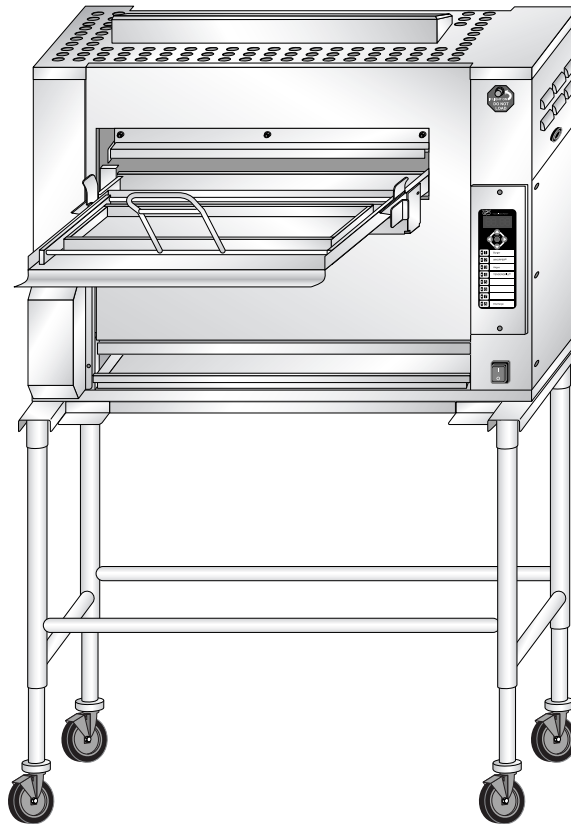




*Your Solutions Partner*

# **Installation and Operation Manual**

## **BURGER KING FLEXIBLE BATCH BROILER**



**Please read this manual completely before attempting  
to install, operate or service this equipment**

---

*This manual is Copyright © 2013 Duke Manufacturing Co. All rights reserved.  
Reproduction without written permission is prohibited. Duke is a registered  
trademark of the Duke Manufacturing Co.*

### **Duke Manufacturing Co.**

**2305 N. Broadway  
St. Louis, MO 63102  
Phone: 314-231-1130  
Toll Free: 1-800-735-3853  
Fax: 314-231-5074  
[www.dukemfg.com](http://www.dukemfg.com)**

# TABLE OF CONTENTS

IMPORTANT WARNING AND SAFETY INFORMATION .....	4
I. GENERAL INFORMATION.....	5
A. BATCH BROILER SPECIFICATIONS.....	5
A-1.0 Model Number Key .....	5
A-2.0 Broiler Dimensions .....	6
II. INSTALLATION INSTRUCTIONS .....	7
A. QUALIFIED PERSONNEL.....	7
B. DELIVERY AND INSPECTION .....	8
C. BROILER ASSEMBLY .....	9
Setup.....	9
D. ADJUSTMENTS AT INSTALLATION .....	10
Raise or Lower Broiler.....	10
E. LOCATION OF THE BROILER.....	11
F. GAS PIPING.....	11
NOTICE TO INSTALLER:.....	11
G. ELECTRICAL CONNECTIONS.....	11
H. VENTILATION.....	12
Venting to a Canopy Exhaust Hood .....	12
Maintenance of Ventilation System .....	12
III. OPERATION INSTRUCTIONS.....	13
A. BROILER CONTROLS .....	13
B. COOKING PRODUCT .....	14
B-1.0 Lighting the Broiler.....	14
B-2.0 Cook Product.....	14
B-3.0 Cook Cycle Complete .....	15
B-4.0 Fine Cooking Adjustment.....	15
B-5.0 Cancel a Cook Cycle .....	15
B-6.0 Checking the Broiler Temperature .....	15
B-7.0 Checking the Set Point Temperature .....	15
B-8.0 Shutdown the Broiler .....	15
C. CLEANING .....	16
C-1. Four (4) Hour Cleaning.....	18
C-2. Daily Cleaning .....	19
C-3. Weekly Cleaning.....	21
CLEANING CONSIDERATIONS.....	22
SAFETY CONSIDERATIONS .....	22
C-4. Monthly Cleaning.....	24
D. PROGRAMMING THE CONTROL .....	25
D-1.0 Entering Program Mode .....	25
D-2.0 Navigating the Programming Screens.....	25
D-3.0 Level 1 Programming .....	25
D-3.1 Product Identifier AbCd.....	25

D-3.2 Cook Temperature "Sett" .....	25
D-3.3 Cooking Profile "on 1", "oFF1", "on 2", "oFF2" .....	25
D-3.4 Exit Program Mode .....	26
D-4.0 Level 2 Programming .....	26
D-4.1 °F or °C Parameter "dEg" .....	26
D-4.2 Change the Idle Temperature "Sett" .....	26
D-4.3 Additional Factory Parameters .....	26
D-4.4 Exit Program Mode .....	26
E. TROUBLESHOOTING .....	27
IV. SERVICE AND REPAIR .....	29
V. REPLACEMENT PARTS LIST .....	30
VI. ELECTRICAL SCHEMATIC .....	32

## IMPORTANT WARNING AND SAFETY INFORMATION

**POST IN A PROMINENT LOCATION** instructions to be followed in the event the user smells gas. This information shall be obtained by consulting the local gas supplier.

### FOR YOUR SAFETY:

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

**⚠ 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.

**THIS MANUAL MUST BE RETAINED FOR FUTURE REFERENCE.**

# I. GENERAL INFORMATION

## A. Batch Broiler Specifications

FLEXIBLE BATCH BROILER SPECIFICATIONS				
	NATURAL GAS		PROPANE	
ALTITUDE (MAXIMUM)	2000 FT	607 m	2000 FT	607 m
GAS PIPE CONNECTION	3/4" F-NPT		3/4" F-NPT	
INLET PRESSURE RANGE	7" – 12" W.C.		10" – 12" W.C.	
	MANIFOLD PRESSURE		MANIFOLD PRESSURE	
INFRARED BURNERS (TOP)	3.75" W.C.	0.93 kPa	8.0" W.C.	2.0kPa
LOWER BURNER	3.75" W.C.	0.93 kPa	8.0" W.C.	2.0kPa
TOTAL ENERGY RATE	87000 – 111,000 BTU/HR	25.5 – 32.5 kW	79,000 – 105,000 BTU/HR	23.2 – 30.7 kW
	BURNER ORIFICE SIZE		BURNER ORIFICE SIZE	
FRONT INFRARED BURNER	#40	2.49mm	#52	1.61mm
BACK INFRARED BURNER	#36	2.70mm	#51	1.70mm
LOWER BURNER	#31	3.05mm	#49	1.85mm

**SHIPPING WEIGHT:** 482 lbs (219 Kg)

**SHIPPING DIMENSIONS:** 47" x 34" x 68" (119.4 x 86.4 x 172.7 cm)

MODEL NUMBER	ELECTRIC	NATURAL & LP GAS
FBB-NO-120	120VAC, 2A, 60Hz	87,000 – 111,000 BTU/HR
FBB-NC-120	120VAC, 2A, 60Hz	87,000 – 111,000 BTU/HR
FBB-PO-120	120VAC, 2A, 60Hz	79,000 – 105,000 BTU/HR
FBB-PC-120	120VAC, 2A, 60Hz	79,000 – 105,000 BTU/HR

### A-1.0 Model Number Key

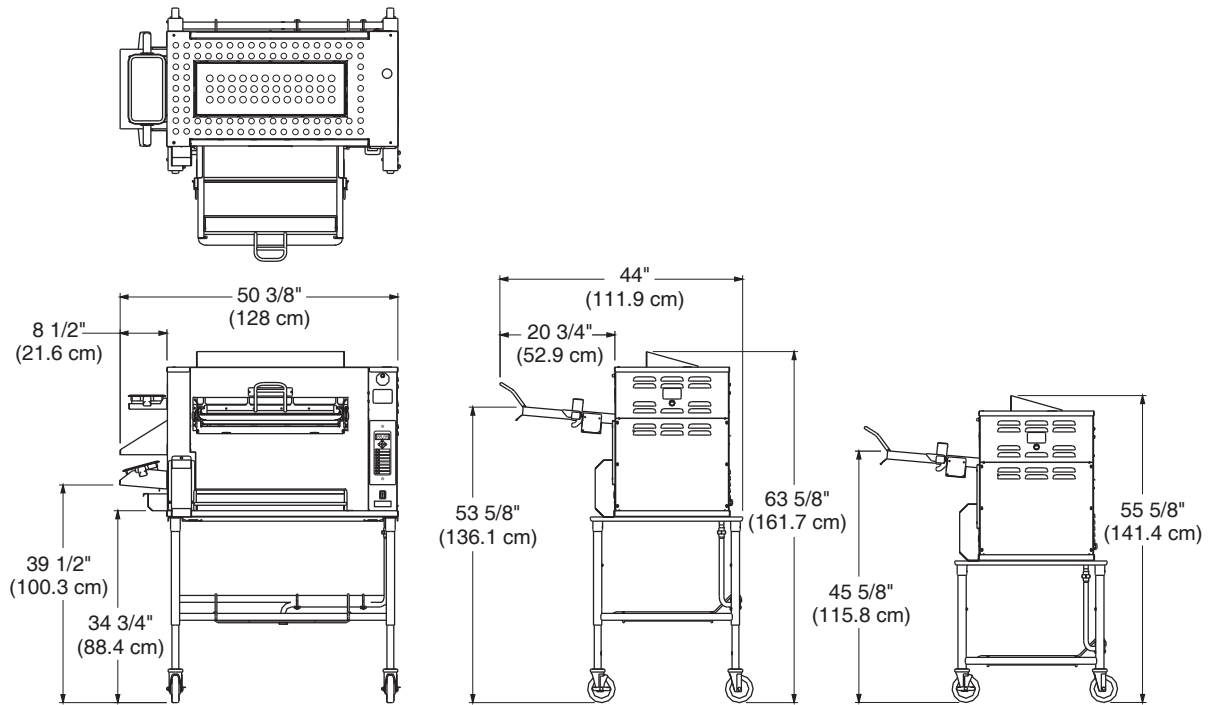
FBB-X Y -120

X = N (NATURAL GAS) OR P (PROPANE / LP GAS)

Y = O (NO CATALYST) OR C (CATALYST)

120 = 120 VOLTS

### A-2.0 Broiler Dimensions



## II. INSTALLATION INSTRUCTIONS

### A. QUALIFIED PERSONNEL

These installation instructions 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 broiler and/or injury to the operator.

Qualified installation personnel are those individuals, firms, companies or corporations which either in person or through an agent is engaged in and responsible for:

- The installation or replacement of gas piping or the connection, installation, repair or servicing of equipment, who are experienced in such work, familiar with all precautions required, and have complied with all requirements of state and local authorities having jurisdiction. See: National Fuel Gas Code NFPA 54 (ANSI Z223.1).
- The installation of electrical wiring from the electric meter, main control box or service outlet to the electrical appliance. Qualified installation personnel must be familiar with all precautions required and have complied with all requirements of state and local authorities having jurisdiction. See: National Electrical Code, ANSI/NFPA70.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

The installation must conform with local codes, or in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1 as applicable, including:

- The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of ½ psi (3.5 kPa).
- The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than ½ psi (3.5 kPa).

For a broiler mounted on casters, the installation shall be made with a connector that complies with the Standard for Connectors for Movable Gas Appliances, ANSI Z21.69/CSA 6.16 and a quick-disconnect device that complies with the Standard for Quick-Disconnect Devices for Use with Gas Fuel, ANSI Z21.4/CSA 6.9. When installing the broiler with casters and quick-disconnect hose, adequate means must be provided to limit the movement of the broiler without depending on the connector and the quick disconnect device or its associated piping to limit the broiler movement. A means for restraining may be attached to the vertical portion of the base frame in the rear of the broiler.

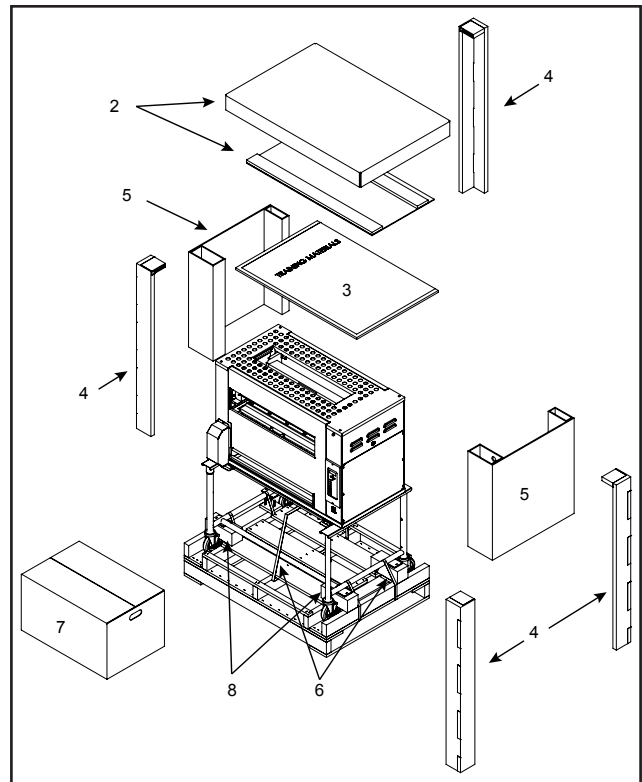
## B. DELIVERY AND INSPECTION

Duke Manufacturing Co. does everything within its power to insure you received your broiler in good condition. They are strapped down on heavy wooden skids and packed to prevent shipping damage. They have all been carefully inspected before they were packaged and consigned to the carrier.

Upon delivery of your Duke broiler:

- Look over the shipping container, carefully noting any exterior damage on the delivery receipt, which must also be signed by the driver/ delivery person.
- Unpack and check for any damage, which was not evident on the outside of the shipping container.
- Check for concealed damage. The carrier must be notified within fifteen (15) days of the delivery of the broiler and the carton, skid and all packaging materials must be retained for inspection.

Duke Manufacturing Co. cannot assume liability for loss or damage suffered in transit. The carrier assumes full responsibility for delivery in good order when the shipment was accepted. However, we are prepared to assist you in filing your claim.



**Caution: The broiler is very heavy!  
Use adequate help when lifting.**

- 1) Using a utility knife, cut away plastic wrap (Not shown).
- 2) Remove the top cardboard and inner cap.
- 3) Remove Training Material Box
- 4) Remove cardboard from the corners (4 places).
- 5) Remove cardboard on the ends (2 places).
- 6) Remove banding straps (Cut with utility knife or scissors: 5 places).
- 7) Remove box of attachable parts & accessories from the front.
- 8) Safely lift one end of broiler and tap block towards center and then sideways to remove. Repeat for remaining blocks. This allows casters to touch the pallet.
- 9) Remove the broiler from the shipping pallet using 3 people to guide and distribute it's weight (approx 335 lbs) accordingly. While carefully supporting the broiler. Roll it forward until the front casters are clear of the pallet. Lift the broiler 6-8 inches above and away from the pallet, and gently place on floor to avoid damage to casters.
- 10) Remove protective blue tape from broiler panels, double checking that no tape remains.



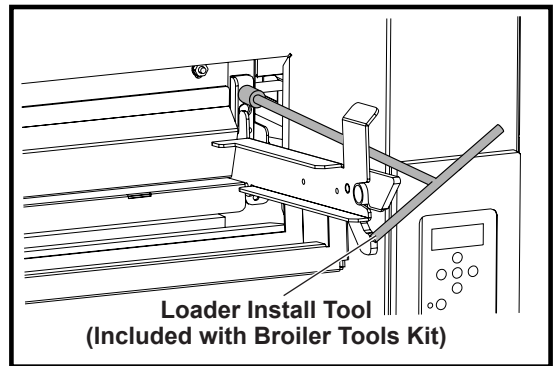
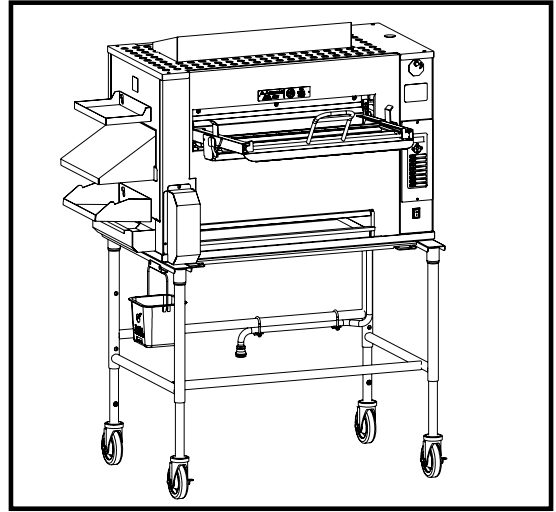
### C. BROILER ASSEMBLY

Before assembling and installing the broiler, please check to make sure that all necessary parts are present.

ITEM	PART NAME	PT.NO.
1	PRODUCT PAN SHELF	175353
2	DISCHARGE CHUTE	175340
3	DISCHARGE HOOD	175778
4	DISCHARGE PAN HOLDER	175358
5	DISCHARGE GREASE PAN	175357
6	"V" GREASE PAN	175325
7	MAIN GREASE PAN	175329
8	LOADER	175444
9	LOADER TRAY	175430
10	LOADER BRACKET	175438
11	DOOR	175429
12	LOADER RAMP	175741
13	IMPEDANCE PAN	175226
14	CATALYST (OPTIONAL)	175480
15	CATALYST GUARD (OPTIONAL)	175482
16	SANITATION PAIL	175842
17	KIT, CLEANING TOOLS/INSTALLATION TOOL CLEANING – LOWER BURNER FLAME ROD TUBE CLEANER BRUSH, TUBE CLEANER TOOL– LOADER INSTALL WRENCH, ALLEN, 3/16"	175700
18	KIT – BROILER SVC. PARTS, NAT. GAS W/ CONTROLLER W/COOK CHAIN (OPTIONAL)	175725
19	KIT – BROILER SVC. PARTS, PROPANE, W/ CONTROLLER W/COOK CHAIN (OPTIONAL)	175740
20	KIT – USER REPLACEABLE, BOTTOM BURNER, FLAME ARRESTOR, LOADER & BURNER SHIELD (OPTIONAL)	175726
21	KIT – USER REPLACEABLE, BOTTOM BURNER & FLAME ARRESTOR (OPTIONAL)	175750
22	KIT – GAS HOSE CONNECTOR ASSEMBLY (OPTIONAL)	175690
23	KIT – HIGH SUPPLY GAS PRESSURE REGULATOR (OPTIONAL)	175689

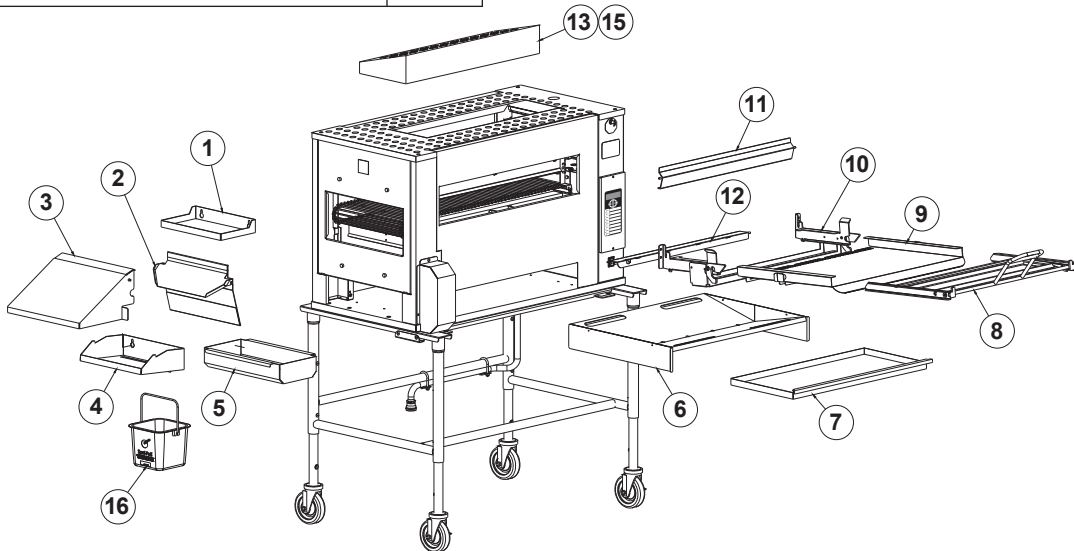
### Setup

Install all items as shown below.



Install loader bracket with (4) 1/4-20 nuts.

Use supplied extension tool to remove and reinstall nuts. (Nuts are shipped installed on loader mounting studs.)



## D. ADJUSTMENTS AT INSTALLATION

Each broiler section and all its component parts have been tested thoroughly and inspected before your broiler was shipped from the factory. However, it is sometimes necessary to further test or adjust the broiler once it has been installed. Such adjustments are the responsibility of the Dealer or Installer. These types of adjustments are not considered defects, rather a normal and routine part of the proper installation of the equipment.

These adjustments include but are not limited to:

- Adjustments to the gas pressure regulator
- Broiler height adjustment (if required)

No installation should be considered complete without proper inspection and, if necessary, any adjustments by qualified service or installation personnel.

It is also important not to obstruct the natural flow of combustion and ventilation air if the broiler is to operate properly. This broiler should not be installed on a curb base or sealed to the wall. Either condition can restrict the flow of air to the combustion compartment or prevent proper ventilation of the unit. Before making any connections to the broiler, check the ratings plate to be sure the broiler specifications concur with the type of gas and voltage to be supplied to the broiler.

The rating plate is located on the back of the control compartment cover panel on the right end of the unit.

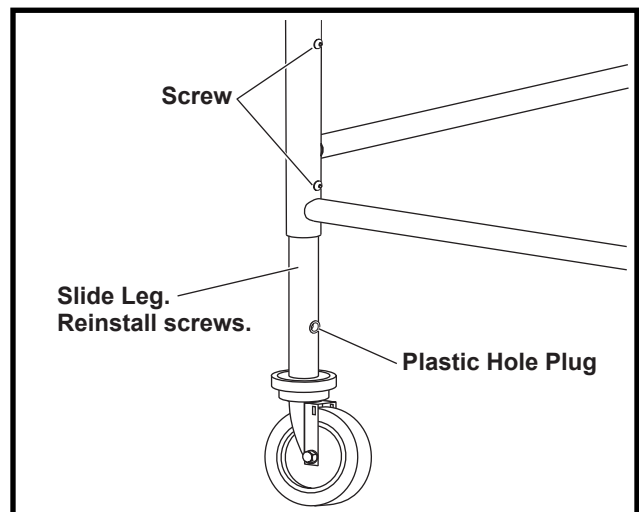
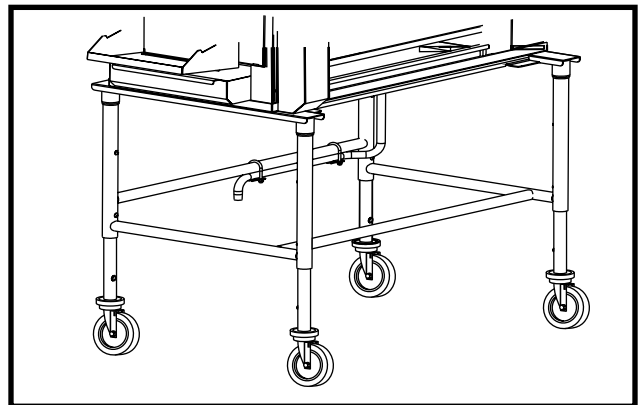
The plate bearing the broiler's model number and serial number is attached to the back side of the unit.

### Raise or Lower Broiler

The broiler height can be adjusted via two screws on each leg.

**Caution: The Broiler is very heavy! Use adequate help for lifting.**

1. Lift one end of the broiler onto a wide, sturdy stand (not supplied).
2. Remove (2) screws per leg and raise/lower to threaded holes. Reinstall screws.
3. Remove stand and safely raise/lower broiler.
4. Place plastic hole plugs (supplied attach to stand) in any unused holes.



### E. LOCATION OF THE BROILER

Proper planning and placement of the broiler will give you the best results in terms of long-term user convenience and satisfactory performance. We urge you to give adequate thought in the placement of your broiler prior to its arrival.

- The broiler should be placed in an area that is free from drafts and accessible for proper operation and servicing.
- The area around the broiler must be kept clear of combustible materials. A minimum clearance of:

	COMBUSTIBLE	NON-COMBUSTIBLE
Discharge End	12" (305)	12" (305)
Access Panel End	3" (76)	3" (76)
Rear	4" (102)	4" (102)
Floor/Table	0" (0)	0" (0)

### F. GAS PIPING

The standard broiler consumes gas at a total of 100,000 BTU/hr. In order to achieve the degree of performance for which the unit has been designed, the overall piping plan of the kitchen, properly sized, is essential. The installation of this broiler must conform with all local codes, or in the absence of any local codes, to the National Fuel Gas Code, NFPA 54 and ANSI Z 223.1.

Your local gas supplier should consult the National Fuel Gas Code for proper sizing and installation of gas piping. Generally, piping should be sized to provide a gas supply sufficient to meet the maximum demand of all gas appliances on a line without undue loss of pressure at the outlet to the equipment. The total BTU requirements of the equipment being served and the length of the piping from the meter to the appliances are major considerations in the proper design of the gas supply system.

**NOTICE:** Using the Loader Tray to support heavy items or an individual's body weight can damage components of the broiler.

### NOTICE TO INSTALLER:

THIS APPLIANCE SHALL BE CONNECTED TO A GAS SUPPLY IN THE RANGE OF:

NATURAL GAS 7" TO 12" W.C.

PROPANE GAS 10" TO 12" W.C.

Gas supply pressure must be checked prior to installation. If supply pressure is in excess of 12" W.C., The *HIGH SUPPLY PRESSURE KIT*, Duke P/N 175689 shall be installed and adjusted, per kit instructions, for an outlet pressure of:

Natural Gas - 7" W.C.

Propane Gas – 11" W.C.

**NOTE:** A fixed restraint of the proper length must be incorporated to secure the broiler to a non-movable surface to eliminate strain on the gas connector. If the broiler is removed from its normal position, the restraint must then be reattached when returned.

### G. ELECTRICAL CONNECTIONS

Your broiler is supplied for connection to a dedicated 120 volt, grounded circuit. The electric motors, indicator lights and control circuits are connected through a seven-foot electric supply cord found at the rear of the broiler.

Before making any connections to these units, check the rating plate to assure that the voltage and phase of the broiler is compatible with the electrical supply. When installing, all broilers must be electrically grounded in accordance with local codes, or in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 (in Canada - CSA Std. C22.2). Wiring diagrams are located in the control compartment area of the broiler. Standard wiring schematics are also provided with this manual.

**⚠ WARNING:** This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. DO NOT cut or otherwise remove the grounding prong from this plug.

## H. VENTILATION

This appliance shall be installed with sufficient ventilation to prevent the occurrence of unacceptable concentrations of substances harmful to health in the room in which the appliance is installed.

### Venting to a Canopy Exhaust Hood

A mechanically driven exhaust hood must have a minimum capacity of 1700 m<sup>3</sup>/hr (1000 cfm) with a minimum 100cm by 130cm (39.4 in by 51.2 in) opening to adequately vent this appliance. The specified capacity and opening is required in a dedicated hood for this appliance or in addition to other appliance vented through a common canopy exhaust hood.

### Maintenance of Ventilation System

The ventilation system must be maintained and annually inspected by Qualified Personnel concurrent as part of or in addition to governmental requirements.

This inspection/maintenance should consist of, but not be limited to:

- Inspection for blockages or build up which might interfere with the venting of the broiler.
- Repair of such blockages.
- Inspection of the venting canopy, its drive motors and bells, etc.

**NOTICE:** Do not place any objects such as sheet pans, food containers or aluminum foil on the top of the broiler. This will obstruct the venting of cooking vapors and airflow through the unit—resulting in poor cooking performance.

### III. OPERATION INSTRUCTIONS

The information in this section is intended for the use of qualified operating personnel. Qualified Operating Personnel are those individuals who have carefully read the information contained in this manual, are familiar with the function of the broiler and/or have had experience with operating the equipment described. We recommend following these instructions to insure optimum performance, long life and trouble-free service from your broiler.

The controller is pre-programmed at the factory for known recipes at the time of manufacture. The product keys must be programmed with an approved recipe and the broiler properly calibrated prior to use.

#### A. BROILER CONTROLS

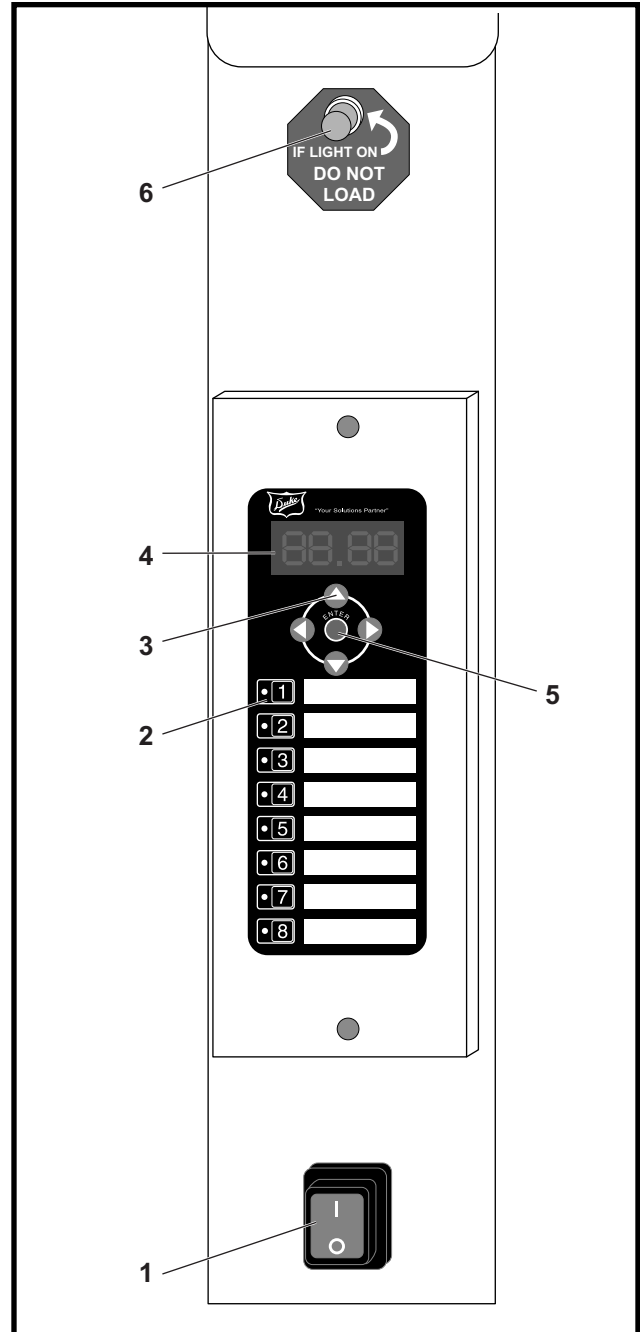
1. **Power Switch** – Turns the broiler ON or OFF. The broiler is self-lighting.
2. **Product Selection Keys** – Selects the product recipe to run. Also functions as number keys 1-8 in programming mode.
3. **Arrow Keys**

Up-Arrow: Displays the current broiler temperature when pressed in run mode. Scrolls backward through parameters when pressed in program mode.

Down-Arrow: Displays the broiler set-point temperature when pressed in run mode. Scrolls backward through parameters when pressed in program mode.

Left-Right Arrows: Moves between characters or parameters in program mode. Also used as numerals 0 and 9 keys.

4. **Display**
5. **Enter Key** – Press and hold for 5 seconds to enter program mode. Also used to move through and enter parameters in programming mode.
6. **Cook Light** – This light is lit during preheat and the entire cook. The operator should not load the broiler while the light is lit.



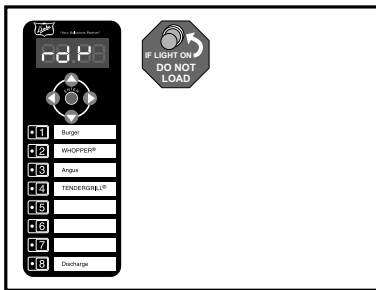
## B. COOKING PRODUCT

### B-1.0 Lighting the Broiler

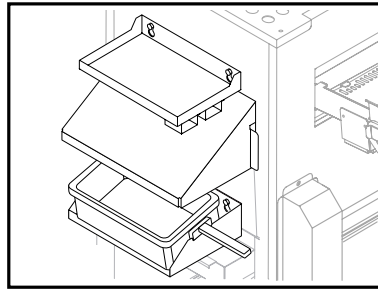
- Start Ventilation System.
- Turn ON/OFF switch to the ON (1) position.
- The control will display **PrE** during the pre-heat cycle.

- The LED's next to all product keys with non-zero cook times will be red.
- The control will display **rdY** at the completion of the pre-heat cycle and the LED's next to all product keys with non-zero cook times will be green.
- (To shutdown the broiler, see section B-8.0)

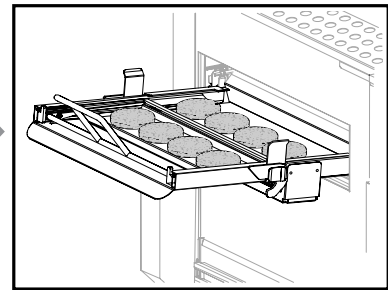
### B-2.0 Cook Product



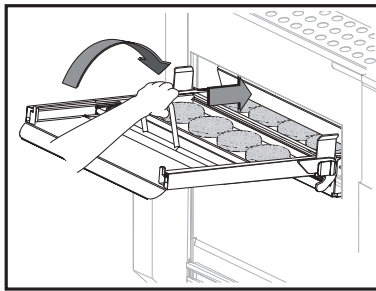
Broiler displays **rdY** and Cook light is not on.



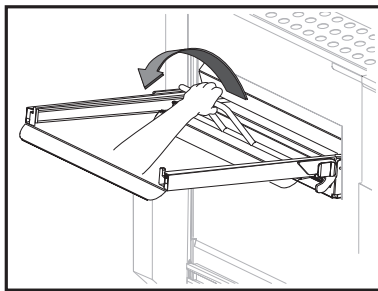
Place holding pan at discharge.



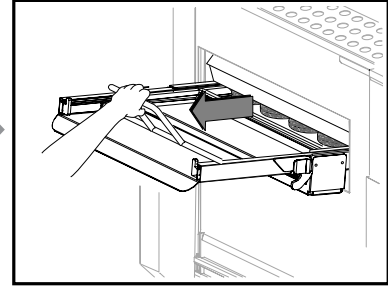
Place product in front and back rows.



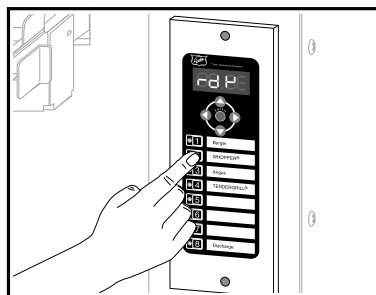
Load product. Push forward as shown.



Rotate handle down to lift inside bar over product.



Pull out loader with handle rotated.

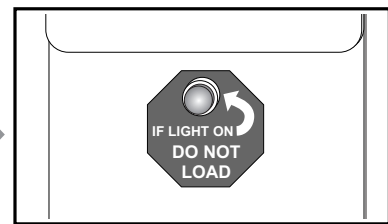


Press appropriate product key.

You will have 15 seconds to press another product key if a wrong selection is made.

The display will alternately display the time remaining and the four-character product identifier.

The LED next to the selected product key will flash red.



The cook light will be lit.

### B-3.0 Cook Cycle Complete

The chain will rotate and discharge the product.

Do not load product into broiler until the cook light has gone off and **rdY** is displayed on the control!

*To prevent thawing of product, it is recommended not to place product onto the loader more than five minutes prior to loading.*

### B-4.0 Fine Cooking Adjustment

Use this function to add or subtract up to 30 seconds from a product cook cycle recipe. This should be used in the event product cooking needs to be optimized outside of the programming environment. This function works as follows:

Press and hold the ▲ and ▼ keys for 3 seconds.

The control will display **AdJ**.

All product LED's for products with a programmed time will light red.

Select a product key to adjust.

The selected product LED will remain red and all other product LED's will go blank.

The control will flash **AdJ** followed by the product identifier.

The ▲ and ▼ keys are used to set the fine cooking adjustment.

The first press of the ▲ or ▼ key brings up the adjustment screen. The control will display the total product cook time including the previous fine cooking adjustment.

Subsequent presses of the ▲ or ▼ key adds or subtracts 1 second from the cook time.

The cook time can be increased or decreased by up to 30 seconds with this function.

To exit this function and save the setting, press the ENTER key.

### B-5.0 Cancel a Cook Cycle

Pressing and holding a product key for 3 seconds will cancel a cook cycle and discharge the product.

### B-6.0 Checking the Broiler Temperature

Pressing the ▲ key at any time (other than in programming mode) will display the actual cavity temperature.

### B-7.0 Checking the Set Point Temperature

Pressing the ▼ key at any time (other than in programming mode) will display the set-point cavity temperature.

### B-8.0 Shutdown the Broiler

Turn ON/OFF switch to the OFF (O) position.



### C. CLEANING

The exterior stainless steel on your broiler can be kept clean with a good non-abrasive stainless steel cleaner, many of which are on the market. Moisten a cloth and wipe down the broiler while it is COLD. Wiping down a broiler while it is hot will cause streaking and otherwise unsatisfactory results. Once the broiler is clean it can be wiped down with light oil.

To help make your use of this broiler trouble-free and to maintain the warranty, the following recommendations must be followed:

- A. Do not expose the broiler to prolonged contact with detergents, cleansers, bleaches, etc. Shield the IR burners and flame sensing rods from all cleaning fluids. Do not spray IR burners with any foreign materials. Chemical cleaners, degreasers, bleaches and soap solutions must never be allowed to come into contact with the IR burner metal housings or ceramic burner tiles as they may damage these surfaces and/or cause broiler malfunction and will void the warranty. To prevent damage to the ceramic burner tiles, never allow physical contact with cleaning tools or other objects that may scratch

or mar the tile surfaces or cause blockage of the gas ports in the tile faces. Do not spray flame sensing rods with any foreign materials. Chemical cleaners, degreasers and soap solutions must never be allowed to come into contact with the flame sensing rods as they may damage these surfaces or cause broiler malfunction and will void the warranty. If required, clean the flame sensing rods only after allowing to cool off to room temperature, and using a light wiping action with a pre-saturated alcohol pad to remove any carbon buildup.

- B. Never leave the chemical compounds, particularly those containing chlorine, on broiler parts overnight. Chlorine will cause pitting and corrosion.
- C. Never use chemicals in a stronger concentration than recommended by the manufacturer.
- D. Use clean water and a soft cloth to wipe cleaning residue from surfaces.
- E. Never use ordinary steel wool or scouring pads on the surfaces: use non-abrasive broiler de-greasers and soft cloths

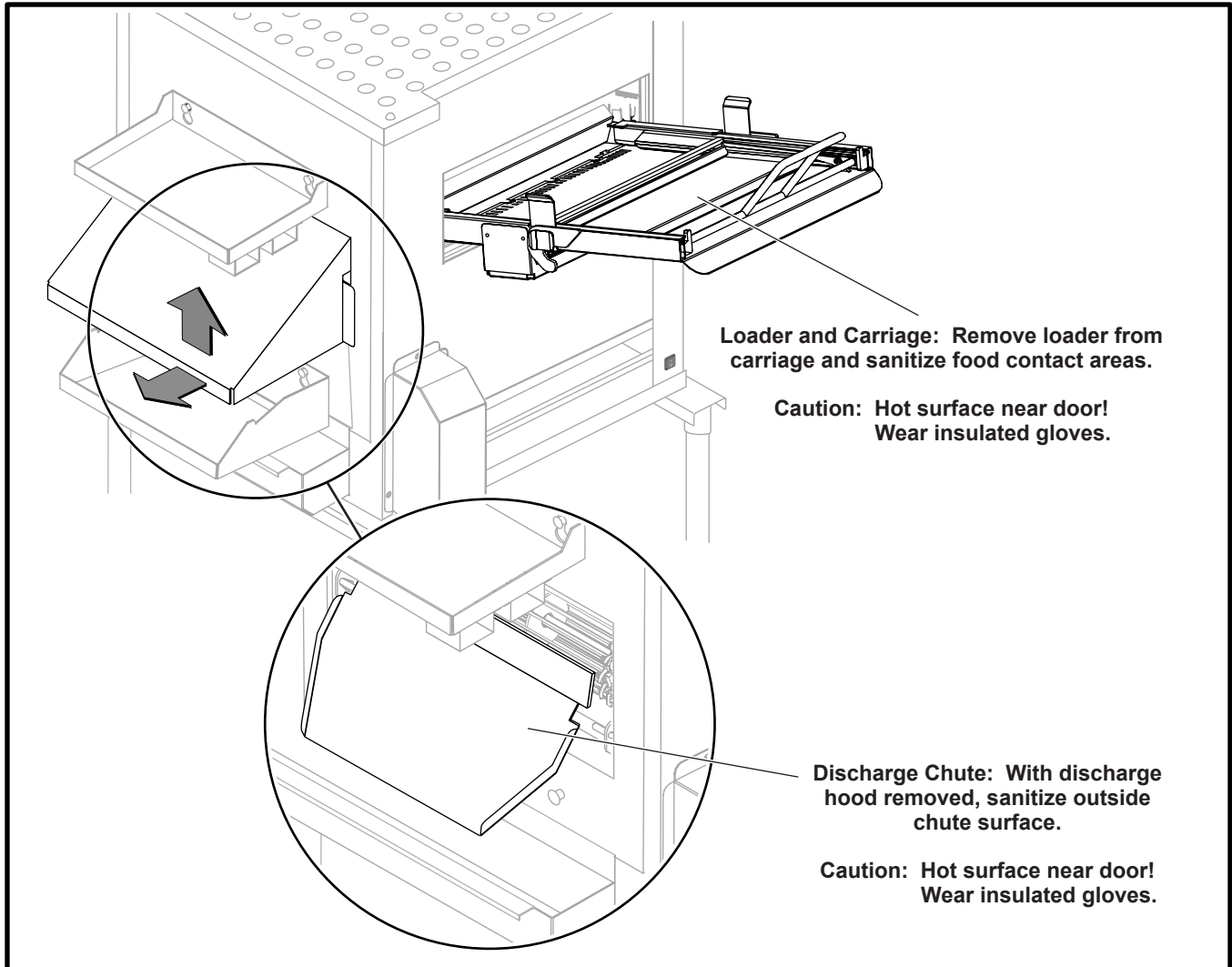
**Carefully following these recommendations will help this broiler to give satisfactory services to extend its life.**



<b>CLEANING SCHEDULE</b>		
WHAT'S TO BE CLEANED	BROILER COOL	DISCONNECT POWER
<b>4 HOUR CLEANING</b> (Sanitize in place)		
SANITIZE LOADER & TRAY (CAUTION: HOT SURFACES, WEAR INSULATED GLOVES WHILE CLEANING)		
SANITIZE DISCHARGE CHUTE		
<b>DAILY CLEANING</b> (Remove and Wash/Rinse/Sanitize)		
DISCHARGE PAN (CAUTION: HOT SURFACES, WEAR INSULATED GLOVES WHILE CLEANING)		
DISCHARGE HOOD	X	
DISCHARGE GREASE PANS	X	
MAIN GREASE PANS	X	
DISCHARGE END PANEL	X	
DISCHARGE SCRAPER	X	
LOADER & TRAY (CAUTION: HOT SURFACES, WEAR INSULATED GLOVES WHILE CLEANING)		
DISCHARGE CHUTE	X	
LOADER RAMP	X	
<b>WEEKLY CLEANING</b>		
LOWER TUBE BURNER	X	X
BROILER FLIPPER DOOR	X	X
FLAME ARRESTOR	X	X
CATALYST	X	X
<b>MONTHLY CLEANING</b>		
FLAME SENSOR (UPPER BURNERS)	X	X
FLAME SENSOR (LOWER BURNERS)	X	X
FLAME SENSOR TUBE (UPPER BURNERS)	X	X

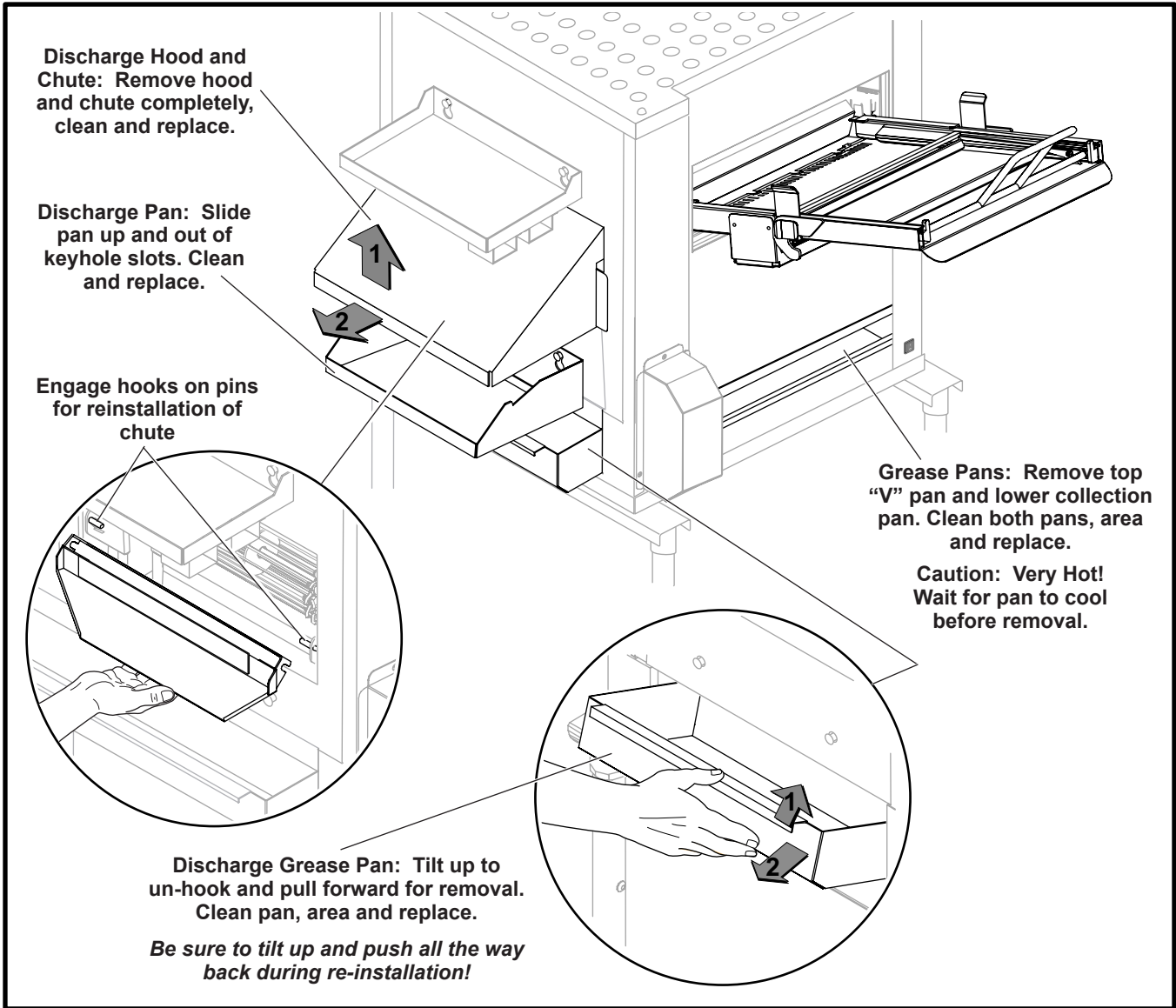
### C-1. Four (4) Hour Cleaning

All components that are in contact with food product must be cleaned and sanitized every 4 hours.

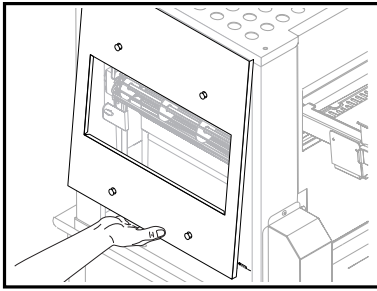


### C-2. Daily Cleaning

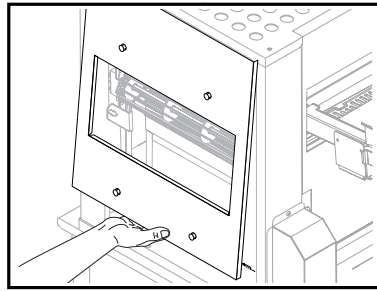
Daily cleaning should also include all items listed in the 4 hour cleaning schedule.



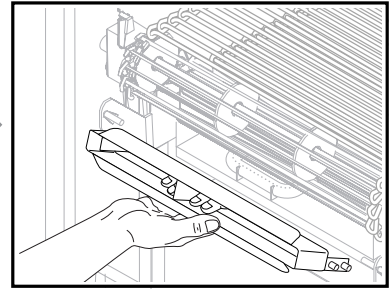
**C-2. Daily Cleaning (cont'd.)**



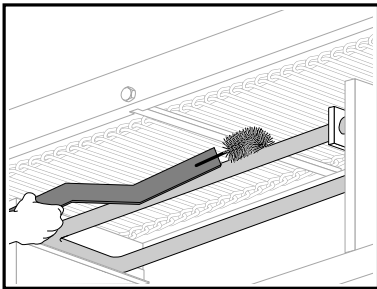
**Discharge End Panel:**  
Remove discharge accessories  
and lift panel up while swinging  
out and down.



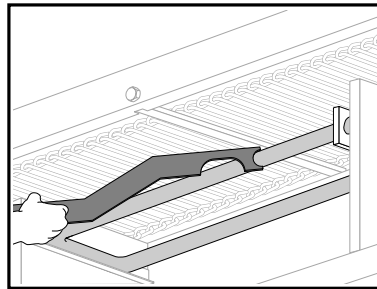
**Discharge Scraper:**  
Lift up and pull forward.



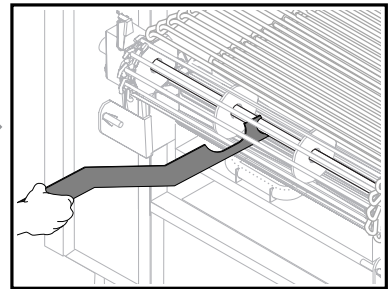
**Discharge Scraper:**  
Pull out removing locating pins  
from slots. Clean scraper and  
area. Replace.



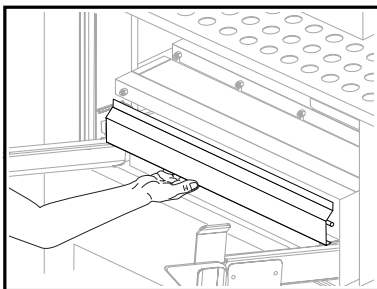
Clean the top of the burner  
with the brush end of the "Tube  
Burner Cleaning Tool".



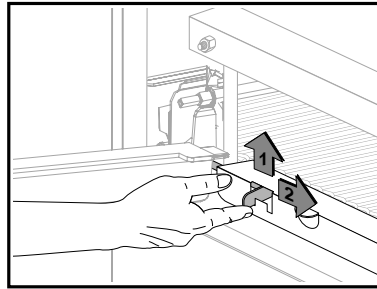
For heavy build-up, use the  
scraper end of the "Tube Burner  
Cleaning Tool".



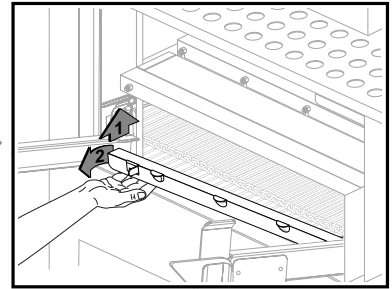
Use the end of the tool to  
clean the discharge shaft of  
the conveyor.



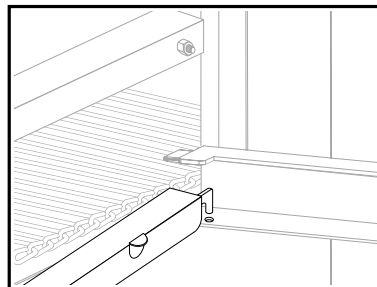
With the broiler cool, lift and  
remove the flipper door.  
Clean and set aside.



Lift and slide retaining bolt right.

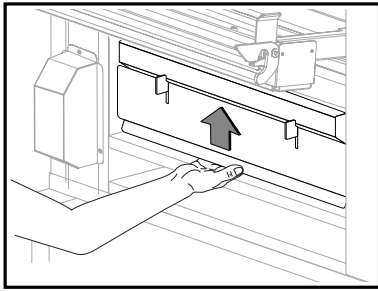


Lift slightly and remove loader  
ramp as shown.

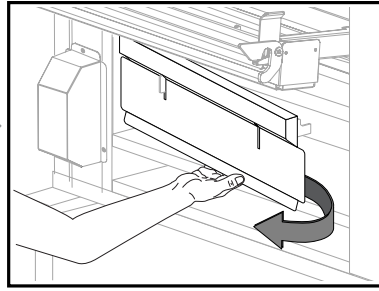


Disengage pin from pivot hole.  
Clean and set aside.

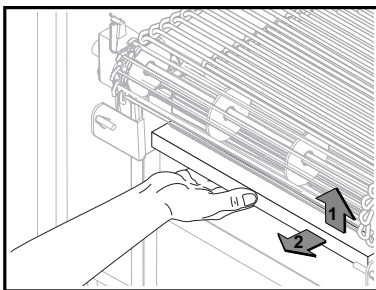
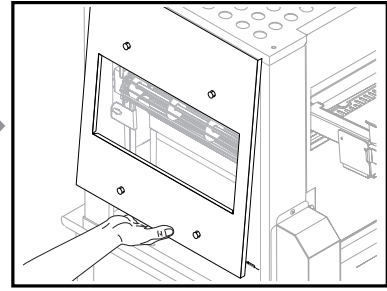
**C-3. Weekly Cleaning**



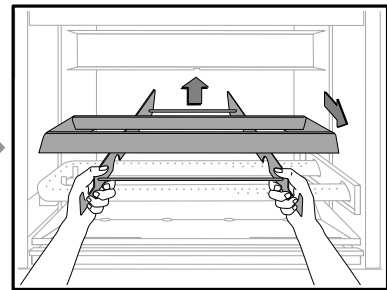
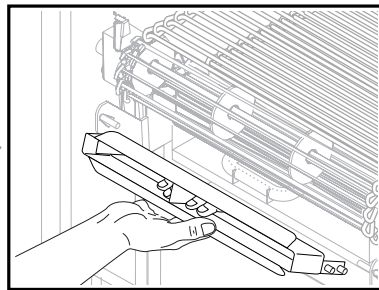
With outer front panel removed, lift up the combustion chamber panel.



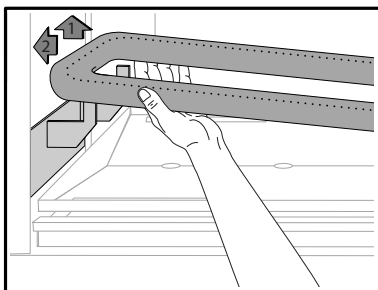
Swing the right side of the panel out as shown. Clean and set aside.



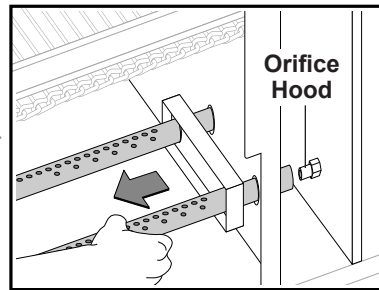
Remove discharge panel and scraper as was performed for daily cleaning.



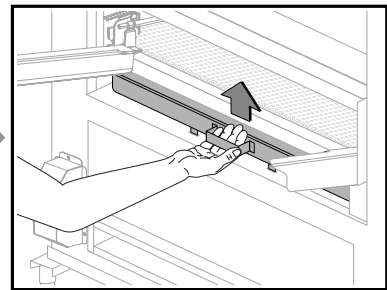
Remove burner shield.



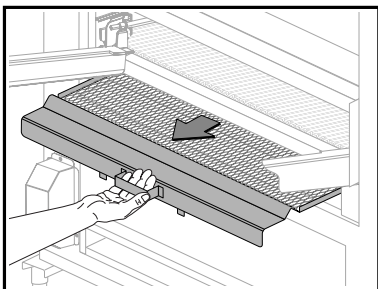
Lift rear of burner out of saddle and continue to hold it.



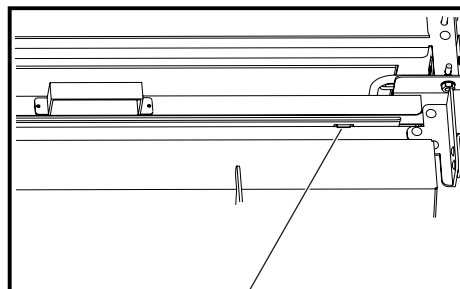
Pull burner off of orifice and through broiler wall. Remove from chamber. Clean, empty any remaining water from the burner and replace. Thoroughly dry out all burner ports!



Lift flame arrester up to disengage tabs from slots. Tabs are located under the front of the arrester.



Pull flame arrester out. Clean and reinstall.



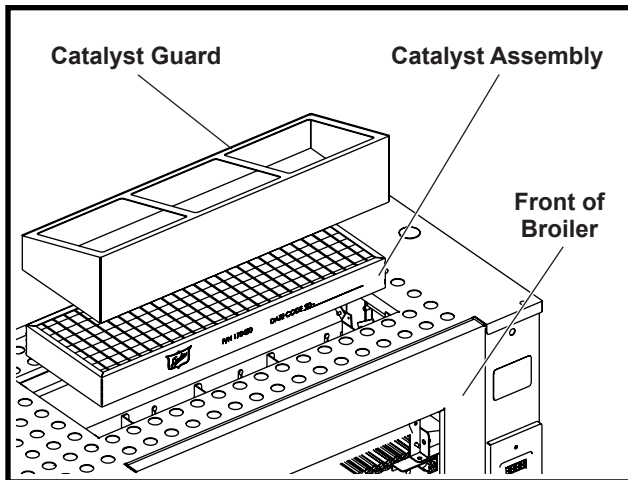
TAB ON THE BOTTOM OF THE FLAME ARRESTOR DROPS INTO SLOT

### C-3. Weekly Cleaning (cont'd)

#### CLEANING CONSIDERATIONS

**⚠ WARNING:** Do not use soap, detergents, degreasers, silicone, sodium salts, bleaches, anti-oxidants or any other commercial cleaning agents to clean the catalyst. Use of these chemicals will damage the catalyst and render it inoperable

**NOTE:** Do not clean catalyst in a dishwasher or ultrasonic cleaner. In no case should any abrasive material or abrasive scrubber be used for cleaning.



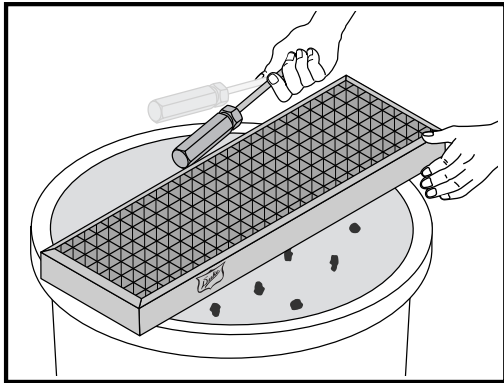
#### SAFETY CONSIDERATIONS

The catalytic converter (catalyst) is normally part of a combustion system, and the general safety practices observed with such systems should be practiced. The following considerations are specific to the catalyst portion.

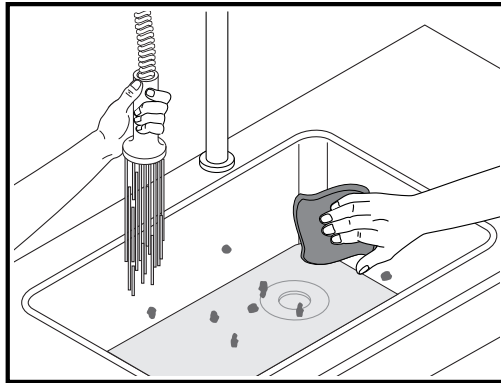
- A: Remove power: Before removing the catalyst, disconnect power to the broiler and allow to cool to room temperature. Remove the catalyst guard and set aside for re-installation after the catalyst has been cleaned.
- B: Handling catalyst: Care should be taken so that the catalyst is not dropped or damaged in handling. If the unit is going to be handled soon after a cooking cycle, care should be taken to protect one's hands from any hot surfaces by wearing gloves designated for this purpose. There are no moving parts or electrical hookups associated with the catalyst, therefore there should be no danger of a shock hazard when washing the unit. Allow the catalyst to cool to room temperature before starting the cleaning process.
- C: Operation: Understand and follow the system instructions provided with the broiler included in the installation and operations manual. It is very important that you make sure that the ducts above the cooking appliance are clean of any grease, prior to the initial operation of the appliance with the catalytic converter in place.

IF NATURAL GAS IS PART OF THE EXHAUST STREAM, BE SURE THAT THE NATURAL GAS DOES NOT BUILD UP TO AN EXPLOSIVE MIXTURE IN THE EXHAUST SYSTEM.

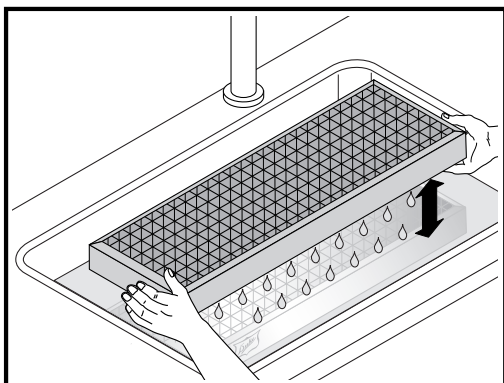
**C-3. Weekly Cleaning (cont'd)**



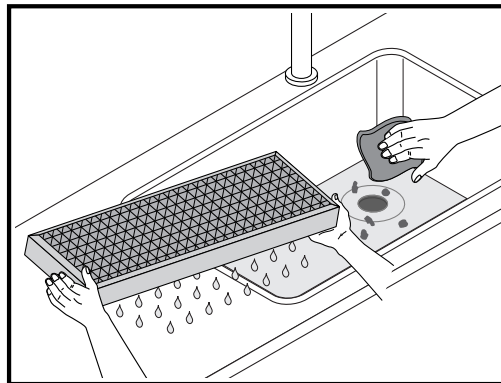
Gently tap frame of the catalyst while holding over a waste bin to dislodge any loose ash/carbon particles.



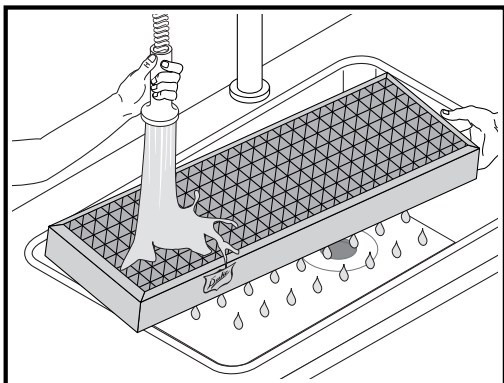
Begin with a clean sink and remove all foreign matter from any wash basin used, before starting the catalyst washing process.



Partially fill wash basin, that is large enough to accommodate the catalyst, with enough clean hot water (100-130°F) to completely cover the catalyst when placed into the basin. Agitate the catalyst up and down in the water a few times and then let it soak for 20 minutes.



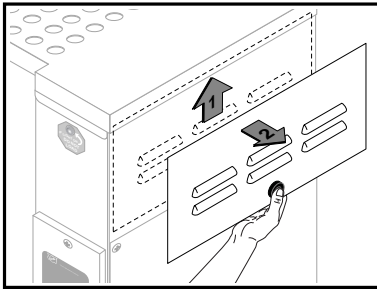
Remove the catalyst and shake out the excess water. Drain and clean the basin thoroughly and then repeat previous step .



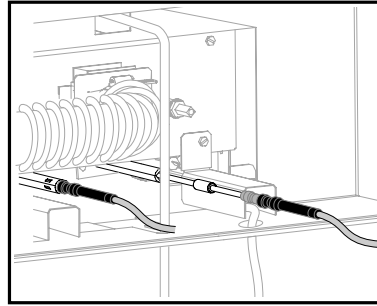
Remove the catalyst and rinse thoroughly with a large volume of hot water. The typical restaurant dishwashing spray nozzle (low pressure, high volume) is perfect for this operation. Work the spray slowly over the entire surface both front and back to assure the removal of any particles caught in the catalyst face or behind the frame. Shake the remaining water from the catalyst and then let it air dry overnight. The catalyst can then be reinstalled in the broiler. Ensure that the catalyst guard is re-installed over the catalyst prior to turning on the broiler.



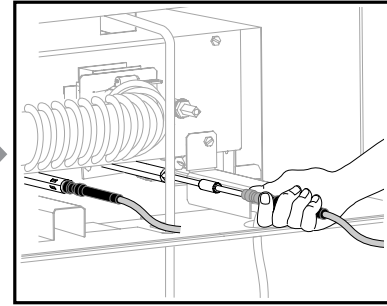
### C-4. Monthly Cleaning



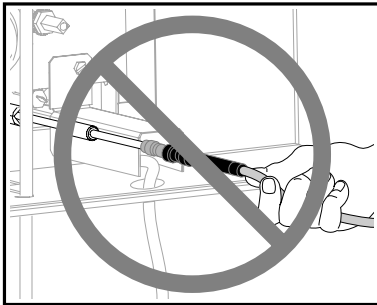
Remove top panel by lifting up and out.



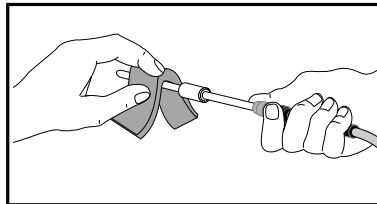
Locate the flame sensors for the upper burners.



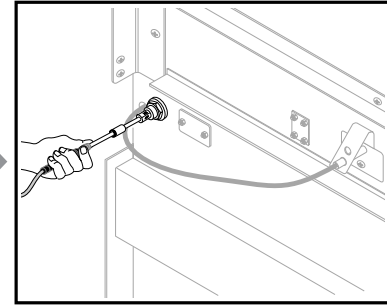
Use caution and safely remove the sensor by holding onto the black boot at the base of the sensor.



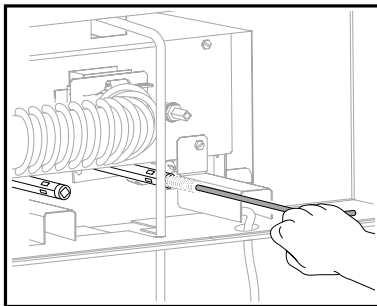
**DO NOT REMOVE BY PULLING ON THE BRAIDED WIRE.**



Using an alcohol swab, clean the entire metal portion of the sensor rod to remove any buildup. Clean the white ceramic insulator using the alcohol swab until all residue has been removed.



Remove the back panel of the broiler and carefully remove the sensor for the lower burner. Follow the same procedures as those for the upper burners.

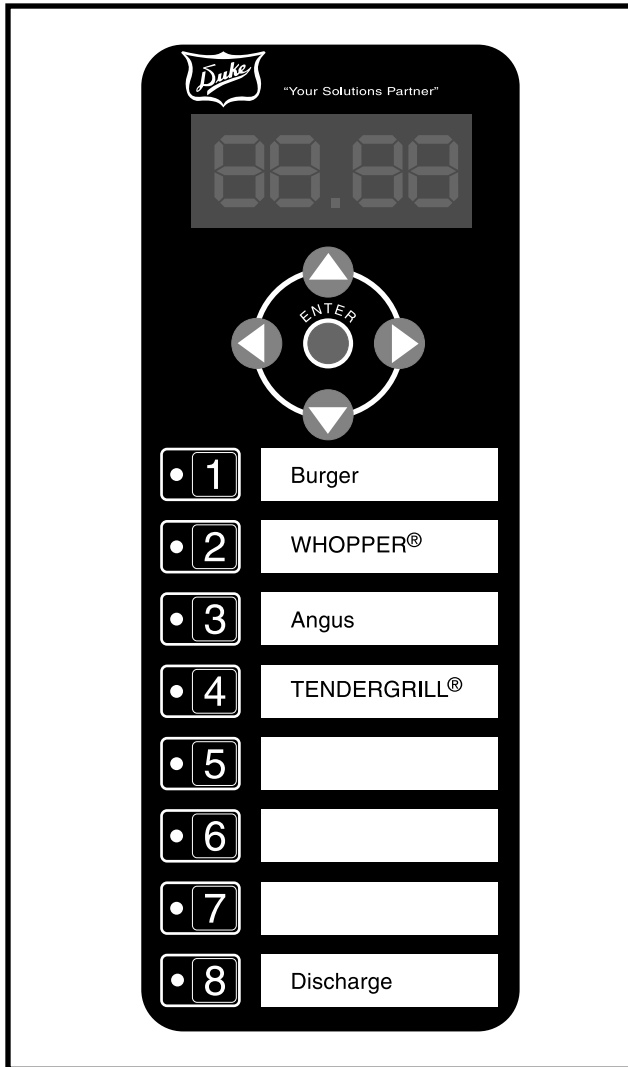


After the sensor is removed, use the T-handled cleaning tool by inserting it completely into the sensor tubes and remove. Repeat the process at least five (5) times to remove any residue inside the tube.

Once the cleaning procedures are complete, replace the sensors and panels. Wait at least 30 minutes before starting the broiler.



## D. PROGRAMMING THE CONTROL



### D-1.0 Entering Program Mode

There are two levels of control Programming.

Level 1: Recipe related programming.

Level 2: Broiler functionality programming.

Press and hold the ENTER button for 5 seconds.

The control will then display **CodE**. Enter a password that is specific to the level of programming.

### D-2.0 Navigating the Programming Screens

The ENTER key is used to move forward through the list of parameters. The first press of the ENTER key brings up the parameter name and the next press bring up the editable parameter setting.

The ▲ and ▼ keys will move backward through the parameters.

The ◀ and ▶ keys will scroll through parameter settings and also function as numbers 0 and 9.

Product keys 1-8 also function as number keys 1-8.

### D-3.0 Level 1 Programming

Enter the password 1-8-2-7 and press the ENTER key.

At this point the control will display **PROD** and all Product LED's will turn green.

Select a product key for a product that you wish to change. The LED next to the selected product will turn green. All other product LED will be blank.

#### D-3.1 Product Identifier **AbCd**

This parameter allows the user to define a four digit alphanumeric product name to associate with each product button.

The ▲ and ▼ keys are used to move through the character set.

The ◀ and ▶ keys are used to move to the next or previous character. The character that is active will flash.

Hitting ▶ after the last character will take you to the next parameter.

#### D-3.2 Cook Temperature **Sett**

This is the set-point temperature for the broiler during this products cook cycle.

The product keys 1-8 are used for entering numbers 1-8. The ◀ and ▶ keys are used to enter numbers 0 and 9.

#### D-3.3 Cooking Profile

**on 1**, **oFF1**, **on 2**, **oFF2**, ...

Defines the cycling parameters for the upper infrared burner and the overall cook time.

These parameters will have 6 segments. Each segment consists of one On/Off cycle.

The On portion of the cycle will come first.

The product keys 1-8 are used for entering numbers 1-8. The ◀ and ▶ keys are used to enter numbers 0 and 9.

The control will display the total cook time (the sum of all ON and OFF cycles) as a final non-changeable parameter.

As an example:

	ON	OFF
Segment #1	0:00	1:00
Segment #2	2:00	0:00
Segment #3	0:00	0:00
Segment #4	0:00	0:00
Segment #5	0:00	0:00
Segment #6	0:00	0:00

After entering this last parameter; Hitting the ▶ key will take you back to the Product selection, so that you can select another product to program.

### D-3.4 Exit Program Mode

To exit programming and save new entries press the ENTER key until the control displays **RdY**, **PrE** or **Lo**.

To exit programming without saving entries, cycle the main On/Off switch off and on.

### D-4.0 Level 2 Programming

Enter the password 3-6-4-5 and press the ENTER key.

#### D-4.1 °F or °C Parameter **dEg**

Changes temperature displayed between Fahrenheit (F) and Celsius (C).

The ◀ and ▶ keys are used scroll through the settings.

#### D-4.2 Change the Idle Temperature **Sett**

This is the set-point temperature for the broiler during the preheat and idle cycles.

The default for this parameter is 680 °F.

The product keys 1-8 are used for entering numbers 1-8. The ◀ and ▶ keys are used to enter numbers 0 and 9.

#### D-4.3 Additional Factory Parameters

The remaining parameters in this section are factory settings and should not be changed. These settings are as follows:

- **oFSt**
- **Hton**
- **Lo t**
- **Hi t**
- **Cdti**
- **BEEP**
- **lrSt**
- **PCr**
- **AFCr**

#### D-4.4 Exit Program Mode

To exit programming and save new entries press the ENTER key until the control displays **RdY**, **PrE** or **Lo**.

To exit programming without saving entries, cycle the main On/Off switch off and on.

## E. TROUBLESHOOTING

SYMPTOM	CAUSE	REMEDY
Control display does not light up	No power	Ensure broiler is plugged into a proper voltage/Hz receptacle (per name plate rating) and receptacle as power. Check dedicated circuit breaker.
Raw or undercooked product with no controller error messages displayed.	<p>Product not loaded properly.</p> <p>Product button was depressed prior to loading product.</p> <p>Wrong product button was depressed.</p> <p>Lower burner not lighting properly. (Observe bottom burner through slits in lower grease tray)</p> <p>Infrared burners not lighting properly. (Observe Infrared through discharge end of broiler. Note: Burners should remain lit in idle mode)</p>	<p>Review loading technique.</p> <p>Ensure product button is depressed immediately after product is loaded into broiler.</p> <p>Ensure proper product button is being depressed.</p> <p>If broiler is hot, attempt to clean burner in place with broiler cleaning tool.</p> <p>If broiler is cold or allowed to cool down, remove lower burner by removing access panels, clean, and reinstall. Remove lower flame sensor and clean with a soft cloth and isopropyl alcohol.</p> <p>Remove upper control compartment panel and clean two upper flame sensors with a soft cloth and isopropyl alcohol. Clean flame sensor tube with flame sensing tube cleaning brush.</p>
Conveyor belt will not move to discharge product.	Conveyor belt is being obstructed	<p>Observe for obstructions by manually rotating conveyor belt from discharge end of broiler using broiler cleaning tool.</p> <p>Ensure discharge scraper is properly in place.</p> <p>Ensure docking plate is properly in place.</p> <p>Ensure flame arrestor is properly in place.</p>
Loader is not able to be pushed completely into cooking chamber.	Docking plate is not properly in place.	Ensure docking plate and locking tab are correctly in place.
Product is getting stuck or mangled upon loading	<p>Docking plate is not properly in place</p> <p>Flame arrestor is not properly in place</p>	<p>Ensure docking plate and locking tab are correctly in place.</p> <p>Ensure flame arrestor is correctly in place and tabs are slotted correctly.</p>
Control display is reading "Hi"		Contact Duke Manufacturing Co. or a Duke Authorized Service agent.
Control display is reading "Lo"	<p>Lower burner not lighting properly. (Observe bottom burner through slits in lower grease tray)</p> <p>Infrared burners not lighting properly. (Observe Infrared through discharge end of broiler. Note: Burners should remain lit in idle mode)</p> <p>Grease pan is not installed</p> <p>Impedance pan or catalyst is not installed.</p>	<p>If broiler is hot, attempt to clean burner in place with broiler cleaning tool.</p> <p>If broiler is cold or allowed to cool down, remove lower burner by removing access panels, clean, and reinstall. Remove lower flame sensor and clean with a soft cloth and isopropyl alcohol.</p> <p>Remove upper control compartment panel and clean 2 upper flame sensors with a soft cloth and isopropyl alcohol. Clean flame sensor tube with flame sensing tube cleaning brush.</p> <p>Install grease pan.</p> <p>Install impedance pan or catalyst.</p>
Control display is reading "Prob"		Contact Duke Manufacturing Co. or a Duke Authorized Service agent.

**E. TROUBLESHOOTING (CONT'D)**

SYMPTOM	CAUSE	REMEDY
Control Display is reading "tESt Prod"	<p>Lower burner not lighting properly. (Observe bottom burner through slits in lower grease tray)</p> <p>Infrared burners not lighting properly. (Observe Infrared through discharge end of broiler. Note: Burners should remain lit in idle mode)</p>	<p>If broiler is hot, attempt to clean burner in place with broiler cleaning tool.</p> <p>If broiler is cold or allowed to cool down, remove lower burner by removing access panels, clean, and reinstall. Remove lower flame sensor and clean with a soft cloth and isopropyl alcohol.</p> <p>Remove upper control compartment panel and clean 2 upper flame sensors with a soft cloth and isopropyl alcohol. Clean flame sensor tube with flame sensing tube cleaning brush.</p>
Control display is reading "gAS toP"	<p>Broiler not receiving gas supply.</p> <p>Infrared burners not lighting properly. (Observe Infrared through discharge end of broiler. Note: Burners should remain lit in idle mode)</p>	<p>Ensure that gas valve(s) in line with the broiler are in the ON position.</p> <p>Remove upper control compartment panel and clean 2 upper flame sensors with a soft cloth and isopropyl alcohol. Clean flame sensor tube with flame sensing tube cleaning brush.</p>
Control display is reading "gAS bot"	<p>Broiler not receiving gas supply.</p> <p>Lower burner not lighting properly. (Observe bottom burner through slits in lower grease tray)</p>	<p>Cycle broiler off and back on. If this error persists, proceed with the next steps.</p> <p>Ensure that gas valve(s) in line with the broiler are in the ON position.</p> <p>If broiler is hot, attempt to clean burner in place with broiler cleaning tool.</p> <p>If broiler is cold or allowed to cool down, remove lower burner by removing access panels, clean, and reinstall. Remove lower flame sensor and clean with a soft cloth and isopropyl alcohol.</p>
Control display is reading "gAS SEnt"	<p>Infrared burners not lighting properly. (Observe Infrared through discharge end of broiler. Note: Burners should remain lit in idle mode)</p>	<p>Remove upper control compartment panel and clean 2 upper flame sensors with a soft cloth and isopropyl alcohol. Clean flame sensor tube with flame sensing tube cleaning brush.</p>
Control display is reading "gAS SEnb"	<p>Lower burner not lighting properly. (Observe bottom burner through slits in lower grease tray)</p>	<p>If broiler is hot, attempt to clean burner in place with broiler cleaning tool.</p> <p>If broiler is cold or allowed to cool down, remove lower burner by removing access panels, clean, and reinstall. Remove lower flame sensor and clean with a soft cloth and isopropyl alcohol.</p>

## IV. SERVICE AND REPAIR

### A-1. WARNINGS

**⚠ WARNING:** Disconnect the power supply to the appliance before servicing.

**⚠ WARNING:** Units provided with casters have a restraint to limit the movement of the broiler. If this restraint is disconnected during servicing it must be reconnected after the appliance has been returned to its original installed position.

**NOTE:** Proper clearances must be maintained during servicing.

Maintenance is to be performed by qualified service personnel only. Service by other than qualified personnel may result in damage to the broiler and/or injury to the operator.

Qualified service personnel are those individuals, firms, companies or corporations which either in person or through an agent are engaged in and responsible for repair or servicing of commercial food preparation equipment, who are experienced in such work, familiar with all precautions required, and have complied with all requirements of state and local authorities having jurisdiction.

If you should require assistance in the selection of a qualified service agency, please contact Duke Manufacturing Co.'s Service Department at 800-735-3853.

## V. REPLACEMENT PARTS LIST

ITEM	DESCRIPTION	P/N
1	SWITCH, LIGHTED, DPST	175503
2	BURNER, INFRARED	175780
3	BURNER, TUBE, J STYLE (FOR USE IN US & CANADA)	175505
	KIT, BURNER, ADJUSTABLE (FOR USE OUTSIDE US & CANADA)	175950
4	MOTOR-CONVEYOR	175867
5	SPROCKET, B21X3/8 BORE (MOTOR)	175517
6	SHAFT, DISCHARGE SIDE	175037
7	SHAFT, RIGHT SIDE	175038
8	CAPACITOR, MOTOR-CONVEYOR	175507
9	MODULE, IGNITION (LOWER BURNER –NATURAL GAS)	175877
	MODULE, IGNITION (LOWER BURNER – PROPANE)	175872
10	MODULE, IGNITION (UPPER BURNERS)	175869
11	TRANSFORMER,40VA, 120VAC-24VAC	175526
12	PROBE, TEMP., C-CHAMBER	175977
13	LIGHT, COOK	175550
14	RELAY - SOLID STATE	175870
15	CHAIN, DRIVE	175551
16	CONTROLLER	175575
17	GASKET, CONTROL BEZEL	175510
18	GASKET, BLOWER INLET	175511
19	BLOWER, 120V 60HZ W/ CENTRIFUGAL SWITCH	176185
20	HOSE, BLOWER	175189
21	ORIFICE HOLDER, IR	175542
22	VALVE, LP - GAS, COMBO 24VAC (PROPANE ONLY)	175766
	VALVE, NAT - GAS COMBO 24VAC (NATURAL GAS ONLY)	175531
23	ORIFICE, LOWER BURNER #31/3.05mm, (NAT. GAS ONLY)	175823
	ORIFICE, LOWER BURNER #49 (PROPANE ONLY)	175737
24	ORIFICE, IR FRONT #40 (NATURAL GAS ONLY)	175735
	ORIFICE, IR FRONT #52 (PROPANE GAS ONLY)	175767
25	ORIFICE, IR REAR, #36 (NATURAL GAS ONLY)	175736
	ORIFICE, IR REAR, #51 (PROPANE GAS ONLY)	175768
26	ORIFICE HOLDER 3/8 COMP. STRGHT X BULKHEAD	176368
27	TUBING-TEE TO VALVE, KIT	175477
28	TUBING-TEE TO IR, KIT	175476
29	TUBING-LOWER BURNER TO VALVE ,KIT	175478
30	SENSOR-LOWER BURNER	175534
31	SENSOR-IR BURNER	175535

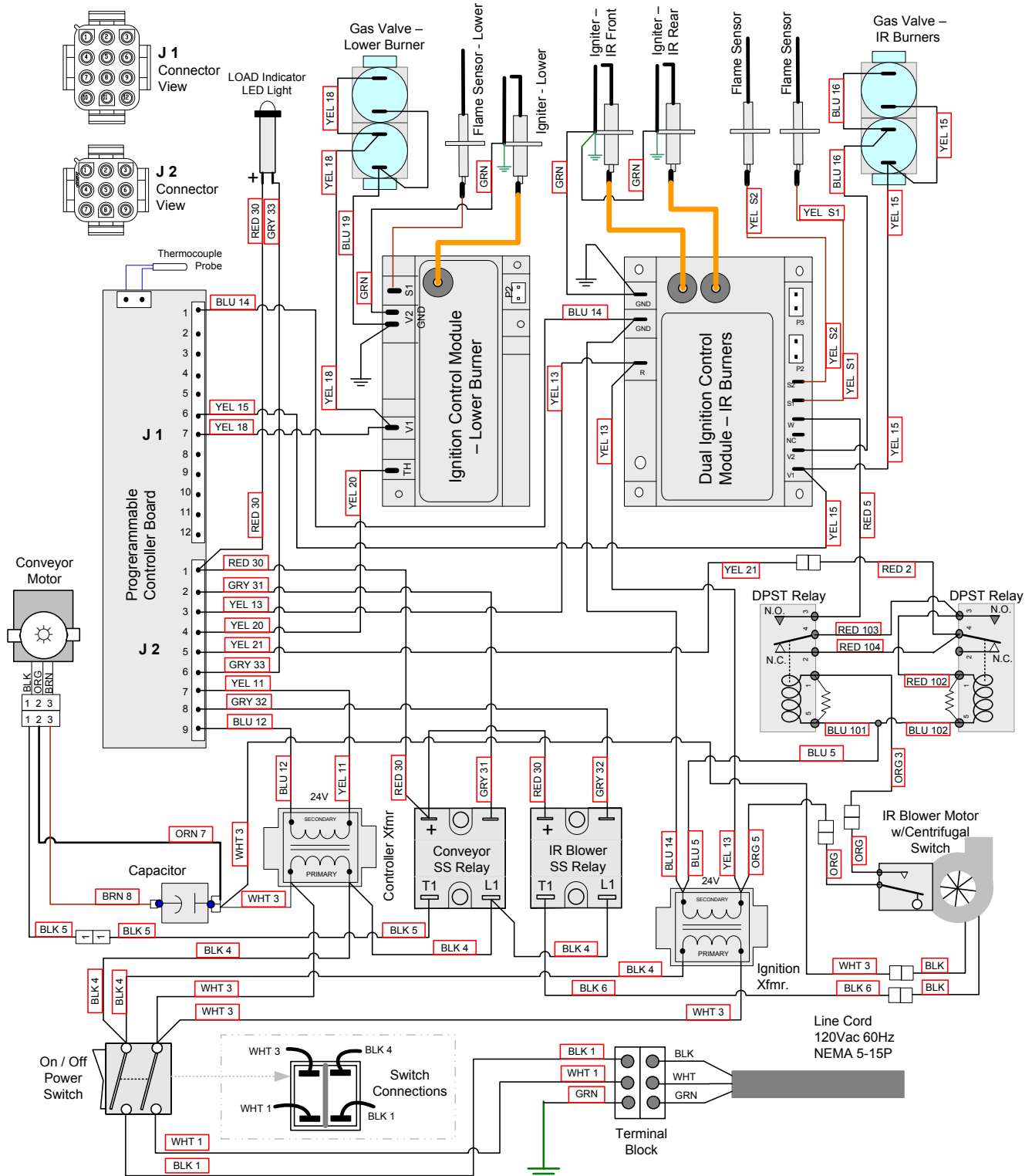
## V. REPLACEMENT PARTS LIST (CONT'D)

ITEM	DESCRIPTION	P/N
32	IGNITER	175536
33	IGNITION SUPPRESSION CABLE-IR	175537
34	IGNITION SUPPRESSION CABLE-LOWER	175538
35	CHAIN, COOK	175674
36	BUSHING BLOCK, CONVEYOR	175525
37	LOADER TRAY	175430
38	LOADER MOUNTING BRACKET	175438
39	LOADER	175444
40	LOADER RAMP	175741
41	DOOR	175429
42	FLAME ARRESTOR	175293
43	BURNER SHIELD	175200
44	DISCHARGE CHUTE	175340
45	DISCHARGE HOOD	175778
46	PRODUCT PAN SHELF	175363
47	DISCHARGE PAN	175358
48	MAIN GREASE PAN	175329
49	"V" GREASE PAN	175325
50	SIDE, GREASE PAN	175357
51	PIVOT ASH SCRAPER	175150
52	REAR PANEL	175305
53	FRONT PANEL	175300
54	PANEL, UPPER, LIFT OFF	175392
55	PANEL, ACCESS ELECTRICAL	175383
56	PANEL, ACCESS DISCHARGE	175250
57	IMPEDANCE PAN (IF NO OPTIONAL CATALYST )	175226
58	CATALYST (OPTIONAL)	175480
59	CATALYST, GUARD	175482
60	TUBE BURNER CLEANING TOOL	175485
61	FLAME ROD TUBE CLEANER	175701
62	BRUSH, FLAME ROD TUBE CLEANER	175705
63	SANITATION PAIL	175842
64	RELAY, 10A, 24VAC	175184

# VI. WIRING SCHEMATIC

## ELECTRICAL SCHEMATIC – FLEXIBLE BATCH BROILER

DUKE MFG. PN 175611 Rev. E





**NOTES**



**NOTES**

**NOTES**



*Your Solutions Partner*

## **Duke Manufacturing Co.**

2305 N. Broadway  
St. Louis, MO 63102  
Phone: 314-231-1130  
Toll Free: 1-800-735-3853  
Fax: 314-231-5074

[www.dukemfg.com](http://www.dukemfg.com)