

ClevelandRange

SteamCraft[®] V

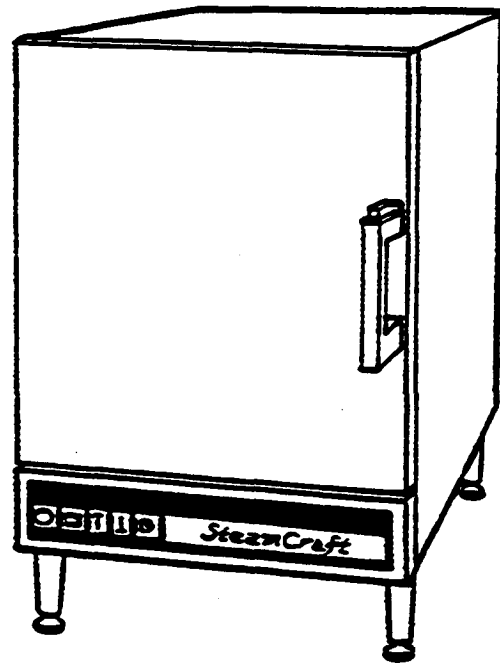
COUNTER TYPE

CONVECTION STEAMER

SERVICE MANUAL

Model CET-16

Printed March, 1990



Cleveland Range

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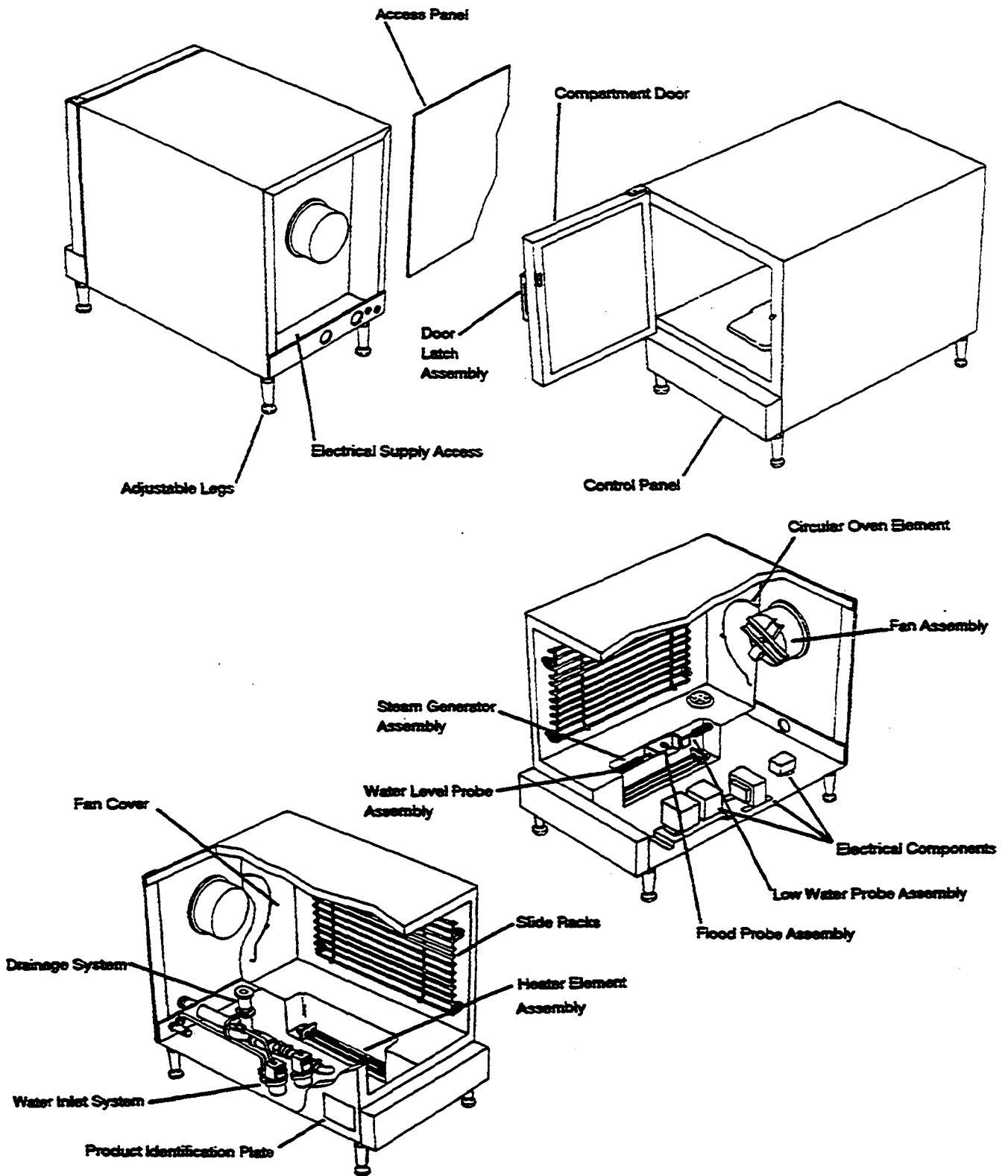


Figure 1-1. SteamCraft V Counter Type Convection Steamer

CHAPTER 1. PRODUCT IDENTIFICATION

Cleveland Range, Inc. identifies products by two numbers: a model number and a serial number. The model number identifies the product characteristics. The serial number identifies the individual unit

MODEL NUMBER

SteamCraft V steamers are identified by model number CET-16. Each character of the model number identifies a characteristic of the steamer. The SteamCraft V is a Convection steamer, Electric powered, and Table mounted with an input energy rating of 16.5 KW. This manual covers all standard features of model CET-16 SteamCraft V steamers. Figure 1-1 illustrates the SteamCraft V and identifies the major components.

SERIAL NUMBER

During manufacture, SteamCraft V's are assigned serial numbers. A typical SteamCraft V serial number is: WC-7350-89G-02 The left half of the number carries design information. The right half of the number contains the manufacturing date and the unit of the manufacturing lot. The date of our sample number is July, 1989:89= 1989, G=July. 02=the second unit of the manufacturing lot.

Serial numbers are used when explaining differences in design, parts, or operation among units with the same model number. For example: a particular part is used on all CET-16 steamers, with serial numbers before WC-7350-89G-02, and a different part is used on CET-16 steamer WC-7350-89G-02 and all those manufactured after it

Presently, there are no significant design, parts, or operating differences among model CET-16 SteamCraft V steamers.

PRODUCT INFORMATION PLATE

The serial number and model number for each are listed on the product information tag secured to the left side of the steamer. Refer to figure 1-1 for the location of this tag. Figure 1-2 illustrates a typical SteamCraft product information plate. Note that the power and wiring requirements are also listed.

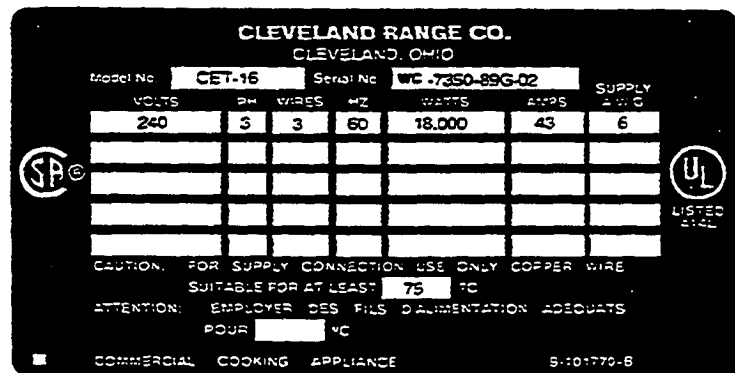


Figure 1-2. SteamCraft V Product Information Plate

CHAPTER 2. INSTALLATION INSTRUCTIONS

INTRODUCTION

This chapter is a guide for qualified, professional plumbers and electricians installing the SteamCraft V steamer. This guide does not include procedures and precautions in the common domain of licensed plumbers and electricians, or experienced food service equipment installers. The instructions in this chapter must be used in conjunction with a thorough understanding of the Basic Plumbing Code of the Building Officials and Code Administrators International, Inc. (BOCA) and the Food Service Sanitation Manual of the Food and Drug Administration (FDA).

Before starting installation, the owner and the installer should read through this chapter and thoroughly understand and agree upon:

- The installation policies of Cleveland Range, Inc. as stated in Installation Policies
- An installation plan based on Installation Overview and Preparation For Installation
- Responsibility for feed water quality and its testing as described in Preparation for Installation, Water Quality

WARNING

DEATH, INJURY, AND EQUIPMENT DAMAGE could result from improper installation of the SteamCraft V, or from installation of a unit damaged during shipment or storage. Either of these conditions could also void the equipment warranty. DO NOT INSTALL a SteamCraft V suspected of damage. Install the SteamCraft V according to the policies and procedures outlined in this manual

INSTALLATION POLICIES

- The SteamCraft V must be installed by qualified plumbing and electrical personnel, working to all applicable national and local codes. Equipment installation must comply with the Basic Plumbing Code of the Building Officials and Code Administrators International Inc. (BOCA) and the Food Service Sanitation Manual of the Food and Drug Administration (FDA).
- This equipment is designed and manufactured to comply with applicable standards for manufacturers. Included among those certification agencies which have approved the safety of the

equipment design and construction are: UL, A.G.A., ASME/N. Bd., NSF, CSA, CGA, ETL, and others.

- This equipment is designed and certified for safe operation only when permanently installed in accordance with local and/or national codes. Many local codes exist, and it is the responsibility of the owner and installer to comply with these codes.
- In no event shall the manufacturer assume any liability for damage or injury resulting from installations which are not in strict compliance with the Installation Instructions and the codes cited above. Specifically, the manufacturer will not assume any liability for damage or injury resulting from improper installation of equipment, including, but not limited to, temporary or mobile installations.

INSTALLATION OVERVIEW

Schematic Installation Diagram, figure 2-1, illustrates the various electrical, water, and drain lines that must be connected to the SteamCraft V. These lines can be constructed and connected to the SteamCraft V easily and without delay if the various construction and installation tasks are performed a planned sequence. Table 2-1 summarizes these tasks and lists them in a recommended sequence. The Installation Checklist outlines the overall installation process; the instructions referenced in the table provide details Installation requirements may vary from site to site; adapt the checklist accordingly.

Table 2-1. Installation Check List

TASK	PAGE REFERENCE	COMPLETED
Preparation	6	
Test SteamCraft V Water Supply	6	
Install Water Treatment System	7	
Select SteamCraft V location	7	
Install Power Line	9	
Extend Water Line(s)	10	
Extend Drain Line	11	
Installation		
Unpack and Inspect SteamCraft V	13	
Assemble Parts Shipped Loose	14	
Position and Level SteamCraft V	16	
Connect Electrical Line	17	
Connect Untreated Water Line	18	
Connect Treated Water Line	20	
Connect Drain Line	20	
Perform Setup and Checkout	21	
Perform Function Test	23	

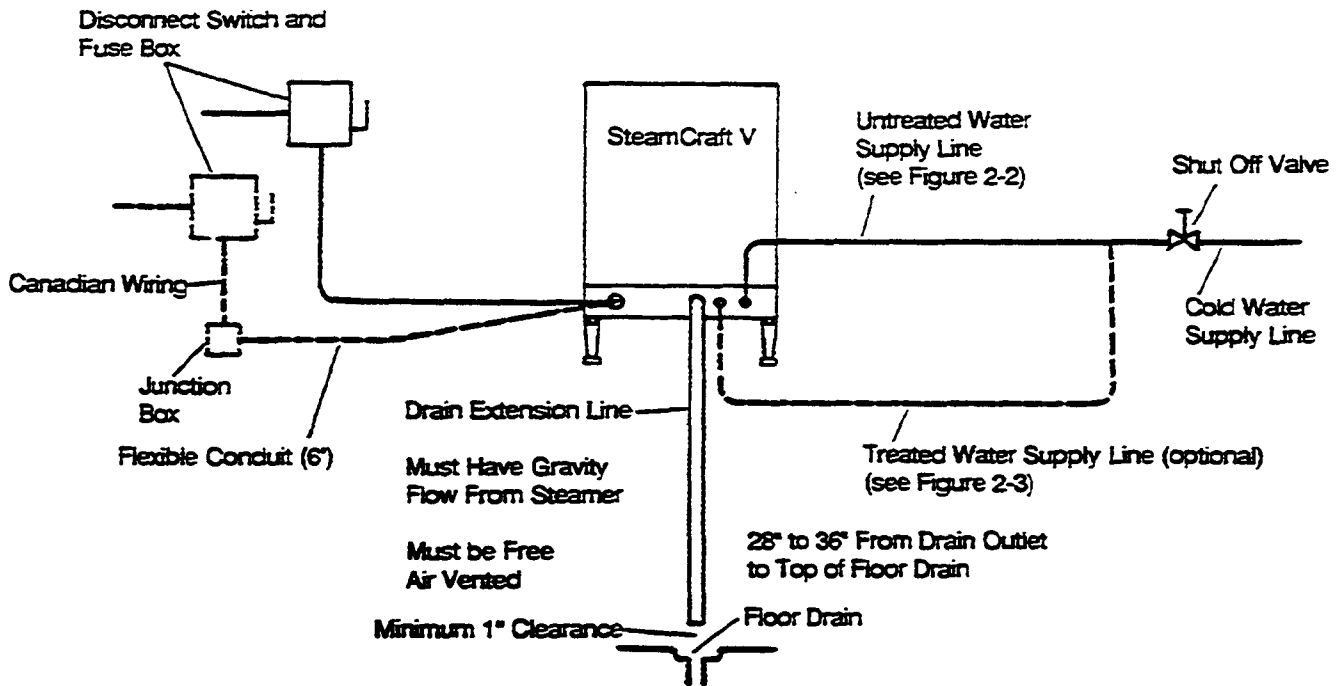


Figure 2-1. Schematic Installation Diagram

1. Electrical conduit access to terminal block inside back cover.
 - Canadian steamers are supplied with six feet of flexible conduit for compliance with Canadian Standards Association.
2. A separate disconnect switch with fuses sized to line amps (see Table 2-3) **MUST** be installed for each steamer.
 - Furnished and installed by others.
3. The steamer **MUST** be electrically grounded by the Installer.
4. Untreated cold water connection (1/4" NPT).
 - Steam Generator and Condenser supply for units without water treatment system.
 - Condenser supply for units with SteamerGard water treatment system.
5. Access for treated cold water connection.
 - Steam Generator supply for units with SteamerGard water treatment systems.
 - Requires additional parts and installation by authorized service representative.
6. Drain outlet connection with 1-1/4" NPT.
 - Outlet extension connects to drain outlet.
 - Outlet extension line has free air vented connection to floor drain.

PREPARATION FOR INSTALLATION

Before unpacking and positioning the SteamCraft V, select and prepare the installation site. This section of Chapter 2 details selection of the SteamCraft operating location, and preparation of that site with power, water, and drain lines.

Water Quality Requirements

**CAUTION
VOID WARRANTY**

The use of steam generator feed water not within the limits specified in this section of the manual could void equipment warranties.

As with any steam generating equipment, water quality is a critical factor in SteamCraft V performance. If Seed water is low in Total Dissolved Solids (TDS) and free of particulate matter, the steam generator, heating elements, and valves of the SteamCraft V will give years of trouble-free service with a minimum of maintenance .

In some areas, even potable tap water contains a variety of impurities that can cause costly problems in steam generating equipment. Of primary concern are mineral salts, IPS, which remain behind as line or scale deposits after the water has boiled away as steam. These deposits have caused a variety of components to fail, including heating elements, probes, and solenoid valves. Of equal importance is the loss of energy efficiency due to line or scale buildup. In these areas, either a SteamerGard water treatment system must be installed, or time frequency of maintenance, cleaning, and descaling must be increased.

It is critical to know the quality of the feed water before starting construction of the water supply lines. If a SteamerGard water treatment system must be installed to achieve acceptable water quality, it should be installed before running the water supply lines to the SteamCraft V.

Contact a local water treatment specialist for an on-the-premises water analysis. The recommended minimum feed water quality requirements for the SteamCraft V are listed in table 2-2.

- If analysis shows that the supply water is within the required limits, a single water connection can be installed as illustrated in figure 2-2.
- If analysis shows that the supply water is NOT within the required limits, a SteamerGard water treatment system and two water supply lines must be installed as illustrated in figure 2-3.
- If analysis shows that the supply water is NOT within the required limits, and it is not possible to install a SteamerGard water treatment; plan on increasing the frequency of maintenance, cleaning, and descaling beyond that recommended in the maintenance schedule (Chapter 4, page 37).

Table 2-2. Minimum Feed Water Quality Requirements

Total Dissolved Solids	less than 60 parts per million
Silica	less than 13 parts per million
Alkalinity	less than 20 parts per million
pH factor	greater than 7.5

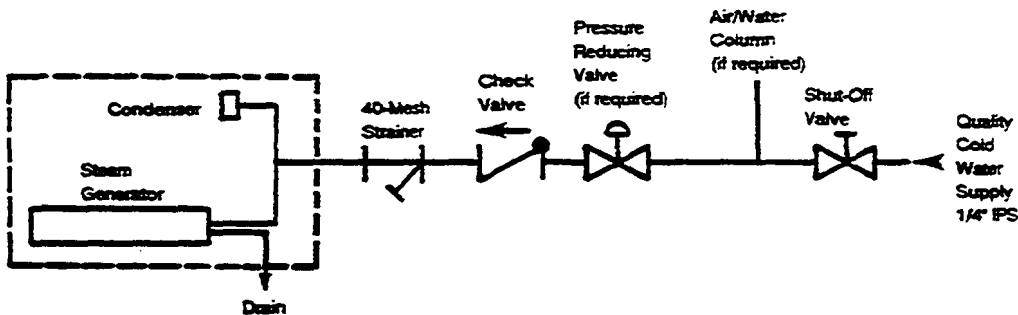


Figure 2-2. Single Water Connection

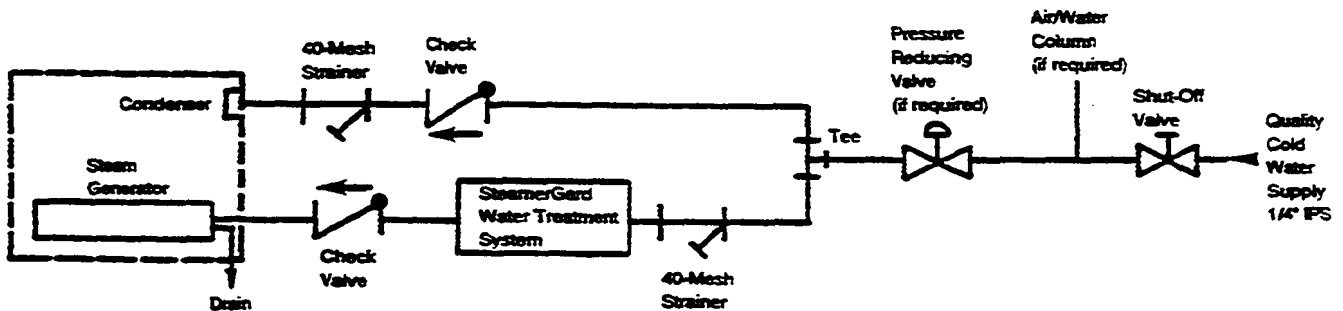


Figure 2-3. Double Water Connection

SteamCraft V Operating Location

When selecting an operating location for the SteamCraftV, observe the following criteria.

- The SteamCraft V takes up a minimum of counter space. Figure 2-4 illustrates the dimensions and clearances required. The 3" clearance at the rear includes spacing for the water inlet strainer and fittings, and the maximum size (2" NPT) drain fittings.
- Figure 2-4 illustrates a left hand door hinge. A right hand door hinge (model # DHR-5) is also available for the SteamCraft V.

INSTALLATION CLEARANCES

- A - 2"
- B - 2"
- C - 3"
- D - 3"
- E - 4"

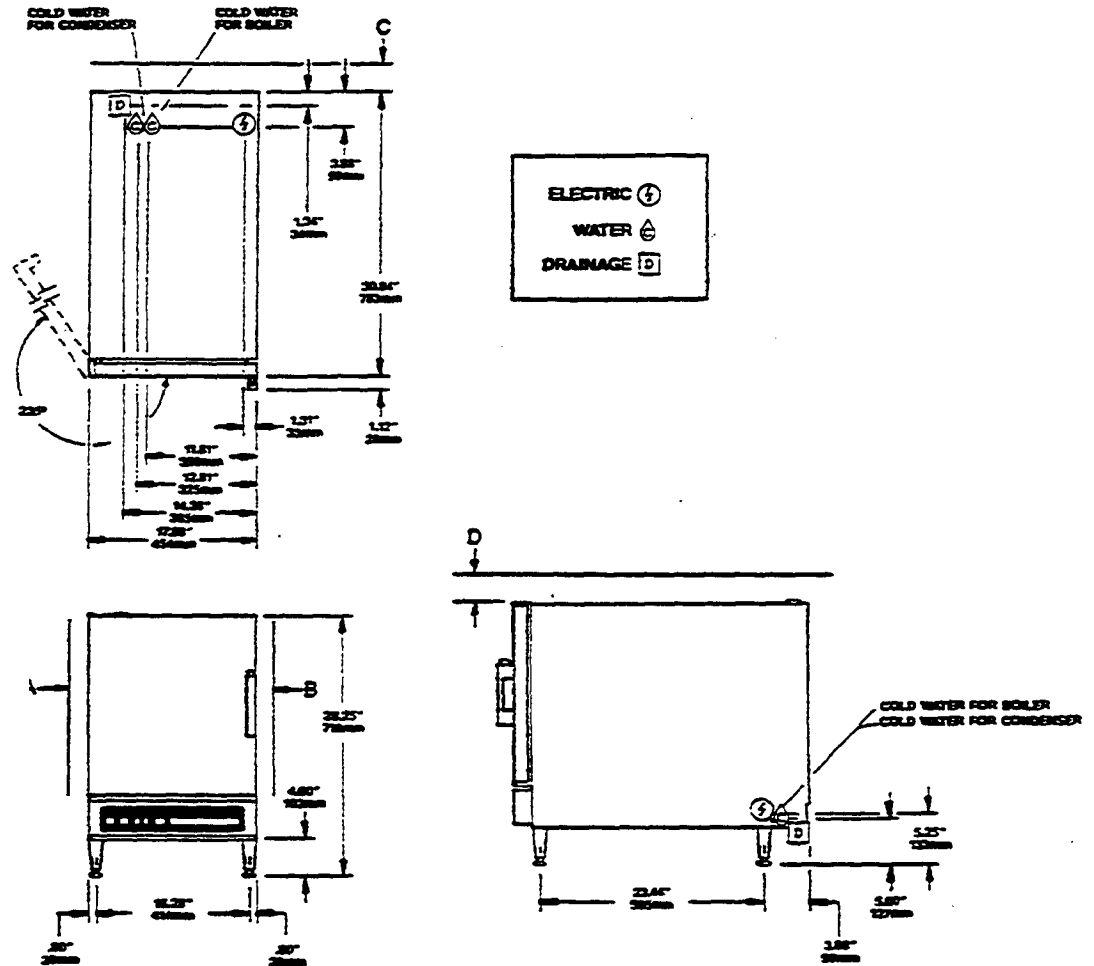


Figure 2-4. SteamCraft V Dimensions and Clearances

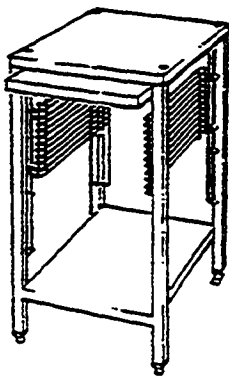


Figure 2-5. Equipment Stand

- Note in figure 2-4 that a 3" clearance is required above the SteamCraft V. Do not store articles on top of the unit.
- The SteamCraft V weighs approximately 120 pounds. The counter area selected must be capable of supporting an operational weight of approximately 150 pounds to include the weight of water and food.
- The SteamCraft V has capacity for five 12" x 20" x 2.5" Cafeteria Pans (model # SP-25 or PP-25). Convenient storage for these pans and their alternates should be considered when selecting the operating location. If a satisfactory counter location is not available consider using a model ES-1827 Equipment Stand. This stand, illustrated in figure 2-5, is specifically designed for the SteamCraft V, and meets the above criteria.

Electric Power Line

Furnishing and installing the electrical power lines, switches, fuse boxes, connectors and their accessories is the responsibility of the owner and/or installer. Figure 2-6 illustrates an electrical layout recommended by Cleveland Range. When installing the electrical power lines and accessories, observe the following instructions.

1. In the United States, install the electrical power lines in accordance with local codes and/or the National Electric Code, ANSI/NFPA No. 70-1990 (USA).
2. In Canada, install the electrical power lines in accordance with local codes and/or the Canadian Electrical Code, CSA Standard C22.1 (Canada).
3. Install the proper size disconnect switch, circuit breaker or fuses, and wire and conduit to conform to all local codes and the national codes cited above. See table 2-3 for wire requirements.

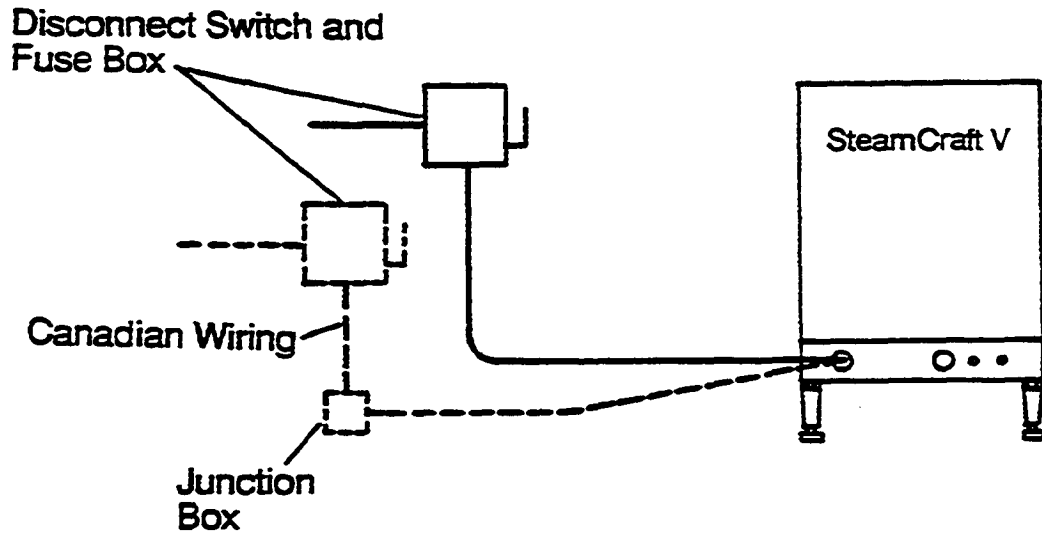


Figure 2-6. Electrical Layout

Table 2-3. Minimum Wire Requirements

LINE VOLTAGE	KILO WATTS	LINE AMPS*	WIRE GAUGE**
208	16.7	46	6
220	15.3	40	6
240	18.0	43	6
380/220	15.3	23	10
415/240	18.0	25	10
440	15.3	20	10
480	18.0	22	10

*All 3 Phase

**Use copper wire rated for 75° C.

4. Install a separate disconnect switch and fuses sized to line amps (see Table 23). The fuses may be an integral part of the disconnect switch or in a separate fuse box.
 5. There should be a sufficient length of flexible conduit between the SteamCraft V connector and the wall so the unit can be moved for service.
 - Canadian steamers are supplied with six feet of flexible conduit for compliance with Canadian Standards Association. The electrical supply line must end in a junction box behind the steamer for connection of the flexible cable from the steamer.
 6. Each steamer MUST be electrically grounded by the installer.
 7. The characteristics of the electric power supply must match the power requirements specified on the SteamCraft V product identification plate. The plate is located on the left side of the unit (refer to figure 1-1).
 8. All SteamCraft V's are wired for 3 phase only, and are not convertible to single phase.
-

Water Supply Lines

Furnishing and plumbing the water supply lines is the responsibility of the owner and/or installer. Figures 2-2 and 2-3 illustrate plumbing layouts recommended by Cleveland Range. When installing water supply lines, observe the following instructions.

1. Always connect a COLD water supply to the condenser/steam generator connection (item 4, figure 2-1). If hot or warm water is supplied to this connection, the steam condenser in the SteamCraft V will not work.
2. Supply water pressure must be a minimum dynamic pressure of 35 psi (2.4 kg/cm²) and a maximum static pressure of 60 psi (4.1 kg/cm²).
3. The recommended size for the water supply lines is 1/4" L.P.S. This is the size of the lines in the SteamCraft V. If larger lines are used, a pressure reducer must be installed in the supply line to maintain the pressure specified in #2, above.
4. NSF requires the installation of a check-valve in accordance with and as required by local plumbing codes.
5. When a water treatment system is not installed, Cleveland Range recommends the plumbing layout illustrated in figure 2-2.
6. When a water treatment system is installed, Cleveland Range recommends the plumbing layout illustrated in figure 2-3.
 - The water supply to the condenser/steam generator connection (item 4, figure 2-1) can be untreated.
 - The treated water supply is connected to the steam generator only connection (item 5, figure 2-1).
 - The steam generator only connection requires plumbing changes inside the SteamCraft V. These changes can be made only by an authorized service representative.

Free Air Vented Drain Lines

The drain outlet discharges exhaust steam and hot condensate from the steamer. This discharge is usually under pressure. The drain outlet **MUST** be free air vented to disburse the pressure, and avoid creating a back pressure or a vacuum within the SteamCraft V.

- Backpressure will cause steam and hot water leakage around the door.
- A vacuum will implode the steamer.

Furnishing and plumbing the drain lines is the responsibility of the owner and/or installer. Figure 2-7 illustrates a drain layout recommended by Cleveland Range. Observe the following instructions to determine the pipe size, the number of fittings required, and the layout of the drain line path.

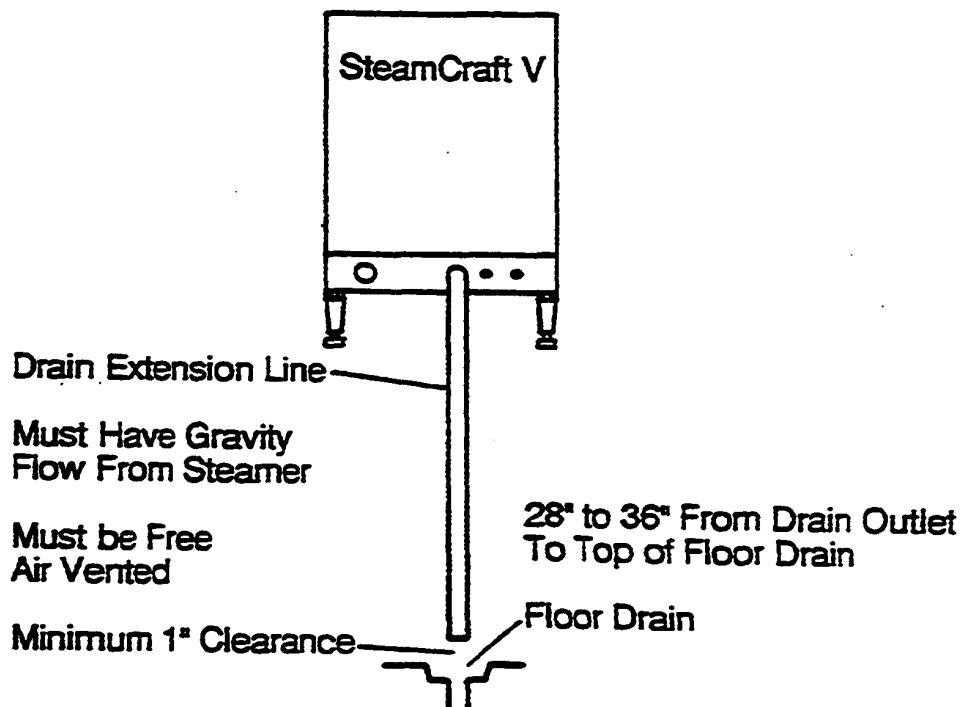


Figure 2-7. Drain Layout

WARNING

DEATH, INJURY, AND EQUIPMENT DAMAGE could result from improper installation of the drain outlet lines.

Improper installation of these lines could void the SteamCraft V warranty. The following restrictions are critical to the safety of personnel and equipment, and must not be violated under any circumstances.

Do not run the drain line into PVC pipe, or any other drain material that cannot sustain 180° F. Do not connect more than two pieces of equipment to one common drain line.

Do not connect the drain outlet extension line directly to a floor drain or sewer line without free air venting.

1. The drain lines must be installed in compliance with the Basic Plumbing Code of the Building Officials and Code Administrators International, Inc. (BOCA), and the Food Service Sanitation Manual of the Food and Drug Administration (FDA).
2. The pipe size used to extend the drain outlet to an open drain is determined by the cumulative length of pipe and/or number of elbow fittings required to reach the open drain.
 - If the drain outlet extension requires six feet or less of pipe, and no more than two elbows are required, use 1/4" pipe and fittings.
 - If the drain outlet extension requires six to twelve feet of pipe, or requires more than three elbows, use 2" pipe and fittings.
3. The drain line must have a gravity flow from the SteamCraft V drain outlet to the floor drain.
4. There must be a minimum of one-inch clearance between the end of the drain line and the top of the floor drain to assure free air venting.
5. When assembling the pipe and fittings of the drain line, apply a hardening type pipe sealant to the threads, and tighten them together **FINGER TIGHT ONLY. DO NOT USE A WRENCH.**

INSTALLATION INSTRUCTIONS

After selecting and preparing the SteamCraft V operating location, the steamer can be unpacked, positioned, and installed. This section of Chapter 2 details inspecting, positioning, and connecting the SteamCraft V to the power, water, and drain lines already prepared. After final setup and testing, the SteamCraft V is ready for years of reliable operation.

WARNING

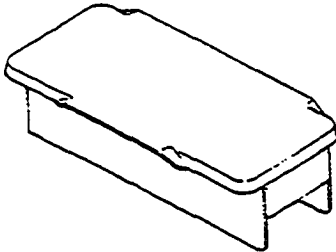
DEATH, INJURY, AND EQUIPMENT DAMAGE could result from installation of a unit damaged during shipment or storage. Equipment damaged during shipment or storage is not covered under warranty.

DO NOT UNPACK A DAMAGED SHIPPING CARTON.

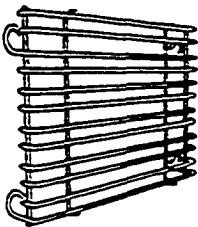
DO NOT INSTALL a SteamCraft V suspected of damage.

Unpacking and Inspection

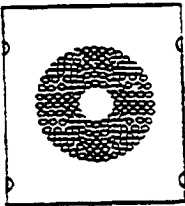
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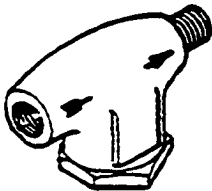
B



C



D



- Before unpacking the shipping carton visually inspect it for damage.
 - If the shipping carton appears damaged, do not open the carton. Refer to the Shipping Damage Instructions below.
 - If the shipping carton is undamaged, open it and remove the SteamCraft V.
- Slit the four corners of the carton and peel carton sides away from the SteamCraft V.
- Open the door of the SteamCraft V, and remove the package of unassembled parts. This package contains the four parts illustrated in figure 2-8. Check that all four parts have been included in the package.
 - Steam Generator Cover
 - Two Slide Racks
 - Fan Guard
 - Water Strainer
- When the unassembled parts package is removed, several pre-assembled parts can be seen inside the unit. Refer to figure 2-9. Do not attempt to remove these parts.
 - Water Level Probes
 - Heater Elements
 - Drain Screen
- Inspect the SteamCraft V and unassembled parts for damage or loss.
 - If there is damage or parts are lost, refer to the Shipping Damage Instructions below.
 - If all items are accounted for and undamaged, proceed to Assembly and install the unassembled parts listed in step 3.

Figure 2-8. Unassembled Parts

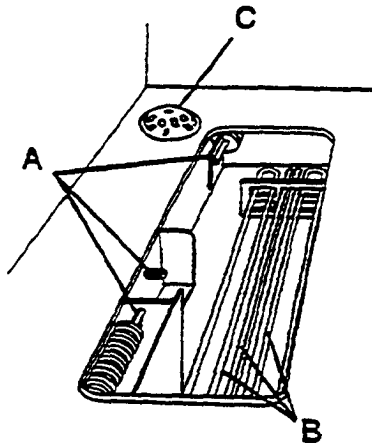


Figure 2-9. Pre-assembled Parts

Assembly



Figure 2-10. Steam Generator Cover in Place

Shipping Damage Instructions

If shipping damage to the SteamCraft V is discovered or suspected, observe the following guidelines in preparing a shipping damage claim.

- Write down a description of the damage or the reason for suspecting damage as soon as it is discovered. This will help in filling out the claim forms later.
- As soon as damage is discovered or suspected, notify the carrier that delivered the shipment.
- Arrange for the carrier's representative to examine the damage.
- Fill out all appropriate claims forms and have the examining carrier sign and date each form.

Parts shipped unassembled (figure2-8) can be assembled before or after the SteamCraft V is connected to the electric power, water supply, and drain lines. If these parts are to be stored during the connection procedures, place them back in their shipping box place the box back inside the steamer, and dose the steamer door. Otherwise, assemble these parts according to the following instructions.

Install The Steam Generator Cover

1. Refer to figure 2-10, and hold the steam generator cover with the short handle to the left and the long handle to the right. The printing on the top (of the cover should be right side up (Descale With Kit P/N 101751 - Remove Daily To Clean).
2. Keeping the cover level, place the right leg of the cover against the right side of the steam generator body and the left leg against the protective baffle on the left side.
3. Lower the cover into place over the steam generator opening.

Install The Fan Guard

1. Refer to figure 2-11 and hold the fan guard so the hanger pin slots are pointing up and towards the back of the guard.
2. Slide the right side of the guard past the hanger pins, and into the right rear comer of the steamer compartment.
3. Swing the left side of the guard past the hanger pins, and into the left rear corner of the steamer compartment. The guard will cover the fan.
4. Holding both sides of the guard, lift it to aline the hanger slots with the large hanger pins at the back of the steamer.
5. Pull the fan guard forward and down to slide the hanger slots over the hanger pins.

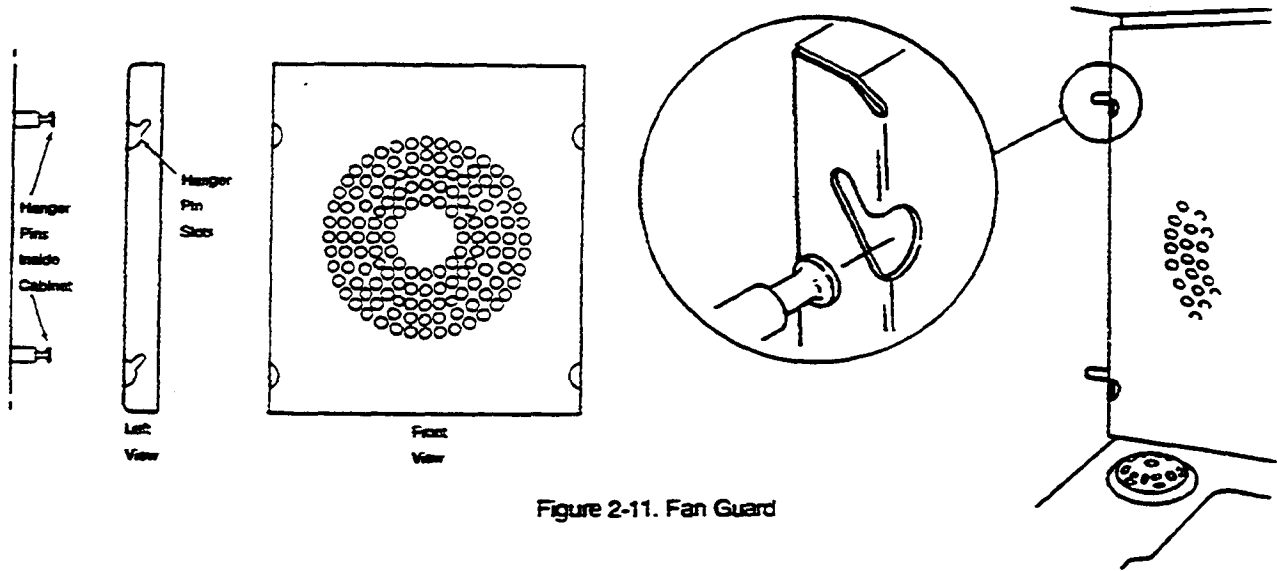
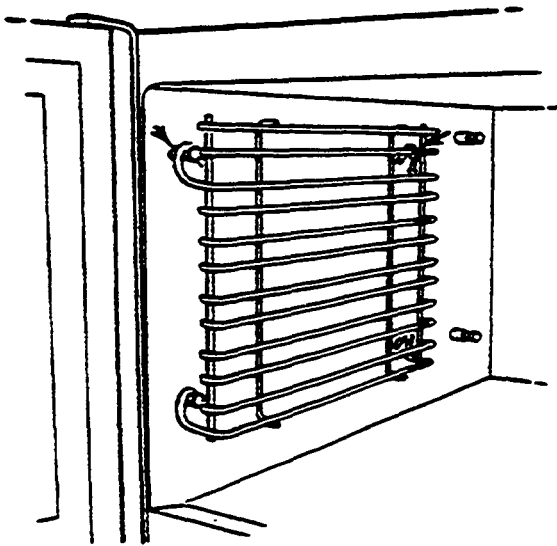


Figure 2-11. Fan Guard

Install The Slide Racks



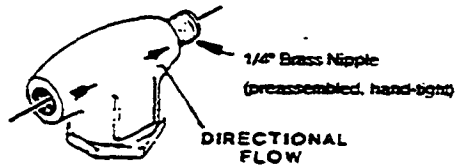
1. Refer to figure 2-12. Each rack has four loops: two on top and two on the bottom. Hold one slide rack so the ends of the hanger loops are pointing down.
2. Slide one rack into the steamer compartment with the hanger loops toward one side of the compartment
3. Hoop the two top loops over the top pins, then hook the bottom loops over the two bottom pins.
4. Repeat steps 1 through 3 for the other rack.

Figure 2-12. Slide Racks

Install The Water Strainer

As illustrated in figure 2-13, the water strainer is supplied with a 1/4" brass nipple threaded into the strainer outlet. This nipple fits the untreated water connection (cold water inlet, figure 2-14).

1. Check that the nipple is connected to the strainer output as indicated by the flow direction arrow on the strainer body.
2. Apply pipe dope or teflon tape to the brass nipple.



NOTE: The Strainer must be installed with the Directional Flow Arrow aiming in towards the rear of the steamer.

Figure 2-13. Water Strainer

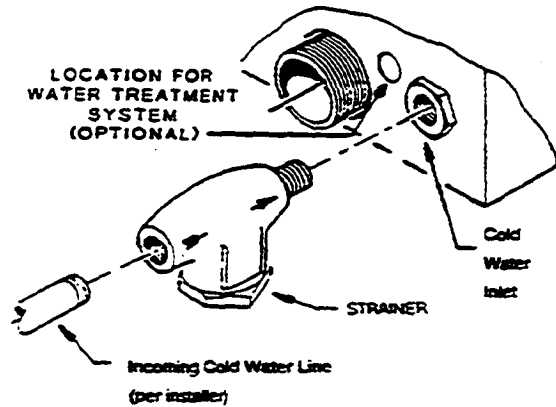


Figure 2-14. Water Strainer Connections

3. Thread the nipple into the bulkhead coupling of the untreated water connection.
4. Using a pipe wrench, thread the assembled strainer and nipple into the coupling until it is tight, and the strainer access nut is facing down.

Position and Level Steamcraft V

For efficient operation, the steamer should be level both front to back and side to side. The adjustable legs of the SteamCraft V are four inches long when the adjustable feet arc fully retracted. The adjustable feet can be extended approximately two inches, providing adjustment for leveling the steamer.

1. Refer to the Installation Check List, Table 2-1 Check that all Preparation Tasks are complete, Check that all Unpacking and Assembly tasks are complete.
2. Looking at the counter where the SteamCraft V will be placed, estimate the location of the four corners that will support the legs. Using a carpenter's level, determine the highest corner and mark it with an "H".

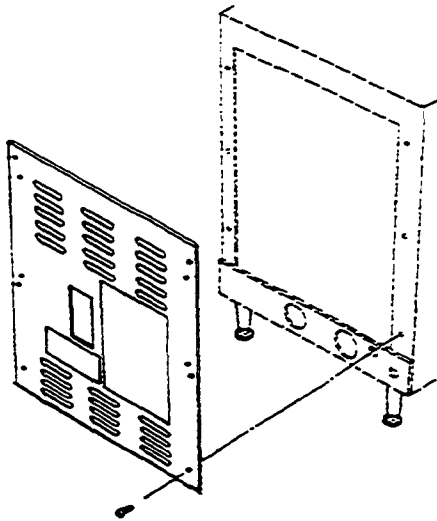
WARNING

INJURY AND EQUIPMENT DAMAGE could result from improper lifting. The SteamCraft V weighs approximately 120 pounds. Use an adequate number of personnel with experience in lifting heavy equipment to place the Steam-Craft V on the counter.

3. Lift the SteamCraft V into place on the counter. Do not change the height of the leg in the highest corner of the counter as marked in step 2. Using a carpenter's level, adjust the other three legs until the unit is level both front to back and side to side.

Connect Electrical Line

Referring to Electric Power Line (page 9), verify that the electric power lines have been extended to the SteamCraft V properly. Connect them to the terminal block inside the rear cover as described below.



1. Move the SteamCraft V so the rear panel can be easily reached.
2. Remove the rear panel by removing six screws (figure 2-15) that hold it in place. Save the screws.
3. Mechanically secure the flexible conduit to the electrical conduit access note (figure 2-15). (See Canadian Wiring Considerations below.)
4. The terminal block and ground connection are near the left side of the rear opening. The unit has either a three terminal block for 3 wire DELTA connection, or a four terminal block for 4 wire WYE connection.
5. Refer to the connection diagrams in figure 2-16, and connect the wires to the terminal block and ground connector accordingly.
6. Each steamer MUST be electrically grounded by the installer.
7. All SteamCraft V's are wired for 3 phase only, and are not convertible to single phase.
8. If no further work is required inside the SteamCraft V, secure the rear panel in place using six mounting screws (figure 2-15).

Figure 2-15. Rear Panel Removal

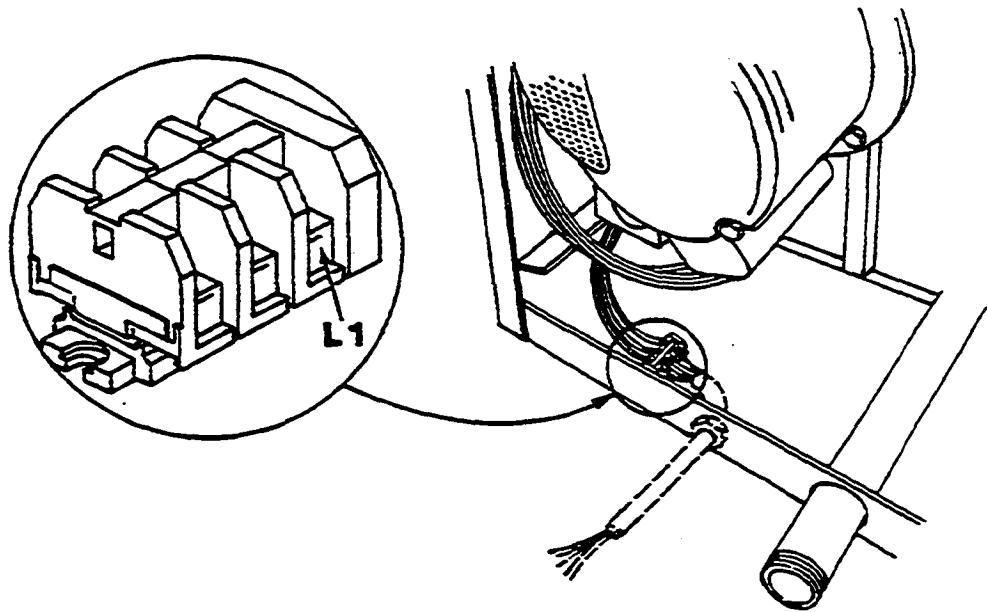
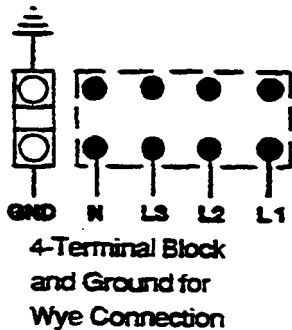
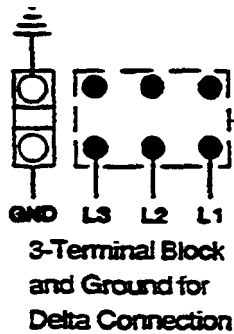


Figure 2-16. Connection Diagrams

Canadian Wiring Considerations.

For all applications in Canada, install the electrical power lines in accordance with local codes and/or the Canadian Electrical Code, CSA Standard C22-1 (Canada).

- Canadian steamers are supplied with six feet of flexible conduit connected to the steamer and wired to the terminal block at the factory.
- The electrical supply line ends in a Junction box behind the steamer for connection of the SteamCraft V flexible cable.
- Connect the wires from SteamCraft V flexible cable to those in the Junction box according to figure 2-17.
- Each steamer MUST be electrically grounded by the installer.

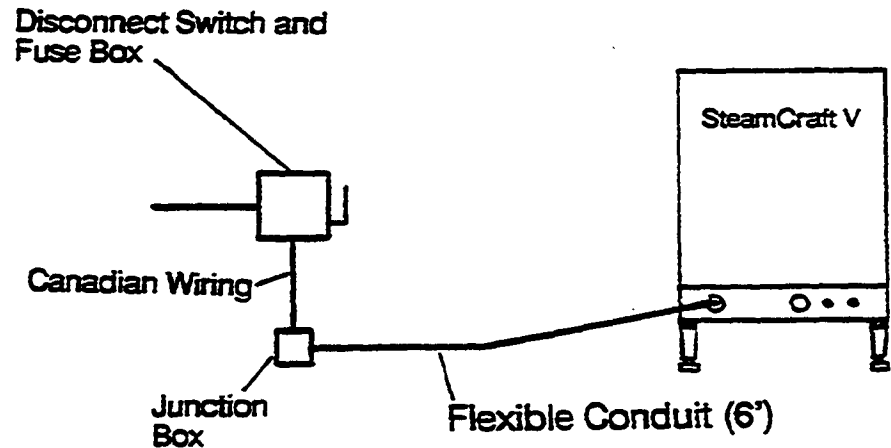


Figure 2-17. Canadian Connection Diagrams

Connect Untreated Water Line

Referring to Water Supply Lines (page 10) and figure 2-2, verify that the water supply line has been extended to the SteamCraft V properly. Connect the supply line to the SteamCraft V as described below.

1. If the untreated water supply lines are larger than 1/4" L.P.S., verify that a pressure reducer has been installed to maintain the SteamCraft V water pressure requirements specified in Water Supply Lines (page 10).
2. If the water strainer is not already connected to the SteamCraft V, refer to Install The Water Strainer (page 15), and connect the water strainer to the untreated water intake bulkhead coupling.
3. Remove the SteamCraft V rear panel by removing six screws (figure 2-15) that hold it in place. Save the screws.
4. Verify that the cold water steam generator feed line and cold water condenser feed lines are properly connected for the water supply arrangement being used.

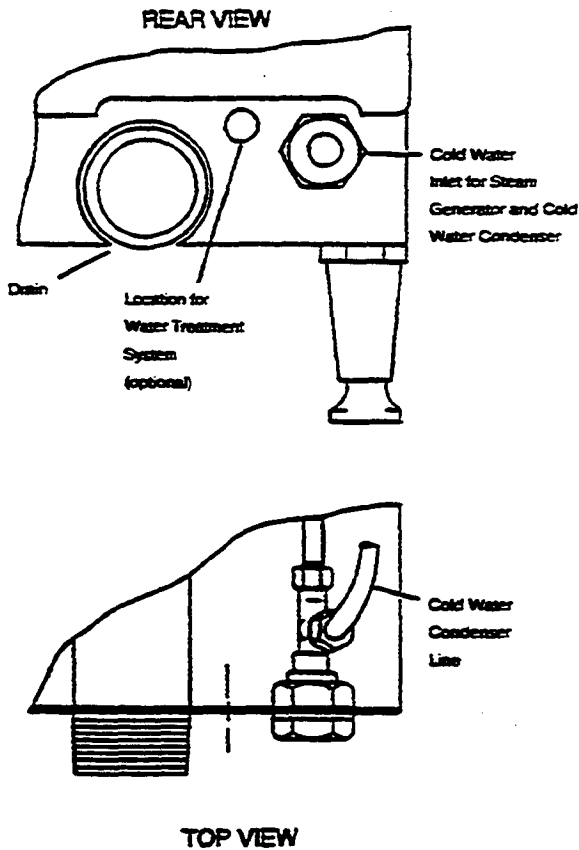


Figure 2-18. Single Water Connection (Untreated)

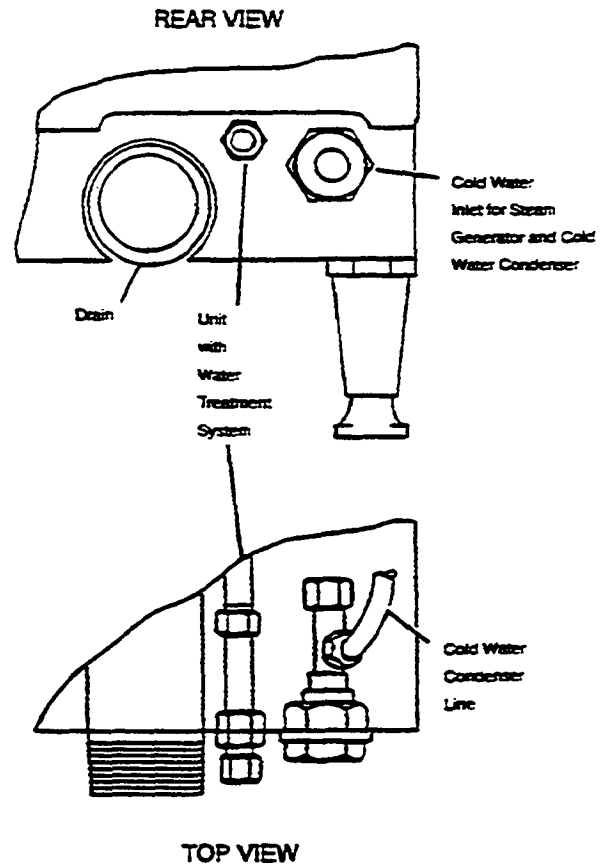


Figure 2-19. Water Connections with Water Treatment System

- If the water supply arrangement does not include a water treatment system; refer to figure 2-18, and verify that the cold water steam generator feed and condenser feed lines are attached to the tee and bulkhead coupling inside the steamer.
 - If the water supply arrangement includes a water treatment system; refer to figure 2-19, and verify that the cold water condenser feed line is attached to the tee and bulkhead coupling inside the steamer. Verify that the steam generator supply outlet of the tee has been securely capped.
5. Flush the water supply line before connecting it to the strainer intake port
 6. Apply pipe dope or teflon tape to the threads of the water supply line, and securely connect the supply line to the strainer input port.
 7. Turn on the untreated water supply, and check the lines for signs of leakage, both outside and inside the steamer.
 8. If no further work is required inside the SteamCraft V, secure the rear panel in place using six mounting screws (figure 2-15).

Connect Treated Water Line

Referring to Water Supply Lines (page 10) and Figure 2-3, verify that the water supply line has been extended from the SteamerGard water treatment system to the SteamCraft V properly. Connect the treated water supply line to the SteamCraft V as described below.

1. Refer to the SteamerGard installation manual and verify that it has been installed properly for this application.
2. Verify that a check valve has been installed between the SteamerGard water treatment system and the SteamCraft V.
3. Remove the SteamCraft V rear panel by removing six screws (figure 2-15) that hold it in place. Save the screws.
4. Referring to figure 2-19, inspect the SteamCraft V to verify that the treated water supply bulkhead coupling has been properly installed and securely attached to the steam generator feed line inside the steamer.
5. Flush the treated water supply line before connecting it to the steam generator intake bulkhead coupling.
6. Apply pipe dope or teflon tape to the threads of the treated water supply line, and securely connect the supply line to the steam generator intake bulkhead coupling.
7. Turn on the treated water supply, and check the lines for signs of leakage, both outside and inside the steamer.
8. If no further work is required inside the SteamCraft V, secure the rear panel in place using six mounting screws (figure 2-15).

Connect Drain Line

Referring to Free Air Vented Drain Lines (page 11), verify that the drain lines meet capacity and venting requirements. Connect the SteamCraft V drain outlet to the outlet extension and drain lines as described below.

1. The SteamCraft V drain outlet (figure 2-20) is a 1-1/4" NPT pipe protruding from the back of the unit. An elbow connects this drain outlet to the drain extension pipe assembled during site preparation.
2. Refer to figure 2-20. The outlet extension line has a free air vented connection to floor drain or lines leading to the floor drain.
3. When assembling the pipes and fittings of the drain outlet extension, apply a hardening type pipe sealant to the threads, and thread them together FINGER TIGHT ONLY. DO NOT USE A WRENCH.

WARNING

**DRAIN
MUST BE
FREE AIR
VENTED!**

Note: Drain line must vent to atmosphere and terminate beyond perimeter of unit. If drain has to have 3 or more bends, increase line size. Do not connect solid to floor drain.

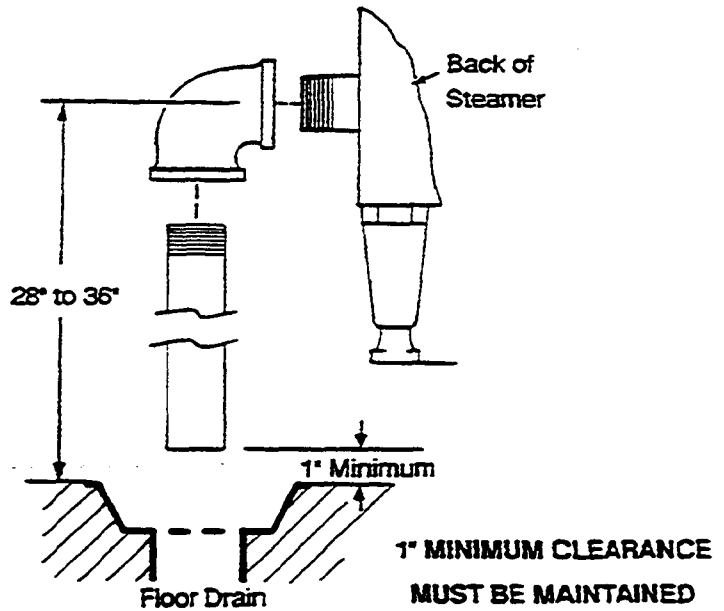


Figure 2-20. Drain Line

Final Setup And Checkout

This is a simple test procedure to verify that the electrical, water, and drain lines have been properly connected to the SteamCraft V. The test also verifies basic operation of the steamer. For a more complete test of the SteamCraft V functions, perform the Function Test on page 23.

Setup

1. Refer to Assembly (page 14) and verify that racks, guard, and cover are properly positioned in the steamer compartment.
2. Refer to figure 2-21, and dose the drain valve (handle points toward right side of the unit).

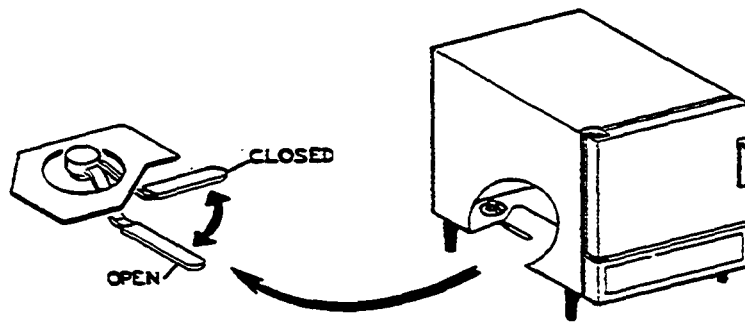


Figure 2-21. Drain Valve Open/Closed

3. Turn on the main and the untreated water supply valves.
4. If a SteamerGard water treatment system is installed, refer to the SteamerGard manual and start the system. Proceed with setup while the system processes an operating supply of water. If there is a valve between the SteamerGard and the SteamCraft V, be sure it is open.
5. Refer to electrical schematic, figure 2-6, and verify that the proper size fuses are installed. Turn on electric power to the SteamCraft V at the fused disconnect switch.
6. Close the steamer door.
7. Refer to figure 2-22, and turn on the SteamCraft V by pressing the POWER touch pad. The red light above POWER and the WATER alarm light turn on.
 - Water begins to fill the steam generator.
 - The low water indicator (WATER) remains on until the steam generator is filled with enough water to operate safely.
 - When the generator is filled, the WATER light turns off, and the steam generator water begins to heat to stand-by temperature.

TIMED Test -1 Minute

1. If not already done, perform SETUP.
2. Refer to figure 2-22, and set the TIME DISPLAY (9) to 01 minute by pressing the TIME SET minute touch pad (5) once.

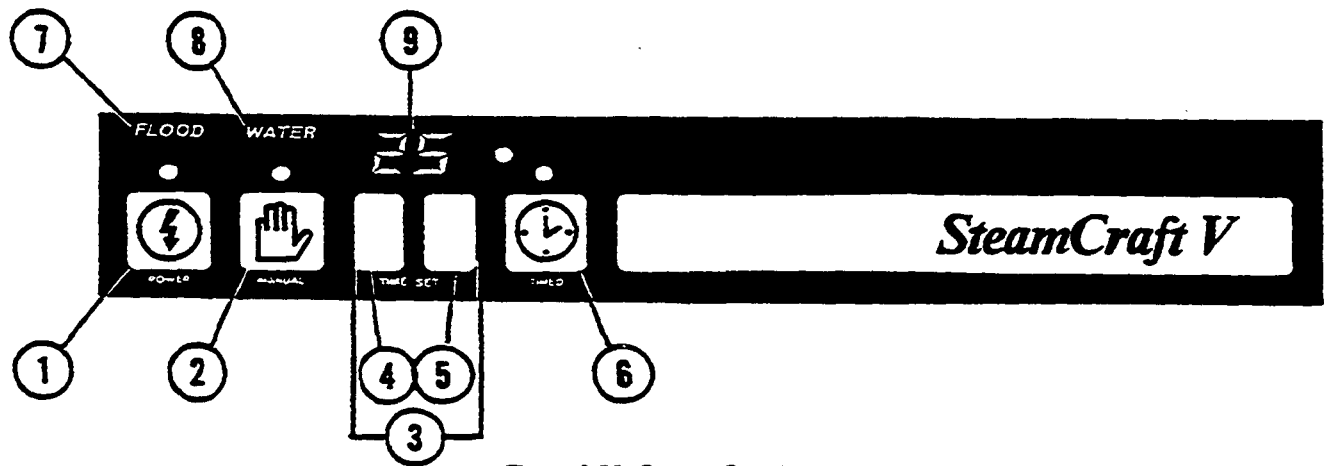


Figure 2-22. Control Panel

3. Start the timed cooking sequence by pressing the TIMED touch pad(6).
 - If no TIMED or MANUAL tests have been done, it will Take approximately two minutes for the water in the steam generator to reach operating temperature and begin generating steam.
 - The timer counts down to 00 and an alarm beeps four times.

MANUAL Test

1. If not already done, perform SETUP.
2. Activate the manual cooking cycle by pressing the MANUAL touch pad (2).
 - The heater elements and the cold water condenser will turn on.
 - If no TIMED or MANUAL tests have been done, it will take approximately two minutes for the water in the steam generator to reach operating temperature and begin generating steam
3. Open the steamer door. The compartment should be filled with steam.
 - When the door is opened, the heating elements mm off. The steam should clear from the compartment quickly.
4. When the steam has cleared from the compartment, close the steamer door.
 - The heater elements and the cold water condenser win turn on, and start generating steam.
5. Open the steamer door. The compartment should again be filled with steam.
6. If necessary, repeat this test to be sure the steam shuts off when the door opens and restarts when the door closes.

TIMED Test - 10 Minutes

1. If not already done, perform SETUP.
2. Refer to figure 2-22, and set the TIME DISPLAY (9) to 10 minutes by pressing the TIME SET 10 minute touch pad (4) once.
3. Start the timed cooking sequence by pressing the TIMED touch pad (6).
 - If no TIMED or MANUAL tests have been done, it will take approximately two minutes for the water in the steam generator to reach operating temperature and begin generating steam.
 - The timer counts down to 00 and an alarm beeps four times.
4. When the alarm beeps four times, refer to figure 2-21, and open the drain valve. Measure the temperature of the drain water. It should be between 150° and 170°.

FUNCTION TEST

Before S/N WC 9018-90A-05

The function Test is a more thorough test of the SteamCraft V than the Set-Up and Check-Out procedures. If the checkout has been unsatisfactory or a more thorough inspection is required, perform the following Function Test procedures

Flow, Leak, and Flood Test

1. Do not remove the control panel unless it is necessary to check the lines and fittings inside the SteamCraft V for leaks. Remove the control panel as follows.

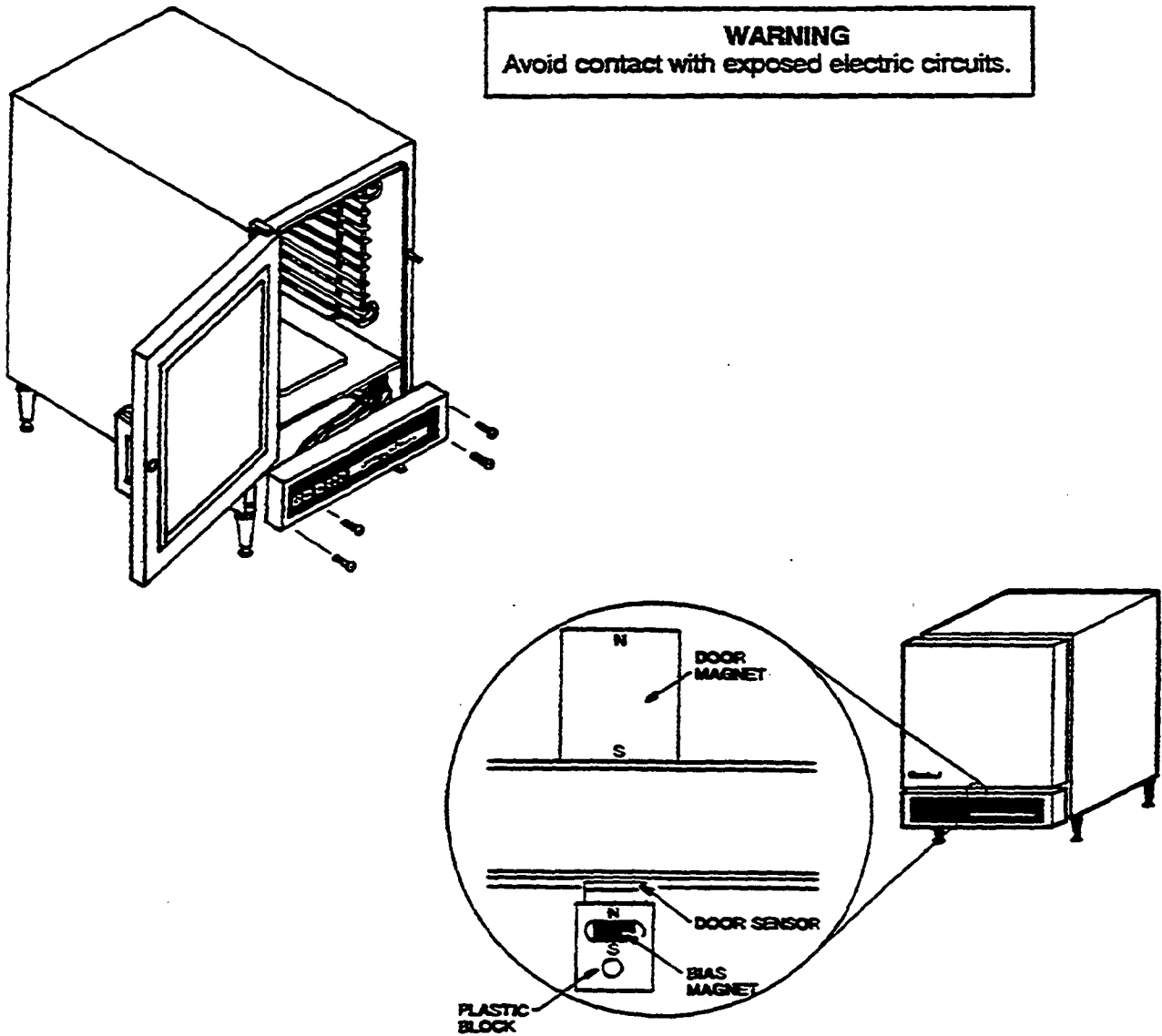


Figure 2-23. Control Panel Removal

- a. Support the control panel so it doesn't fall when the mounting screws are removed.
- b. DO NOT DISCONNECT any of the control panel wiring.
- c. Refer to figure 2-23, and remove the mounting screws. Save the screws. Place the panel upright at the base of the steamer.
- d. Set a magnet over the door switch as shown in figure 2-23.

CAUTION

DAMAGE TO PANEL ELECTRONICS could result from water splashing or spilling on the circuit board. If water spills or splashes on the circuit board during this test, immediately turn power OFF at the disconnect switch.

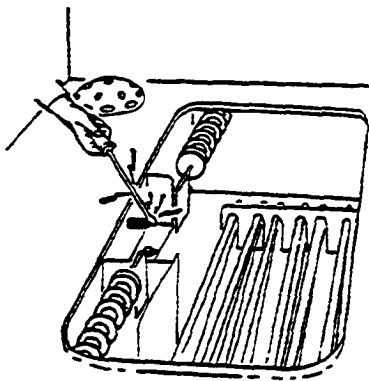


Figure 2-24. Shorting Flood Probe

2. Open the water supply valve to the steamer and open the steamer drain valve.
3. Turn electricity on at the disconnect switch. Press the POWER touch pad. Check that the red light over the POWER touch pad is on.
4. Water flows through the steamer and drain. Check for water leakage at pipe joints and tube connections or unions. Wait for a few minutes, then look for water leaking from the steam generator. Repair any leaks before continuing.
5. As illustrated in figure 2-24, use a screwdriver to short the flood probe to ground for four seconds. The FLOOD alarm light flashes. Push the POWER touch pad. The unit will not turn on. The FLOOD alarm light continues to flash.
6. Turn electricity off at the disconnect switch. Wait ten seconds. Turn electricity on at the disconnect switch.
7. Close the steam generator drain valve.
8. Press the POWER touch pad on the Control Panel.
9. The red light above the touch pad turns on. The alarm WATER displays and TIME displays.
10. After about five seconds, the water solenoid operates, filling the steam generator with water. Check for water leakage around the steam generator.
11. If the control panel was removed to observe the internal pipes and fittings, replace it as follows.

WARNING

Avoid contact with exposed electric circuits.

- a. Aline the positioning stud as shown in figure 2-23.
 - b. Make sure fee wires are dear and secure the panel in place with the mounting screws.
12. Close the steamer door. When the water level reaches the water level probe (lowest), the WATER alarm turns off and the heater contactors operate. The heating elements in the steam generator start heating water.
-

Door Switch Test

1. Open the steamer door. Toe contactors, heaters and fan turn off.
 2. Close the compartment door. Press the MANUAL touch pad. The condenser valve, heater contactors, and fan motor turn on.
 3. Check for condenser water flow from the drain.
 4. Open the steamer door. The condenser valve, three heaters, one contactor, and fan motor turn off.
 5. Set a magnet over the door switch as shown in figure 2-23. The condenser, fan and heaters turn on.
 6. Remove the steam generator cover and check that all four heating elements are on.
 7. Remove magnet from the control panel.
-

TIME and Temperature Tests

Differences in heater outputs are observed during this procedure. To emphasize these differences, start this procedure with cold water in the steam generator. It may be necessary to drain and refill the steam generator.

1. Install the steam generator cover in steam generator opening and dose the steamer door.
2. Press the TIMED touch pad (6, figure 2-25).

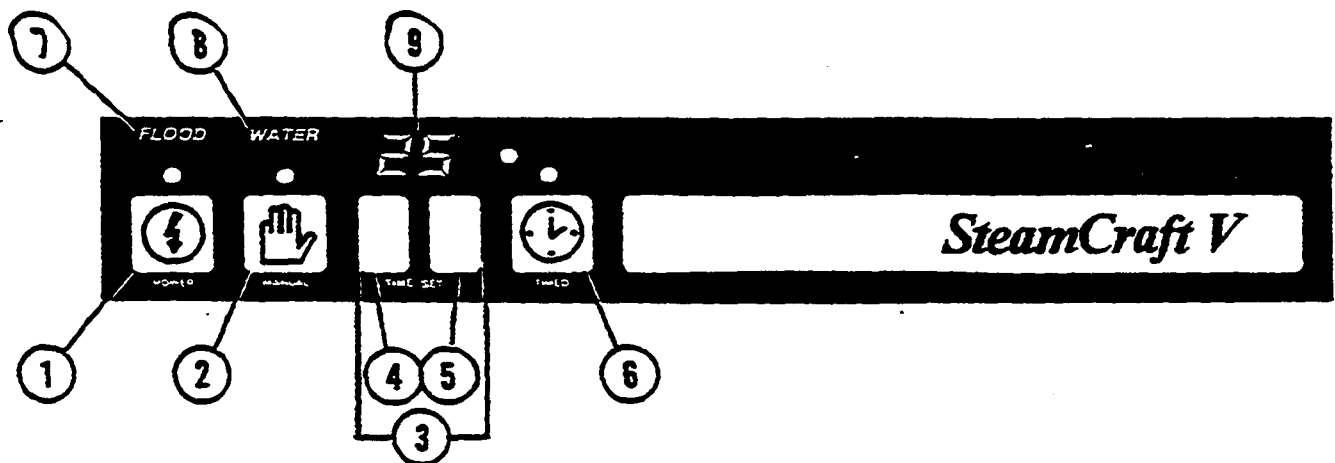


Figure 2-25. Control Panel

3. Refer to figure 2-25 and press the TIME SET one minute touch pad (5) to increase TIME DISPLAY from 00 to 09, then back to 00.
4. Refer to figure 2-25 and press the TIME SET ten minute touch pad (4) to increase TIME DISPLAY from 00 to 90, then back to 00.
5. Set the TIME DISPLAY to 01 and press the TIMED touch pad (6).
6. As the cycle starts, the steam generator heaters turn on. The green light to the light of the TIME DISPLAY should not be on.
7. As the steam generator reaches temperature, the green light begins flashing. One heater contactor will cycle on and off every five Seconds 8.
8. The TIME DISPLAY counts down to 00, an alarm beeps four times and the TIME DISPLAY flashes 00.
9. The heaters, fan, and condenser valve turn off.
10. Press the TIMED touch pad (6) to stop displays.
11. Set TIME to any number over 00. Press the MANUAL touch pad (2).
12. TIME DISPLAY resets to 00. The heaters, fan and condenser valve turn on.
13. Allow unit to run for at least one minute to see that TIME DISPLAY counts up.

WARNING

SEVERE BURNS may result to eyes, nose, mouth or skin exposed to hot steam.
Avoid hot steam. When opening steamer door, allow steam to vent before reaching into steamer compartment.

14. Open the steamer door.
15. Steam flow stops. The heaters, fan, and condenser valve turn off.
16. Press the POWER touch pad to turn the steamer off. The red light over touch pad turns off.
17. End of test.

FUNCTION TEST After S/N WC 9018-90A-05

The Function Test is a more thorough test of the SteamCraft V than the Set-Up and Check-Out procedures. If the checkout has been unsatisfactory or a more thorough inspection is required, perform the following Function Test procedures.

Flow, Leak, and Flood Test

1. Do not remove the control panel unless it is necessary to check the fines and fittings inside the SteamCraft V for leaks. Remove the control panel as follows.

WARNING
Avoid contact with exposed electric circuits.

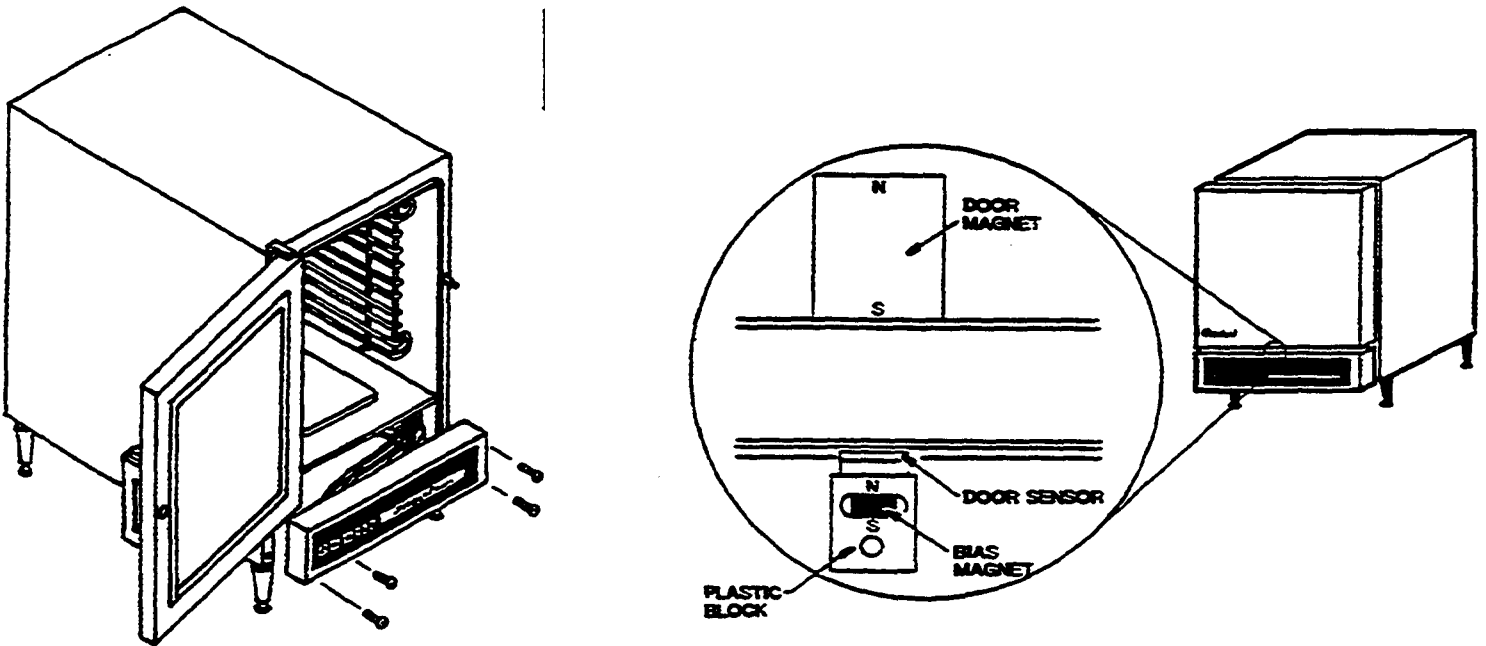


Figure 2-26. Control Panel Removal

- a. Support the control panel so it doesn't fall when the mounting screws are removed.
- b. DO NOT DISCONNECT any of the control panel wiring.
- c. Refer to figure 2-26, and remove the mounting screws. Save the screws. Place the panel upright at the base of the steamer.
- d. Set a magnet over the door switch as shown in figure 2-26.

CAUTION

DAMAGE TO PANEL ELECTRONICS could result from water splashing or spilling on the circuit board. If water spills or splashes on the circuit board during the test, immediately turn power OFF at the disconnect switch.

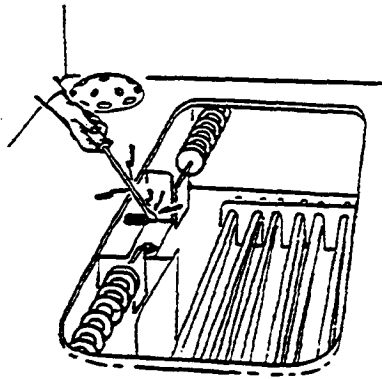


Figure 2-27. Shorting Flood Probe

2. Open the water supply valve to the steamer and open the steamer drain valve.
3. Turn electricity on at the disconnect switch. Press the POWER touch pad. Check that the red light over the POWER touch pad is on.
4. Water flows through the steamer and drain. Check for water leakage at pipe joints and tube connections or unions. Wait for a few minutes, then look for water leaking from the steam generator. Repair any leaks before continuing.
5. As illustrated in figure 2-27, use a screwdriver to snort the flood probe to ground for four seconds. The FLOOD alarm light flashes. Push the POWER touch pad. The unit will not turn on. The FLOOD alarm light continues to flash.
6. Be sure the steam generator is completely drained. Press the POWER touch pad on the Control Panel twice. The unit will deair and come back on.
7. The red light above the POWER touch pad turns on. The WATER alarm displays and TIME displays.
8. Close the steam generator drain valve.
9. After about five seconds, the water solenoid operates, filling the steam generator with water. Check for water leakage around the steam generator.
10. If the control panel was removed to observe the internal pipes and fittings, replace it as follows.

WARNING

Avoid contact with exposed electric circuits.

- a. Aline the positioning stud as shown in figure 2-26.
 - b. Make sure the wires are clear and secure the panel in place with the mounting screws.
11. Close the steamer door. When the water level reaches the water level probe (lowest), the WATER alarm turns off and the heater contactors operate. The heating elements in the steam generator start heating water.
-

Door Switch Test

1. Open the steamer door. The contactors, heaters and fan turn off.
 2. Close the compartment door. Press the MANUAL touch pad. The condenser valve, heater contactor, and fan motor turn on.
 3. Check for condenser water flow from the drain.
 4. Open the steamer door. The condenser valve, three heaters, one contactor, and fan motor turn off.
 5. Set a magnet over the door switch as shown in figure 2-26. The condenser, fan and heaters turn on.
 6. Remove the steam generator cover and check that an four heating dements are on.
 7. Remove magnet from the control panel.
-

TIME and Temperature Tests

Differences in heater outputs are observed during this procedure. To emphasize these differences, start this procedure with cold water in the steam generator, it may be necessary to drain and refill the steam generator.

1. Install the steam generator cover in steam generator opening and close the steamer door.
2. TIME DISPLAY should read 00 (double zeros) lit but not flashing.
3. Refer to figure 2-28 and press the TIME SET one minute touch pad (5) to increase TIME DISPLAY from 00 to 09, then back to 00.
4. Refer to figure 2-28 and press the TIME SET ten minute touch pad (4) to increase TIME DISPLAY from 00 to 90, then back to 00.
5. Set the TIME DISPLAY to 01 and press the TIMED touch pad (6).
6. As the cycle starts, the steam generator heaters turn on. The green above the TIMED touch pad turns on.
7. As toe steam generator reaches temperature, the green light to the right of the TIME DISPLAY flashes on and off and the TIME DISPLAY starts counting down. One heater contactor will cycle on and off every five seconds.
8. The TIME DISPLAY counts down to 00, an alarm beeps four times and the TIME DISPLAY flashes 00.
9. The heaters, fan, and condenser valve turn off.

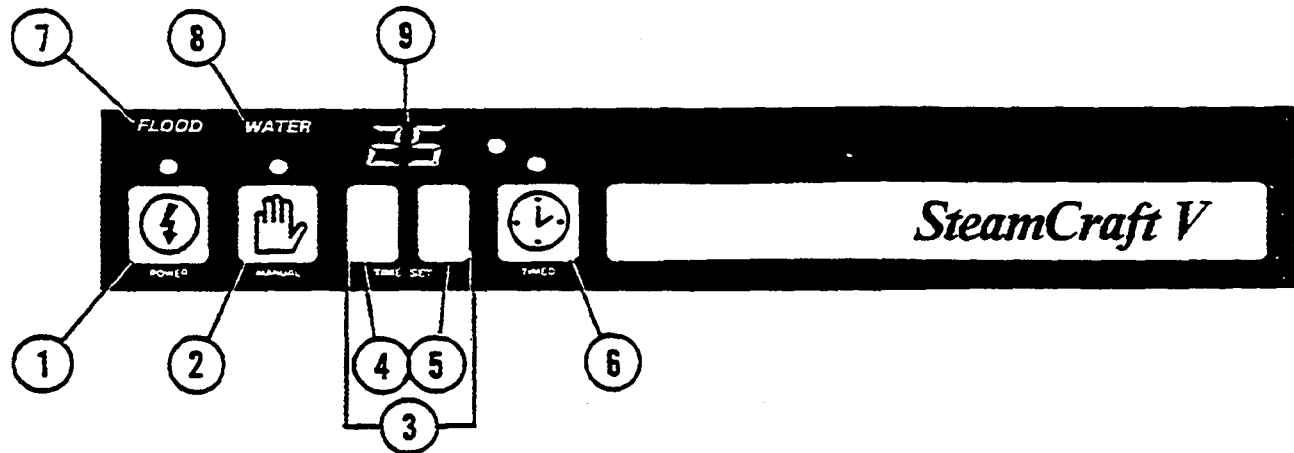


Figure 2-28. Control Panel

10. Press the TIMED touch pad (6) to stop displays.
11. Press the MANUAL touch pad (2). The green light above the touch pad turns on.
12. The heaters, fan and condenser valve turn on.
13. Allow unit to run for one minute, then press the MANUAL touch pad (2) again to stop steaming. The green light above the MANUAL touch pad turns off; the heaters, fan, and condenser valve turn off.
14. Set TIME to any number over 00. Press the MANUAL touch pad (2). The heaters, fan and condenser valve turn on.
15. Pressing MANUAL overrides the timer. Unit will remain unopened until the MANUAL touch pad is pressed again. Automatic timer can be used during MANUAL cooking, but unit will not turn off at end of timed cycle.

WARNING

SEVERE BURNS may result to eyes, nose, mouth or skin exposed to hot steam. Avoid hot steam. When opening steamer door, allow steam to vent before reaching into steamer compartment.

16. Open the steamer door.
17. Steam flow stops. The heaters, fan, and condenser valve turn off.
18. Press the POWER touch pad to turn the steamer off. The red light over touch pad turns off.
19. End of test.

CHAPTER 3. OPERATION

INTRODUCTION

To get the full advantage of steam cooking, the Cleveland Range Steam-Craft V must be property operated as described in this chapter.

WARNING
DEATH, INJURY, AND EQUIPMENT DAMAGE could result from improper operation of the SteamCraft V. Be sure steamer has been installed correctly according to the installation instructions in Chapter 2 before starting operation.

OPERATIONAL SAFETY

WARNING
SEVERE BURNS may result to eyes, nose, mouth or skin exposed to hot steam. Avoid hot steam. When opening steamer door, allow steam to vent before reaching into steamer. Do not reach into steamer or handle hot items without wearing dry heat-proof gloves. Wet or damp gloves conduct heat, and will cause bums when touching hot items.

The SteamCraft V will require minimum servicing if it is properly operated and maintained by trained personnel The following steps will help keep the steamer in good condition.

1. Conduct regular steamer inspections. Check for water and drain leaks, clogged drain, steam generator scale buildup and steamer control malfunctions.
2. Tram all personnel who will use the steamer. Make sure personnel know how to operate the steamer, dean exterior and interior, and wash out and descale the steam generator. Personnel most also be able to recognize problems and know how to take corrective action.
3. Follow the instructions for steamer and steam generator maintenance.
4. Use only factory authorized replacement pans. This will maintain Underwriters Laboratories (UL) and/or Canadian Standards Association (CSA) certification, and all approvals to protect warranty coverage.
5. Never allow unauthorized personnel to service the SteamCraft V.
6. Maintain written records of steamer maintenance.

CONTROL PANEL

Before S/N WC 9018-90A-05

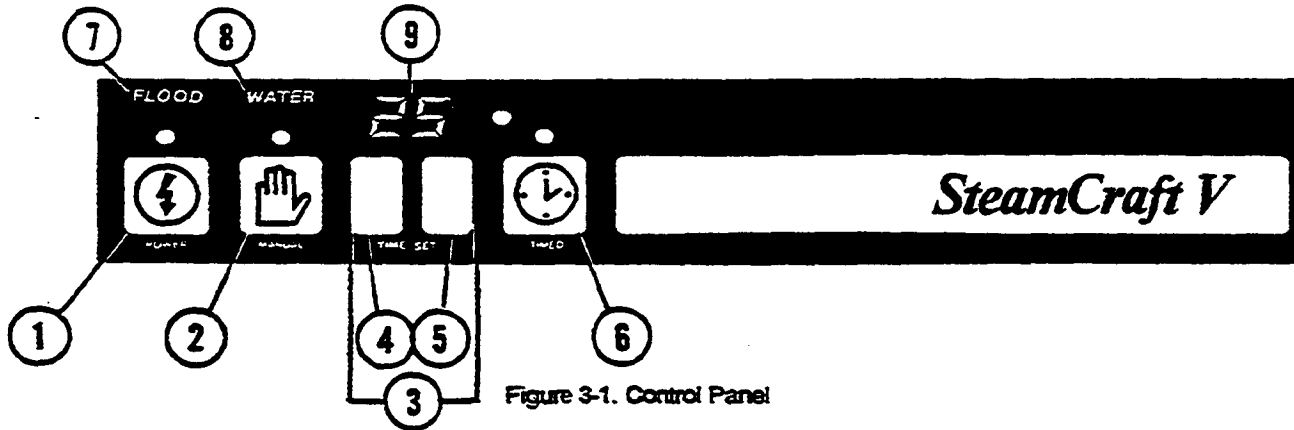


Figure 3-1. Control Panel

CAUTION

Press touch pad switches with linger tip only. Do not use finger nails, kitchen utensils, or anything sharp to press switches.

1. **POWER** This on/off touch pad controls electrical power to the steamer. A red light above the touch pad turns on when electrical power is on.
2. **MANUAL** This on/off touch pad controls MANUAL cooking time. A green light above the touch pad turns on when MANUAL mode is on. When in MANUAL mode, the DIGITAL TIME DISPLAY counts up from 00.
3. **TIMESSET** The left and right TIME SET touch pads set the DIGITAL TIME DISPLAY. A maximum of 99 minutes can be programmed using the left and right TIME SET touch pads.
4. **TIME SET-10 Minute (Left)**
The left TIME SET touch pad sets the DIGITAL TIME DISPLAY in 10 minute segments from 00 to 90 and back to 00.
5. **TIME SET-1 Minute (Right)**
The right TIME SET touch, pad sets the DIGITAL TIME DISPLAY in 1 minute segments from 00 to 09 and back to 00.
6. **TIMED** This on/off touch pad controls TIMED mode. A green light above the touch pad turns on when TIMED mode is on. When in TIMED mode, the DIGITAL TIME DISPLAY counts down.
7. **FLOOD** FLOOD is a high water safety warning. It indicates that the water level in the steam generator is too high. The

steamer shuts off and cannot be turned on until the problem is corrected. Refer to Troubleshooting in Chapter 4.

8. WATER WATER is a low water safety warning. It indicates that the water level in the steam generator is too low. Water cannot be heated until the steam generator has enough water to operate, safely. When the steamer is first turned on, the WATER safety warning normally displays until the steam generator fills to the proper level.

9. DIGITAL TIME DISPLAY

- The DIGITAL TIME DISPLAY shows cooking time.
- When MANUAL cooking is selected, the TIME DISPLAY counts up from 00 so the operator can watch elapsed time until the proper cooking time has been reached.
- When TIMED cooking is selected, the TIME DISPLAY counts down from the time set using the left and right TIME SET touch pads.
- A green light to the right of the TIME DISPLAY flashes on and off when the dock is counting. This green light turns off when the dock stops counting.
- Counting stops when the steamer door is opened or when the steamer compartment is not up to temperature.

CONTROL PANEL After S/N WC 9018-90A-05

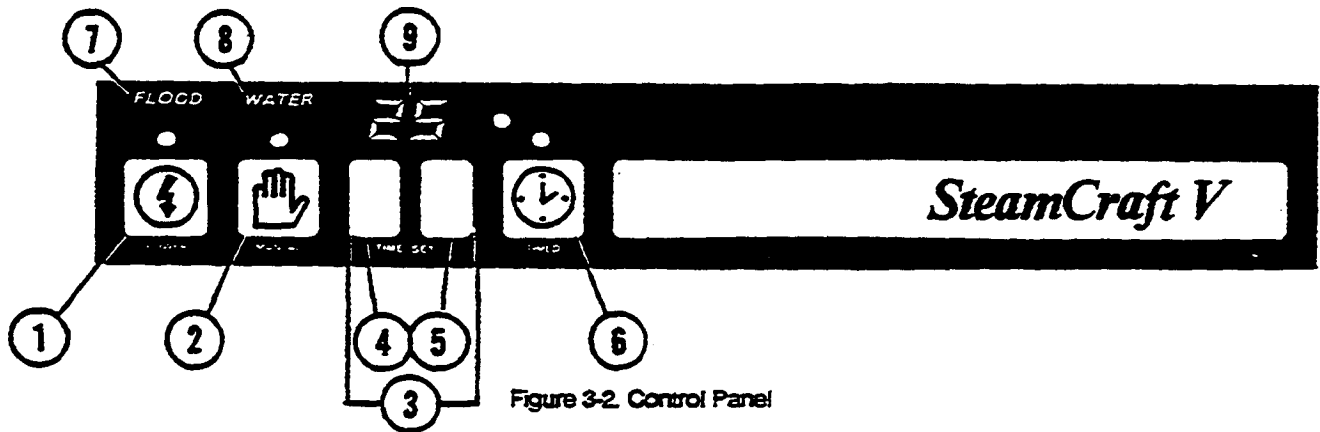


Figure 3-2. Control Panel

CAUTION

Press touch pad switches with finger tip only. Do not use finger nails, kitchen utensils, or anything sharp to press switches.

1. **POWER** This on/off touch pad controls electrical power to the steamer. A red light above the touch pad turns on when electrical power is on.
2. **MANUAL** This on/off touch pad controls MANUAL cooking time. A green light in the center of the touch pad turns on when MANUAL mode is on.
3. **TIME SET** The left and right TIME SET touch pads set the DIGITAL TIME DISPLAY. A maximum of 99 minutes can be programmed using the left and right TIME SET touch pads.
4. **TIME SET - 10 Minute (Left)**
The left TIME SET touch pad sets the DIGITAL TIME DISPLAY in 10 minute segments from 00 to 90 and back to 00.
5. **TIME SET - 1 Minute (Right)**
The right TIME SET touch pad sets the DIGITAL TIME DISPLAY in 1 minute segments from 00 to 09 and back to 00.
6. **TIMED** This on/off touch pad controls TIMED mode. A green light above the touch pad turns on when TIMED mode is on. When in TIMED mode, the DIGITAL TIME DISPLAY counts down and the green light to the right of the TIME DISPLAY flashes on and off.
7. **FLOOD** FLOOD is a high water safety warning. It indicates that the water level in the steam generator is too high. The

steamer shuts off and cannot be turned on until the problem is corrected. Refer to Troubleshooting in Chapter 4.

8. **WATER** WATER is a low water safety warning. It indicates that the water level in the steam generator is too low. Water cannot be heated until the steam generator has enough water to operate safely. When the steamer is first turned on, the WATER safety warning normally displays until the steam generator fills to the proper level

9. **DIGITAL TIME DISPLAY**

- The DIGITAL TIME DISPLAY shows cooking time
- When TIMED cooking is selected, the TIME DISPLAY counts down from the time set using the left and right TIME SET touch pads. A green light above the TIMED touch pad turns on when TIMED is pressed.
- A green light to the left of the DIGITAL TIME DISPLAY flashes on and off when the clock is counting. When the clock stops counting, this green light turns off and the DIGITAL TIME DISPLAY shows 00 (double zeros) flashing on and off.
- Counting stops when the steamer door is opened or when the steamer compartment is not up to temperature.

DRAIN VALVE

The steamer drain valve is located underneath the steamer, near the left rear corner; see figure 3-3. Push the handle to the right to close the drain valve. Pull the handle toward the front of the steamer to open the drain valve. The drain valve is closed during operation. The drain valve is opened to drain water from the steam generator.

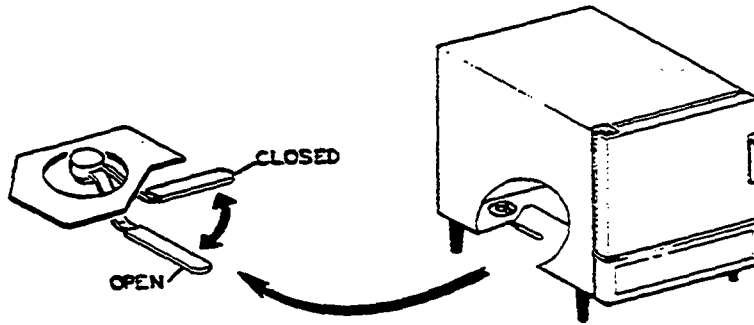


Figure 3-3. Drain Valve Open/Closed

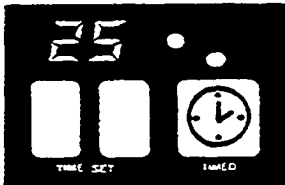
TIMED MODE**Before S/N WC 9018-90A-05**

Figure 3-4. TIMED Mode

TIMED mode is used when the operator wishes to set the timer for a specific length of cooking time, for example, according to food package instructions or recipe instructions.

1. The left and right TIME SET touch pads set cooking time. Press the left touch pad to increase time in 10 minute segments. Press the right touch pad to increase TIME in 1 minute segments. The DIGITAL TIME DISPLAY must be reset before each new cooking process.
2. Pressing the TIMED touch pad starts timed cooking. The green light above the TIMED touch pad turns on.
3. When the steamer reaches cooking temperature, time starts, counting down from the value set on the display. A green light to the right of the DIGITAL TIME DISPLAY flashes on and off when the steamer is operating. If the steamer door is opened or the steamer compartment is not up to cooking temperature, the clock stops counting and the green light turns off.
4. Time counts down to 00. At the end of the cooking time, the green light turns off, the DIGITAL TIME DISPLAY flashes 00, and a signal beeps four times.

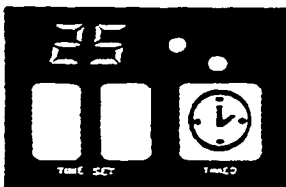
TIMED MODE**After S/N WC 9018-90A-05**

Figure 3-5. TIMED Mode

TIMED mode is used when the operator wishes to set the timer for a specific length of cooking time, for example, according to food package instructions or recipe instructions.

1. The left and right TIME SET touch pads set cooking time. Press the left touch pad to increase time in 10 minute segments. Press the right touch pad to increase TIME in 1 minute segments. The DIGITAL TIME DISPLAY must be reset before each new cooking process.
2. Pressing the TIMED touch pad starts timed cooking. The green light above the TIMED touch pad turns on.
3. When the steamer reaches cooking temperature, time starts counting down from the value set on the display. The green light to the right of the DIGITAL TIME DISPLAY flashes on and off when the steamer is operating and time is counting down.

If the steamer door is opened or the steamer compartment is not up to cooking temperature, the dock stops counting and the green light turns off.

4. Time counts down to 00. At the end of the cooking time, the green light turns off, the DIGITAL TIME DISPLAY flashes 00, and a signal beeps four times.
5. Pressing the POWER touch pads turns off all lights and displays.

MANUAL MODE Before S/N WC 9018-90A-05

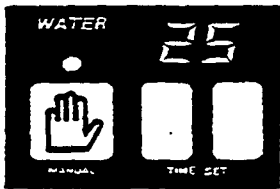


Figure 3-6. MANUAL Mode

When MANUAL cooking is selected, the DIGITAL TIME DISPLAY counts up from 00. The operator can watch time elapse until proper cooking time has been reached. If exact cooking time is not known, the operator can check food periodically to find when it is done.

1. Pressing the MANUAL touch pad starts steamer manual time cooking. The green light above the touch pad turns on. Time starts counting up from 00 on the DIGITAL TIME DISPLAY.
2. When correct cooking time has elapsed, pressing the MANUAL touch pad a second time stops the steamer.
3. Time stops counting when steamer door is opened or steamer compartment is not up to temperature.

MANUAL MODE After S/N WC 9018-90A-05

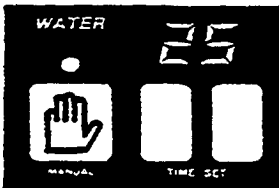


Figure 3-7. MANUAL Mode

When MANUAL cooking is selected, the steamer operates until the MANUAL touch pad is pressed again. If exact cooking time is not known, the operator can check food periodically to find when it is done.

1. Pressing the MANUAL touch pad starts steamer manual cooking. The green light above the touch pad turns on.
2. When correct cooking time has elapsed, pressing the MANUAL touch pad a second time stops the steamer.
3. Steaming stops when the steamer door is opened or the steamer compartment is not up to temperature.
4. The timer can be set during MANUAL cooking; but when the timer counts down to 00 and the alarm beeps, the steamer does not turn off. The MANUAL touch pad must be pressed to stop steaming.

THERMOSTATIC TIMER COMPENSATION

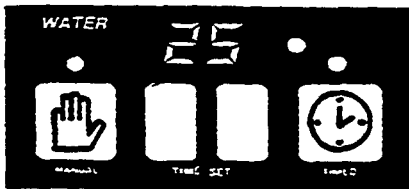


Figure 3-8. Timer Compensation

This is an automatic function designed to ensure consistent cooking results. Time does not start counting until the steamer reaches cooking temperature. Time automatically stops counting if the steamer door is opened during cooking time, or if the steamer compartment is not up to cooking temperature. Whenever automatic adjustment is taking place, the DIGITAL TIME DISPLAY stops counting and the green light turns off. When the steamer reaches a preset temperature, the timer will automatically begin counting. This feature does not require any control settings by the operator.

CONTROL PANEL WARNINGS
WARNING

If FLOOD light is flashing, **DO NOT OPEN COMPARTMENT DOOR!** Shut off water valve to steamer and allow steamer to cool down before opening steamer door.

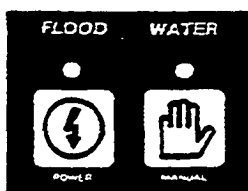


Figure 3-9. FLOOD/WATER Message

FLOOD is a high water alarm. It lights when the water level in the steam generator is too high. Steamer operation stops and cannot be restarted until the cause of the FLOOD message is corrected. The compartment must be drained completely, and the POWER touch pad pressed twice to remove the FLOOD alarm. Refer to Troubleshooting in Chapter 4.

WATER is a low water alarm. It lights when the water level in the steam generator is too low. The heaters in the steam generator will not run until the water level is high enough for safe steam generator operation. When the steamer is first turned on, the WATER safety warning normally displays until the steam generator fills to the proper level.

If the FLOOD or WATER alarm does not turn off when the water level is corrected:

1. Open the drain valve.
2. Wash out the steamer compartment and steam generator.
3. Descale the steam generator.
4. Refer to Troubleshooting in Chapter 4.
5. If the FLOOD or WATER alarm still does not function correctly, arrange to have an Authorized Service Representative inspect and repair the steamer.

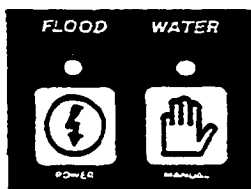
START-UP AND PREHEAT


Figure 3-10. POWER On

1. Make sure that the drain valve is closed and the compartment drain is clear of debris. The fan guard, slide racks and steam generator cover must be installed in the steamer compartment. Close the steamer door.
2. Press the POWER touch pad. The red light above POWER and the WATER alarm light turn on. Water starts to run until the steam generator fills with water. When the proper water level is reached, the water and the WATER alarm light turn off. The heaters turn on to heat the steam generator water to stand-by temperature.
3. Press the MANUAL touch pad. The green light above the touch pad turns on. Wait about five minutes for steam to preheat the compartment.

COOKING

1. Clean any debris out of the steamer compartment.
2. Preheat steamer compartment as described above.

CAUTION

Some foods drip juices. Use a solid catch pan under pans used for steaming food that will drip juices. Failure to use a catch pan can cause a clogged drain.

3. Put food into pans and slide the pans into the pan *racks* inside the steamer. Do not place pans on the steam generator cover. When cooking foods that will drip, such as meats, poultry, or fish; put solid catch pan in the bottom slide of the rack. Close the steamer door.
4. To obtain the best cooking results, use shallow (2-1/2 inch deep), perforated pans without covers (Cleveland Range model number PP-2.5). This gives the best heat transfer and shortest cooking time for the food.
5. Select either TIMED or MANUAL cooking. Refer to TIMED and MANUAL cooking instructions that follow.

WARNING

SEVERE BURNS may result to eyes, nose, mouth or skin exposed to hot steam. Avoid hot steam. When opening steamer door, allow steam to vent before reaching into steamer. Do not reach into steamer or handle hot items without wearing dry heat-proof gloves. Wet or damp gloves conduct heat, and will cause burns when touching hot items.

CAUTION

Press touch pad switches with linger tip only. Do not use finger nails, kitchen utensils, or anything sharp to press switches.

NOTE

Although steamer door can be opened at any time during cooking, steam flow and dock will stop when door is open. Clock restarts and steam flows when door is closed. Also, the dock will not run if steamer is not up to temperature.

TIMED Cooking

-
1. Use SUGGESTED TIMER SETTINGS guide located on the steamer door.
 2. Set TIME by pressing the left and right TIME SET touch pads.
 3. Press the TIMED touch pad. The green light above the touch pad turns on. When the steamer reaches cooking temperature, the green light to the right of the DIGITAL TIME DISPLAY flashes on and off and the timer starts counting down.
 4. Food starts cooking.
 5. At the end of cooking time, DIGITAL TIME DISPLAY flashes 00 and the alarm beeps four times.
 6. Carefully open steamer door and remove food.

MANUAL Cooking

-
1. Use SUGGESTED TIMER SETTINGS guide located on the steamer door.
 2. Press the MANUAL touch pad. The green light above the touch pad turns on.
 3. Food starts cooking.
 4. At end of cooking time, press the MANUAL touch pad again. The green light above the touch pad turns off.
 5. Carefully open steamer door and remove food.

SHUT DOWN (At end of day or shift)

This procedure must be performed at the end of each day or shift to maintain warranty coverage.

1. Turn off the steamer electrical power at the disconnect switch.
2. Turn off the main and untreated water supply valves.

WARNING

SEVERE BURNS may result eyes, nose, mouth or skin exposed to hot steam. Avoid hot steam. When opening steamer door, allow steam to vent before reaching into steamer. Do not reach into steamer or handle hot items without wearing dry heat-proof gloves. Wet or damp gloves conduct heat, and will cause burns when touching hot items.

3. Open the steamer door and allow the steamer to cool down.

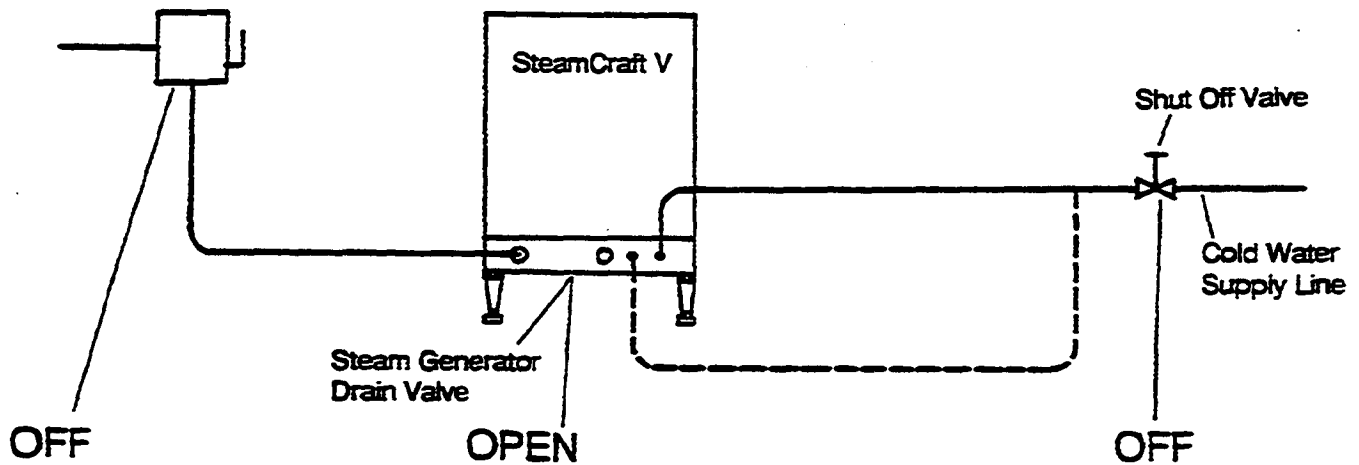


Figure 3-11. Shut Down Schematic

WARNING
Inside of steamer and circulator heater (behind fan guard) stay hot for a long time. Be careful when cleaning inside steamer compartment

4. Remove the slide racks, fan guard and steam generator cover. Wash and nose separately or run them through dishwasher according to health requirements.
5. Before draining, while water is still warm, use a very soft brush to brush down the probes, generator walls and elements to remove accumulated scale before it hardens.
6. Open the drain valve underneath the steamer by pulling the handle toward the front of the steamer.
7. Remove any spilled food inside compartment and make sure the drain screen is clear. Wipe the interior with a damp cloth. Do not use soap, detergent or any cleaning agent inside the steamer.

8. Run clean rinse water through the compartment drain and steam generator.

WARNING

Let rinse water drain through compartment drain opening. If water does not drain freely, drain lines must be cleaned before cooking again. Clogged or slow drains are dangerous because hot water may spill out when compartment doors are opened during or after a cooking cycle.

9. Wipe the exterior a damp cloth only. Do not hose down equipment.

10. Inspect the steam generator for scale buildup. Perform steam generator descaling as required.

11. After cleaning, leave the steamer door open to increase door gasket life and stop compartment odors until the next day or shift.

CHAPTER 4. PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING

INTRODUCTION

Maintenance on the steamer must be performed on a regular basis to keep the unit running properly. Follow the maintenance instructions in this chapter and problems will be kept to a minimum. If problems do occur, refer to the Troubleshooting Guide on page 51. For more information on products and services, contact your nearest Authorized Service Representative.

MAINTENANCE RECORDS

Make a file solely for maintenance records and keep a written record of daily, weekly, and yearly maintenance and when the steamer is descaled. These records will protect warranty coverage and help personnel to know when to perform maintenance functions.

DAILY MAINTENANCE

1. Clean interior and exterior of SteamCraft V according to instructions of SHUT DOWN on page 43, Operation.
2. Before draining, while water is still warm, brush the generator out with a very soft brush going over the probes, elements and sides. This removes scale before it hardens and prevents scale buildup. Drain the steam generator at least twice a day in order to maintain the quality of water being used. The more often water is drained from the steam generator, the less scale builds up on the heating coils. If poor quality water is used, the steam generator may have to be drained more often than twice a day. See Water Quality Requirements on page 6.
3. Remove any spilled food from the steamer and ensure that drain screen is clear. Wipe interior and door gasket with a damp cloth only. Do not use soap or detergent inside steamer. Run clean rinse water through compartment drain and steam generator.
4. The slide racks, fan guard, and steam generator cover can be removed for thorough cleaning as necessary. Wash and rinse separately or wash them in dishwasher.
5. Before cleaning steamer exterior, be sure that electricity is turned off at the disconnect switch. Use a damp cloth for cleaning as necessary. Never hose down the equipment.

WEEKLY MAINTENANCE

WARNING

The steamer is equipped with a drain screen in the back of the cooking compartment. The steamer should never be operated without the screen in place. This screen prevents large food particles from entering and possibly blocking the drain line. Any blockage of the drain line may cause a slight buildup of back pressure in the compartment resulting in steam leaks around the door gasket. It also may adversely affect the convection action of the steam in the compartment, which is necessary for optimum performance.

1. Make sure the drain screen and drain line are not blocked. Pour USDA approved drain cleaner through drain once a week.
2. Inspect for steam generator scale weekly. The frequency of steam generator descaling depends upon water quality and daily steam generator drain and washout. If steam generator scale buildup is a frequent problem, install a water treatment system for the steamer. See Water Quality Requirements on page 6.
3. Regardless of use, steam generator should be descaled at least once a month. See Steam Generator Descaling Procedure below.

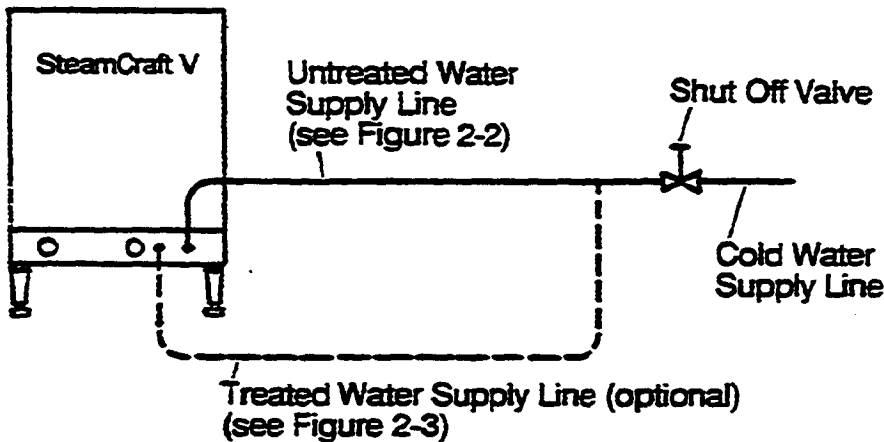


Figure 4-1. Water Line Valve

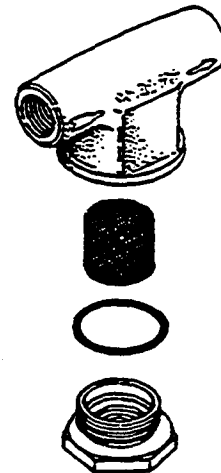


Figure 4-2. Cleaning Strainer

YEARLY MAINTENANCE

Clean the water line filter at least once a year as follows:

1. Close the valve in the steamer water line. Refer to figure 4-1.
2. Unscrew the filter from the bottom of the strainer which is located in back of the steamer. Refer to figure 4-2.

3. Remove the filter screen and wash it with clean water. Refer to figure 4-2.
4. Put screen back into cap and screw cap into strainer.
5. Open water valve and check for water leaks.

STEAM GENERATOR DESCALING PROCEDURE

Steam generator should be descaled at least once a month, depending on scale buildup. If you have serious steam generator scale buildup, install a water treatment system for the steamer. Cleveland Range, Inc. recommends use of the descaling kit (part number 101751). Full descaling may take several hours, or more than one add process. Perform descaling until an scale buildup is cleaned out.

WARNING

Liquid Phosphoric Acid can be harmful if not handled properly. Follow these basic safety rules for handling and using acid.

- Wear protective clothing when mixing or applying chemical cleaners. Wear rubber gloves, mask and approved cup-type goggles.
- Avoid breathing fumes and dust. If dust or liquid comes in contact with skin, flush immediately with large quantities of cold water. Remove contaminated clothing.
- If chemical contacts eyes, flush with cold water for a minimum of 15 minutes. Get immediate medical attention.
- If chemical is swallowed or ingested, follow instructions on the chemical container. Get immediate medical attention.

CAUTION

Do not scrape heating elements or water level probes with a solid tool.

1. Make sure that electrical power is turned off at the disconnect switch and that the steam generator drain valve is open. Allow time for the steamer compartment and steam generator to cool down before performing step 2.

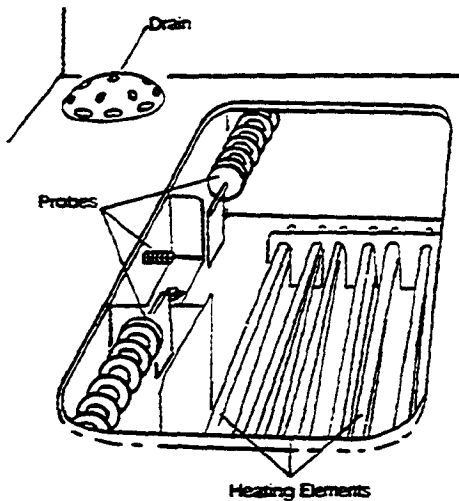


Figure 4-3. Drain, Probes, and Heating Elements

2. Rinse out the steam generator with clean water. Remove loose particles from inside the steam generator. Do not rinse them down the drain.
3. Turn electrical power on at the disconnect switch.
4. Close the drain valve; leave the steam generator cover off.
5. Press the POWER touch pad. The red light over the touch pad turns on. In about five seconds, water starts filling the steam generator.
6. When the steam generator stops filling, check that the water level is above scale buildup. Add hot water until all scale is under water.
7. Close the steamer door and press the MANUAL touch pad. The green light above the touch pad turns on. Let water heat up to 140°F to 160°F. Press the MANUAL touch pad again; the green light turns off.
8. Mix 2 or 3 caps of phosphoric add with the hot water in the steam generator. A bubbling and hissing indicates that the acid is dissolving the scale.
9. Put the cover into the steam generator so cover will also be descaled.
10. Leave acid in the steam generator for at least 1-1/2 hours. Full descaling may take several hours, depending upon the amount of scale buildup. If add is consumed (bubbling and hissing stops), add one or two more cups of add to the steam generator solution.
11. When the steam generator is clean of scale, remove and wash off cover in clean water.
12. Drain acid by opening the dram valve.
12. Close the drain valve and fill the steam generator with cold water to original water level.
14. Add three or four tablespoons of baking soda to the water to neutralize any remaining add.
15. Close the door and press the TIMED touch pad (green fight over touch pad turns on). Set TIME SET for 10 minutes.
16. At the end of the TIMED cycle, press the POWER touch pad. The red fight over the touch pad turns off.
17. Open the drain valve and flush oat the steam generator with cold water.
18. Inspect the steam generator. If scale still exists, repeat the above process; otherwise, descaling is complete.

NOTE

Contact service representative or manufacturer for descaling kits or for information on descaling procedures.

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	REMEDY/REFERENCE
POWER touch pad on, but panel light does not turn on.	Electricity turned off.	Turn on on electricity.
WATER alarm light on. Steamer does not make any steam.	Normally on during FILLING.	
	Water supply to steam generator is turned off.	Open water supply valve.
	Water line filter is dogged.	Clean out water supply filter-
	Drain valve is open.	Close drain valve.
	Inoperative controls.	See note #1.
FLOOD alarm light on. (Steamer controls do not work.)	WARNING: Do NOT open door. Steamer flooded; drain closed.	Open drain.
	Drain clogged inside steamer	See note #2.
	False alarm by water splashing on flood probe. Water pressure too high.	Restart per note #3.
	Unit may need new flood probe retrofit kit.	Contact service representative.
	Water solenoid or controls inoperative.	Turn electricity and water off and refer to note #1.
	Steam coming from drain hub.	Water supply to condenser turned off
Water line strainer is clogged.		Clean oat water supply strainer.
Water supply line to the can-denser blocked, broken, or leaking.		Repair or replace water supply line See note #1.
Inoperative condenser solenoid.		Replace solenoid. See note #1.
Inoperative controls.		Turn off electricity. See note #1.
Steam and/or water draining around cabinet door.		Drain clogged or covered.
	Door seal or door parts worn.	See note #1.
	Steamer not level.	See note #6.
Steam flow does not stop when timer reads 00, or fan and heaters stay on when cabinet door is open.	Inoperative controls inside cabinet.	Turn off electricity. See note #1.

TROUBLESHOOTING GUIDE (continued)

PROBLEM	POSSIBLE CAUSE	REMEDY/REFERENCE
Water leaking from bottom of cabinet.	Broken or loose parts inside steamer cabinet.	Turn off electricity and close water supply valve(s). See note #1.
Water leaking from water pipes or	Plumbing needs repair.	See note #5.
Food takes too long to cook.	Trays too close to the bottom of cabinet.	Put trays in slots near top of cabinet.
	Steam generator scale buildup.,	Descale steam generator with USDA approved descaler.
	Condenser on an the time.	See note #1.
	Cabinet overloaded with too much food.	Put less food into trays, or fewer trays in cabinet.
	Voltage too low for unit	See note #4.
	Suggested cooking times are for sea level cooking.	Extend cooking times for altitudes above 2500 feet.
Cabinet bottom dirty with food drippings.	Juices and/or food leaking from perforated trays.	Put a solid tray under perforated trays to catch drippings.

TROUBLESHOOTING NOTES

WARNING

Do not attempt to open compartment door while steamer is hot.

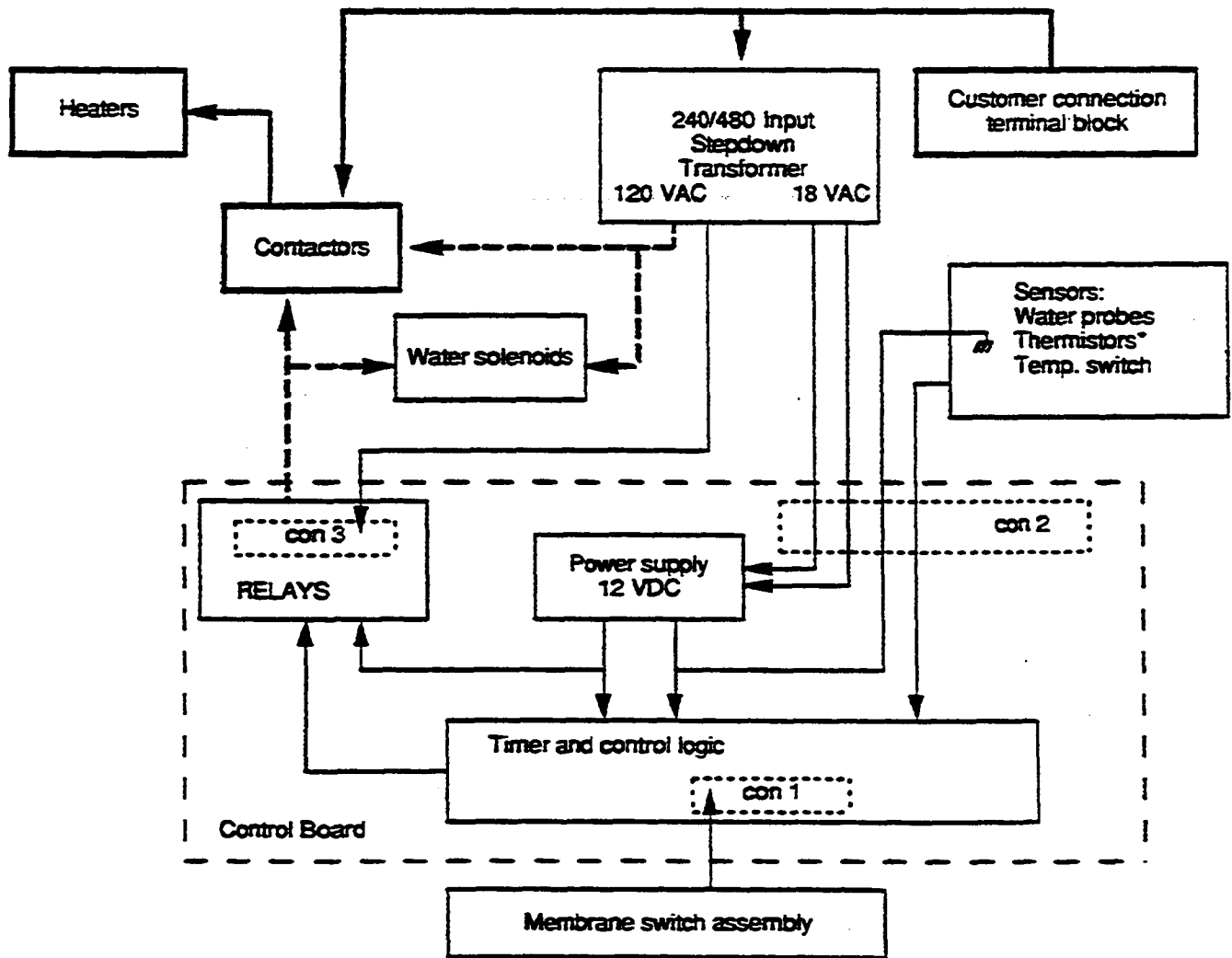
NOTE

Some unit problems such as steam generator flooding or no water in steam generator can be caused by dirt or scale on water level probes inside steam generator. Try descaling steam generator.

1. If problem is inside the steamer compartments, call an authorized service representative. Cleveland Range, Inc. will not pay for warranty repairs by unauthorized repair centers.
2. Perform the following procedure.
 - a. Turn water off at water supply valve.
 - b. Let steamer cool down for half an hour.
 - c. Place a container under steamer door to catch any water as door is opened.
 - d. Clear drain of debris.

- e. Press the POWER touch pad twice. FLOOD alarm should clear.
 - f. If the FLOOD alarm light comes on during next operation cycle, repeat steps a through d, then clean drain with USDA approved drain cleaner.
3. Follow steps in # above. If steamer is not flooded, the flood probe may have been splashed. Turn water back on at water supply valve and restart steamer according to instructions in Chapter 3 Operation.
 4. Repairs to external wiring should be done by a Licensed Electrician.
 5. Repairs to external plumbing should be done by a Licensed Plumber.
 8. Proper installation of the SteamCraft V is the responsibility of the owner or installer. Refer to Cleveland Range, Inc. warranty on the inside front cover.

For more information on products and services, contact your nearest Authorized Service Representative. Call factory for a preventative maintenance program, descaling kits, descaling information and water treatment systems: USA: 800-782-0040, Canada: (416) 663-7770.



- 208 to 480 Volt Circuits
- - - 120 Volt Circuits
- Low Voltage Control Circuits

* on units before S/N C 1613-88A-24

Figure 5-1. Block Diagram

CHAPTER 5. ELECTRICAL SYSTEM

OVERVIEW

The SteamCraft V electrical system has three separate power circuits shown in the block diagram, Figure 5-1. They are the primary (high voltage) circuit, the 120 VAC circuit, and the low voltage control circuits. Normally open relay contacts provide the interface among the three circuits.

Wiring diagrams and schematic diagrams are located in Chapter 6. Table 6-1 lists serial numbers and their applicable wiring and schematic diagrams. The schematic and wiring diagrams are at the end of Chapter 6. Refer to Table 6-1 to find the wiring and schematic diagrams that apply to the unit being serviced.

The primary circuit taps high voltage (208, 230, or 460 VAC) directly from the external power source connected to the terminal block. A three-pole terminal block is used for delta connections; a four-pole terminal block is used for wye connections. This circuit powers the primary coil of the transformer, the steam generator heater elements, the fan motor, and the fan heater element.

The 120 VAC circuit draws its power from the 120 VAC secondary windings of the transformer. This circuit supplies power to contactors and solenoids which control high voltage and water flow. The front and rear contactors control power to the heaters and fan motor. The solenoids control the water fin and condenser spray valves.

The low voltage circuit draws power from the 18 VAC secondary windings of the transformer. The 12-VDC power supply is on the control board. It provides regulated DC power to the temperature sensors, to the relays that control the 120 VAC contactors and solenoids, and to the timing, display and safety circuits. A high frequency section (15-20 kHz) supplies power to the water level probes.

NOTE

The following must be isolated from around: all high voltage (208-480 VAC) input, heater, transformer primary wiring, transformer secondary circuits (18 and 120 VAC), secondary loads, and switching devices (including relay circuits on control boards).

PRIMARY CIRCUIT

The primary circuit draws power directly from the external power lines. For proper SteamCraft V operation, the electrical characteristics of the primary circuit components must match the external supply voltage, cont.

cont. (208,230, or 460 VAC). The primary circuit components are: the transformer primary coil, the fan motor, and the steam generator and fan heater elements. Cleveland Range supplies these components in groups compatible with most international power systems. To identify the electrical characteristics of the primary circuit components, refer to the Product Identification plate on the left side of the unit (Figure 6-1), and the Performance Data plate on the fan motor (Fan Assembly, Figure 6-1).

When servicing, repairing, or replacing any of the primary circuit, components, observe the requirements of the Product Identification and the Performance Data plates, and pay particular attention to the following.

1. For operation at 208-240 VAC, the primary windings of the stepdown transformer must be wired in parallel.
2. For operation at 440-480 VAC the primary windings of the stepdown transformer must be wired in series.
3. Steam generator and fan heater elements are available for 208,230, or 460 VAC operation. When testing or replacing steam generator or fan heater elements, refer to Heater Elements and Tables 5-1 and 5-2.
4. Normally, the SteamCraft V control panel is factory set for 60 Hz operation. For 50 Hz operation, Cleveland Range supplies the control panel with jumper wire JP1 removed. See Figure 5-2. If installation requires removal of JP1 in the field, the conformal coating must be repaired with Cleveland Range approved coating material.

Table 5-1. Steam Generator Heater Elements

PART NO.	WATTS	VOLTS	OHMS +5%
101223	2660	205	16
1012231	2660	230	48
1012232	2660	460	78
101224	5300	205	8
1012241	5300	240	10
1012242	5300	480	39

Table 5-2. Fan Heating Elements

PART NO.	WATTS	VOLTS	OHMS +5%
101227	300	208	139
1012271	300	230	172
1012272	300	460	666

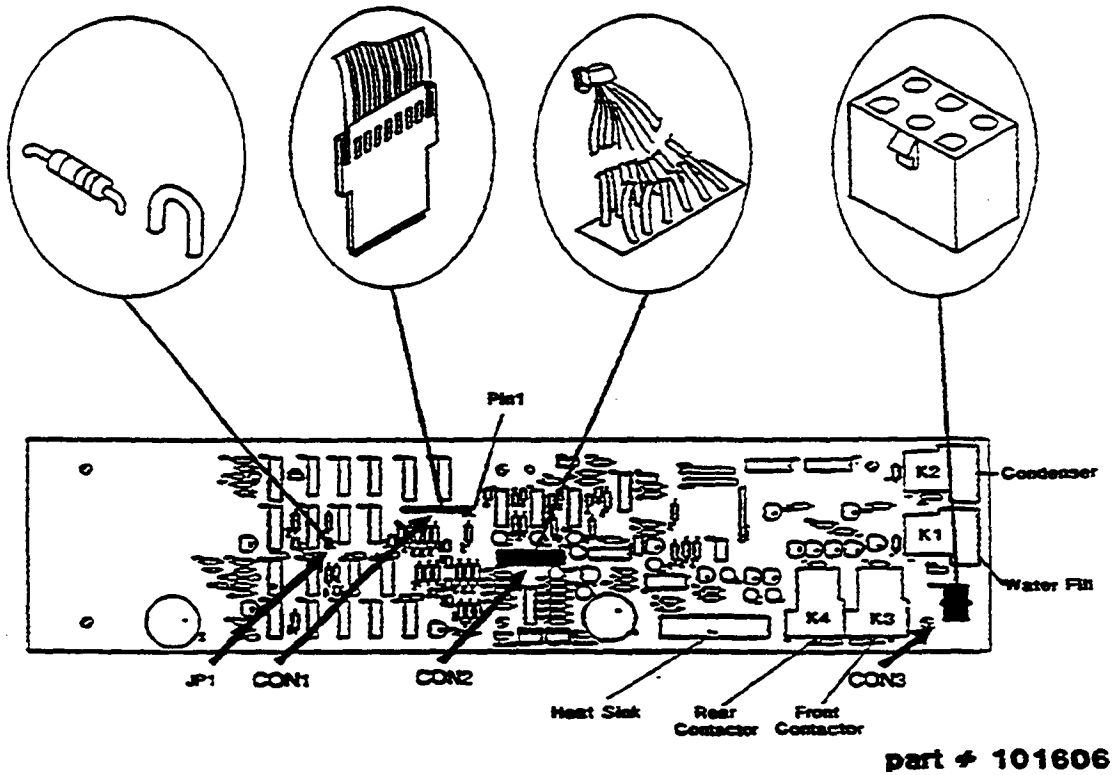
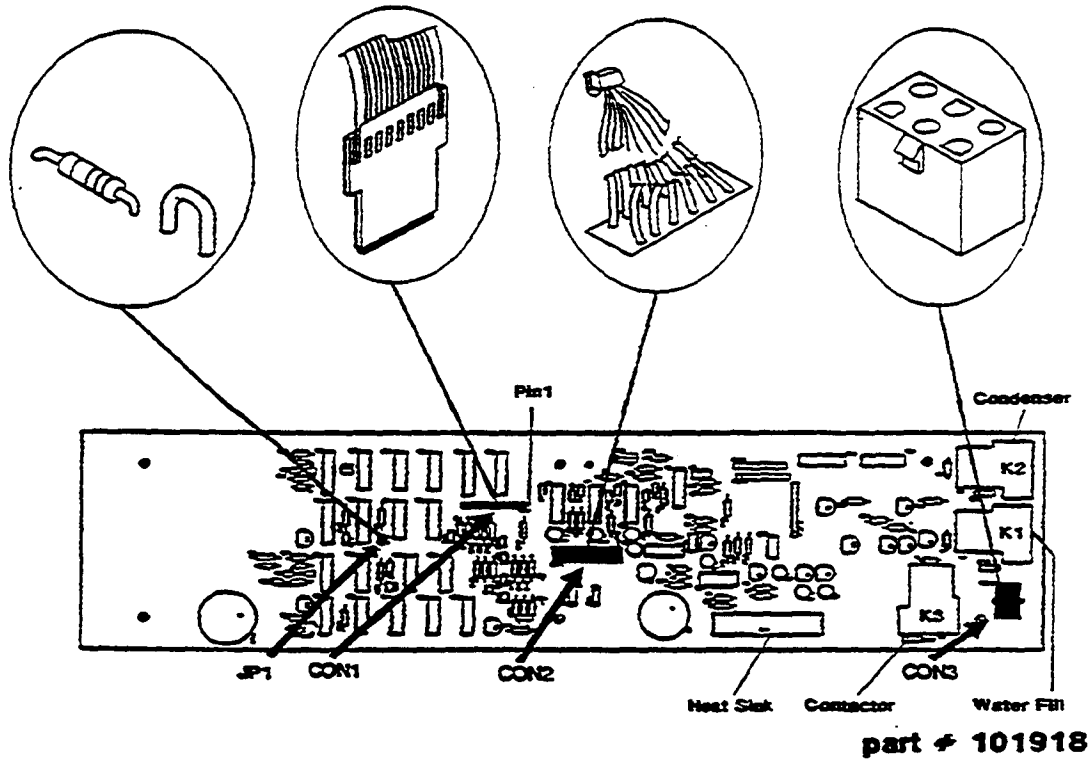


Figure 5-2. Control Board Printed Circuit Board

Heater Element Testing

WARNING

DEATH, INJURY, OR EQUIPMENT DAMAGE may be caused by the voltages associated with the generator and heater elements.

Turn the power OFF at the external disconnect switch before testing the heater elements.

The steam generator and fan heater elements may be tested while installed the steam generator with or without wiring connected. When testing a heater element, observe the following considerations.

1. Before performing tests that require steamer disassembly, observe the heater elements during steamer operation. The formation of small steam bubbles around an energized heater element indicates the element is operating correctly. Note that the heaters operate only when the door is dosed. To simulate a dosed door, refer to the Door Sensor section, page 62.
2. Turn power off at external disconnect switch.
3. Measure the resistance between the heater terminals and the steam generator tank (ground). The heater element is undamaged if a very high (over 1 megohm) or infinite resistance is measured between either terminal and ground.
4. Measure the resistance of the heater element and compare the results to the values in Tables 5-1 and 5-2 for the particular part number being tested.
5. When testing an element known to be good, it is possible to identify the part number by matching the actual measurements with the ratings listed for each part number.

120 VAC CIRCUITS

The 120 VAC circuit draws power from the 120 VAC secondary windings of the transformer. This circuit includes the contactors and solenoids which control the heater elements, can motor, water fill valve, and condenser spray valve. The board-mounted relays K1, K2, K3, and K4 control 120 VAC power to the front contactors, rear contactors, and fill/condenser solenoids through the six pin plug CON 3.

Power Circuits

When troubleshooting or tracing circuits, refer to the block diagram (Figure 5-1), and Table 6-1 for the wiring and schematic diagrams that apply to the unit being serviced.

For ease of identification, all 120 VAC circuits are wired with 18 AWG wire, white or white with color tracer (stripe). One harness assembly contains all 120 VAC wiring and connects to the control board through CON 3. The acceptable voltage range for the 120 VAC circuits is 105 to 140 VAC as measured at the transformer with the loads disconnected.

Control Circuits

Relays (K1, K2, K3, K4) mounted on the control board use normally open contacts to control 120 VAC power to the front/rear contactors and the water flow solenoids. One side of each contactor or solenoid connects directly to one side of the 120 VAC secondary of the transformer. Power to the other side of the contactors and solenoids comes from the control board through CON 3 with a separate wire to each contactor or solenoid. Refer to the wiring diagram (see Table 6-1) for the tracer colors of these wires. One wire (white with black tracer) from the transformer feeds power through CON 3 to the one side of the contacts of relays K1-K4 on the control board. When K1, K2, K3, or K4 energizes, its contacts close to complete the circuit through CON 3 and energize the associated contactor or solenoid. In turn, contacts of the energized contactor close to turn on the heaters and fan motor. Solenoids, when energized, open the water flow valves.

NOTE

False digital multimeter (DMM) voltage readings will result from improper test connections. DO NOT disconnect CON 3 from the control board when checking voltage output from CON 3 to solenoids or contactors. The load (CON 3) must remain connected to the board for accurate results. If the load is not connected to the board, the DMM gives a false reading.

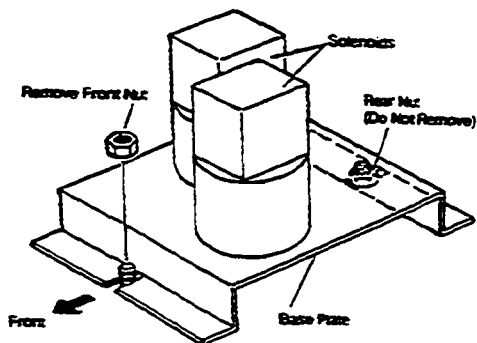


Figure 5-3. Removable Base Plates

To check power from the control board to the front or rear contactors (energized), measure the voltage (120 VAC nominal) across the terminals at the contactor. The exposed contactor terminals or the capacitor leads provide convenient hook-up points. For ease of access, the solenoids mount on removable base plates. Remove the nut (Figure 5-3) from the front end of the plate. Lift the front edge of the plate and slide it toward the front. The rear base plate nut may need to be loosened to allow the plate to slide freely.

To check power to the water flow solenoids, slide the connectors about 1/8-inch or less from the solenoid terminals. The connectors must remain firmly attached to the solenoid terminals. Move the connector only enough to allow the voltmeter probes to contact the metal solenoid terminals. Measure the voltage (120 VAC nominal) across the terminals of the energized solenoid. When measurements are completed, remember to slide the connectors fully onto the solenoid terminals. Replace the base plate and secure with the front base plate nut.

Water Fill Solenoid Valve

The water level control for the steam generator activates whenever the steamer is on. During normal operation, the water fill solenoid energizes (valve open) if the resistance between the water level probe and the steam generator ground has been higher than the set point (12,000 Ohm) continuously for more than 5 seconds. This indicates that the water level in the steam generator is below the flag welded to the tip of the probe.

When water touches the probe flag, the resistance between the probe and ground drops below the set point, and the solenoid valve shuts immediately. See Water Level Control Testing section, page 65.

Condenser Spray Solenoid Valve

The condenser spray solenoid energizes (valve open) during all cooking cycles while the compartment door is closed. This maintains a steady flow of cooling water to the condenser during steamer operation.

Steamer Ready Conditions

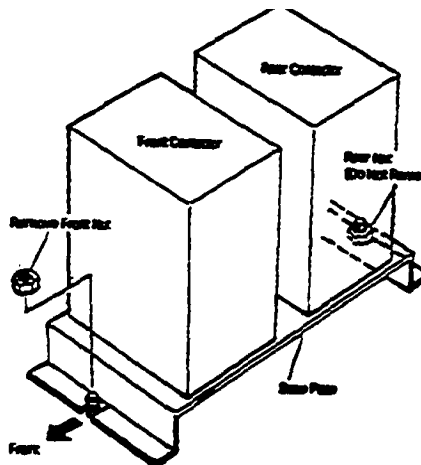


Figure 5-4. Removable Base Plates

Front Contactor (3 pole)

The steamer circuits are ready to generate steam when ALL three of the following conditions are met

- The compartment door is closed.
- Water level is above the low water probe (WATER alarm is not fit).
- One of the cooking cycles (TIMED or MANUAL) is in progress.

For ease of access, the front and rear contactors mount on removable base plates. Remove the nut (Figure 5-4) from the front end of the plate. Lift the front edge of the plate and slide it toward the front. The rear base plate nut may need to be loosened to allow the plate to slide freely.

The front contactor energizes during standby steaming cycles. The SteamCraft V operates in standby anytime the steamer has been energized by pressing the POWER switch on the front panel, the door is closed, and the water level is above the low water probe. Contacts (L2 and L3 for DELTA connection, L1 and L2 for WYE connection) of the front contactor close to turn ON the fan motor and the 5.3 kW heater nearest the left side of the unit. This maintains water temperature at 190 F. During the steaming cycles, the front contactor remains energized and the rear contactor cycles as described below. See the schematic and wiring diagrams (refer to Table 6-1).

For units with 3-wire DELTA connection, contact L1 doses to supply power to one side of the middle two 2.56 kW heaters.

For units with 4-wire WYE connection, L3 doses to connect neutral to the two 2.56 kW heaters, the right side 53 kW heater, and the 300 W fan motor heater.

Rear Contactor (3 POLE)

The rear contactor functions during steaming cycles when the steamer ready conditions are met

For DELTA connected units, contacts L1 and L2 close to energize the right side 5.3 kW heater and the 300 W fan heater. Contact L3 doses to complete the circuit through the two 2.56 kW heaters. Both front and rear contactors must energize to operate the 2.56 kW heaters.

For WYE connected units, contacts L1, L2, and L3 close to complete the circuits to the two 2.56 kW heaters, the right side 5.3 kW heater, and the 300 W fan motor heater. Both front and rear contactors must energize to operate these heaters.

During steaming cycles, both the front and rear contactors operate. The front contactor remains energized to operate one 5.3 kW heater and the fan motor. The rear contactor cycles to operate all other heaters. See Temperature Control Circuits on page 67.

When measurements are completed, remember to slide the connectors fully onto the solenoid terminals. Replace the base plate and secure with the front base plate nut.

LOW VOLTAGE CIRCUITS and CONTROL BOARD

Low voltage components, energized by the 12 VDC power supply, control an steamer functions through circuits on the control board. As the wiring diagram (see Table 6-1) shows, temperature sensors and level probes connect through CON 2. The user input switch pad connects through CON 1. CON 3, as described in previous sections, connects the 120 VAC relay control circuits to the contactors and solenoids.

CON 1 Connections

As illustrated in Figure 5-2, the flat cable from the membrane touch pad panel connects to CON 1 of the control board. Conformal coating encapsulates this connection to protect it from moisture, and to maintain its secure contact with the control board. If CON 1 must be disconnected to test the switch panel, take care when reinserting the connector so that the pins are not bent and that all seven pins mate correctly with female connector. Repair the conformal coating with Cleveland Range approved coating material.

CON 2 Connections

CON 2 provides the connection point for all low voltage functions. The 18 VAC secondary of the transformer supplies power to the control board. Proper operation of the 18 VAC supply can be noted by illumination of any of the indicator lights on the front of the control panel.

The 12 VDC power supply, located on the control board, provides regulated DC power to the generator temperature and drain temperature thermistors, to the compartment temperature switch, and to the timing, display and safety circuits. A high frequency (15-20 kHz) section supplies 0.6 VAC to the water level probes.

Color Coded Wiring Harness

All lines connecting to CON 2 are bundled in a color coded wiring harness. Refer to the wiring diagram (see Table 6-1) for a complete guide to the color code. Note the common ground connection (green wire) for the three water level control probes. The compartment temperature switch, generator temperature thermistor, and the drain temperature thermistor connect to CON 2 with individual wire pans. Both wires of each pair share the same color. Except for the 18 VAC input, inadvertent cont.

shorting to ground of CON 2 wires will not damage the steamer circuits. However, any open or shorted wire will cause improper operation of the steamer. See information below for details.

Printed Circuit Boards

For moisture protection, a conformal coating covers all components and circuits of Cleveland Range printed circuit boards. If this coating is damaged or removed during handling or shipment, moisture may seep under the coating causing erratic behavior of a control board. Typically, this condition will cause no permanent damage to the control board. In cases where moisture is the suspected cause of failure, the control board should be removed and thoroughly dried. Dry the board with a hot air blower or in an oven set at low temperature (180 F or less). Particular attention should be paid to connectors and wire leads. When returning the control board to operating condition, steps to prevent further contamination should be taken. This may include additional coatings, repair of water leaks, or correction of installation deficiencies. Use only Cleveland Range approved material to repair conformal coatings.

Door Sensor

The door sensor switch is mounted on the Control Board Assembly as illustrated in Figure 5-5. It is a proximity switch activated by a magnet mounted inside the compartment door. The control circuitry prevents operation of heater elements and the condenser solenoid valve while this switch is open (door open).

To test operation of the door safety circuits when the control panel assembly is removed or compartment door open, a small magnet may be used to activate the door sensor. The magnet must be positioned over the sensor with the south magnetic pole facing the sensor. Move the magnet slowly over the top of the panel in the area near the sensor to activate the circuit. Correct positioning of the magnet can be noted by the click sound when a contactor or solenoid energizes.

When replacing a Control Board Assembly it may be necessary to reuse the plastic mounting block, 8-32 x 1/4" screw, and bias magnet. To avoid change magnet polarity, do not remove the bias magnet from the plastic block.

Membrane Switch

When testing a properly installed membrane switch with an ohmmeter, the resistance reading must be less than 70 ohms with the switch dosed, as set by the switch vendor. The Cleveland Range circuit design operates with dosed switch resistance of 5000 ohms or less. Before testing or replacing a membrane switch panel, be sure that both the pins and sockets of the switch connector at CON 1 are clean and free of contamination and moisture. Refer to Figure 5-2 and the wiring diagram (see Table 6-1) for connector pin location.

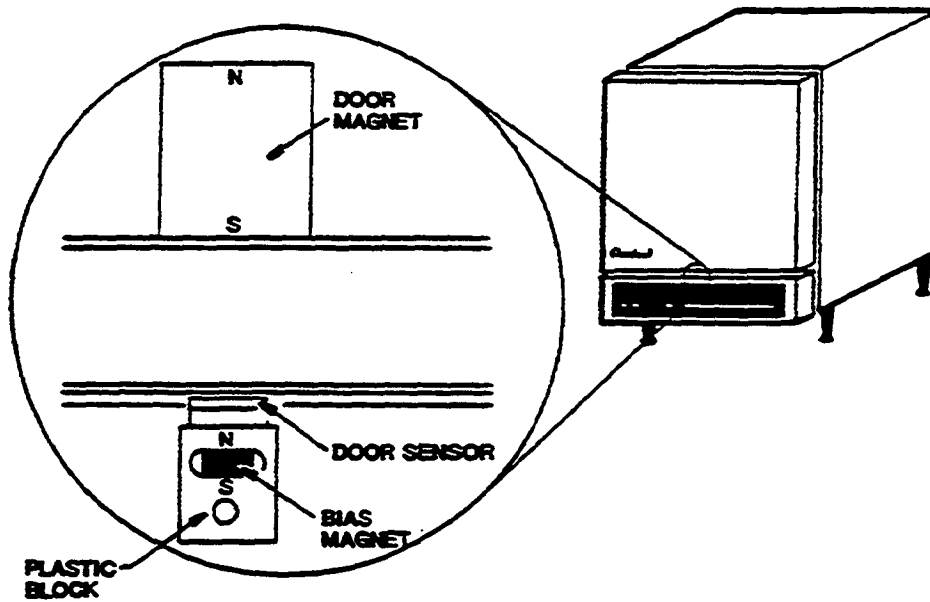


Figure 5-5. Door Sensor Location

Compartment Temperature Switch

A snap action thermostatic switch attaches to the underside of the steamer compartment near the front left corner of the steam generator. The switch closes when the compartment temperature rises above 180-200 F and controls the timing circuit during TIMED operation. If frozen food, for example, causes the compartment temperature to drop below the switch set point, the switch prevents the timer from starting its countdown until the compartment temperature rises and the switch closes. Also, if the door opens during a TIMED cycle and the compartment cools, the switch opens and interrupts the timing circuit countdown until the compartment reheats. Thus, the action of the compartment temperature switch and the timing circuit adjust cooking duration to compensate for factors that affect cooking time: product temperature (fresh or frozen), compartment loading, and opening of the compartment door during a cooking cycle.

Time/Temperature Circuit - Troubleshooting

Improper cooking cycles may result from a faulty timing circuit, or a damaged or improperly installed thermostatic switch.

1. To check the timing circuit, locate the two purple wires at CON 2. Trace these wires back toward the temperature switch and unplug them at the in-line connectors to the temperature switch. Jumper the two purple wires together to simulate a closed switch.
2. Start a TIMED cycle and check the countdown on the front panel display using an accurate watch or clock. A 3-minute test usually suffices.
 - If the timer counts correctly when isolated from the temperature switch, the switch is either faulty or not properly installed. Replace and/or install the switch properly.
 - If timer fails to count minutes correctly when isolated from the temperature switch, separate the purple wires and check for correct voltage (12 VDC) between them. If no voltage is detected, inspect wire leads and terminals and repair as required.
3. To test the thermostatic switch, disconnect switch and jumper wires (follow step 1 above).
4. Start a TIMED steamer cycle. Using an ohmmeter, check that the switch closes when compartment temperature reaches 180°to 200°F. This should occur about the same time as the rear contactor starts to cycle OFF and ON. After the compartment heats up and the switch closes, turn the steamer OFF and open the steamer door. The switch should open within 2 minutes. If the switch operates correctly, check for proper installation of the switch.
5. Remove meter and jumper.

WATER LEVEL PROBES

The SteamCraft V water level controls employ resistance sensing control circuits. The control circuit uses a high frequency (15 to 20 kHz) AC current source with an open circuit voltage of 0.6 V RMS (+5%) between the shell of the steam generator and the sensing probe. When water fills the tank enough to contact the probe flag, current flows from the generator/control board ground through the water, the probe, and the wiring back to the control board, completing the circuit. This current flow triggers the appropriate switching action, i.e., turning off the water fill solenoid when current flows in the water level probe circuit.

Set Point

Current flow through any circuit is a function of both the voltage and the resistance of the circuit. As water level rises to and over the lower edge of the probe (or flag), resistance decreases. At some level, the resistance decreases to the nominal set point. The associated current increase triggers the switching action that, for example, closes the fill valve. The set point resistance is expressed as a nominal DC resistance value and does not include the reactive (AC) characteristics of the water in the.. cont.

circuit. The nominal set point resistance for all water level probe functions is 12,000 ohms. Because the measured resistance includes both AC and DC components, the measured resistance through water (probe to tank) may be higher than the set point resistance. The measured resistance may be as high as 17,000 ohms without significant effect on performance.

Water Level Control Testing

To test the operation of water level sensing functions, use a multimeter or ohmmeter and a 100,000 ohm potentiometer to check resistance. Refer to test procedures below for function to be tested.

Flood Probe Control Circuit

1. Refer to the wiring diagram (see Table 6-1). Disconnect the red wire from the flood probe (small probe near top center of tank).
2. Using the meter, set the resistance of the potentiometer to 20,000 Ohms.
3. Refer to Figure 5-6. With the probe disconnected, connect the potentiometer between the common (green) wire and red wire that leads back to CON 2.
4. Turn on unit by pressing the POWER touch pad. The ON indicator will light.
5. Allow 1 minute of operation for the flood shut down circuit to enable.
6. Remove potentiometer and change resistance to 5,000 ohms.
7. Reconnect the potentiometer. If the circuit is functioning properly:
 - The FLOOD alarm light will begin to flash after 3 to 5 seconds.
 - The POWER on/off touch pad will not function.
8. Remove the potentiometer and reconnect the probe. This will not restore the unit to normal operation. Remove all power from the steamer at the disconnect switch and then re-energize to reset the FLOOD circuit for operation.

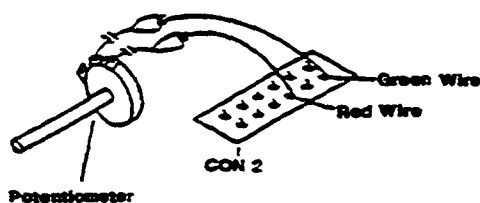


Figure 5-6. Flood Probe Test Connection

Water Level Probe Control Circuit

1. Shut off water supply lines and drain the steam generator.
2. Refer to the wiring diagram (see Table 6-1). Disconnect the blue wire from the water level probe (probe nearest front).
3. Using a meter, set the resistance of the potentiometer to 20,000 Ohms.
4. With the probe disconnected, connect the potentiometer between the common (green) wire and the blue wire that leads back to CON 2 (see Figure 5-7).
5. Turn on the unit by pressing the POWER touch pad and begin timing. The water fin solenoid should energize in 5 to 8 seconds.

6. Slowly adjust the potentiometer to reduce the resistance. Stop adjusting the potentiometer at the moment the water solenoid turns off.
7. Remove potentiometer and measure its resistance. The resistance should be between 10,000 and 15,000 ohms (see Figure 5-8).
8. Reconnect the potentiometer. The water solenoid should turn off immediately.
9. Disconnect the potentiometer and reconnect the probe.

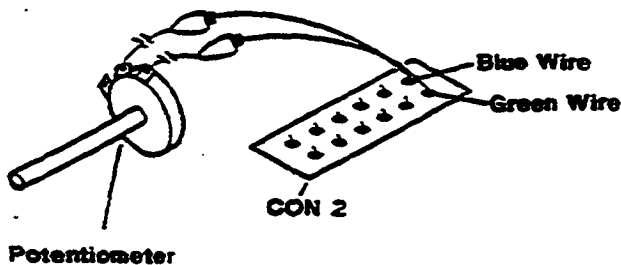


Figure 5-7. Water Level Probe Test Connection

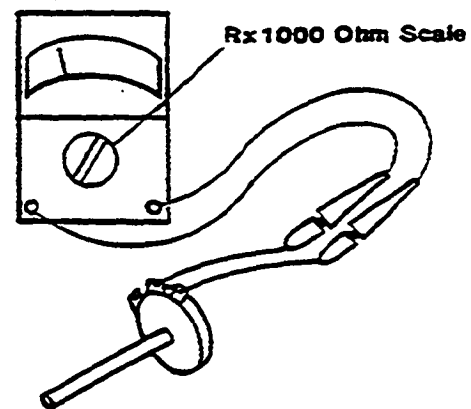


Figure 5-8. Potentiometer Test Connection

Low Water Level Control Circuit

1. Turn off water supply lines and drain the steam generator.
2. Refer to the wiring diagram (see Table 6-1). Disconnect the black wire from the low water level probe (probe nearest rear).
3. Using a meter, set the resistance of the potentiometer to 20,000 Ohms.
4. With probe disconnected, connect the potentiometer between the common (green) wire and the black wire that leads back to CON 2 (see Figure 5-9).
5. Turn on unit by pressing the POWER touch pad. The WATER alarm light should light.
6. With a test magnet installed over the door sensor, press the MANUAL touch pad. The ON indicator over the touch pad will light, and the condenser solenoid valve will open. The heater contactors will not energize.
7. Slowly adjust the potentiometer to reduce the resistance. Stop adjusting potentiometer at the moment the contactors energize and the WATER alarm light turns off.

8. Disconnect potentiometer, the contactor(s) should should turn immediately
Measure the resistance of the potentiometer. The resistance should be between 10,000 and 18,000 Ohms (see Figure 5-8).
9. Reconnect the potentiometer. The contactor(s) should turn on immediately.
10. Disconnect potentiometer and reconnect the probe.

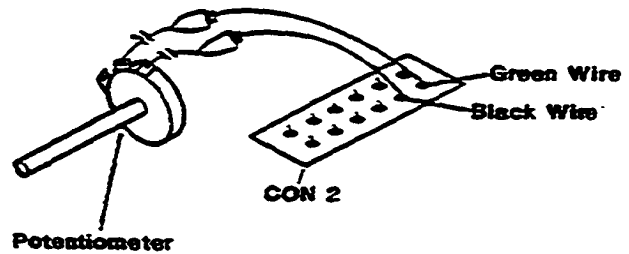


Figure 5-9. Low Water Probe Test Connection

TEMPERATURE CONTROL CIRCUITS

The SteamCraft V uses two separate temperature control circuits. These circuits provide standby operation and power conservation. Each circuit uses a negative temperature coefficient thermoistor as a temperature sensor and a board mounted potentiometer for set point adjustment. Replacement of either thermoistor the control board requires calibration of BOTH temperature control circuits. The operation of both the generator temperature adjustment circuit and the drain temperature adjustment circuit use the rear heater contactor to control generator temperature during a steaming cycle. When the water temperature decreases below 190°F, the generator temperature adjustment circuit turns ON the rear contactor, energizing the generator and fan heaters. When the drain temperature increases above 150-160 F, the drain temperature adjustment circuits causes the rear contactor to de-energize, which turns OFF the fan heater, one 5.3 kW heater, and the two 2.56 kW heaters. Thus, the two temperature control circuits work together to regulate steam during cooking cycles.

NOTE

Before the rear contactor will operate, the Steamer Ready Conditions (page 60) must be met. If the compartment door is open for troubleshooting or repair, a magnet must be placed over door sensor to simulate a closed door.

Generator Temperature Control Circuit

The generator temperature thermistor attaches to the front of the steam generator near the water level probes. The mounting of the thermistor is critical to proper operation of the control.

- The thermistor must be in good contact with the mounting surface.
- A thermal conductive pad or compound between the mounting surface and thermistor is necessary for proper thermal conduction.
- The mounting surface should be smooth, clean, and free of weld spatter or other defects that may interfere with thermal conduction. The water temperature, below which the rear contactor energizes, can be changed by adjusting the control board potentiometer labeled GEN TEMP ADJUST (Figure 5-2). Turn the screw clockwise to increase temperature. Set the control so the water temperature remains approximately 190 F. Being careful not to contact the heater elements, measure the water temperature with a thermometer.

Drain Temperature Circuit

The drain temperature thermistor attaches to the condenser. The drain temperature adjustment circuit depends upon proper mounting of the thermistor and proper adjustment of the board-mounted potentiometer. Follow the same mounting considerations as for the generator temperature thermistor. Use the following procedure to adjust the potentiometer labeled DRAIN TEMP ADJUST.

1. Remove front control panel assembly and install a magnet over the door sensor location as shown in Figure 5-5.
2. Turn DRAIN TEMP ADJUST potentiometer clockwise 10 turns.
3. Turn steamer on and start a manual steaming cycle by pressing the MANUAL touch pad.
4. Allow steamer to operate empty for 15 to 20 minutes. During this time, check that the rear heater contactor does not cycle on. If contactor does turn off, turn off the steamer and turn DRAIN TEMP ADJUST potentiometer clockwise several additional turns.
5. Repeat steps 3 and 4 until the rear contactor remains energized for at least 15 minutes.

6. Slowly turn potentiometer counter clockwise until contactor just turns off. The contactor should begin to cycle on and off.
7. Continue to adjust potentiometer until the off time period in these cycles is 4 to 6 seconds. Since the on/off cycle time will be affected by water fill solenoid operation, it is best to check timing at a time midway between water fill cycles.

NOTE

When the DRAIN TEMP ADJUST potentiometer is set properly, the drain water temperature will average 150° to 160°F. Measure this temperature with a thermometer in the water flow at the open discharge from the steamer.

Thermistor Testing

Resistance of a negative temperature coefficient thermistor decreases as temperature increases. To test a thermistor, connect an ohmmeter to the thermistor leads and observe the changes in resistance as the thermistor is heated. To determine proper operation of a thermistor left in the circuit, observe the following,

1. Turn off the steamer and allow to cool.
2. Disconnect the thermistor and connect an ohmmeter to the thermistor leads. Leave meter connected throughout test.
3. Measure the resistance of the thermistor at room temperature; it should be between 90,000 and 125,000 ohms.
4. Turn on the SteamCraft V and observe the decrease in resistance of the thermistor as the unit heats. After 10 minutes, the resistance should decrease to between 10,000 and 25,000 ohms.
5. Disconnect the ohmmeter and reconnect the thermistor.

CHAPTER 6. ILLUSTRATED PARTS LISTS

INTRODUCTION

This chapter lists and illustrates replacement parts for model CET-16 SteamCraft Counter type convection steamers. Presently, there are no significant design or replacement parts differences among Cleveland Range steamers with this model number.

There are a few minor operational differences among the control panels supplied on the original equipment. The operating instructions in Chapter 3 explain these operating differences in detail. When replacing a control panel, use the replacement assembly listed on Figure 6-5. This assembly contains the latest version of toe control panel. Once this is installed, the unit will operate in the same manner as all units after serial number WC 9018-90A-05.

Figure 6-1 identifies the major SteamCraft V component groups, and references the figure(s) in which they are illustrated. Each component illustration is accompanied by a component parts list which includes the part name, part ordering number, and quantity used in that component group.

WIRING AND SCHEMATIC DIAGRAMS

Table 6-1 lists SteamCraft V wiring and schematic diagrams for DELTA and WYE connections. The diagrams are shown in sequence at the end of this chapter.

Table 6-1. Wiring and Schematic Diagrams

Connections	Wiring Diagram	Schematic Diagram
DELTA	Figure 6-11	Figure 6-12
WYE	Figure 6-13	Figure 6-14

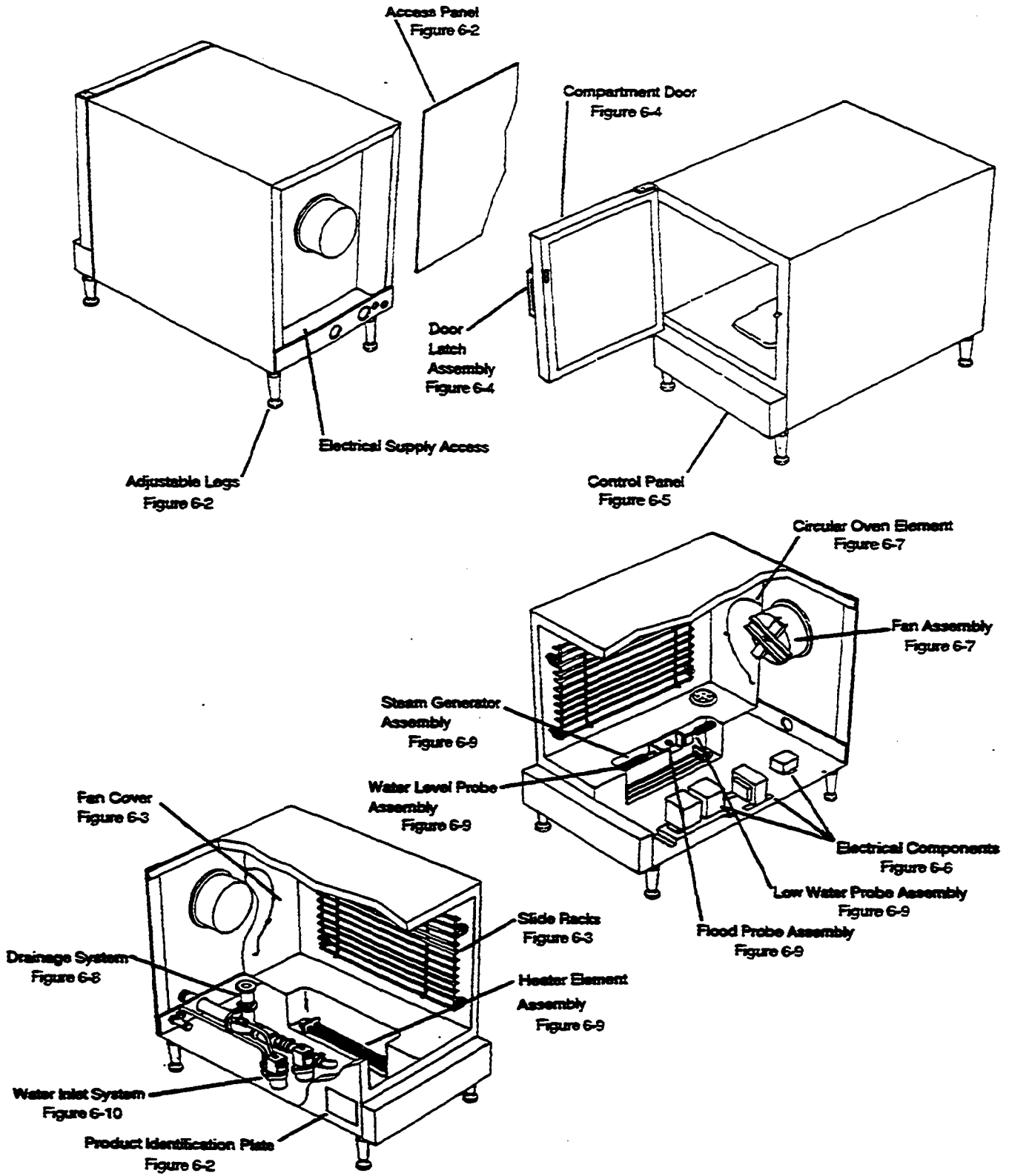


Figure 6-1. MAJOR COMPONENT GROUPS

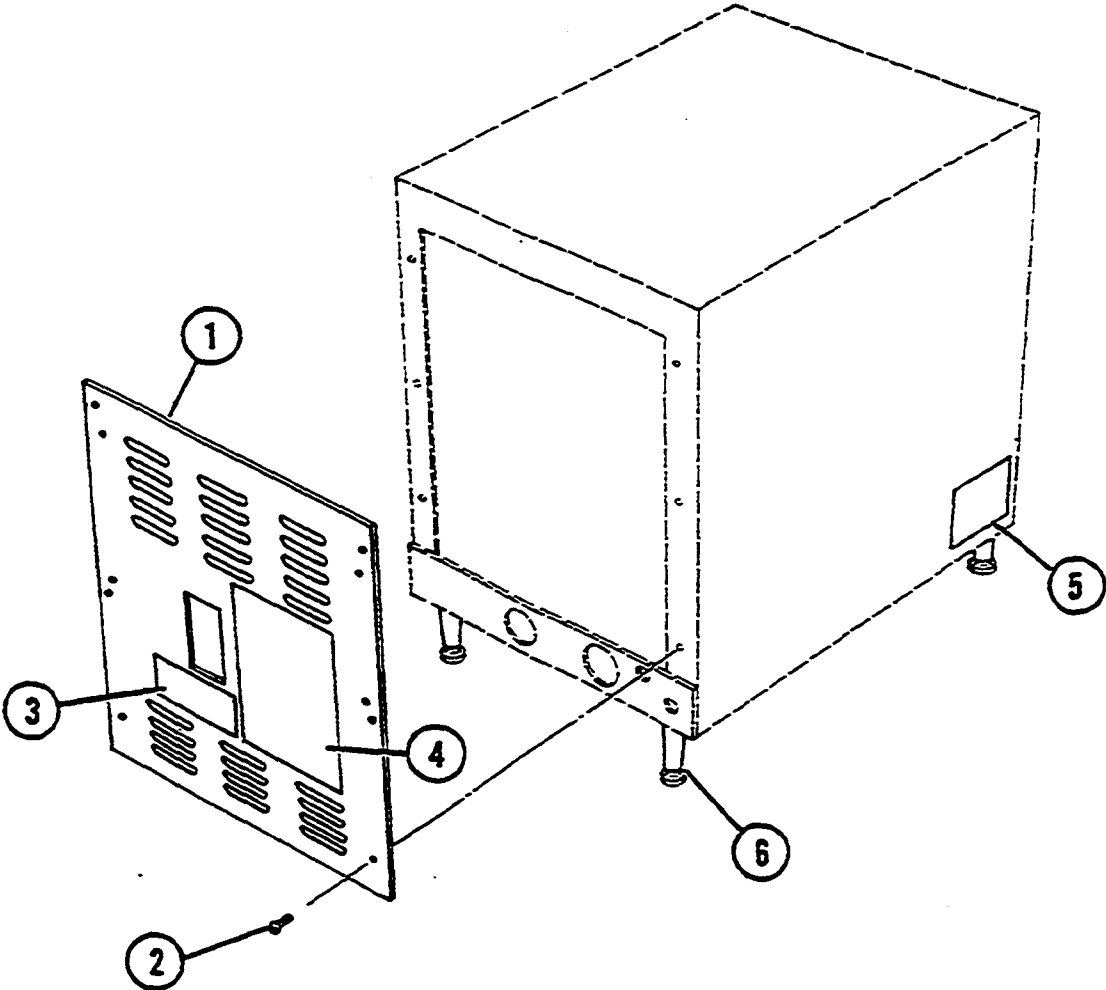


Figure 6-2. ACCESS PANEL AND EXTERNAL COMPONENTS

Item	Part No.	Description	Quantity
1	101397	Access Panel	1
2	19148	Screw, Panel Mounting	6
3	101622	Decal, Drain Specification	1
4	101795	Decal, Electrical Schematic, Standard US Units	1
	101966	Decal, Electrical Schematic, 4-Wire Connection	1
	101966	Decal, Electrical Schematic, Sous Vide Option	1
5	101770	Plate, Product Identification	1
6	06158	Leg, 4" Adjustable with Foot, S/S	4

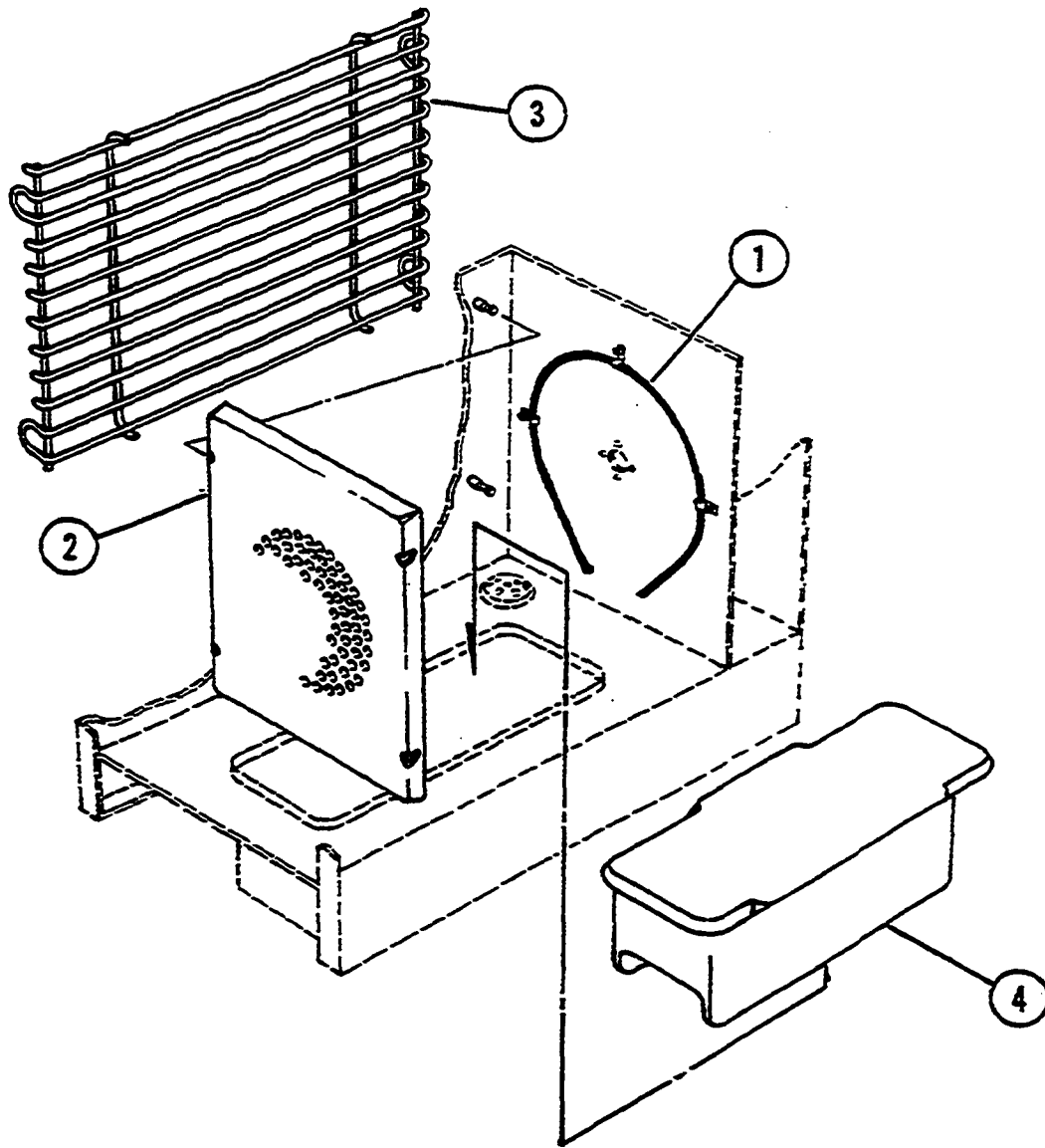


Figure 6-3. STEAMER COMPARTMENT GROUP

Item	Part No.	Description	Quantity
1		Circular Oven Element Assembly (See Figure 6-7 For Parts)	1
2	101436	Cover, Fan	1
3	414232	Rack, Slide	2
4	1012881	Cover, Steam Generator	1

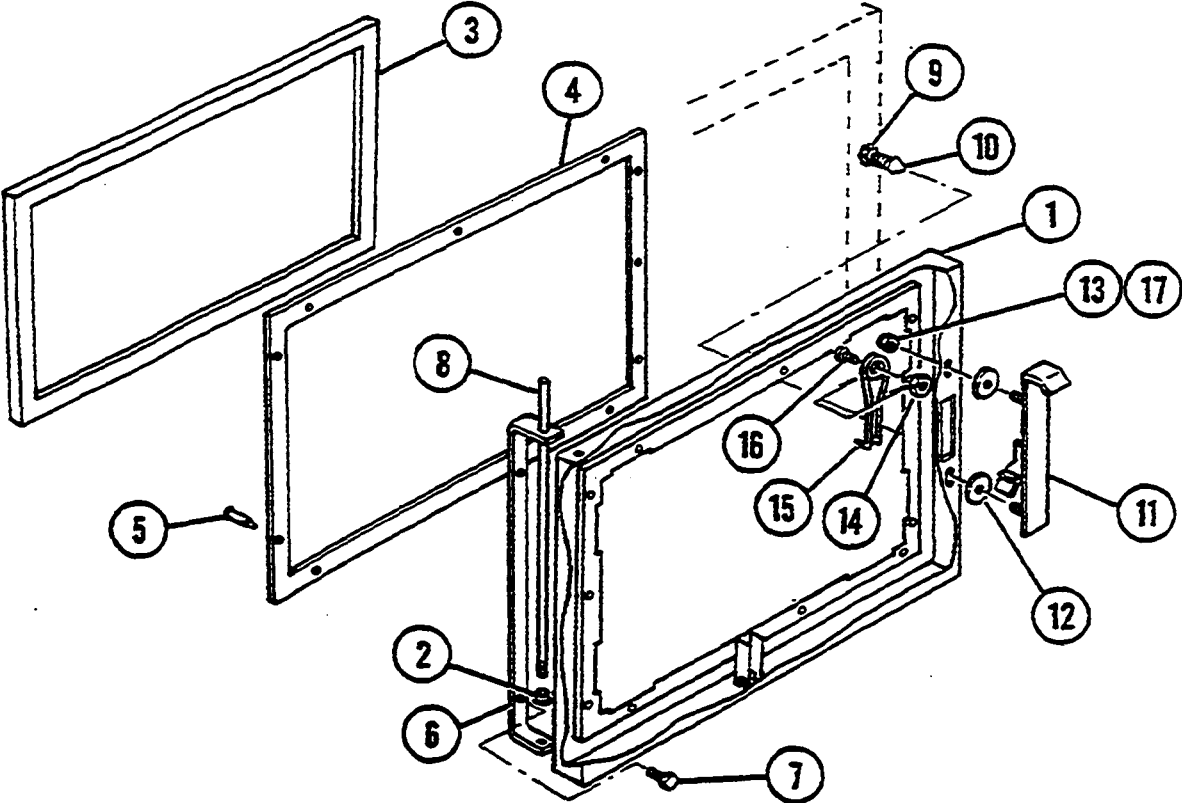


Figure 6-4A. COMPARTMENT DOOR AND HINGE ASSEMBLIES

Item	Part No.	Description	Quantity
COMPARTMENT DOOR ASSEMBLY			
1	1017722	Compartment Door Assembly, hinged left (standard)	1
	1017723	Compartment Door Assembly, hinged right (optional)	1
2	101299	Bushing, Nylon, Flanged	2
3	101401	Door Gasket	1
4	101358	Internal Door Plate	1
5	18357	Pop Rivet, Mounting, Internal Door Plate	12
COMPARTMENT DOOR HINGE ASSEMBLY			
6	101357	Bracket, Compartment Door Hinge	1
7	101334	Screw, 10x32 Pan Head	2
8	101355	Rod, Compartment Door Hinge	1
9	101253	Nut, Jam, Door Strike Pin 3/8-24	1
10	101256	Pin, Strike, Door	1
DOOR HANDLE AND LATCH ASSEMBLES			
11	101277	Handle, Door Assembly	1
12	101284	Washer, Teflon, Door Handle	4
13	101873	Nut, 1/4"-2D Hex elastic lock	2
14	101255	Nut, Spring	1
15	101260	Spring, Door Latch	1
16	101334	Screw, #10-32 x 1/2" Slotted Pan Head S/S	1
17	23116	Washer	2

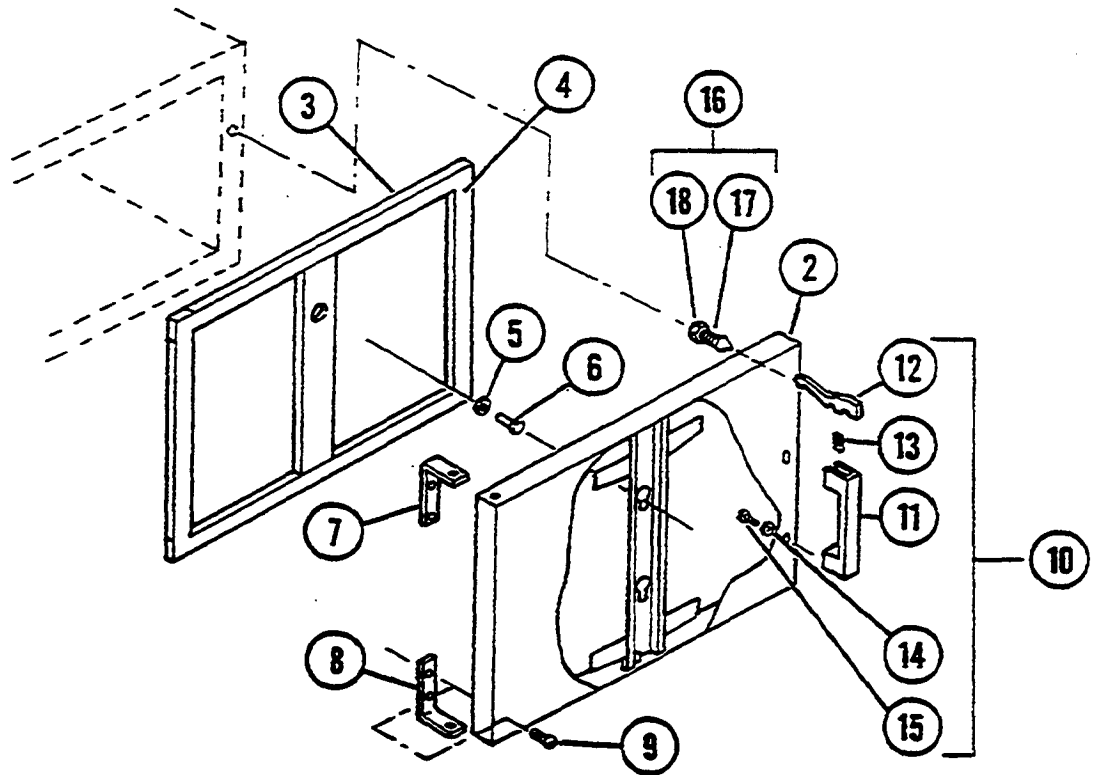


Figure 6-4B. COMPARTMENT DOOR AND HINGE ASSEMBLIES

Item	Part No.	Description	Quantity
COMPARTMENT DOOR ASSEMBLY			
1	102414	Compartment Door Assembly, <i>hinged</i> left (standard)	1
	1024141	Compartment Door Assembly, <i>hinged</i> right (optional)	1
2	102410	Door, Outer, <i>hinged</i> left (standard)	1
	1024101	Door, Outer, <i>hinged</i> right (optional)	1
3	102411	Door, Inner	1
4	101401	Gasket, Inner Door	1
5	102513	Washer, Rat	2
6	19923	Pin, Mounting, Inner Door	2
7	102000	Hinge, Door, Top	1
8	102001	Hinge, Door, Bottom	1
9	101334	Screw, 10 x 32 Pan Head	2
DOOR HANDLE AND LATCH ASSEMBLIES			
10	102231	Handle Assembly, Door	1
11	**	Handle, Door	1
12	**	Latch, Door	1
13	**	Spring, Door Latch	1
14	23114	Washer # 10-Int Tooth Lock S/S	2
15	101334	Screw #10-32 x 1/2 S/S Pan Head	2
16	102231	Striker Assembly, Door	1
17	101256	Pin, Strike, Door	1
18	101253	Nut, Jam, Door Strike Pin 3/8-24	1
**Not sold separately			

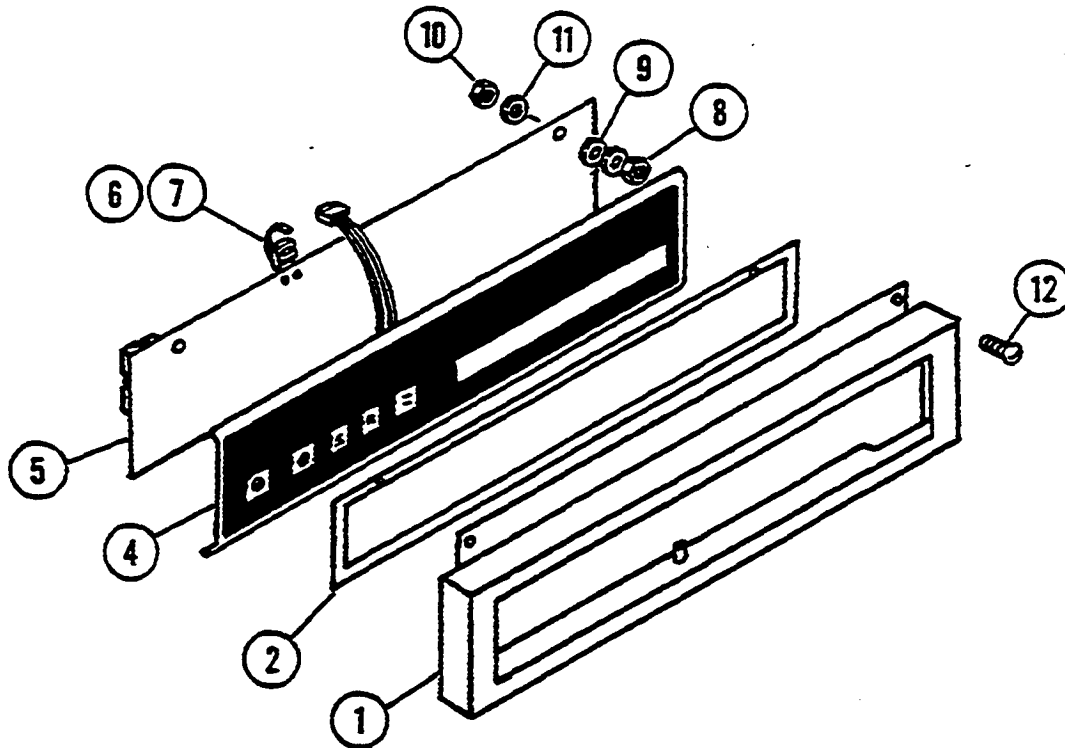


Figure 6-5. CONTROL PANEL ASSEMBLY

Item	Part No.	Description	Quantity
CONTROL PANEL ASSMBLY			
1	1012921	Weldment, Panel	1
2	101944	Gasket, Panel	1
3	1026941	Replacement Assembly, Membrane Switch and Control Board	1
4	**	Membrane Switch (1019301)	1
5	**	Printed Circuit Board, Control Panel PCB (101606)	1
6	**	Magnet, Compartment Door Sensor (101684)	1
7	**	Bracket, Magnet Mounting(101710)	1
8	***	Nut, 8 x 32 Hex (14598)	6
9	***	Washer, #8 Nylon (23148)	12
10	14598	Nut, 8 x 32 Hex	6
11	23148	Washer, #8 Nylon	6
12	101334	Screw, 10 X 32 Pan Head	2
** Not sold separately.			
*** Discard old hardware when installing the replacement kit.			

Figure 6-6. ELECTRICAL COMPONENTS ASSEMBLY

Item	Pan No.	Description	Quantity
1	101352	Terminal Block 4 pole	1
2	14598	Nut	10
3	23114	Washer, Star	10
4	127286	Screw, Mounting, Terminal Block	10
5	20304	Lug, Grounding	1
6	127286	Screw, Mounting, Grounding Lug	1
7	14598	Nut, Mounting, Grounding Lug	1
8	23114	Washer, Star	1
9	101640	150 V.A. Step Down Transformer	1
DOUBLE CONTACTOR ASSEMBLY			
10	101899	Contactor, 120 V, 50/60 cycle	2
11	102286	Varistor 276-568 ****	2
12	1015931	Plate, Contactor Mounting	1
THERMOSWITCH ASSEMBLY****			
13	101543	Thermoswitch, Snap Disc	1
14	101643	Nut, Mounting, Thermoswitch	2
15	23111	Washer, Star	2
THERMAL SENSOR ASSEMBLY			
16	101508	Sensor, Thermal	1
17	102348	Bracket, Mounting, Thermal Sensor	1
18	14672	Nut, Self-locking	1
19	23114	Washer, #10 S/S	3
20	20323	Terminal, #10 Ring	2
21	14672	Nut, Hex, Lock, Elastic 10-32 Plated	1
22	1017554	Insulation, Steam Generator	1
23	19980	Thermoswitch-not illustrated-(Canadian Units Only) ***	1
WIRE HARNESS ASSEMBLES (Not illustrated)			
24	101937	Terminal Block to Contactor	1
25	101938	Contactor to Heater Elements	1
26	101921	Control Circuit Harness	1
***Mounted to Steam Generator (Prior to CSA Approval).			
****Mounted terminal to terminal on contactor coil.			

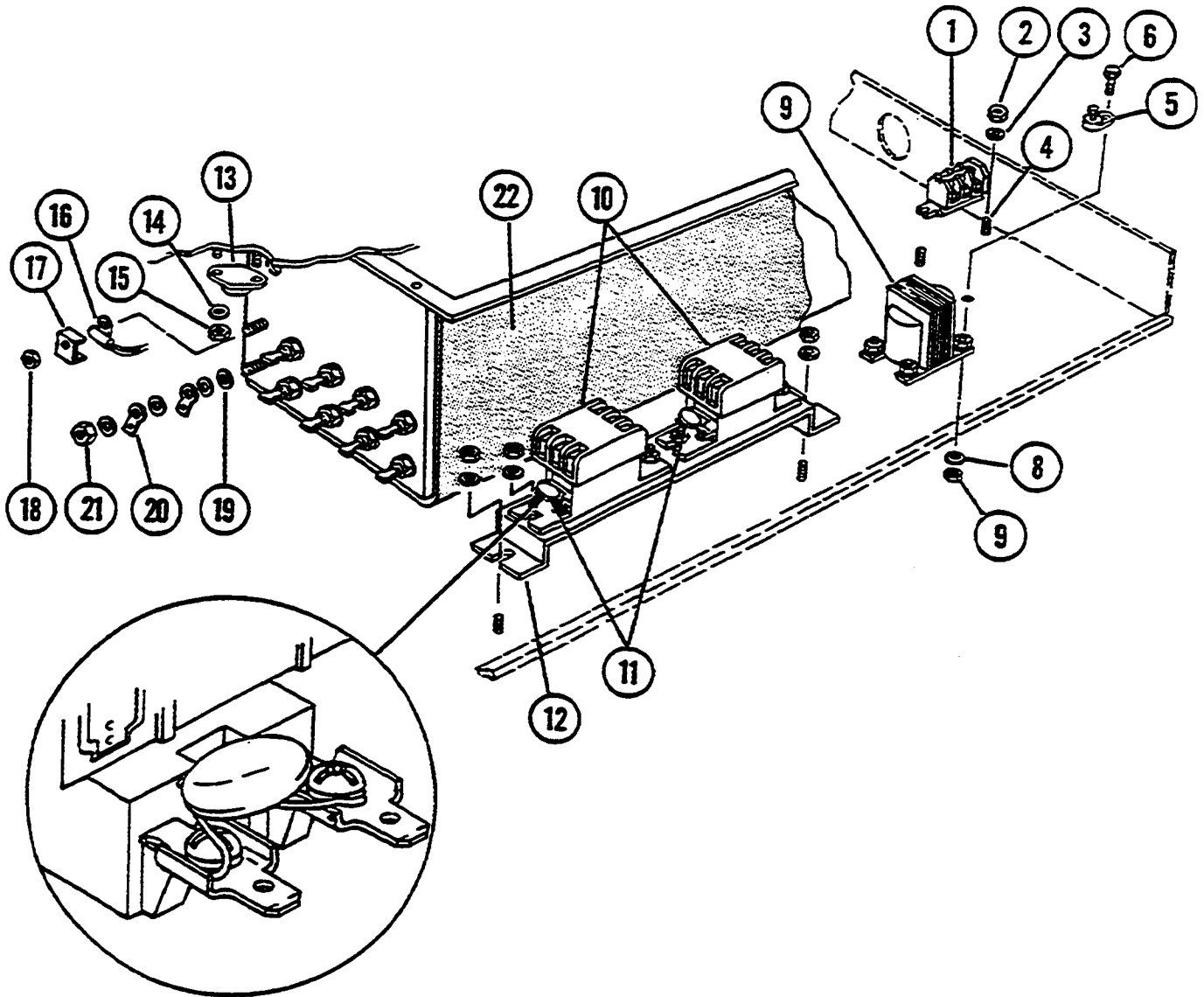


Figure 6-6. ELECTRICAL COMPONENTS ASSEMBLY

Figure 6-7. FAN ASSEMBLY

Item	Part No.	Description	Quantity
1	1014241	FAN ASSEMBLY	1
2	101424	Blade, Fan	2
3	101398	Hub, Pan Drive	1
4	19218	Bolt, Blade Mounting	4
5	23105	Lockwasher	4
6	101399	Cap, Seal Protection	1
7	101334	Screw, Cap Mounting	4
8		Motor, Fan Drive, Electric	1
	101235	208/240V, Single Phase	
	1012351	440/480V, Single Phase	
9	102264	Seal, Motor Shaft	1
10	19288	Bolt, Motor Mounting	4
11	23105	Lockwasher	4
12	101676	Bolt, Fan to Motor Mounting	1
13	23106	Lockwasher	1
		CIRCULAR OVEN ELEMENT	
14		Heater Coil, 300W	1
	101227	208V	
	1012271	220V-240V	
	1012272	440V-480V	
15	101306	Washer, Mounting, Coil Element	2
16	101308	Nut, Mounting, Coil Element	2
17	101768	Washer, Mounting, Coil Element	2
18	101389	Bracket, Mounting, Coil Element	3
19	101334	Screw, Bracket Mounting	3

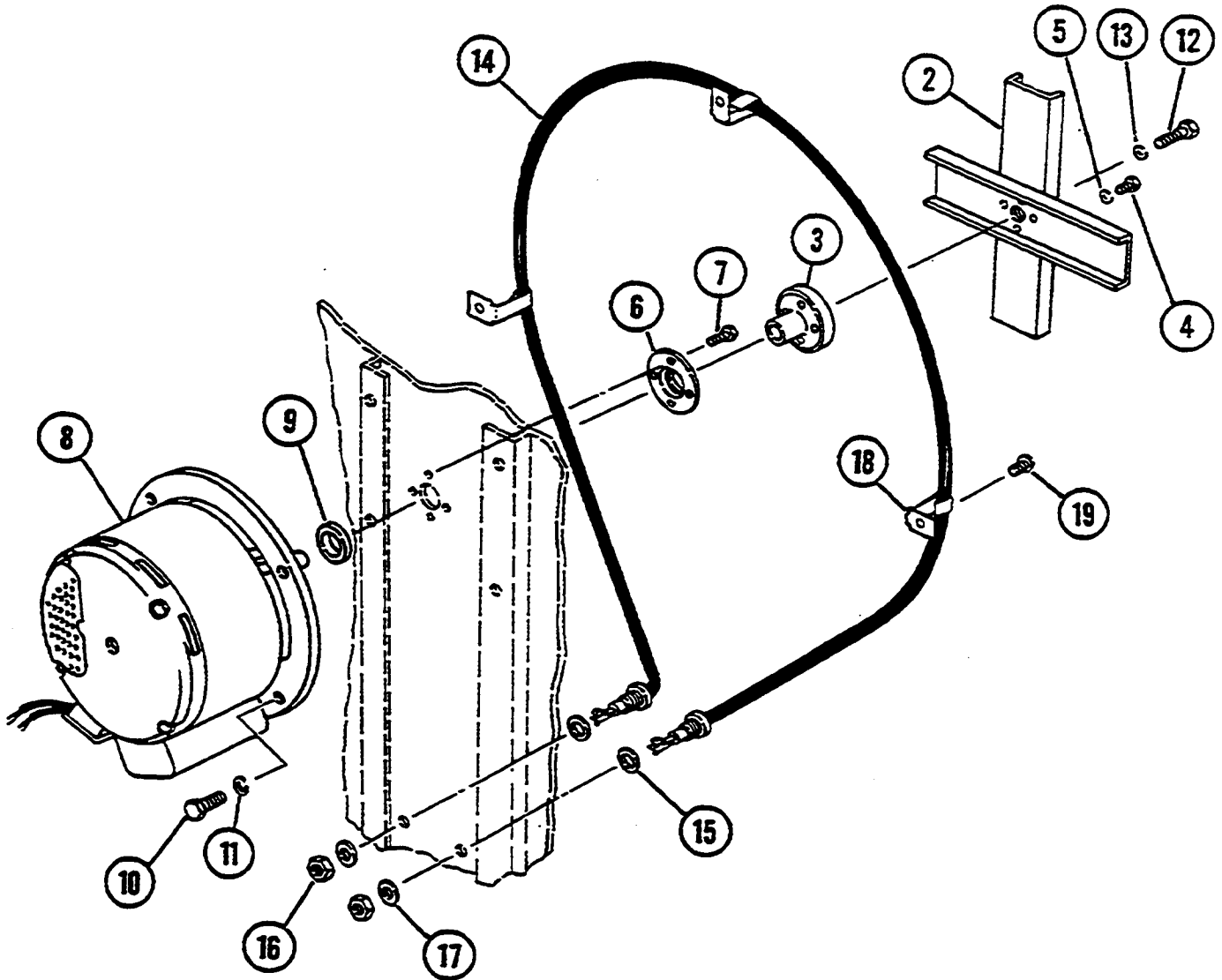


Figure 6-7. FAN ASSEMBLY

Figure 6-8. CONDENSER AND DRAINAGE SYSTEMS

Item	Part NO.	Description	Quantity
1	1020301	DRAIN CONDENSER ASSEMBLY	1
2	1019701	Condenser Housing	1
3	23116	Washer, Flat, 1/4-5/8	3
4	101873	Nut, Self-locking, 1/4-20	3
5	102112	Gasket Rubber, Condenser Housing	1
6	101508	Sensor, Thermal	1
7	102348	Bracket, Mounting, Thermal Sensor	1
8	14672	Nut, Self-locking	1
9	101320	Stud, Threaded, Mounting, 10-32	1
10	102424	Duckbill	1
11	14497	Nozzle, Condenser, Brass	1
12	06231	Fitting, 1/4" tube x 1/8" FPT, 90° Brass	1
13	14401	Nipple, Pipe, Drain Extension, 1-1/4" LP.S. x 9.5	1
14	20230	Tee - Black, 1-1/4" x 1/2" x 1-1/4"	1
		DRAIN VALVE ASSEMBLY	
15	22243	Valve, Ball, 1/2" (Drain Valve)	1
16	**	Nut, Self-locking	1
17	222431	Handle, Drain Valve	1
18	102113	Grip, Ball Valve Handle (Red)	1
19	06249	Fitting, 1/2" MPT x 5/8" I.D., Hose	1
20	03206	Clamp, Hose, Worm Drive, 1/2 x 29/32" dia.	2
21	085250500	Hose, 5/8" O.D. x 1/16" w., Translucent Silicone Rubber	As Req'd
		**Not sold separately.	

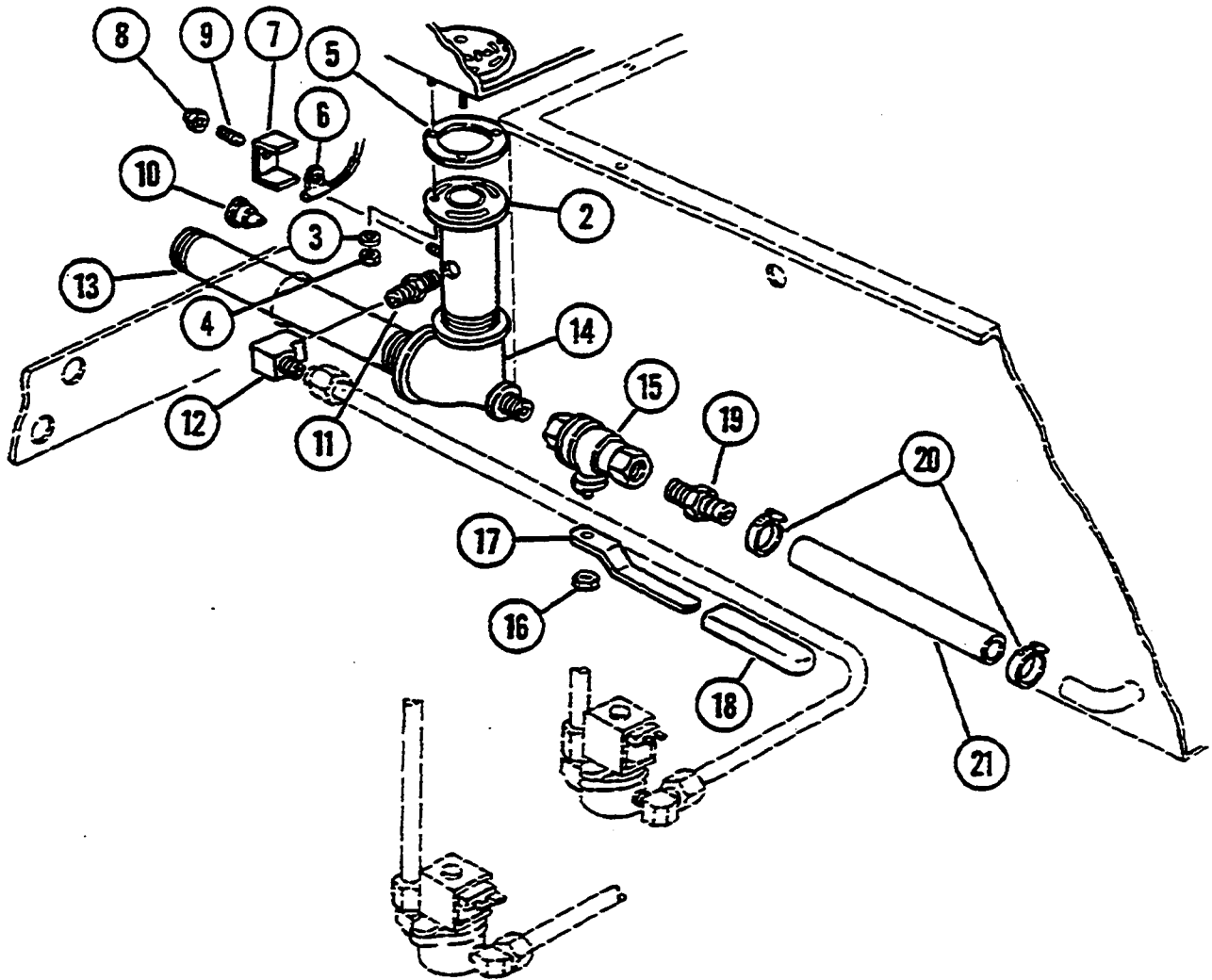


Figure 6-8. CONDENSER AND DRAINAGE SYSTEMS

Figure 6-9. STEAM GENERATOR ASSEMBLY

Item	Pan No.	Description	Quantity
STEAM GENERATOR ASSEMBLY			
1	1022571	Steam Generator Body	1
2	101402	Steam Generator Gasket	1
3	14677	Acorn Nut, 1/4-20, S/S	
HEATING ELEMENT ASSEMBLY			
4		Element, Heating, 2666 Watt	2
	101223	208 V	
	1012231	220-240 V	
	1012232	440-480 V	
5		Element, Heating, 5300 Watt	2
	101224	208 V	
	1012241	220-240 V	
	1012242	440-480 V	
6	102646	Retainer, Element, Heating (5300 Watt only)	2
7	101306	Washer, Sealing, S/S	8
8	101768	Washer, .Heater, 515 I.D., Zinc PL	8
9	101308	Nut, Hex, Brass, 1/4-20	8
10	1013121	Spacer, Heating Element	1
11	14677	Nut, Acorn, 1/4-20, S/S	1
12	102519	LOW WATER PROBE ASSEMBLY	1
13	1022532	Probe Weldment Assembly	1
14	102236	Bushing, Insulator	1
15	1013023	Seal, O-ring 5/8" I.D. x 3/4" O.D.	1
16	102254	Nut, Hex 5/8"-11 Nylon	1
17	102518	WATER LEVEL PROBE ASSEMBLY	1
18	1022532	Probe Weldment Assembly	1
19	102236	Bushing, Insulator	1
20	1013023	Seal, O-ring 5/8" I.D. x 3/4" O.D.	1
21	1012781	Baffle, Probe	1
22	102254	Nut, Hex 5/8"-11 Nylon	1
23	102515	FLOOD PROBE ASSEMBLY	1
24	1012954	Probe, S/S	1
25	101298	Insulator	1
26	101303	Seal, O-ring 3/8" I.D. x 1/2" O.D.	1
27	102649	Baffle, Probe	1
28	1013161	Nut, Probe	1

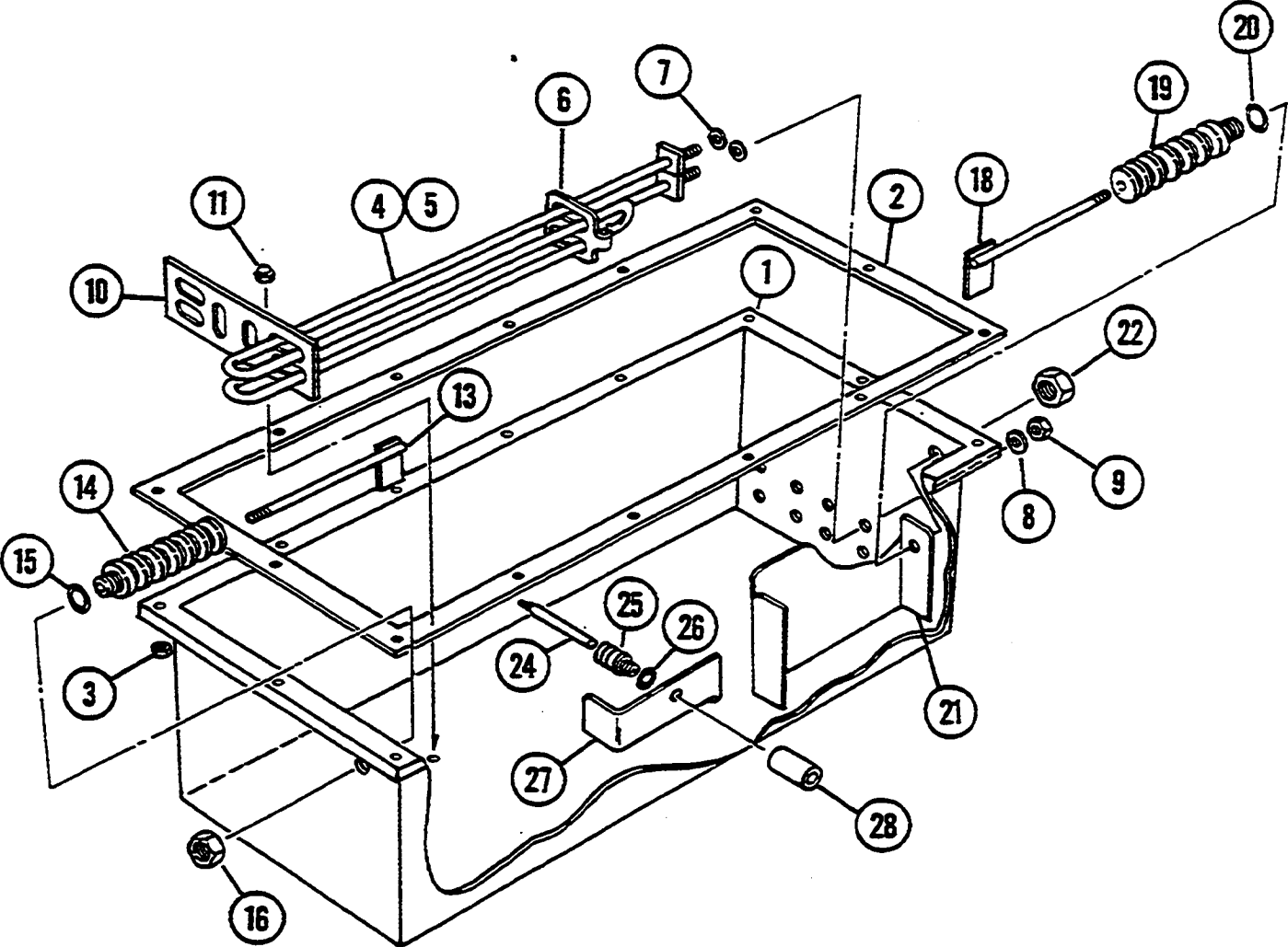


Figure 6-9. STEAM GENERATOR ASSEMBLY

Figure 6-10A. DOUBLE WATER INLET ARRANGEMENT

Item	Part No.	Description	Quantity
1	102383	Cold Water Inlet Strainer Assembly	1
2	19870	Strainer, 1/4"	1
3	14304	Nipple, 1/4"	1
4	03641	Coupling Assembly, Bulkhead 1/4" Female	1
5	-	Adapter, Coupling	1
6	**	Nut, Coupling Retainer	1
7	**	Lockwasher	1
8	101774	Insert, 1/4" Tubing	*8
9	1024865	Tubing, Condenser	24"
10	06214	1/4" Tube 90° Compression rating, 1/4" MPT	4
11	22218	Valve, Condenser Solenoid, 1/4", 120V	1
12	1024862	Tubing, Condenser	24"
13	102431	Coupling Assembly, Bulkhead 1/4" Female	1
14	**	Adapter, Coupling	1
15	**	Nut, Coupling Retainer	1
16	**	Lockwasher	1
17	1024862	Tubing 1/4", Polyethylene	24"
18	22218	Valve, Solenoid, Steam Generator	1
19	1024861	Tubing 1/4", Polyethylene	18"
20	06190	Compression Fitting, 1/4" T x 1/8" P	1
21	102520	Bulkhead Ground, Wire Assembly	1
22	101674	Fitting, Steam Generator Inlet	1
23	101307	Nut, Steam Generator Intet Fitting 7/16" X 20	1
24	1013022	O-ring	1
		*Only one illustrated	
		**Not sold separately	

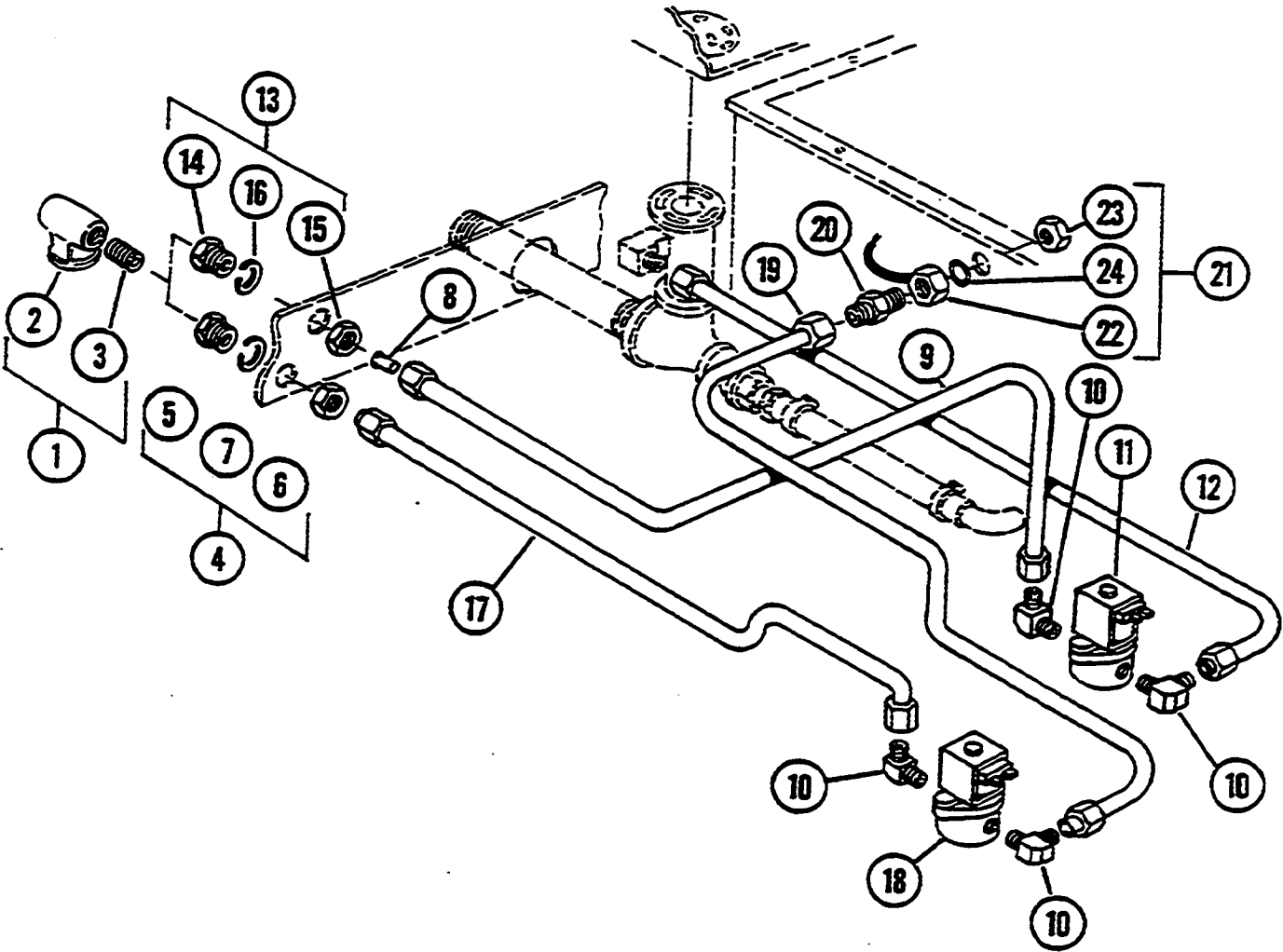


Figure 6-10A. DOUBLE WATER INLET ARRANGEMENT

Figure 6-10B. SINGLE WATER INLET ARRANGEMENT

Item	Part No.	Description	Quantity
1	102383	Cold Water Inter Strainer Assembly	1
2	19870	Strainer, 1/4"	1
3	14304	Nipple, 1/4" 1/4"	1
4	03641	Coupling Assembly, Bulkhead 1/4" Female	1
5	**	Adapter, Coupling	1
6	**	Nut, Coupling Retainer	1
7	**	Lockwasher	1
8	06188	Tee, Tubing Male Fitting	1
9	101774	Insert, 1/4" Tubing	*8
10	1024862	Tubing, Condenser	24"
11	06214	1/4" Tube 90° Compression Fitting, 1/4" MPT	4
12	22218	Valve, Condenser Solenoid 1/4", 120V	1
13	1024862	Tubing, Condenser	24"
14	1024862	Tubing 1/4", Polyethylene	24"
15	22218	Valve, Solenoid, Steam Generator	1
16	1024861	Tubing 1/4", Polyethylene	18"
17	06190	Compression Fitting, 1/4" T x 1/8" P	1
18	102520	Bulkhead Ground, Wire Assembly	1
19	101674	Fitting, Steam Generator Inlet	1
20	101307	Nut, Steam Generator Inlet Pitting 7/16" x 20	1
21	1013022	O-Ring	1

*Only one illustrated.
 **Not sold separately.

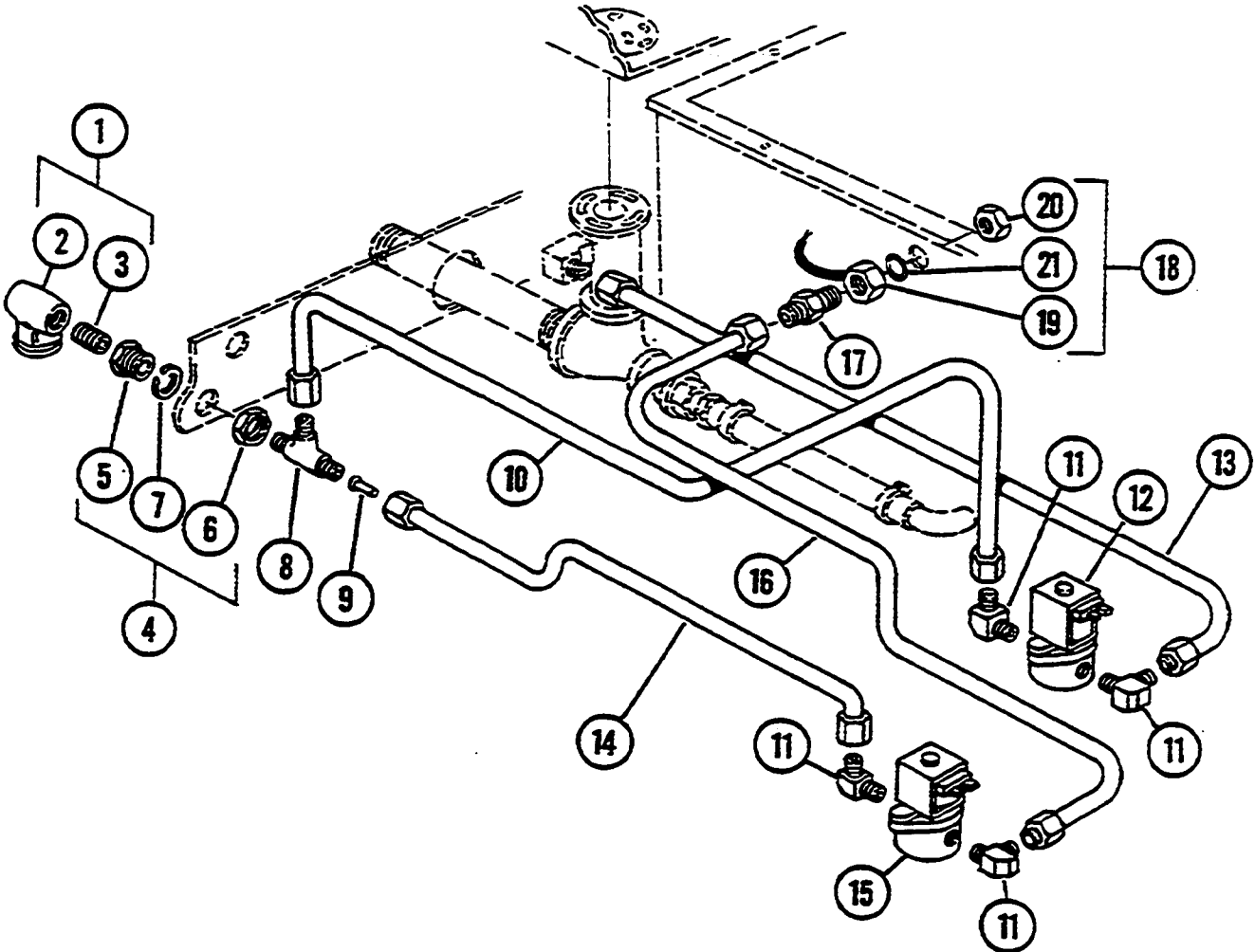


Figure 6-10B. SINGLE WATER INLET ARRANGEMENT

Figure 6-10C. DOUBLE WATER INLET ARRANGEMENT WITH STEAMERGARD

Item	Part No.	Description	Quantity
1	102383	Cold Water Inlet Strainer Assembly	1
2	19870	Strainer, 1/4"	1
3	14304	Nipple, 1/4"	1
4	03641	Coupling Assembly, Bulkhead 1/4" Female	1
5	**	Adapter, Coupling	1
6	**	Nut, Coupling Retainer	1
7	**	Lockwasher	1
8	06188	Tee, Tubing Male Fitting	1
9	101774	Insert, 1/4" Tubing	*8
10	1024862	Tubing, Condenser	24"
11	06214	1/4" Tube 90° Compression Fitting, 1/4" MPT	4
12	22218	Valve, Condenser Solenoid 1/4", 120V	1
13	1024862	Tubing, Condenser	24"
14	16619	Fitting, 1/4" Plug	1
15	102431	Coupling Assembly, Bulkhead 1/4" Female	1
16	**	Adapter, Coupling	1
17	**	Nut, Coupling Retainer	1
18	**	Lockwasher	1
19	1024862	Tubing 1/4", Polyethylene	24"
20	22218	Valve, Solenoid, Steam Generator	1
21	1024861	Tubing 1/4", Polyethylene	18"
22	06190	Compression Fitting, 1/4" T x 1/8" P	1
23	102520	Bulkhead Ground, Wire Assembly	1
24	101674	Fitting, Steam Generator Inlet	1
25	101307	Nut, Steam Generator Inlet Fitting 7/16" x 20	1
26	1013022	O-Ring	1
		*Only one illustrated.	
		**Not sold separately.	

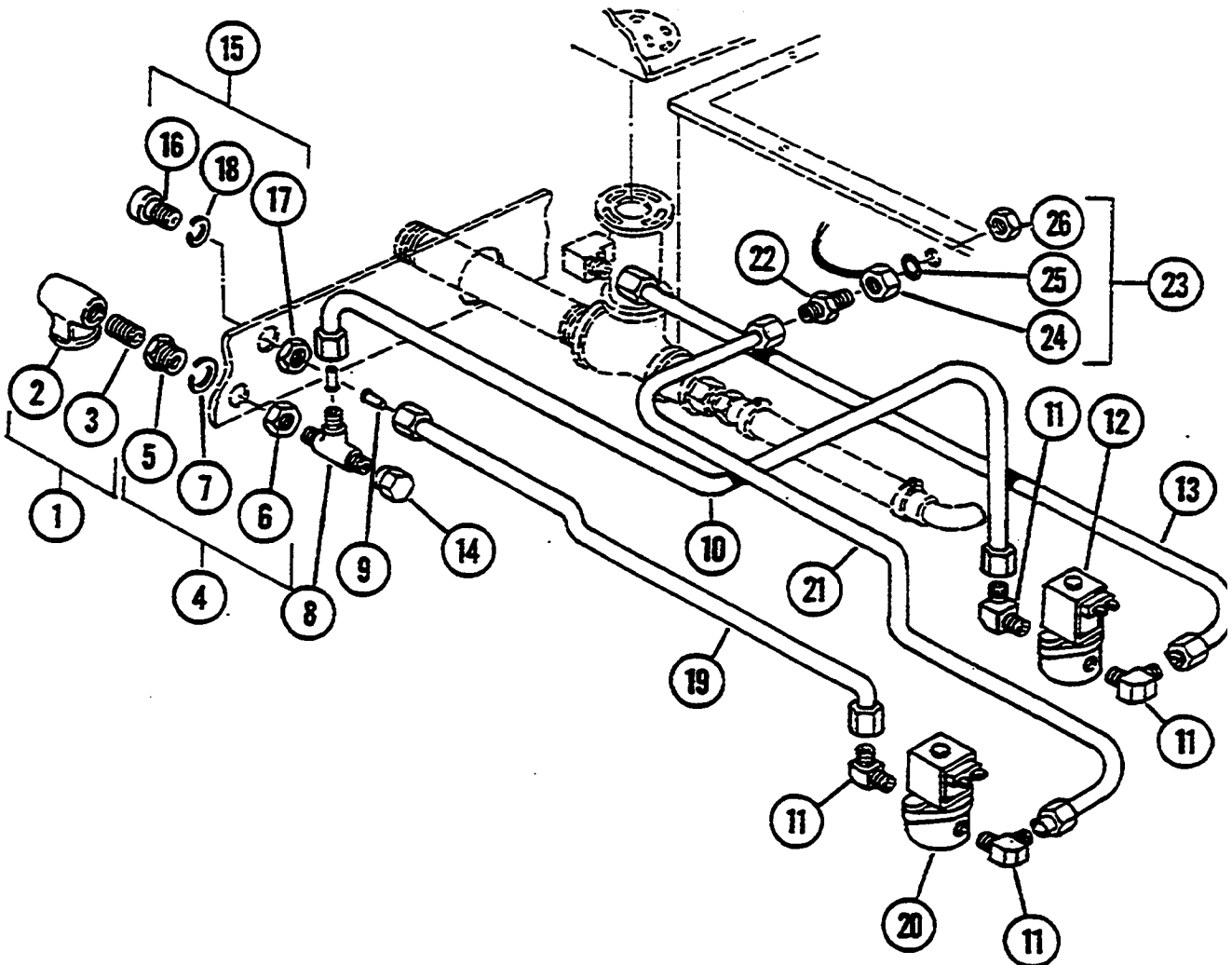


Figure 6-10C. DOUBLE WATER INLET ARRANGEMENT WITH STEAMERGARD

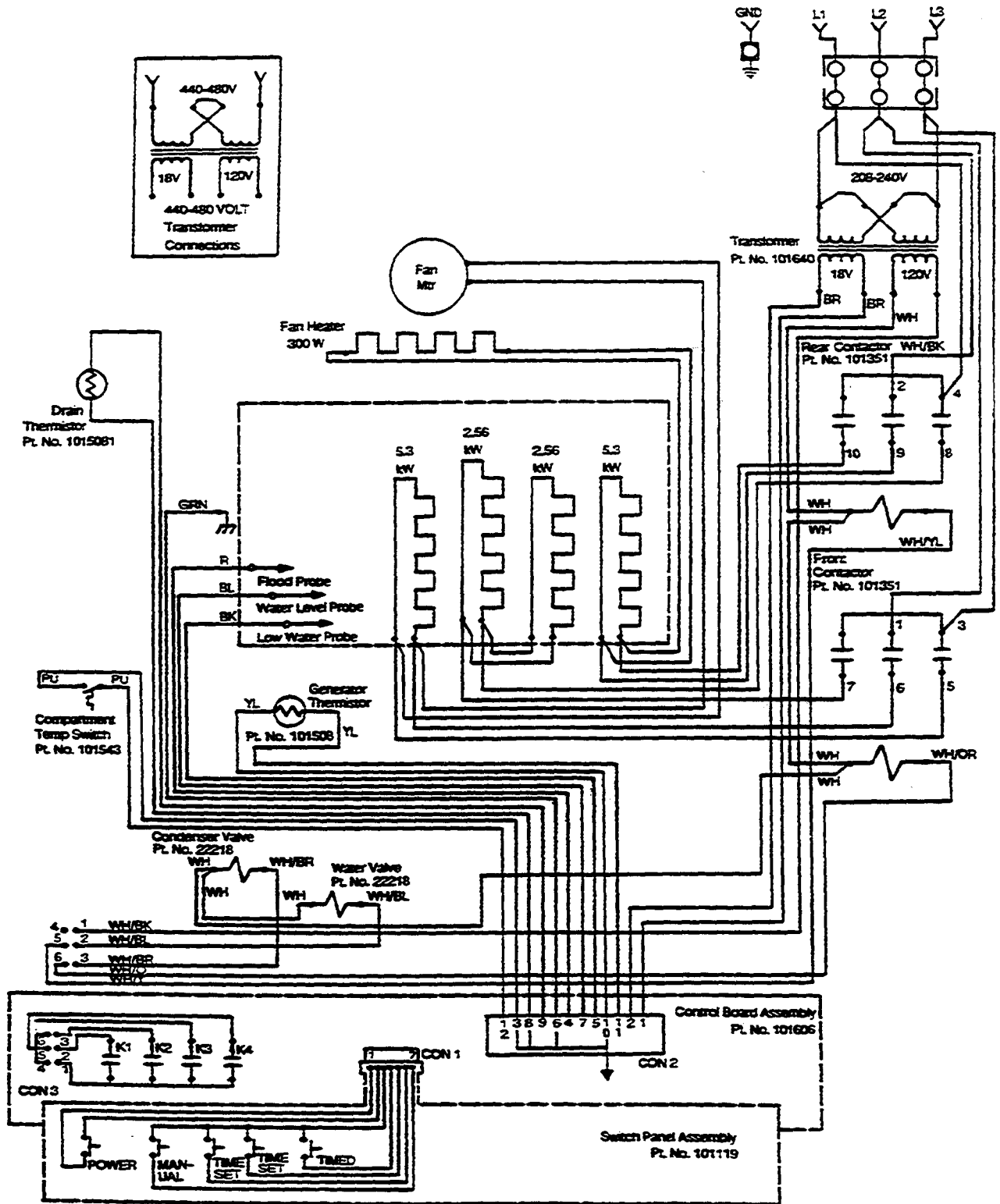


Figure 6-11. SteamCraft V Wiring Diagram, 3-Wire DELTA Connection

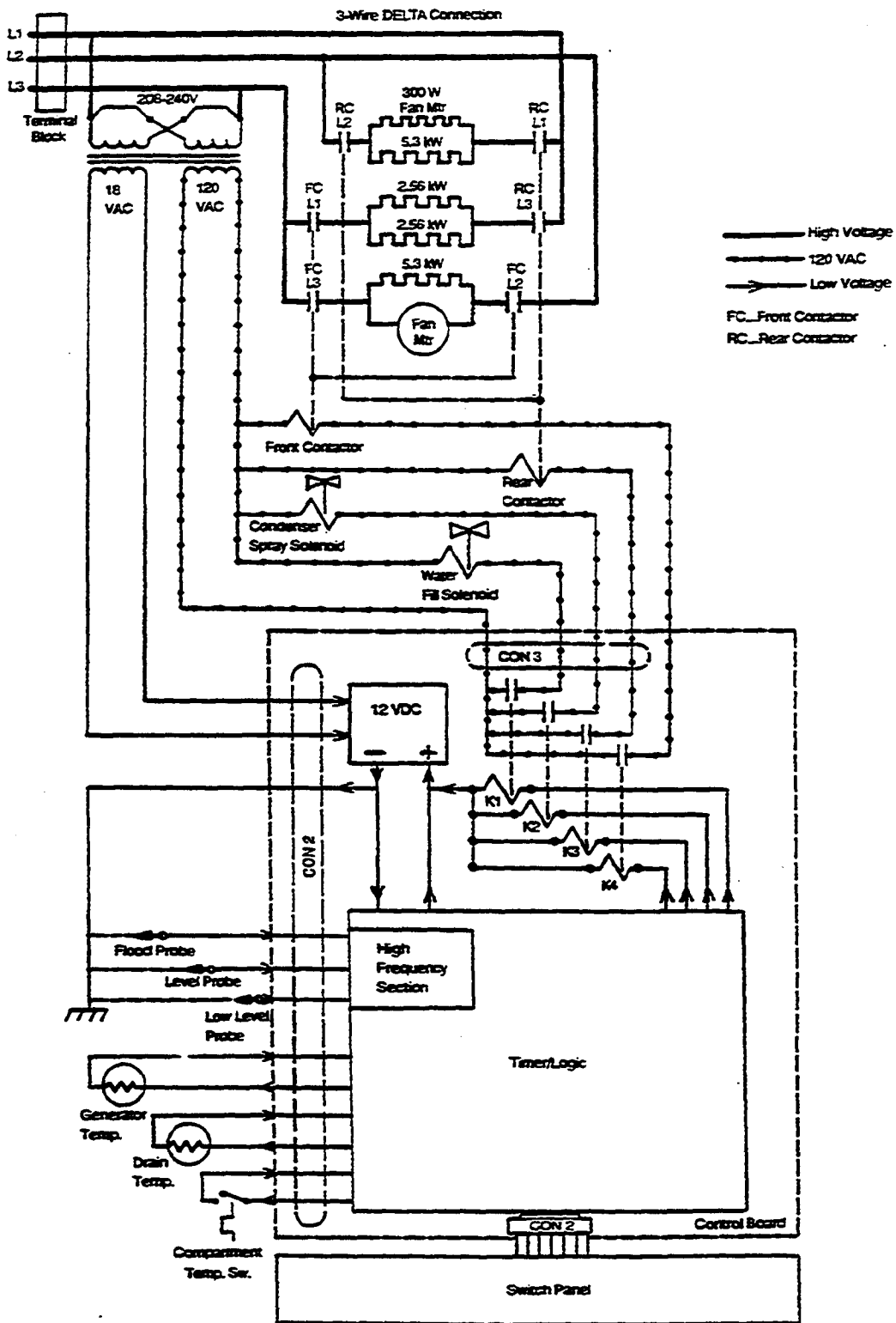


Figure 6-12. SteamCraft V Schematic Diagram, 3-Wire DELTA Connection

