



TURBOCHEF TECHNOLOGIES, INC.

HHB2 Rev B Service Manual Changes

August 2010

- Changed all “press and hold” key strokes to 2 seconds
- Updated F7 troubleshooting
- Updated “Cook Door Open When Door is Closed” troubleshooting
- Updated “Food Not Cooking Properly” troubleshooting
- Where applicable, updated drawings to match DOC-1267 parts catalog
- Where applicable, updated part numbers and descriptions to match DOC-1267 parts catalog
- Added hinge detail drawings
- Added miscellaneous components drawing (covers, legs)



Service Manual

FOR THE TURBOCHEF HIGH h BATCH 2™ RAPID COOK OVEN



©2009–2010 TurboChef Technologies, Inc.

For further information call:
Customer Service *at* 800.90TURBO
Sales & Marketing *at* 866.90TURBO



The information contained in this manual is important for the proper installation, use, maintenance, and repair of this oven. Follow these procedures and instructions to ensure satisfactory baking results and years of trouble-free service.

Errors – descriptive, typographic, or pictorial – are subject to correction. Specifications are subject to change without notice.

PLEASE CAREFULLY READ THIS MANUAL AND RETAIN IT FOR FUTURE REFERENCE.

Table of Contents

Safety Instructions

General Safety Information	i
Reducing Fire Risk	i
Preventing Oven Damage	ii
Grounding Instructions	ii
Power Cord Replacement	ii

Specifications and Installation

Theory of Operation	1
Certifications	1
Dimensions	1
Construction	2
Exterior	2
Interior	2
Electrical Specifications	2
United States	2
Canada	2
Latin America	2
Europe/Asia/Pacific	2
United Kingdom/Ireland	2
Standard Features	3
Performance	3
Installation	3
Packaging	3
Damaged Shipment Claims	3
Lifting and Placing the Oven	3
Securing Oven to Cart	4
Double Stacking Ovens	4
Built-In Installation	4
Installation Near Open Heat Source	6
Setup	6
Ventilation Requirements	6
Optional Installation Items	7
Oven Restraint Kit	7
Oven Cart	7
Replacing/Exchanging Jetplates	8

Oven Maintenance

Daily Cleaning	9
Deep Cleaning	10

Operating the Oven

Control Display and Key Identification	13
Cooking Instructions	14
Additional Cooking Options	15
Time Screen	15
Done Screen	15
Options Menu	15
Enabling/Disabling the Edit Menu	16
Erasing the Recipe Menu	16
Enabling/Disabling the Write Card Function	17
Enabling/Disabling the Time Screen	17
Enabling/Disabling the Done Screen	18
Demonstration Mode	18
Programming Recipes	19
Adjusting the Cook Cavity Temperature	19
Modifying Recipes	19
Ordering a Smart Card	21
Loading Menu from Smart Card	21
Saving Menu to Smart Card	21
Checking Recipe Counter	21

Diagnosing an Issue

Fault Codes: Descriptions, Clearing Instructions, and Troubleshooting	23
F1: BLOWER (Blower Running Status Bad)	23
F2: LOW TEMP (Cook Temperature Low)	23
F6: EC TEMP (Electrical Compartment Temperature High)	24
F7: THERMO (Thermocouple Open)	24
F8: HEAT LOW	24
Status Indicators	25
Door	25
Heater A	25
Heater B	25
Blower	25
Testing Options	25
Diagnosing Door Switch Operation	26
Testing the Blower Motor	26
Viewing/Clearing the Fault Log	26
Adjusting the Temperature Offset	26
Checking Heaters A and B	26
Testing the Rack Oscillator Motor	26
Enabling/Disabling Diagnostic Mode	26
Viewing Cook Counter/Time	26
Viewing the Cumulative Operating Time	27
Viewing the Electrical Compartment Temperature	27
Setting Fahrenheit/Celsius	27
Viewing/Editing the Serial Number	27

Fault Code Troubleshooting	28
F1: BLOWER (Blower Running Status Bad)	28
F2: LOW TEMP (Cook Temperature Low)	29
F6: EC TEMP (Electrical Compartment Temperature High)	30
F7: THERMO (Thermocouple Open)	30
F8: HEAT LOW	31
Non-Fault Code Troubleshooting	32
No Keypad Input	32
“Cook Door Open” Message when Door is Closed	32
No Display – Screen is Blank	33
Food Not Cooking Properly	34
“Read Fail” Message When Loading Menu	35
“Write Fail” Message When Loading Menu	35

The Control System

Components	37
Control Board	37
Cooling Fans	37
Display	37
EMI Filter	37
Fuses	37
Keypad	37
Power Cord	37
Power Supply	37
Relay - Rack Oscillation Motor	37
Smart Card Reader	37
Solid State Relay (SSR)	38
Thermocouple – Cook Cavity	38
Thermocouple – Electrical Compartment (EC)	38
Thermostat – Cooling Fan	38
Thermostat – High-Limit	38
Voltage Sensor	38
Wire Harness	38

The Convection System

Components	41
Blower Motor	41
Blower Motor Speed Controller	41
Heaters	41
Jetplates	41
Jetplate Support Rails	41
Oven Rack	41
Rack Oscillation Motor	41
Swing Arm Assembly	41
Convection System Troubleshooting	41

The Oven Door

Components	45
Door Gasket	45
Door Handle	45
Door Hinges	45
Door Skin	45
Door Interlock Switch	45
Removing/Reinstalling the Oven Door	45


The Filtering System/Miscellaneous Components

Filtering System Components	47
Grease Filter	47
Grease Filter Frame	47
Catalytic Converter	47
Miscellaneous Components	48

Schematics

High h Batch 2 Schematic	49
Control Board and Test Point Locations	52

IMPORTANT SAFETY INSTRUCTIONS

 **WARNING:** When operating this oven, strictly adhere to all safety precautions below, on page ii, and throughout this manual to reduce the risk of burns, electric shock, fire, injury, oven damage, or property damage. Improper installation, adjustment, alteration, service, or maintenance of this equipment can cause property damage, injury, or death. Thoroughly read the installation, operating, and maintenance instructions before installing or servicing this equipment.

General Safety Information

- Use this appliance only for its intended uses as described in this manual.
- Only qualified service personnel should service this appliance. Contact the nearest authorized service facility for examination, repair, or adjustment.
- Always ensure the oven is disconnected from the power supply before servicing, repairing, or adjusting any components or parts.
- This appliance must be grounded. Connect only to properly grounded outlet. See “Grounding Instructions” found on page ii.
- Install or locate this appliance only in accordance with the provided installation instructions.
- ☒ DO NOT place the cord near heated surfaces.
- ☒ DO NOT store or use flammable vapors or liquids (e.g., gasoline) in the vicinity of this appliance.
- ☒ DO NOT allow children to use this appliance.
- ☒ DO NOT place corrosive chemicals or vapors in this appliance. It is not designed for industrial or laboratory use.
- ☒ DO NOT operate this appliance if it
 - Has a damaged cord or plug
 - Is not working properly
 - Has been damaged or dropped
- ☒ DO NOT cover or block any openings on this appliance.
- ☒ DO NOT store this appliance outdoors.
- ☒ DO NOT use this appliance near water.
- ☒ DO NOT immerse this appliance or any of its components (e.g., cord, plug, etc.) in water.
- ☒ DO NOT let the cord hang over the edge of a table or counter.
- ☒ This appliance is not to be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

Reducing Fire Risk

If materials inside the oven ignite or if smoke is observed:


1. Keep the oven door closed.
2. Turn off the oven.
3. Disconnect the power cord or shut off power at the fuse/circuit breaker panel.

- Carefully monitor the oven if paper, plastic, or other combustible materials are placed inside to facilitate cooking.
- ☒ DO NOT leave items in the cook cavity when the oven is not in use.
- ☒ DO NOT cook items wrapped in cling wrap or plastic film.
- ☒ DO NOT overcook food.

Preventing Oven Damage

- Clean the oven daily (page 9). Failure to do so will adversely affect cooking performance and shorten the life of the oven.
- Once per month or more frequently depending on use, perform the deep cleaning procedure (pages 10-11). Failure to do so will adversely affect cooking performance and shorten the life of the oven.
- Clean the oven only with TurboChef Oven Cleaner.
- Operate the oven only when food is in the cook chamber.
- ⊗ DO NOT clean with a water jet.
- ⊗ DO NOT slam or mishandle the oven door.
- ⊗ DO NOT frequently open and close the door to check the cook status of the food.
- ⊗ DO NOT allow cleaning solution or water to remain in the cook chamber after cleaning or at any other time.
- When servicing this appliance, do not tear insulation to get to components. Rather, find the edge of the insulation and remove the tape that holds it in place.

Grounding Instructions

 **WARNING:** Improper grounding increases the risk of electric shock.

This appliance must be grounded. It is equipped with a cord that has a grounding wire and plug, which in the event of an electrical short circuit reduces the risk of electric shock by providing an escape wire for the electric current. The wire must be plugged into an outlet that is properly installed and grounded. Consult a qualified electrician or serviceman for more information on grounding instructions or to determine if the appliance is properly grounded.

- ⊗ DO NOT use an extension cord. If the power supply cord is too short, ask a qualified electrician or serviceman to install an outlet near the appliance.

Power Cord Replacement

To avoid potential hazards, only the manufacturer, an authorized service agent, or a similarly-qualified person should replace a damaged power cord.

Specifications and Installation

Theory of Operation

The TurboChef® High h Batch 2™ oven generates high heat transfer rates to rapidly cook food by recirculating impinged air at speeds of up to 60 mph. The technology includes utilizing a variable speed blower, oscillating rack, and catalytic converter, resulting in minimal energy input, high food quality, and UL®-certified ventless operation.

Certifications

UL, cUL, NSF, TÜV, CE



UL 710B (KNLZ) listed for ventless operation. See page 6 for details and limitations.

Dimensions

Single Units

Height	17.4"	(442 mm)
with legs*	21.4"	(544 mm)
without legs	17.4"	(442 mm)
Width	25.9"	(658 mm)
Depth	29.2"	(742 mm)
with handle	31.7"	(805 mm)
Weight	157 lb.	(71 kg)

Double Units (Requires a Stacking Kit)

Height		
top w/ legs	42.8"	(1087 mm)
top w/out legs	38.8"	(986 mm)
Width	25.9"	(658 mm)
Depth	29.2"	(742 mm)
with handle	31.7"	(805 mm)
Weight	314 lb.	(142 kg)

* Legs are 4" (102 mm)

Cook Cavity

Height	8"	(203 mm)
Width	18.75"	(476 mm)
Depth	16.75"	(425 mm)
Volume	1.45 cu. ft.	(41.1 liters)

Wall Clearance

Top	2"	(51 mm)
Sides	2"	(51 mm)

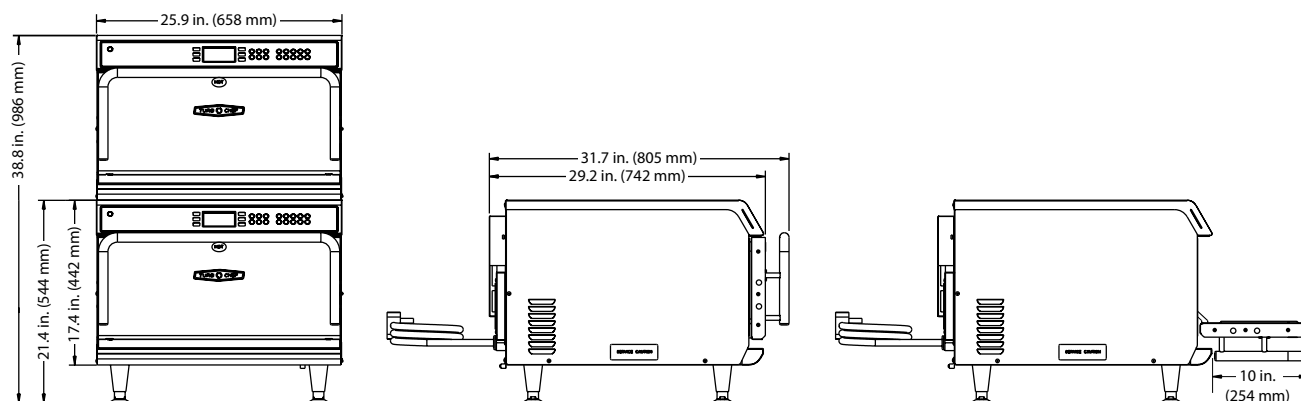


Figure 1: High h Batch 2 Dimensions

Construction

Exterior

- Stainless steel front, top, back, and powder-coated sides
- 4" (102 mm) matte black legs
- Ergonomic, cool to touch powder-coated door handle

Interior

- 304 stainless steel interior
- Water-tight construction
- Interchangeable jetplates for customized cooking results

Electrical Specifications

United States

- HHB2 (P/N: HHB-8603-1)

Phase	1
Voltage*	208/240 VAC
Frequency	50/60 Hz
Current	24 amps
Max Circuit	30 amps
Max Input	5000 watts
Cord	10 gauge, 3 wire, 6 foot, SOOW
Plug	NEMA 6-30P

Canada

- HHB2C (P/N: HHB-8603-1C)

Phase	1
Voltage*	208/240 VAC
Frequency	50/60 Hz
Current	24 amps
Max Circuit	50 amps
Max Input	5000 watts
Cord	10 gauge, 3 wire, 6 foot, SOOW
Plug	NEMA 6-50P

*Smart Voltage Sensor Technology automatically senses the supply voltage and prompts the operator to configure the oven to the correct setting (208 or 240). However, it does not compensate for lack-of or over-voltage situations.

Latin America

- HHB2LA (P/N: HHB-8603-1K-2073)

Phase	1
Voltage	230 VAC
Frequency	50/60 Hz
Current	24 amps
Max Circuit	32 amps
Max Input	5000 watts
Cord	10 gauge, 3 wire, 5 foot, SOOW
Plug	NEMA 6-30P

Europe/Asia/Pacific

- HHB2EW (P/N: HHB-8603-1W)

Phase	3
Voltage	400 VAC
Frequency	50/60 Hz
Current	10 amps
Max Circuit	16 amps
Max Input	5000 watts
Cord	HO7RN-F, 5 wire
Plug	IEC 309, 5-pin, 16 amp
- HHB2ED (P/N: HHB-8603-1D)

Phase	3
Voltage	230 VAC
Frequency	50/60 Hz
Current	14 amps
Max Circuit	20 amps
Max Input	5000 watts
Cord	HO7RN-F, 4 wire
Plug	IEC 309, 4-pin, 32 amp

United Kingdom/Ireland

- HHB2UK (P/N: HHB-8603-1K)

Phase	1
Voltage	230 VAC
Frequency	50/60 Hz
Current	24 amps
Max Circuit	32 amps
Max Input	5000 watts
Cord	HO7RN-F, 3 wire
Plug	IEC 309, 3-pin, 32 amp

NOTE: The owner is responsible for supplying voltage that meets the above specifications. For more information, consult a qualified electrician.

Standard Features

- Integral recirculating catalytic converter for UL listed ventless operation (UL KNLZ)
- Top and bottom jetplates removable for cleaning
- Variable-speed High h recirculating impingement airflow system
- Oscillating rack for high heat transfer without spotting
- Half-sheet pan/16-inch pizza capacity
- Smart Voltage Sensor Technology* (U.S. only)
- Stackable design (requires stacking kit)
- Smart menu system capable of storing up to 72 recipes
- Built-in self diagnostics for monitoring oven components and performance
- Includes plug and cord (5 ft.)
- Warranty - 1 year parts and labor

Performance

- Heat transfer rates (h) are 3X–4X typical convection oven
- Heat transfer rates (h) are 2X typical conveyor oven

Installation

Install or locate this appliance only in accordance with the instructions provided below and on pages 4-8. In no event shall the manufacturer assume any liability for damages or injuries resulting from installations which are not in compliance with these instructions and the safety instructions listed on pages i and ii.


Packaging


All ovens are packaged in a double-wall corrugated box with integrated skids. If the oven may possibly be shipped from its original place of installation for any reason, TurboChef recommends retaining the packaging in good condition.


Damaged Shipment Claims

Upon delivery, remove the oven from its packaging and immediately note any damage. To file a claim, contact the shipping company within 24 hours of receiving the shipment. TurboChef is not responsible if a product is damaged during shipment.

Lifting and Placing the Oven

 **WARNING:** Oven weight is approximately 157 lb. (71 kg). Two or more persons are required to lift it.

 **WARNING:** To prevent personal injury or damage to the oven, DO NOT lift the oven from the front and rear or by the handle.

 **WARNING:** Ensure the oven is properly placed on the table or countertop at all times. TurboChef will not recognize a fallen oven as a warrantable claim and is not liable for any injuries that may result.

When lifting and placing the oven:

1. Position one or more persons on the left and right sides of the oven.
2. Lift from the bottom of the oven.
3. Place the oven on surface at least 30" (762 mm) deep and capable of supporting 167 lb. (76 kg).

Securing Oven to Cart

Reference Figure 3, adjacent.

1. Lock the oven cart wheels.
2. Place the oven on the cart.

⚠ WARNING: Do not attempt to lift the oven with fewer than 2 people.

⚠ WARNING: When lifting the oven, position at least one person on each side. Do not lift the oven from the front and back, and do not use the handle to lift the oven.

⚠ WARNING: Do not transport ovens on cart when stacked.

4. Attach one oven cart bracket to each leg (kit HHB-8206 includes four brackets).
5. Secure each leg by aligning the bracket with the holes on the oven cart and attaching the parts listed in Figure 3.

Double Stacking Ovens

1. Ensure the surface that will hold the stacked ovens can support the weight (314 lb./142 kg).
2. Allow each oven time to cool and then unplug.
3. If stacking ovens on an oven cart, make sure the bottom oven is bolted to the cart and the wheels are locked (Figure 3).
4. Attach the stacking bracket to the back of the bottom oven using the existing oven screws as shown in Figure 4.
5. Remove the screws from the top oven, as shown in Figure 4.
6. If desired, remove the legs from the top oven.

NOTE: Ovens can be stacked either with legs attached or removed from the top oven.

7. Place the top oven on the bottom oven.

⚠ WARNING: Do not attempt to lift the oven with fewer than two people.

⚠ WARNING: When lifting the oven, position at least one person on each side. Do not lift the oven from the front and back, and do not use the handle to lift the oven.

8. Align the holes on the stacking bracket with the holes on the top oven and reinstall the screws.

⚠ WARNING: Do not stack ovens more than two-high.

Built-In Installation

TurboChef ovens are designed to be installed on a countertop or table. They are not intended for built-in or enclosed installation.

“Built-in or enclosed installation” is defined as installing an oven in any structure that surrounds the oven by five sides (top/rear/base/side panels).

If installation must be “built in,” the operator must ensure the following (see Figure 2):

- At least 300 cfm (8.5 cmm) of supplement flow within the cabinet.
- At least 2” (51 mm) clearance to every surface.

The operator will be responsible for compensating any extra time required to service the product due to removing the product for serviceability.

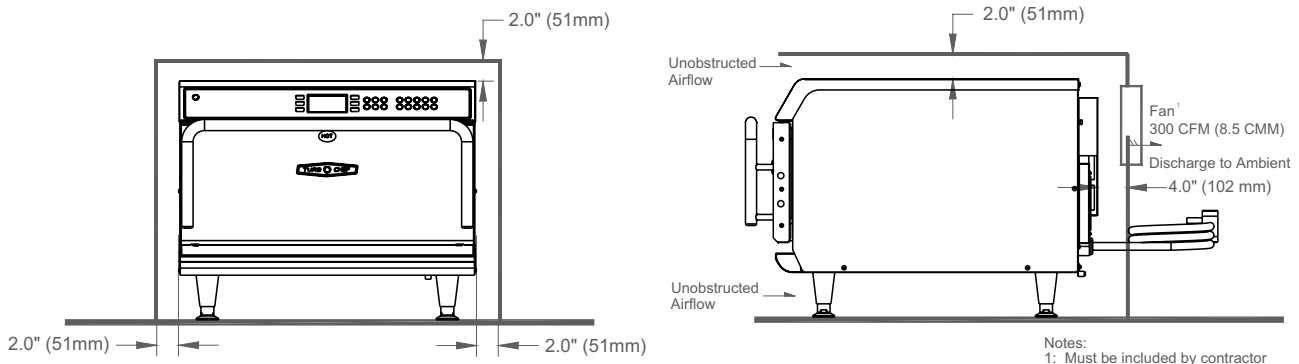


Figure 2: Built-in Installation

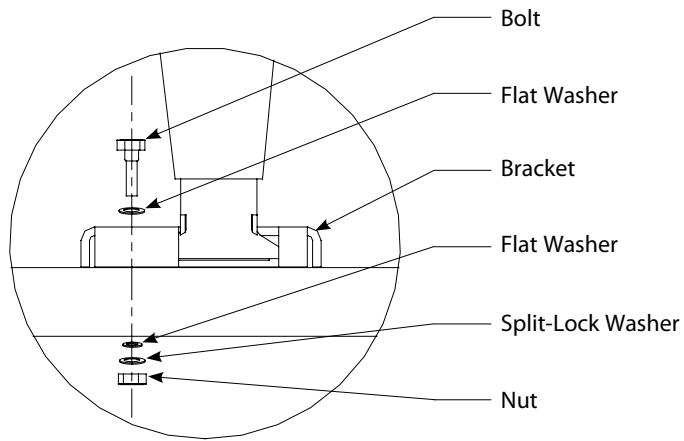


Figure 3: HhB 2 Oven Secured to TurboChef Oven Cart

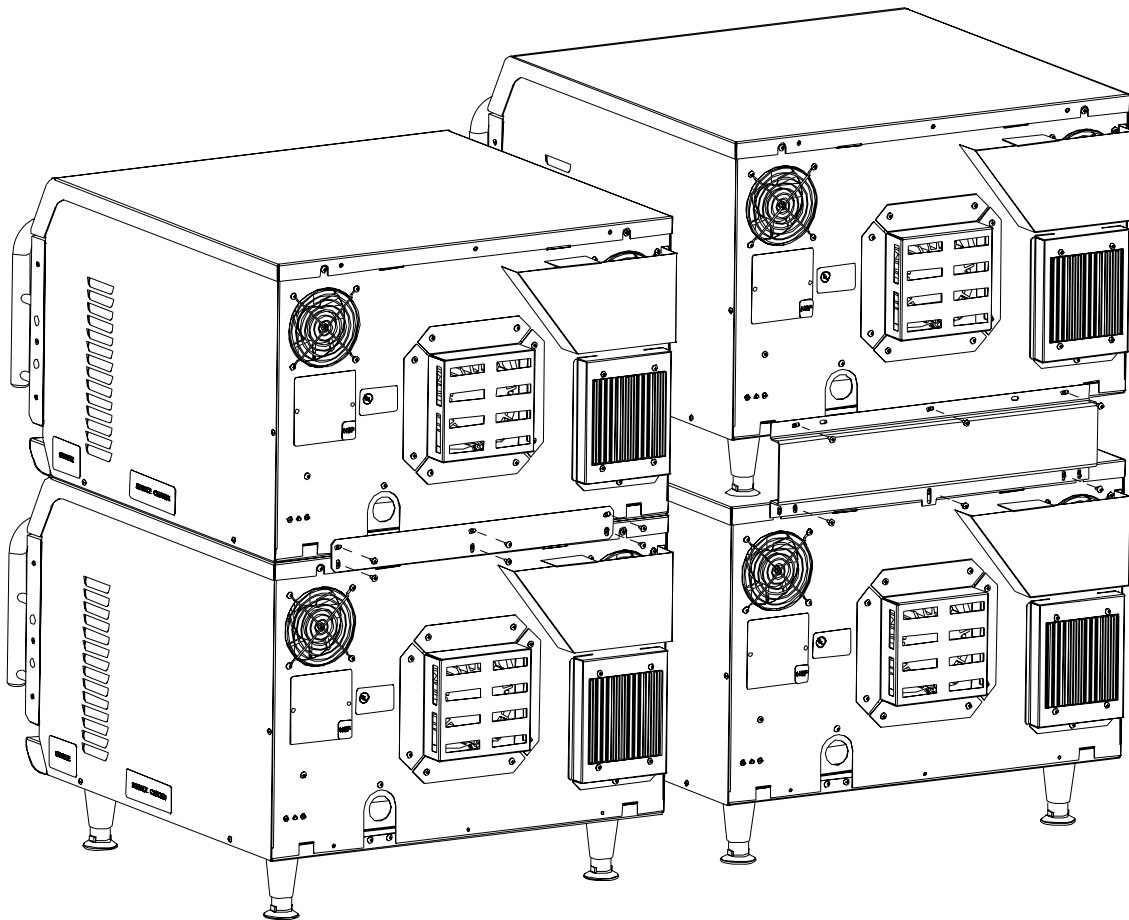


Figure 4: Stacked HhB 2 Ovens (Two Configurations)

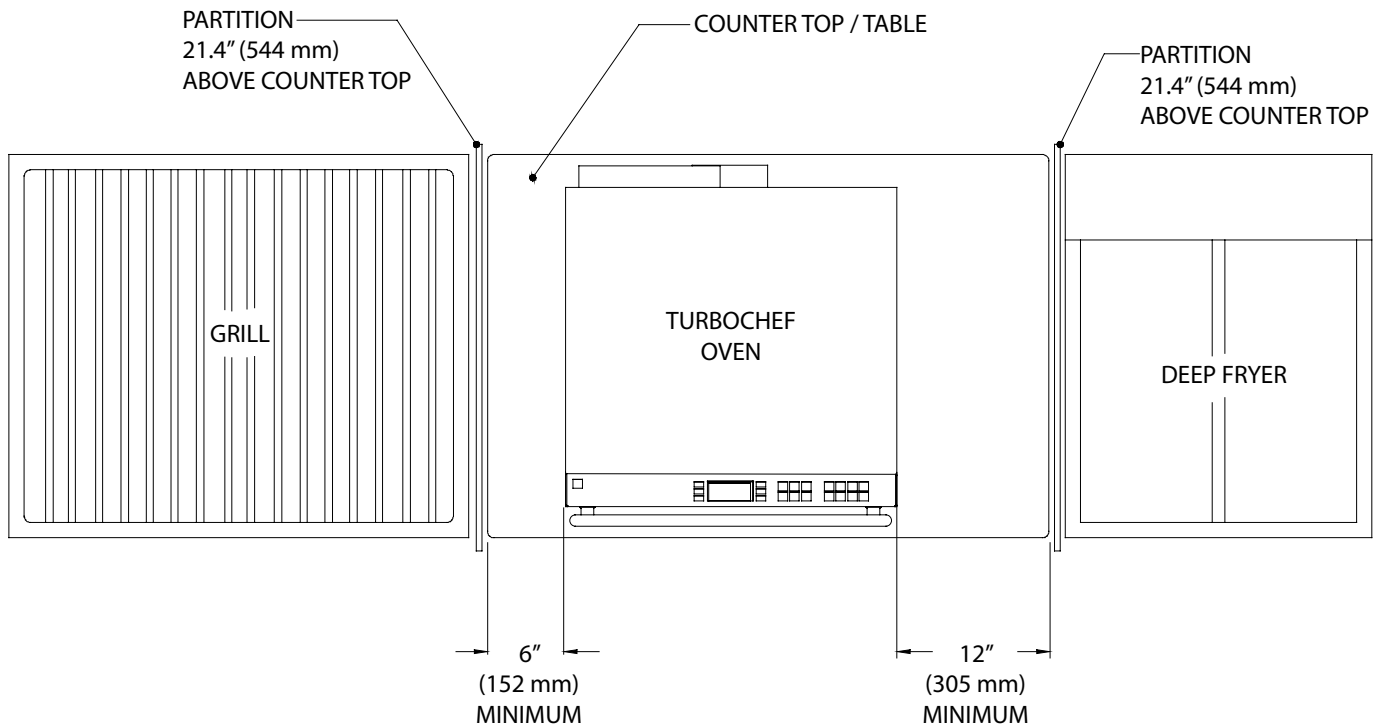


Figure 5: Installation Near Open Heat Source

Installation Near Open Heat Source

When placing a TurboChef oven near an open heat source, strictly adhere to the following (Figure 5):

- Verify oven location has a minimum 6" (152 mm) clearance on top and minimum 2" (51 mm) of clearance on each side.
- If the oven is being placed near a grill or stove, there must be a divider between the oven and the open heat source, with a minimum of 6" (152 mm) between the oven and the divider.
- If the oven is being placed near a fryer, there must be a divider between the oven and fryer, with a minimum of 12" (305 mm) between the oven and the divider.
- The height of the divider must be greater than or equal to the height of the oven (21.4"/544 mm).

Setup

Once the oven is properly positioned on the counter:

1. Remove packing material from the cook cavity.
2. Install the oven rack by placing it over the support pins.
3. Plug the oven into a wall-mounted electrical receptacle. (See Electrical Specifications, page 2.)
4. The oven has been preprogrammed with factory settings and is ready to operate out of the box.

Ventilation Requirements

The TurboChef model HhB/HhB 2 oven has been approved by Underwriter's Laboratory for ventless operation (UL 710B, KNLZ listing) for all food items except for foods classified as "fatty raw proteins." Such foods include bone-in, skin-on chicken, raw hamburger meat, raw bacon, raw sausage, steaks, etc. If cooking these types of foods, consult local HVAC codes and authorities to ensure compliance with ventilation requirements.

Optional Installation Items

Oven Restraint Kit (P/N: TC3-0242 KIT)

The oven restraint kit is an optional device that prevents the oven from moving forward during use and cleaning. It will not prevent the oven from falling off a countertop if the oven is pulled off or the legs are allowed to slide off the edge. Call 1-800-90TURBO or your Authorized Distributor for more information.

Oven Cart

Construction

- Available heights: 18" (457 mm) or 24" (610 mm)
- 304 stainless steel
- 14-gauge 304 stainless steel top
- 16-gauge 304 solid stainless steel shelf
- Four 6" (152 mm) high polyurethane tired casters, front two with safety locking brakes; bolt-on to stainless steel leg

Standard Features

- Reinforcement: Welded gusset plates between legs and top to ensure rigidity/eliminate stand racking
- Frame: Fully welded 1.5" x 1.5" (38 mm x 38 mm) square stainless steel tube
- Easy to assemble

Call 1-800-90TURBO or your Authorized Distributor for more information.

18" (457 mm) Oven Cart Dimensions

Height	18"	(457 mm)
with single oven	39.4"	(1001 mm)
with stacked ovens*		
top unit without legs	56.8"	(1443 mm)
top unit with legs	60.8"	(1544 mm)
Width	27.8"	(706 mm)
with single oven	27.8"	(706 mm)
with stacked ovens*	27.8"	(706 mm)
Depth	26.625"	(676 mm)
with single oven	31.7"	(805 mm)
with stacked ovens*	31.7"	(805 mm)

24" (610 mm) Oven Cart Dimensions

Height	24"	(610 mm)
with single oven	45.4"	(1153 mm)
with stacked ovens*		
top unit without legs	62.8"	(1595 mm)
top unit with legs	66.8"	(1697 mm)
Width	27.8"	(706 mm)
with single oven	27.8"	(706 mm)
with stacked ovens*	27.8"	(706 mm)
Depth	26.625"	(676 mm)
with single oven	31.7"	(805 mm)
with stacked ovens*	31.7"	(805 mm)

*Requires Stacking Bracket.

Assembly instructions are included with the cart. If additional help is needed, call 1-800-90TURBO or your Authorized Distributor.

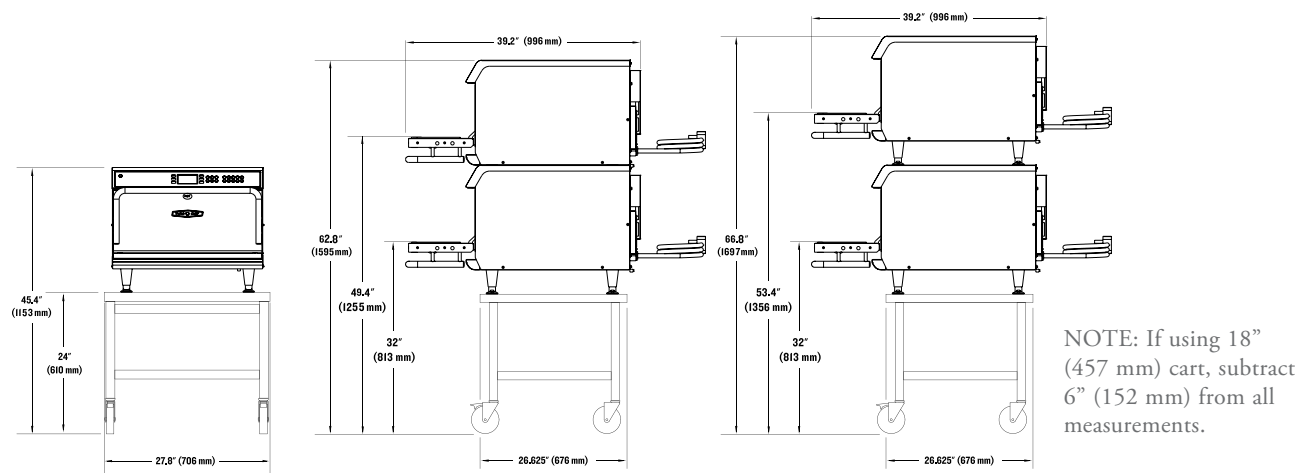


Figure 6: 24" (610 mm) Oven Cart with Oven(s)

Replacing/Exchanging Jetplates

Reference Figure 7. The top and bottom jetplates ensure hot air is distributed evenly to maximize food quality. For product-specific results, jetplates with different hole patterns can be installed.

To remove the bottom jetplate:

1. Ensure the oven is off and the cook cavity temperature is below 150°F (66°C).
2. Remove the oven rack.
3. Remove both lower support rails.
4. Remove the lower jetplate.

To remove the top jetplate:

1. Ensure the oven is off and the cook cavity temperature is below 150°F (66°C).
2. Remove the oven rack.
3. Remove the filter bracket.
4. Remove both upper support rails.
5. If additional clearance is required, remove the air diverter from the rear oven wall using a Phillips screwdriver.
6. Remove the top jetplate.

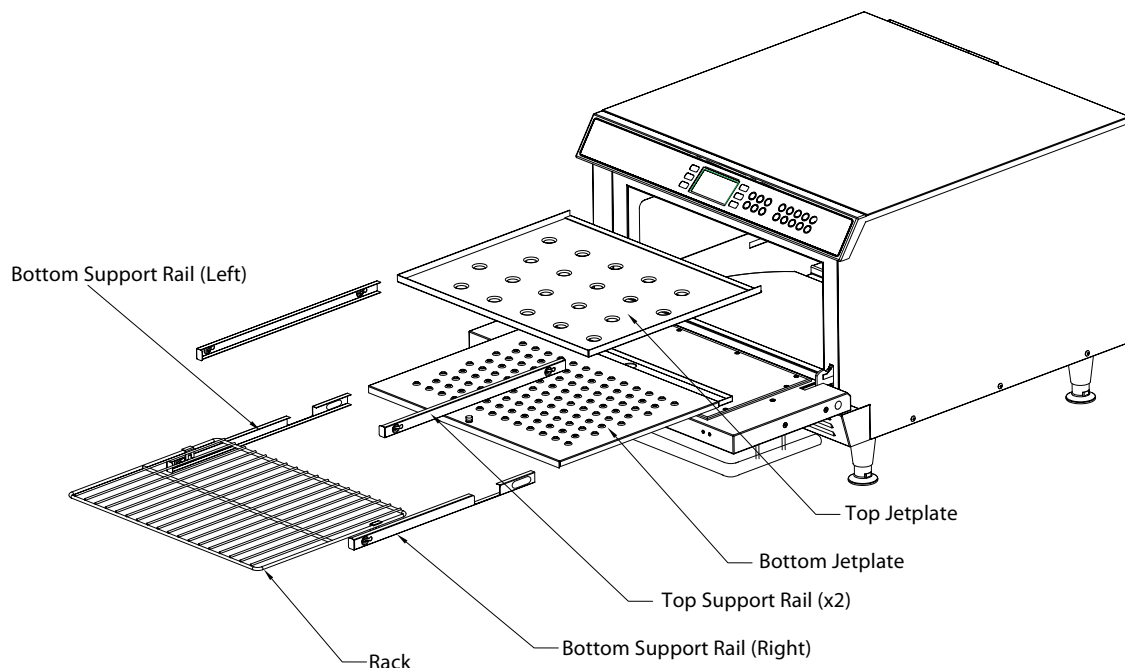
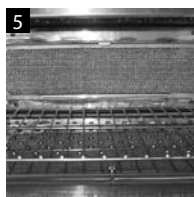


Figure 7: Removing Jetplate

Oven Maintenance

The daily and deep cleaning procedures below will help maintain the High h Batch 2 oven. Be sure to use only TurboChef Oven Cleaner; any other cleaner can damage and void the warranty on critical parts. To order TurboChef Oven Cleaner, Oven Guard, or a new filter, call 1-800-90TURBO, +1-214-379-6000, or your Authorized Distributor.



Supplies and Equipment: TurboChef Oven Cleaner (P/N: 103180), Oven Guard (P/N: 103181), nylon scrub pad, cleaning towel, soft-bristle cleaning brush, Phillips screwdriver (only if required for top jetplate removal)

Step 1: Prepare the Oven

- Ensure the oven is turned off – press the On/Off key.
- DO NOT attempt to clean the oven until the display reads “Ready to Clean.”



WARNING: Injury can occur if the oven is not allowed to cool properly before cleaning.

Step 2: Remove the Oven Rack

- Wash, rinse, sanitize, and dry the oven rack.

Step 3: Clean the Grease Filter

- Grasp the filter latch and lift and pull out until the filter and bracket lie flat (Figure 3).
- Remove the filter from the bracket and gently rinse it.



CAUTION: DO NOT scrub the filter or use a water jet when cleaning.

- If required, replace the filter (HHB-8287) if it has large holes or is becoming detached from the frame.

Step 4: Clean the Oven Door and Cook Chamber

- Using a damp towel, remove food particles.
- For stubborn stains, spray Oven Cleaner and allow it to penetrate for 5 minutes.
- Scrub with a nylon scrub pad.
- Wipe the oven door and cook chamber with a clean damp towel.
- Using a clean dry towel, thoroughly dry the cook chamber.

Step 5: Reinstall the Grease Filter and Oven Rack

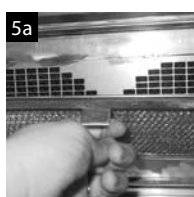
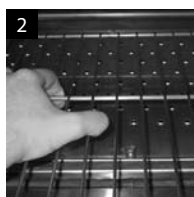
Step 6: Apply Oven Guard

- Follow instructions on bottle.

Step 7: Wipe the Oven Exterior with a Clean Damp Towel



CAUTION: DO NOT spray chemicals into any openings, such as the louvers on the side panels or the cooling fans on the back of the oven. Doing so can damage critical oven components, resulting in a non-warranty service call.



Deep Cleaning

TurboChef recommends deep-cleaning once per month, or more frequently depending on oven use.

Step 1: Prepare the Oven

- Ensure the oven is turned off – press the On/Off key.
- DO NOT attempt to clean the oven until the display reads “Ready to Clean.”



WARNING: Possible injury can occur if the oven is not allowed to cool properly before cleaning.

Step 2: Remove the Oven Rack

- Wash, rinse, sanitize, and dry the oven rack.

Step 3: Clean the Oven Door

- Using a damp towel, remove food particles.
- For stubborn stains, spray Oven Cleaner and allow it to penetrate for five minutes.
- Scrub with a nylon scrub pad.
- Wipe the oven door with a clean damp towel.

Step 4: Remove the Bottom Jetplate

- Remove the left and right support rails by gently pulling the rail out, then toward the middle of the oven (Figure 4a), and then out again.
- Remove the bottom jetplate by gripping the thumb screw and lifting up and out (Figure 4b).
- Wash, rinse, sanitize, and dry the bottom jetplate and both support rails.

Step 5: Remove the Grease Filter and Bracket

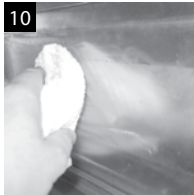
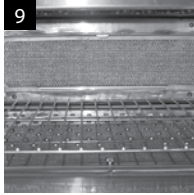
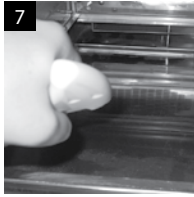
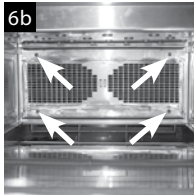
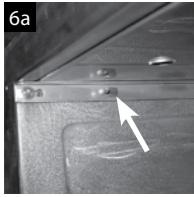
- Grasp the filter latch and lift and pull out until the filter and bracket lie flat (Figure 5a).
- Lift the right side of the filter bracket until you are able to remove it (Figure 5b).
- Remove the filter from the bracket and gently rinse it.



CAUTION: DO NOT scrub the filter or use a water jet when cleaning.

- Wash, rinse, sanitize, and dry the filter bracket.
- Insert the filter back into the bracket. If required, replace the filter (HHB-8287) if it has large holes or is becoming detached from the frame.

Continued on page 11.



Step 6: Remove the Upper Jetplate

- Remove both upper support rails by pulling the peg (Figure 6a).
- Remove the upper jetplate. If additional clearance is required, remove the air diverter using a Phillips screwdriver (Figure 6b).
- Wash, rinse, sanitize, and dry the upper jetplate and support rails.

Step 7: Clean the Cook Chamber



CAUTION: DO NOT spray Oven Cleaner directly on the back oven wall. Doing so may damage critical oven components, resulting in a non-warranty service call.

- Spray Oven Cleaner to break up stubborn stains and allow it to penetrate for five minutes.
- Scrub with a nylon scrub pad.
- Clean the cook chamber thoroughly with a clean damp towel.

Step 8: Dry the Cook Chamber

- Using a clean dry towel, thoroughly dry the cook chamber.



CAUTION: DO NOT operate the oven with water, cleaner, or debris in the bottom of the cook chamber.

Step 9: Reinstall all Clean Parts

- Reinstall in the following order:
 1. Air diverter (if removed)
 2. Upper jetplate
 3. Upper support rails
 4. Bottom jetplate
 5. Lower support rails
 6. Grease filter and bracket
 7. Oven rack

Step 10: Apply Oven Guard

- Follow instructions on the bottle.

Step 11: Clean the Cooling Fan Housing

- Using a dry soft-bristle brush, clean the rear cooling fan housing.

Step 12: Wipe the Oven Exterior with a Clean Damp Towel



CAUTION: DO NOT spray chemicals into any openings, such as the louvers on the side panels or the cooling fan openings on the back of the oven. Doing so can damage critical oven components, resulting in a non-warranty service call.

*This page intentionally
left blank.*

Operating the Oven

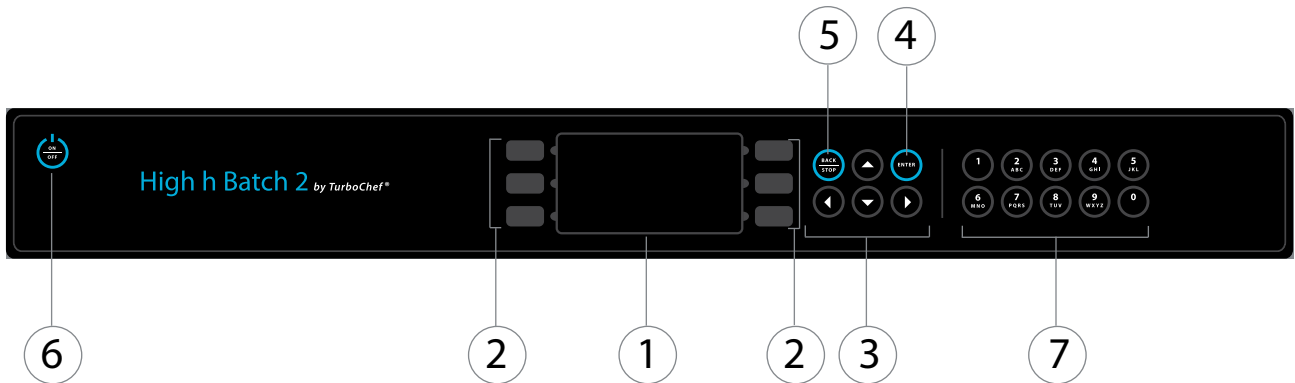


Figure 8: High h Batch 2 Keypad

This section contains information on:

- Control display and key identification
- Cooking instructions
- Additional cooking options
- Programming recipes
- Using the Options menu

Control Display and Key Identification

Reference Figure 8.

1. Display

Displays operational information.

2. Soft keys (6)

Press to select an option on the screen that is displayed adjacent to key.

3. Directional keys

Press to navigate menus and adjust incremental settings, where applicable.

4. Enter key

Press to save edited information.

5. Back/Stop key

Press to stop a cook cycle or return to a previous screen.

6. On/Off key

Press to turn the oven on and off.

7. Numeric Keypad

Modifies cook settings in Edit mode.

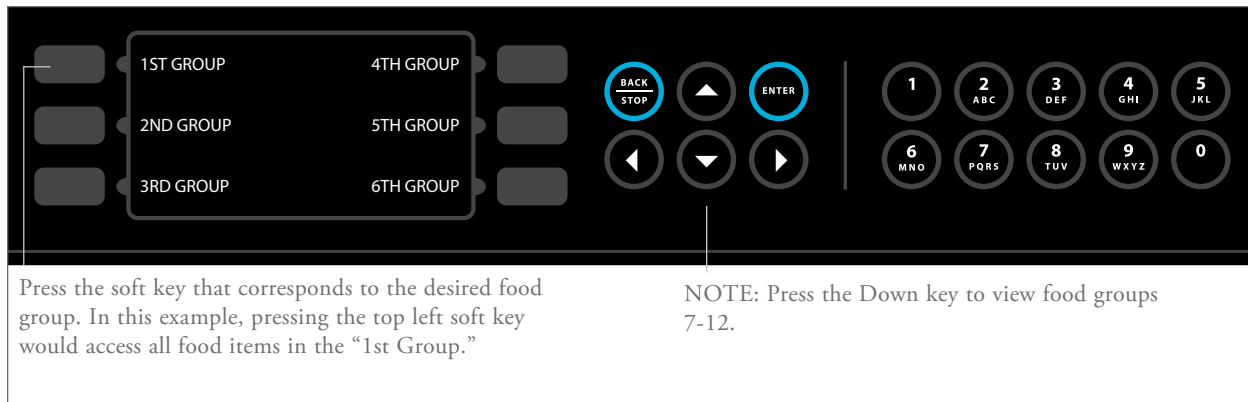


Figure 9: Selecting a Food Group




Figure 10: Selecting a Food Item

Cooking Instructions

Each oven is pre-programmed with recipe settings and is ready to operate out of the box. For instructions on customizing these settings, see page 19.

To select a recipe and initiate a cook cycle:

1. Press the On/Off key to turn the oven on.
The oven will start warming up.
 2. Once the oven reaches its predetermined cook temperature (typically 500°F or 260°C), it will beep and display “Ready to Cook.”
 3. Carefully place the food item to be cooked in the cook cavity.
-  **WARNING:** Inside of oven is HOT! Insert food with caution.
4. To select a food group, press the corresponding soft key (Figure 9).

NOTE: Press the Down key to view food groups 7–12.

5. Select the item to cook by pressing the corresponding soft key (Figure 10).
6. The oven will begin cooking, unless the Time screen is enabled (see page 14).

NOTE: To immediately terminate a cook cycle, press the Back/Stop key.

7. When cooking is complete, the oven will beep and display “Please Remove Food from Oven.”



WARNING: Inside of oven is HOT!
Remove food with caution.

8. Remove the food. The oven will return to the food group selection screen unless the Done screen is enabled (see page 15).

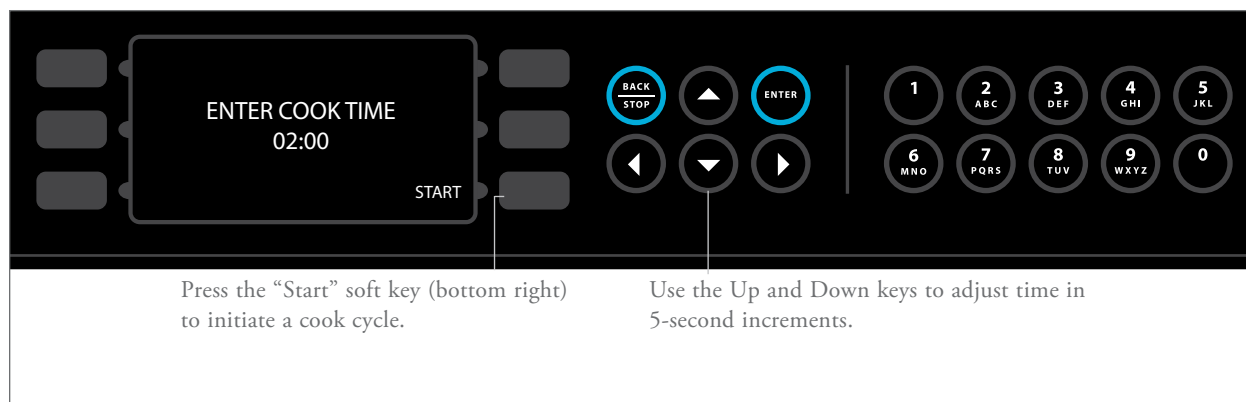


Figure 11: Time Screen

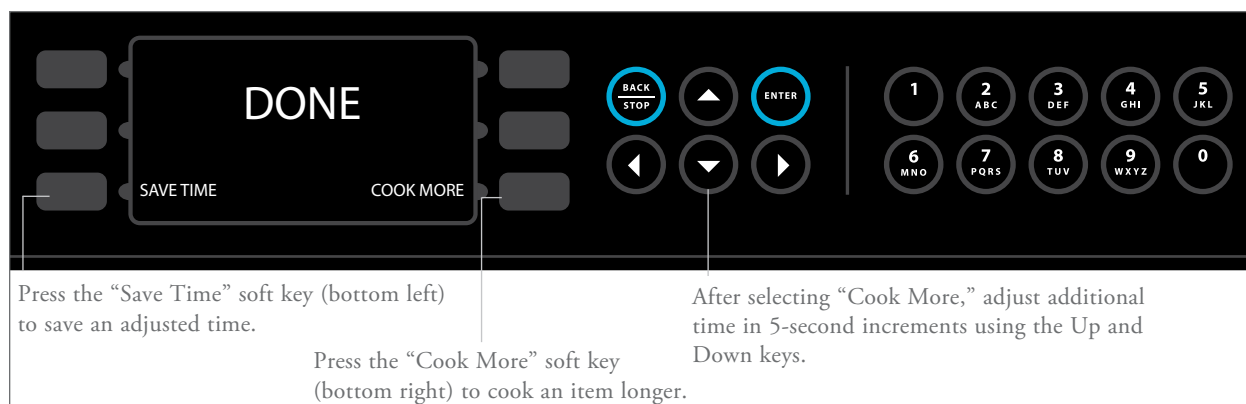


Figure 12: Done Screen

Additional Cooking Options

Time Screen

Reference Figure 11. If the Time screen is enabled, the operator will be given the option to adjust the cook time in 5-second increments before initiating a cook cycle.

To learn about enabling and disabling the Time screen, see page 17.

Done Screen

Reference Figure 12. If the Done screen is enabled, the operator is given two choices upon opening the oven door at the end of a cook cycle:

1. Save Time – save an adjusted cook time (only if the Time screen is also enabled).
2. Cook More – cook an item longer after it reaches the end of its cook cycle.

When an item is cooked longer, the oven cooks it to the specifications of the final event in the initial cook cycle. To learn about events of a recipe, see *Modifying Recipes* (pages 19-22).

To learn about enabling and disabling the Done screen, see page 18.

Options Menu

Use the Options menu to:

- ☐ Enable/disable the Edit menu
- ☐ Erase the Recipe Menu
- ☐ Enable/disable the Write Card function
- ☐ Enable/disable the Time screen
- ☐ Enable/disable the Done screen
- ☐ Enable/disable Demonstration mode

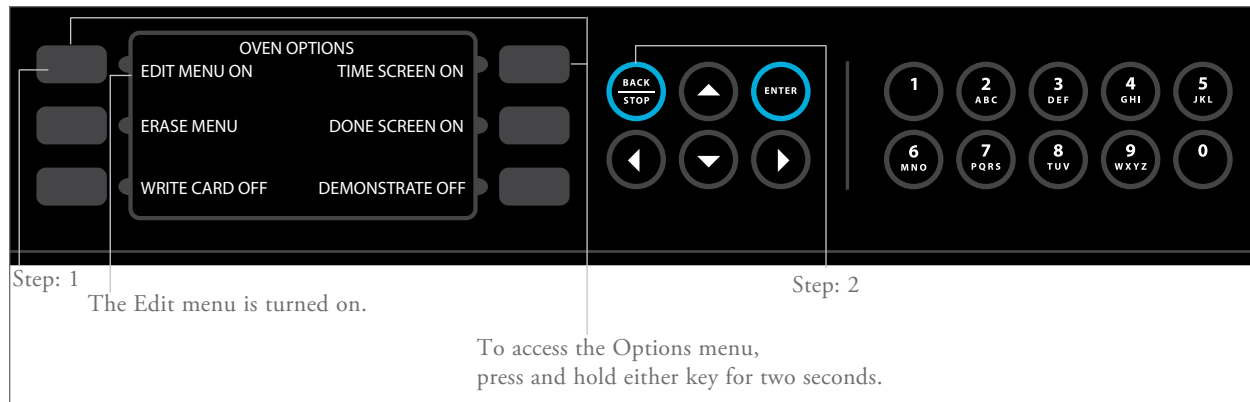


Figure 13: Enabling/Disabling the Edit Menu

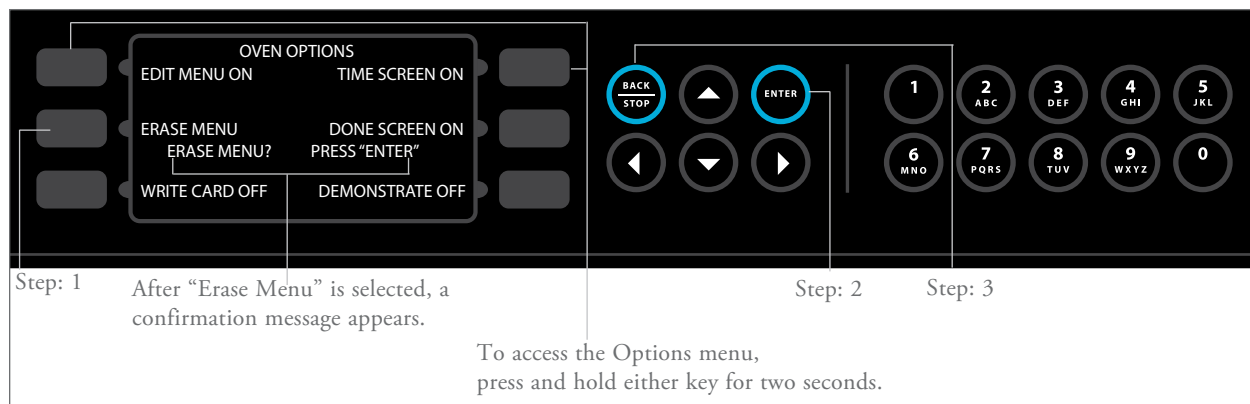


Figure 14: Erasing the Menu

To access the options menu:

1. Ensure the oven is cooling down or off.
2. Press and hold either the top left or top right soft key for two seconds.

Enabling/Disabling the Edit Menu

Reference Figure 13. Enabling the Edit menu allows operators to modify the cook cavity temperature, group/item names, and recipe settings. Disabling the Edit menu prevents operators from accessing these options. By default, the Edit menu is enabled.

To enable/disable the edit menu:

1. From the options menu, press the "Edit Menu" soft key (top left) to turn the edit menu on/off.
2. Press the back/stop key to exit.

Erasing the Recipe Menu

Reference Figure 14. Erasing the recipe menu will permanently delete currently-stored recipes and recipe settings, and is generally not recommended.

To erase the recipe menu:

1. From the options menu, press the "Erase Menu" soft key (middle left).
2. Press the enter key to confirm or the back/stop key to cancel.
3. Press the back/stop key to exit.

NOTE: Erasing the recipe menu is not required when uploading new settings from a smart card (page 21).

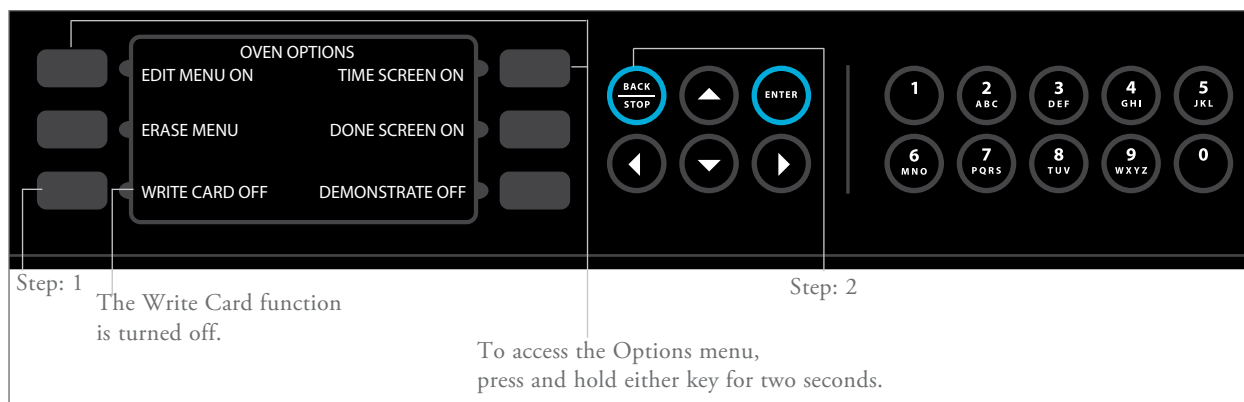


Figure 15: Enabling/Disabling the Write Card Function

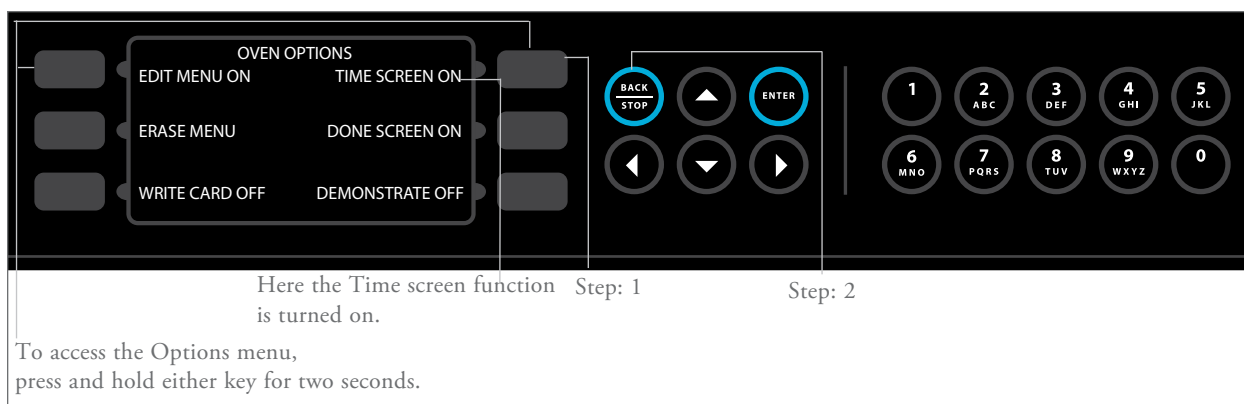


Figure 16: Enabling/Disabling the Time Screen

Enabling/Disabling the Write Card Function

Reference Figure 15. Enabling the Write Card function allows the operator to save recipes from the oven to a smart card. Disabling the Write Card function prevents operators from doing so. By default, the Write Card function is disabled.

To enable/disable the Write Card function:

1. From the Options menu, press the “Write Card” soft key (bottom left) to turn the Write Card function on or off.
2. Press the Back/Stop key to exit.

Enabling/Disabling the Time Screen

Reference Figure 16. Enabling the Time screen allows the operator to adjust the total cook time before initiating a cook cycle. Disabling it helps ensure originally-programmed cook times remain unaltered.

To enable/disable the Time screen:

1. From the Options menu, press the “Time Screen” soft key (top right) to turn the Time screen function on or off.
2. Press the Back/Stop key to exit.

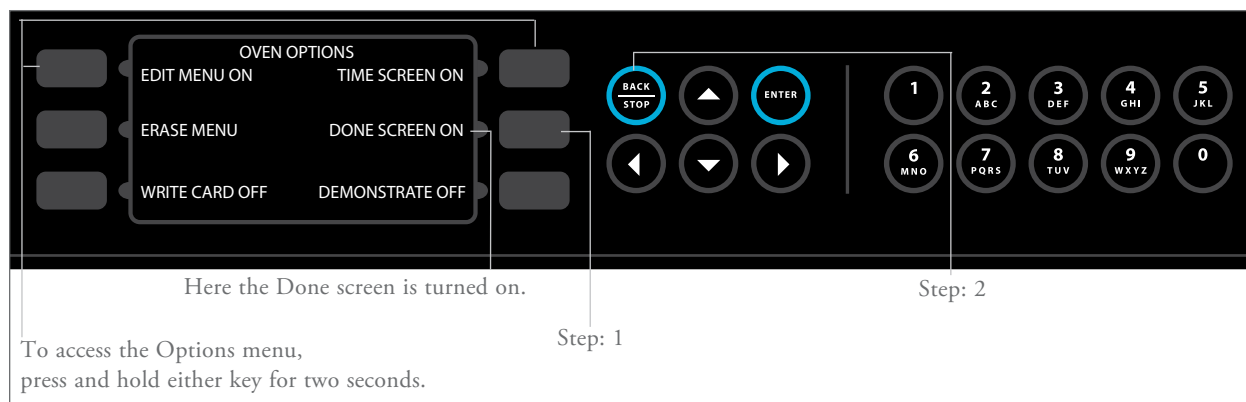


Figure 17: Enabling/Disabling the Done Screen

Enabling/Disabling Done Screen

Reference Figure 17. Enabling the Done screen allows the operator to:

- Save an adjusted cook time
- Cook an item longer after it reaches the end of its cook cycle

Disabling it helps ensure all originally-programmed cook times remain unaltered. By default, the Done screen is enabled.

To enable/disable the Done screen:

1. From the Options menu, press the “Done Screen” soft key (middle right) to turn the Done screen on or off.
2. Press the Back/Stop key to exit.

Demonstration Mode

When enabled, demonstration mode will prevent the oven from heating. This mode should remain off unless otherwise instructed by TurboChef.

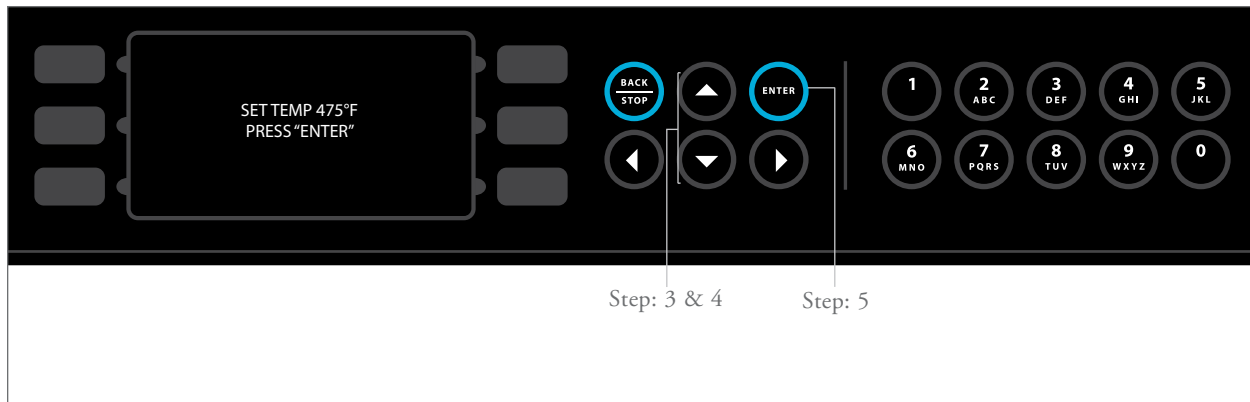


Figure 18: Adjusting the Cook Cavity Temperature

Programming Recipes

Programming options include:

- Adjusting the temperature set point
- Modifying recipes
- Loading a menu from a smart card
- Saving a menu to a smart card
- Checking the recipe counter

To access programming options, the oven must be either cooling down or off.

Adjusting the Cook Cavity Temperature

Reference Figure 18.

1. Ensure the oven is either cooling down or off.
2. Verify the Edit menu is enabled (for instructions, see page 16).
3. Press and hold the Up key for two seconds.
4. Adjust the cook cavity temperature in 25°F (15°C) increments using the Up and Down keys.
5. Press Enter to confirm the change and proceed to editing individual recipes, or press the Back/Stop key to cancel.

Modifying Recipes (Figures 19-21)

To modify a food item:

1. Ensure the oven is either cooling down or off.
2. Verify the Edit menu is enabled (for instructions, see page 16).
3. Press and hold the Up key for two seconds.
4. Adjust the cook cavity temperature in 25°F (15°C) increments using the Up and Down keys.
5. Press Enter to confirm the change and proceed to editing individual recipes.

6. Select the food group that contains the item to be modified (Figure 19).
7. Select the food item to be modified (Figure 20).
8. From Food Item screen (Figure 21):
 - a. Press the Left or Right key to move from one field to another. The selected field will be bracketed.
 - b. Press the top-left and top-right soft keys to move from one character to another.
 - c. Change the food group and item names using the number keys or the Up and Down keys.

NOTE: Pressing the Up and Down keys will clear the field of its current content unless you first press either the top-left or top-right soft key.

- d. Set the cook time by pressing the Up and Down keys (5-second increments).
- e. Turn rack oscillation on or off by pressing the Up or Down key.
- f. Enter cook time percentage per event (total must equal 100%) using the number keys.
- g. Enter % air per event using the number keypad (rounds to nearest 5, with minimum setting of 10%).
9. To test settings before saving, press the bottom-left soft key. The oven will initiate a cook cycle to the new specifications.
10. To save settings, press Enter. "Settings Saved" will be displayed.
11. Press the Back/Stop key to exit the menu (doing so before saving settings will discard changes).

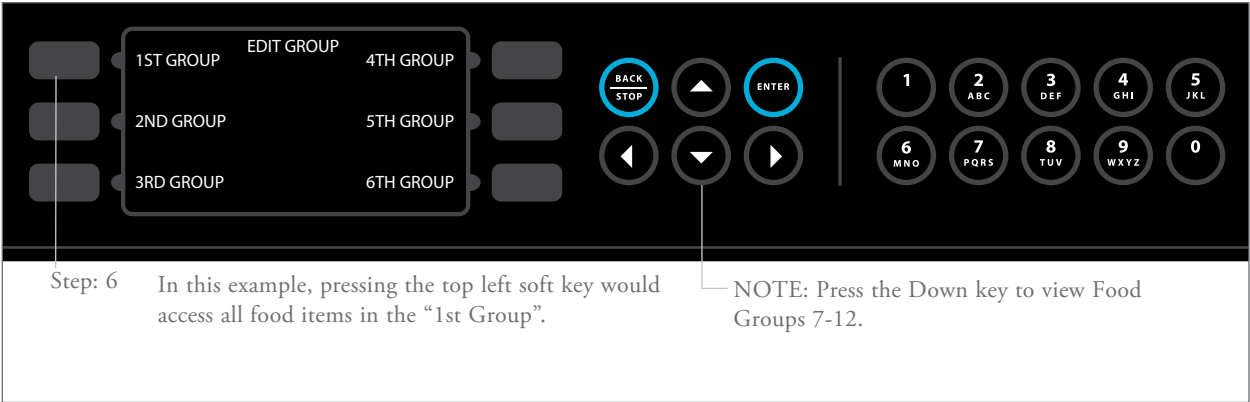


Figure 19: Modifying Recipes – Step 6



Figure 20: Modifying Recipes – Step 7

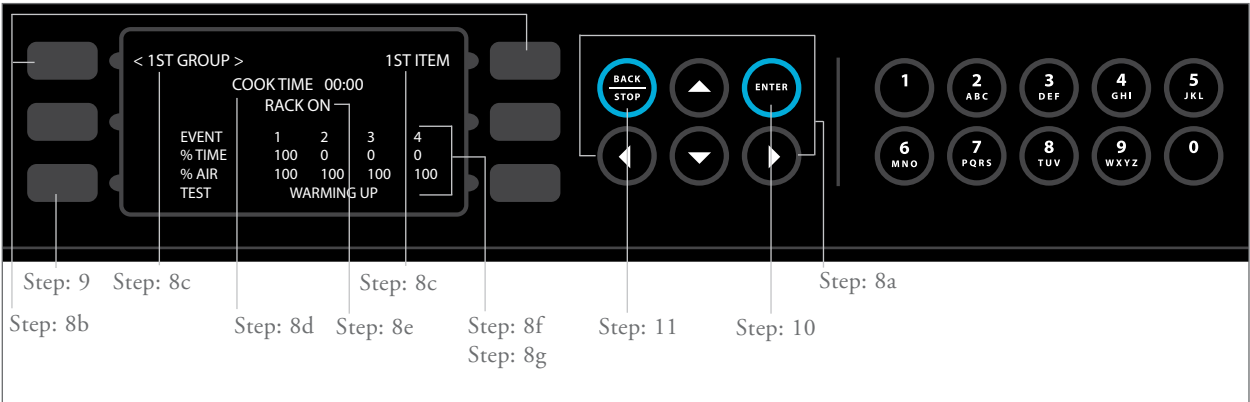


Figure 21: Modifying Recipes – Steps 8-11

Ordering a Smart Card

To order a Smart Card, call 1-800-90TURBO, +1 214-379-6000, or your Authorized Distributor.

Loading Menu from Smart Card

CAUTION: Loading a menu from a smart card will overwrite all existing recipes programmed into the oven.

To load a menu from a smart card:

1. Ensure the oven is either cooling down or off.
2. Insert the smart card into the smart card reader. Orient the card as shown in Figure 22.
3. Press the bottom-left soft key.
4. Press the middle-left soft key to “Load Menu from Card” (Figure 23).
5. Press Enter to confirm or Back/Stop to cancel.

After approximately 5 seconds, screen will display that menu has loaded from card.

Saving Menu to Smart Card

CAUTION: Saving a menu to a smart card will overwrite all existing recipes programmed on the smart card.

To save a menu to a smart card:

1. Ensure the oven is either cooling down or off.
2. Verify the Write Card function is enabled (for instructions, see page 17).

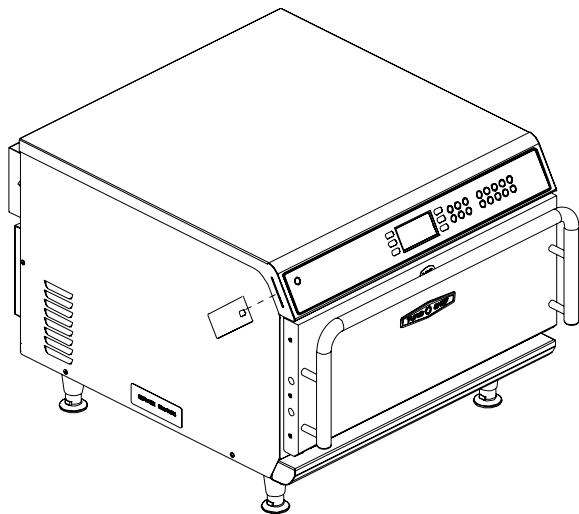


Figure 22: Inserting Smart Card into Reader

3. Insert the smart card into the smart card reader. Orient the card as shown in Figure 22.
4. Press the bottom-left soft key.
5. Press the top-left soft key to “Save Menu to Card” (Figure 24).
6. Press Enter to confirm or Back/Stop to cancel.

Checking Recipe Counter

To view how many times each recipe (food item) has been cooked:

1. Press and hold the middle-left or middle-right soft key for two seconds.
2. The screen will display food items in the first food group. To view other food groups, use the Up and Down keys.
3. Press the Back/Stop to exit the menu.

NOTE: To erase counters, press Enter when viewing the totals.



Figure 23: Loading from Smart Card



Figure 24: Saving to Smart Card

*This page intentionally
left blank.*

Diagnosing an Issue

Fault Codes: Descriptions, Clearing Instructions, and Troubleshooting

To help in troubleshooting, this section contains information on

- Fault codes: descriptions, clearing instructions, and troubleshooting
- Status indicators
- Testing options

The High h Batch 2 oven continually monitors and logs fault conditions. For instructions on viewing the fault log, see page 26.

The fault log:

- Logs each fault up to 255 instances before rolling back to zero.
- Increments when a fault is detected and retains a count even if the fault message is cleared.

Reference Figure 25 (below) to determine when a fault can occur.

F1: BLOWER (Blower Running Status Bad)

This fault will display when the blower motor speed controller (BMSC) indicates no running status. The oven responds to this fault by terminating a cook cycle and/or reverting to the Off state. The oven will automatically attempt to restart every 2 seconds until the fault is cleared.

To clear this fault:

1. Turn the oven on. The blower motor may restart successfully on its own.
2. Test the blower motor in Test Mode (page 26).

Troubleshooting this fault:

To troubleshoot an F1 Fault, see the diagram on page 28.

F2: LOW TMP (Cook Temperature Low)

This fault will display if the cook chamber temperature is more than 84°F (47°C) below the set temperature after 5 seconds into a cook cycle.

To clear this fault:

Try cooking again. If the cook chamber temperature is within 84°F (47°C) of the set temperature, the fault will clear.

Troubleshooting: F2 Fault

To troubleshoot an F2 Fault, see the diagram on page 29.

Fault Code and Description	When Active				Refer to
	Warm-up	Ready to Cook	Cool Down	Off State	
F1: Blower Running Status Bad*	x	x	x	x	Page 28
F2: Cook Temperature Low*		x		x	Page 29
F6: EC Temperature High	x	x	x	x	Page 30
F7: Thermocouple Open	x	x		x	Page 30
F8: Heat Low	x			x	Page 31

*Will terminate a Cook Cycle upon discovery.

Figure 25: Fault Code Description Table

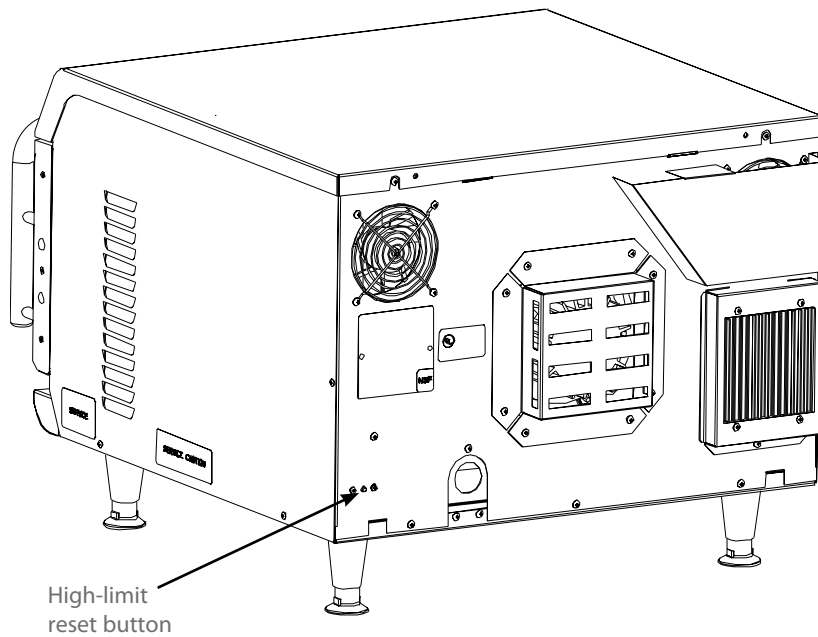


Figure 26: Location of High-Limit Thermostat Reset Button

F6: EC TEMP (Electrical Compartment Temperature High)

This fault displays if the electrical compartment (EC) temperature exceeds 158°F (70°C). The control system checks the EC thermocouple once per minute.

NOTE: This fault will not terminate a cook cycle.

To clear this fault:

The EC temperature must recede below 158°F (70°C).

Troubleshooting: F6 Fault

To troubleshoot an F6 Fault, see the diagram on page 30.

F7: THERMO (Thermocouple Open)

This fault will display if the control system detects that the cook chamber (CC) thermocouple is open (reads 999°F/C).

To clear this fault:

The control system must detect continuity on the thermocouple circuit.

Troubleshooting: F7 Fault

To troubleshoot an F7 Fault, see the diagram on page 30.

F8: HEAT LOW

This fault will display if the cook chamber temperature fails to rise at least 35°F (18°C) over a five minute period during warm-up.

NOTE: This fault will not log; rather, it will display an error message during warm-up.

Troubleshooting: F8 Fault

To troubleshoot an F8 Fault, see the diagram on page 31.

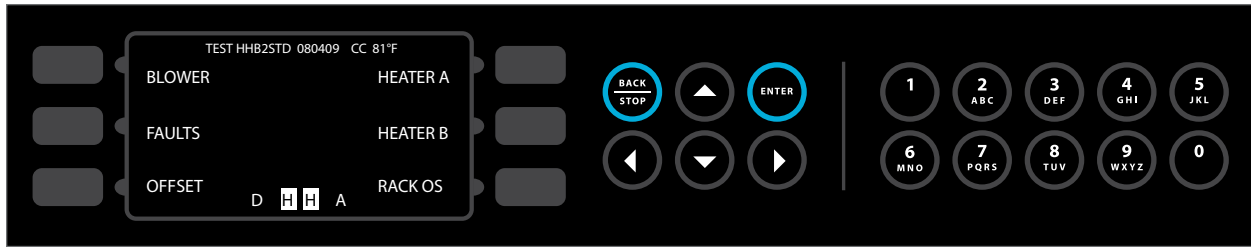


Figure 27: Test Mode Screen 1 of 2

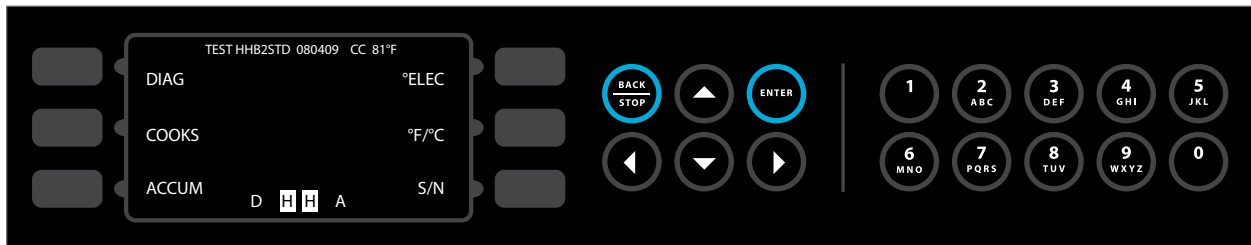


Figure 28: Test Mode Screen 2 of 2

Status Indicators

To assist in troubleshooting, status indicators are displayed in Test Mode and while the oven is cooking in Diagnostic Mode. The following oven parts are represented by letters at the bottom of the display (Figure 27).

Door (D)

Backlit = OPEN

Not backlit = CLOSED

Heater A (left H)

Backlit = OFF

Not backlit = ON

Heater B (right H)

Backlit = OFF

Not Backlit = ON

Blower (A for "air")

Backlit = OFF

Not Backlit = ON

NOTE: In Figure 27, the door is closed, heaters A and B are off, and the blower is on.

Testing Options

To access Test Mode:

1. Ensure the oven is either off or cooling down.
2. Press and hold the Right key for two seconds.

NOTE: Use the Up and Down keys to toggle between Test Mode screen 1 and 2.

From Test Mode screen 1 (Figure 27):

- ☐ Diagnose door switch operation
- ☐ Test the blower motor
- ☐ Set the offset temperature
- ☐ Test heaters A & B
- ☐ Test the rack motor

From Test Mode screen 2 (Figure 28):

- ☐ Set the oven to diagnostic mode
- ☐ View cook counts/total cook time
- ☐ View cumulative operating time
- ☐ View the electrical compartment temperature
- ☐ View/edit the serial number
- ☐ View/clear the fault log

Diagnosing Door Switch Operation

From Test Mode screen 1, view status indicator D as you monitor/adjust the door, hinges, or switch.

Testing the Blower Motor

1. From Test Mode screen 1 (Figure 27), press the top-left soft key (BLOWER).
2. Continue pressing to raise blower speed in 10% increments.

Viewing/Clearing the Fault Log

1. From Test Mode screen 1 (Figure 27), press the middle-left soft key (FAULTS).
2. To zero the fault log, press the Enter.

Adjusting the Temperature Offset

The center of the cook cavity is not usually as hot as the where the thermocouple takes readings. If desired, the “temperature offset” feature allows the displayed temperature to be adjusted for this difference.

The value entered for temperature offset will deduct from the oven’s temperature reading. For example, if the oven temperature = 500°F, an offset of 20° will cause the oven to display 480°F.

For the most accurate results, measure the temperature in the center of the cook cavity after the oven has completed warmup and been idle for at least 15 minutes.

To adjust the temperature offset:

1. From Test Mode screen 1 (Figure 27), press the bottom-left soft key (OFFSET).
2. Continue pressing to adjust in 5°F increments.
3. Press Enter to confirm.

NOTE: Adjustments can be made only in Fahrenheit (5°F equals approximately 2.8°C).

NOTE: After 20°F, the offset will roll back to 0°F.

Checking Heaters A and B

NOTE: The motor must be running to test the heaters. If the blower speed is 0%, it will automatically increase to 10% at the initiation of this test.

To turn on heaters A and B (Figure 27):

1. From Test Mode screen 1, press the top-right soft key (HEATER A) to turn heater A on/off.
2. Press the middle-right soft key (HEATER B) to turn heater B on/off.

Testing the Rack Oscillator Motor

NOTE: The Oven Rack will not oscillate if it is not properly set on the support pins.

To test the rack oscillator motor:

1. From Test Mode screen 1 (Figure 27), press the bottom-right soft key (RACK OSC) to turn the rack motor on/off.

Enabling/Disabling Diagnostic Mode

When Diagnostic Mode is enabled, the following features will be available during a cook cycle:

- Event settings (see page 19 for more details).
- Status indicators (see page 25 for more details).

To enable/disable Diagnostic Mode:

1. From Test Mode screen 1, press the Down Arrow key to view screen 2 (Figure 28).
2. Press the top-left soft key (DIAG) to turn Diagnostic Mode on or off.

Viewing Cook Counter/Time

The oven logs how many cook cycles have completed, as well as the cumulative cook time (shown in minutes and seconds). To view cook counter/time:

1. From Test Mode screen 2 (Figure 28), press the middle-left soft key (COOKS) to view the total number of cook cycles completed.
2. To view the cumulative cook time, press the middle-left soft key (COOKS) again.

NOTE: To permanently erase the cook counter/cumulative cook time, press the Enter key.

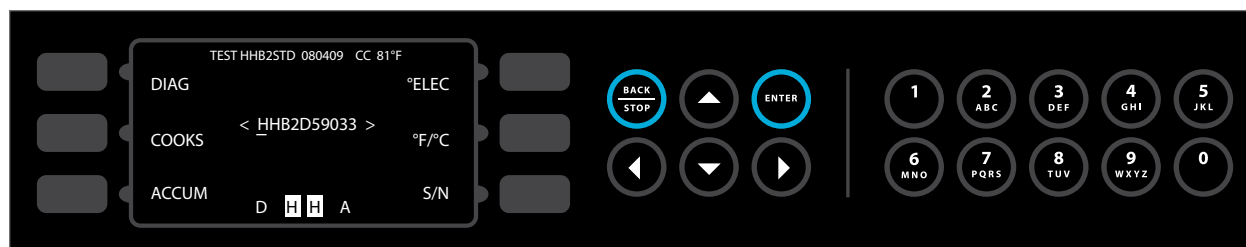


Figure 29: Serial Number Edit

Viewing the Cumulative Operating Time

The oven logs the total amount of time the oven has been on (shown in hours and minutes), including cooking and idle time.

From Test Mode screen 2 (Figure 28, page 25), press the “ACCUM” Soft Key (bottom left) to view cumulative operating time.

NOTE: To permanently erase the cumulative operating time, press the Enter key.

Viewing the Electrical Compartment Temperature

From Test Mode screen 2 (Figure 28, page 25), press the top-right soft key (°ELEC) to view the electrical compartment temperature.

Setting Fahrenheit/Celsius

From Test Mode screen 2 (Figure 28, page 25), press the middle-right soft key (°F/°C) to change the type of temperature measurement.

Viewing/Editing the Serial Number

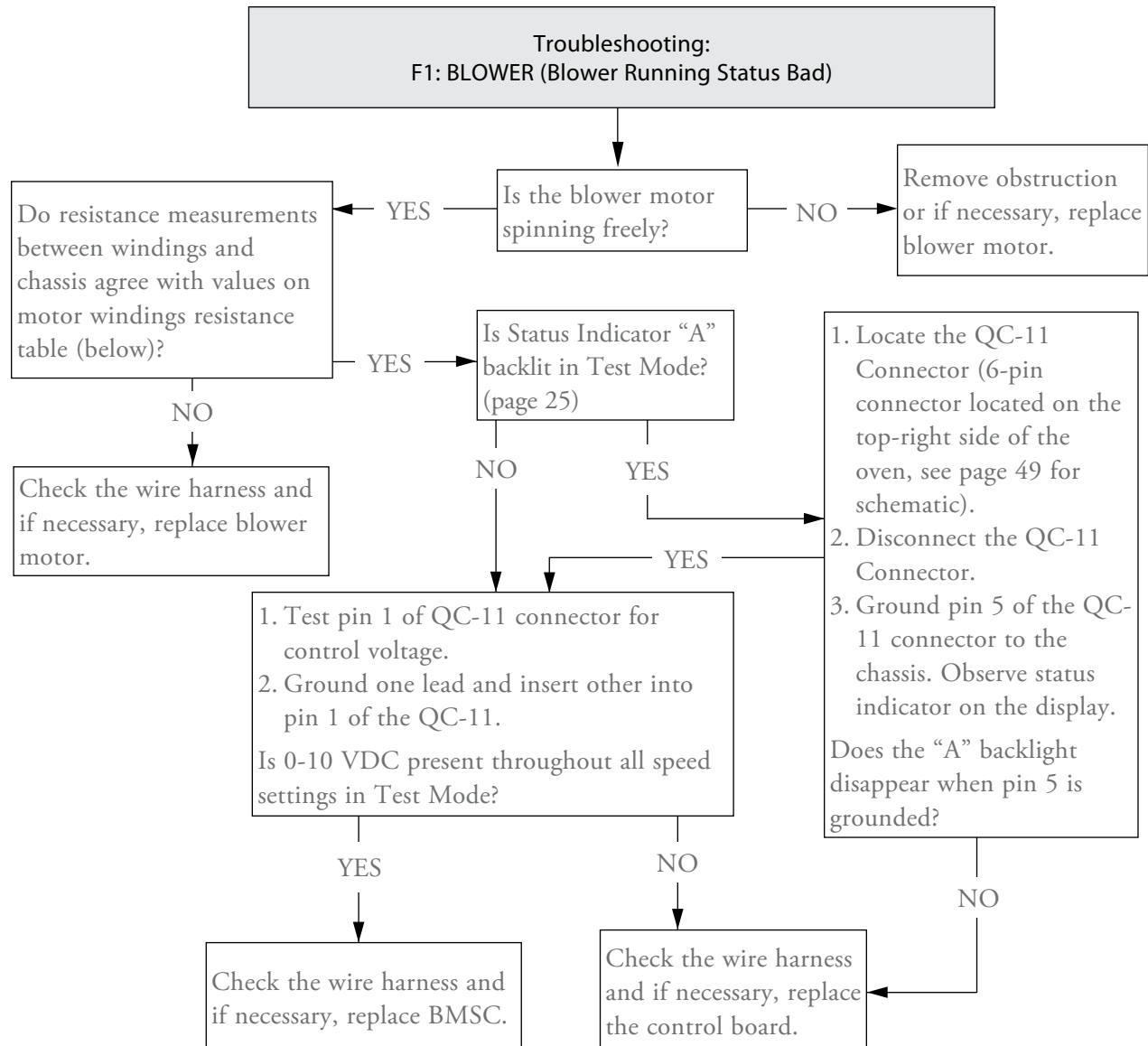
1. From Test Mode screen 2 (Figure 28, page 25), press the bottom-right soft key (S/N) to view the serial number.
2. To edit the serial number (Figure 29), use the number keys.
3. To move from character to character, use the middle-left and middle-right soft keys.

NOTE: The cursor will also move to the next character automatically if you wait two seconds.

4. Press the Enter key to save changes.

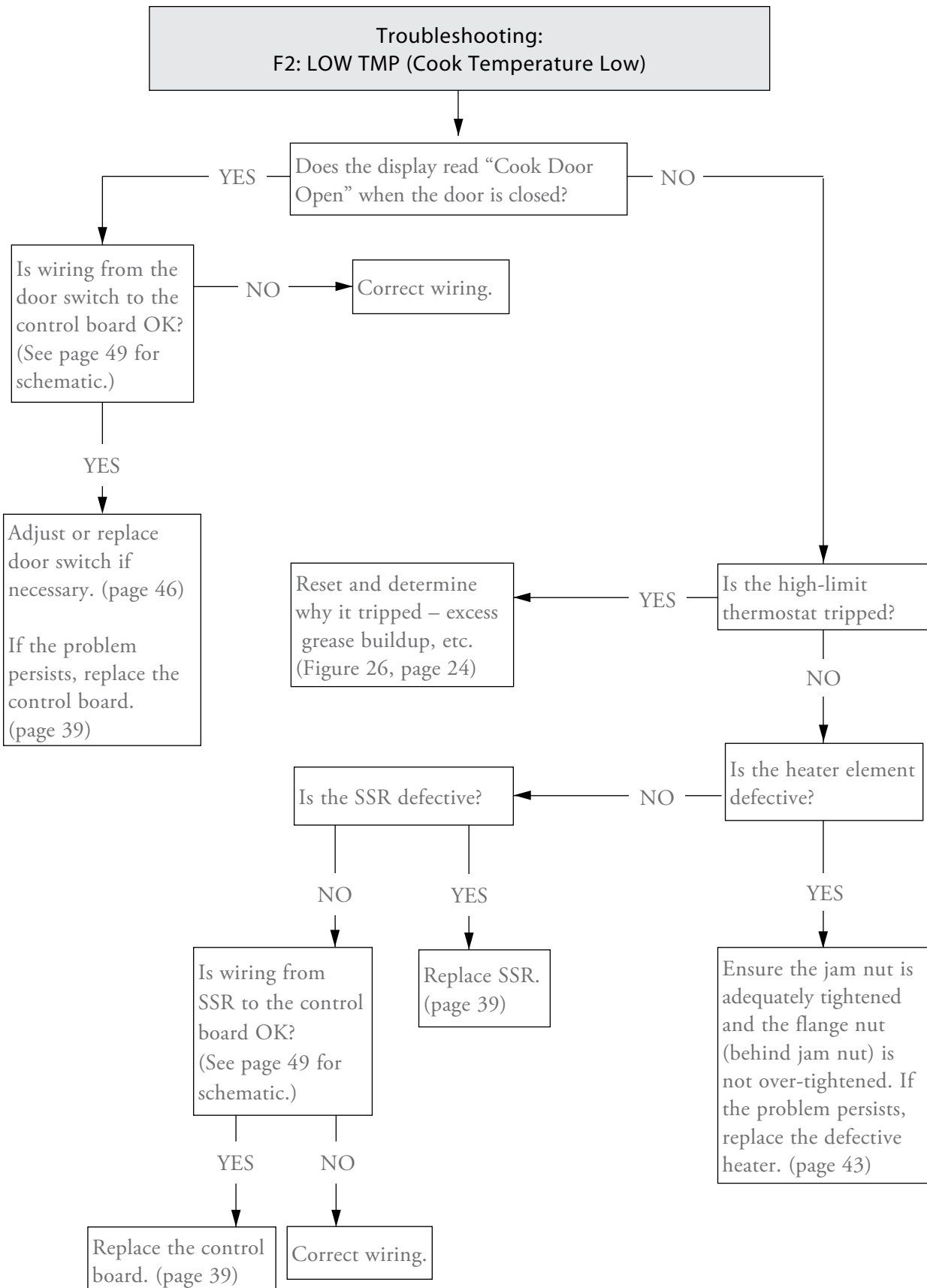
NOTE: If you do not press the Enter key, all changes will be lost. You can also cancel editing by pressing the Back/Stop key.

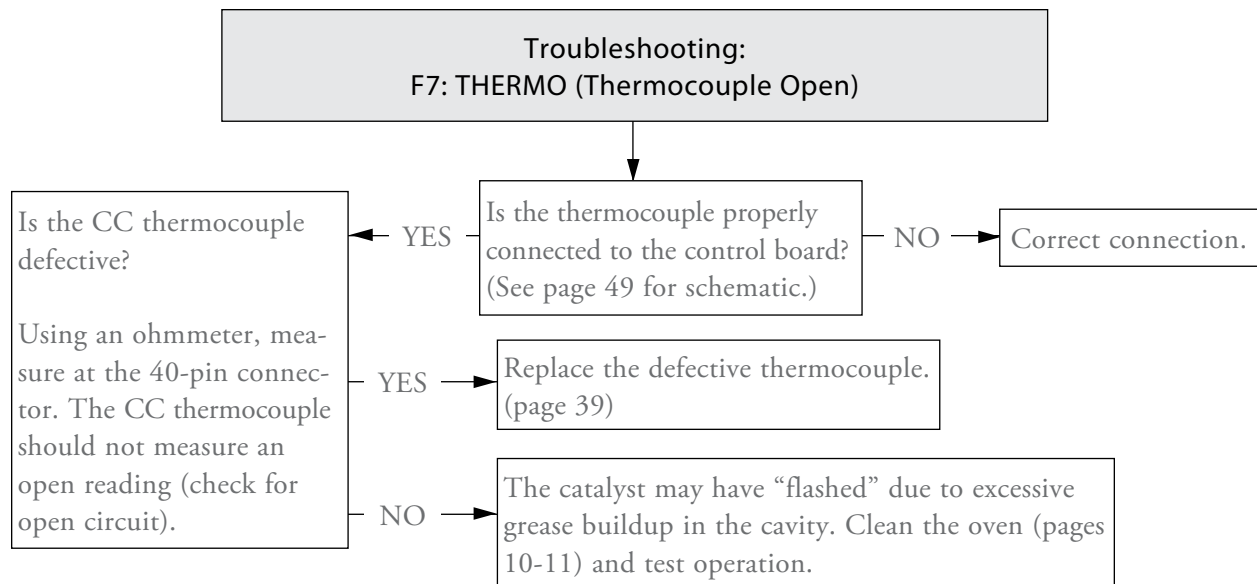
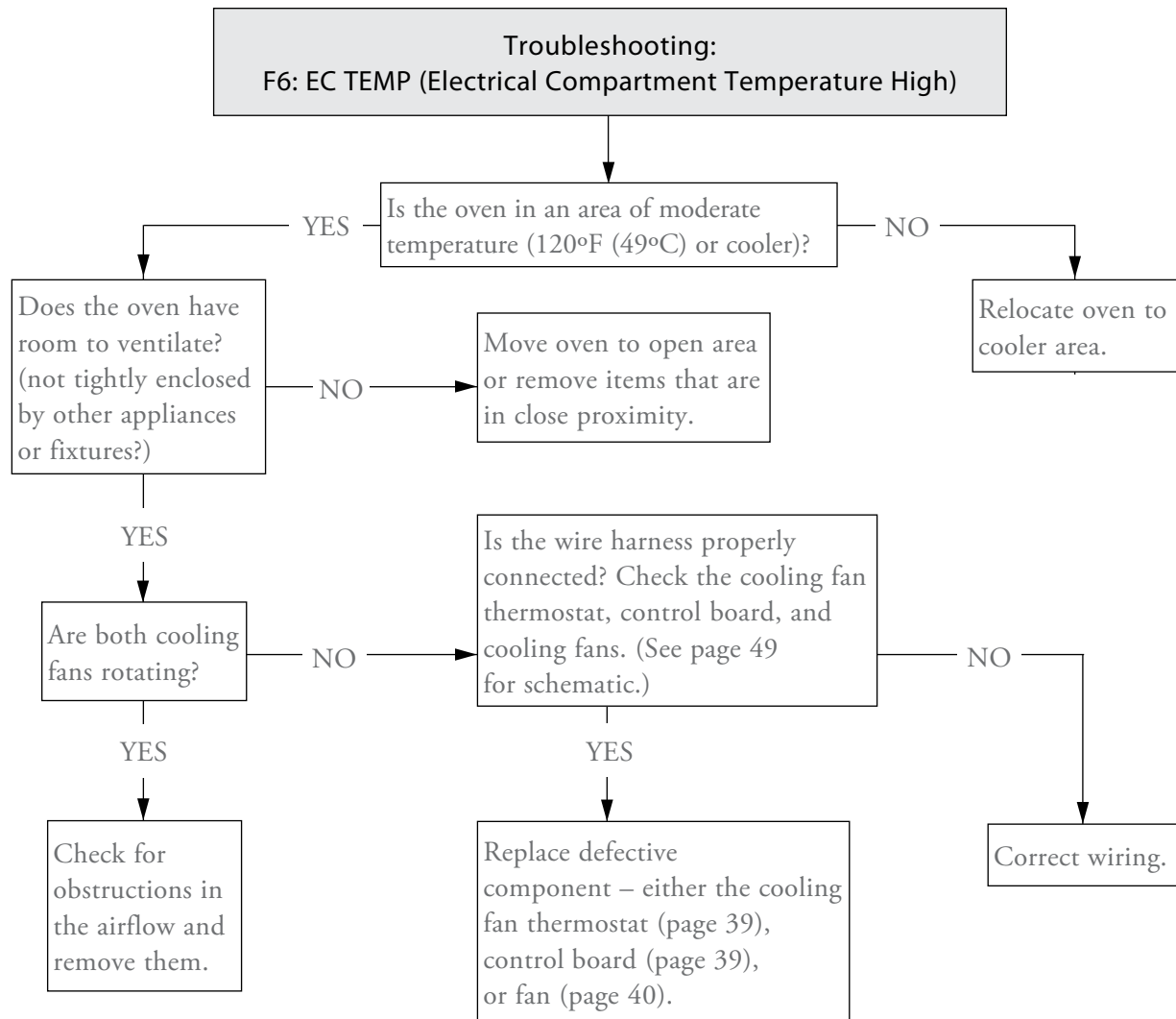
Fault Code Troubleshooting

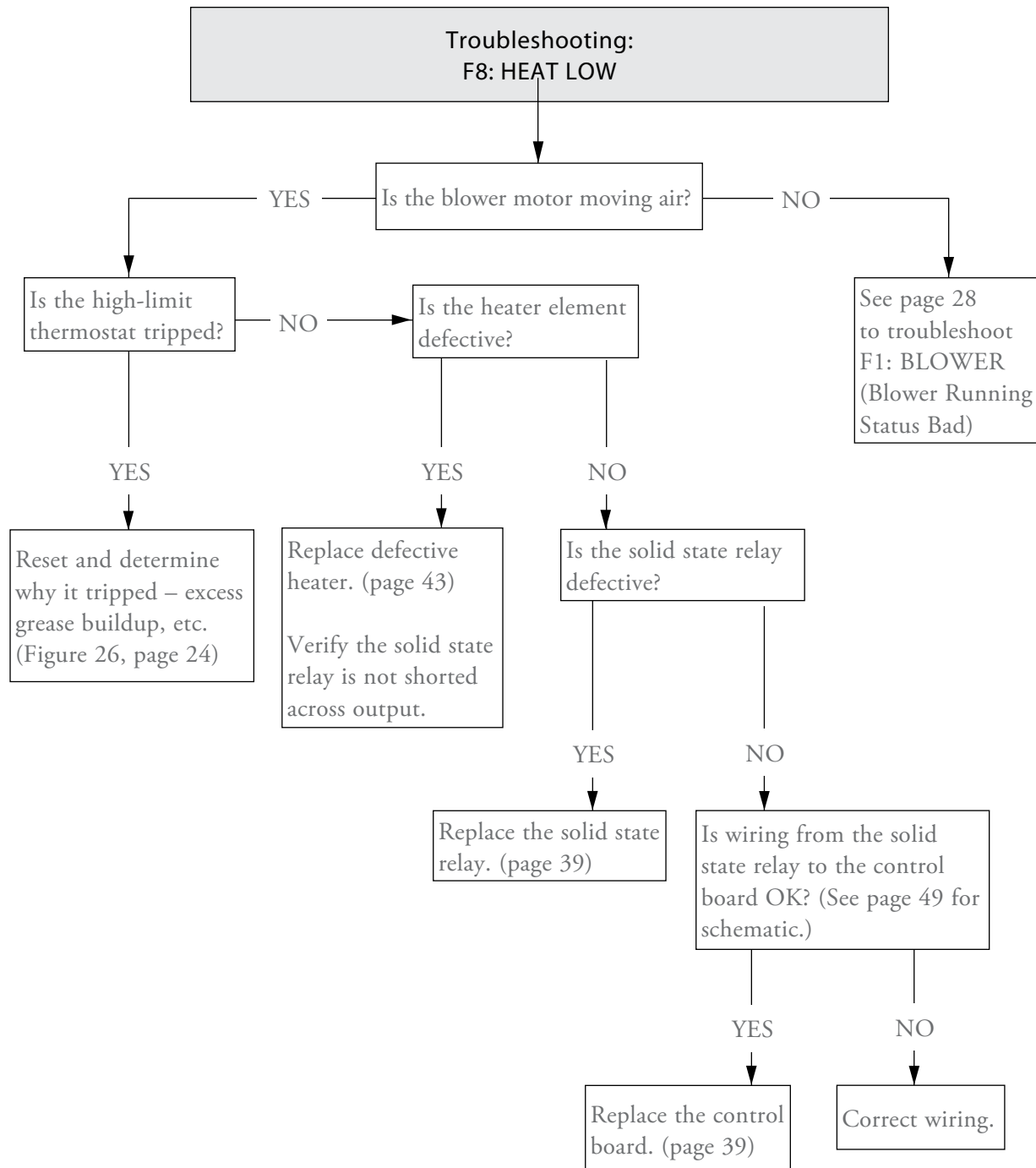


TO	FROM	DESCRIPTION	EXPECTED RESISTANCE
Black	Red	Winding (A-B)	2.0-2.6 Ohms
Black	White	Winding (A-C)	2.0-2.6 Ohms
Red	White	Winding (B-C)	2.0-2.6 Ohms
Black, Red or White	Green	Windings to Chassis	Open

Figure 30: Motor Windings Resistance Table

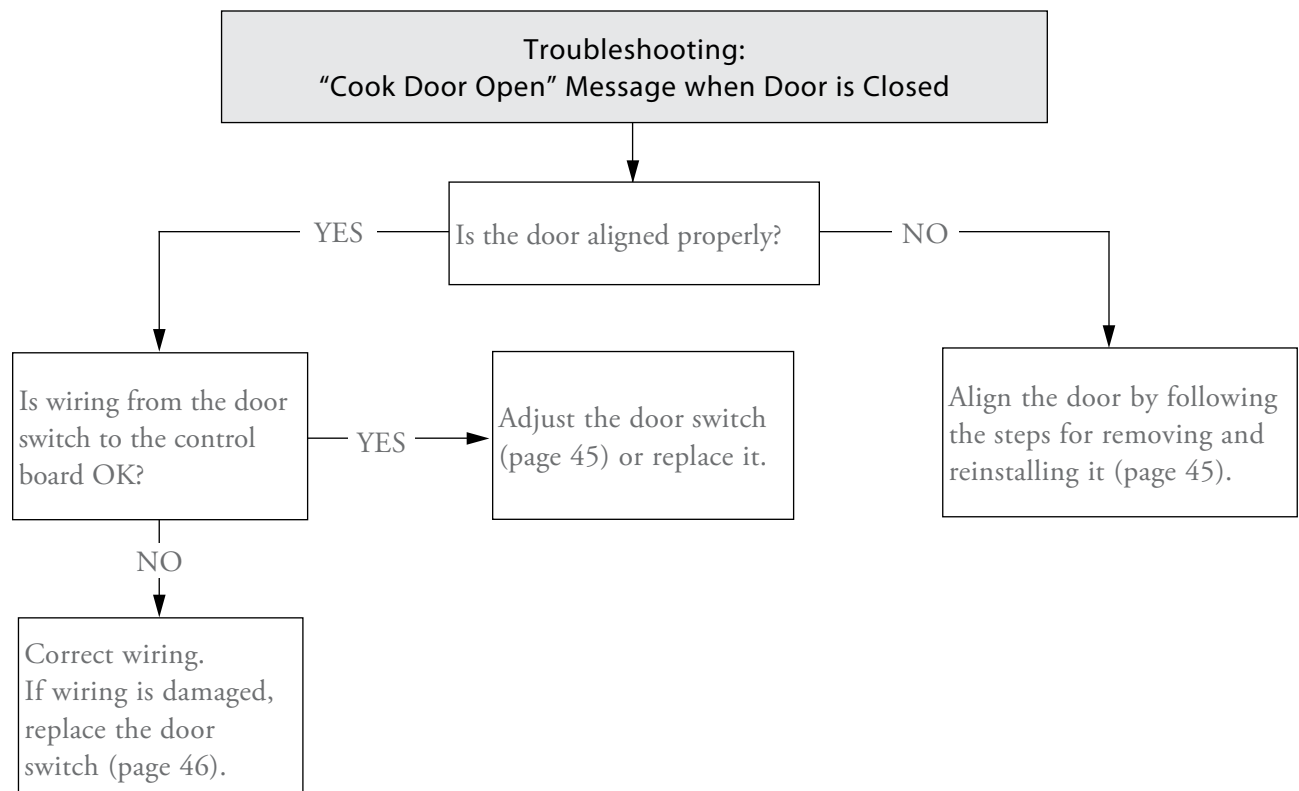
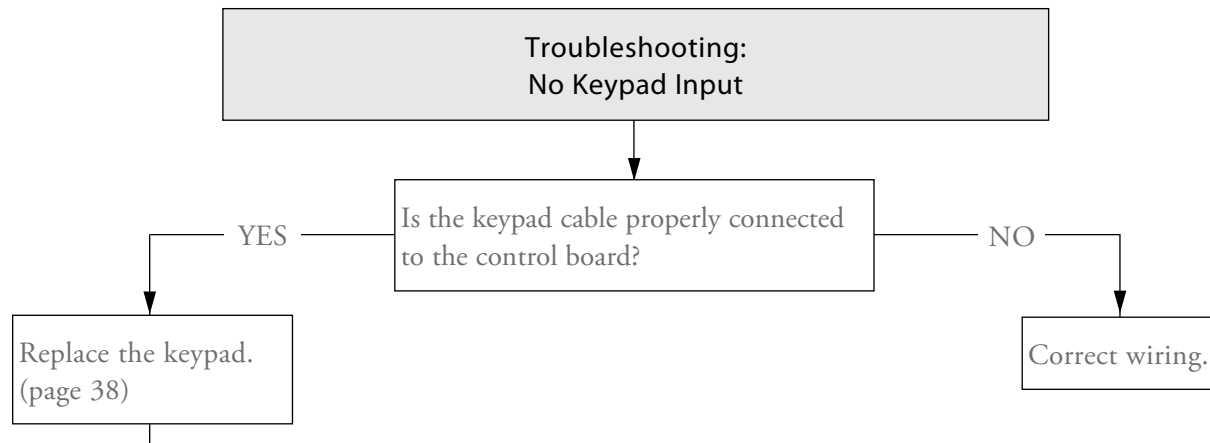


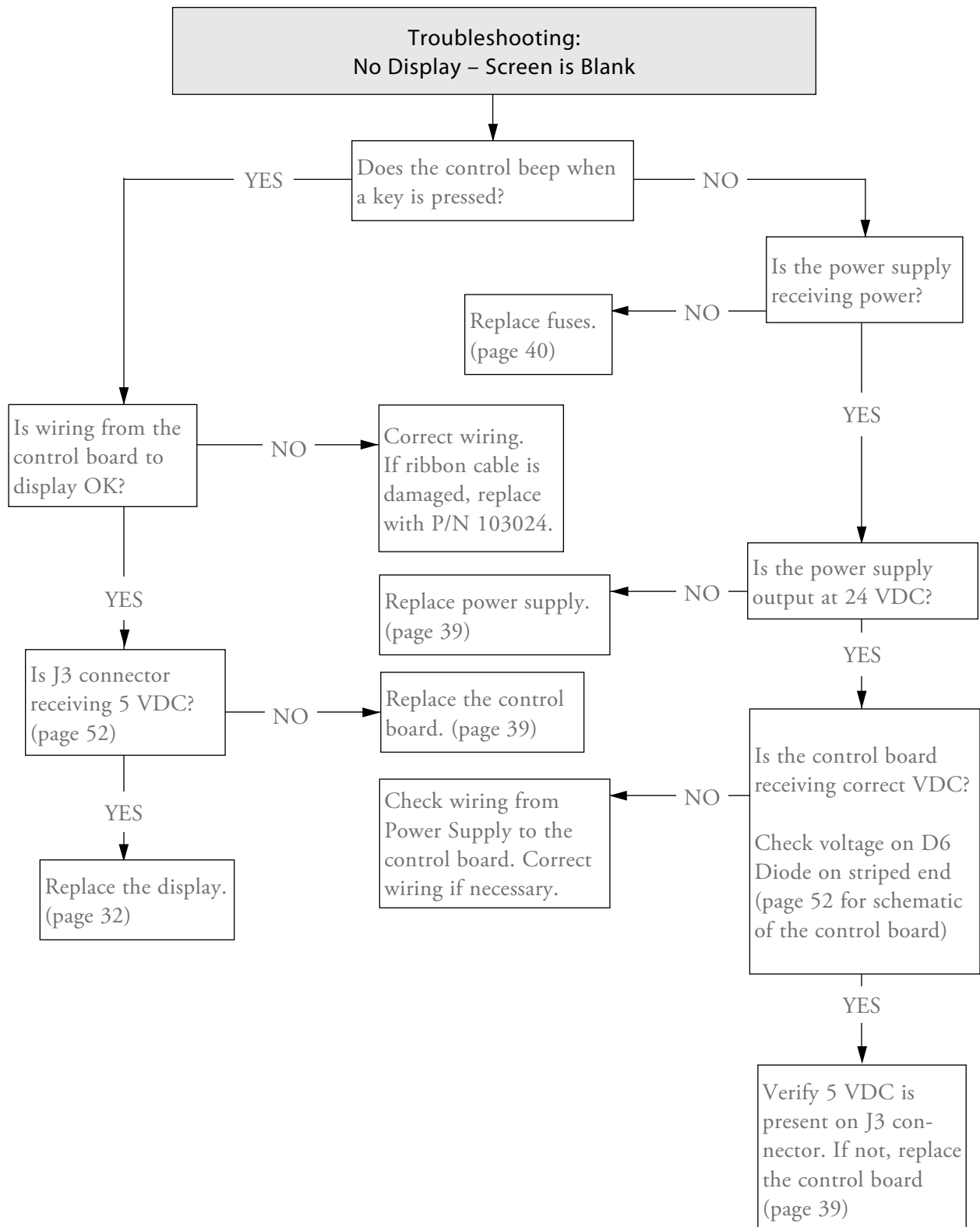


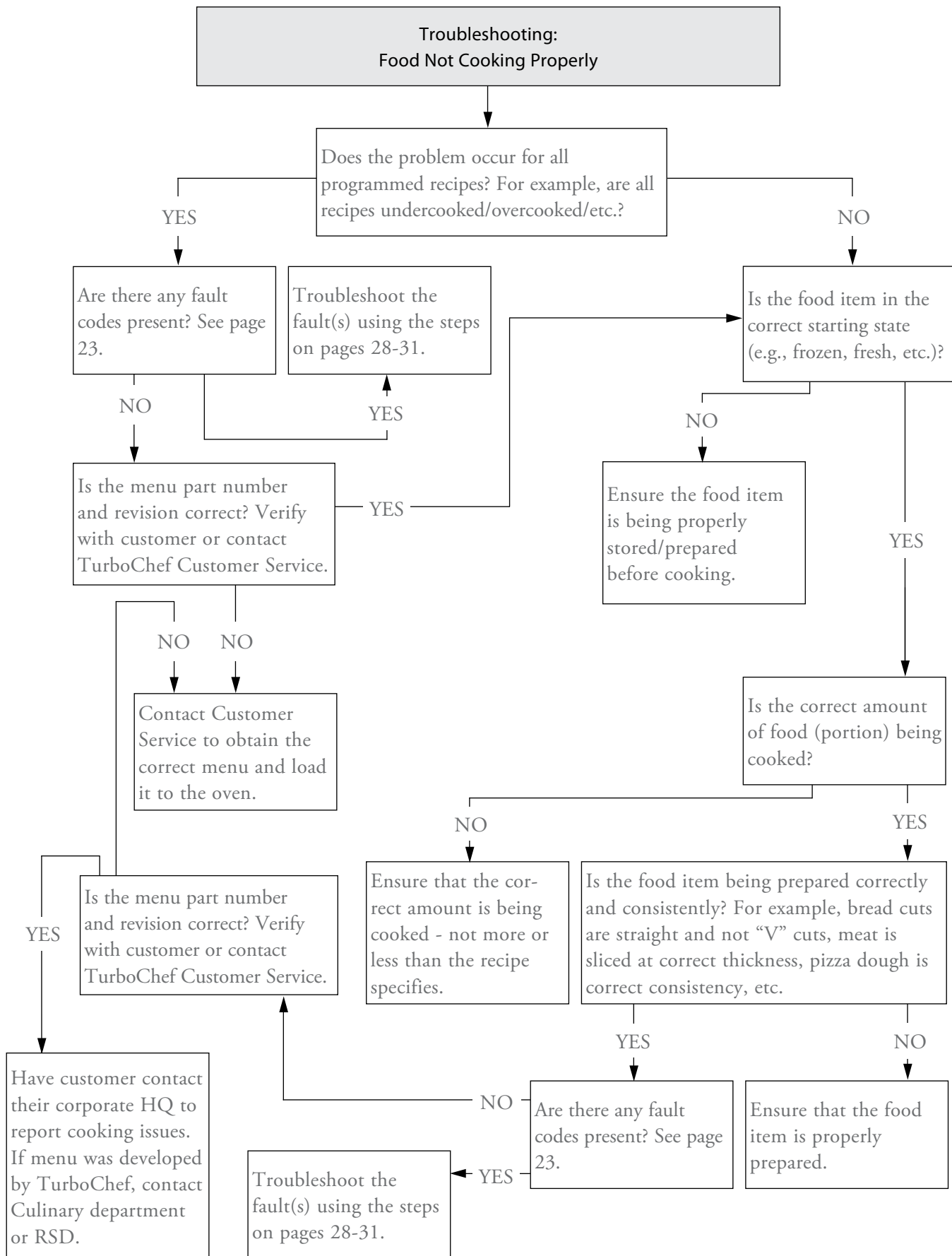


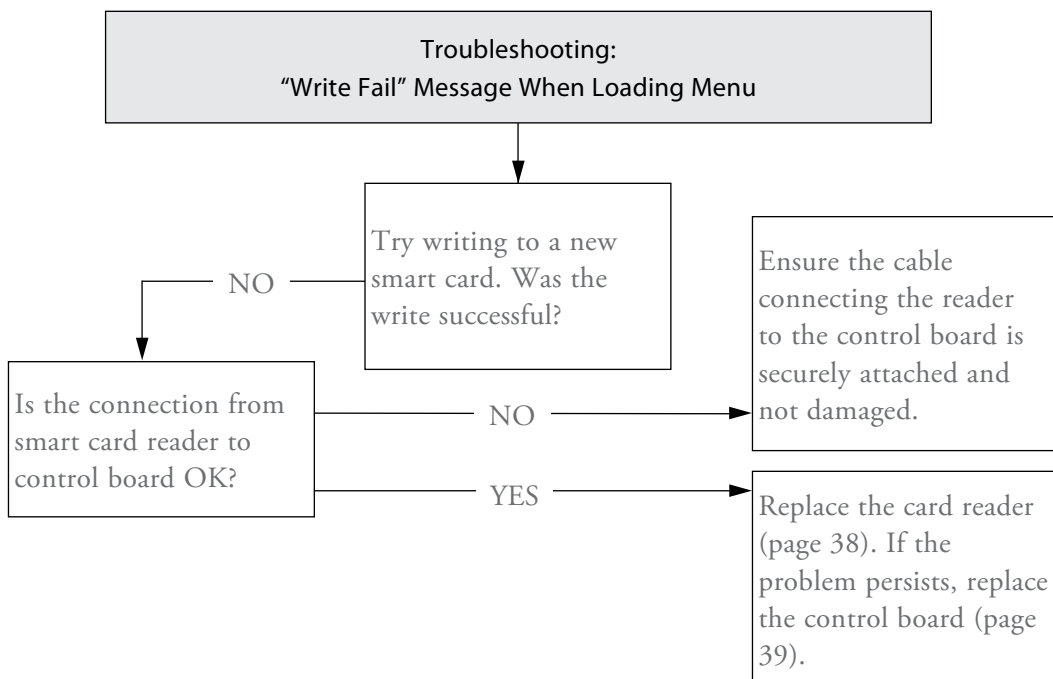
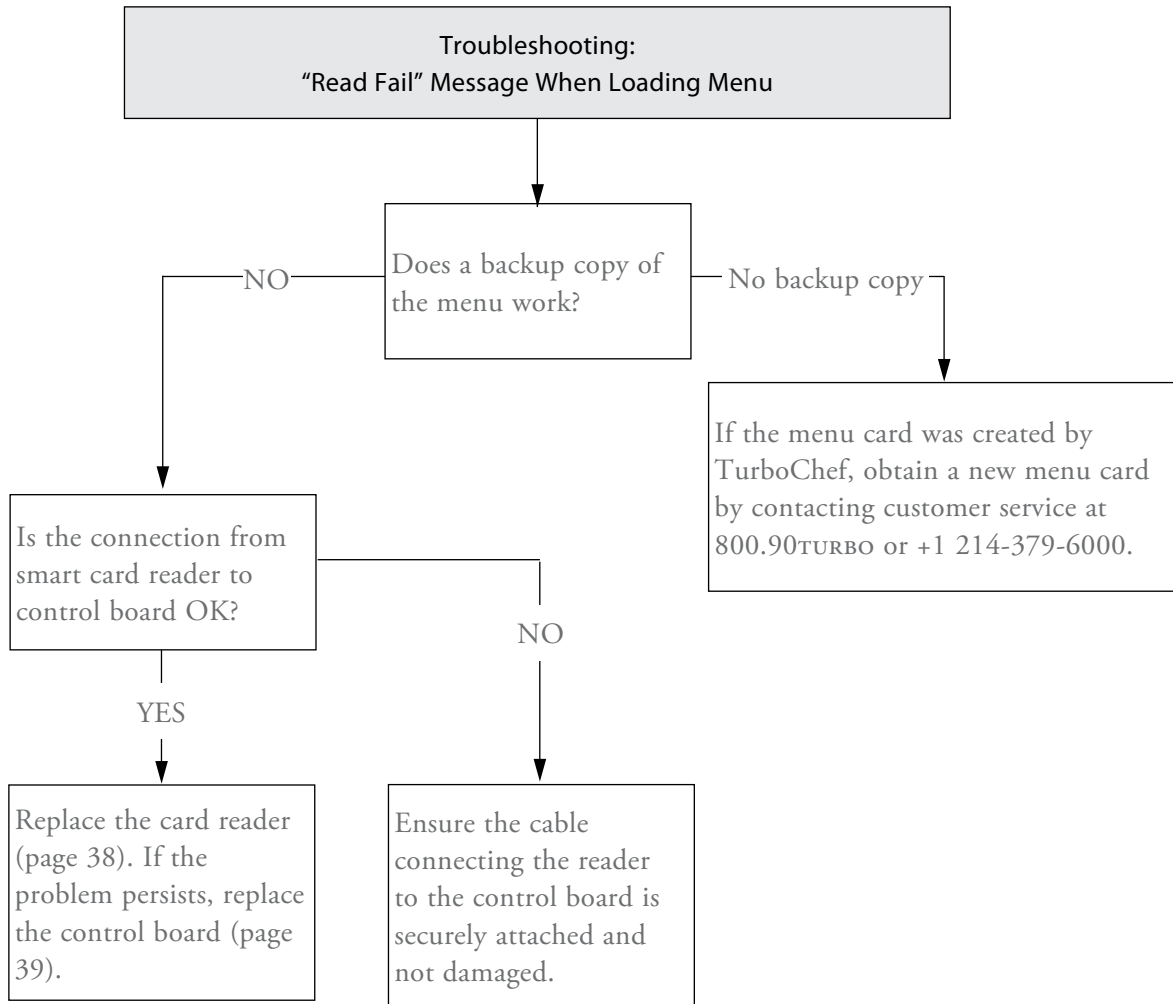
Non-Fault Code Troubleshooting

This section provides troubleshooting tips for issues that may occur independent of an oven fault.









*This page intentionally
left blank.*

The Control System

The control system signals, senses, commands, and actuates all electrical components within the oven. See page 49 for a schematic. See pages 38-40 for illustrations regarding part locations and replacement.

Components

The control system consists of the following components:

- Control board
- Cooling fans
- Display
- EMI filter
- Fuses
- Keypad
- Power cord
- Power supply
- Relay - rack oscillation motor
- Smart card reader
- Solid state relay
- Thermocouple – cook cavity
- Thermocouple – electrical compartment
- Thermostat – cooling fan
- Thermostat – high-limit
- Voltage sensor
- Wire harness

Control Board

Figure 32. The control board uses 24 VDC from the power supply to control each electrical component of the oven. Check for the 24 VDC on the striped end of the D6 Diode. See page 52 for the location of the D6 Diode on the control board.

Cooling Fans

Figure 32. The cooling fans (located in the rear of the oven) are actuated by the cooling fan thermostat when the temperature of the electrical compartment reaches 120°F (49°C).

Display

Figure 31. The vacuum fluorescent display (VFD) is the primary user interface. The display uses 5 VDC from the control board to operate.

EMI Filter

Figure 32. The EMI filter helps suppress the amount of RF interference emitted by the oven.

Fuses

Figure 34. The F1 and F2 fuses are 12-amp, ATMR, type D.

The F1 fuse (via brown wire) and F2 fuse (via blue wire) are designed to blow in case of an over-current situation relative to these components:

- BMSC motor controller
- Electrical compartment cooling fans
- Power supply
- Stirrer motor

Keypad

Figure 31. The keypad is a 5 x 11 matrix membrane switch. For details on key functions, see page 13.

Power Cord

The power cord is equipped with a grounding wire and plug. See page 2 for different plug configurations, or page 49 for a schematic. To avoid potential hazards, only the manufacturer, an authorized service agent, or a similarly-qualified person should replace a damaged power cord.

Power Supply

Figure 32. The power supply outputs 24 VDC at 40 watts to the control board.

Relay - Rack Oscillation Motor

Figure 32. The relay is 30 amp, double pole, double throw, 24 VDC, and actuates the rack oscillation motor.

Smart Card Reader

Figure 31. The smart card reader allows the oven operator to load menu updates from a smart card. A menu that already exists in the oven can also be saved to a smart card. For instructions, see page 15.

Solid State Relay (SSR)

Figure 32. The solid state relay is a 240 VAC, dual 40-amp relay. K4 (right) switches power to heater 1. K5 (left) switches power to heater 2. When the SSR is actuated, the (-) control input will go to 0.00 VDC. When not actuated, the control input will read -24.00 VDC.

Thermocouple – Cook Cavity

Figure 32. The cook cavity thermocouple is type K and measures the temperature of the recirculating impingement airflow. The thermocouple is “open” (F7 Fault) if the display shows 999°F/C.

Thermocouple – Electrical Compartment (EC)

Figure 32. The electrical compartment thermocouple is type K and measures the temperature of the electrical compartment. If the temperature within the electrical compartment is above 158°F (70°C), the control will display an F6 Fault. It is located on the 40-pin connector.

Thermostat – Cooling Fan

Figure 32. The cooling fan thermostat actuates the rear cooling fans when the electrical compartment temperature reaches 120°F (49°C).

Thermostat – High-Limit

Figure 34. The high limit thermostat is a three-pole, manual-reset thermostat with a trip point of 572°F (300°C). The thermostat interrupts power to the main convection heater in the event of an abnormal condition. Reset the high-limit thermostat by pressing the reset button (Figure 34).

Voltage Sensor

Figure 34. For North America oven models, the oven will detect 208 or 240 incoming voltage.

Initial voltage selection is determined before the oven is used by the customer. However, if incoming voltage for the store is different than the preset voltage, the operator must select either 208 or 240 after pressing the On/Off key to turn on the oven. The correct voltage will be enlarged on the screen, identifying which option to select.

Wire Harness

The wire harness distributes power to the oven's electrical components. (See schematic, page 49).

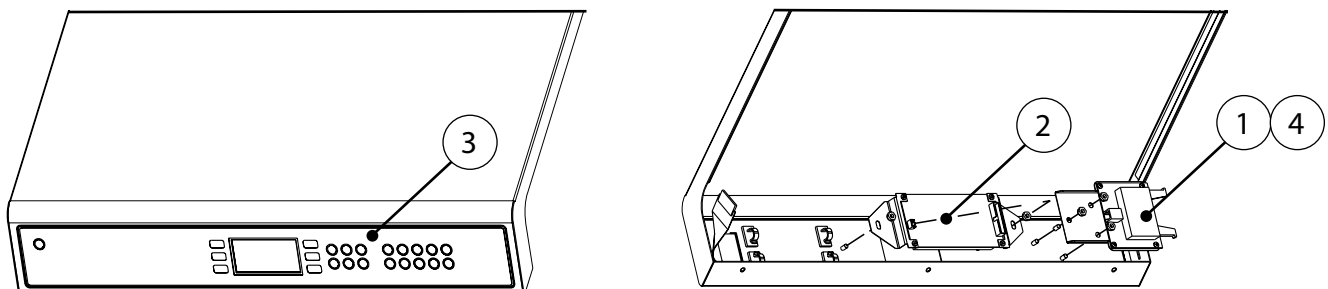


Figure 31: Control System Components - Keypad and Display Housing

Ref #	Part Description	Part Number	Hardware Description	Hardware #
1	Cable, Smart-Card, 30 inch	100161	N/A	N/A
2	Display with Ribbon Cable, Brackets	HHB-3204	Screw, #4-40 x 1/4", PPH, SS, Sems, Int Th Nut, Keps Hex, #10-32, Cres, Ext Th	101520 (qty 4) 102963 (qty 2)
3	Keypad, General Market	HHB-8244	N/A	N/A
4	Smart Card Reader	100506	Screw, #6-32 x 1/4", PPH, SS	101560 (qty 4)

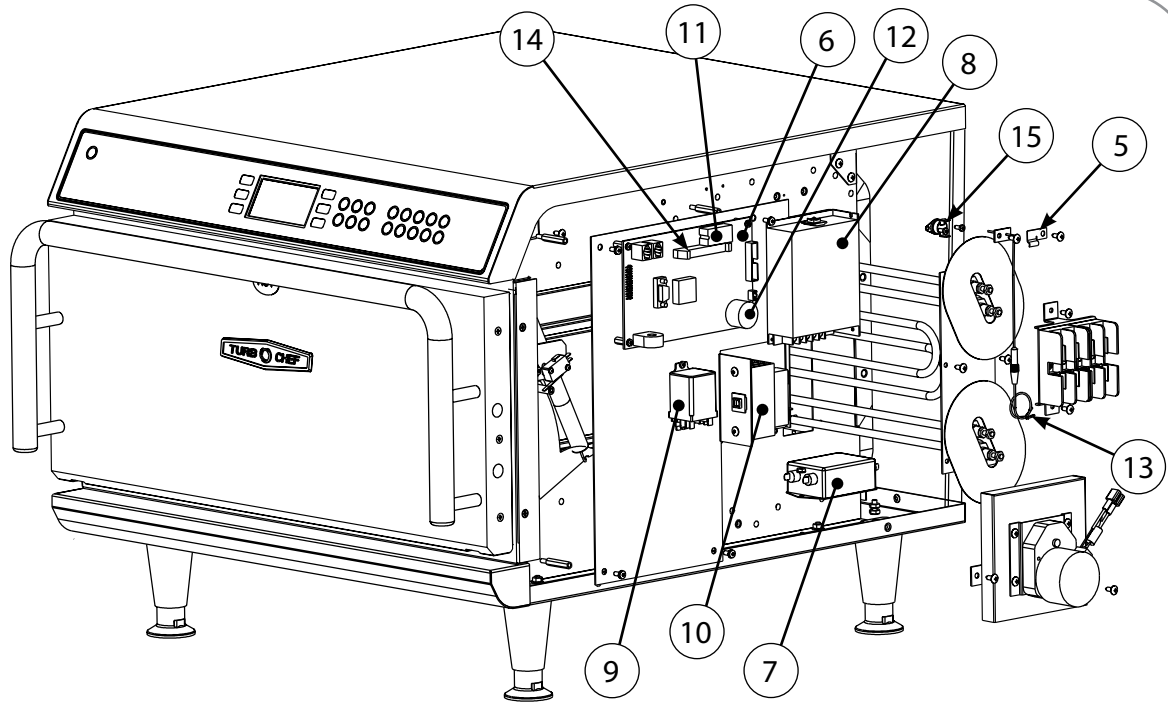


Figure 32: Control System Components - Right Side

Ref #	Part Description	Part Number	Hardware Description	Hardware #
5	Clamp, Thermostat	NGC-1152	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688
6	Control Board, Standard Kit (USA and Intl) Control Board, Dual Temp Kit (USA and Intl)	HHB-3213-X HHB-3222-X	Screw, 6-32 x 3/8, PPH M/S, Sems, Lock Wshr Standoff, #6-32 X 1/2	102911 (qty 4) 101952 (qty 4)
7	EMI Filter	100539	Nut, Keps Hex, #6-32, Ext Tooth, Cres	102961 (qty 2)
8	Power Supply, 24VDC	101211	Screw, 6-32 x 3/8, PPH M/S, Sems, Lock Wshr	102911 (qty 3)
9	Relay, Two Pole	101273	Screw, 6-32 x 3/8, PPH M/S, Sems, Lock Wshr	102911 (qty 2)
10	Relay, Solid State, Dual 40-Amp, Kit	NGC-3005	Screw, 6-32 x 3/8, PPH M/S, Sems, Lock Wshr	102911 (qty 2)
11	Software, Control, EPROM, HHB (Domestic Oven) Software, Control, EPROM, HHB (Dual Temp)	HHB-8243-1 HHB-8243-2	N/A	N/A
12	Sound Device, Alternate	NGC-3083	N/A	N/A
13	Thermocouple (Cook Cavity), Ungrounded, Assembly	HHB-8170	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 2)
14	Thermocouple, Electrical Compartment	700-1199	N/A	N/A
15	Thermostat (Cooling Fan), Snap Disk, N.O. Close on Rise 120°F	102086	Screw, #6-32 x 1/2, PPH, Drill Point, Zinc	101687 (qty 2)
N/A	Harness, HV, Fuses-Limit	HHB-8308	N/A	N/A
N/A	Harness, HV, Fuses-SSR-Hx	HHB-8310	N/A	N/A
N/A	Harness, Low V, Main	HHB-8311	N/A	N/A
N/A	Harness, HV, Main	HHB-8314	N/A	N/A
N/A	Harness, HV, Limit-Hx	HHB-8315	N/A	N/A

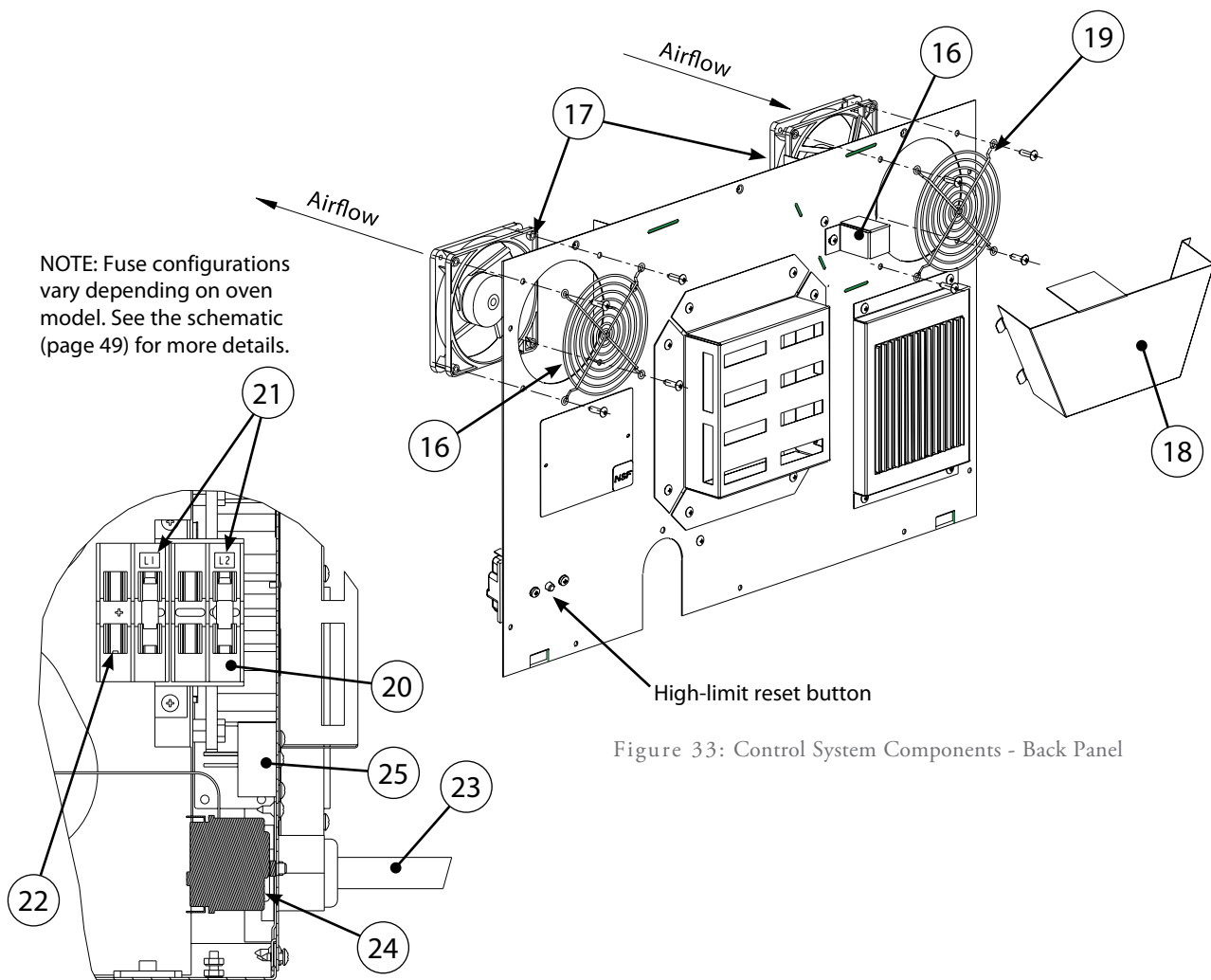


Figure 34: Control System Components - Lower Corner of Electrical Compartment

Ref #	Part Description	Part Number	Hardware Description	Hardware #
16	Baffle, Vent Tube	NGC-1085	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688
17	Cooling Fan	100516 (qty 2)	Screw, 10-32 x 1/2, PPHD, Type F, SS	101694 (qty 4 per)
18	Cover, Exhaust Fan	HHB-8281	N/A (attached via tabs)	N/A
19	Finger Guard, Fan	100087 (qty 2)	See item 13	See item 13
20	Fuse Block, 2 Pole	103548	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 2)
21	Fuse, 12 Amp, ATMR, Type D	100592 (qty 2)	N/A	N/A
22	Harness, Wiring, Jumper (Single Phase Ovens)	HHB-8312	N/A	N/A
23	Power Cord	See schematic (p. 49)	N/A	N/A
24	Thermostat, High-Limit, EGO 300°C Manual Reset, 3 Pole	102075	Screw, M4 x 6, PPH SQ CO Sems, Zinc	101672 (qty 2)
25	Voltage Sense Module (60 Hz USA Only)	100783	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688

The Convection System

The convection system is designed to rapidly heat, clean, and recirculate air into the cook cavity. See page 49 for a schematic. See pages 42-44 for illustrations regarding part locations and replacement.

Components

The convection system consists of the following components:

- Blower motor
- Blower motor speed controller
- Heaters
- Jetplates
- Jetplate support rails
- Oven rack
- Rack oscillation motor
- Swing arm assembly

Blower Motor

Figure 36. The convection motor is a brushless AC switch reluctance type. Its top speed is 7100 RPM at 1 HP. The motor is controlled by a proprietary controller, spins counterclockwise, and can be tested in Test Mode (page 26).

Blower Motor Speed Controller

Figure 36. The blower motor speed controller (BMSC) is proprietary and will only operate the convection motor described above. It is controlled via 0-10 VDC speed command from the control board. The BMSC can be tested in Test Mode by testing the blower motors (see page 26).

Heaters

Figure 37. There are two convection sheathed-style heaters, each rated at 3000 watts at 208 VAC with a resistance of 14.4 ohms. The heaters are controlled by the K4/K5 solid state relay. The heaters can be tested in Test Mode (see page 26).

Jetplates

Figure 35. The jetplates channel air from the blower motor into the cook cavity. Different hole patterns are available for custom cooking results; contact TurboChef for more details.

Jetplate Support Rails

Figure 35. Each jetplate is supported by two rails. These rails must be removed prior to replacing or removing the jetplate for cleaning (see page 10 for detailed cleaning instructions).

Oven Rack

Figure 35. The oven rack sits on two pins and oscillates to help ensure even cooking. Rack oscillation can be turned on or off on a per-item basis.

Rack Oscillation Motor

Figure 37. The rack oscillation motor actuates the swing arm assembly, which causes the rack to oscillate. The motor can be enabled on an item-by-item basis, and can be tested in Test Mode (page 26).

Swing Arm Assembly

Figure 38. The swing arm assembly consists of two arms connected by a link bar beneath the oven cavity. It is actuated by the rack oscillation motor.

Convection System Troubleshooting

The following faults may occur in relation to the convection system:

- F1: Blower (see page 28)
- F2: Low Temp (see page 29)
- F6: EC Temp (see page 30)
- F7: Thermo (see page 30)
- F8: Heat Low (see page 31)

The following cooking performance issues may occur in relation to the convection system:

- Food not cooking properly (see page 34)

NOTE: Oven door removed for illustration clarity;
not required for removing cavity components.

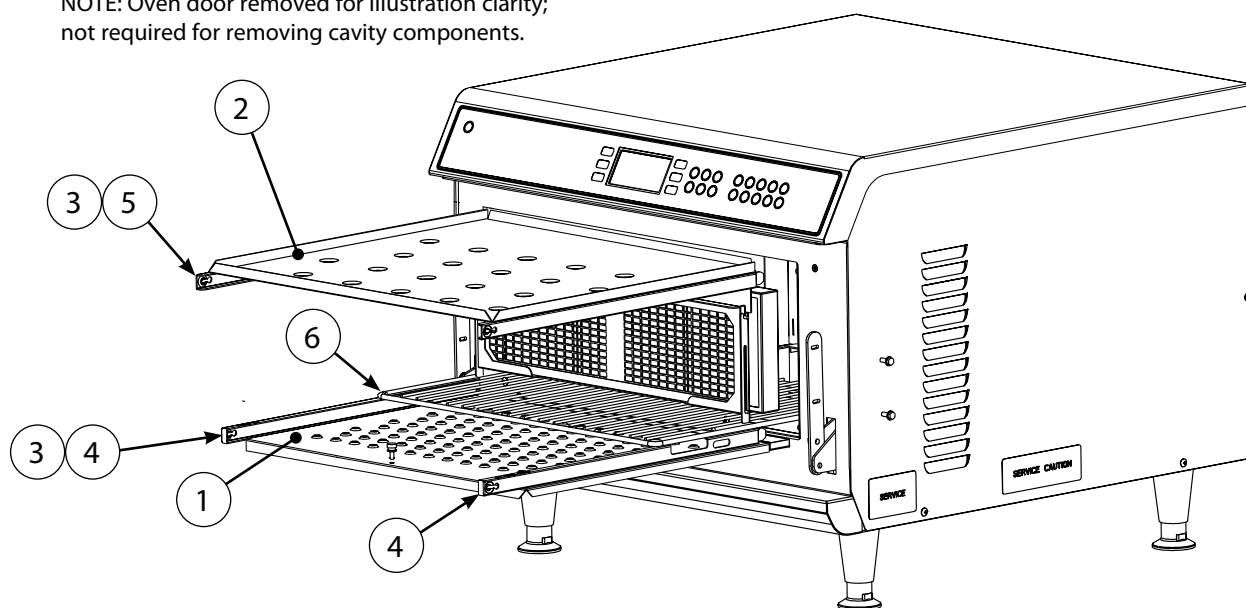


Figure 35: Convection System Components - Oven Cavity

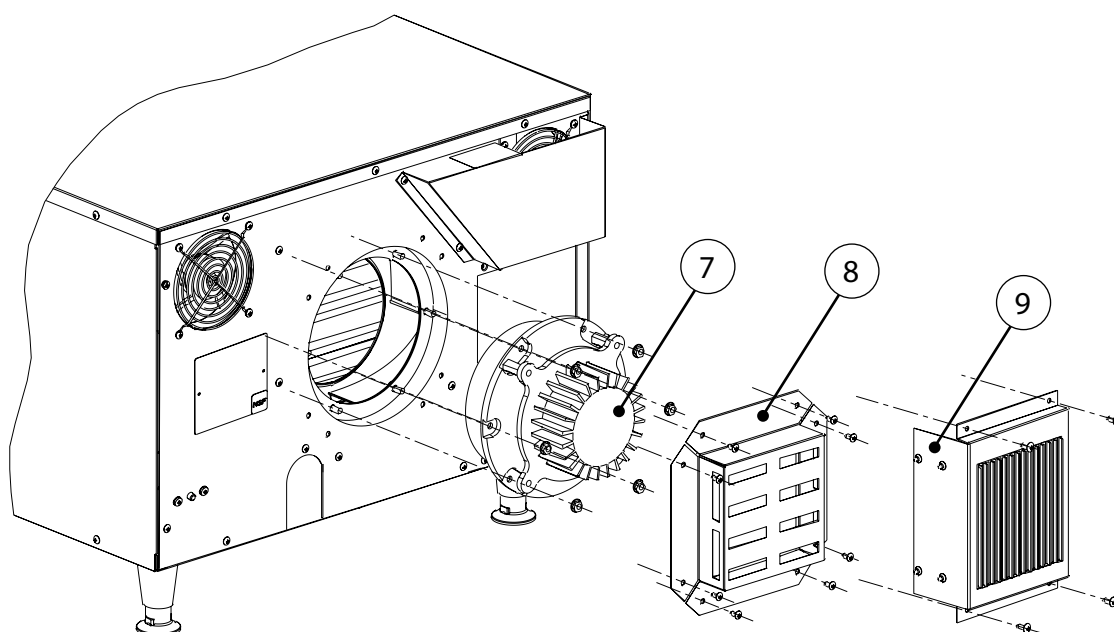


Figure 36: Convection System Components - Back Panel

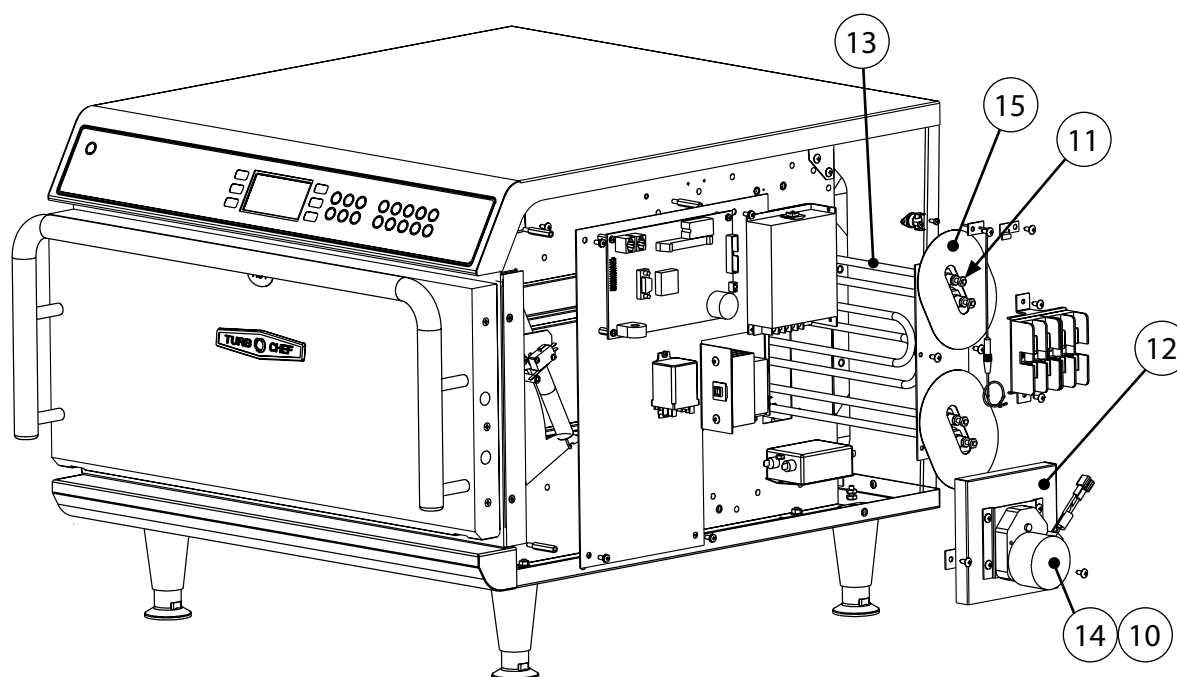


Figure 37: Convection System Components - Right Side

Ref #	Part Description	Part Number	Hardware Description	Hardware #
1	Jetplate, Bottom, Standard	HHB-8013-1	Screw, Thumb, 8-32 x 3/8, SS Washer, Split Lock, #10	101748 102350
	Jetplate, Bottom, High Coverage	HHB-8155-1		
	Jetplate, Bottom, Pizza	HHB-8156-1		
	Jetplate, Bottom, Super Coverage	HHB-8212-1		
2	Jetplate, Top, Standard	HHB-8013-2	N/A	N/A
	Jetplate, Top, High Coverage	HHB-8155-2		
	Jetplate, Top, Pizza	HHB-8156-2		
	Jetplate, Top, Super Coverage	HHB-8212-2		
3	Rail Stud (x4), Kit	HHB-3210	N/A	N/A
4	Support Rails, Left and Right, Bottom Kit	HHB-3214	N/A	N/A
5	Support Rail, Top (qty 2)	HHB-8117	N/A	N/A
6	Oven Rack, Standard	HHB-8104	N/A	N/A
	Oven Rack, Double-Sided	HHB-8118		
7	Blower Motor	HHB-8106	Nut, 1/4-20, Serrated Hex Flange, Zinc	100906 (qty 6)
8	Blower Motor Cover	NGC-1081	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 8)
9	Blower Motor Speed Controller	CON-7013	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 4)
10	Bell Crank, Motor Mount	HHB-8296	N/A	N/A
11	Cap, Silicone, Ultra-Bake (qty 4)	100795	N/A	N/A
12	Cover, Swing Arm, with Mount	HHB-8293	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 2)
13	Heater Kit	HHB-3216	Screw, #8 x 3/8 Phil. Mod. Truss B 410 SS	101682 (qty 2)
			Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 4)
14	Rack Motor, Kit	HHB-3231*	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 4)
15	Shield, Heater Insulation (qty 2)	i5-9216	N/A	N/A

* HHB-3231 kit includes item 13.

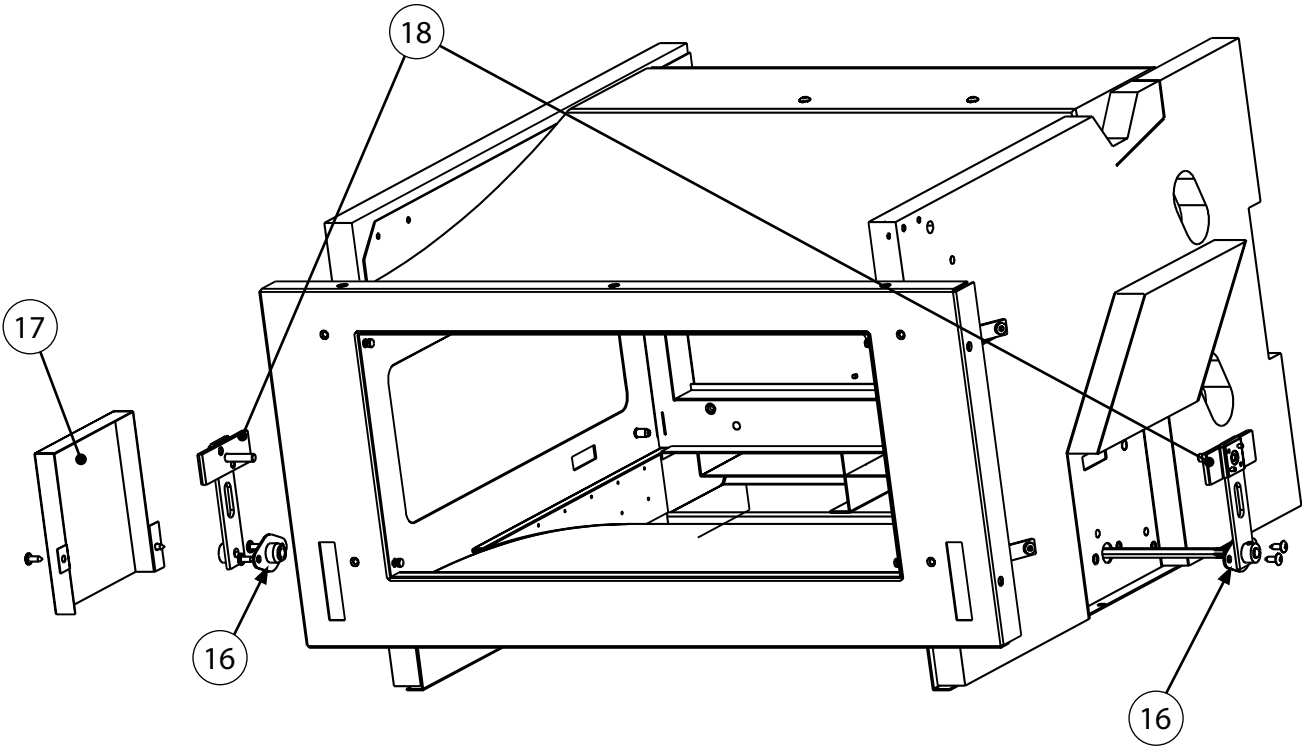


Figure 38: Convection System Components - Swing Arms and Link Bar

Ref #	Part Description	Part Number	Hardware Description	Hardware #
16	Bushing, Swing Arm, 5/16 Flange Mount (qty 2)	100152	N/A	N/A
17	Cover, Swing Arm, No Mount	HHB-8297	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 2)
18	Swing Arms, Kit	HHB-3227	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 4)

The Oven Door

Components

The oven door consists of the following components:

- Door Gasket
- Door Handle
- Door Hinges
- Door Skin
- Door Interlock Switch

Door Gasket

The door gasket ensures a proper seal when the door is closed.

⚠ CAUTION: Do not scrub the gasket or attempt to scrape beneath it. Doing so will damage the gasket, resulting in a non-warranty service call.

Door Handle

If damaged, the door handle can be replaced without replacing the entire door.

Door Hinges

The door hinges are spring-loaded and unlike the original HhB oven, the design will not allow for door removal during cleaning.

Door Skin

If damaged, the door skin can be replaced without replacing the entire door.

Door Interlock Switch

The interlock switch engages and disengages when the door is opened/closed, alerting the control system of the oven door state.

To adjust the door interlock switch, follow the steps below.

1. Ensure the oven is at operating temperature.
2. Confirm the door closes properly.
3. Adjust the door interlock switch paddle arm to close completely, but not touching the switch itself.
4. Tighten the three adjustment screws.

Removing/Reinstalling the Oven Door

To remove or reinstall the oven door, follow the steps below.

1. Ensure the oven has cooled to 150°F (66°C).
2. Open the oven door to its full open position and insert rivets, screws, or nails as shown in Figure 40 to hold the hinges in the open position.
3. Remove the four plastic plugs (two per side) and the four 5/16 hex standoffs (two per side) that attach the oven door to the hinges.
4. Carefully remove the oven door by pulling the door away from the oven. It will slide off the hinges.
5. To reinstall or fit a new door, carefully slide it back onto the hinges and replace the four 5/16 hex standoffs (two per side).
6. Carefully remove the rivets, screws, or nails you inserted in step 2.
7. Close the oven door.
8. Verify that the door is parallel to the oven frame. If it is not parallel, complete the following:
 - Incrementally, loosen the four 5/16 hex standoffs until you can manually adjust the door.
 - Gently push/pull the door towards/away from the oven frame until the door and oven frame are parallel.
 - Tighten the four 5/16 hex standoffs and replace the four plastic plugs.
9. From Test Mode (page 26), check the status indicator D to verify the switch engages (door closed) and disengages (door open) properly and adjust if necessary (see steps in “Door Interlock Switch” section, adjacent).

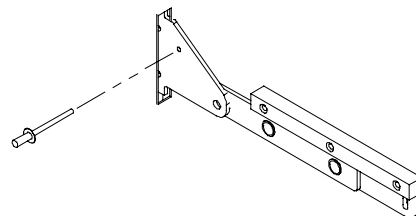


Figure 39: Insert Rivet/Screw/Nail to Keep Hinge Open

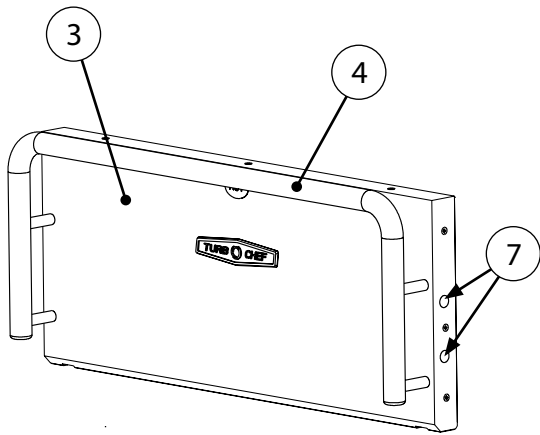


Figure 40: Oven Door

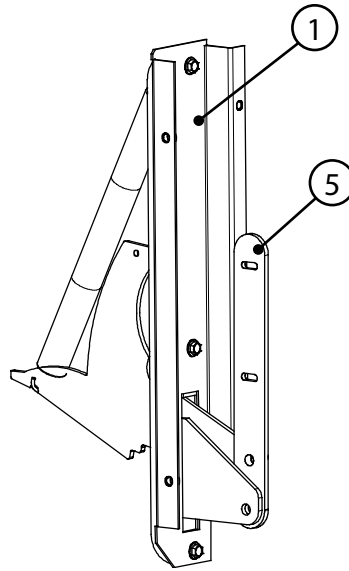


Figure 41: Left Hinge Detail

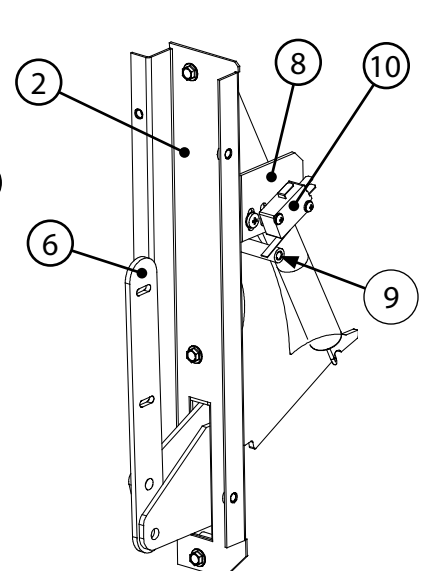


Figure 42: Right Hinge Detail

Ref #	Part Description	Part Number	Hardware Description	Hardware #
1	Bracket, Hinge Support, Left	HHB-8238	Screw, #8-32 x 3/8, Hex Washer Head	102953 (qty 3)
2	Bracket, Hinge Support, Right	HHB-8239	Screw, #8-32 x 3/8, Hex Washer Head	102953 (qty 3)
3	Door, Complete Assembly	HHB-3232	Standoff, 5/16 Hex, 1.125L, 10-32 M/F Hole Plug, Door, 1/2" Black	101924 (qty 4) 101191 (qty 4)
4	Door Handle	HHB-8240	Bolt, #1/4-20 x 1.0, Hex, Serr, SS	102945 (qty 4)
5	Hinge, Left	102805	Screw, #8-32 x 3/8, PPHD, Int Sems, SS Screw, #8-32 x 3/8, Hex Wshr Head Bracket, Hinge Support, Left	102809 (qty 4) 102953 (qty 3) HHB-8238
6	Hinge, Right	102804	Screw, #8-32 x 3/8, PPHD, Int Sems, SS Screw, #8-32 x 3/8, Hex Wshr Head Bracket, Hinge Support, Right	102809 (qty 4) 102953 (qty 3) HHB-8239
7	Hole Plug, Door (qty 4)	101191	N/A	N/A
8	Plate, Door Switch	NGC-1126	Screw, #8-32 x 3/8, PPHD, Int Sems, SS	102921
9	Standoff, #8-32 x 3/8 x 1.0 Lg, 5/16/ F/F	101914	Screw, #8-32 x 1/2, PPHD, Int Sems, SS	102923
10	Switch, Interlock	102012	Screw, #4-40 x 3/4, Sems, PPHD, SS	102904 (qty 2)

The Filtering System and Miscellaneous Components

Filtering System Components

The filtering system consists of the following components:

- Grease filter
- Grease filter frame
- Catalytic converter

Grease Filter

The grease filter is located on the rear cavity wall and helps remove grease and food particles from the recirculating airflow. Checking the filter daily is recommended to ensure optimal oven operation. See page 9 for cleaning instructions.

Grease Filter Frame

The grease filter frame is designed to pivot forward for easy removal of the grease filter. See page 9 for removal and cleaning instructions.

Catalytic Converter

The catalytic converter, a VOC type catalyst, is located behind the rear cook cavity wall and is responsible for cleaning the recirculating airflow. The catalyst functions by substantially lowering the combustion temperature of grease entrained in the air path to approximately the same temperature of the airflow, thus the grease burns and breaks down into CO_2 and H_2O as it passes through the catalytic converter. The catalyst will operate most efficiently at temperatures above 475°F (246°C).

The catalytic converter is self-cleaning. It is not a component that requires scheduled maintenance. Additionally, the catalyst material is very sensitive to certain chemical compounds. Irreversible damage can occur if the catalyst is exposed to cleaning chemicals containing phosphates, NaOH , silicates, Na and Potassium Salts; therefore, use only Turbo-Chef Oven Cleaner when cleaning the oven.

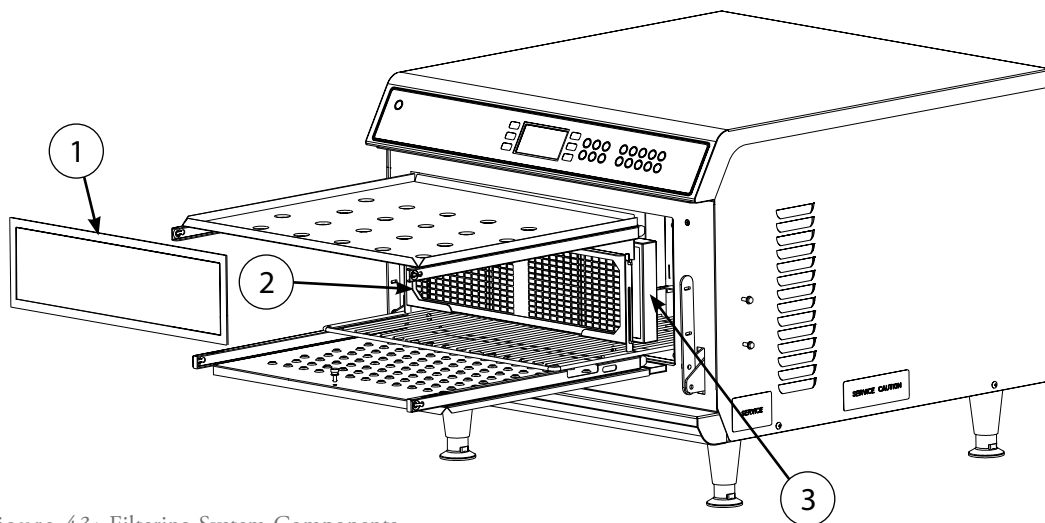


Figure 43: Filtering System Components

Ref #	Part Description	Part Number	Hardware Description	Hardware #
1	Filter, Grease	HHB-8287	N/A	N/A
2	Filter, Bracket	HHB-8288	N/A	N/A
3	Catalytic Converter	HHB-8108	N/A	N/A

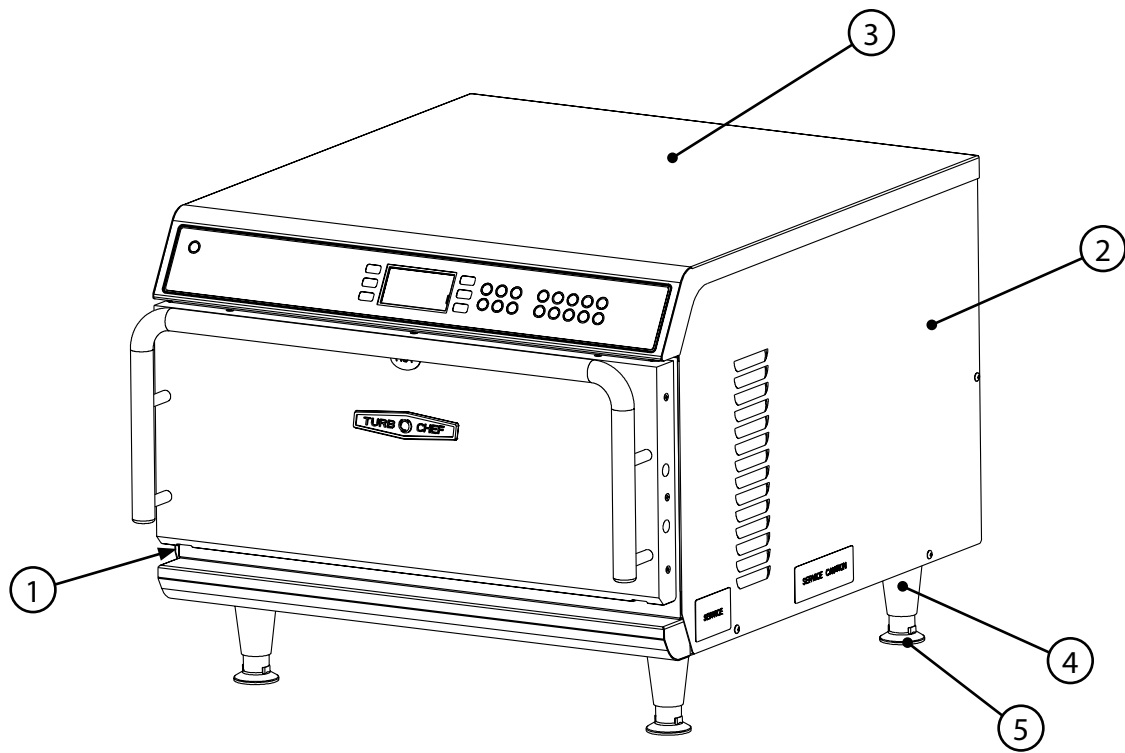


Figure 44: Miscellaneous Components

Ref #	Part Description	Part Number	Hardware Description	Hardware #
1	Cover, Left Side	HHB-8271	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 3)
2	Cover, Right Side	HHB-8272	Screw, #8 x 1/2 PTRH, Type 17, Serr, 410 SS	101688 (qty 3)
3	Cover, Top/Controls	HHB-8254	Screw, #10-32 x .38 Lg, 100 Deg, PFLHD, SS	101401 (qty 3)
4	Leg, with Pad (qty 4)	HHB-3205	N/A	N/A
5	Pad, Abrasive (qty 4)	NGC-1440	N/A	N/A

Schematics

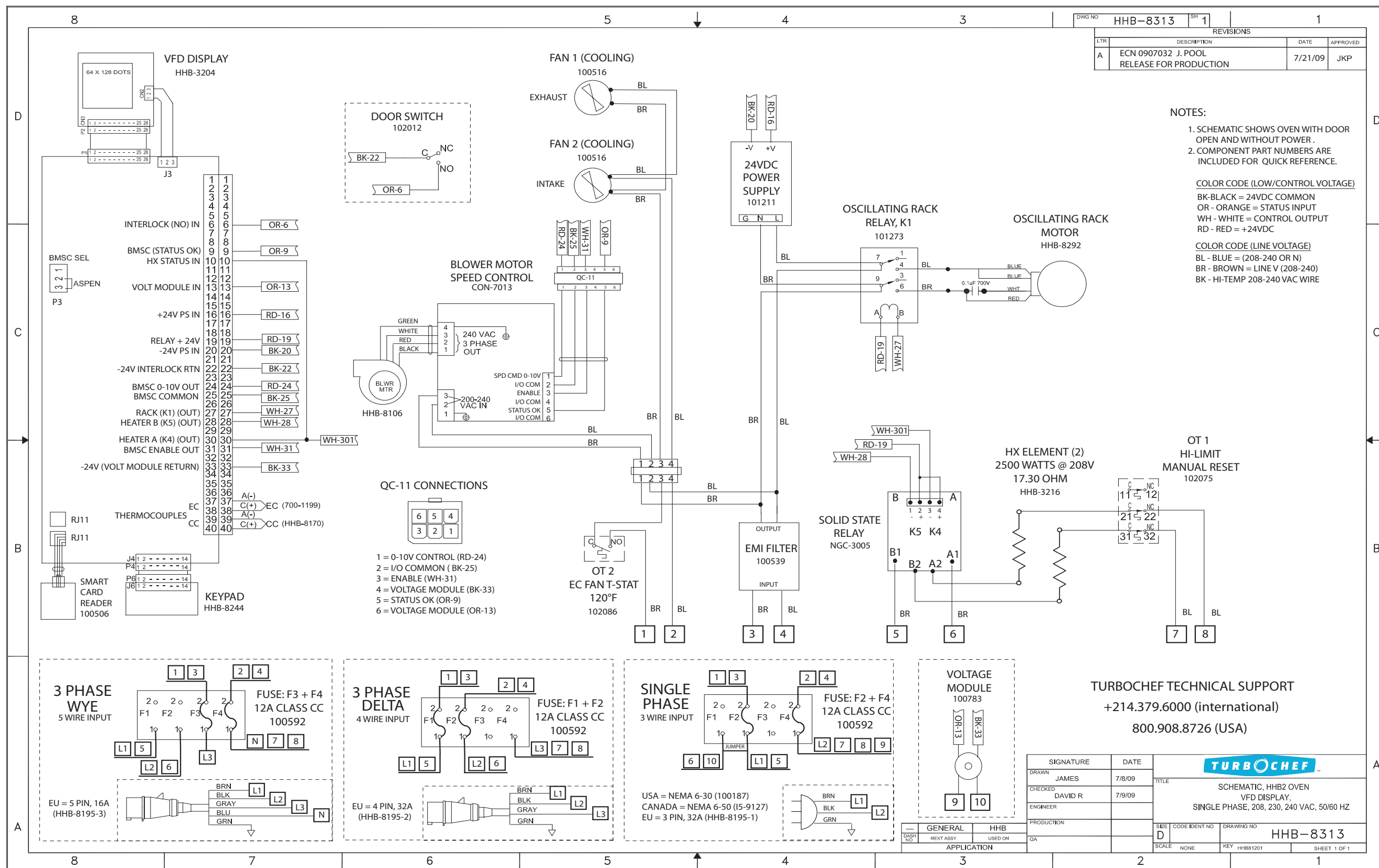


Figure 44: High h Batch 2 Schematic

*This page intentionally
left blank.*

HhB 2 Oven Schematic

Figure 45, page 49.

NOTE: Schematic shows the oven with door open and without power applied.

Color Code (Line Voltage)

BL – Blue = Line V (208/240)

BR – Brown = Line V (208/240)

Color Code (Low/Control Voltage)

BK – Black = 24 VDC Common

OR – Orange = Status Input

WH – White = Control Input

RD – Red = +24 VDC

Line Voltage Components

Blower Motor

Blower Motor Controller

Cooling Fans

Fuses

Heater Element

Power Supply, +24VDC

Rack Oscillator Motor

Relay

Solid State Relay

Thermostat – Cooling Fan

Thermostat – Hi-Limit

Voltage Sensor Module

Wiring Harness – Line Voltage

Low Voltage Components

Cable – Smart Card Connector

Display, VFD

Door Switch

I/O Control Board

Keypad

Ribbon Connector – Display

Smart Card Reader

Thermocouple – CC

Thermocouple – EC

Wiring Harness – Low Voltage

I/O Control Board Component Identification and Test Point Locations

Figure 46, page 52

J2 40-Pin Connector for LV Harness

J3 3-Pin Connector for VFD Display

J4 14-Pin Connector for Keypad

J5 26-Pin Connector for Display Data

RJ11 Connector for Smart Card Cable

U15 EPROM Socket

P1 Voltage Reference 0-5 VDC

P3 Blower Controller Pin Configuration

SKP1 Beeper

R51 Beeper Volume Adjustment

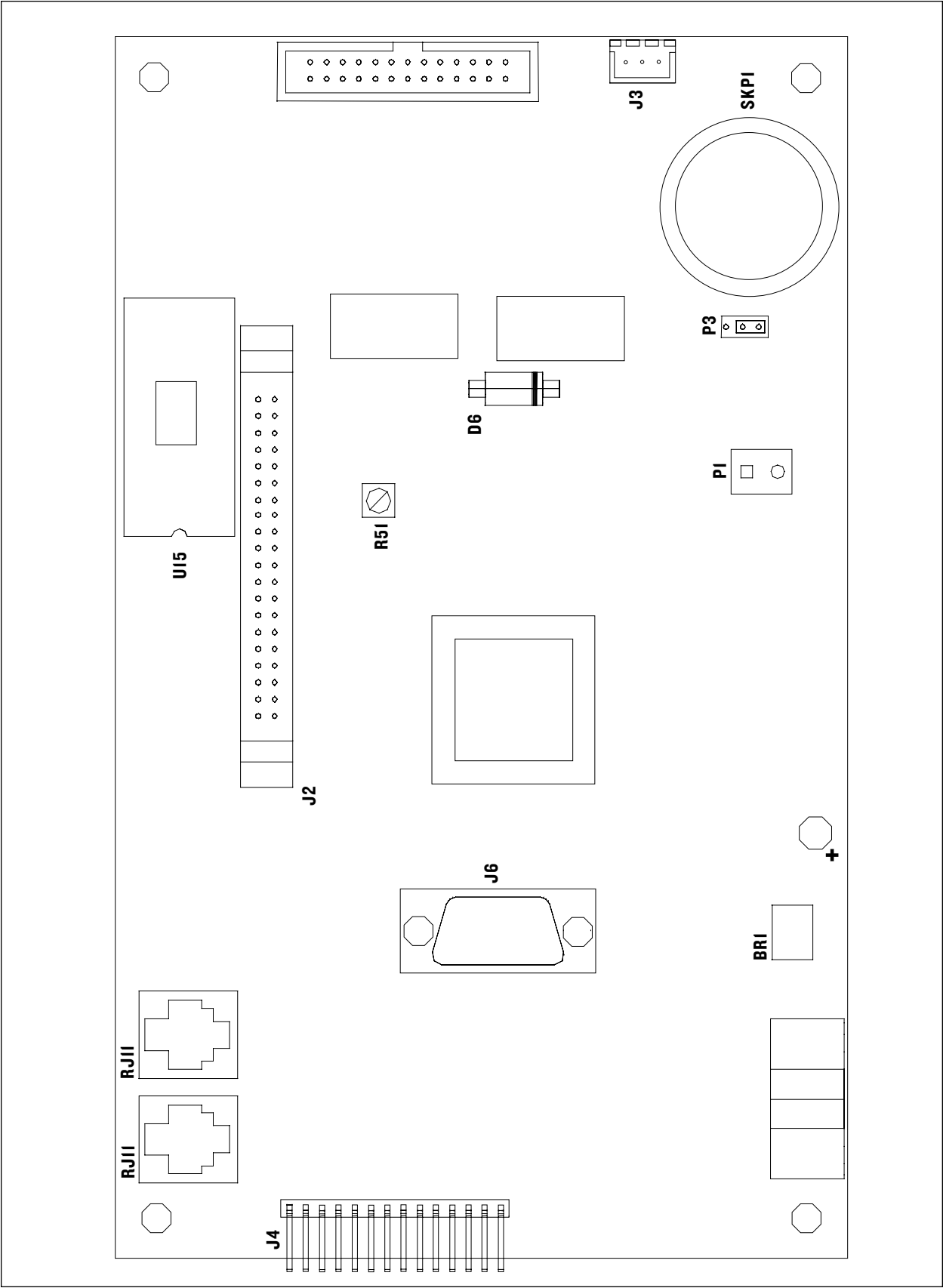


Figure 46: I/O Control Board and Test Point Locations

For further information call:
Customer Service *at* 800.90TURBO
Sales and Marketing *at* 866.90TURBO



Global Operations
4240 International Pkwy, Suite 105
Carrollton, Texas 75007
214.379.6000 PHONE
214.379.6073 FAX

Customer Service
800.90TURBO

turbochef.com