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COS-5HA

INSTALLATION AND OPERATION INSTRUCTIONS FOR SHIPBOARD USE

FSCM 07695

BLODGETT COMBI

www.blodgett.com

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PN R10303 Rev J (10/05)

SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These recommend precautions that personnel must understand and apply during many phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position, due to the charge retained in capacitors. To avoid casualties, always remove power and discharge and ground a circuit before touching it.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

RESUSCITATION

Personnel working with or near high voltages should be familiar with modern methods of resuscitation.

The following appear in the text of this volume, and are repeated here for emphasis.

WARNING:

Before performing any maintenance or replacing any component on this unit, disconnect oven from electrical source.

CHANGE RECORD

CHANGE NO.	DATE	TITLE/BRIEF DESCRIPTION	SIGNATURE OF VALIDATING OFCR.

LIST OF EFFECTIVE PAGES

Insert latest changed pages. Destroy superceded pages.

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The total number of pages in this publication are: 54
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APPROVAL AND PROCUREMENT RECORD

APPROVAL DATA FOR: COS-5H
Electric Combination Oven

TITLE OF MANUAL: Technical Manual, COS-5H
Electric Combination Oven

APPROVAL AUTHORITY: Defense General Supply Center

Letter Dated ?? ??? ??

CONTRACT NO.	NSN	NO. OF UNITS	APL

REMARKS

DATE: 5 Mar 98

CERTIFICATION:

It is hereby certified that the technical manual provided under contract number XXX-XXX-XX-X-XXXX for COS-5H has been approved by the approval data shown above.

(Signed) _____
John Bardeau

(Title) VP Sales and Marketing
Blodgett Combi
55 Boyer Circle
Williston, VT 05495
FSCM 07695

(Insert Classif. of TMDER Here and At Bottom of Page) CLASSIFICATION:

NAVSEA (USER) TECHNICAL MANUAL DEFICIENCY/EVALUATION REPORT (TMDER) (NAVSEA S0005–AA–GYD–030/TMMP & NAVSEAINST 4160.3)

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IMPORTANT

WARNING: IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. READ THE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THIS EQUIPMENT

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

The information contained in this manual is important for the proper installation, use, and maintenance of this oven. Adherence to these procedures and instructions will result in satisfactory baking results and long, trouble free service. Please read this manual carefully and retain it for future reference.

Errors: Descriptive, typographic or pictorial errors are subject to correction. Specifications are subject to change without notice.

A PERSONAL WORD
FROM BLODGETT COMBI

Congratulations on your purchase of the BLODGETT Combi-Oven/Steamer. We firmly believe that your choice has been a wise one, and trust you will receive many years of excellent service from your new multi-purpose oven.

The Combi-Oven/Steamer concept offers completely new potential for cooking which minimizes shrinkage, while maintaining food's essential vitamins and valuable nutrients. In addition, you will find that cooking with the Combi-Oven/Steamer will save time, labor and extensive cleaning of both the kitchen and the appliance.

With the Combi-Oven/Steamer the quality, taste, consistency, and look of the food are improved, thus endorsing the policy to which we've always adhered: "For Better Cooking!"

Once you've had a chance to use your multi-purpose oven, please tell us, your dealer and colleagues about any creative and interesting applications you have discovered; exchange ideas with other users. Be sure to advise us or your dealer immediately should any mechanical or technical problems be encountered (...we're here to help!) and above all "Enjoy Cooking the BLODGETT Combi-Oven/Steamer Way!

BLODGETT COMBI®

Model:

Your Service Agency's Address:

Serial Number:

Your oven was installed by:

Your oven's installation was checked by:

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Table of Contents

Maintenance

Introduction

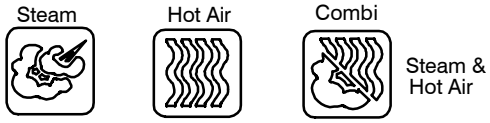
The Blodgett Combi-Oven/Steamer

For quite some time, commercial cooking equipment has remained more or less unchanged. There are kettles, deck ovens, the good old range with its legion of pots and many other extra appliances. The result: time expenditure, excessive manual work, and countless cleaning processes. The last few years have paved the way for a revolution in the equipment of restaurant and institutional kitchens.

The Blodgett Combi-Oven/Steamer offers a completely new method of cooking. With the Oven/Steamer you have the choice of **two cooking processes**: **Steam** and **Hot Air**, either...

- **Separately**
- **Combined, or**
- **In Sequence**

And for easy operation you can choose from three modes:



In the **Steam** mode you can:

steam	reheat	reconstitute
stew	thaw	simmer
blanch	preserve	braise
poach		

In the **Hot Air** mode you can

roast	bake
grill	gratinate
broil	

In the **Combination Steam and Hot Air** mode you can:

defrost	roast	rethermalize
reheat	bake	forced steaming

Not only that, you can use two or three functions in sequence during one cooking process. We call this:

- combi-steaming
- combi-roasting
- combi-baking

The combination of circulating hot air and steam in the space saving, high performance Combi-Oven/Steamer leads to improvements in the following areas:

- increased productivity in the kitchen
- a reduction in capital expenditures for multiple equipment replacement
- a wider range of menu choices
- a simplified cleaning process

The work process is simplified since products are prepared on or in steam table pans and trays. Food can be cooked, stored, and transported with the same pans. Small amounts of product can be processed efficiently; pre-cooked and convenience foods can be reheated within minutes. Many frozen foods can be processed without prethawing. This flexibility in preparation reduces the need for kettles and steam tables since there is no need for large amounts of food to be kept warm for long periods of time.

Today the improvement of food quality is more important than ever. Vegetables are cooked in the Blodgett Combi-Oven/Steamer without water at the optimal temperature of just under 212°F/100°C, maintaining valuable vitamins, minerals, nutrients and trace elements. Cooking meat in the Combi results in less shrinkage and a firmer, juicier product. The Blodgett Combi-Oven/Steamer is being used more and more for baking. Steam and Hot Air modes make it a general purpose baking appliance.

Description of the Combi-Oven/Steamer

ABOUT THE OVEN/STEAMER

Blodgett Combi-Oven/Steamers are quality produced using high-grade stainless steel with first class workmanship.

The high performance fresh steam generator with its control system makes it possible to enjoy all of the advantages of a high quality steamer at the flick of a switch. Fresh steam enters the oven cavity without pressure and is circulated at high speed. This process enables quick and gentle cooking and ensures high quality food while providing convenient working methods. The steam generator is completely automatic and protected from running dry.

The exhaust system is effective in all cooking modes and results in better quality foods and **no flavor transfer**. The fan, which is guarded against accidental finger contact, is driven by a quiet and powerful motor. The condenser draws out excess steam from the appliance. Condensation and waste water, which result during steaming and cleaning, are continuously drained.

The use of high quality insulation impedes excessive heat radiation and saves energy.

OVEN/STEAMER OPERATION

Ease of operation is guaranteed through the simple arrangement of the controls. Graphic symbols make the appliance easy for even inexperienced kitchen staff to operate. Steam, Hot Air and Combi modes can be selected with one switch. A fourth function on the mode selection switch, the Cool Down mode, allows the oven cavity to cool down rapidly with the door opened or closed.

Cleaning is kept to a minimum. The interior is sprayed with a self-acting cleaning solution which interacts with steam to easily remove crusts and stains. The oven is designed for easy care and is welded water tight so that the internal cooking cavity may be rinsed with a hose after the steam cleaning process.

SPECIFICATIONS – COS-5HD/AB	
Electrical	
Specifications	440-480 VAC, 3 phase, 44 KW, 58 amps
Water	Atmospheric Vented Drain
Water Pressure	40 PSI (276 kPa) minimum 50 PSI (345 kPa) maximum
Water Connection	3/4” NPT Female

Introduction

Oven Features

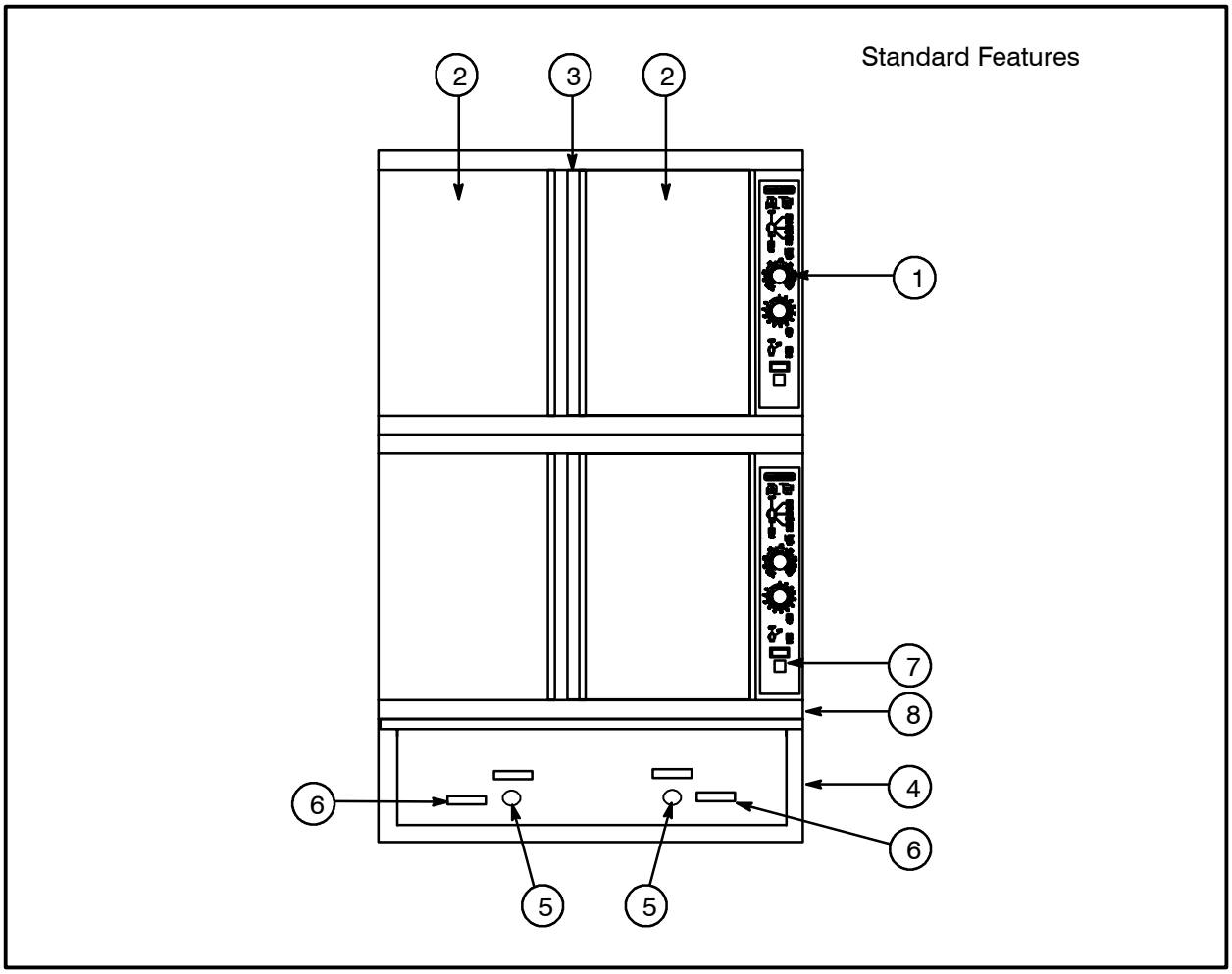


Figure 1

1	Control Panel
2	Oven Doors
3	Rotating Door Latch
4	Base Section

5	Deliming Port
6	Deliming Handle
7	Optional Meat Probe
8	Door Drip Pan

Installation

General Installation Information

The purpose of the installation section of this manual is to assist the designers and naval architects engineering the installation of a Blodgett Combi COS-5HA Hatchable Combination Oven into a new or existing ship.

Blodgett Combi has developed the COS-5HA to fit in the same footprint as a Blodgett Mark V convection Oven. The COS-5HA Combination oven can be used as a convection oven, steamer, or in a "Combi" mode in which pulsed steam is combined with convection to provide faster cooking and increase the moisture content of cooked foods. Because of these features, the oven utilizes water for generating steam. The Combi is a multi-system cooking oven and is more complex than a convectional oven. Therefore, more attention has to be paid to the installation process than that of a convection oven.

The COS-5HA requires the following support systems:

- **Power** 440 VAC, 3 phase, 60 amp service
- **Water** Potable, 40 to 50 psi
- **Drain** Atmospheric vented drain, 1" minimum diameter
- **Hood** Air venting required for steam removal

THE INSTALLATION INSTRUCTIONS CONTAINED HEREIN ARE FOR THE USE OF QUALIFIED INSTALLATION AND SERVICE PERSONNEL ONLY. INSTALLATION OR SERVICE BY OTHER THAN QUALIFIED PERSONNEL MAY RESULT IN DAMAGE TO THE OVEN AND/OR INJURY TO THE OPERATOR.

Qualified installation personnel are individuals, a firm, a corporation, or a company which either in person or through a representative are engaged in, and are responsible for:

- The installation of electrical wiring from the electric meter, main control box or service outlet to the electric appliance.

Qualified installation personnel must be experienced in such work, be familiar with all precautions required and have complied with all requirements of state or local authorities having jurisdiction.

Reference: *National Electrical Code, ANSI/NFPA 70–Latest Edition and/or Canadian Electrical Code CSA C22.1* as applicable.

This equipment is to 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)*.

Installation

Delivery and Location

DELIVERY AND LOCATION

The COS-5HA hatchable combination oven is shipped fully assembled on a special vibration resistant pallet. In addition, the oven is mounted on two hardwood skids to facilitate removal from the pallet. These skids were designed to match the height of the separate installation base. This allows the assembled oven to be slid directly onto the base after the installation base is mounted in position and hard plumbed with potable water and electric power.

COS-5HA dimensions:

Height	62.25” with legs 68.25” with 6” legs 65” with base
Width	38.19”
Depth	44.13”

The following clearances are required for the COS-5HA:

Sides	0”
Rear	6”

UNPACKING

1. Remove the protective cover around the oven. Inspect the unit for visible damage.
2. Remove the bolts that lock the 2-1/2” x 4” hardwood skids to the pallet base.
3. Use a forklift to raise the oven assembly off the pallet. The skids can be left in position to assist in moving an assembled oven onto the installation base or discarded after the oven assembly is unbolted into separate components for passage through hatches.

ASSISTANCE

Blodgett Combi also provides engineering assistance when custom installation kits are required. Our goal is to ensure that each oven installation can be made in the most efficient and economical manner.

For further information, please contact the Blodgett Combi Engineering Department:

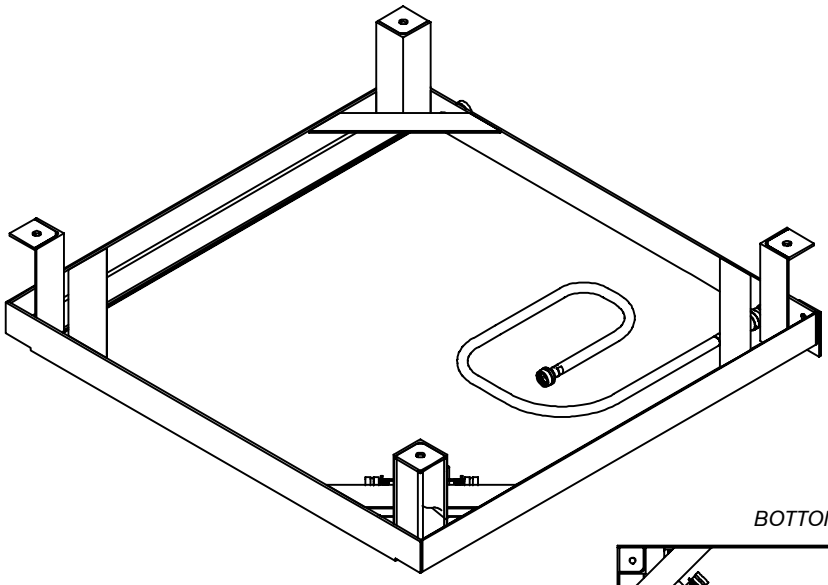
- **Phone** 1-800-331-5842
- **Fax** 802-860-3702

Installation Base

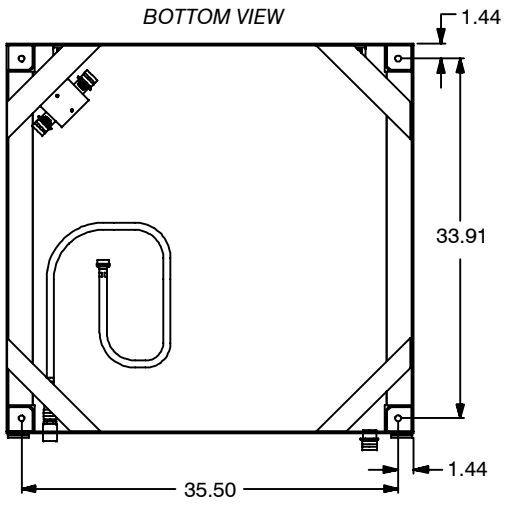
The Blodgett Combi COS-5H utilizes a stainless steel locking installation base. The base is available with or without legs. The installation base was designed to facilitate the installation process and to improve the access to the oven if and when major service is required.

Since the COS-5H is slightly narrower than the installation base, multiple bases can be installed side by side on the deck with no allowance for side clearance.

1. Secure the 2-1/2" high installation base using one of the following methods:
   a.) Weld the base directly to the deck.
   b.) Bolt the base to the deck.
2. Seal the base with an NSF approved sealant.



Base Shown Upside Down

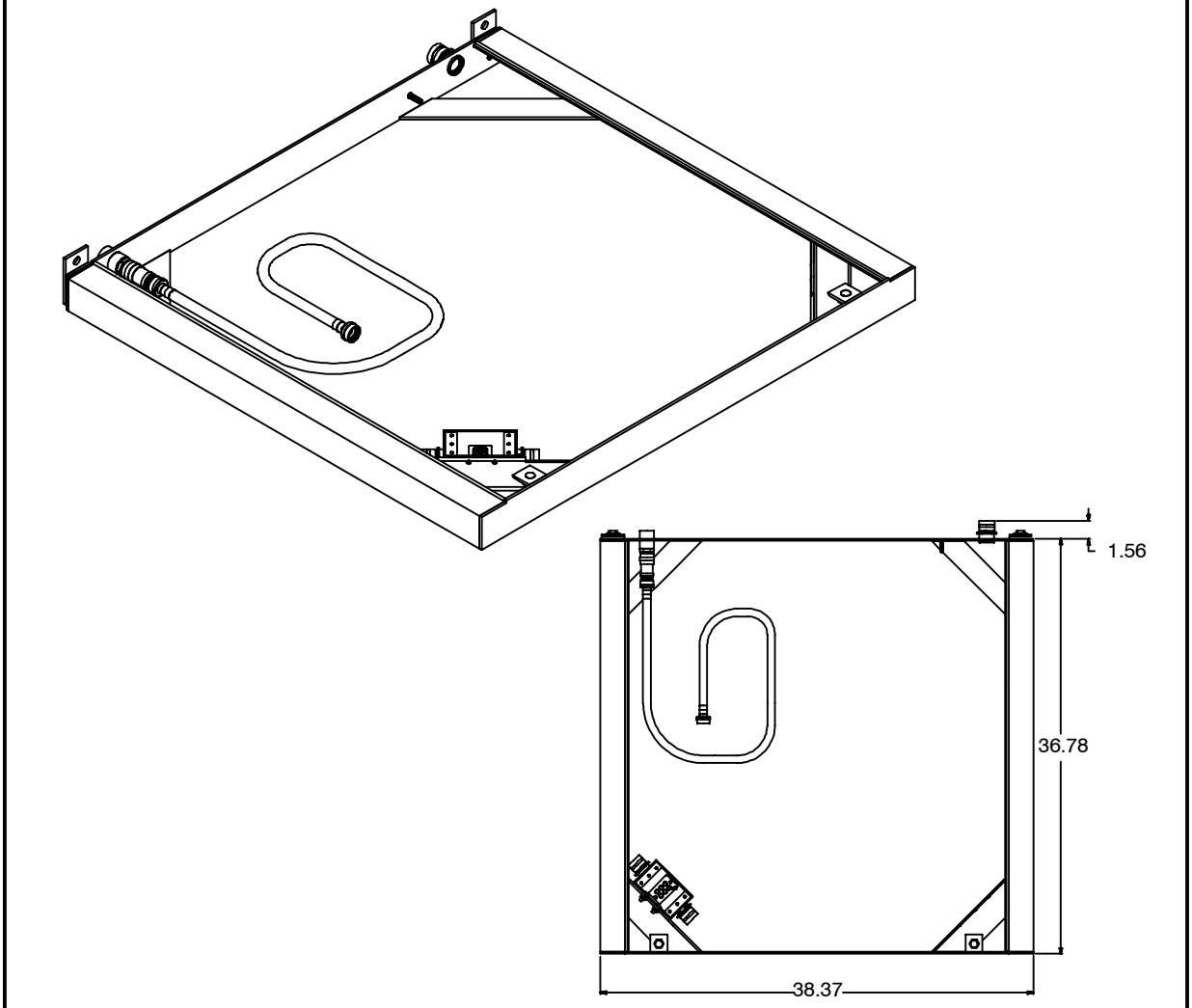


INSTALLATION BASE WITH LEGS

Figure 2

Installation

Installation Base



INSTALLATION BASE

Figure 3

Utility Connections

WATER CONNECTION

The oven requires access to potable water with a pressure of approximately 40 to 50 PSI.

1. The water is connected to the rear of the installation base at the 3/4” NPT female coupling.
2. The water is directed to the oven through an in-line pressure regulator and a flexible internal hose which connects to a fitting in the front of the oven.

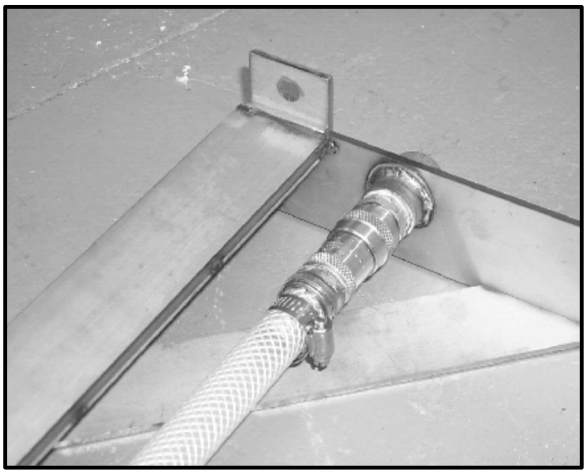


Figure 4

DRAIN CONNECTION

An open drain system utilizing a fixed funnel is recommended. For multiple oven installations, install a deck mounted sloping drain with individual funnels positioned to accept the drain outlets of the individual ovens.

ELECTRICAL CONNECTION

The power requirement of the oven is 440 volt, 3 phase, 60 amp service.

1. The electrical service is brought into the oven through the seal tight connector located on the rear of the installation base.
2. The power leads are brought into a splash proof terminal box located in the front of the installation base.
3. A grounding stud is supplied on the inside of the installation base. See Figure 5.

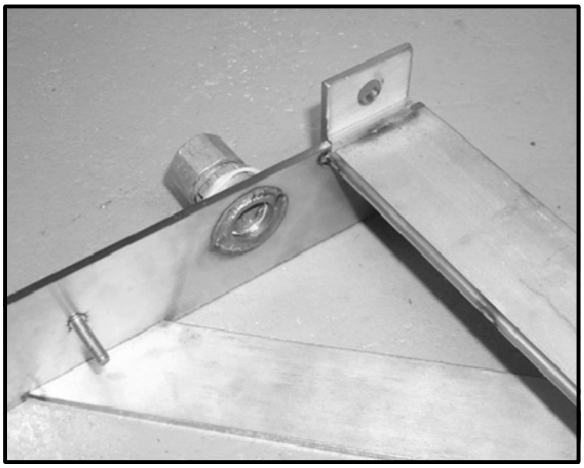


Figure 5

Installation

Oven Installation – No Dismantling Required

Use this procedure if the oven assembly does not have to be dismantled to bring it into the galley where the installation base has been fitted.

1. Slide the oven assembly on the shipping skids in front of the installation base.
2. Remove the two 1/2" bolts from the front of the installation base. See Figure 6.

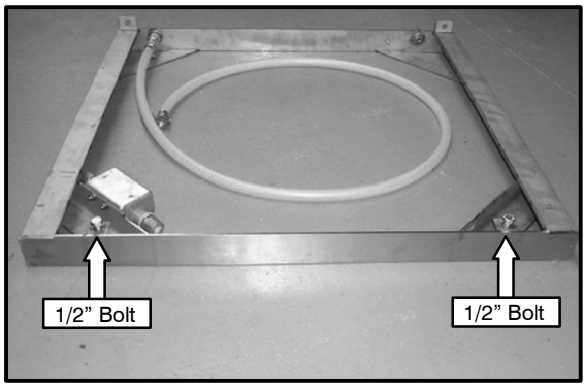


Figure 6

3. Unscrew the front panel from the oven base section. Leave the hoses connected to the front panel and the oven base section.
4. Remove the two bolts securing the skids to the front of the oven base section. See Figure 7.

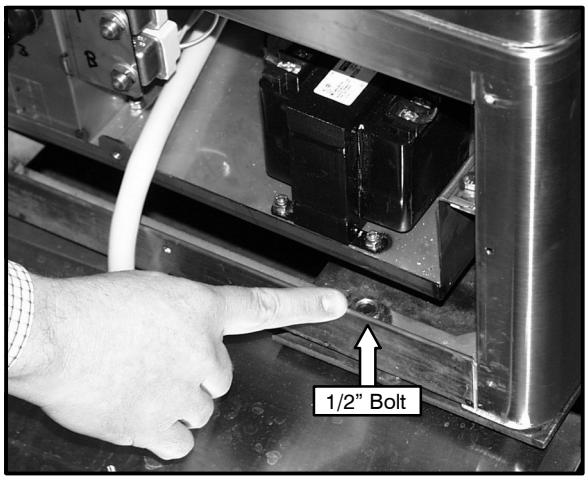


Figure 7

5. Remove the two bolts and angle plates securing the skids to the rear of the oven base section.

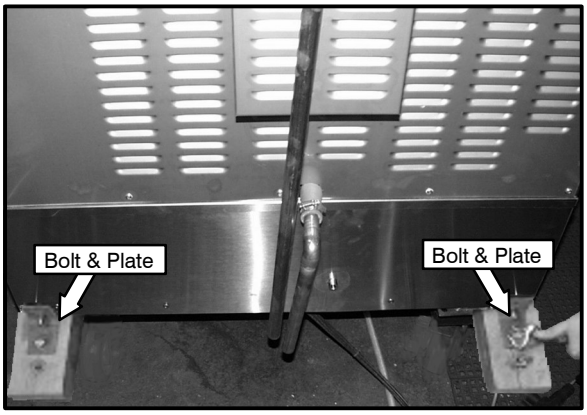


Figure 8

6. Move the oven assembly to the installation base as follows:
   a.) Lubricate the top surface of the installation base with a little grease or silicone spray.
   b.) Slide the oven assembly off the skids onto the tracks of the installation base.
   c.) The locking pins on the rear of the oven base section will fit into and lock the base to the upright tabs attached to the installation base.
7. Reinstall the two bolts that were removed in Step 2, from the installation base through the oven base section into the installation base. See Figure 7 for installation location.
8. Hook up water and electrical connections to the oven base section. Apply NSF approved sealant to the cover of the splash proof terminal box.

Oven Installation – Some Dismantling Required

Use this procedure if the oven assembly will be dismantled to bring it into the galley where the installation base has been fitted.

The assembled oven consists of three sections:

- upper oven section
- lower oven section
- oven base section.

The oven base section consists of the major electrical components, steam generator, and the attachment components for mating the oven assembly to the installation base which is mounted directly to the deck. In order to dismantle the oven assembly, you will have to separate electrical wire harnesses and plumbing lines. We recommend that you tape both sides of each electrical and hose connection and mark them for easy identification during reassembly.

If you are installing more than one oven assembly, keep all hardware and panels associated with one oven assembly separate from the other oven assemblies. If the oven assembly has to be dismantled in order to fit through the hatches, use the following procedure:

OVEN DISMANTLING

1. Remove the racks from the inside of both the upper and lower oven sections. See Figure 9.

Figure 9

2. Remove the side support racks from the inside of both the upper and lower oven sections. See Figure 10.

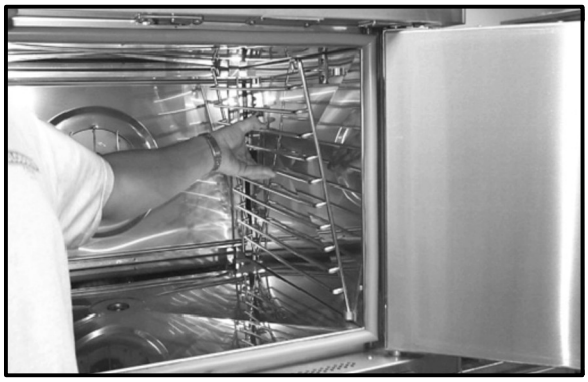


Figure 10

Installation

Oven Installation – Some Dismantling Required

3. Remove the drip pan from the front of both ovens. See Figure 11.

Figure 11

4. Remove the locking tab plate above the control panel by removing the Phillips screw. See Figure 12. Do this to both the upper oven and the lower oven.

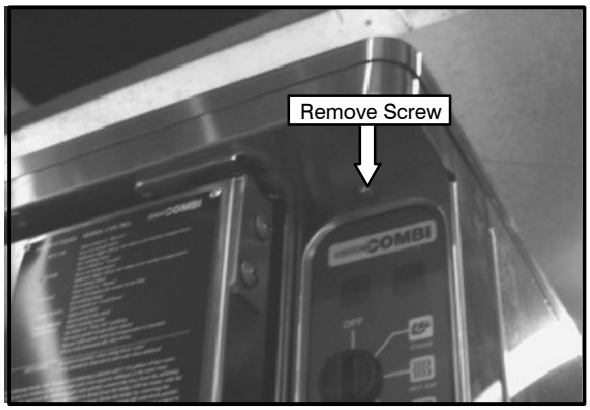


Figure 12

5. Remove the control panel cover by lifting and pulling the “D” handle toward you about 6”. See Figure 13. Do this to both the upper oven and the lower oven.

Figure 13

Oven Installation – Some Dismantling Required

6. Remove the right side rear panel by sliding it forward about an inch and then lifting the entire panel to free the retaining springs. See Figure 14. Do this to both the upper oven and the lower oven.

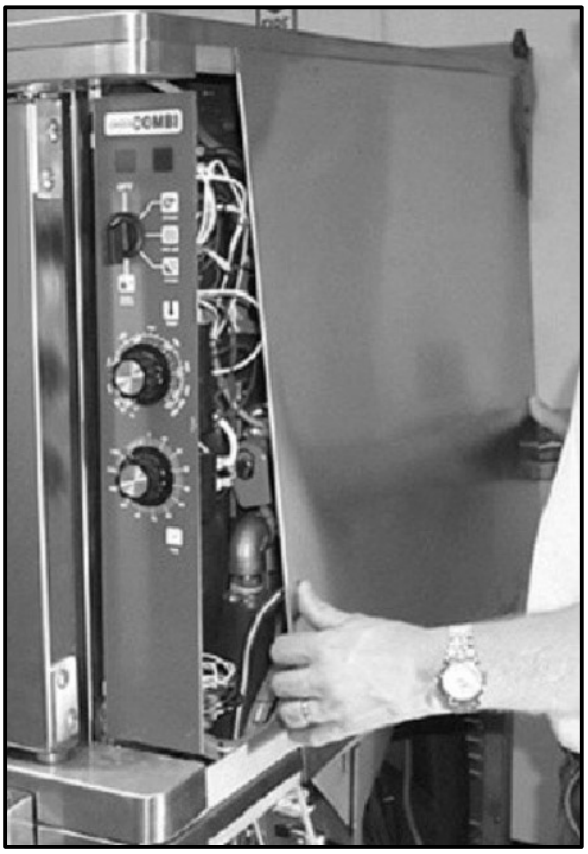


Figure 14

7. Cut the wire tie holding the copper drain tubes together. See Figure 15.

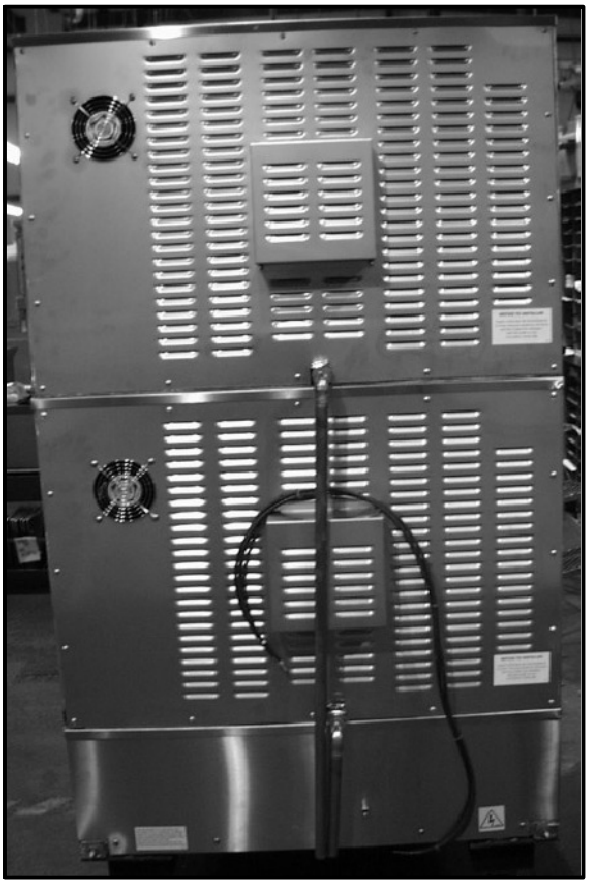


Figure 15

Installation

Oven Installation – Some Dismantling Required

8. Disconnect the electrical wire harnesses (J1, J3, J7, and J8) that connect the upper and lower oven section to the oven base section. See Figure 16. Mark connections prior to disconnecting for ease of re-assembly.

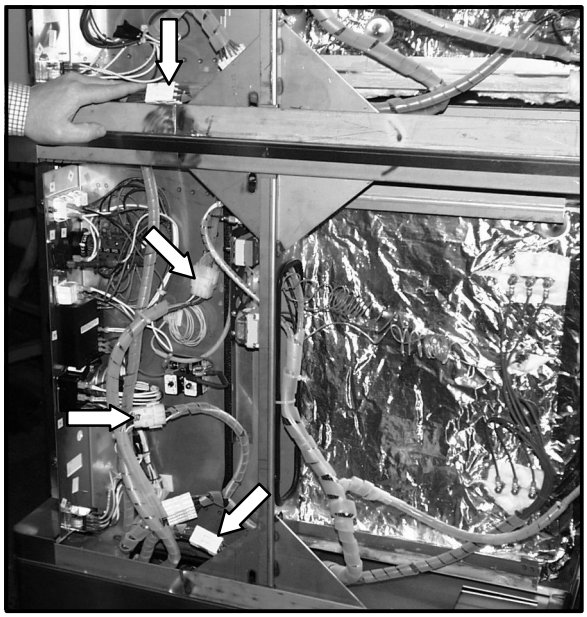


Figure 16

9. Disconnect and remove the steam lines to the upper and lower oven sections at locations shown in Figure 17 and Figure 18. The top of the hose is secured with a band clamp. The bottom of the hose pulls out of the boiler in the oven base section.

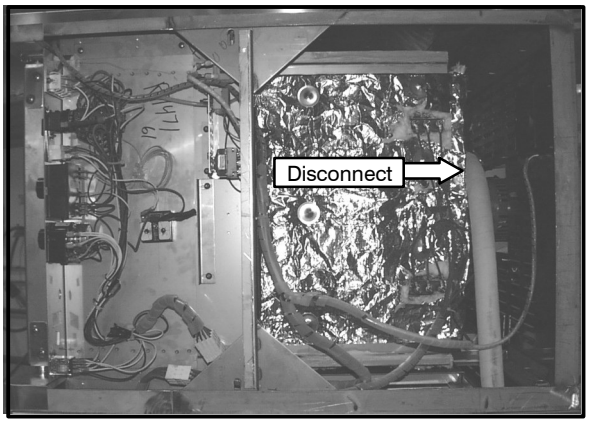


Figure 17

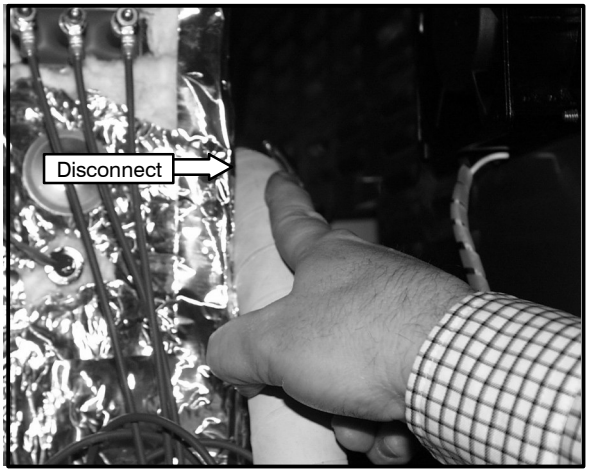


Figure 18

10. Remove the rear body panel on the lower oven section.

Oven Installation – Some Dismantling Required

11. Remove the three bolts (1/2 inch diameter) that connect the top and lower oven sections together.

    Two bolts are located in the rear upper left and right corners of the lower oven section. These bolts can be accessed from the back of the lower oven section. See Figure 19.

    The third bolt is accessed from the right side of the lower oven section. It is located in the upper right hand corner. See Figure 20.

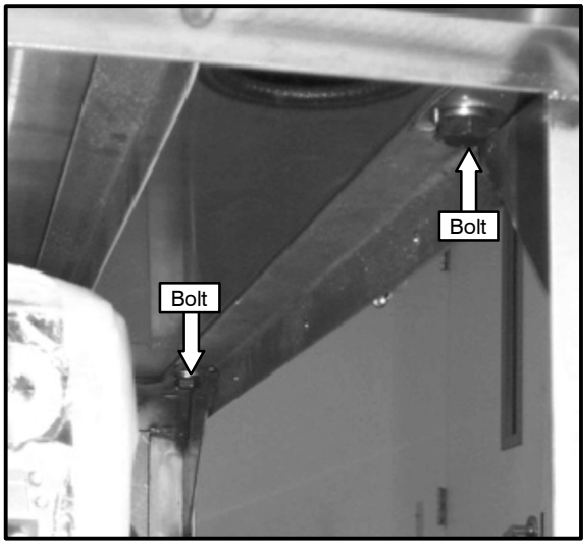


Figure 19

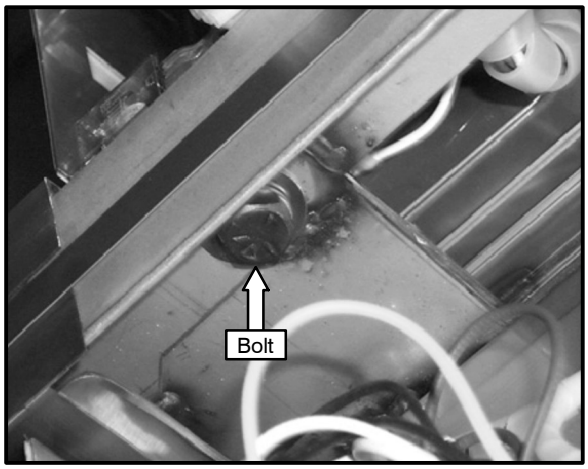


Figure 20

Installation

Oven Installation – Some Dismantling Required

12. Remove the upper oven section from atop the lower oven section. Use care not to chafe any of the harnesses that come from the base section. Use gloves to protect hands from any sharp edges.
13. Remove the rear body panel from the oven base section. Unscrew the front panel from the oven base section. Leave the hoses connected to the front panel and the oven base section.
14. Remove the four bolts (1/2 inch diameter) that connect the lower oven section and oven base section together.

    Two bolts are located in the rear upper left and right corners of the oven base section. These bolts can be accessed from the back of the oven base section. See Figure 21 and Figure 22.

    The third bolt is accessed from the right side of the oven base section. It is located in the upper front right hand corner. See Figure 23.

    The fourth bolt is accessed from the left side of the oven base section. It is located in the upper front left hand corner. See Figure 24.
15. Remove the lower oven section from atop the oven base section. Use care not to chafe any of the harnesses that come from the base section. Use gloves to protect hands from any sharp edges.

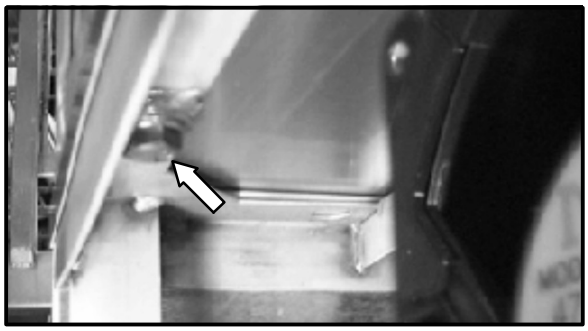


Figure 21

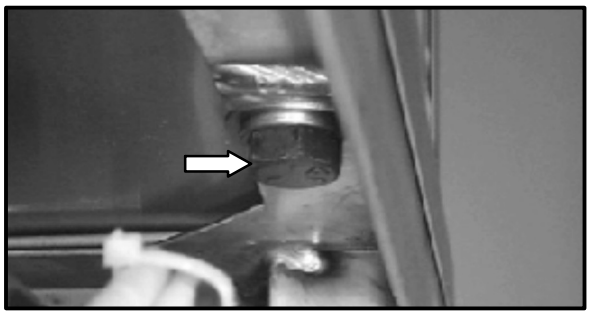


Figure 22

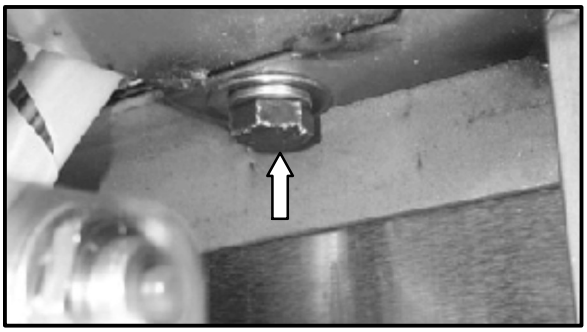


Figure 23

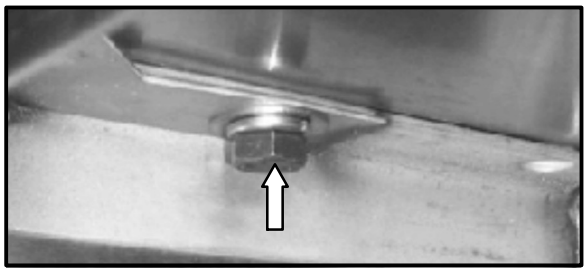


Figure 24

Oven Installation – Some Dismantling Required

OVEN RE-ASSEMBLY

After the installation base is secured in position, connected to potable water and electrical power, the oven sections may be assembled onto it. In galleys where ovens are located next to each other, the oven sections should be assembled prior to sliding the oven assembly into the final position on the installation base.

1. Remove the two 1/2” bolts from the front of the installation base. See Figure 25.

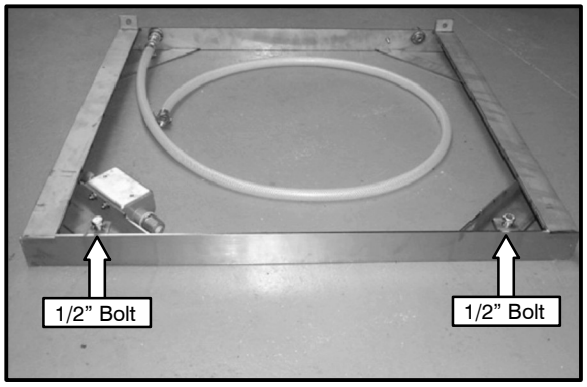


Figure 25

2. Lubricate the top surface of the installation base with a little grease or silicone spray. Position the oven base section onto the flat track surface of the installation base approximately 4” to 5”. Support the front of the oven base section with a piece of 2” pipe (2-3/8” OD approximately) by 39” (minimum) long.
3. Apply a 1/8 inch bead of clear silicone RTV to the perimeter of the top edge of the oven base section. Lift the lower oven section onto the oven base section. Use gloves to protect hands from any sharp edges.
4. Install the four bolts (1/2 inch diameter) that connect the lower oven section and oven base section together.

   Two nuts are located in the rear lower left and right corners of the lower oven section. These nuts can be accessed from the back of the oven base section. See Figure 21 and Figure 22 on page 16.

   The third nut is accessed from the right side of the oven base section. It is located in the lower front right hand corner of the lower oven section. See Figure 23 on page 16.

   The fourth nut is accessed from the left side of the oven base section. It is located in the lower front left hand corner of the lower oven section. See Figure 24 on page 16.
5. Install the rear body panel on the oven base section.
6. Apply a 1/8 inch bead of clear silicone RTV to the perimeter of the top edge of the lower oven section. Lift the upper oven section onto the lower oven section. Use gloves to protect hands from any sharp edges.

Installation

Oven Installation – Some Dismantling Required

7. Install the three bolts (1/2 inch diameter) that connect the top and lower oven sections together.

   Two nuts are located in the rear lower left and right corners of the upper oven section. These nuts can be accessed from the back of the lower oven section. See Figure 26.

   The third nut is accessed from the right side of the lower oven section. It is located in the upper front right hand corner of the upper oven section. See Figure 27.

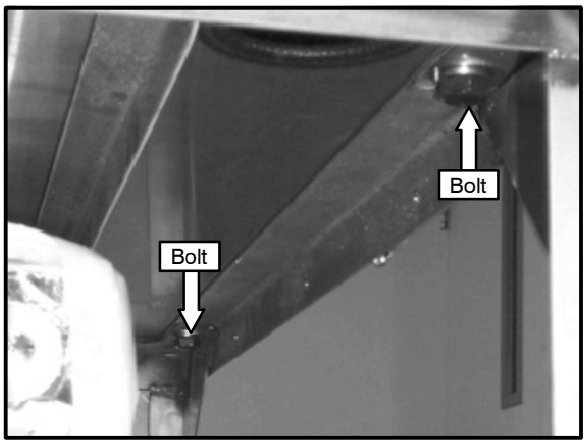


Figure 26

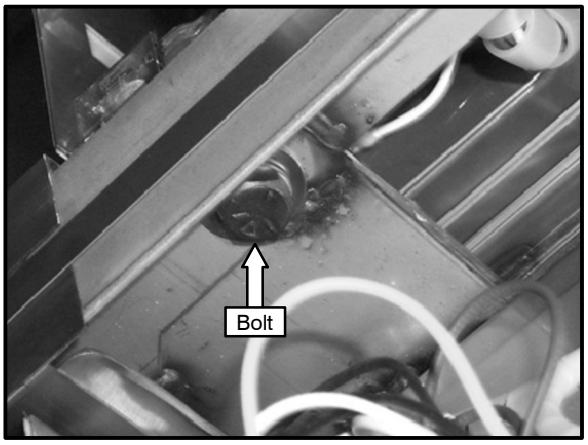


Figure 27

8. Install the rear body panel on the lower oven section.
9. Install and reconnect the steam line to the upper oven section at locations shown in Figure 28 and Figure 29. Secure the top of the hose with a band clamp. Insert the bottom of the hose in the fitting on the steam generator in the oven base section.

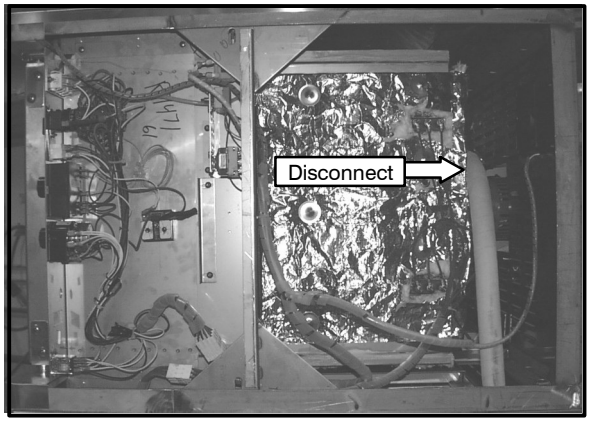


Figure 28

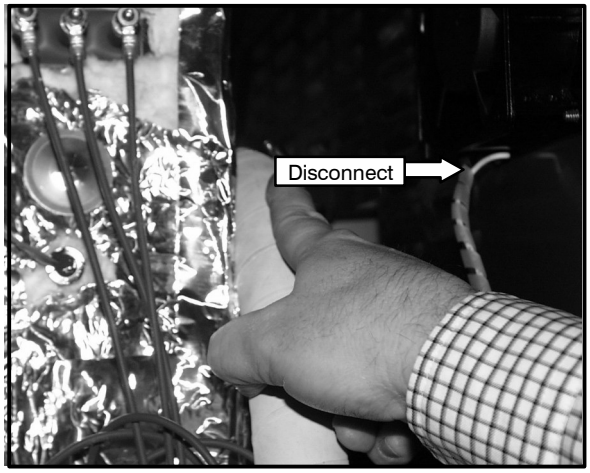


Figure 29

Oven Installation – Some Dismantling Required

10. Reconnect four electrical wire harnesses (J1, J3, J7, and J8) that connect the upper and lower oven section to the oven base section.

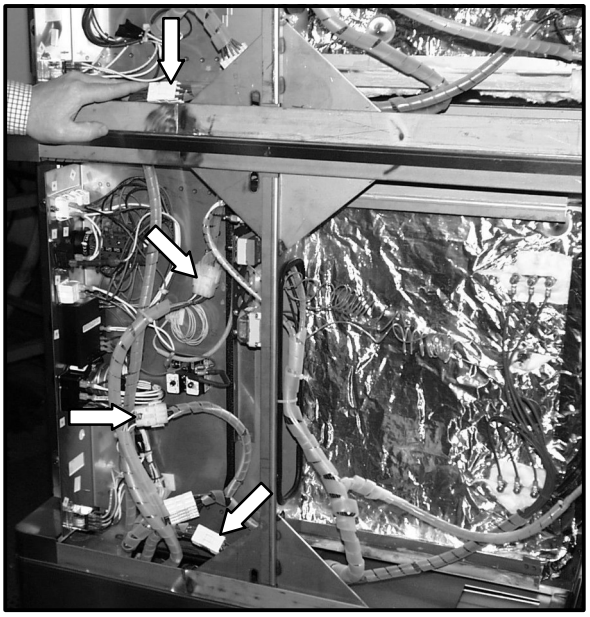


Figure 30

11. Locate the bag of parts inside the oven.
12. Install the barb fitting into the coupling to the right of the copper drain tubes on the bottom base of the oven.
13. Using the provided clamp, tighten the clamp around the hose and barb fitting connection, and the hose and reducer on the copper drain assembly.
14. Wire tie the two copper drain tubes together at location shown in Figure 31.

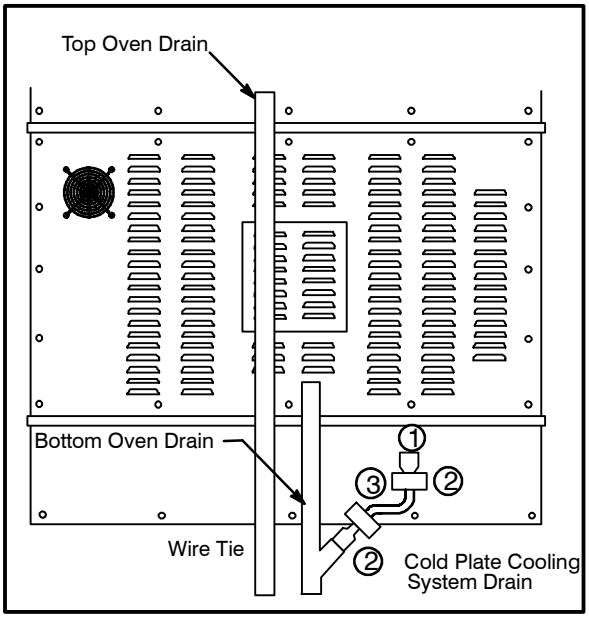


Figure 31

15. Review instructions in STEPS 1 thru 10 to ensure that all connections have been made properly, hoses are not kinked, and all electrical wire harnesses are routed correctly to prevent chafe or damage.
16. Complete the attached checklist document.
17. Replace oven electrical control panels on both upper and lower oven sections. See Figure 13 and Figure 14.
18. Slide the oven assembly back onto the installation base. The locking pins on the rear of the oven base section will fit into and lock the base to the upright tabs attached to the installation base. Install the two bolts (1/2 inch diameter) removed in STEP 1 (Figure 25), thru the oven base section and into the installation base. Insure that the drains from the upper and lower ovens are located over the floor drain.
19. Hook up water and electrical connections to oven base section. Apply NSF approved sealant to cover of splash proof terminal box.

INSTALLATION COMPLETE. PROCEED WITH CHECK-OUT PROCEDURE.

Operation

Oven Startup and Shutdown

OVEN START-UP

1. Turn the mode switch to the desired mode, Steam, Hot Air, Combi, Cool Down.

STEAM MODE

1. Turn the mode switch selector knob to the Steam Position. The green “POWER” indicator lamp illuminates on the front control panel.
2. Steam fills the cavity and is controlled by a non-accessible internal thermostat.

Preheating for the STEAM mode

Before the first use of the appliance, daily or after the oven has been idle for 3 hours, preheat with the STEAM function until steam enters the oven cavity. The appliance can then be loaded.

HOT AIR MODE

1. Turn the mode selector switch to the Hot Air position. The green “POWER” indicator lamp illuminates on the front control panel.
2. Set the Hot Air thermostat to the desired temperature. The Thermostat lamp illuminates indicating the cavity temperature is below the desired set point.
3. When the cavity temperature reaches the desired set point, the temperature indicator lamp goes off.

Preheating for the HOT AIR mode

Always preheat the appliance prior to loading. Open the door and load the product quickly.

COMBI MODE

1. Turn the mode selector switch to the Combi position. The green “POWER” indicator lamp illuminates on the front control panel.
2. Set the Hot Air thermostat to the desired temperature.
3. The hot air thermostat lamp illuminates, indicating the cavity temperature is below the desired set point.
4. Once the cavity temperature reaches the desired set point, the temperature indicator lamp goes off.
5. The steam and hot air modes come on to satisfy the thermostat set points.

Preheating for the COMBI mode

Always preheat the appliance prior to loading. Open the door and load the product quickly.

COOL DOWN

1. Turn the mode selector switch to the Cool Down mode.
2. The convection blower comes on with the door open or closed.

OVEN SHUT DOWN

1. Turn the mode selector switch to the off position.

Optional Meat Probe

CONTROLS IDENTIFICATION

1. **MEAT PROBE SWITCH**
   Controls power to the meat probe.
2. **MEAT PROBE CONTROL**
   Use to set the desired probe temperature. Indicates the actual temperature of the product
3. **MEAT PROBE CONNECTOR**
   Receptacle for the plug in meat probe.

   NOTE: For sanitation it is recommended that the meat probe remain plugged into the front panel receptacle at all times.

OPERATION

Measuring the product core temperatures during long roasting periods is very practical. It is especially important for products such as Roast Beef to reach a specific internal temperature.

Place the probe through to the middle of the product's thickest section. Be sure the probe does not touch any bone and the tip is not in a fat pocket. These conditions can cause inaccurate readings.

1. Set the MODE SELECTOR Switch to the desired function.
2. Turn the MEAT PROBE Switch (1) to *ON*.
3. To set the desired core temperature press the blue SET BUTTON (4) on the MEAT PROBE CONTROL (2).

   Use the up arrow key (6) to increase the setpoint temperature. Use the down arrow key (5) to decrease the setpoint temperature.

   Press the set button again to store the setpoint.
4. Set the TIMER to *STAY ON*. The cooking process runs automatically.

   When the selected core temperature is reached, the buzzer will sound and the appliance shuts off automatically.

   The temperature and mode can be changed at any time during the process.
5. Shut the appliance off by setting all switches to *OFF*.

NOTE: When setting the internal temperature, be sure to allow for carry-over cooking after the roast is removed from the oven

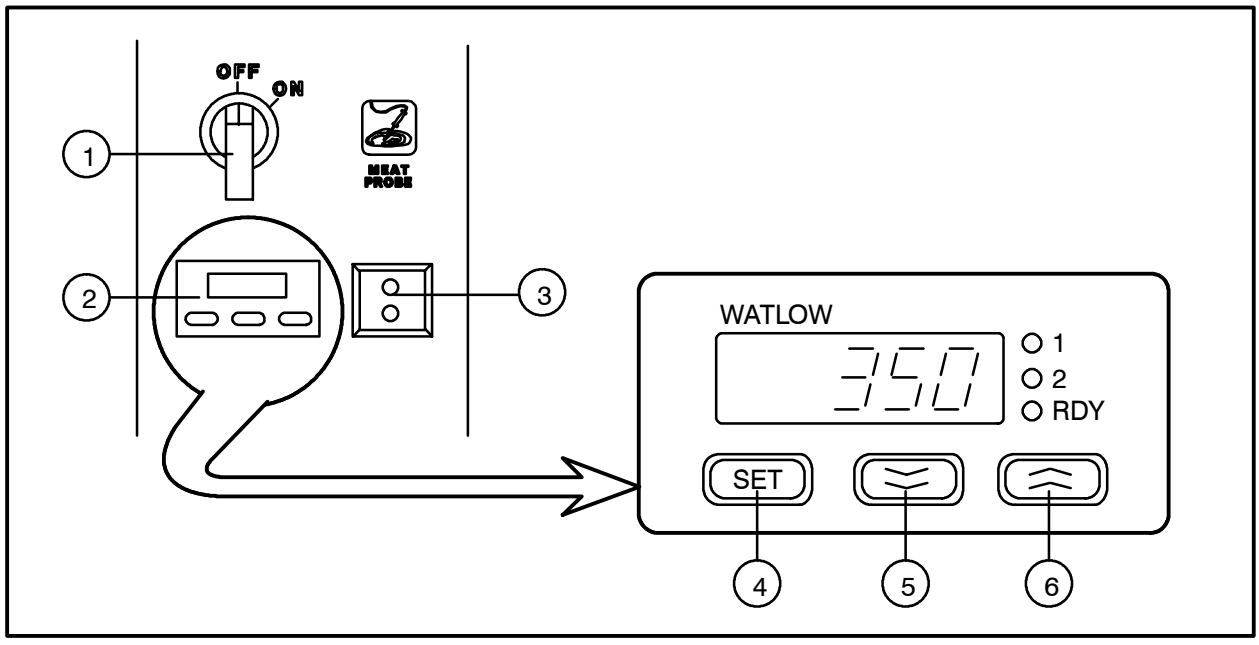


Figure 32

Operation

Standard Controls

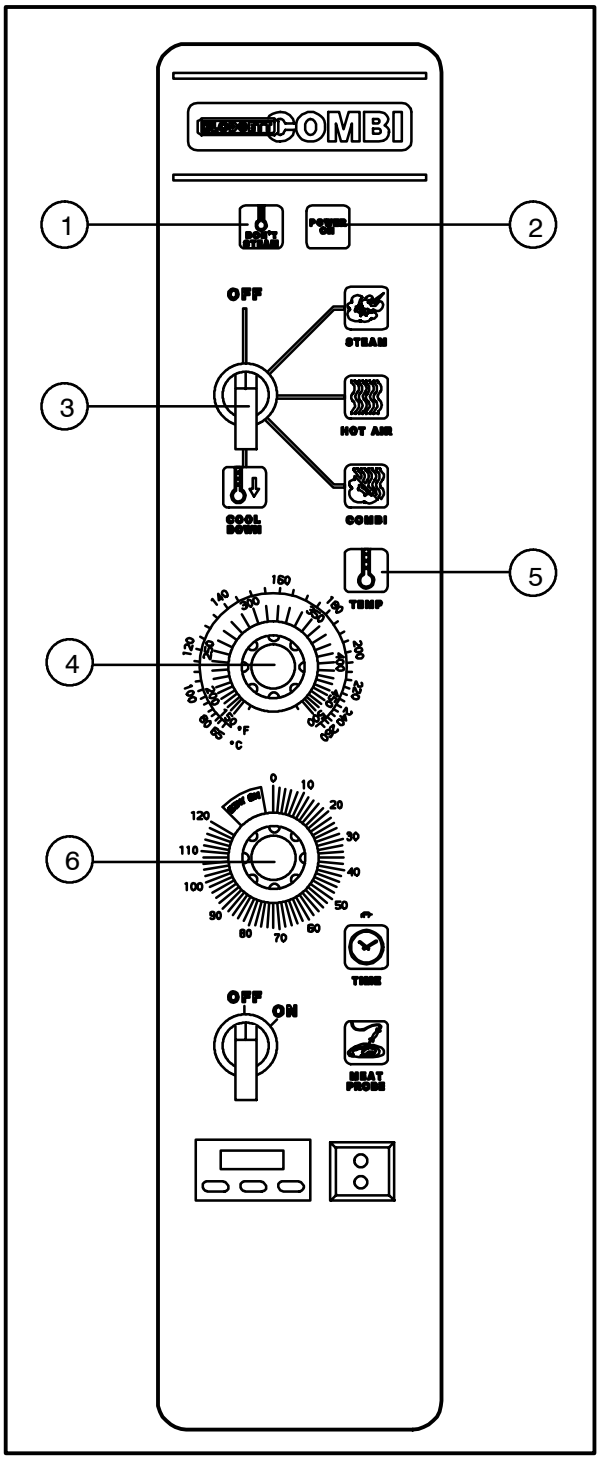


Figure 33

CONTROLS IDENTIFICATION

1. **DON'T STEAM LIGHT**
   Indicates the unit is too hot to operate in the steam mode. Place the unit in the Cool Down mode until the temperature is below 230°F (110°C). This light does not inhibit steam production.
2. **POWER ON LIGHT**
   Indicates the unit is in Steam, Hot Air or Combi.
3. **MODE SELECTOR SWITCH**
   Turns power to the oven on or off. Allows selection of Steam, Hot Air, Combi or Cool Down Modes.
4. **TEMPERATURE DIAL**
   Used to set desired cooking temperature.
5. **HEATING INDICATOR LIGHT**
   Lights when the Hot Air heating is in operation.
6. **TIMER DIAL**
   Used to set desired cooking time.

Standard Controls

OPERATION

1. Turn the MODE SELECTOR Switch (3) to the desired function.

   The POWER ON Light (2) illuminates.
2. Set the TIMER (6) for the desired cooking time or set it to *STAY ON*. The buzzer sound and the unit shuts off when the time has expired.
3. For the HOT AIR and COMBI modes, set the TEMPERATURE Dial (4) to the desired cook temperature. The HEATING INDICATOR Light (5) illuminates and stays lit until the desired temperature is reaches.
4. The selected mode operates automatically. The temperature, time and mode can be altered at any time during the cooking process. The operation can be stopped by the use of the Mode Selector Switch or by opening the door.
5. At the end of the specified time period, the buzzer sounds and the appliance will shut off automatically. Move the TIMER (6) to the *STAY ON* position to stop the buzzer and restart the unit.
6. To cool down the oven cavity, switch the MODE SELECTOR Switch (3) to COOL DOWN. In the Cool Down mode neither the temperature dial or the timer will be operational. The blower will function with the door open or closed.
7. The mode selector switch is also the main power switch. In the OFF position the appliance is not operational.

NOTE: Always disconnect the power supply before servicing the unit.

Cooking Guide

The Steam Mode

INFORMATION ABOUT THE STEAM MODE

How steaming works

This mode gently cooks food using non-pressurized steam. Fresh steam is directed into the oven from the generator. It is not necessary to add water to foods during the cooking process.

What can be steamed

Vegetables, side dishes, fish, meat, poultry, diet foods, garnishes, dumplings, casseroles, meat loaf, fruits, desserts and eggs.

How to operate the Steam mode

Simply turn the Mode Selector Switch to the STEAM position and set the Timer.

The advantages of steaming

Steaming is a well-known cooking process frequently used in restaurant and institutional kitchens. With this appliance it is now possible to enjoy the many advantages of steaming, some of which are:

- **Shorter Cooking Times**

  The continuous processing of large amounts of product is no problem and long cooking times are no longer necessary. Even with full loads, relatively shorter cooking time for food is needed.

- **High Quality Foods**

  With the useof steam, valuable taste and aroma are preserved since steamed foods retain their own natural taste. During the steaming process foods retain the nutrients and vitamins which are lost in water during boiling. Therefore, when compared, steamed foods have much better color than foods that have been boiled. Also, by using shallow containers the product is not layered as deeply and mushing is avoided.

- **Vitamin Retention**

  Vitamins are not destroyed. This is due to the shorter cooking times, the use of less or little water and the use of a low temperature; slightly less than 212°F/100°C.

- **Firmness**

  With the use of steam, overcooking is not a problem and firmness can be individually controlled.

- **Simultaneously Steaming Different Foods**

  There is no flavor transfer when cooking with the STEAM mode. For this reason, various types of food with different cooking times can be loaded or removed at any point during the cooking process.

The Steam Mode

TIPS AND PROCEDURES

Containers

Both solid and perforated steam table pans of varying sizes (full, half, and one-third size) may be used in the appliance. Small pans may be placed on wire racks.

Stocks for Sauces

When trays are used for cooking there is usually enough stock collected for making sauces. When using perforated pans, insert a solid pan in the bottom rack to collect the stock.

Seasoning

Since there is no liquid added during the steaming process, season using one of the following methods:

- **Season before cooking:** Sprinkle the spice mixture evenly over the food prior to cooking.
- **Oil seasoning after cooking:** Stir the oil mixture into the product. Steam again for two minutes in some cases.

Blanching and Prep Work

Large amounts of product can be blanched in a short amount of time. Trays should not be filled higher than 3 inches.

The STEAM mode is excellent for preparing vegetables for peeling.

Canning and Preserving

The diameter of the containers must not exceed 4-5 inches when canning.

Thawing

Thawing time is much shorter when using steam and produces higher quality food.

Reheating

The use of steam creates an even distribution of heat, which gives food better taste and retention of nutrients.

Foods are reheated in the trays in which they were cooked. Reheating times vary according to the height and content of the containers.

SAMPLE DISHES

Vegetables

Fresh and frozen vegetables may be steamed together. Frozen vegetables should be loosely scattered on the trays. Perforated trays shorten cooking time, although solid trays may be used.

Cooking times will vary depending on the quality of the vegetables. When steaming fresh vegetables, check the product $^3/_4$ of the way through the cooking period.

Steamed vegetables tend to soften after cooking. Since there is a delay between cooking and serving, it is best not to steam vegetables too soft. This is especially important for foods prepared for transport.

Rice and Potatoes

Rice requires the addition of water for steaming. Remember that the rice continues to swell after cooking; plan your quantities accordingly.

Always cook potatoes in perforated pans. Steam can permeate the potatoes better if they are quartered through the width and not the length.

Eggs

Eggs are inserted onto wire racks, either in the cardboard container or placed into perforated trays (there is no need to puncture them). Cooking eggs with the STEAM function saves work and results in less waste since steamed eggs do not break. Also, the degree of hardness can be controlled exactly. Begin timing when the oven window is misted over.

Fish

Fish can be steamed in trays without using extra stock. Use a 1 inch pan for fresh fish (Fillets). For larger or frozen pieces, use a 2 inch pan.

Poached fish can be prepared with aromatic herbs and vegetables in either solid or perforated pans. Steam without stock.

Shell fish can be steamed in perforated pans. Use a solid pan to catch drippings for stock.

Cooking Guide

The Hot Air Mode

INFORMATION ABOUT THE HOT AIR MODE

How cooking with hot air works

Hot air is circulated at high speed on all sides of the product, providing a concentrated cooking process. This function is extremely effective for intensive browning.

What can be cooked with hot air

Hot air can be used for all foods which need a short cooking time and intensive browning. For example: steaks, cutlets, fillets, breaded foods, and various baked foods. This function may also be used for au gratin.

COOKING WITH THE HOT AIR MODE

Temperatures

For intensive browning and crispy crusts, preheat the oven to the maximum temperature of 500°F/260°C. This is especially important when searing.

Performance

The charts showing performance examples (See Cooking Guide) are based on full capacity. Better results may be obtained by reducing product quantities.

Cooking Times

Due to the constant hot air circulation, this appliance cooks faster than conventional grills and deck ovens.

Cooking times will vary according to the quality, weight, and height of the product.

Trays or Racks?

This is a question of individual choice. Racks have the advantage of browning food on all sides; the underside of tightly packed foods may be lighter when using trays.

TIPS AND PROCEDURES

Loading the Oven

Place like sized product together on one rack. In order to ensure proper air circulation, racks and trays should not be crowded.

Oiling

The quality of some foods, such as steaks and breaded meats, can be enhanced by coating with oil or a paprika oil mixture.

Breaded Foods

The degree of browning is dependent on the amount of raw material in the breading. Oil can be used to intensify the browning. Press the breading firmly but don't overload the oven. Flouring seared foods is not recommended.

Baking

For baking, the Mode selector switch may be set to HOT AIR, STEAM, COMBI or any combination according to the type of product. Steam added to the baking process opens up a wide range of possibilities: such as hard crusts and good shine on certain types of breads. Here are some tips for baking:

- Preheat oven to the baking temperature.
- Baking temperatures can generally be set 50-75°F/20-25°C lower than with a conventional baking or roasting oven. When in doubt, lower the temperature.
- The baking time can be shorter than with conventional methods.
- Slightly reduce your quantities of mixtures with excessive moisture.
- Use deep trays for light mixtures in order to ensure undisturbed baking. Baking forms should not be higher than 3 inches.
- Cake forms (pans, tins, etc.), should be placed on racks.
- Distribute foods evenly when loading half loads.
- Use every second tier for baking bread, heavy mixtures (yeast doughs, etc.) and well filled forms.

The Combi Mode (Steam and Hot Air)

INFORMATION ABOUT THE COMBI (STEAM AND HOT AIR) MODE

How Combi Mode Works

With this function, the advantages of steam (short cooking time, less shrinkage) and hot air (intensive aroma, appetizing color) are combined. Steam and hot air circulate at high speeds, enveloping the product on all sides and providing an intensive cooking process.

What can be cooked in Combi mode?

All types of roasts, duckling, pork, beef, lamb, meat loaf, ground chuck foods, casseroles, poultry, stuffed vegetables, vegetables au gratin and yeast doughs.

The advantages of Combi mode?

- **Productivity**

  Previously, several different appliances, and multiple procedures, were necessary to combine heat andsteam preparation. Now all of these methods can be used without time wasting interruptions, with one appliance.

- **Less Shrinkage**

  The usual weight loss during roasting in conventional appliances can be reduced by approximately 13% of the original weight.

- **Juiciness and Crunchy Crusts**

  When used at the beginning of the cooking procedure, the searing action of steam instantly closes all pores. This reduces the loss of protein and meat juices. Therefore, products with long roasting times remain juicy. Foods retain their moisture and roasts develop a pleasing color as well as an appetizing crust. Meats have a pronounced roasted taste and burning of the surface is almost impossible.

COOKING IN THE COMBI MODE

The COMBI function can be used for the entire cooking process or for any portion of the cooking procedure you desire.

What do Combi-roasting, Combi-steaming and Combi-baking mean?

We have created these names since both modes, STEAM and HOT AIR, can be applied in any combination as follows:

- Together, as in the COMBI function.
- In sequence

  Example: first STEAM and then HOT AIR.

- Or in sequence and then in combination

  Example: first HOT AIR and then COMBI
  Or conversely: first COMBI and then HOT AIR.

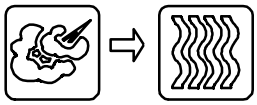
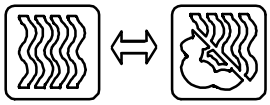
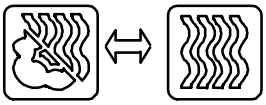
- Or all three functions in sequence

  Example: first STEAM, then HOT AIR, then COMBI.

For additional tips on when to use each of these Combi Modes see the “Summary of Functions” on the following page.

Cooking Guide

Summary of Functions

MODE SELECTION	COOKING METHODS	PRODUCTS
 Steam	Steaming, defrosting, thawing, re-heating-reconstituting, blanching, preserving, poaching, simmering, braising, stewing.	Convenience food, potatoes, rice, fresh or frozen vegetables, fresh or frozen fish, poultry, meat, fruit, eggs, puddings, casseroles.
 Hot Air	Roasting, grilling, baking, au gratin.	Roast beef, pork, veal, lamb, chicken, hamburger, fish, stuffed vegetables, toast, lasagne, potatoes, pies, shortbread, puff pastry, Danish and French pastry, bread.
 Combi	Combi-steaming, Combi-roasting, Combi-baking, defrosting-thawing, reheating-reconstituting.	Prime rib, whole bone ham, goose, turkey, fish, mutton, beef, pork roast, French pastry, bread, rolls, puff pastry, Danish pastry, convenience food.
 Steam Hot Air	Combi-steaming, Combi-braising, Combi-roasting, Combi-baking, *(Begin with steam, then with dry heat for crusting, browning, gratinating.)*	Stuffed peppers, gratinated vegetables, fennel, broccoli, cauliflower, rack of lamb, pork
 Hot Air Combi	Combi-steaming, Combi-roasting, Combi-baking, *(Start with dry heat, switch over to Combi for slow but gentle even browning, switch back and forth as necessary.)*	French pastry, puff pastry, yeast dough, turkey, duck, goose, lamb, stuffed vegetables.
 Combi Hot Air	Combi-braising, Combi-roasting, Combi-baking, *(Start with Combi, finish with dry heat for crusty, crisp, brown surface, switch back and forth as necessary.)*	Whole bone ham, ham in bread dough (English Ham), whole fillets of beef, pastry dough, yeast dough (bread, rolls).
 Steam Hot Air Combi	Combi-steaming, Combi-roasting, Combi-baking, *(For meats: sear pores closed with steam, then brown with dry heat, then switch between Combi and dry heat. For stuffed vegetables: steam first and switch between dry heat and Combi during the rest of the cooking process.)*	Veal, pork, beef, leg of lamb, goose, duck, turkey, prime rib, puddings, stuffed peppers; ideal for all products which need a humid cooking process.

General Tips and Procedures

USING RACKS

Use racks for roasts needing a longer roasting time, large roasts (pork, veal, beef, venison, lamb), searing, toast, au gratin, (chicken, duck, goose, legs, chops), cooking in containers, thawing, baking in tins, etc. When cooking in racks it is important to turn food products.

USING PANS

- **1″ Deep Steam Table Pan**

  For fried potatoes, hamburgers, au gratin, thawing, meat loaf, meat balls, fried, poached and steamed fish, baked goods, vegetable casseroles, duck and goose.

- **2″ Deep Steam Table Pan**

  For cabbage rolls, stuffed peppers, stews, rice, vegetables, sauerkraut, assorted fruits and compote. Also for collecting stock, preparing sauces, etc.

- **2½″Deep Perforated Steam Table Pan**

  For vegetables without stock, side dishes (breads) and products with shorter cooking times.

- **4″Deep Perforated Steam Table Pan**

  For vegetables (blanching spinach for example), potatoes, shelled or unshelled eggs.

- **6″Deep Perforated Steam Table Pan**

  For potatoes.

COOKING TIMES

The length of the cooking process depends on the quality, weight and thickness of the food product.

TEMPERATURES

Typically, the longer the cooking process, the lower the temperature.

LOADING THE OVEN

To ensure that the product will brown on all sides, do not place foods too close together. Place the grain of meats parallel to the air stream (left to right). This ensures better absorption and shortens the cooking process. Place like sized pieces together on the same rack, smaller pieces cook more quickly.

Place the food in the appropriate pans/trays or distribute it on the racks. Insert racks and trays into the pan rack. It is recommended that the pan rack be loaded outside of the oven when processing large amounts of product. The pan rack for table models is well suited for this purpose; it allows for a higher hourly production and an efficient work sequence.

REMOVING THE PRODUCT

Turn the Mode Selector Switch to OFF before opening the appliance door.

NOTE: Open the door slowly after steaming! Hot Steam Will Be Present!

Cooking Guide

Suggested Times and Temperatures

PRODUCT		SUGGESTED CORE TEMPERATURE	
Beef			
Fillet of Beef	medium rare	130°-140°F	54°-60°C
Roast Beef	medium rare	130°-140°F	54°-60°C
Pot Roast	well done	170°F	78°C
Veal			
Saddle of Veal	medium	160°F	70°C
Loin	well done	165°-175°F	75°-80°C
Shoulder	well done	165°-175°F	75°-80°C
Stuffed or Boned		165°-170°F	75°-78°C
Leg, Top-side	fricandeau	172°F	78°C
Pork			
Leg	well done	185°F	85°C
Picnic Shoulder	well done	185°F	85°-80°C
Ham	juicy	155°F	68°C
Smoked Pork Chops		158°F	70°C
Ribs	well done	150°F	70°C
Tongue	well done	195°F	90°C
Poultry			
Chicken	well done	185°F	85°C
Goose	well done	195°-198°F	90°-92°C
Turkey, Duck	well done	175°-185°F	80°-85°C
Lamb			
When the meat is well done it has a core temperature between 173°-185°F (79°-85°C). The core has a slightly pink color and the juices are clear.			
Saddle	slightly pink	158°-165°F	70°-75°C
Saddle	well done	175°F	80°C
Leg	slightly pink	165°-170°F	75°-78°C
Leg	well done	180°-185°F	82°-85°C
Pâtés			
Pâté		160°-165°F	72°-74°C
NOTE: Actual temperatures may vary from those shown. Write in your proven temperatures for ready reference.			

Notes

Maintenance

Cleaning and Preventive Maintenance

CLEANING THE INTERIOR

Daily cleaning of the appliance is essential for sanitation, and to ensure against operational difficulties.

For difficult cleaning, allow the spray-on oven cleaner to work longer before rinsing.

1. **Cool the oven down** to 140°F/60°C or, if the oven has been idle, turn the steam mode on for 3 to 4 minutes in order to warm the oven surfaces.
2. Spray the interior of the oven with a cleaning solution.

   NOTE: Never spray water into the unit when the temperature is above 212°F. NEVER SPRAY WATER IN THE UNIT AFTER USING THE HOT AIR OR COMBI MODES.
3. Let the cleaner work for 10 to 20 minutes with the oven off. For difficult, baked on grease, etc. allow to work over night.
4. Set the timer for 15 to 20 minutes.
5. Set the mode selector switch to Steam. This will soften all burned on residue.
6. Rinse the oven interior with water (a hose may be used, but take care that only the oven's interior cavity is sprayed with water).
7. Set the mode selector to steam for another five minutes to flush out the oven interior and remove all detergent residue.

NOTE: The oven cavity should never be scoured or scraped.

On stainless interiors, deposits of baked on splatter, oil, grease or light discoloration may be removed with a good non toxic industrial stainless steel cleaner. Apply cleaners when the oven is cold and always rub with the grain of the metal. The racks, rack supports and the blower wheel may be cleaned in the oven or by removing them from the oven and soaking them in a solution of ammonia and water.

NOTE: DO NOT use corrosive cleaners on the Oven/Steamer.

CLEANING THE EXTERIOR

Oven exteriors may be cleaned and kept in good condition with a light oil. Saturate a cloth and wipe the oven when it is cold; wipe dry with a clean cloth.

NOTE: The outside of the appliance is not to be sprayed with water.

PREVENTIVE MAINTENANCE

The best preventive maintenance measures are the proper initial installation of the equipment and a program for cleaning the oven routinely. The Oven/Steamer requires no lubrication. Contact the factory, the factory representative or a local Blodgett Combi service company to perform maintenence and repairs should they be required.

WARNING!!

Disconnect appliance from power supply before servicing or cleaning.

Decalcification

The COS-5HA has a separate boiler for each unit. There are deliming ports and handles for each boiler located on the base unit. The left deliming port and handle is for the bottom unit. The right deliming port and handle is for the top oven. To save time the boilers should be delimed simultaneously.

The COS-5HA should be delimed on a monthly basis regardless of water quality or usage. Use the following procedure to delime the boilers.

⚠ WARNING!!

ALWAYS USE PROPER SAFETY EQUIPMENT WHEN DELIMING. Gloves and eye safety equipment are recommended.

1. Set both mode selector switches to Steam mode. Wait until steam is produced. This will ensure that the water in the steam generators is hot.
2. Turn the mode selector switches to *OFF*.
3. Remove both deliming port covers on the base unit.
4. Add 10 ounces of deliming solution to the deliming bottle and then add 1-3/4 gallons of warm water.

   NOTE: Lime-a-way ™ or a generic equivalent are recommended. The main active ingredient should be a deluted concentration of phospheric acid.
5. Delime the boilers as follows:
   a.) Connect the deliming hose to one of the deliming ports on the base section.
   b.) Turn the corresponding red deliming handle on the base unit so it is vertical. This opens the deliming port.
   c.) Pump in all of the solution.
   d.) Close the deliming handle and remove the deliming hose from the deliming port. The handle is now horizontal.
6. Repeat STEPS 4 and 5 for the other oven.
7. Allow the ovens to sit with the deliming solution in them for at least 1/2 hour.

   NOTE: For heavy lime build up, allow to stand for 1 hour.
8. Drain and flush the boilers as follows:
   a.) Connect a drain hose to one of the deliming ports. Allow the boiler to drain completely. The drain hose is not supplied.
   b.) Carefully rinse out the deliming container and fill it with 1-3/4+ gallons of fresh water only.
   c.) Turn the oven to Steam and allow the boiler to fill. Wait at least 2 minutes.
   d.) Connect the deliming pump to the same deliming port on the base section.
   e.) Turn the red deliming handle on the base unit so it is vertical. This opens the deliming port.
   f.) Pump in all of the water in the deliming pump.
   g.) Close the deliming handle and remove the deliming hose from the deliming port. The handle is horizontal.
   h.) Connect the drain hose to the same deliming port on the base section.
   i.) Turn the red deliming handle on the base unit so it is vertical. This opens the deliming port.
   j.) Let all the water drain from the boiler.
   k.) Remove the drain hose and turn the handle to the horizontal position.
9. Repeat STEPS b. and 8 for the other boiler.
10. Reattatch the covers to the deliming ports.

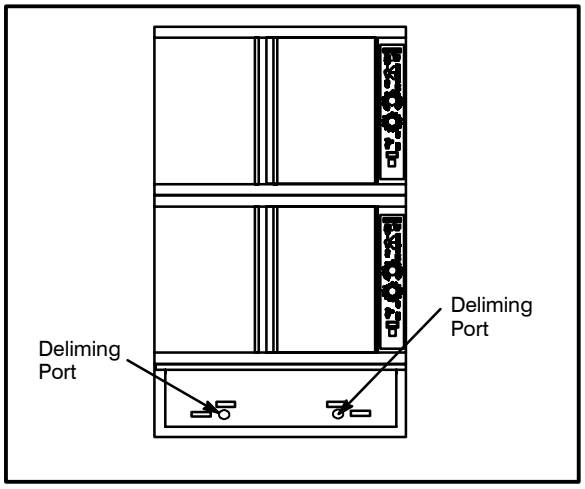


Figure 34

Maintenance

Troubleshooting Top Oven Section

COOL DOWN MODE

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Motor doesn't run in cool down.	
• Blown 2 amp input fuses.	• Remove and check fuses. Determine cause of circuit overload.
• Transformer is defective	• Verify input to transformer. Check transformer coils. Approximately 2.2 ohms primary / .7 ohms secondary. Replace if necessary.
• Blown 2 amp secondary fuse.	• Remove and check fuse. Determine the cause of circuit overload.
• P13 snap disk on the solid state relay assembly is open (SSR assembly is to the left of the boiler)	• Verify water is on ohm out snap disk P13
• Mode selector switch (S1) is not closing between 23 & 24.	• Check closing of switch with meter. Replace if needed.
• Motor contactor (K1-A) is not pulling in.	• Verify voltage to coil A1 to A2 of motor contactor. (Coil resistance is 500+ ohms) Replace if defective.
• Motor protector (PKZM-A) has tripped.	• Motor protector is defective or see "Convection Motors Run Intermittently" below.
• Convection motor is bad.	• Check windings of coil motor. Resistance of windings is approximately 85 ohms. Running current .5 amps.
SYMPTOM: Convection motor runs intermittently.	
• Thermal overload on motor (M1) is opening and closing (automatically resets when cooled).	• Check current draw. See if motor seal is out of alignment. (Requires removal of blower wheel.) Adjust seal if needed. Evaluate motor. Replace if defective.
• Electrical compartment cooling fan is not running.	• Check windings on fan (600+ ohms coil resistance) if open, replace.

NOTE: SSR refers to Solid State Relays which are water cooled on a cold plate.

Troubleshooting Top Oven Section

HOT AIR MODE

NOTE: Confirm cool down works before proceeding with hot air.

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Mode switch is in the hot air position but no control panel lights are on.	
• Cavity high limit (F3) is open. (opens at 662°F)	• Hot air thermistor is out of tolerance. Unplug from thermostat and check resistance. (Use ohm chart) Replace if needed.
	• Defective hot air thermostat. Replace
	• Cavity high limit is defective. Replace
• Power on light (H4) has 220V but is not lit.	• Replace light (H5)
SYMPTOM: Hot air temperature light (H5) will not come on but power on light (H4) is lit.	
• Oven is up to temperature.	• Everything is OK.
• Mode selector switch (S1) is not closed between terminals 9 & 10.	• Defective mode selector switch (S1). Replace switch.
• Door switch (S2) is not closing.	• Proximity door switch (S2) is not engaging. Remove access plate & inspect. Replace if defective.
• Relay (R5) is open.	• Optional meat probe control has reached temperature and shut off oven by supplying 220V to terminals 7 & 8 on (R5).
	• Relay (R5) is defective. Replace
• Timer (S4) has timed out to zero minute position.	• Reset timer to a timed position or fully into the stay on position if continued operation is desired.
• Defective timer (S4).	• Replace timer (S4). Verify voltage 220V is present on terminals 6 & 7 before replacement.

Troubleshooting Top Oven Section

HOT AIR MODE (continued)

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Hot air temperature light (H5) will not come on but power on light (H4) is lit. (continued)	
• Hot air thermostat (P5) is not getting 220V at inputs L1 and C.	• Check wire connections.
• Hot air thermostat (P5) is getting voltage 220V to inputs but has no 220V to terminal "NO" and common.	• Hot air thermistor probe is bad or out of tolerance. Refer to OHM chart. Replace if needed. 77 = 100,000 212 = 6,780 347 = 1,070.
	• Defective hot air temperature control (P5). Replace.
SYMPTOM: No heat in Hot Air Mode but hot air (H5) and power light (H4) are both on.	
• Motor is running and the centrifugal switch is open.	• OHM out switch (red wires in motor) while motor is running, if it is open, remove motor and inspect centrifugal switch through access plate for loose or disconnected wires. Replace if defective. If you replace a motor, always replace the motor seal.
• Hot air SSR (K2-A) does not pull in.	• Verify 220V to coil. Replace if needed. See if red LED is on.
• Hot air SSR (K2-A) is energized 220V at coil but no heat.	• Contactor is not closing on one or more poles. Replace.
	• Hot air elements are open. Replace as needed.
SYMPTOM: Oven appears to be working properly, but the bake pattern has changed or is uneven.	
• One or more hot air elements are open.	• Check continuity of elements. Replace as needed.

Troubleshooting Top Oven Section

STEAM MODE

NOTE: Confirm cool down and hot air modes work before continuing. By checking hot air mode first, you have trouble shot all common components in both the hot air and steam mode up to and through the timer (S4).

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Mode switch is in the steam mode position but power light is off.	
• Mode selector switch (S1) is not closed between terminals 3 & 4.	• Defective mode selector switch (S1). Replace mode switch.
• Power on light (H4) is defective.	• Replace light.
• High limits F3 has tripped.	• Return to Troubleshooting Hot Air Mode.
SYMPTOM: Steam generator overfills.	
• Float assembly is hanging up.	• Delime steam generator / remove float assembly if needed and clean / move float assembly up / down, verify reed switch is opening & closing with VOM
• Relay R2 is stuck close	• Verfy coil (7 & 8) has no power to it, replace R2 relay.
• Solenoid is staying open.	• Replace if needed.
• SYMTOM: TO HOT FOR STEAM light is on.	• TOO HOT FOR STEAM light is a information light only, if it is “ON” it does not affect operation
	• Open door and cool down cooking cavity if TOO HOT FOR STEAM light comes on in the steam mode, P1 is defective.

Troubleshooting Top Oven Section

STEAM MODE (continued)

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Mode switch is in the steam mode, power on light is on, but no steam.	
NOTE: If the water level is not maintained properly, a safety F6–A (caliary type thermostat, opens at 275F & must be manualy reset) Before continuing, review the sequence of operation to understand the float circuit / fill logic.	
• Mode switch terminals 1 & 2 open	• Use VOM to ohm out terminals, replace mode switch in needed
• Mode switch terminals 5 & 6 open	• Use VOM to ohm out terminals, replace mode switch in needed
• Boiler high limit F6-A has tripped. (Also review if you are having water fill issues)	• Continued resetting of F6-A boiler high limit may weaken the high limit and cause premature tripping.
	• Ball float is hung up in boiler and staying open. Ohm out between R1 relay terminal 2 & R2 relay terminal 7 Removal of float assembly may be necessary to determine if float is hanging up due to mineral build up or internal reed switch has failed.
	• Quesent timer is not supplying flat water check (90 seconds on / 10 off) verity power in on both inputs, terminals 2/3 & 7/3. Verify output on terminal 4.
• Boiler is not filling deliming port to determine if boiler has water	• Relay R1 supplies power to the float / verify terminals 6 to2 are closed.
	• Relay R2 supplies power to the fill solenoid / verify the terminals 7 & 8 have power (relay coil) / verify terminals 5 to 3 are closed.
	• Coil for the fill solenoid Y1 is open / verify input. Ohm out coil windings, should be approximately 1800 ohms. Replace Yi if needed.
SYMPTOM: Steam contactor K3-A is not engaged.	
• Defective SSR / See if RED LED on SSR is lit	• Verify power to coil / replace if needed
• Steam solid state contactor K3-A has power in to input, but no heat.	• Solid state contactor is not closing on one or more poles. Replace.
	• Steam elements are open. Ohm out elements. Replace as needed.

Troubleshooting Top Oven Section

COMBI MODE

NOTE: Confirm cool down, hot air and steam modes work before continuing. By confirming previous modes you have tested most of the components in Combi.

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Mode switch is in the Combi position but no control panel lights are on.	
• Mode selector switch (S1) terminals 21 & 22 are open.	• Replace switch.
SYMPTOM: Power light (H4) is on, hot air heat light (H5) is on and off, but no steam.	
• Mode selector switch (S1) terminals (15 & 16) or (17 & 18) are open. • Solid state combi timer is not operating. (no steam in the combi mode only)	• Replace switch. • Verify resister assembly (with adjusting knobs) is plugged fully in • Verity power in on terminals 2 & 3 • Verify output on terminal 1 • Verify timer knob settings (15 sec “on” / 45 sec “off”)
SYMPTOM: Power light (H4) is on, steam works, but no hot air.	
• Mode selector switch (S1) terminals 19 & 20 are open.	• Replace switch.
SYMPTOM: Not enough steam in the Combi mode.	
• Cavity temperature is too high (over 400°F) • Timing sequence needs adjusting to increase steam.	• Reduce temperature. • Left knob is time “ON” /right knob is time “OFF”

Maintenance

Troubleshooting Top Oven Section

SEQUENCE OF OPERATION -- HOT AIR

NOTE: Electricity flows through these components in the order listed.

1. Terminal block L1, L2, L3 (440V/3ph)
2. Primary 2 amp slow blow fuses F2 / F3
3. Primary coil of transformer (step down 440V to220V)
4. Secondary coil of transformer 220V
5. Secondary 2 amp slow blow fuse F1
6. P13 Solid State cold plate snap disk high limit (opens at176F)
7. Plug connector (J3) terminal 9
8. Cooking compartment high limit (F3) terminals 1 to 2
9. Plug connector terminal 2 (J9)
10. Mode selector switch (S1) terminal 9 to 10
11. Power ON light (H4)
12. Plug connecter terminal 5 (J9)
13. Electrical compartment cooling fan (CF)
14. Door switch (S2)
15. Plug connector (J9) terminal 13
16. Meat probe relay (R5) terminal 6 to 1
17. Timer (S4) terminals 4 to 6 or Timer (S4) terminal 4 to 5 if timer is timed out
18. Buzzer (T1)
19. Plug connector (J9) terminal 11
20. Plug connector (J3) terminal 1
21. Power junction: to follow motor operation to step 26.
22. Motor contactor (K1-A) terminal A1 to A2
23. Power in L1, L2 & L3 (440V/3ph) motor contactor (K2-B)
24. Motor protector (PKZM-A)
25. Plug connector terminal 1, 2 & 3 (J1)
26. Convection motor
27. Mode selector switch (S1) terminal 11 to 12
28. Hot air thermostat (P5) C to L1
29. Hot air thermostat (P5) COM to NO
30. Hot air light (H5)
31. Plug connector (J9) terminal 10
32. Motor centrifugal switch (CS1)
33. Plug connector (J3) terminal 7
34. Hot air contactor (K2-A) terminal A1 to A2
35. Power in L1, L2 & L3 (440V/3ph)
36. Hot air contactor (K2-A) L1, L2 & L3 to T1, T2 & T3
37. Plug connector (J1) terminals 4 thru 9
38. T1 to plug connector 4 & 5 (J1)
39. T2 to plug connector 6 & 7 (J1)
40. T3 to plug connector 8 & 9 (J1)
41. Hot air elements

Troubleshooting Top Oven Section

SEQUENCE OF OPERATION -- STEAM

NOTE: Electricity flows through these components in the order listed.

1. Terminal block L1, L2, L3 (440V/3ph)
2. Primary 2 amp slow blow fuses F2 & F3
3. Primary coil of transformer (step down 440V to 220V)
4. Secondary coil of transformer 220V
5. Secondary 2 amp slow blow fuse F1
6. P13 (high limit snap disk for Solid State cold plate (opens at 176°F)
7. Plug connector (J3) terminal 9
8. Cooking cavity high limit (F3) terminals 1 & 2 (opens at 662°F or 350°F)
9. Power Junction: To follow, partial fill circuit to step #20
10. Plug connector (J9) terminal 21
11. Mode selector switch terminal 5 to 6
12. Plug connector (J9) terminal 24
13. Plug connector (J3) terminal 10
14. Powers up Quiescent Timer terminals 2 / 3
15. Relay R1 terminals 6 to 2 (normally closed)
16. Water level sensing ball float
17. Relay R2 terminal 7 / 8 (coil)
18. Relay R2 terminal 5 to 3 closed
19. Fill solenoid Y1
20. Plug connector (J9) terminal 2
21. Cooling fans (2)
22. Power junction: To follow meat probe option / skip to 30 if no meat probe
23. Meat probe switch control terminals 5 to 6
24. Meat probe controller terminals 8 & 5 / 7 (power in to control)
25. Meat probe (J type thermocouple)
26. When set temperature reached, output to terminal 6
27. Relay R5, terminal 7 & 8 (coil)
28. Relay R5, terminal 6 to 3 close / terminal 6 to 1 open
29. Buzzer T1
30. Plug connector (J9) terminal 5
31. Magnetic Door switch (S2)
32. Plug connector (J9) terminal 13
33. Relay R5 terminals 6 to 1
34. Timer S4 terminals 4 to 6 (terminals 4 to 6 open when timed out to zero)
35. Power junction: To follow convection motor / skip to 43 to skip convection motor
36. Plug connector (J9) terminal 11
37. Plug connector (J3) terminal 1
38. Motor contactor (K1-A) terminal A1 to A2
39. Power in L1, L2, & L3 (440V/3ph) motor contactor K1-A
40. Motor protector PKZM-A
41. Plug connector (J1) terminals 1, 2 & 3
42. Convection motor (has internal thermal overload, 250°F)
43. Mode selector switch terminal 7 to 8
44. Plug connector (J9) terminal 19
45. Too Hot For Steam thermostat (P1) closes at 230°F
46. Plug connector (J9) terminal 20
47. Don't Steam light (H2)
48. Mode selector switch terminals 1 to 2
49. Plug connector (J9) terminal 6
50. Plug connector (J3) terminal 5
51. Boiler high limit F6-A terminal 11 to 12 (opens at 275°F)
52. Relay R2 terminals 6 to 2 (normally closed, opens when filling)
53. Quiescent timer terminals 1 to 4 (closed 90 sec / open 10 sec)
54. Relay R1 terminals 7 / 8 (coil, opens terminals 6 to 2, can't fill with steam contactor pulled in)
55. Steam contactor K3-A terminal A1 to A2
56. Power in L1, L2, & L3 (440V/3ph)
57. Steam contactor K3-A L1, L2, & L3 to T1, T2, & T3
58. Steam elements (12KW)

Troubleshooting Top Oven Section

SEQUENCE OF OPERATION -- COMBI

NOTE: Electricity flows through these components in the order listed.

For the Combi mode both the HOT AIR and STEAM MODE circuits are powered up. The steam circuit is cycled in at a timing interval of 15 seconds “ON” and 45 seconds “OFF”. Refer to each circuit separately and substitute in the following sequence of operation.

HOT AIR

11. Mode selector switch (S1) terminals 21 to 22
28. Mode selector switch (S1) terminals 19 to 20

STEAM

11. Mode selector switch (S1) terminals 17 to 18
42. Mode selector switch (S1) terminals 15 to 16
43. Combi solid state timer terminal 2 to1 (“ON” 15 seconds, “OFF” 45 seconds)
44. Skip
45. Skip
46. Skip
47. Skip

SEQUENCE OF OPERATION -- COOL DOWN

NOTE: Electricity flows through these components in the order listed.

1. Terminal block L1,L2,L3 (440V/3ph)
2. Primary 2 amp slow blow fuses F2 / F3
3. Primary coil of transformer (step down 440V to220V)
4. Secondary coil of transformer 220V
5. Secondary 2 amp slow blow fuse F1
6. P13 Solid State cold plate snap disk high limit (opens at176F)
7. Plug connector (J3) terminal 9
8. Plug connector (J9) terminal 21
9. Mode switch terminal 23 to 24
10. Plug connector (J9) terminal 11
11. Plug connector (J3) terminal
12. Motor contactor (K1-A) terminal A1 to A2
13. Power in L1, L2 & L3 (440V/3ph)
14. Motor contactor K1-A
15. Motor protector PKZM-A
16. Plug connector (J1) terminals 1,2, & 3
17. Convection motor (has internal thermal overload, 250°F)

Troubleshooting Bottom Oven Section

COOL DOWN MODE

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Motor doesn't run in cool down.	
• Blown 2 amp input fuses.	• Remove and check fuses. Determine cause of circuit overload.
• Transformer is defective	• Verify input to transformer. Check transformer coils. Approximately 2.2 ohms primary / .7 ohms secondary. Replace if necessary.
• Blown 2 amp secondary fuse.	• Remove and check fuse. Determine the cause of circuit overload.
• P13 snap disk on the solid state relay assembly is open (SSR assembly is to the left of the boiler)	• Verify water is on ohm out snap disk P13
• Mode selector switch (S1) is not closing between 23 & 24.	• Check closing of switch with meter. Replace if needed.
• Motor contactor (K1-B) is not pulling in.	• Verify voltage to coil A1 to A2 of motor contactor. (Coil resistance is 500+ ohms) Replace if defective.
• Motor protector (PKZM-B) has tripped.	• Motor protector is defective or see "Convection Motors Run Intermittently" below.
• Convection motor is bad.	• Check windings of coil motor. Resistance of windings is approximately 85 ohms. Running current .5 amps.
SYMPTOM: Convection motor runs intermittently.	
• Thermal overload on motor (M2) is opening and closing (automatically resets when cooled).	• Check current draw. See if motor seal is out of alignment. (Requires removal of blower wheel.) Adjust seal if needed. Evaluate motor. Replace if defective.
• Electrical compartment cooling fan is not running.	• Check windings on fan (600+ ohms coil resistance) if open, replace.

NOTE: SSR refers to Solid State Relays which are water cooled on a cold plate.

Maintenance

Troubleshooting Bottom Oven Section

HOT AIR MODE

NOTE: Confirm cool down works before proceeding with hot air.

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Mode switch is in the hot air position but no control panel lights are on.	
• Cavity high limit (F3) is open. (opens at 662°F)	• Hot air thermistor is out of tolerance. Unplug from thermostat and check resistance. (Use ohm chart) Replace if needed.
	• Defective hot air thermostat. Replace
	• Cavity high limit is defective. Replace
• Power on light (H4) has 220V but is not lit.	• Replace light (H5)
SYMPTOM: Hot air temperature light (H5) will not come on but power on light (H4) is lit.	
• Oven is up to temperature.	• Everything is OK.
• Mode selector switch (S1) is not closed between terminals 9 & 10.	• Defective mode selector switch (S1). Replace switch.
• Door switch (S2) is not closing.	• Proximity door switch (S2) is not engaging. Remove access plate & inspect. Replace if defective.
• Relay (R5) is open.	• Optional meat probe control has reached temperature and shut off oven by supplying 220V to terminals 7 & 8 on (R5).
	• Relay (R5) is defective. Replace
• Timer (S4) has timed out to zero minute position.	• Reset timer to a timed position or fully into the stay on position if continued operation is desired.
• Defective timer (S4).	• Replace timer (S4). Verify voltage 220V is present on terminals 6 & 7 before replacement.

Troubleshooting Bottom Oven Section

HOT AIR MODE (continued)

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Hot air temperature light (H5) will not come on but power on light (H4) is lit. (continued)	
• Hot air thermostat (P5) is not getting 220V at inputs L1 and C.	• Check wire connections.
• Hot air thermostat (P5) is getting voltage 220V to inputs but has no 220V to terminal "NO" and common.	• Hot air thermistor probe is bad or out of tolerance. Refer to OHM chart. Replace if needed. 77 = 100,000 212 = 6,780 347 = 1,070.
	• Defective hot air temperature control (P5). Replace.
SYMPTOM: No heat in Hot Air Mode but hot air (H5) and power light (H4) are both on.	
• Motor is running and the centrifugal switch is open.	• OHM out switch (red wires in motor) while motor is running, if it is open, remove motor and inspect centrifugal switch through access plate for loose or disconnected wires. Replace if defective. If you replace a motor, always replace the motor seal.
• Hot air SSR (K2-B) does not pull in.	• Verify 220V to coil. Replace if needed. See if red LED is on.
• Hot air SSR (K2-B) is energized 220V at coil but no heat.	• Contactor is not closing on one or more poles. Replace.
	• Hot air elements are open. Replace as needed.
SYMPTOM: Oven appears to be working properly, but the bake pattern has changed or is uneven.	
• One or more hot air elements are open.	• Check continuity of elements. Replace as needed.

Troubleshooting Bottom Oven Section

STEAM MODE

NOTE: Confirm cool down and hot air modes work before continuing. By checking hot air mode first, you have trouble shot all common components in both the hot air and steam mode up to and through the timer (S4).

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Mode switch is in the steam mode position but power light is off.	
• Mode selector switch (S1) is not closed between terminals 3 & 4.	• Defective mode selector switch (S1). Replace mode switch.
• Power on light (H4) is defective.	• Replace light.
• High limits F3 has tripped.	• Return to Troubleshooting Hot Air Mode.
SYMPTOM: Steam generator overfills.	
• Float assembly is hanging up.	• Delime steam generator / remove float assembly if needed and clean / move float assembly up / down, verify reed switch is opening & closing with VOM
• Relay R4 is stuck close	• Verfy coil (7 & 8) has no power to it, replace R4 relay.
• Solenoid is staying open.	• Replace if needed.
• SYMTOM: TO HOT FOR STEAM light is on.	• TOO HOT FOR STEAM light is a information light only, if it is “ON” it does not affect operation
	• Open door and cool down cooking cavity if TOO HOT FOR STEAM light comes on in the steam mode, P1 is defective.

Troubleshooting Bottom Oven Section

STEAM MODE (continued)

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Mode switch is in the steam mode, power on light is on, but no steam.	
NOTE: If the water level is not maintained properly, a safety F6–A (caliary type thermostat, opens at 275F & must be manualy reset) Before continuing, review the sequence of operation to understand the float circuit / fill logic.	
• Mode switch terminals 1 & 2 open	• Use VOM to ohm out terminals, replace mode switch in needed
• Mode switch terminals 5 & 6 open	• Use VOM to ohm out terminals, replace mode switch in needed
• Boiler high limit F6-B has tripped. (Also review if you are having water fill issues)	• Continued resetting of F6-B boiler high limit may weaken the high limit and cause premature tripping.
	• Ball float is hung up in boiler and staying open. Ohm out between R3 relay terminal 2 & R4 relay terminal 7 Removal of float assembly may be necessary to determine if float is hanging up due to mineral build up or internal reed switch has failed.
	• Quesent timer is not supplying flat water check (90 seconds on / 10 off) verity power in on both inputs, terminals 2/3 & 7/3. Verify output on terminal 4.
• Boiler is not filling deliming port to determine if boiler has water	• Relay R3 supplies power to the float / verify terminals 6 to2 are closed.
	• Relay R4 supplies power to the fill solenoid / verify the terminals 7 & 8 have power (relay coil) / verify terminals 5 to 3 are closed.
	• Coil for the fill solenoid Y2 is open / verify input. Ohm out coil windings, should be approximately 1800 ohms. Replace Y2 if needed.
SYMPTOM: Steam contactor K3-B is not engaged.	
• Defective SSR / See if RED LED on SSR is lit	• Verify power to coil / replace if needed
• Steam solid state contactor K3-B has power in to input, but no heat.	• Solid state contactor is not closing on one or more poles. Replace.
	• Steam elements are open. Ohm out elements. Replace as needed.

Maintenance

Troubleshooting Bottom Oven Section

COMBI MODE

NOTE: Confirm cool down, hot air and steam modes work before continuing. By confirming previous modes you have tested most of the components in Combi.

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
SYMPTOM: Mode switch is in the Combi position but no control panel lights are on.	
• Mode selector switch (S1) terminals 21 & 22 are open.	• Replace switch.
SYMPTOM: Power light (H4) is on, hot air heat light (H5) is on and off, but no steam.	
• Mode selector switch (S1) terminals (15 & 16) or (17 & 18) are open. • Solid state combi timer is not operating. (no steam in the combi mode only)	• Replace switch. • Verify resister assembly (with adjusting knobs) is plugged fully in • Verity power in on terminals 2 & 3 • Verify output on terminal 1 • Verify timer knob settings (15 sec “on” / 45 sec “off”)
SYMPTOM: Power light (H4) is on, steam works, but no hot air.	
• Mode selector switch (S1) terminals 19 & 20 are open.	• Replace switch.
SYMPTOM: Not enough steam in the Combi mode.	
• Cavity temperature is too high (over 400°F) • Timing sequence needs adjusting to increase steam.	• Reduce temperature. • Left knob is time “ON” /right knob is time “OFF”

Troubleshooting Bottom Oven Section

SEQUENCE OF OPERATION -- HOT AIR

NOTE: Electricity flows through these components in the order listed.

1. Terminal block L1, L2, L3 (440V/3ph)
2. Primary 2 amp slow blow fuses F2 / F3
3. Primary coil of transformer (step down 440V to220V)
4. Secondary coil of transformer 220V
5. Secondary 2 amp slow blow fuse F1
6. P13 Solid State cold plate snap disk high limit (opens at176F)
7. Plug connector (J4) terminal 9
8. Cooking compartment high limit (F3) terminals 1 to 2
9. Plug connector terminal 2 (J9)
10. Mode selector switch (S1) terminal 9 to 10
11. Power ON light (H4)
12. Plug connecter terminal 5 (J9)
13. Electrical compartment cooling fan (CF)
14. Door switch (S2)
15. Plug connector (J9) terminal 13
16. Meat probe relay (R5) terminal 6 to 1
17. Timer (S4) terminals 4 to 6 or Timer (S4) terminal 4 to 5 if timer is timed out
18. Buzzer (T1)
19. Plug connector (J9) terminal 11
20. Plug connector (J4) terminal 1
21. Power junction: to follow motor operation to step 26
22. Motor contactor (K1-A) terminal A1 to A2
23. Power in L1, L2 & L3 (440V/3ph) motor contactor (K2-B)
24. Motor protector (PKZM-A)
25. Plug connector terminal 1, 2 & 3 (J1)
26. Convection motor
27. Mode selector switch (S1) terminal 11 to 12
28. Hot air thermostat (P5) C to L1
29. Hot air thermostat (P5) COM to NO
30. Hot air light (H5)
31. Plug connector (J9) terminal 10
32. Motor centrifugal switch (CS1)
33. Plug connector (J4) terminal 7
34. Hot air contactor (K2-A) terminal A1 to A2
35. Power in L1, L2 & L3 (440V/3ph)
36. Hot air contactor (K2-B) L1, L2 & L3 to T1, T2 & T3
37. Plug connector (J2) terminals 4 thru 9
38. T1 to plug connector 4 & 5 (J1)
39. T2 to plug connector 6 & 7 (J1)
40. T3 to plug connector 8 & 9 (J1)
41. Hot air elements

Maintenance

Troubleshooting Bottom Oven Section

SEQUENCE OF OPERATION -- STEAM

NOTE: Electricity flows through these components in the order listed.

1. Terminal block L1, L2, L3 (440V/3ph)
2. Primary 2 amp slow blow fuses F2 & F3
3. Primary coil of transformer (step down 440V to 220V)
4. Secondary coil of transformer 220V
5. Secondary 2 amp slow blow fuse F1
6. P13 (high limit snap disk for Solid State cold plate (opens at 176°F)
7. Plug connector (J4) terminal 9
8. Cooking cavity high limit (F3) terminals 1 & 2 (opens at 662°F or 350°F)
9. Power Junction: To follow, partial fill circuit to step #20
10. Plug connector (J9) terminal 21
11. Mode selector switch terminal 5 to 6
12. Plug connector (J9) terminal 24
13. Plug connector (J4) terminal 10
14. Powers up Quiescent Timer terminals 2 / 3
15. Relay R3 terminals 6 to 2 (normally closed)
16. Water level sensing ball float
17. Relay R4 terminal 7 / 8 (coil)
18. Relay R4 terminal 5 to 3 closed
19. Fill solenoid Y2
20. Plug connector (J9) terminal 2
21. Cooling fans (2)
22. Power junction: To follow meat probe option / skip to 30 if no meat probe
23. Meat probe switch control terminals 5 to 6
24. Meat probe controller terminals 8 & 5 / 7 (power in to control)
25. Meat probe (J type thermocouple)
26. When set temperature reached, output to terminal 6
27. Relay R5, terminal 7 & 8 (coil)
28. Relay R5, terminal 6 to 3 close / terminal 6 to 1 open
29. Buzzer T1
30. Plug connector (J9) terminal 5
31. Magnetic Door switch (S2)
32. Plug connector (J9) terminal 13
33. Relay R5 terminals 6 to 1
34. Timer S4 terminals 4 to 6 (terminals 4 to 6 open when timed out to zero)
35. Power junction: To follow convection motor / skip to 43 to skip convection motor
36. Plug connector (J9) terminal 11
37. Plug connector (J4) terminal 1
38. Motor contactor (K1-B) terminal A1 to A2
39. Power in L1, L2, & L3 (440V/3ph) motor contactor K1-B
40. Motor protector PKZM-B
41. Plug connector (J1) terminals 1, 2 & 3
42. Convection motor (has internal thermal overload, 250°F)
43. Mode selector switch terminal 7 to 8
44. Plug connector (J9) terminal 19
45. Too Hot For Steam thermostat (P1) closes at 230°F
46. Plug connector (J9) terminal 20
47. Don't Steam light (H2)
48. Mode selector switch terminals 1 to 2
49. Plug connector (J9) terminal 6
50. Plug connector (J4) terminal 5
51. Boiler high limit F6-B terminal 11 to 12 (opens at 275°F)
52. Relay R4 terminals 6 to 2 (normally closed, opens when filling)
53. Quiescent timer terminals 1 to 4 (closed 90 sec / open 10 sec)
54. Relay R3 terminals 7 / 8 (coil, opens terminals 6 to 2, can't fill with steam contactor pulled in)
55. Steam contactor K3-B terminal A1 to A2
56. Power in L1, L2, & L3 (440V/3ph)
57. Steam contactor K3-B L1, L2, & L3 to T1, T2, & T3
58. Steam elements (12KW)

Troubleshooting Bottom Oven Section

SEQUENCE OF OPERATION -- COMBI

NOTE: Electricity flows through these components in the order listed.

For the Combi mode both the HOT AIR and STEAM MODE circuits are powered up. The steam circuit is cycled in at a timing interval of 15 seconds “ON” and 45 seconds “OFF”. Refer to each circuit separately and substitute in the following sequence of operation.

HOT AIR

11. Mode selector switch (S1) terminals 21 to 22
28. Mode selector switch (S1) terminals 19 to 20

STEAM

11. Mode selector switch (S1) terminals 17 to 18
42. Mode selector switch (S1) terminals 15 to 16
43. Combi solid state timer terminal 2 to1 (“ON” 15 seconds, “OFF” 45 seconds)
44. Skip
45. Skip
46. Skip
47. Skip

SEQUENCE OF OPERATION -- COOL DOWN

NOTE: Electricity flows through these components in the order listed.

1. Terminal block L1,L2,L3 (440V/3ph)
2. Primary 2 amp slow blow fuses F2 / F3
3. Primary coil of transformer (step down 440V to220V)
4. Secondary coil of transformer 220V
5. Secondary 2 amp slow blow fuse F1
6. P13 Solid State cold plate snap disk high limit (opens at176F)
7. Plug connector (J4) terminal 9
8. Plug connector (J9) terminal 21
9. Mode switch terminal 23 to 24
10. Plug connector (J9) terminal 11
11. Plug connector (J4) terminal
12. Motor contactor (K1-B) terminal A1 to A2
13. Power in L1, L2 & L3 (440V/3ph)
14. Motor contactor K1-B
15. Motor protector PKZM-B
16. Plug connector (J2) terminals 1,2, & 3
17. Convection motor (has internal thermal overload, 250°F)

Schematic – Top Oven

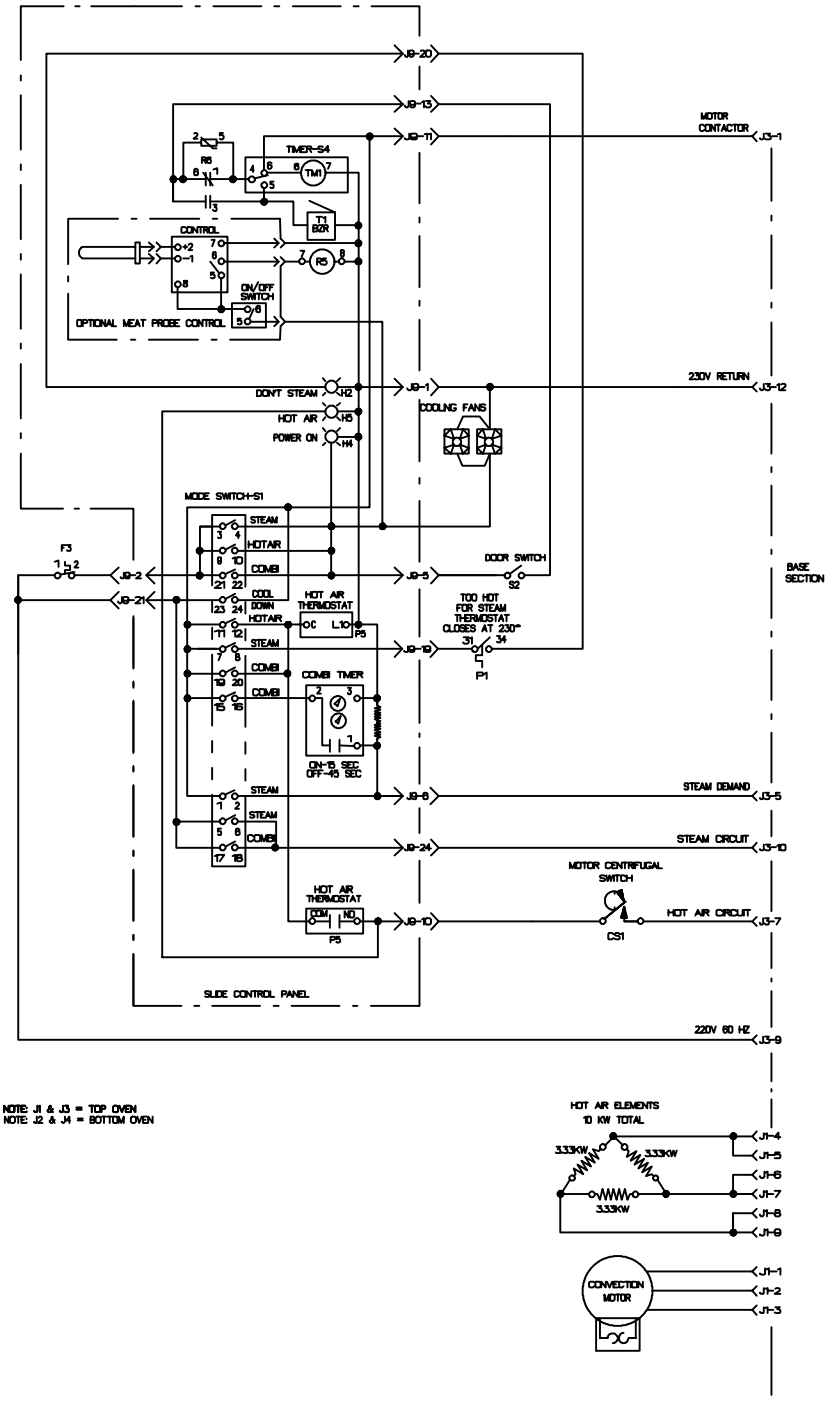


Figure 35

Schematic – Bottom Oven

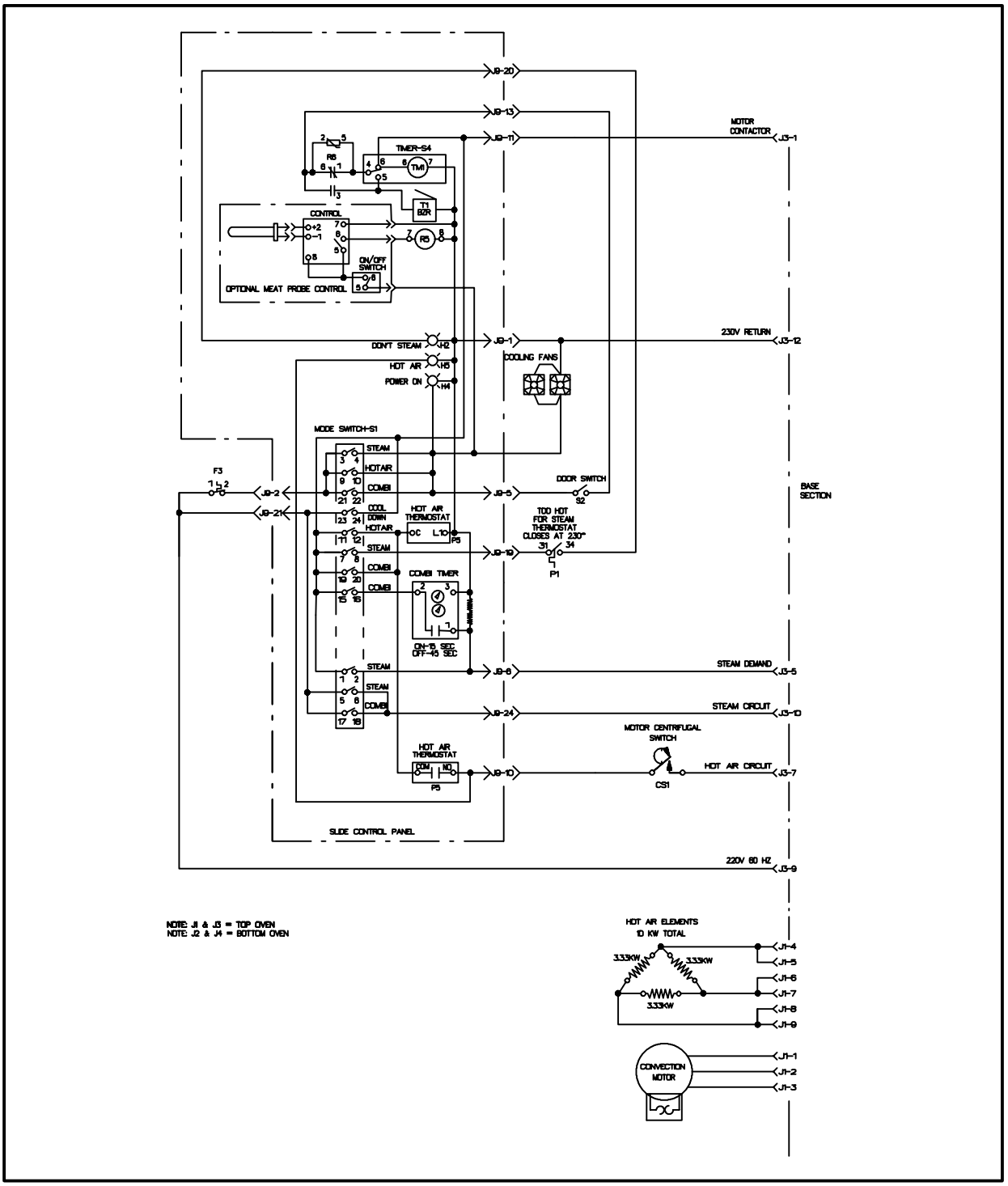


Figure 36

Schematic – Oven Base

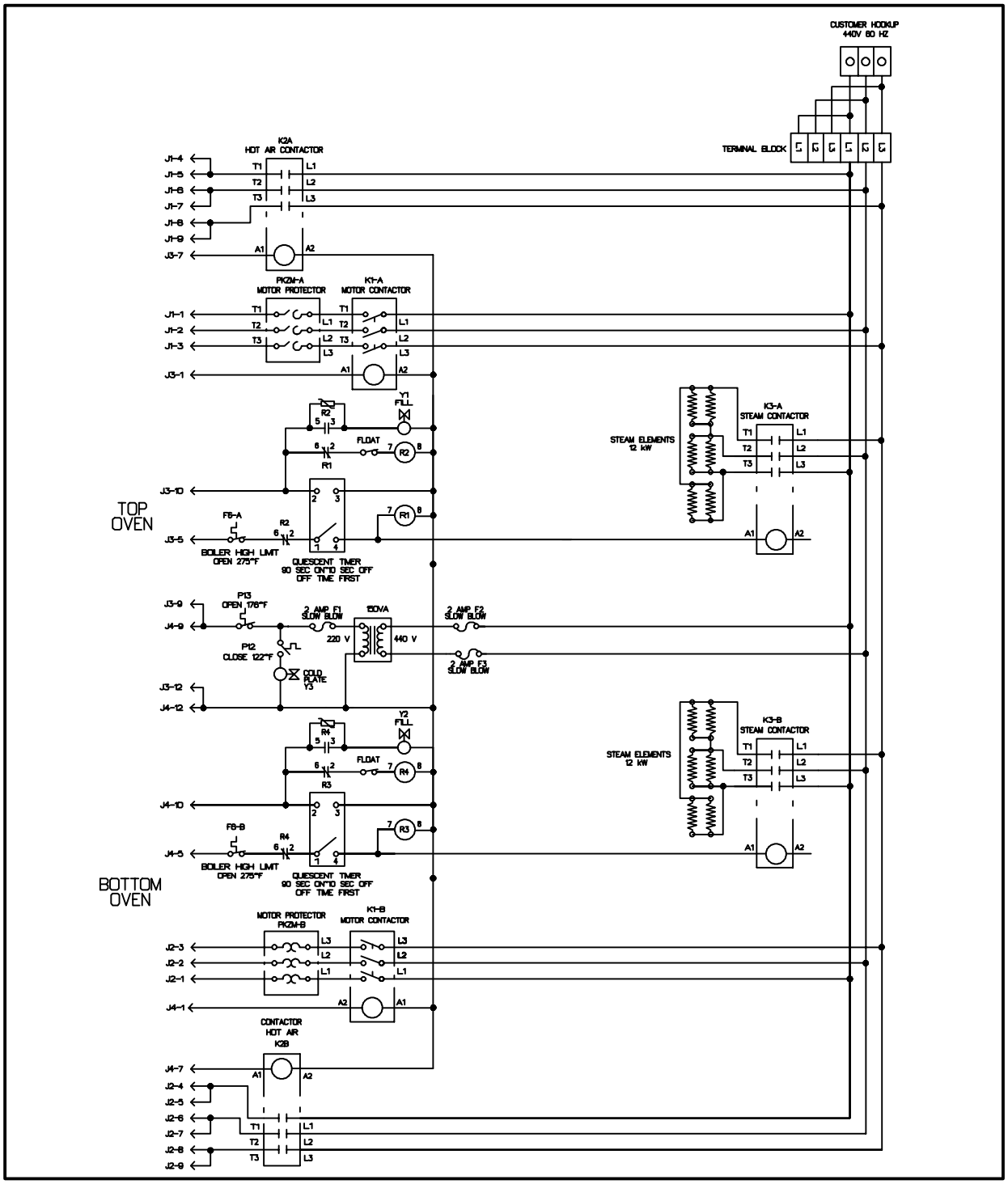


Figure 37