

E AIR DRYER
AT-8670
MAINTENANCE AND REPLACEMENT PARTS

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1. GENERAL

1.01 This section covers the maintenance and replacement parts procedures for the AT-8670 E air dryer.

1.02 The E air dryer has been rated Manufacture Discontinued. This section is issued for the maintenance and replacement parts procedures of those dryers still in service. Replacement parts will still be available.

1.03 Refer to Section 637-302-701 for the description and installation procedures for the E air dryer.

1.04 Parts for the dryer that can be readily replaced in the field are shown by their part number and name in Fig. 1 and 2. For replacement parts list and ordering information, refer to Part 3.

2. MAINTENANCE

GENERAL

2.01 It is essential for continued good operation that the E air dryer be inspected and maintained at scheduled intervals.

2.02 The maximum time interval between inspections shall be 6 months.

ANNUAL MAINTENANCE KIT

2.03 The 4323 annual maintenance kit, which must be ordered separately, provides the following materials which are normally required as maintenance replacements during a full year of operation.

- Two—3986 filter felts
- Two—4006 piston seals
- Two—4005 piston rings
- One—4008 rider ring
- One—3999 head gasket
- One—4000 outlet valve
- One—4002 inlet valve
- One—4003 cylinder gasket
- One—4001 valve plate

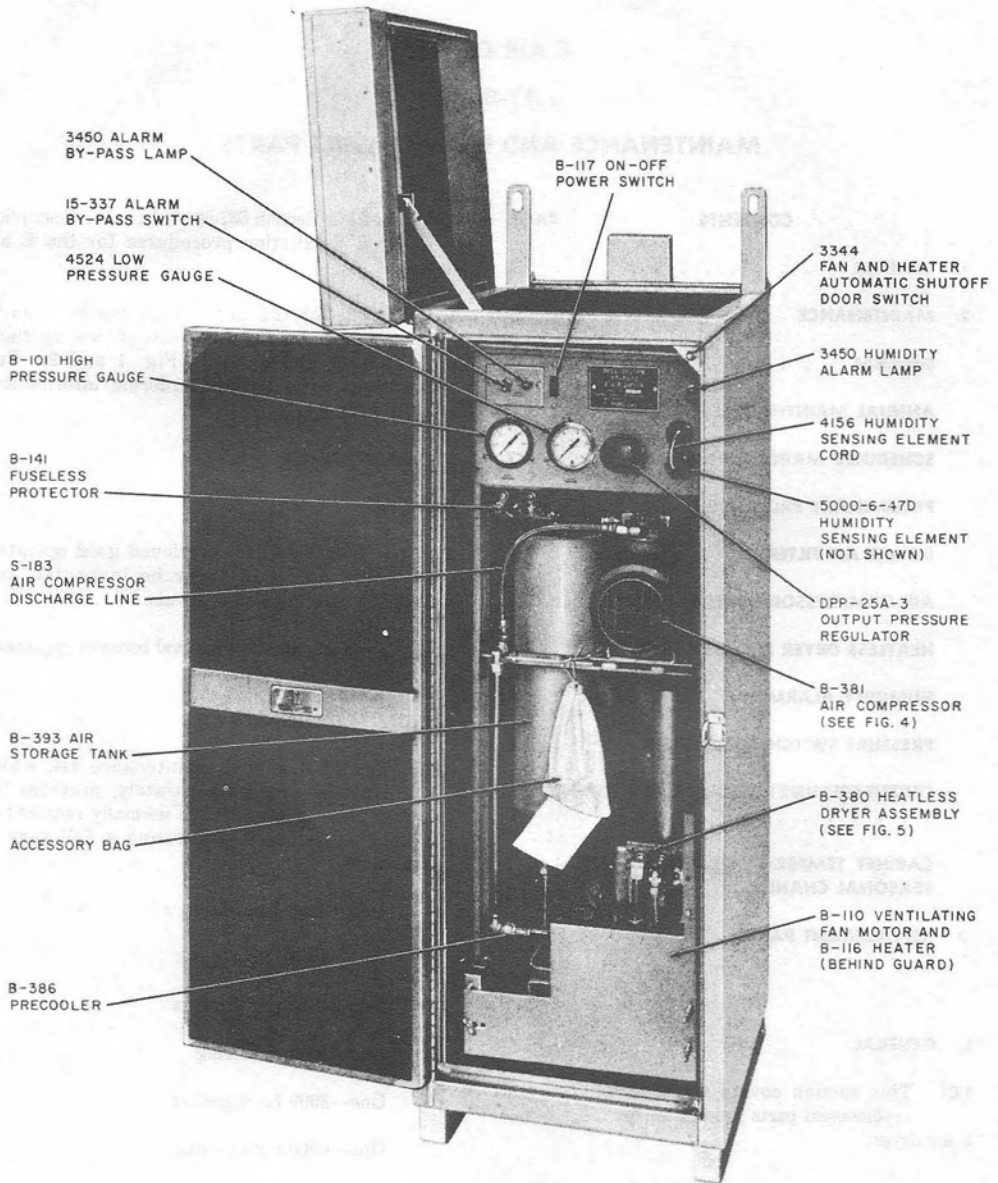


Fig. 1—E Air Dryer—Cabinet Doors Open

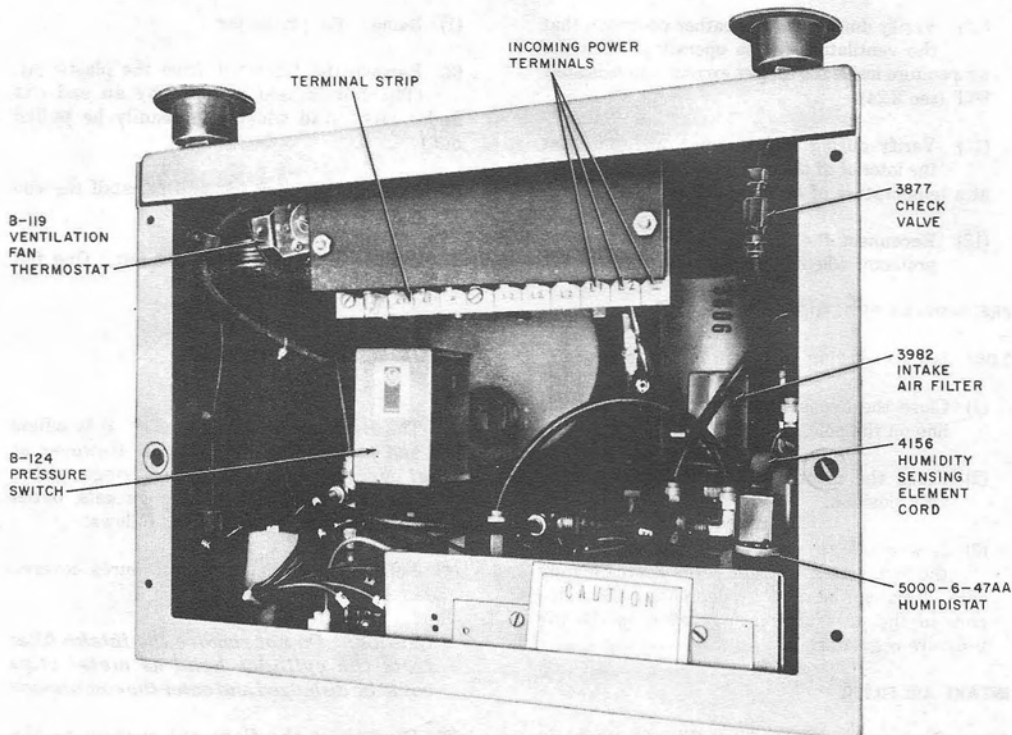


Fig. 2—E Air Dryer—Top Interior View—Chassis Cover Removed

SCHEDULED MAINTENANCE

2.04 On scheduled maintenance visits, the following procedure is necessary:

- (1) Disconnect one side of the alarm pair at the fuseless protector to prevent false operation.
- (2) Check the air compressor pressure switch which maintains the pressure in the air receiver between 30 ± 2 psig and 40 ± 2 psig as indicated on the high pressure gauge. If pressure is not maintained within these limits, adjust pressure switch per 2.19.
- (3) Replace the air compressor intake filter felts (see 2.06).
- (4) **Annually:** Replace the air compressor piston rings, rider ring, piston seals, cylinder gasket, inlet valve, outlet valve, and head gasket (see 2.07).
- (5) Clean the air precooler.
- (6) Check that the screened vents are clean for proper ventilation (2.23).
- (7) Check the operation of the humidity alarm (2.17).
- (8) Check the output air pressure at the pressure-testing valve on the regulator and adjust if necessary (see 2.22).
- (9) Check for leakage within the dryer with the 5-minute test described in 2.14.

- (10) Verify during warm weather operation that the ventilating fan is operating when the temperature inside the cabinet exceeds approximately 80°F (see 2.24).
- (11) Verify during cold weather operation that the interior of the cabinet is being maintained at a temperature of at least 45°F (see 2.25).
- (12) Reconnect the alarm pair at the fuseless protector when all work has been completed.

- (1) Remove the plastic jar.
- (2) Remove the filter felt from the plastic jar. (The felt is held in place by an end cap and a rivet stud which can readily be pulled out.)
- (3) Replace the filter felt and reinstall the end cap and plastic jar.

Note: Do not reuse the old felt. One felt is furnished with the dryer.

PRELIMINARY PROCEDURE

2.05 Before working on the air compressor:

- (1) Close the bypass valve in the lead pipe air line on the pole.
- (2) Place the master ON-OFF switch to the OFF position.
- (3) Lower the air pressure in the dryer until the high pressure gauge reads approximately zero. This can be done by depressing the valve core in the pressure-testing valve on the air pressure regulator.

AIR COMPRESSOR MAINTENANCE

2.07 The B-381 air compressor (Fig. 4) is oilless and requires no lubrication. However at **annual** intervals replace the piston rings, piston seal, rider ring, head and cylinder gaskets, outlet and inlet valves, and valve plate as follows:

- (1) Follow the preliminary procedures covered in 2.05.

Caution: Do not remove the intake filter from the cylinder head as metal clips could be dislodged and enter the compressor.

INTAKE AIR FILTER

2.06 Replace the intake filter (Fig. 3) every six months as follows:

- (2) Disconnect the flare nut connecting the compressor discharge line to the precool.

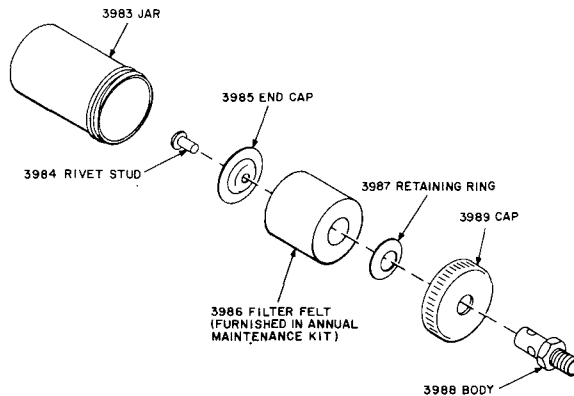


Fig. 3—3982 Intake Air Filter

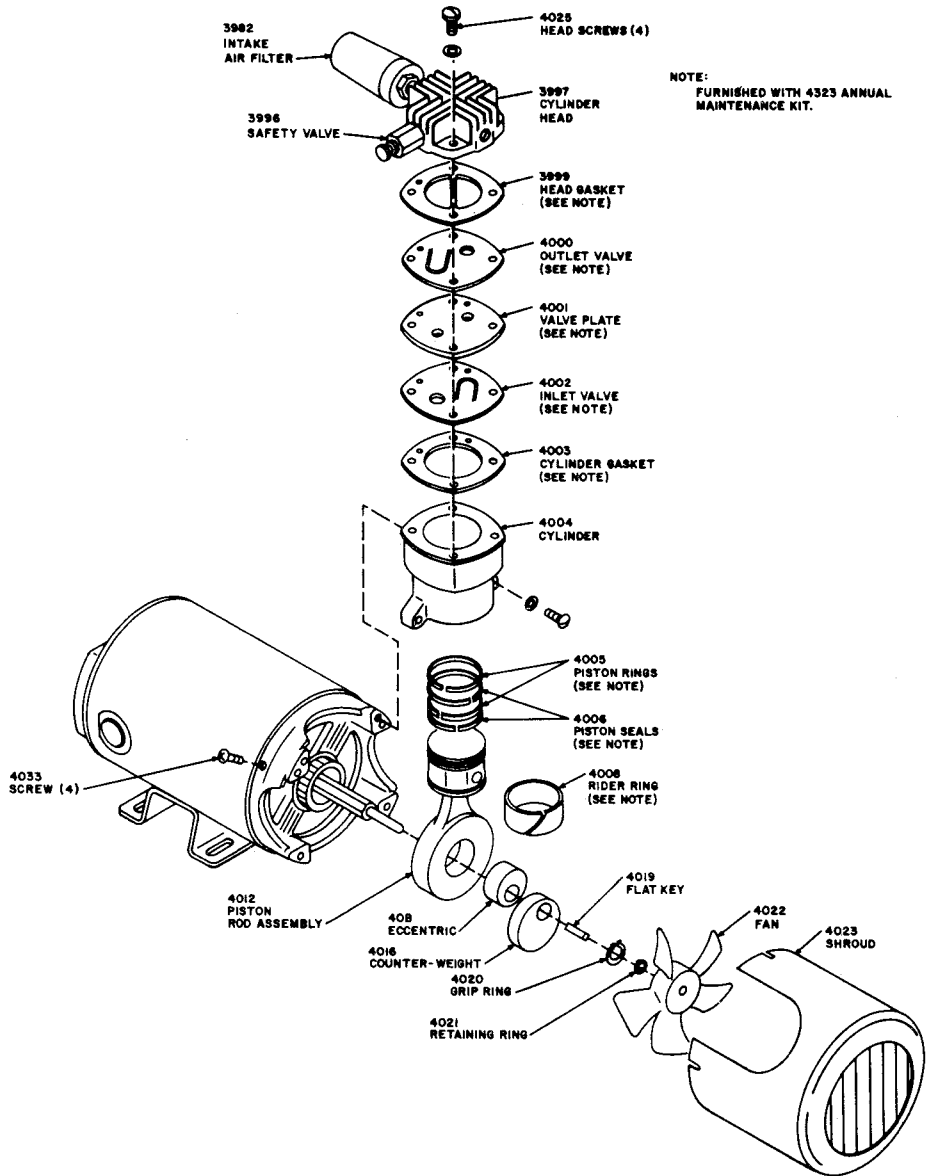


Fig. 4—B-381 Air Compressor (Exploded View)

- (3) Remove the four (4) screws which secure the compressor shroud and pull shroud forward and off the compressor housing.
- (4) Remove the four (4) cylinder head screws and lockwashers and lift off the cylinder head, gaskets, valves, and valve plate.
- (5) Remove the two (2) cylinder screws and lockwashers and lift out the cylinder.
- (6) Remove the piston seals, piston rings, and rider ring.
- (7) Clean all components with a nonflammable, nontoxic cleaning solvent.
- (8) Install the new piston seals, piston rings, and rider ring on the piston. (Locate the ring joints approximately opposite each other.)
- (9) Attach cylinder to bracket with the cylinder screws and lock washers. **Tighten screws finger tight.**
- (10) Move the piston to the top dead center position and adjust the cylinder flush with the top of the piston and tighten down on the cylinder screws.
- (11) Install the valves, gaskets, and valve plates by stacking them as shown in Fig. 4.

Note: The leaves on the inlet and outlet valves have been prebent and should not be adjusted in any way.

- (12) Install the cylinder head using the four (4) head screws and lockwashers. Do not tighten the head screws at this time.

Caution: *On top of the cylinder head the end of two (2) fins have been omitted. They are always in the exhaust port.*

- (13) Tighten the four (4) head screws.
- (14) Reconnect the compressor discharge line.
- (15) Check for leakage within the dryer (see 2.14).

HEATLESS DRYER MAINTENANCE

2.08 The B-380 heatless dryer (Fig. 5) requires no lubrication or field adjustments. However, it is recommended that at periodic intervals the unit be inspected.

2.09 If the heatless dryer is suspected of improper operation, first ensure that none of the air fittings leak (see 2.14).

2.10 A high humidity condition may be a result of the following defects in the heatless dryer:

- (1) No air purge (2.11)
- (2) Low outlet pressure reading (2.12)
- (3) Defective desiccant towers (2.13).

2.11 The heatless dryer has a timer motor which switches from one tower to the other approximately every 30 seconds. This switching can be heard as an air purge and timed. If this air purge cannot be heard, the cause may be as follows:

- (1) Defective timer, cam, or timer switch
- (2) Defective solenoid valve.

2.12 If a low pressure reading is observed, check for the following:

- (1) Defective solenoid valve
- (2) Check valve not seated
- (3) Plugged air passage
- (4) Plugged purge orifice.

2.13 Defective or contaminated desiccant towers can cause channeling of the air stream and improper drying. If desiccant towers are found to be defective, replace towers. **No attempt should be made to repack desiccant towers in the field.**

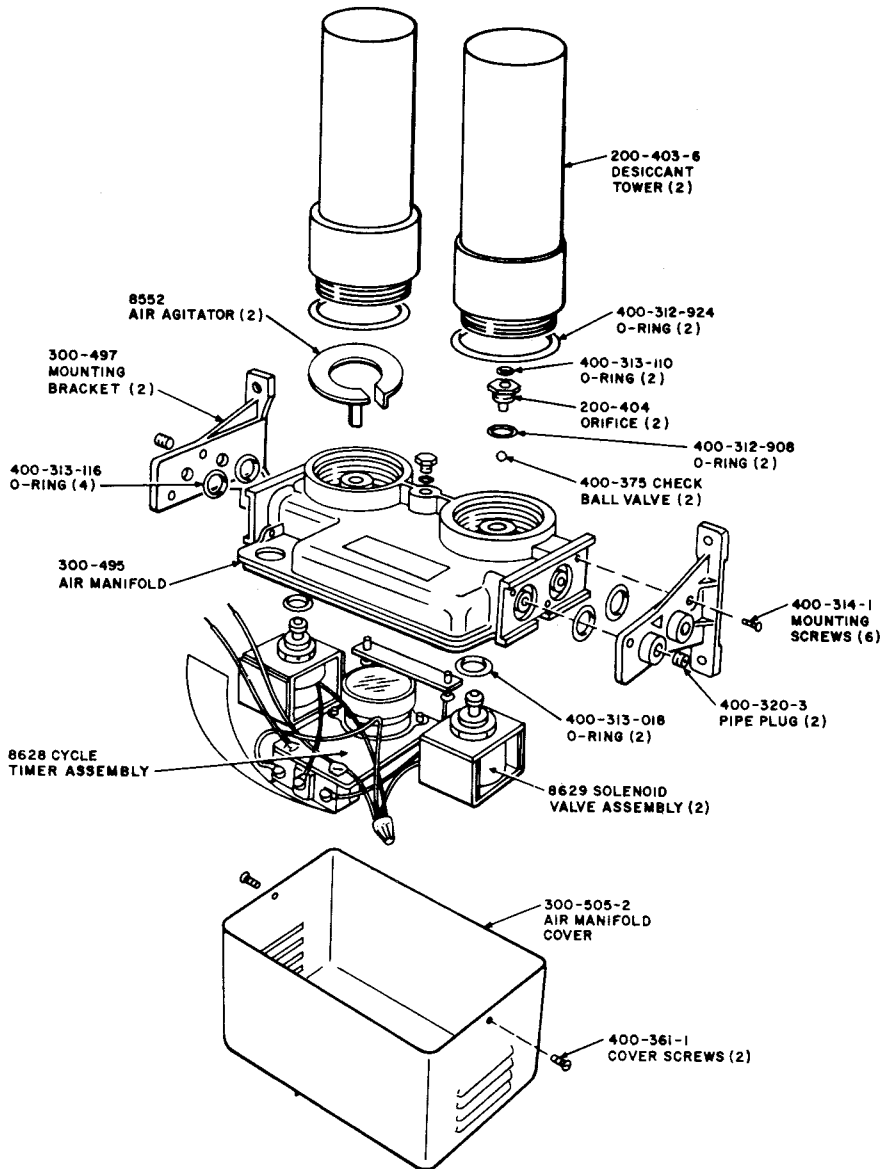


Fig. 5—B-380 Heatless Dryer (Exploded View)

2.14 Check for leakage within the dryer as follows:

- (1) Close the bypass valve on the lead pipe on the pole. Observe the high pressure gauge reading for 5 minutes. A drop of 1 pound per square inch (psi) or less indicates that all the fittings are satisfactorily tight.
- (2) If the 5-minute test reveals a drop of more than 1 psi, check for leaks at all air connections and fittings with pressure-testing solution.

HUMIDITY ALARM

2.15 The humidity alarm consists of a humidity sensing element connected by cable to the humidistat. The sensing element is mounted in the dry air outlet line.

2.16 When a high humidity condition exists, the humidity alarm will not only activate the alarm lamp but will also shut down the air dryer. It is necessary to move the alarm bypass switch to the ON position which restores power to the dryer, enabling the operator to then clear the alarm condition. When the alarm condition has been cleared, the alarm lamp will automatically extinguish and the alarm bypass switch should be placed in the OFF position.

2.17 With the master ON-OFF switch turned on and the alarm bypass switch in the ON position, verify the operation of the humidity alarm as follows:

- (1) Connect an ohmmeter across the alarm terminals.
- (2) Remove the humidity sensing element from the receptacle, exposing the sensing element to the ambient air. Temporarily seal the open housing to prevent loss of air.
- (3) The ohmmeter should indicate a full scale deflection and the alarm lamp should begin flashing.
- (4) If the action described in (3) does not occur, breathe on the sensing element. If after breathing on the element the alarm still does not operate, examine the sensing element cable connection at the humidistat and examine the cable for a broken conductor. If the cable is

satisfactory, replace the sensing element and repeat the check. If the alarm still does not operate, consider replacing entire humidistat assembly.

Caution: *Do not use an ohmmeter to measure the resistance of the sensing element. Any voltage applied to the sensing element will make it inoperative.*

- (5) Return the sensing element to its housing and in a short while the ohmmeter should read zero and the alarm lamp will automatically extinguish.
- (6) Replace the alarm bypass switch to the OFF position.

PRESSURE SWITCH ADJUSTMENT

2.18 With the master ON-OFF switch in the ON position, the high pressure gauge should cycle between 30 and 40 psi. When the pressure reaches approximately 40 psi, the air compressor should shut off, and when it drops to approximately 30 psi, the air compressor should start.

(1) *If the pressure is between 30 and 40 psi and the compressor is not running*, bleed air from the system at the regulator valve until the compressor starts. Note the pressure at which it starts, then note the pressure at which it stops. If it starts within a range of 28 to 32 psi and stops within a range of 38 to 42 psi, the compressor and pressure switch can be considered to be operating satisfactorily.

(2) *If the pressure exceeds 42 psi*, the trouble is probably in the B-124 pressure switch (in the top section of the cabinet) and adjustment or replacement of the switch will be necessary (Fig. 6).

2.19 To adjust the pressure switch proceed as follows:

- (1) *Put on rubber gloves.*
- (2) With the 3-connector incoming power cord connector and the master ON-OFF switch on, remove the top cover of the cabinet.
- (3) Check the operation of the pressure switch by noting the pressure at which the air compressor starts and stops. (See 2.18)

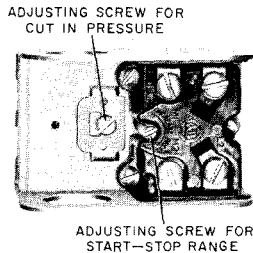


Fig. 6—B-124 Pressure Switch

- (4) To *increase* the start and stop range, turn the adjusting screw at the top of the terminal block in a clockwise direction (Fig. 6).
- (5) To *decrease* the start and stop range, turn the adjusting screw at the top of the terminal block in a counterclockwise direction.
- (6) If the 10 psi range difference between start and stop settings of the switch requires adjustment, turn the adjusting screw at the base of the terminal block counterclockwise to increase, or clockwise to decrease, the cut-in pressure. This adjustment will not change the cutoff pressure setting.
- (7) Remove rubber gloves.

2.20 If the compressor is running continuously over a 15-minute period and the pressure is *not* building up, it is an indication that either the cable system is draining more than the normal rated capacity of the unit, or that there is a major leak in the dryer system.

- (1) Close the shutoff valve in the dry air line and observe the pressure reading. If the pressure builds up satisfactorily, it indicates that the continuous running of the air compressor was due to the requirements of the cable system.

Note: If the pressure was being maintained at less than 35 psi before the shutoff valve was closed, it is probable that there is a serious leak nearby in the cable system, which will require attention.

- (2) If the pressure fails to build up, it indicates wear in the air compressor or a major leak in the dryer system which can be detected readily with pressure-testing solution.

2.21 If the pressure is less than 28 psi and the air compressor is *not* operating, it indicates a trouble in the pressure switch, in the power supply or electrical wiring, or in the compressor motor.

- (1) Check first for pressure switch trouble by bleeding air from the pressure-testing valve on the regulator. If lowering of the pressure causes the compressor to operate, adjustment or replacement of the pressure switch will be necessary (2.19).
- (2) If lowering the pressure does not result in compressor operation, **turn off the master ON-OFF switch and the service switch on the pole.** Then check all power wiring connections. If no loose connection or broken wiring is found, **turn on the service switch and master ON-OFF switch** and proceed as follows:
 - (a) **Put on rubber gloves.**
 - (b) With an approved ac voltmeter, and referring to Fig. 2 and 7, check voltmeter readings as outlined in Table A.
 - (c) Remove rubber gloves.

OUTPUT PRESSURE REGULATOR ADJUSTMENT

2.22 With a C pressure gauge, check the output pressure at the pressure-testing valve on the air pressure regulator. If adjustment is required, loosen the handwheel locknut at the top of the regulator bonnet and turn the handwheel clockwise to increase or counterclockwise to decrease the output air pressure, then tighten the locknut securely.

CABINET TEMPERATURE REQUIREMENTS—SEASONAL CHANGES

2.23 Clean the wire screen of the cover louver, and the fan screen on the underside of the cabinet with a stiff brush.

2.24 In warm weather, check for operation of the ventilating fan. The fan should operate when the temperature within the cabinet is approximately 80°F or higher. If the fan does not operate under these conditions, **turn off the service switch on the pole and the master ON-OFF switch** and check all power wiring connections. If no loose connection or broken wiring is found, **turn on the service switch and the master ON-OFF switch** and proceed as follows.

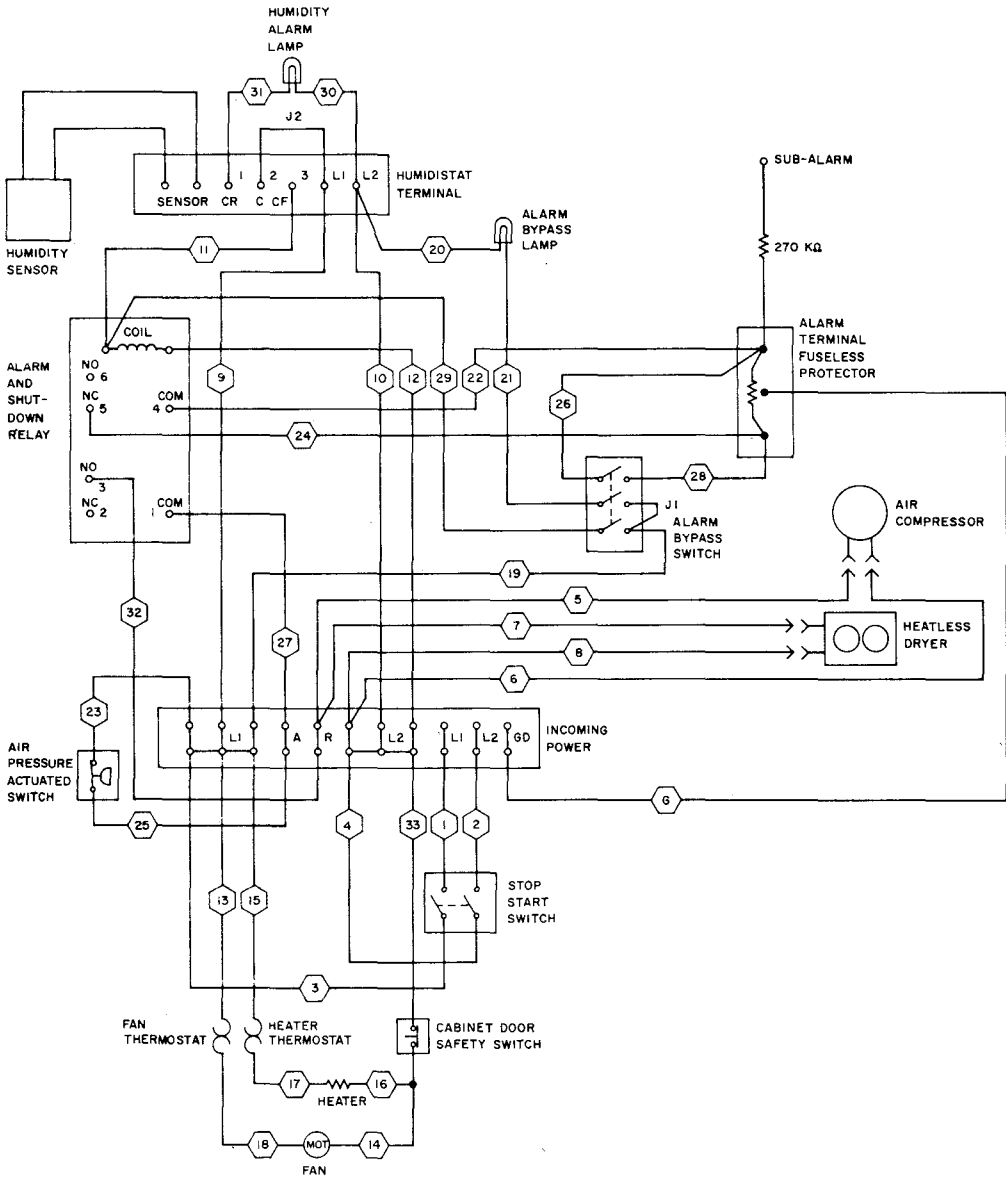


Fig. 7—E Air Dryer—Wiring Diagram

TABLE A
TROUBLESHOOTING AIR COMPRESSOR CIRCUIT

VOLTMETER TEST POINTS (ON POWER TERMINAL)	VOLTMETER READINGS	
	115 VOLTS	0 VOLTS
L1 - L2 (Before ON-OFF switch)	Power at incoming power terminations.	Power not applied to dryer. Check service switch.
L1 - L2 (After ON-OFF switch)	ON-OFF switch is good.	Defective ON-OFF switch
L2 - R	Trouble is in compressor motor or connections at motor.	Circuit through compressor motor is good.
L2 - A	Defective alarm and shutdown relay.	Defective pressure switch.

(1) *Put on rubber gloves.*

(2) With an approved ac voltmeter, and referring to Fig. 2 and 7, check for 115 volts first across the leads of the fan thermostat and then across the leads of the fan motor to determine which component is defective and must be replaced.

(3) Remove rubber gloves.

2.25 In cold weather, check for operation of the heater in the base of the cabinet. The heater should operate when the temperature within the cabinet is approximately 45°F or lower. If the heater does not operate under these conditions, **turn off the service switch on the pole and the master ON-OFF switch.** Check all power wiring connections. If no loose connection or broken wiring is found, **turn on the service switch and the master ON-OFF switch** and proceed as follows.

(1) *Put on rubber gloves.*

(2) With an approved ac voltmeter, and referring to Fig. 2 and 7, check for 115 volts first across the leads of the heater thermostat and then across the leads of the heater to determine which component is defective and must be replaced.

(3) Remove rubber gloves.

2.26 At each maintenance visit, check to see that the vent screen insulator is being used in accordance with the following:

(1) When sustained periods below freezing are anticipated, the insulator shall be inserted in the slot below the fan to reduce the ambient air circulation.

(2) When sustained periods above freezing are anticipated, the insulator shall be removed from the slot below the fan and stored in the lower right-hand corner of the cabinet.

3. REPLACEMENT PARTS

3.01 When ordering a replacement, state the name of the part, manufacturer's name, and code number of part, for example:

"Switch Pressure, Puregas Equipment Corp., No. B-124"

3.02 The replacement parts which can be ordered for the E air dryer are as follows:

PUREGAS EQUIP. CORP. CODE NO.	NAME OF ITEM
B-381	Assembly, Compressor, Air
3982	Assembly, Filter, Intake, Air
B-380	Assembly, Dryer, Heatless
B-11	Blade, Fan, Ventilating
4156	Cable, Element, Sensing
5000-6-47D	Element, Sensing, Humidity
B-101	Gauge, Pressure, High
4524	Gauge, Pressure, Low

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PUREGAS EQUIP. CORP. CODE NO.	NAME OF ITEM	PUREGAS EQUIP. CORP. CODE NO.	NAME OF ITEM
B-116	Heater, Cabinet	DPP-25A-3	Regulator, Pressure, Output
5000-6-47AA	Humidistat	4547	Relay, Alarm
B-396	Insulator, Screen, Vent	B-152	Resistor
4323	Kit, Maintenance, Annual	15-337	Switch, Bypass, Alarm
3450	Lamp, Alarm, Humidity	3344	Switch, Door
3450	Lamp, Bypass, Alarm	B-117	Switch, ON-OFF
S-183	Line, Discharge, Compressor, Air	B-124	Switch, Pressure, Compressor, Air
B-110	Motor, Fan, Ventilating	B-119	Thermostat, Fan, Ventilating
4541	Mount, Isolation	B-118	Thermostat, Heater, Cabinet
669	Nut, Fan	B-393	Tank, Storage, Air
5000-6-18F	O-Ring	3877	Valve, Check