregas has overnight delivery on all air dryer parts.

PARTS LIST
Refer to Previous Addendum Page for
Figure of PUREGAS HEATLESS DRYER

DESCRIPTION	*QTY.	PART NO.
17. Solenoid Valve Assembly		
18A. 53 VDC (For 110 VAC 50/60 HZ Dryers).....	2	P-400-308-DC1
106 VDC (For 220 VAC 50/60 HZ Dryers).....	2	P-400-308-DC2
18B. 53 VDC (For 110 VAC 50/60 HZ Dryers).....	2	P-400-589-DC1
106 VDC (For 220 VAC 50/60 HZ Dryers).....	2	P-400-589-DC2
20. Coil		
(18A) 53 VDC.....	2	P-400-308-DC11
106 VDC.....	2	P-400-308-DC21
(18B) 53 VDC.....	2	P-400-589-DC11
106 VDC.....	2	P-400-589-DC21
22. Screw No. 6-32X3/8" Pan. Hd.....	2	P-400-361-1
23. Screw No. 3-32x1", BH.....	2	H-SB83-OFC-10
24. Screw No. 6-32x1 1/4" BH.....	2	H-SB83-OFC-04
25. Nut, Keps 8-32.....	2	H-NK01-OHC-R5
26. Screw No. 6-32x1/2".....	2	H-SB83-OFC-02
27. Decal Terminal Cover.....	1	P-06498
28. Terminal Cover.....	1	P-06499
29. Solid State Timer		
110 V 50/60 HZ.....	1	P-06521-F1
220 V 50/60 HZ.....	1	P-06521-F2
30. Bracket - Mtg. SS Timer.....	1	P-06497
31. Plate-Adapater-SS Timer Brkt.....	1	P-06496

* NOTE: THE QUANTITY LISTED ABOVE IS FOR 1 COMPLETE DEHYDRATOR

ADDENDUM



EXPLODED VIEW OF PUREGAS HEATLESS DRYER
 WITH SOLID STATE TIMER
 (DEHYDRATOR)