

# AMSCO Maintenance Manual



**SPARKLE SERIES**  
Glassware Dryer  
• electric • steam

(3/88)

P-757512-001

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## SAFETY PRECAUTIONS

The following *safety precautions* should be observed when operating or servicing this equipment. The page or pages on which the precautions appear in this manual is indicated by the number in the lower right corner of each item.

**WARNING: BEFORE STARTING ANY MAINTENANCE, PRESS THE POWER SWITCH OFF AND ALLOW THE CHAMBER TO COOL.**

3-1, 4-1

**CAUTION:** When using cleaners such as *AMSCO STAINLESS STEEL CLEANER & POLISH* or *AMSCO PRY Cleaner*, rub in a back-and-forth motion (in the same direction as the surface grain). Do not rub with a rotary or circular motion. Do not use these cleaners on painted surfaces. Follow directions on the containers.

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## SECTION 1

## GENERAL INFORMATION

The TECH DATA sheet included in this section contains factual data relating to the principal descriptive and identifying characteristics of Sparkle Series Glassware Dryers. It describes and illustrates general concepts of the equipment, its purpose, capabilities, limitations, and technical specifications.



AMSCO

**PULSTAR 5000**  
Glassware Dryer  
• steam • electric

**TECH  
DATA**

SD-121R3  
(6/83)

## APPLICATION

This equipment will dry a variety of glassware and utensils. Drying time is compatible with total cycle time for the AMSCO Pulstar 5000 Glassware Washer... approximately 12 minutes (electrically heated Dryer), 17 minutes (steam-heated Dryer).

## MODEL AND SIZE

**Single-door Dryer** is for front loading. Chamber is 25 inches wide x 50 inches high x 25 inches deep (635x1270x635 mm). Cabinet dimensions are 30 inches wide x 74 1/8 inches high x 30-9 1/8 inches deep (762x1896x776 mm).

**Double-door Dryer** is for pass-through operation. Chamber is 25 inches wide x 50 inches high x 27 inches deep (635x1270x686 mm). Cabinet dimensions are 30 inches wide x 74-5/8 inches high x 34-1/8 inches deep (762x1896x867 mm).

## DESIGN AND CONSTRUCTION

**General.** We furnish all components necessary to obtain a complete working unit, ready for (but not including) installation and connection to building utility service lines. With the exception of the operating control panel and its trim, the unit is of welded-stainless-steel construction. Inside joints are ground smooth. Exposed surfaces are polished.

The control panel and trim are phosphatized carbon steel, coated with a corrosion-resistant base primer followed by a textured epoxy finish on the control panel and synthetic resinous enamel on the trim. Each coating is oven-baked to make these surfaces attractive, durable and easy to clean.

The sides and top of the chamber are insulated with 1-1/2 inch (38 mm) thick glass fiber insulation to minimize heat loss to the room.

**Drying Chamber** has four, full-width (electro-polished) stainless-steel wire shelves. The shelves slide easily in and out of the chamber and are height adjustable in 1 inch (25 mm) increments. An optional track assembly will permit the use of material handling dollies from ancillary washing equipment.

The fully insulated chamber door has a full-height tempered-glass viewing window. The door is mounted on chromium-plated pivot hinge conveniently located at either the right or left side, as specified. A handle-actuated latch in combination with a heat-resistant gasket, seals the door tightly while the Dryer is in operation.

A top-mounted light illuminates the chamber interior whenever the Dryer is energized. A perforated bottom plate permits unrestricted flow of hot air throughout the chamber. The plate is readily removable for access to the heater.

**Controls** are above the drying chamber. The control panel includes a main power switch; 16-hour timer, with manual "HOLD" position; adjustable thermostat with low, medium, and high settings; dial-type chamber thermometer. Lights are furnished to indicate when the heaters are actuated and when the unit is operating. The entire panel hinges upward to expose the control components for easy servicing. The secondary instrument panel on a double-door model contains an additional chamber thermometer and duplicate cycle-status lights.

After setting the timer and thermostat and pressing the power switch, the load is automatically dried with hot filtered air, for the period of time selected. The thermostatically controlled heaters will turn off whenever the set time has expired; the air blower will continue as long as the power switch is energized. The thermostat setting may be changed at any time during the cycle.



Typical only — some details may vary.

**THE SELECTIONS CHECKED BELOW  
APPLY TO THIS EQUIPMENT**

**Model**

- ☐ Single Door  
☐ Double Door (pass-thru)

**Heating System**

- ☐ Steam  
☐ Electric

**Mounting**

- ☐ Free Standing  
☐ For Recessing

**Door Hinge Location**

- ☐ Left Side  
☐ Right Side

**Options**

- ☐ Chamber Track Assembly  
Qty: \_\_\_\_\_  
☐ Materials Handling Accessories  
(See separate product literature)

Item No. \_\_\_\_\_  
Location(s) \_\_\_\_\_

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**Heating System** is concealed beneath the chamber by a perforated bottom plate. The heating system includes • either finned electric or steam-coil heater assembly (as you prefer) so positioned to provide even heat distribution • centrally located air blower (3.5 air changes per minute) • incoming-air filter. Effluent air is conducted through a dampered, louvered vent stack in the top of the chamber. The damper is factory set for maximum operating economy. The stack terminates in a 4 inch (102 mm) diameter flange for connection to a building vent system without an exhaust fan. The incoming-air filter is accessible for servicing. All components are thoroughly protected against drippage from wet glassware.

The operating controls for a steam-heated unit require 120-volt, 60-Hz service. Electrically heated units are available for operation on a choice of either 200 (208)- or 230-volt, 60-Hz, three-phase service, 4 wire.

#### MOUNTING

AMSCO Pulstar 5000 Series Glassware Dryers are available either free-standing or for recessing. A Dryer for recessing conceals the wall opening without the need for additional trim strips. A freestanding Dryer has stainless-steel side panels.

#### MATERIALS HANDLING ACCESSORIES

See separate product literature for listing.

#### UTILITIES CONSUMPTION:

##### Steam-heated Unit

- steam — 24 lb/hr (11 kg/hr) at 35 to 50 psig (2.46 to 3.52 kg per sq cm) ... contingent upon cycle intervals.

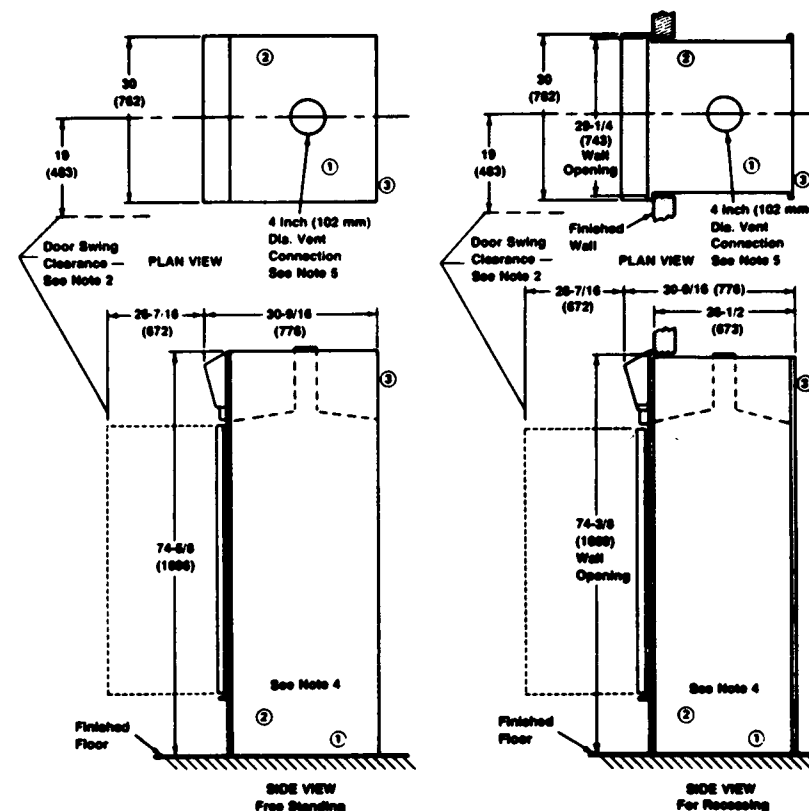
- electricity — 0.105 kw

**Electrically Heated Unit** — three phase, 4 wire — 6.1 kw

**HEAT LOSS** (thru cabinet at 70 F [21 C] room temperature):

**Steam-heated Unit** — 1900 BTU Hr

**Electrically Heated Unit** — 2200 BTU/Hr



#### MODELS WITH SINGLE DOOR

(See next page for models with double doors)

**DIMENSIONS ARE INCHES (MILLIMETERS) — DRAWING IS NOT TO SCALE**

#### OPERATING REQUIREMENTS

- STEAM** — 3/8 NPT (35 to 50 psig [2.45 to 3.52 kg per sq cm]), Not required for electrically heated units
- STEAM RETURN** — 3/8 NPT, Not required for electrically heated units
- ELECTRIC:**
  - Steam-heated Units — 120 Volt, 1 amp, 60 Hz
  - Electrically Heated Units — 200 (203) or 230 Volt, 15 amp, 60 Hz Three Phase, 4 wire.

#### NOTES

- Pipe sizes shown indicate utility service terminals. Building service lines to and from the equipment should be increased one pipe size to ensure optimum equipment performance.
- Right-hand door-swing clearances shown. Clearances for left-hand door swing are identical.
- Approximate weight — 465 lbs (211 kg).
- Screened openings are provided for installation of steam and steam return lines (not required for electrically heated units) through back of unit in lieu of bottom entry. Openings are above the floor and in line with terminals.
- Connect to a building vent system without an exhaust fan.

This print is for guidance when planning space and utility services. Actual installation prints may be obtained from any AMSCO office or representative.

## SECTION 2

### OPERATING INSTRUCTIONS

#### 2-1. GENERAL

The following instructions are intended to guide servicemen when (1) instructing operators in techniques that will ensure optimum equipment performance; and (2) verifying the validity of operator complaints. If the Dryer is not operating properly, refer to Paragraph 3-6, TROUBLE-SHOOTING. For capabilities of the equipment, refer to Section 1, GENERAL INFORMATION.

Figure 2-1 shows the Dryer controls in their approximate locations.

#### 2-2. BEFORE OPERATING THIS EQUIPMENT

1. Open the chamber door and inspect the Dryer interior. See instructions on page 3-3 if cleaning is necessary.

2. Shelves may be repositioned as follows:

- Remove shelf from slide.
- Lift slide and remove it from slots.
- Insert guide tabs in desired slots and replace shelf.

**NOTE:** The optional track assembly should be positioned for alignment with a Sparkle II Series Transfer Carriage (36" work height). Once positioned, the assembly (adjustable in 1/8" increments) should be secured with the screws provided.

3. Press Power Switch ON.

4. Be sure the steam supply valve (if applicable) on the Dryer is open. Access to the valve is through the hinged toeplate.

#### OPERATIONAL NOTES

- Blower will operate and interior light will glow whenever Power Switch is on ... regardless of Timer and Thermostat settings.

- Chamber temperature will be maintained at Thermostat setting unless Timer is at "0."
- Place Timer in HOLD position and manually control cycle periods longer than 16 hours.
- Avoid spillage of water on chamber bottom plate.

#### 2-3. OPERATING THE EQUIPMENT

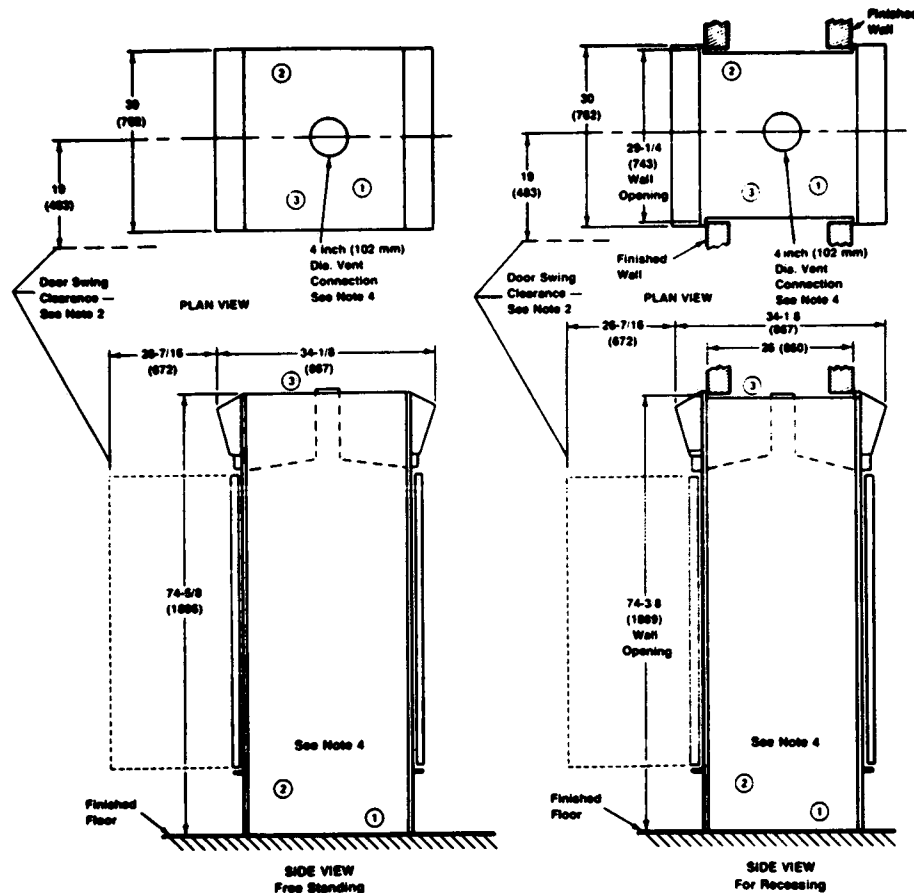
1. Position loaded rack (or racks) in center of Dryer. Arrange the items for proper air flow. Do not place goods on perforated bottom plate. Do not block the upper slotted exhaust outlet.

**NOTE:** Allow excess moisture to drain before placing goods in chamber. Also, to prevent the formation of condensate within items washed on spindle-type dollies, reload these items in compartment-type racks before placing them in the Dryer.

2. Set Timer and Thermostat for desired cycle. (Some loads can be dried in as little as 20 minutes; however, typical cycles should be determined at each installation, as conditions may vary.) Compensate time if cycle is started with cold chamber.

3. Be sure Power Switch is at ON and then close chamber door. Timer will automatically turn off heaters and Operating indicating light when time has expired. The blower will continue to aerate the chamber until the Power Switch is positioned at OFF.

4. Press Power Switch OFF and remove load when cycle is complete.



MODELS WITH DOUBLE DOORS

DIMENSIONS ARE INCHES (MILLIMETERS) — DRAWING IS NOT TO SCALE

#### OPERATING REQUIREMENTS

- STEAM** — 3/8 NPT (35 to 50 psig [2.46 to 3.52 kg per sq cm]). Not required for electrically heated units
- STEAM RETURN** — 3/8 NPT. Not required for electrically heated units
- ELECTRIC:**
  - Steam-heated Units — 120 Volt, 1 amp, 60 Hz
  - Electrically Heated Units — 200 (208) or 230 Volt, 15 amp, 60 Hz, Three Phase, 4 wire.

#### NOTES

- Pipe sizes shown indicate utility service terminals. Building service lines to and from the equipment should be increased one pipe size to ensure optimum equipment performance.
- Right-hand door-swing clearances shown. Clearances for left-hand door swing are identical.
- Approximate weight — 465 lbs (211 kg).
- Screened openings are provided for installation of steam and steam return lines (not required for electrically heated units) through back of unit in lieu of bottom entry. Openings are above the floor and in line with terminals.
- Connect to a building vent system without an exhaust fan.

This print is for guidance when planning space and utility services. Actual installation prints may be obtained from any AMSCO office or representative.

## INSPECTION AND MAINTENANCE



**Figure 2-1. COMPONENT LOCATIONS.**

The maintenance described in Paragraphs 3-2 through 3-5 should be performed (unless otherwise indicated) at intervals best determined by usage of the Dryer. Should a problem occur, refer to Paragraph 3-6. TROUBLESHOOTING.

**WARNING: BE SURE TO PRESS THE POWER SWITCH OFF AND ALLOW THE CHAMBER TO COOL BEFORE STARTING ANY MAINTENANCE OPERATIONS.**

1. Inspect cabinetry for damage or misaligned parts.

2. Open door and remove the three Phillips-head screws from the underside of the trim channel and raise the control panel. Remove the back plate from the control box to gain access to the electrical components.

- a. Turn main circuit breaker to OFF.
- b. Check control box electrical components for loose wires, improper connections and other obvious defects.
- c. Check chamber thermometer and interior light for loose wires and improper connections.
- d. Lower and secure the control panel.

- 3. Remove the bottom mesh from the drying chamber.**

- a. Steam-heated Units — Check the heater coil and steam supply and return lines for obvious defects or improper connections. Remove one side access panel and check the blower.**

- b. Electrically Heated Units – Inspect the heaters for obvious defects. Raise the heater plate and check the blower.

- c. Replace items removed and reinstall the chamber bottom plate.

4. Raise the hinged toeplate at the front of the unit and check the air filter. Clean or replace the filter, as necessary. Press the Power Switch ON to ascertain that blower is operating properly. Press the Power Switch OFF. Close the toeplate.

5. Open and close the chamber door(s). Be sure that the hinges do not bind and that the gasket does not roll.

6. Check the door gasket(s) for worn sections. Be sure that the gasket(s) is not brittle and that it uniformly adheres to its mating surface.

### 3.3. PERFORMANCE VERIFICATION

**TEMPERATURE CONTROL:**

The following explanation of thermostat operation will help you understand the Performance Verification procedure. The thermostat switches (2) identified as A and B are so stamped. Both switches are actuated by chamber temperature (not heater temperature). Their functions are as follows:

### Electrically Heated Units —

When chamber temperature reaches that of the thermostat setting, B opens and reduces heater wattage by approximately 75 percent. Should temperature continue to rise, A will open at approximately five degrees higher than B and shut off power to the heaters.

### Steam-heated Units —

Only one of the thermostat switches is used. At the selected temperature, the switch opens and de-energizes the steam supply solenoid valve and HEAT indicating light.

**TEMPERATURE CONTROL VERIFICATION:****Electrically Heated Units**

1. Suspend a thermocouple in the center of the heating chamber, five inches below the top. Connect thermocouple lead wires to a potentiometer.\*

2. Set the Thermostat at HIGH and the Timer for one hour. Press the Power Switch ON (OPERATING and HEAT Indicating Lights should glow). Close chamber door.

3. Observe the HEAT Indicating Light and note the potentiometric reading when the light goes off (thermostat B switch opens); it should be  $300 \pm 5$  F. **Note:** Time required for chamber to heat from room temperature to above readings should be approximately 45 minutes.

**NOTE:** The above temperature (300 F) as well as subsequent ones given in this procedure are chamber air temperatures measured on specially placed thermocouples. Therefore, they will not correspond with those registered on the Dryer thermometer.

4. Continue to observe the HEAT Indicating Light and note at what temperature it comes back on (thermostat closes); it should be  $290 \pm 5$  F.

5. Press the Power Switch OFF. Raise the control panel (see Paragraph 3-2, step 2) for access to the thermostat connections. Connect a jumper from B common to B normally closed.

6. Press the Power Switch ON and close the chamber door. Observe the HEAT Indicating Light and note the potentiometric reading when the light goes off (thermostat A switch opens); it should be  $305 \pm 2$  F.

7. Press the Power Switch OFF. Remove the jumper and allow the Dryer to cool. Leave chamber door open.

8. When chamber temperature is less than 290 F, press the Power Switch ON and close the chamber door. Recheck the HIGH setting per step 3.

\*Leeds and Northrup (Philadelphia, Pa.) Catalog No. 8693, or equivalent.

9. Press the Power Switch OFF. Secure the control panel and remove the thermocouple from the chamber.

**Steam-heated Units**

1. Suspend a thermocouple in the center of the heating chamber, five inches below the top. Connect thermocouple lead wires to a potentiometer.\*

2. Set the Thermostat at HIGH and the Timer for one hour. Press the Power Switch ON (OPERATING and HEAT Indicating Lights should glow). Close chamber door.

3. Observe the HEAT Indicating Light and note the potentiometric reading when the light goes off (thermostat B switch opens); it should be  $215 \pm 5$  F.

**NOTE:** The above temperature (215 F) as well as subsequent ones given in this procedure are chamber air temperatures measured on specially placed thermocouples. Therefore, they will not correspond with those registered on the Dryer thermometer.

4. Continue to observe the HEAT indicating Light and note at what temperature it comes back on (thermostat closes); it should be  $205 \pm 5$  F.

5. Press the Power Switch OFF and allow the Dryer to cool. Leave chamber door open.

6. When chamber temperature is less than 205 F, press the Power Switch ON and close chamber door. Repeat steps 3 and 4 to check temperature control repetition.

7. Press the Power Switch OFF and remove the thermocouple from the chamber.

**3-4. PREVENTIVE MAINTENANCE (Quarterly)**

1. Remove the two screws which secure the hinged toeplate at the front of the unit; raise the plate. Remove and inspect the air filter; discard and replace it, if necessary. Vacuum the entire filter installation area and then reinstall the filter in its mounting brackets.

**NOTE:** For maximum Dryer operating efficiency, the filter must be properly maintained. Replace the filter if there is any doubt about its performance capabilities.

2. Use a mild detergent solution such as Calgonite® (Calgon Corp.) to wash nonstainless-steel surfaces. Rinse with tap water using a sponge or damp cloth. Wipe dry with a lint-free cloth.

**3-6. TROUBLESHOOTING**

1. Use the operating procedures in Section 2 to verify trouble symptoms.

2. Refer to the Troubleshooting Chart (Table 3-1) after the symptom has been verified. Select the problem example that is most appropriate. Follow the recommended correction.

3. Use the electrical schematics (Figures 3-1 and 3-2) to locate and understand operation of the system.

4. Also, refer to Section 4, COMPONENT REPAIR AND REPLACEMENT.

2. Place a few drops of oil on the door hinges. Work oil into hinges by opening and closing the door several times. Use the oil sparingly and wipe away excess.

3. Steam-heated Units — Clean the steam supply line strainer as follows:

a. Close the building steam supply valve.

b. Open the chamber door and remove the perforated bottom plate.

c. Remove the strainer by disassembling the couplings in front of and behind the strainer. (Make note of steam flow direction, as indicated on side of strainer.)

d. Disassemble and clean the strainer.

e. Replace the strainer by reversing the above procedure.

**3-5. CLEANING**

1. Use **AMSCO STAINLESS STEEL CLEANER & POLISH** on all stainless-steel surfaces. Apply the cleaner with a damp cloth or sponge, thoroughly wipe the soiled surfaces and then polish with a clean, dry cloth. Use **AMSCO PRY Cleaner** to remove stubborn stains.

**CAUTION:** When using **AMSCO STAINLESS STEEL CLEANER & POLISH** or **AMSCO PRY Cleaner**, rub in a back-and-forth motion (in the same direction as the surface grain). Do not rub with a rotary or circular motion. Do not use these cleaners on painted surfaces. Follow directions on the containers.

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TABLE 3-1. TROUBLESHOOTING CHART

PROBLEM	CORRECTION
1. Dryer won't operate	<p>Check Fuse (Steam-heated Unit) or Circuit Breaker (Electrically-heated Unit); replace or reset, as necessary</p> <p>Check electrical service to Dryer; correct, if necessary</p> <p>Check Power Switch; replace, if necessary</p> <p>Trace Power Circuit; restore continuity, if necessary</p>
2. Power switch on but unit will not heat (HEAT indicating light does not glow)	<p>Be sure Timer is set at other than "0"</p> <p>Check Timer switch; replace Timer, if necessary</p> <p>Check Thermostat; adjust or replace, as necessary</p> <p>Check Control Relays (electrically heated unit); replace, if necessary</p> <p>Trace Heater Circuit; restore continuity, if necessary</p>
3. Dryer heats but temperature is not maintained at thermostat setting	<p>Check Thermostat; adjust or replace, as necessary</p> <p>Be sure Thermometer is calibrated properly; adjust or replace, as necessary</p> <p>Steam-heated Units:</p> <p>Check and clean steam supply Solenoid Valve; replace, if necessary</p> <p>Check and clean steam supply line Strainer; replace, if necessary</p> <p>Check and clean steam return line Trap; replace, if necessary</p> <p>Electrically Heated Units:</p> <p>Check Control Relays; replace, if necessary</p> <p>Check Heater assemblies; replace, if necessary</p>

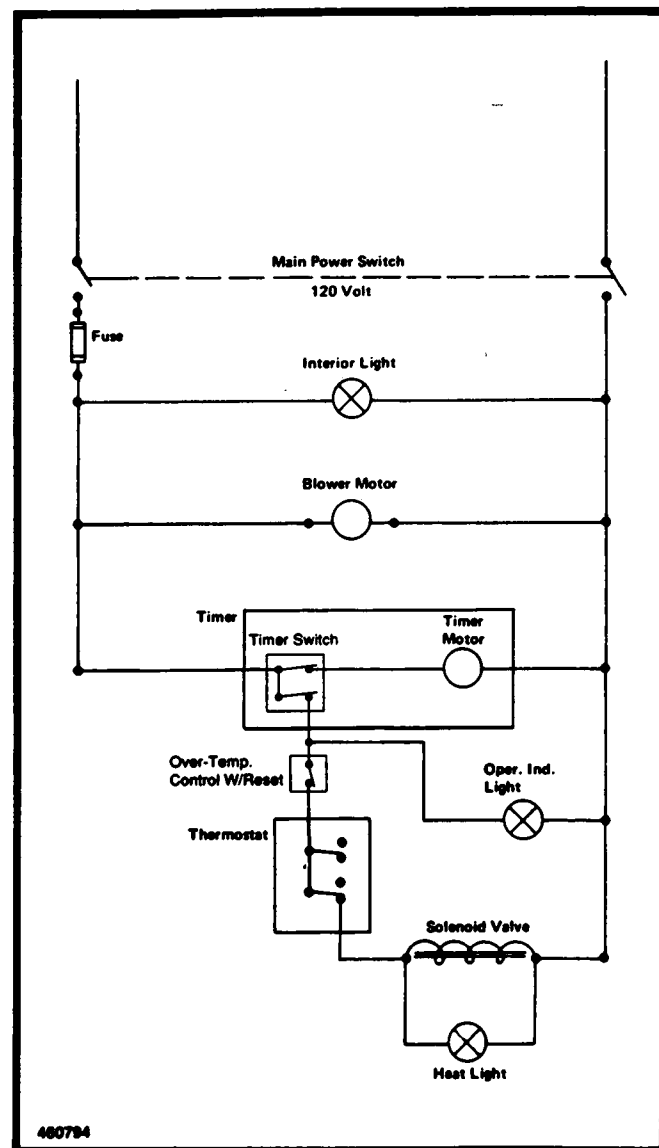
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TABLE 3-1. (Continued)

PROBLEM	CORRECTION
4. Dryer overheats	<p>Check Thermostat; adjust or replace, as necessary</p> <p>Be sure Thermometer is calibrated properly; adjust or replace, as necessary</p> <p>Be sure Blower is operative; see item 5</p> <p>Check air filter; replace, if necessary</p> <p>Check and clean steam supply Solenoid Valve; replace, if necessary (not applicable for electrically heated units)</p>
5. Blower won't operate	<p>Check for thermal overload; change Filter or reduce steam supply pressure (if applicable), as necessary</p> <p>Check Blower; replace, if necessary</p> <p>Trace Blower Circuit; restore continuity, if necessary</p>
6. Timer will not operate	<p>Check Timer; replace, if necessary</p> <p>Trace Timer Circuit; restore continuity, if necessary</p>

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NOTE: Timer Switch is shown in the closed position.

Figure 3-1. ELECTRICAL SCHEMATIC: Steam-heated Units.

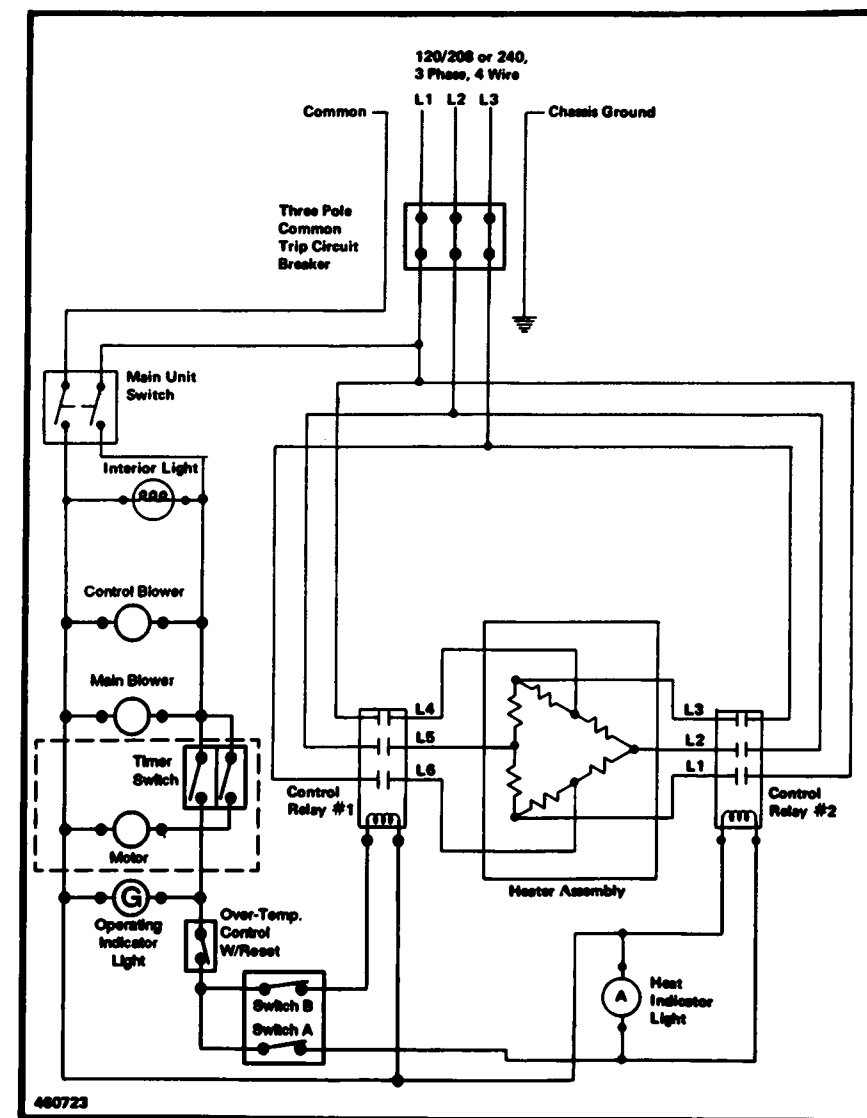


Figure 3-2. ELECTRICAL SCHEMATIC: Electrically Heated Units.

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## SECTION 4

## COMPONENT REPAIR AND REPLACEMENT

## 4-1. GENERAL

This section includes instructions for the adjustment, disassembly, repair, and replacement of the major components of a Glassware Dryer. Exploded views showing the various parts and assemblies referred to in this section are in Section 5.

**WARNING: BE SURE TO PRESS THE POWER SWITCH AND CIRCUIT BREAKER OFF AND ALLOW THE CHAMBER TO COOL BEFORE STARTING ANY OF THE FOLLOWING PROCEDURES.**

## 4-2. THERMOSTAT (Fig. 5-2)

## Adjustment

**NOTE:** Field adjustments should be made only if absolutely essential.

1. The temperature control is designed to automatically maintain selected chamber temperatures (see explanation, Paragraph 3-3). Adjustments to ensure this performance, are as follows:

- a. Remove the thermostat knob (9).
- b. While holding the dial shaft stationary, rotate the center stem screw clockwise to increase the temperature; counterclockwise to decrease it.
- c. Replace the knob.

2. To change the temperature differential at which the overtemperature control (electrically heated units only) will operate, do the following:

- a. Raise the control panel (see Paragraph 3-2, step 2) to gain access to the thermostat.
- b. Locate the hex-head screw beneath the switches on the "common" terminal ends.

c. Turn the screw (with a 1/4 open-end wrench) clockwise to decrease temperature difference; counterclockwise to increase it.

- d. Lower and secure the control panel.

## Replacement

1. Raise the control panel (see Paragraph 3-2, step 2) to gain access to the control area.
2. Remove the thermostat knob (9) and the two screws (17) which secure the thermostat (8) to the control panel.
3. Disconnect the wiring at the thermostat.
4. Carefully pull the sensor bulb from the exhaust stack.
5. Remove the thermostat.
6. Replace existing thermostat with a new one.
7. Carefully return the sensor bulb to the exhaust stack.
8. Reconnect thermostat wiring.
9. Replace thermostat bulb (9) and the two screws (17) which secure the thermostat (8) to the control panel.
10. Lower and secure the control panel.

## 4-3. TIMER (Fig. 5-2)

## Replacement

1. Raise the control panel (see Paragraph 3-2, step 2) to gain access to the timer (7).
2. Remove the timer knob (9) and the three screws (16) which secure the timer to the control panel.

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3. Disconnect the wiring at the timer.
4. Replace existing timer with a new one.
5. Reconnect timer wiring.
6. Reattach timer knob (9) and the three screws (16) which secure the timer to the control panel.
7. Lower and secure the control panel.

#### 4-4. POWER SWITCH (Fig. 5-2)

##### Replacement

1. Disconnect electrical power to the unit.
2. Raise the control panel (see Paragraph 3-2, step 2) to gain access to the control area.
3. Disconnect the four leads from the switch terminals (10).
4. Remove the two hold-down screws (13).
5. Replace existing switch with a new one.
6. Replace the two hold-down screws (13).
7. Reconnect the four leads from the switch terminals (10).
8. Lower and secure the control panel.
9. Turn on electrical power to the unit.

#### 4-5. THERMOMETER (Fig. 5-3)

##### Replacement

1. Raise the control panel (see Paragraph 3-2, step 2) to gain access to the thermometer (1).
2. Carefully unscrew nut holding sensor bulb and remove it from the exhaust stack.
3. Remove the two screws (19) holding the thermometer in position.
4. Replace existing thermometer with a new one.

5. Replace the two screws (19) that hold thermometer in position.

6. Carefully restore sensor bulb to the exhaust stack and tighten nut holding bulb.

7. Lower and secure the control panel.

#### 4-6. PILOT LAMP — Indicating (Fig. 5-2)

##### Replacement

1. Snap the lens cover (3 or 4) out of the control panel.
2. Turn lamp (2) to the left and pull straight out.
3. Push new lamp into socket and turn lamp to the right.
4. Snap the lens cover (3 or 4) back into the control panel.

#### 4-7. MAIN CONTROL FUSE — Steam-heated Units (Fig. 5-2)

##### Replacement

1. Push in on the fuse holder (20) and turn left 1/4 turn to release.
2. The fuse (19) is mounted in the socket of the fuse holder cap and can be removed by pulling out.
3. Replace the fuse; use care when replacing the fuse holder — do not force it into place.

#### 4-8. CIRCUIT BREAKER — Electrically Heated Units (Fig. 5-2)

##### Replacement

1. Disconnect electrical power to the unit.
2. Raise the control panel (see Paragraph 3-2, step 2) to gain access to the circuit breaker (5).
3. Disconnect the wiring at the circuit breaker.

4. Remove the circuit breaker mounting screws (21) and the circuit breaker.

5. Replace existing circuit breaker with a new one.

6. Replace circuit breaker mounting screws (21).

7. Reconnect circuit breaker wiring.

8. Lower and secure the control panel.

9. Turn on electrical power to the unit.

#### 4-9. CONTROL CONTACTORS — Electrically Heated Units (Fig. 5-2)

##### Replacement

1. Raise the control panel (see Paragraph 3-2, step 2) to gain access to the control contactors (6).
2. Position the circuit breaker (5) at OFF and disconnect the wiring at the control contactors.
3. Remove the control contactors mounting screws (23) and nuts (24).
4. Replace existing control contactors with new ones.
5. Replace the control contactors mounting screws (23) and nuts (24).
6. Connect the wiring at the control contactors.
7. Position the circuit breaker (5) to ON.

#### 4-10. PILOT LAMP — Chamber Interior (Fig. 5-3)

When installing either a new-style mounting strap or new-style pilot light receptacle on units shipped before August 24, 1977, proceed as follows:

1. **New-style Mounting Strap:** Drill and tap two holes in the mounting strap for 6-32 screws so that these two holes line up with the mounting holes in the bracket of old-style pilot light receptacle. Attach mounting strap on rear of light receptacle bracket.

2. **New-style Pilot Light Receptacle:** Attach old-style mounting strap on rear of new-style pilot light receptacle bracket.

##### Replacement

1. Open the chamber door to gain access to the interior light (2).
2. Remove the four screws (17) holding the lens (20) and lens cover (21). Remove the lens and lens cover.
3. Turn lamp to the left and pull straight out.
4. Push new lamp into socket and turn lamp to the right.
5. Replace lens (20), lens cover (21) and secure with four screws (17).
6. Close chamber door.

#### 4-11. HEATING ELEMENTS — Electrically Heated Units (Fig. 5-3)

##### Replacement

1. Raise the control panel (see Paragraph 3-2, step 2) and position the circuit breaker at OFF.
2. Open the chamber door and lift out the bottom mesh (6).
3. Remove the screw (22), washer (23), and nut (24) at each end that secures the element to the mounting plate.
4. Disconnect the wires from the defective heating element (9) and discard element.
5. Insert new heating element and reconnect the wires.
6. Secure the new element to the mounting plate using screws (22), washers (23), and nuts (24).
7. Replace bottom mesh (6) and close chamber door.
8. Position circuit breaker to ON.
9. Lower and secure control panel.

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**4-12. HEATING COIL — Steam-heated Units (Fig. 5-3)****Replacement**

1. Shut off the building steam supply to the Dryer.
2. Open the chamber door and lift out the bottom mesh (6).
3. Disconnect the steam-in and steam-out compressions from the coil (7).
4. Remove the coil support mounting screws (17) and lift out the coil.
5. Replace existing coil with a new one.
6. Replace the coil support mounting screws (17).
7. Reconnect the coil steam-in and steam-out compressions.
8. Replace bottom mesh (6) and close chamber door.
9. Turn on building steam supply.

**4-13. STRAINER — Steam-heated Units (Fig. 5-3)****Inspection and Cleaning**

1. Shut off the building steam supply to the Dryer.
2. Open the chamber door and lift out the bottom mesh (6).
3. Remove the strainer (13) by disassembling the couplings in front of and behind the strainer. (Make note of the steam flow direction, as indicated on the side of the strainer.)
4. Disassemble and clean the strainer.
5. Replace the strainer.
6. Reassemble the couplings in front of and behind the strainer. Be sure the steam flow direction is the same direction as indicated by the arrow on the side of the strainer.

7. Replace bottom mesh.

8. Close chamber door.

9. Turn on building steam supply.

**4-14. SOLENOID VALVE — Steam-heated Units (Fig. 5-3)****Replacement**

1. Open the chamber door and lift out the bottom mesh (6).
2. Close the steam supply valve (12). Turn hand-wheel clockwise.
3. Disconnect the solenoid valve (14) wiring.
4. Disconnect the compression fitting at the heater (7) inlet. Remove the nipple from the elbow at the solenoid valve outlet.
5. Disassemble the union nut from the outlet side of the steam supply line strainer (13) and remove the valve. Unscrew the elbow from the solenoid valve outlet. Remove the nipple, reducer and union spud from the solenoid valve inlet.
6. Replace existing solenoid valve with a new one.
7. Attach the nipple, reducer and union spud to the inlet side of the solenoid valve.
8. Screw the elbow into the solenoid valve outlet.
9. Replace solenoid valve and piping on outlet side of steam supply line strainer and assemble union nut to spud.
10. Attach nipple to elbow on outlet side of solenoid valve.
11. Reconnect the compression fitting at the heater (7) inlet.
12. Reconnect the solenoid valve wiring.
13. Open the steam supply valve.

14. Replace bottom mesh.

15. Close chamber door.

**4-15. STEAM TRAP — Steam-heated Units (Fig. 5-3)****Inspection and Cleaning**

1. Close the steam supply valve (12). Turn hand-wheel clockwise.
2. Open the chamber door and lift out the bottom mesh (6). Remove the plumbing access panel to the left of the heating coil (7).
3. Open the trap (16) by unscrewing the hex-shaped cap and removing the disc.
4. Wipe the parts clean, taking care to avoid damage to the disc. Wipe out the trap, being sure that loose material does not enter the piping.
5. Replace the disc. Be sure the grooved side faces the trap body.
6. Replace the hex-shaped cap and tighten.
7. Replace the plumbing access panel and perforated bottom mesh.
8. Close chamber door and open the steam supply valve.

**4-16. AIR BLOWER (Fig. 5-3)****Replacement**

1. Open the chamber door and lift out the bottom mesh (6).
2. If an electrically heated unit, raise the heating elements mounting plate (8). If a steam-heated unit, remove the heating coil (7) — (see Paragraph 4-12).
3. Disconnect the blower (10) leads.
4. Remove the blower hold-down screws (18) and remove bonnet (29) and lift out blower.

5. Replace the existing air blower with a new one, and reinstall bonnet (29).

6. Replace hold-down screws (18).

7. Reconnect blower leads.

8. Replace heating coil (see Paragraph 4-12) or heating elements mounting plate.

9. Replace bottom mesh and close chamber door.

**4-17. AIR FILTER (Fig. 5-3)****Replacement**

1. Remove the two screws (see Figure 5-1, Item 17) securing the hinged toeplate at the front of the unit; raise the plate.
2. Remove and discard the air filter (11).
3. Vacuum the entire filter area and then install the new filter by centering it in the mounting brackets.
4. Close and secure the hinged toeplate.

**4-18. DOOR GASKET (Fig. 5-1)****Replacement**

1. Remove the screws (14) which secure the gasket (9) and inside plate to the door (3). Remove these items.
2. Clean the gasket area. Place the gasket on the plate. Notch the gasket web at the corners for proper fit and position the butt seam at the bottom center of door.
3. Secure the gasket and plate to the door with the screws previously removed.

**4-19. FIELD CONVERSIONS****Door Swing Reversal (Fig. 5-1)**

1. Unscrew and remove the bottom hinge pin (11).

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**3. Reverse the position of the lower hinge block (10) with that of the latch angle (13) on the opposite side. Apply "Loctite" (AMSCO Part R-5300-540, manufactured by Locktite Corporation) or an equivalent thread-bonding agent to the hinge-mounting screws (18).**

**4. Rotate the door 180 degrees. Remove and reposition the remaining hinge pin in the top of the door on the side opposite the latch. Apply "Loctite" or equivalent to the hinge pin.**

5. Remove the screws (14) which secure the gasket (9) and inside plate to the door. Remove these items.

**6. Reverse the positions of the top (6) and bottom (7) latch rods so that the rod with the hook is at the bottom of the door. Replace the gasket and inside plate.**

**7. Replace the door on the Dryer by reversing steps 1 and 2. Apply "Loctite" or equivalent to the bottom hinge pin.**

#### 4-20. STEAM SUPPLY VALVE (Fig. 4-1)

### Cleaning and Inspection

1. Open valve fully.
2. Remove packing nut, gland, and bonnet nut. Remove bonnet assembly from valve stem and remove packing.

**3. Unscrew stem from bonnet. Remove disc holder from stem and install new disc.**

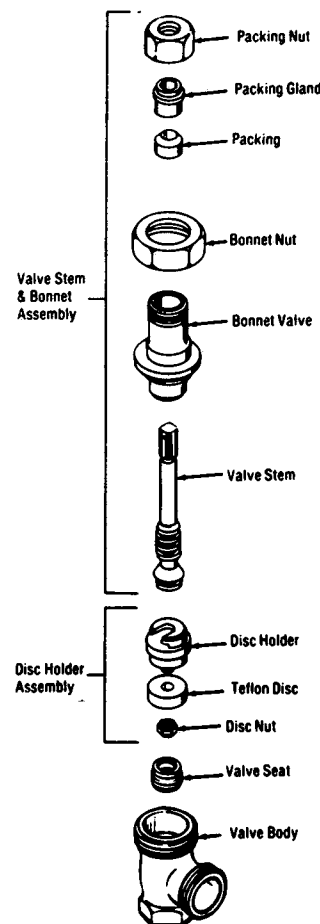
**4. Examine valve seat for scratches, nicks, or wear. Remove and replace if necessary. Clean and inspect all components; replace as necessary.**

## Reassembly

1. Lubricate stem threads with Molykote Type "U", and replace disc holder assembly on stem.

**2. Screw stem into bonnet, and install new packing, forcing it into place with packing nut and gland.**

**3. Replace bonnet assembly on valve body, and tighten bonnet and packing nuts. Tighten only enough to prevent leakage. Excessive tightening will make valve hard to operate.**



**Figure 4-1. STEAM SUPPLY VALVE.**

## SECTION 5

## EXPLODED VIEWS AND PARTS LISTS

The following pages contain an illustrated parts breakdown. Assemblies and components are illustrated and identified as follows:

2. Turn to the page indicated and locate the desired part on the illustration; note its index number.

3. Refer to the accompanying description for specific information regarding the part.

**General Assembly** **Figure 5-1**

Control Assembly Figure 5-2

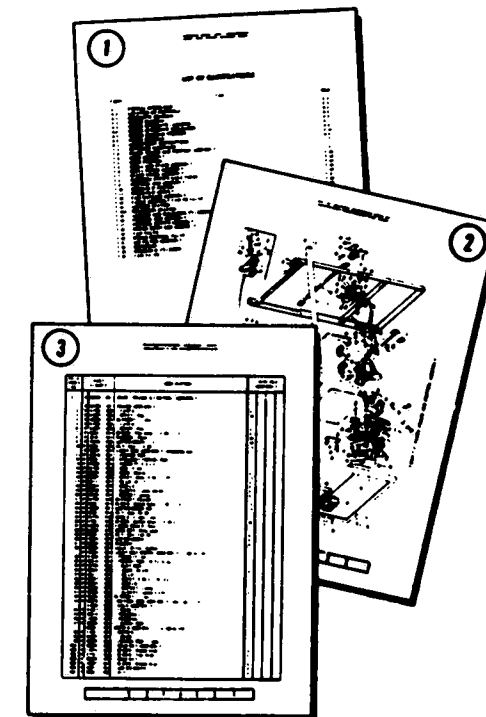
**Heating System** **Figure 5-3**

Index numbers are not assigned to parts having little or no maintenance frequency nor to commercial hardware. Such parts are illustrated, however, merely to aid assembly and disassembly procedures. Parts not having index numbers should be either ordered from AMSCO (by description) or procured locally. When ordering parts by description, include (from the illustration) the number of the assembly on which located. Thread sizes (e.g., No. 8, 10-32, 1/4-20, etc.) are listed to aid selection of proper fasteners.

Each list includes the part numbers, descriptions and quantities of parts required for a single Glassware Dryer. Subassembly components are indicated by indentation. The UNITS PER ASSEMBLY column is indicated by an asterisk.

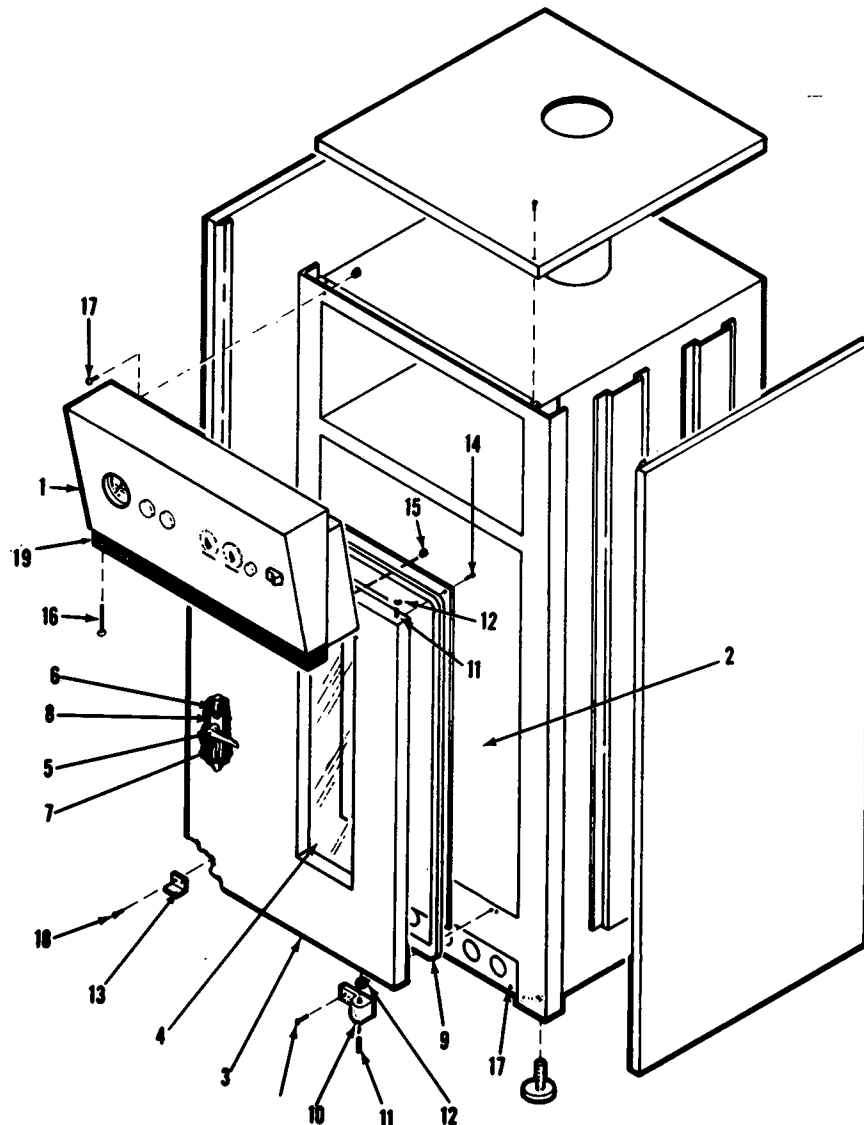
## HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN

**1. Determine the function and application of the part required. Turn to the List of Illustrations and select the most appropriate title. Note the illustration page number.**



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NOTE: Side and top enclosure panels are for freestanding units only.

Figure 5-1. GENERAL ASSEMBLY

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY			
5-1-	468113-001	GENERAL ASSEMBLY: Steam-heated Units, 120 Volt, Single Phase . .	*			
	468114-001	GENERAL ASSEMBLY: Electrically Heated Units, 208 Volt, 3 Phase . .		*		
	468115-001	GENERAL ASSEMBLY: Electrically Heated Units, 240 Volt, 3 Phase . .			*	
1	P-467801-091	CONTROL ASSEMBLY (See Figure 5-2) . . . . .	1			
	P-467974-001	CONTROL ASSEMBLY (See Figure 5-2) . . . . .		1	1	
2	P-466146-001	HEATING ASSEMBLY, 208 Volt (See Figure 5-3) . . . . .		1		
	P-466111-001	HEATING ASSEMBLY, 240 Volt (See Figure 5-3) . . . . .			1	
3	P-465454-091	DOOR ASSEMBLY, Chamber . . . . .	1	1	1	†
4	P-452154-091	• WINDOW, Glass . . . . .	1	1	1	†
	P-452155-091	• CHANNEL, Glass Mounting (Not Shown) . . . . .	2	2	2	†
5	P-451528-056	• HANDLE . . . . .	1	1	1	†
6	P-452151-091	• ROD, Upper Latch . . . . .	1	1	1	†
7	P-452152-091	• ROD, Lower Latch . . . . .	1	1	1	†
8	P-451542-045	• ROD, End . . . . .	2	2	2	†
9	P-452123-091	GASKET, Door . . . . .	1	1	1	†
10	P-455065-155	BLOCK, Hinge . . . . .	1	1	1	†
11	P-452446-191	PIN, Hinge . . . . .	2	2	2	†
12	P-430029-091	WASHER, Hinge . . . . .	2	2	2	†
13	P-452120-091	ANGLE, Latch . . . . .	1	1	1	†
14	P-430056-045	SCREW, Oval Head Type 1 (6x3/8) . . . . .	4	4	4	
15	P-430226-045	NUT, Keps (10-24) . . . . .	4	4	4	
16	P-430407-045	SCREW, Oval Head Type A (8x2) . . . . .	A/R	A/R	A/R	
17	P-430064-045	SCREW, P.H. Type P (8-32x3/8) . . . . .	4	4	4	
18	P-413652-764	SCREW, FHMS (10-24x7/8) . . . . .	4	4	4	
19	P-465453-010	CHANNEL ASSEMBLY . . . . .	1	1	1	†
†Double these quantities for double-door units.						

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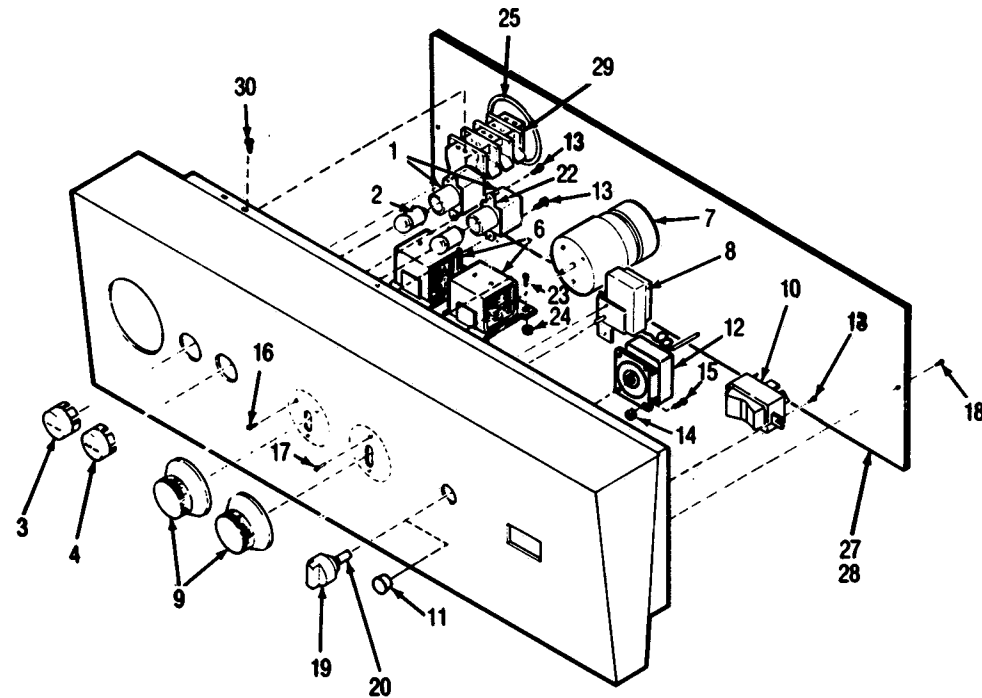


Figure 5-2. CONTROL ASSEMBLY.

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY			
5-2	467801-091 467974-001	CONTROL ASSEMBLY: Steam-heated Units CONTROL ASSEMBLY: Electrically Heated Units, 208 or 240 Volt	•	•		
1	P-455015-001	RECEPTACLE, Pilot Lamp (See Note)	2	2		†
2	P-430028-091	LAMP, Pilot (6 watt)	2	2		†
3	P-90533-010	INDICATOR LENS (Heat)	1	1		†
4	P-451416-010	INDICATOR LENS (Operating)	1	1		†
5		NOT USED				
6	P-453945-001	CONTROL CONTACTOR (20 amp Induct.; 30 amp Resist.)		2		
7	P-451481-091	TIMER, 60 Cycle	1	1		
	P-413716-597	TIMER, 50 Cycle	1	1		
	P-413716-598	TIMER (Used on Prototype Model)	1	1		
8	P-452148-091	THERMOSTAT	1	1		
9	P-453282-001	KNOB, Control	2	2		
10	P-90624-091	SWITCH, Power	1	1		
11	P-453006-091	BUTTON, Plug		1		
12	P-452251-091	FAN		1		
13	P-430379-045	SCREW, Truss Head Type A (6-3/8)	6	6		
14	P-430016-045	NUT, Keps (6-32)	A/R	A/R		
15	P-452761-045	SCREW, Slot Head Machine (6-32x1/2)	A/R	A/R		
16	P-430344-045	SCREW, Bind. Head Type A (8x1/2)	3	3		
17	P-430364-091	SCREW, Special Oval Head (6x32x3/8)	2	2		
18	P-430064-045	SCREW, Bind. Head Machine (8-32x3/8)	4	4		
19	P-20340-091	FUSE HOLDER	1			
20	P-35581-091	FUSE, 1 amp	1			
21	P-430362-045	SCREW, Bind. Head Machine (6-32x3/6)	A/R	A/R		†
22	P-455016-001	STRAP, Mounting (See Note)	2	2		
23	P-3967-041	SCREW, Round MS. SL (8-32x1/4)	1	7		
24	P-430015-045	NUT, Keps (8-32x3/8)	1	11		
25	P-47182-091	BUSHING, Snap	1	2		
26	P-430315-051	BUTTON, Plug, 7/8 (Not Shown)	1			
27	P-452810-091	PLATE, Access	1			
28	P-461575-001	PLATE, Access		1		
29	P-454173-001	BLOCK, Terminal, 30-Amp		1		
30	P-3987-041	SCREW, #8-32 x 3/4		4		

NOTE: When replacing either or both of these parts see paragraph 4-10.

\*Double these quantities for double-door units.

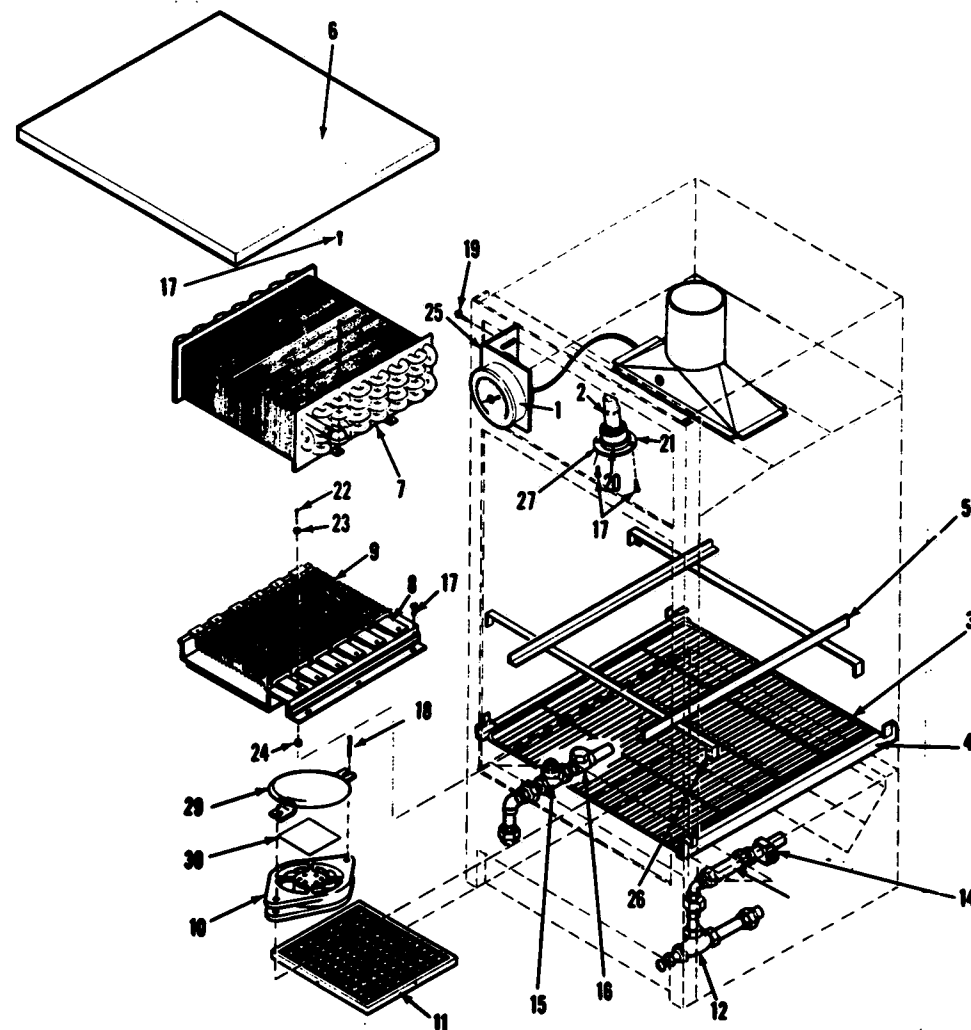


Figure 5-3. HEATING SYSTEM.

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY			
5-3		HEATING SYSTEM: Steam-heated Units, 120 Volt, Single Phase . . . . .	•	•	•	
		HEATING SYSTEM: Electrically Heated Units, 208 Volt, 3 Phase . . . . .				
		HEATING SYSTEM: Electrically Heated Units, 240 Volt, 3 Phase . . . . .				
1	P- 25604-091	THERMOMETER . . . . .	1	1	1	†
2	P- 452634-091	LIGHT, Chamber Interior . . . . .	1	1	1	
	P- 430028-091	LAMP, Pilot (Not Shown) . . . . .	1	1	1	
3	P- 460726-068	SHELF, Wire . . . . .	4	4	4	
4	P- 460725-091	SLIDE, Shelf Support . . . . .	8	8	8	
5	P- 461232-001	TRACK, Single-door Units (Optional) . . . . .	1	1	1	
	P- 461230-001	TRACK, Double-door Units (Optional) . . . . .	1	1	1	
6	P- 452125-091	MESH, Bottom . . . . .	1	1	1	
7	P- 467773-091	COIL, Heating . . . . .	1			
8	P- 466146-001	HEATER ASSEMBLY . . . . .		1		
	P- 466111-001	HEATER ASSEMBLY . . . . .			1	
9	P- 452619-091	• ELEMENT, Heating (1300 watt) . . . . .		3		
	P- 452156-091	• ELEMENT, Heating (1000 watt) . . . . .		3	6	
10	P- 452607-091	BLOWER, Air . . . . .	1	1	1	
11	P- 452818-091	FILTER, Incoming Air . . . . .	1	1	1	
12	P- 430479-091	VALVE, Steam Supply . . . . .	1			
13	P- 430184-091	STRAINER, Steam Supply . . . . .	1			
14	P- 451981-091	VALVE, Solenoid . . . . .	1			
15	P- 5424-091	VALVE, Check . . . . .	1			
16	P- 41067-091	TRAP, Steam . . . . .	1			
17	P- 430064-045	SCREW, P.H. Type F (8-32x3/8) . . . . .	66	66	66	
18	P- 11241-041	SCREW, Machine (8-32x5/8) . . . . .	4	4	4	
19	P- 430371-045	SCREW, O.H. Type F (8-32x1/2) . . . . .	3	3	3	
20	P- 453937-001	LENS . . . . .	1	1	1	
21	P- 453936-001	LENS, Cover . . . . .	1	1	1	
22	P- 430383-045	SCREW, R.H. Slotted Machine (10-24x1/2) . . . . .	A/R	A/R	A/R	
23	P- 430482-045	WASHER (7/32x1/2x.045) . . . . .	A/R	A/R	A/R	
24	P- 430226-045	NUT, Keps (10-24x11/64x7/16) . . . . .	4	4	4	
25	P- 460993-091	BRACKET, Thermometer . . . . .	1	1	1	†
26	P- 452754-091	SCREW, 8-32 x 3/8" . . . . .	8	8	8	
27	P- 453938-001	GASKET, Light . . . . .	2	2	2	
28	P- 454171-001	THERMOSTAT, Reset (Over-heat protector; Not Shown) . . . . .	1	1	1	
29	P- 452705-091	BONNET WELD, Blower . . . . .	1	1	1	
30	P- 452708-091	INSULATION, Bonnet . . . . .	1	1	1	

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