

# Gas Char Grill

## Installation and Operation Instructions

**CE** 2575-22  
PIN: 2575DN32160  
EN203-1:2014

**UK  
CA** 0359-22  
PIN: 0359CU05300  
BSEN203-1:2014

Gas heated catering equipment(TYPE A)

**Model: DC331-N, DC331-P, CF380-N, CF380-P**

### IMPORTANT FOR FUTURE REFERENCE

Please complete this information and retain this manual for the life of the equipment. For Warranty Service and/or parts, this information is required.

Model Number

Serial Number

Date Purchased



**WARNING:** For your safety, do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliances. Keep the area free and clear of combustible materials.



**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.



**WARNING:** Instructions must be posted in a prominent location. All safety precautions must be taken in the event the user smells gas. Safety information can be obtained from your local gas supplier.



**WARNING:** Components must not be cleaned in a dishwasher



Nisbets PLC

Fourth Way, Avonmouth, Bristol, BS11 8TB,

Unit 9003, Blarney Business Park, Blarney, Co. Cork

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## I. Introduction

### CE Only:

These instructions are only valid if the country code appears on the appliance. If the code does not appear on the appliance, refer to the supplier of this appliance to obtain the technical instructions for adapting the appliance to the conditions for use in that country.

### **VERY IMPORTANT! READ THIS FIRST**

Before installing and operating this equipment, ensure that everyone involved in its operation are fully trained and are aware of all precautions. Accidents and problems can result from a failure to follow fundamental procedures and correct operation.

#### **CAUTION!**

This commercial cooking equipment is for professional use and shall be used by qualified persons.

#### **CAUTION!**

To avoid property damage, personal injury or death, all gas joints and connections disturbed during servicing, repair, gas conversion, and installation, must be checked for gas leaks. Use only gas leak detecting solutions or soap and water solution (bubble test) to check for gas leaks. Do not use naked flame to check for gas leaks.

#### **IMPORTANT REMINDER!**

Care must be taken by the operator to use the equipment safely, and to guard it against risk of fire. The following precautions must be adhered to:

- a. The equipment must not be left unattended, while it is in operation.
- b. It is recommended that a regular inspection is carried out by a competent service person to ensure correct and safe operation of your equipment is maintained.
- c. Do not spray aerosols in the vicinity of this appliance while it is in operation.
- d. The equipment must not be operated without the feet/gas stand fitted.

A colour version of this manual is available online

## II. Specifications

### A. General

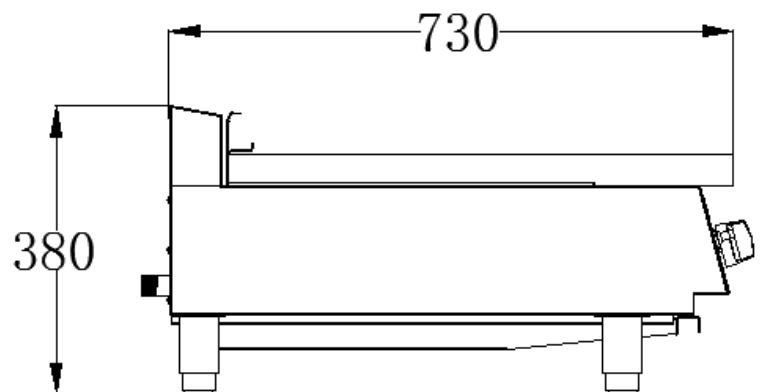
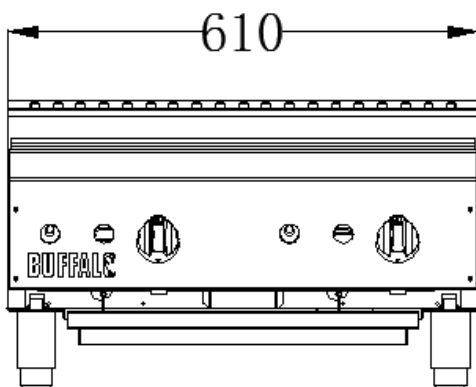
1. A commercial heavy-duty gas Char-Grill.
2. It uses lava rocks or cast radiants.

### B. Pack Contents

1. Buffalo Gas Char-Grill
2. Cast Radiant (Standard), Lava Rocks (Optional)
3. Gas Stand
4. Instruction Manual

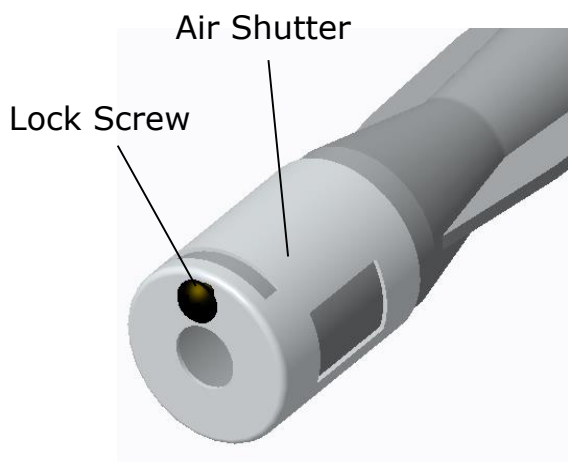
### C. Dimensions

Models	Length (mm)	Height (mm)	Depth (mm)
DC331-P	610	372	730
DC331-N	610	372	730
CF380-P	610	372	730
CF380-N	610	372	730

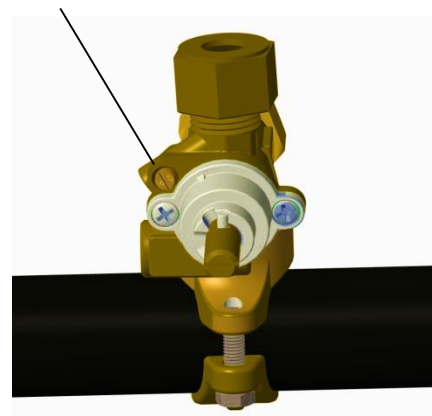


## D. Gas Specification Table

Gas Type		Natural Gas (G20)	Propane (G31)	Butane (G30)
Models		DC331-N CF380-N	DC331-P CF380-P	DC331-P CF380-P
Single burner Heat Input (KW)		7.15	7.15	7.15
No. of burners		2	2	2
Total Heat Input (KW)		14.3	14.3	14.3
Manifold Pressure (mbar)		20	37	30
Supply Pressure (mbar)		20	37	30
Gas Connection		¾" BSP	¾" BSP	¾" BSP
Main burner injector Injector Mark (Orifice Size in mm)		#47 (Ø1.99)	#54 (Ø1.4)	#54 (Ø1.4)
Pilot injector Injector Mark (Orifice Size in mm)		#45 (Ø0.45)	#25 (Ø0.25)	#25 (Ø0.25)
U-Burner Air Shutter Set-up	Default Setting	Fully open	Fully open	Fully open
	Adjustment	Adjust only if necessary.	Adjust only if necessary.	Adjust only if necessary.
Burner Low Flame Bypass Screw	Screw Hole Size	Ø1.6mm (Ex-Factory)	Ø0.7mm (Ex-Factory)	Ø0.7mm (Ex-Factory)
	Default Setting	Fully Closed	From fully closed position, turn or open by 90° counter-clockwise.	



Low flame bypass screw



### III. **Installation Guide**

#### A. **Installation Requirements**

1. Only qualified and/or authorized persons must carry out the installation, gas conversion, and servicing/repair of this equipment.
2. Components having adjustments protected by the manufacturer are not to be adjusted by the installation person. They must only be adjusted by an authorized Service Engineer.
3. This equipment must be installed in an area with sufficient ventilation to prevent the occurrence of unacceptable concentrations of substances harmful to health.
4. The installation of this equipment must comply with the local gas, health, and safety requirements.
5. The warranty will be void if this equipment was not installed in accordance with the manufacturer's specification and relevant National and Local codes.
6. This equipment must be installed in accordance with relevant National Installation codes, and in addition, in accordance with relevant National and Local codes covering gas and fire safety.

**Australia:**

AS 5601/AG 601 (to be AS 5601)- Gas Installations

**New Zealand:**

NZS 5261 - Gas Installation.

**United Kingdom:**

Gas Safety (Installation and Use) Regulations 1998

BS 6173-Installation of Catering Appliances.

BS 5440-1&2 Installation Flueing & Ventilation.

**Ireland:**

IS 820-Non Domestic Gas Installations.

#### B. **Unpack the equipment**

1. Remove all packaging and transit protection from the appliance including all protective film coating from the exterior stainless steel panels. **NOTE:** Take caution when unpacking the equipment, as wood pallets or skids can contain splinters and nails. Shipping cartons can contain large staples. Ensure to wear cut-resistant gloves and protective eyewear during unpacking, opening, removing and disposing of shipping containers.
2. Upon opening the package, check immediately the equipment and accessories/parts for any damage or deficiency.
3. Upon checking of the unit, report immediately to the carrier and the distributor, for any damage or deficiency on the equipment, and its accessories or parts.

#### C. **Establish the operational location of the equipment**

1. This equipment must be installed in an area with sufficient ventilation to prevent the occurrence of unacceptable concentrations of substances harmful to health.
2. Install the equipment in an area which provides enough airflow for combustion.
3. All air for burner combustion is supplied from underneath the unit. The feet/stands must always be fitted and no obstruction must be placed on the underside or around the base of the unit, as obstruction will cause incorrect operation and/or failure of the appliance.
4. Position the appliance in its approximate working location, then install the feet or gas stand provided.

5. Do not put the equipment in an area where the equipment's flue may be obstructed. Also, do not directly connect the equipment's flue to any ventilation equipment or system.
6. Any gas burning appliance requires adequate clearance and ventilation for optimum and trouble-free operation. The minimum installation clearances shown are to be adhered to.

### Clearances

**NOTE: THESE UNITS ARE SUITABLE FOR INSTALLATION ON NON-COMBUSTIBLE SURFACES ONLY.**

**For use in non-combustible locations only**

**For use only on non-combustible countertops**

**Noncombustible and unit clearances: sides and rear – 10”(250mm) floor**

**NOTE:** This Gas Char-Grill is supplied with adjustable stand/feet to enable the appliance to be positioned securely and level. The installation of the gas stand should be carried out before the completion of the gas connection.

### D. Install the gas stand

1. Remove the feet from the packaging
2. For initial installation, remove radiant and cast grate, upturn and support your gas equipment, taking care as items may be heavy. Screw the feet into the gas equipment.
3. Locate the equipment into its final operating position. Then, using a spirit level, adjust the feet to the correct level and height. Then, install the flue and all the cast radiants and cast grates.



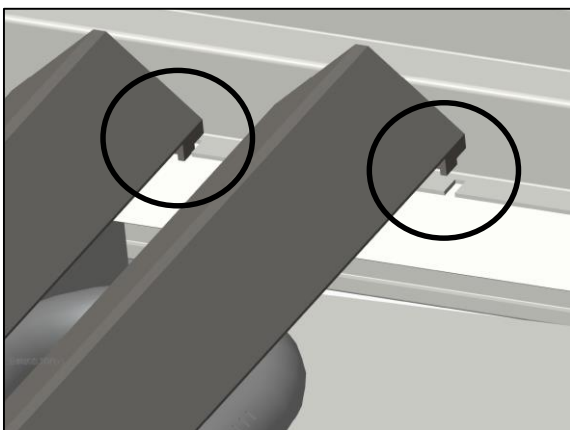
## E. Install the Flue

1. Remove the Flue from the packaging, then remove all protective film from the flue.
2. Install the flue at the back of the unit by pushing it down.



## F. Install the cast radiants (for units with cast radiants)

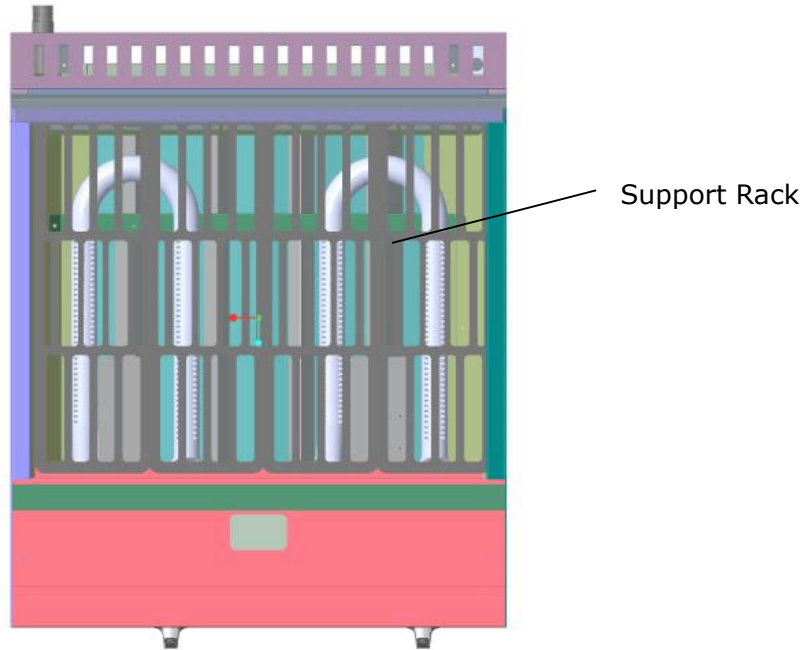
1. Remove the cast radiants from the packaging.
2. Install the cast radiants. Place each cast radiant over the "U" shaped burner tubes (peak-side up). See image below. Ensure that the corner edges are inserted on the position slots on the front and back radiant support flange.



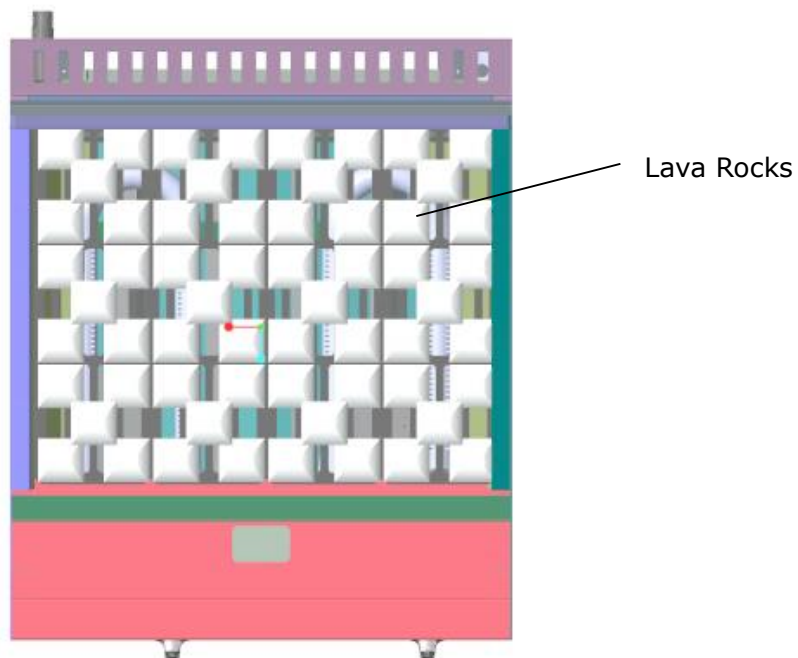


**G. Install the Lava Rock Kit (for units with Lava Rock Kit)**

1. Remove the lava rocks and support racks from the packaging.
2. Then, position the support racks over the burner tubes. The support racks should rest firmly on the front and back support flange. See image below.

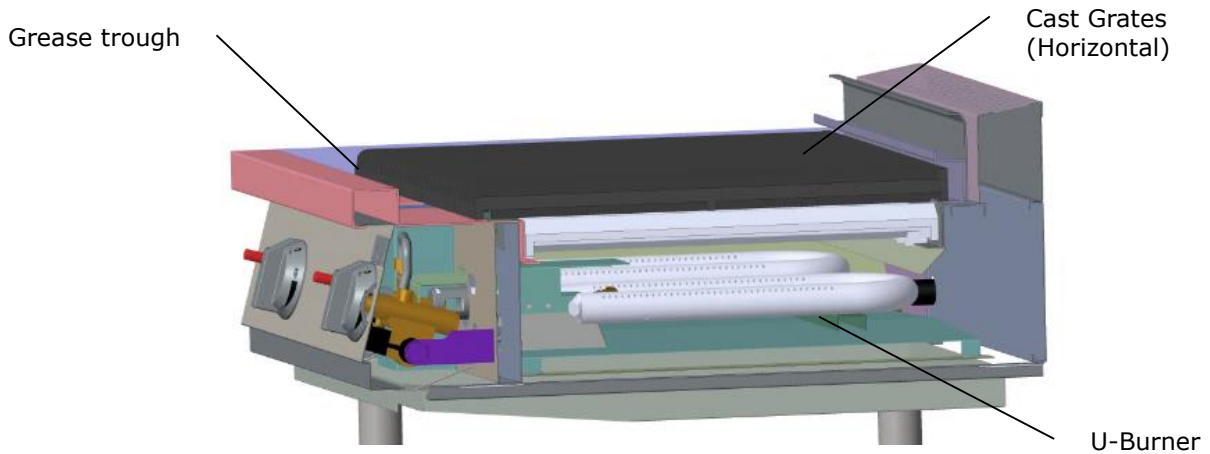


3. Place the lava rocks over the support rack as shown in the photo below. Keep the excess lava rocks for future use

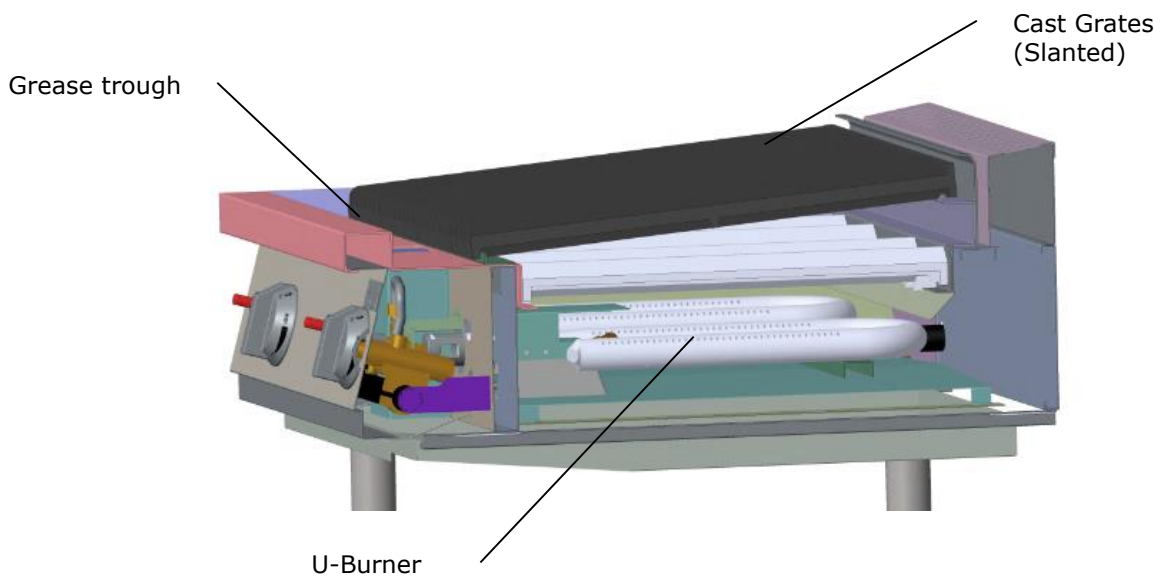


## H. Install the top cast grates/grills

1. Remove the top cast grates from the packaging.
2. Install the top cast grates.
  - a. **Horizontal installation:** Place each cooking grate on the front support flange horizontally while the rear part sits into the back support flange horizontally. See image below.



- b. **Inclined or slanted installation:** Place each cooking grate over the front support flange while the bottom groove of the rear part sits on TOP of the back support flange. See image below.

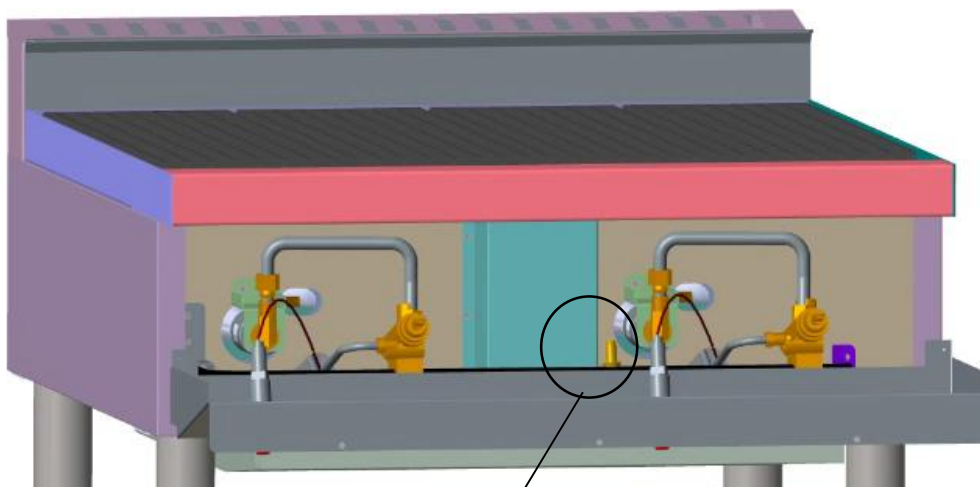


## I. Gas Connection

1. Only qualified and/or authorized persons must carry out the gas connection, testing and commissioning of this equipment.
2. After installing all the necessary parts, position the equipment in its final operating position.
3. Before connecting the gas supply line to the equipment, check the following:
  - a. Check gas type that will be supplied to the equipment. It should match the gas type indicated on the rating label.
  - b. Check the gas supply pressure. It should match the equipment's required gas supply pressure indicated on its rating label. Ensure that adequate supply pressure exists. Adjust the gas supply pressure if necessary.
4. Adjust the gas supply pressure according to the gas type used, and according to the gas supply pressure indicated on the rating label. Refer also to the Gas Specification Table on page 5 of this manual.
5. When a supply regulator is to be installed, ensure that the supply regulator is converted to the correct gas type that the equipment will operate on. Ensure that adequate supply pressure and manifold pressure exists.
6. It is highly recommended that an isolation valve be installed between the equipment and the main gas supply line.
7. Connect the main gas supply to the equipment. Unless compression fittings are used, it is essential that a suitable joining compound which resists the breakdown action of LPG or Natural Gas, must be used on every gas line connection.
8. After connecting the main gas supply to the equipment, check all gas connections for leakages. Use soapy water (bubble check), or any gas leak detecting solution. Do not use naked flame to check for gas leaks.

## J. Testing & Commissioning

1. Check the burner operating pressure. It is taken at the Manifold Pressure Test Point, with one
2. Remove the knobs/dials, and open the front panel cover. Take caution when opening the front panel as the Piezo igniter wire is still plugged in, and might be damaged.



Manifold Pressure  
Test Point

3. Remove the plug from the Manifold Pressure Test Point and install a portable manometer. Check for gas leak on the connection.
4. Turn ON the isolation gas valve, and open one burner and set at "High Flame" for Check the pressure reading in the manometer. The manometer pressure reading should be according to the pressure of the gas type indicated in the rating label and on the Gas Specification Table on page 5 of this manual.
5. Once the burner operating pressure had been confirmed to be within the requirement, turn OFF the burner and pilot, shut off the isolation gas valve, and remove the portable manometer from the Manifold Pressure Test Point, and return the plug. Then, check for gas leak after returning the plug.
6. Plug in the Piezo igniter, and return the front panel cover, and the control knobs.
7. Do not leave the premises until the functions of the following were fully checked and functional:
  - a. Lighting of the Pilot burners
  - b. Lighting of the Main burners
  - c. Setting of the "Low Flame"
  - d. Turning OFF of the Main burners
  - e. Turning OFF of the Pilot burners

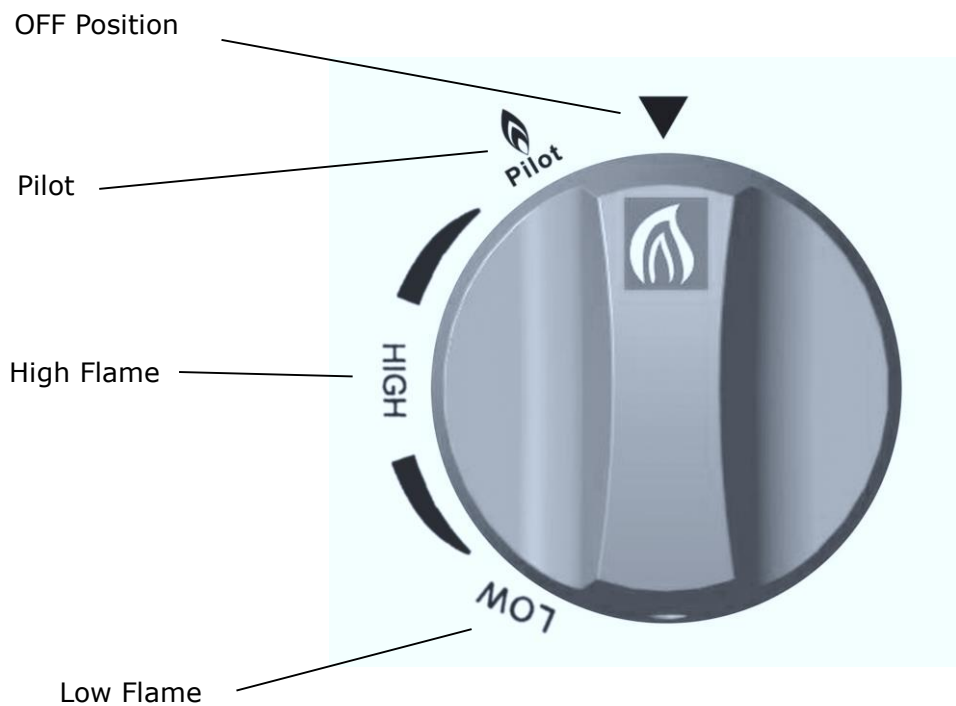
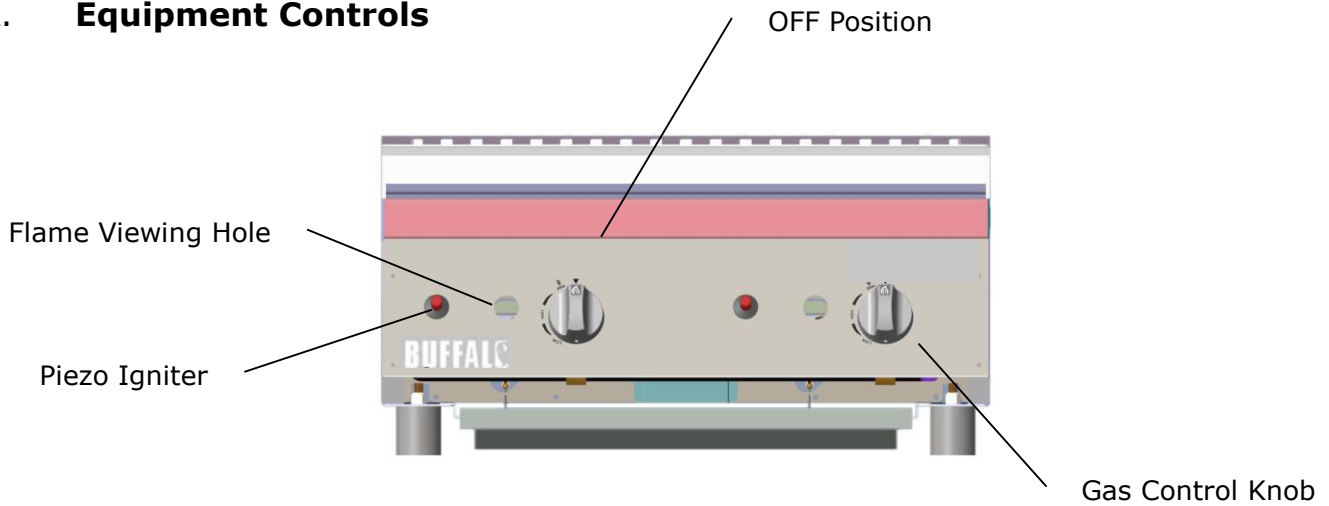
Note that the procedure of the above processes is specified in the "Operation" section of this manual.

8. The owner of the equipment must keep this manual along with the records of the purchase and installation of the equipment for future reference.
9. It is essential that the operator/user was instructed for the correct procedure for lighting, operation and shutdown of the equipment.

## IV. Operation Guide

This equipment is only for professional use and that it shall be used by qualified persons. Parts or components that have adjustments which are protected by the manufacturer or his agents shall not be adjusted by the user/ operator.

### A. Equipment Controls



## B. Lighting the Pilot Burners

The burners of this Gas Char-Grill are fitted with individual standing pilots which allows the main burners to be turned ON or OFF without the need to manually re-light the burner each time that it is turned OFF, as the burner will automatically light itself by the pilot burner.

Flame Failure Protection is incorporated for each burner by way of a thermo-electric system which will shut off the gas supply to that burner in the event that the pilot burner flame goes out, so that un-burnt gas is not expelled to the surrounding area.

1. Select the pilot to be lighted.
2. Depress the gas control knob and turn it counter-clockwise to "PILOT".
3. While the knob is depressed, light the pilot burner or use the piezo igniter provided. Once the pilot has been lit, hold the knob depressed for 10-20 seconds after lighting the pilot burner. This is to give ample time for the gas to flow to the pilot and heat up the thermocouple.
4. Release the knob after 10-20 seconds. The pilot burner should stay alight, if not, repeat Steps (1 to 3 above).
5. If pilot burner was extinguished during normal operation, wait for 5 minutes before lighting it up.

## C. Lighting the Main Burners

1. Select the burner to be lighted.
2. Full flame can now be achieved by depressing the knob a little and turning it counter-clockwise to the first stop, "HIGH" flame position.
3. To achieve simmer control, depress the knob a little and turn it counter-clockwise to the second stop "LOW" flame. Note that the gas control knob can be rotated between "HIGH" and "LOW" flame to achieve your required temperature.

## D. Turning "OFF" the Main Burners

1. Select the burner to be turned "OFF".
2. To turn off the main burner, but keep the pilot burner lighted, rotate the gas control knob clockwise to "PILOT" position. Notice that the main burner will extinguish and the pilot will remain lit.
3. It is recommended to turn "OFF" the main burners during idle periods, but let the pilot stay lit.

## E. Turning "OFF" the Pilot Burners

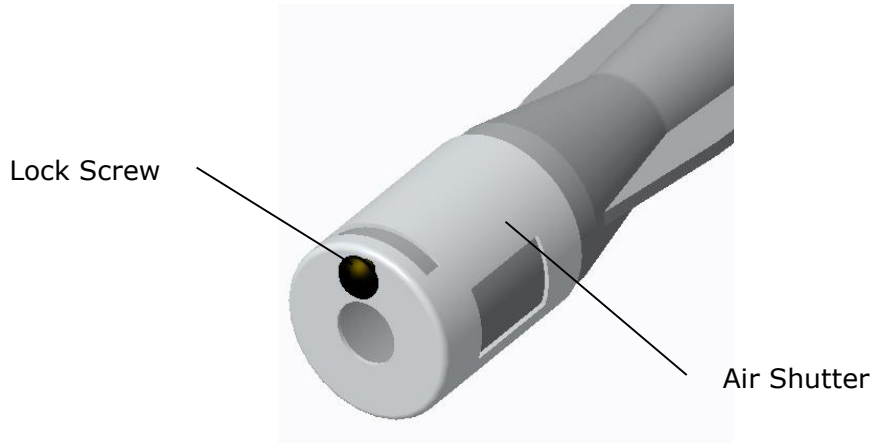
1. Select the Pilot Burner to be turned "OFF".
2. To turn OFF the pilot burner, rotate the gas control knob clockwise to " I " position. Notice that the pilot burner will extinguish.

### **CAUTION!**

The surface temperature of the Char-Grill can reach over 300°C when the equipment is operated at full setting.

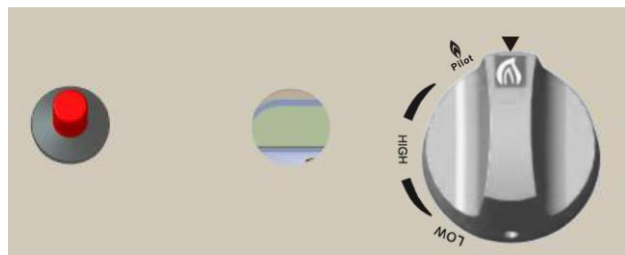
## F. Main burner air supply:

1. For efficient burner operation, a proper balance of gas volume and primary air supply must be maintained which will result in complete combustion. Insufficient air supply results in a yellow streaming flame. The primary air supply is controlled by an air shutter on the front of the burner.
2. Loosen the lock screw on the front of the burner and adjust the air shutter to just eliminate the yellow tips of the burner flame. Lock the air shutter in place by tightening the screw.

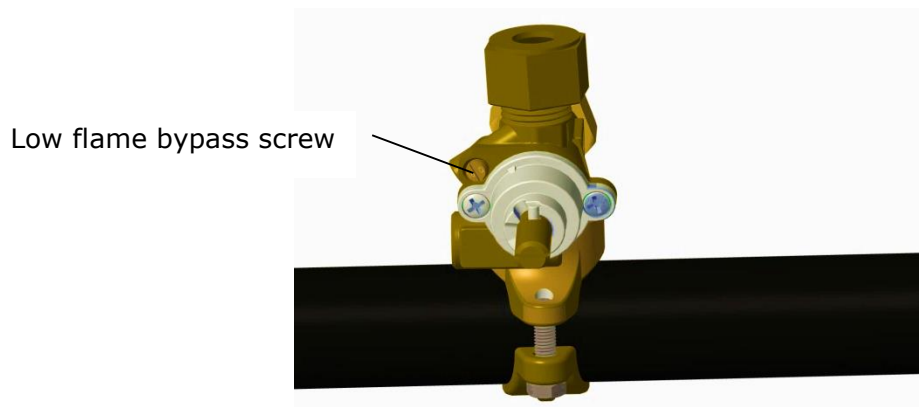


## G. Burner's low flame adjustment

1. Turn ON the main burner and set the knob to low flame.



2. Pull out the knob from the safety gas valve.
3. Turn the low flame bypass screw clockwise to decrease the flame or turn counter-clockwise to increase the flame. Refit the knobs after adjustment.



## H. **Start-up operation or operation from cold start**

1. Turn the burners on about 5 minutes before cooking for preheating.
2. Set the knobs to the desired temperature setting or temperature. Each valve will control the gas flow to the burner to bring that area of the unit up to the set temperature.
3. If different temperature settings are to be used, adjoining areas should be set at progressively higher temperatures using the lowest temperatures on the outside burners. A uniform and systematic approach to the loading of the unit will produce the most consistent product results.

## I. **Radiants**

1. Place the radiants in their position. Make sure that the radiants are sitting properly into the slots on the front and rear supports.
2. Radiants should be centered over straight section of the burners. Refer to page 8 of this manual for the correct installation of the radiants.

## J. **Cooking grates**

1. Place the top cooking grates horizontally or with the grid bars sloping toward the front. Refer to page 10 of this manual for the correct installation of the cast grates.

**NOTE:** When cooking grates are placed sloping toward the front, the grooves on top will guide the excess fat drippings into the grease trough.

## K. **Important reminders**

1. Components protected by the manufacturer or his agent shall not be adjusted by the user/operator.
2. The space between the legs at the bottom admits combustion air. DO NOT BLOCK THIS SPACE.
3. All burners are lit from constantly burning pilots. Turning the valve to the desired temperature setting is all that is required to put the unit in service.
4. Do not permit fans to blow directly at the unit. Wherever possible, avoid open windows next to the units' sides or back. Avoid wall type fans which create air cross-currents within a room.
5. It is also necessary that sufficient air should be allowed to enter the room to compensate for the amount of air removed by any ventilating system. Otherwise, a subnormal atmospheric pressure will occur, affecting operation and causing undesirable working conditions.
6. A properly designed and installed hood will act as the heart of the ventilating system for the room or area in which the unit is installed, and will leave the unit independent of changing draft conditions.
7. All valves must be checked at least annually. This must be done by an authorized service representative in your area.
8. Please wait at least 15 seconds to restart the main burners to maintain the best function of the safety gas valve after turning off the main burners.

### **VERY IMPORTANT!**

You must contact your authorized service personnel so that the appliance is serviced immediately when abnormal conditions, such as, partial or full loss of burner flame, abnormal burner flame, and other burner control problems arise. When such abnormal conditions were noticed, you must not to use or operate the equipment until it has been serviced and commissioned properly by any authorized service personnel.



## V. Cleaning Instructions

### **CAUTION!**

Always turn the unit OFF, and follow the lock-out/tag-out procedure before performing cleaning and maintenance operation.

Allow the unit to cool down first, before starting any cleaning and maintenance operation.

### A. **INITIAL CLEANING:**

Prior to operating your new Char-Grill, perform the Cast Grates "Burn-OFF", when the Char-Grill is first heated, it will smoke until oil used in manufacturing, preservation and dust from storage and shipping are burned off. Wash with soap and water before use.

### B. **DAILY CLEANING:**

1. Remove the grease pan and empty it.
2. Cast Grates "Burn-OFF". The grease buildup on the grates should be cleaned daily (or more often as needed). Do not cover the top of the grates during "Burn-OFF" operation. Restricting the air flow by covering the grates may cause them to warp. It will also cause damage to the valves, knobs, and front panel.  
**Caution:** When handling grates or radiants, always use heat insulated gloves to prevent burns.  
**Warning:** Do not cover the top of the grates during a burn off operation. Restricting the airflow by covering the grates may cause them to warp. It will also cause damage to the valves, the knobs and the front panel.
3. Place grates on Char-Grill, with grid bars horizontal, facing down.
4. Wash the Char-Grill with soap and water after it runs cold
5. Turn off the Char-Grill and allow it to cool for 20 Minutes or more.
6. Clean top and bottom surfaces of the grates with a soft wire brush to remove fats and caramelized grease.
7. Clean channels on grates with a scraper.
8. Remove radiants from Char-Grill. Clean the top surface of radiants with soft wire brush to remove any food debris or caramelized grease deposits.
9. For units with lava rocks, remove the lava rocks and wash them with mild detergent and with warm water.
10. Brush the rocks with soft bristled brush to remove any food debris or caramelized grease that stuck on the rocks. Check the rocks for cracks and damage, and replace with new ones if necessary.
11. Then return the cast grates properly to the equipment. See also page 11 for correct installation of cast grates.

#### **NOTE:**

- a. If the Char-Grill usage is very high, we recommend that a more thorough cleaning is carried out on a more frequent basis. Refer to WEEKLY CLEANING.
- b. DO NOT use harsh abrasive detergents, strong solvents or caustic detergents as they will damage the grate and burners.

## C. **WEEKLY CLEANING:**

1. Remove the grease pan, empty and wash it with mild detergent and warm water, applied by sponge or soft cloth. Then, dry it with a soft dry cloth.
2. To remove normal dirt, clean the flue and exterior body of the equipment with mild detergent and warm water, applied by sponge or soft cloth. Do not use wire brush or steel scouring pads to remove grease and food splatter from the flue and external body of the equipment.
3. To remove grease and food splatter, which have BAKED on the equipment, apply cleanser to a damp cloth or sponge and rub cleanser on the metal in the direction of the polishing lines, so that it will not mar the finish of the stainless steel. Never rub with a circular motion.
4. Grate "burn off". The grease buildup on the grates should be cleaned daily (or more often as needed).

**Caution:** When handling grates or radiants, allow to cool and always use heat insulated gloves to prevent burns.

**Warning:** Do not cover the top of the grates during a burn off operation. Restricting the airflow by covering the grates may cause them to warp. It will also cause damage to the valves, the knobs and the front panel.

5. Place grates on Char-Grill, with grid bars horizontal, facing down.
6. Turn the Char-Grill on for approximately 45 minutes.
7. Turn off the Char-Grill and allow it to cool for 20 Minutes or more.
8. Clean top and bottom surfaces of the grates with mild detergent and warm water using a soft wire brush to remove fats and caramelized grease.
9. Clean channels on grates with a scraper.
10. Rinse the cast grates with warm water and dry thoroughly with a dry cloth
11. Remove radiants from Char-Grill. Clean the top surface of radiants with a mild detergent and warm water, and with soft wire brush to remove any food debris or caramelized grease deposits.
12. For units with lava rocks, remove the lava rocks and brush the rocks with soft bristled brush to remove any food debris or caramelized grease that was stuck on the rocks.
13. Check the rocks for cracks and damage, and replace with new ones if necessary.

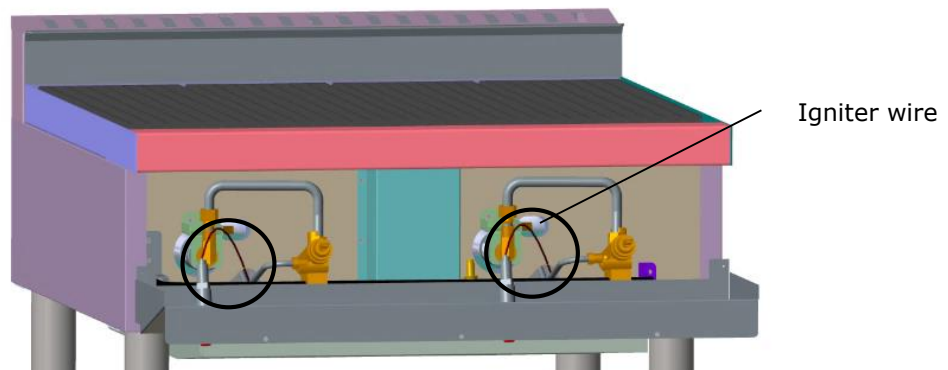
## VI. Gas Conversion

### **CAUTION!**

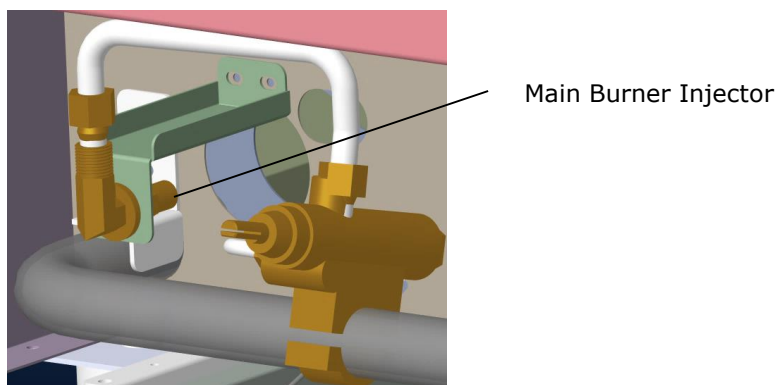
Only qualified/authorized service persons are to carry out gas conversion operations. Before proceeding with the gas conversion procedure, allow the unit to cool down first, and ensure that the main gas supply connected to the equipment is shut-off, and lock-out/tag-out procedure is followed, to prevent injury to persons or damage to property.

#### 1. Replace the Main Burners Injectors

- a. Remove the gas control knobs from the front control panel. The control knobs are a push fit onto the shaft of the gas control valves.
- b. Remove the front control panel by slackening the 4 screws on the front of the control panel and remove the panel from the front of the appliance. Take caution when opening the front panel and ensure to disconnect the electrical connection lead wire from the rear of the piezo igniter fitted at the control panel.



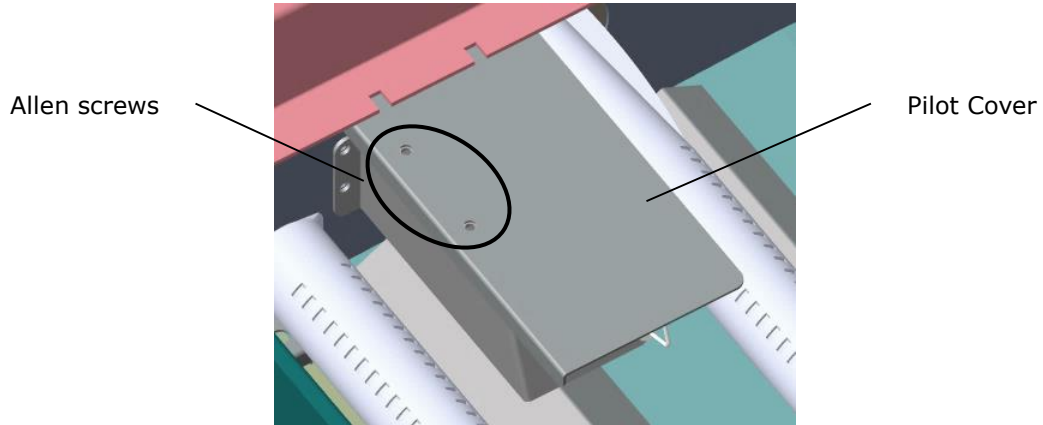
- c. Remove the cast grates and radiants.
- d. Remove the cotter pin which locks the burner in place, and then remove the U-burner.
- e. Remove the Main Burner Injector using a 13mm spanner.



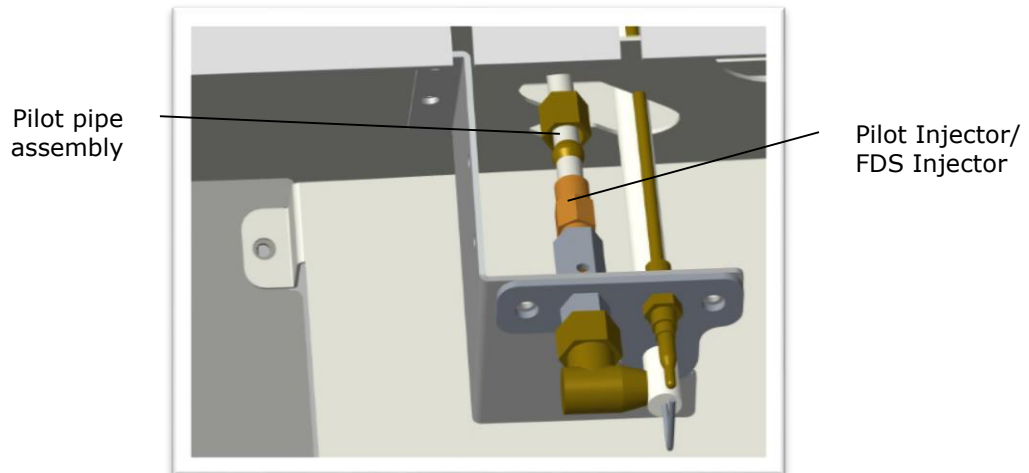
- f. Determine the correct Orifice size for the new gas type. Refer to the Gas Specification Table on page 5 of this manual.
- g. Replace with the correct Main Burner Injector Orifice size (refer to the Gas Specification on page 5).
- h. Return the U-Burner, and return the cotter pin to lock the U-Burner in place. Ensure that the U-burner and main burner injector are properly aligned with each other.

2. Replace the Pilot Injectors

- a. Remove the pilot cover. Slacken the two screws of the pilot cover and remove it.



- b. Disconnect the pilot pipe assembly from the pilot injector. Slacken the nut of the pilot pipe to allow for easy removal. Use 10mm spanner

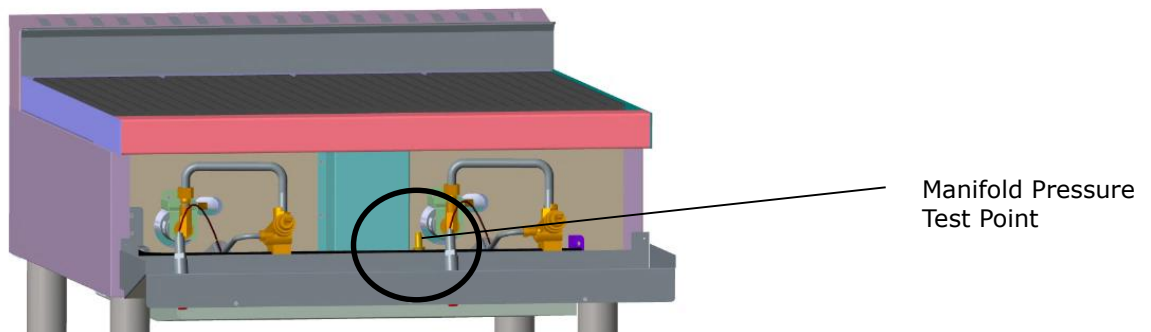


- c. Remove the pilot injector from the pilot assembly.  
d. Determine the correct pilot injector orifice size, refer to the Gas Specification Table on page 5 of this manual. Install the pilot injector to the pilot assembly.  
e. Re-connect the pilot pipe assembly to the pilot injector.

3. Low flame bypass screw Conversion

- a. Determine the correct Orifice size for the new gas type. Refer to the Gas Specification Table on page 5 of this manual.

4. Remove the plug from the Manifold Pressure Test Point and install a manometer. Check for gas leak on the connection.



5. Adjust the inlet pressure according to the gas type used. Refer to the equipment's rating label or the Gas Specification Table on page 5 of this manual.
6. Turn ON the isolation gas valve, and open one burner and set at "High Flame"
7. Check the pressure reading in the manometer. The manometer pressure reading should be according to the pressure of the gas type used. Refer also to the Gas Specification Table on page 5 of this manual.
8. Turn ON all the pilots and main burners and check the flame for any abnormalities.
9. Check the connections for gas leak. Use any authorized gas leak detecting solution to check for gas leak. Never use naked flame to check for gas leaks.
10. Adjust the burner's air shutter, as necessary, to eliminate yellow flame and lifting of flames, and other burner flame abnormalities.
11. Refit the pilot covers, radiants, cast grates, front panel cover, and knobs.
12. After converting the unit, ensure to post the new label with the appropriate gas type used. Fill-up the Gas Conversion Label and attach it to the unit beside the rating label.

GAS CONVERSION LABEL	
MODEL NO.:	DATE:
SERIAL NO.:	INPUT RATE (BTU/HR):
TYPE OF GAS:	MANIFOLD PRESS. (IN W.C.):
INLET GAS PRESS.:	
<b>CAUTION!</b>	
THIS UNIT HAS BEEN CONVERTED TO THE ABOVE GAS SUPPLY SPECIFICATION. REFER TO OPERATION MANUAL FOR MANIFOLD PRESSURE AND INPUT RATE REQUIREMENTS.	
THIS APPLIANCE WAS CONVERTED ON (DATE) _____	
TO (GAS TYPE) _____ BY (COMPANY NAME AND ADDRESS) _____	
WHICH ACCEPTS THE RESPONSIBILITY THAT THIS GAS CONVERSION HAS BEEN MADE PROPERLY.	

13. Before leaving the premises, ensure to check the functions of the following:
  - a. Pilot burner ignition
  - b. Pilot burner flame. It should stay lit.
  - c. Main burners, "HIGH" flame and "LOW" flame.
  - d. Check for gas leaks on the connections that were disturbed during the gas conversion.

**CAUTION!**

To avoid property damage, personal injury or death, all gas joints and connections disturbed during servicing or gas conversion must be checked for gas leaks. Check with a soap and water solution (bubble test), or any authorized gas detecting solution. Do not use naked flame to check for gas leaks.

## Gas Conversion Kits

Item Name	Char-Grill			Model No.		DC331-N/DC331-P CF380-N/CF380-P	
	Country of destination	Category	Gas	Supply Pressure (mbar)	Manifold Pressure (mbar)	Main Burner Injectors	Pilot Burner Injectors
AT, BG, CZ, DK, EE, FI, GR, HR, HU, IS, IE, IT, LV, LT, NO, PT, RO, SK, SI, ES, SE, CH, TR, GB	I2H	G20	20	20	#47 (Ø1.99mm)	0.45	7.15
BE, CH, CZ, IT, ES, FR, GR, GB, HR, LT, NL, PT, SK, IE, SI	I3P(37)	G31	37	37	#54 (Ø1.4mm)	0.25	7.15
BE, CH, CZ, ES, FR, GB, GR, IT, PT	I3+	G30/31	28-30/37	28-30	#54 (Ø1.4mm)	0.25	7.15

## VII. Troubleshooting Guide

### A. GENERAL INFORMATION ON TROUBLESHOOTING:

1. Burning speed:

The velocity at which flame travels through an air-gas mixture. Burning speeds vary with types of gases, and the amount of air mixed with the gas. This air to gas ratio is very important in that it is directly related to flame stability.

2. Products of Combustion:

Carbon dioxide and water vapor is formed in burning plus the nitrogen in the reactants that entered with the combustion air.

3. Flue products:

The combination of combustion and excess air leaving the combustion area. Since water is produced as a vapor in the burning of gas it is also present in flue products. If the flue products and vent system remain hot enough this vapor is harmlessly discharged. If not, the vapor can reach the dew point and condense into water which can accumulate in the system.

4. Incomplete combustion:

A poorly vented appliance restricts flow of air into an appliance. Lack of ventilation around an appliance may lower oxygen content in the surrounding air. This can be a result of spillage of combustion products into the room as well. These conditions can cause incomplete combustion and poor performance of an appliance. Adequate, but not excessive ventilation is a must and cannot be over emphasized.

5. Primary air:

That air which is mixed with gas before the gas leaves the burner port to burn. Ideal burning condition generally is 10 cubic feet of air per cubic foot of gas.

6. Secondary air:

The remaining air needed for complete combustion besides primary air. This is the air surrounding the flames.

7. Flame stability:

Primary air, burning speed, port size and port depth are several factors affecting flame stability. Flames on a burner tend to stabilize at a point where flow velocity out and burning speed back are equal. This balance of flow velocities and burning speed explain why flames change when primary air or gas rate is adjusted.

8. B.T.U.:

British Thermal Units is the heat energy produced when burning a fuel gas. One BTU of heat will raise the temperature of one pound of fresh water one degree Fahrenheit.

## B. Burner problems

### 1. LIFTING FLAMES:

#### **How to recognize:**

When lifting flames occur, part of the flame lifts from the burner port. Lifting flames rise from the ports to burn some distance above the port. In some cases, these flames will drop back to the port and lift again intermittently. Lifting flames may occur on a few or all of the burner port holes. If flames lift from a number of ports, they may create a distinct flame noise. Lifting burner flames result when the velocity of the air-gas mixture from a port exceeds the flame velocity.

#### **How to correct:**

The simplest way to stop burner flames from lifting is to reduce primary air. However, before doing this, check the appliance input rate and reduce if necessary. Lifting may be observed with only one of several burners in an appliance. Check the orifice size of that burner against the others to make sure the burner is not operating over rated input. When reducing primary air to prevent lifting flames, make sure yellow tipping does not occur.

### 2. FLASHBACK:

#### **How to recognize:**

When flashback occurs in a burner, the air-gas mixture ignites inside the burner to burn near the orifice. This burning in the mixer tube usually creates a roaring noise like a blowtorch.

#### **How to correct:**

Flashback on ignition or during burner operation usually can be eliminated by reducing primary air to the burner. Make sure that the air adjustment does not produce yellow tipping of flames. The burner may be under rated, so check input rate and adjust it to its correct value if necessary. The orifice size may be enlarged, or gas pressure increased if rate or supply pressure is found to be too low. Sometimes only one burner of several in an appliance flashes back. Check the orifice size of that burner against those of the other burners. If flashback occurs with the burner's gas valve in off position, the gas valve is probably leaking. Repair the valve or replace it. Replace the burner, or burners, if the above correction fails to eliminate the flashback.

### 3. EXTINCTION POP:

#### **How to recognize:**

Sometimes a small explosion of gas in the burner head occurs when the burner is shut-off. Under these conditions flashback or extinction has taken place. This problem is commonly called "**extinction pop**".

Extinction pop creates a noise or a loud "bang". Ordinarily, it is not followed by burning in the burner head or mixer tube, since the gas supply is turned-off. The pop occurs at the time the gas supply to the burner is shut-off. Sometimes it may be delayed for a few seconds.

#### **How to correct:**

It may be possible to eliminate extinction pop by reducing primary air supplied to the burner. Make sure that this air adjustment does not cause yellow tipping during normal burner operation. It also may help to increase gas pressure and decrease gas orifice size. These changes provide a faster flow of the final air-gas mixture, and allow the air shutter to be closed more than with a larger gas orifice and lower gas pressure. If these actions fail to correct the problem, replace the burner.

### 4. YELLOW TIPPING OF FLAMES:

#### **How to recognize:**

Bunsen-type flames should be completely blue. If not enough primary air is supplied, yellow tips appear in the flames. Do not confuse yellow tips with red or orange streaks which sometimes appear in flames. These color streaks usually are due to dust in the air supply and should create no problems. There also have been some reports of humidifiers, operating with softened water, causing orange flames on burners. The use of some tinted glasses, such as brazing goggles, will eliminate those discolorations from view, leaving true yellow tips still visible. Yellow tip flames indicate incomplete combustion in appliances designed for blue flame operation. This condition is aggravated if the flames impinge on cool surfaces. Yellow flames which produce soot (carbon) can be a nuisance. Sooting presents a serious problem if it collects to block flue-ways. Plugged flue-ways impede venting of combustion products and reduce the amount of air drawn into the combustion chamber. Incomplete combustion can then take place.



**How to correct:**

Yellow tipping is caused by a lack of enough primary air. This condition may be due simply to an incorrect air shutter adjustment. If this is the case, open air shutters to get rid of the yellow tips. Make sure that this added primary air does not cause lifting of flames or flashback.

Lint and dust may have blocked the primary air openings, or collected inside the burner tube or on the underside of burner ports to which reduced primary air injection, causing yellow tipping. If so, clean and re-adjust the burner.

A burner orifice spun out of line will reduce primary air injection. Faulty drilling or a dirty orifice can have the same effect. Check the orifice, clean it, re-align it or replace it if necessary.

## 5. FLUCTUATING FLAMES:

**How to recognize:**

Length of burner flames may fluctuate or shorten over a period of time without any re-adjustments of the burner. This condition usually indicates a non-uniform gas pressure at the orifice. Fluctuating flames usually do not create any immediate problems, such as incomplete combustion, unless flames impinge on cool surfaces. This condition should be corrected, however, since it warns of possible future problems.

**How to correct:**

Unsteady gas pressures cause flames to fluctuate. Usually this condition indicates problems with the gas pressure regulator, the gas meter or other gas supply problems. Burner flames may shorten with no change in gas pressure or primary air adjustment. Check the orifice for blockage by dust or dirt from supply lines. Very small pilot orifices are quite prone to blockage.

## 6. FLAME ROLL-OUT:

**How to recognize:**

When the condition known as flame roll-out occurs, flames roll out of the combustion chamber openings when the burner is turned ON. Flame rollout may create a fire hazard, or scorch appliance finishes, burn wire, or damage controls. The gas in the burner mixer may be ignited, producing a flashback.

**How to correct:**

Flame rollout is actually a variation of floating flames, with flames reaching for air outside the combustion chamber. Again, the basic cause is a lack of combustion air. This lack of air may be due to overrating of burners, poor draft or blockage of flue-ways. Apply the corrections for these problems listed for floating flames.

## 7. FLOATING FLAMES:

**How to recognize:**

The difference between floating flames and lifting (or blowing flames) should be clearly understood. Both conditions are undesirable, but the cause and corrective steps are different in each case. Lifting or blowing flames are well defined and hard, and may create a blowing noise. Cutting back on primary air usually stops flames from lifting. Floating flames are lazy looking. They do not have well defined cones, and appear to be "reaching" for the air. They are long, ill-defined, quiet flames which roll around in the combustion chamber sometimes completely off the ports. Usually a strong aldehyde odor is present. Floating flames almost always indicate incomplete combustion. They point to a dangerous condition which requires prompt correction. If secondary air supply is reduced too far, burner flames will float. Combustion products above the burner re-circulate lower in the chamber. These products contaminate the air supply, adding to the problem.

**How to correct:**

A lack of combustion air causes burner flames to float. Several conditions, or a combination of these conditions, can be the cause. The appliance may be overrated. If so, the flue outlet area provided for the rated input may be too small for the increased gas rate. Check the appliance rate and reduce it if necessary.

Other conditions may cause poor venting and lead to floating flames. Soot or dust may be blocking the flue-ways. Check flue-ways and clear any blockage found. Determine, if possible, the reason the flue-ways were blocked up. Check for blockage of burners, and clean them if necessary. Adjust primary air to get rid of any yellow tipping which may have produced soot to block the flue-ways. Make sure secondary air inlet openings are not blocked.

Reduce natural draft (venting) through an appliance may take place when it is operated from a cold start. Some floating flames may appear for a brief moment until such time draft is

established. When the appliance heats up it should operate in a normal manner.

8. GAS ODOR AT PRIMARY AIR OPENINGS:

Under normal burner operation, a negative pressure (vacuum) should exist inside the primary air openings of a burner, drawing in air. If all gas fed to the burner by the orifice does not flow to the burner head, some gas may spill from the primary air openings. If this condition is found, check the burner body for restrictions, and check the orifice to make certain it is not out of line.

9. CORROSION OF APPLIANCES:

Gas appliances are designed and built to give long dependable service life. In some installations recently, usually severe corrosion has occurred resulting in customer complaints. This corrosion is attributed to the extensive use of aerosol propellants, hydrocarbons which contain the elements FLOURINE AND CHLORINE. These elements are called halogens. Halogens in their free state are very corrosive. When the propellants pass through a flame, they break down and the halogen gases are released. In combination with the water vapor in the flue gases they cause corrosion in heat exchangers, flue-ways and other appliance parts.

## C. Technical Troubleshooting Guide

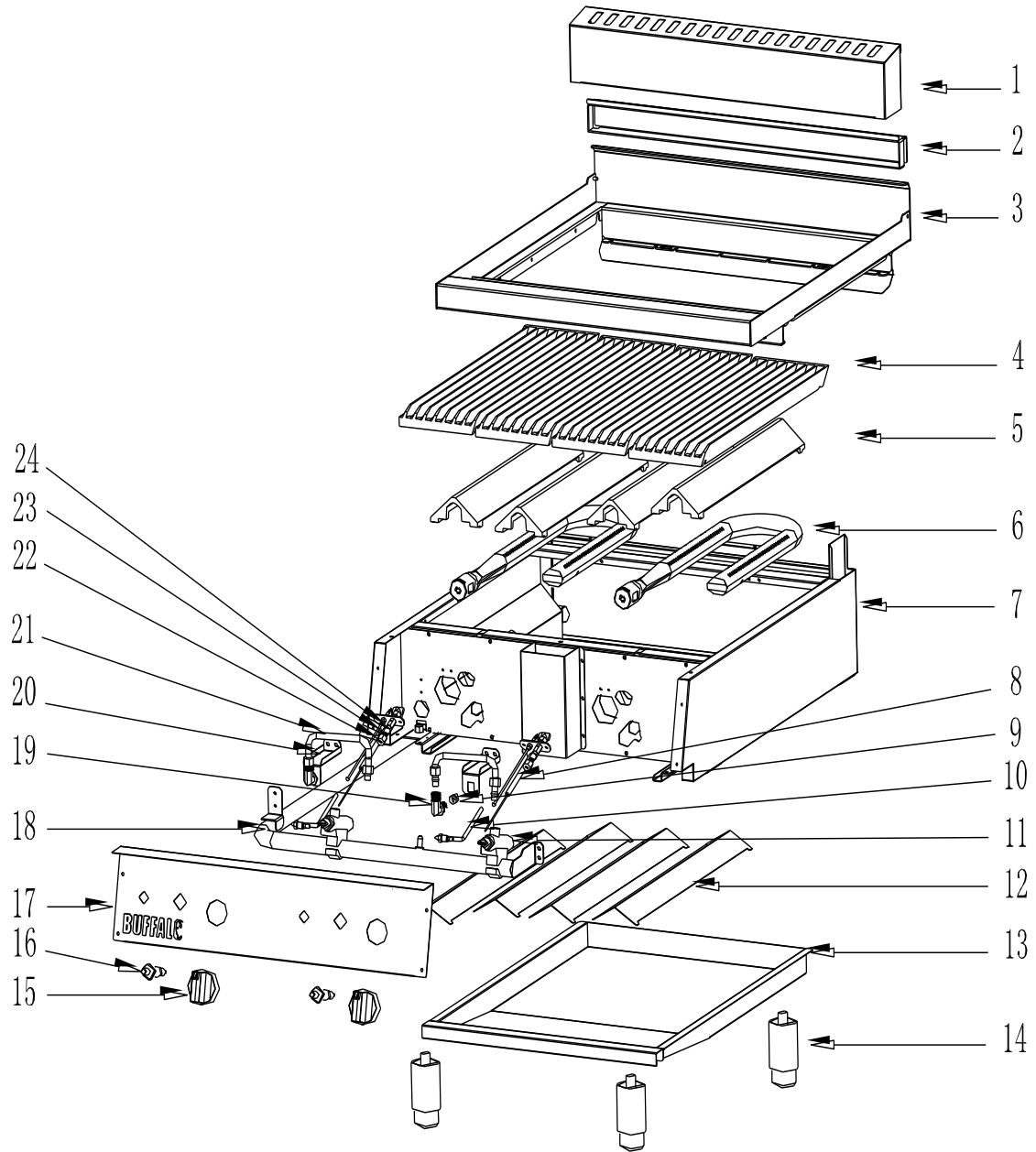
Fault	Possible Cause	Remedy
Pilot won't light.	No gas supply or gas isolation valve is OFF.	Ensure gas isolation valve is turned on, and that gas tanks are not empty.
	Pilot burner is clogged/blocked.	Check the pilot burner if clogged, and clean, or replace if necessary.
	Thermocouple connection to gas valve is loose or too tight.	Check the thermocouple tightness. Tighten the thermocouple to 2.5N-m of torque. Or loosen if necessary.
	Faulty thermocouple.	Replace the thermocouple.
	Faulty safety gas valve.	Replace the safety gas valve.
Pilot flame is very small and can be easily blown out by a small draft.	Insufficient gas supply pressure.	Adjust the gas supply pressure to required standard. Refer to gas pressure requirement section on this manual.
	Thermocouple connection to gas valve is loose or too tight.	Check the thermocouple tightness. Tighten the thermocouple to 2.5N-m of torque. Or loosen if necessary.
	Pilot injector is clogged or blocked.	Check the pilot burner if clogged, and clean, or replace if necessary.
	Pilot head is partially blocked.	Check the pilot head for any blockage. Clean or remove the blockage. Replace the pilot head if necessary.
	Faulty safety gas valve.	Replace safety gas valve.
Main Burner will not light.	No gas supply or gas isolation valve is OFF.	Ensure that gas tanks are not empty, and gas isolation valve is turned ON.
	Insufficient gas supply pressure.	Adjust the gas supply pressure to required standard. Refer to gas pressure requirement section on this manual.
	Clogged or blocked burner injector.	Clean the burner injector or replace it if necessary.
	Faulty or broken gas valve.	Replace the gas valve.
Main burner and pilot shuts-off after a few minutes of operation.	Clogged pilot injector.	Replace pilot injector.
	Thermocouple connection to gas valve is loose or too tight.	Check the thermocouple connection. Loosen or tighten if necessary.
	Faulty thermocouple.	Replace thermocouple.
	Faulty safety gas valve.	Replace safety gas valve.
Flame does not come out from some of the holes of the main burner.	Holes are clogged with carbon or food debris.	Clean the burner or replace it if necessary.

Fault	Possible Cause	Remedy
Burner and Pilot flame color is yellow.	Wrong gas type used.	Check the gas type used, change to the correct gas type.
	Wrong orifice installed.	Check the orifice installed. Replace it with correct orifice for the gas type used.
	Air shutter is partially or fully closed. Not enough combustion air.	Adjust the air shutter of the burner to eliminate the yellow flame.
Burner flame is too high or too low.	Pressure is too high or too low.	Adjust pressure to standard. See standard pressure settings.
	Burner injector used is not appropriate for the gas type used.	Change the burner injector to appropriate gas type used.
	Incorrect gas type used.	Change gas type used based on the product's rating label.
	Faulty safety gas valve.	Replace safety gas valve.
Yellow tipping of flames	Lack of primary air due incorrect air shutter adjustment.	Open air shutters to get rid of yellow flame.
	Lint and dust may have blocked primary air openings or have collected inside the burner tube or on the underside of the burner ports which reduced primary air injection.	<ul style="list-style-type: none"> <li>a. Clean and re-adjust the burners' air shutter.</li> <li>b. Replace the burners if necessary.</li> </ul>
	The burner orifice/injector might have spun out of line.	Check and re-align the injector to the burner.
	Blocked or clogged injector orifice.	<ul style="list-style-type: none"> <li>a. Check and clean the injector orifice.</li> <li>b. Replace it if necessary.</li> </ul>
Flashback or backfire	Too much primary air.	Adjust the air shutter of the burner to minimize primary air input.
	Wrong injector orifice size installed.	Check the orifice size of the injector installed. Replace injector if necessary.
	If flashback occurs when the burner gas valve is in an OFF position. The gas valve is probably leaking.	Replace the gas valve.
	Gas pressure is too low.	Adjust the gas supply pressure to required standard.
	Faulty or clogged burner.	Clean the burner or replace it if necessary.
	Operated from cold start. Warm up stage.	Allow the appliance to heat up.
	The main burner injector and burner are not aligned with each other.	Align the main burner injector with the burner.

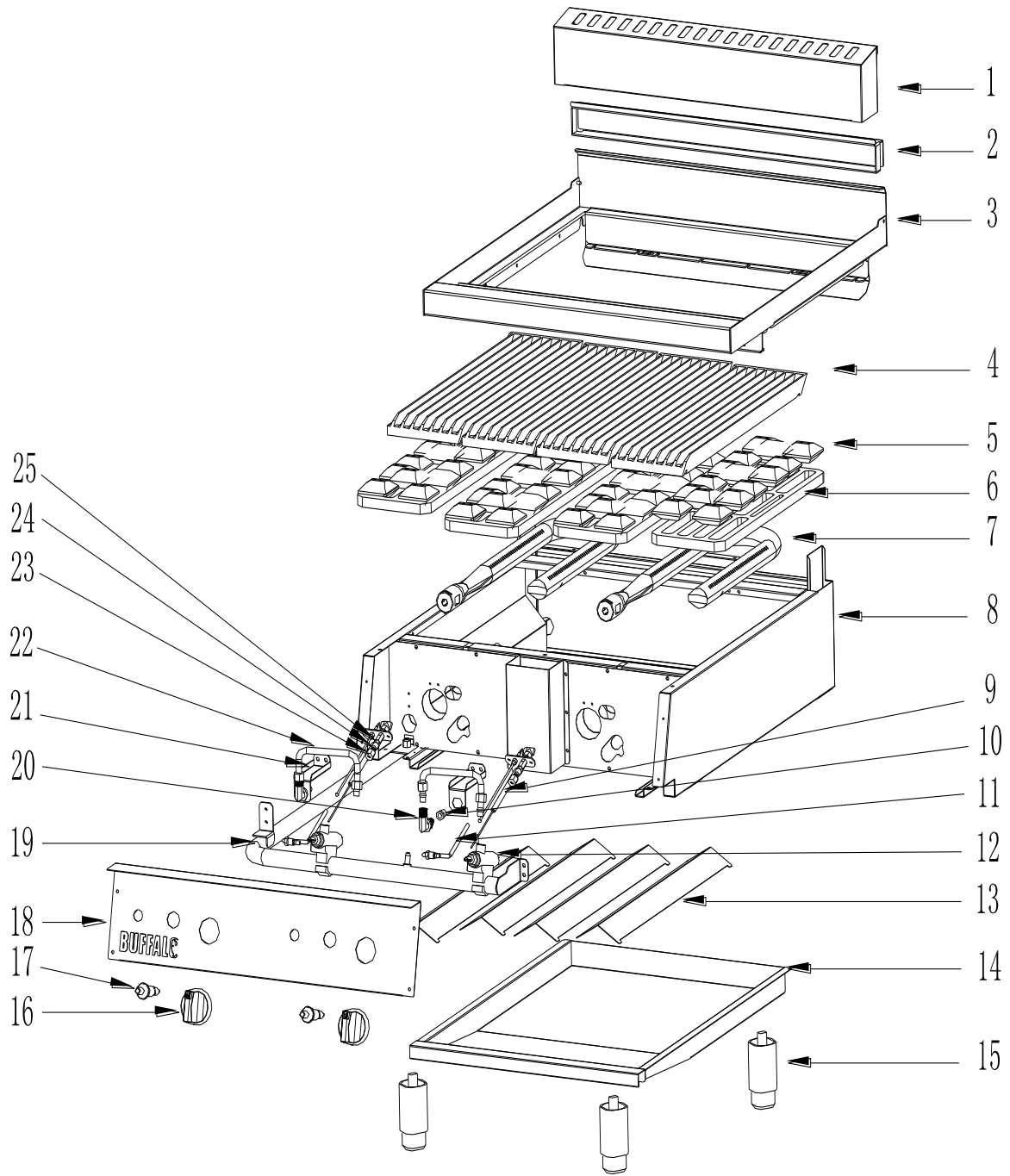
<b>Fault</b>	<b>Possible Cause</b>	<b>Remedy</b>
Lifting of flames or Blowing Flames	Too much primary air.	Adjust the air shutter to eliminate lifting of flames.
	Wrong size of injector orifice installed.	Check the orifice size of the injector installed. Replace injector if necessary.
Extinction Pop or Flashback during extinction	Too much primary air.	Adjust the air shutter of the burner to minimize primary air input.
	Gas pressure is too low.	Adjust the gas supply pressure to required standard.
	Wrong injector orifice size installed.	Check the orifice size of the injector installed. Replace it if necessary.
	Faulty or clogged burner.	Clean the burner or replace it if necessary.
Fluctuating flames	Unsteady gas pressure due to faulty gas pressure regulator or gas meter.	Replace the gas regulator or gas meter.
	Injector's orifice is clogged or blocked by dust or dirt.	Clean the injector's orifice or replace it as necessary.
	The burners are directly under the exhaust fans.	Check and ensure that the burners are not directly under the exhaust fans. Relocate the unit if necessary.
Floating flames	Poor venting. Flue-ways are blocked by soot or dust.	Check and clean the flue-ways.
	Burners are clogged or blocked.	Clean the burners or replace them as necessary.
	Operated from cold start. Warm up stage.	Allow the appliance to heat up.
Flame roll-out.	Poor venting. Flue-ways are blocked by soot or dust.	Check and clean the flue-ways.
	Burners are clogged or blocked.	Clean the burners or replace them as necessary.
Piezo igniter won't ignite	Faulty igniter wire.	Replace the Pilot Assembly/Flame Device System (FDS).
	Faulty piezo igniter.	Replace the piezo igniter. The piezo igniter is a consumable and is not covered under warranty.

## VIII. Exploded View

Model: DC331-N, DC331-P



Model: CF380-N, CF380-P



## IX. Spare Parts List

Model: DC331-N, DC331-P

NO.	SUPPLIER CODE	DESCRIPTION	QTY.
1	06.15.1473545	Flue Assembly.	1
2	01.05.1031811	Cast grate hanger	1
3	06.05.1473542	CB weld Assembly	1
4	01.03.1015028	Cast iron grill	4
5	01.03.1015048	Cast Radiant	4
6	06.05.1470384	U Burner	2
7	06.05.1473546	Frame weld assy	1
8	01.22.1069541	Flame Device System	2
9	01.20.1068654 (LPG) 01.20.1068647 (NG)	Orifice	2
10	01.24.1071041	Pilot pipe	2
11	01.20.1068706	Safety Valve	2
12	01.05.1030658	Heating insulation down	4
13	01.05.1028914	Tray	1
14	01.02.1005165	Feet	4
15	01.02.1005188	Dial	2
16	03.99.1290152	Piezo Igniter	2
17	01.05.1031433	Control panel	1
18	06.05.1473543	Tracheal components	1
19	01.18.1067404	L Connector	2
20	01.05.1029331	Main burner injector fix plate	2
21	01.24.1071050	Pilot pipe	2
22	66.04.1820081	Nut	2
23	01.18.1067405	Copper Cover	2
24	01.20.1068512(LPG) 01.20.1068513(NG)	FDS injector	2



## Spare Parts List

Model: CF380-N, CF380-P

NO.	SUPPLIER CODE	DESCRIPTION	QTY.
1	06.15.1473545	Flue Assembly.	1
2	01.05.1031811	Cast grate hanger	1
3	06.05.1473542	CB weld Assembly	1
4	01.03.1015028	Cast iron grill	4
5	06.05.1472464	Lava Rock Kit	2
6	01.03.1015106	Racks	4
7	06.05.1470384	U Burner	2
8	06.05.1473546	Frame weld assy	1
9	01.22.1069541	Flame Device System	2
10	01.20.1068654 (LPG) 01.20.1068647 (NG)	Orifice	2
11	01.24.1071041	Pilot pipe	2
12	01.20.1068706	Safety Valve	2
13	01.05.1030658	Heating insulation down	4
14	01.05.1028914	Tray	1
15	01.02.1005165	Feet	4
16	01.02.1005188	Dial	2
17	03.99.1290152	Piezo Igniter	2
18	01.05.1031433	Control panel	1
19	06.05.1473543	Tracheal components	1
20	01.18.1067404	L Connector	2
21	01.05.1029331	Main burner injector fix plate	2
22	01.24.1071050	Pilot pipe	2
23	66.04.1820081	Nut	2
24	01.18.1067405	Copper Cover	2
25	01.20.1068512(LPG) 01.20.1068513(NG)	FDS injector	2







<http://www.buffalo-appliances.com/> 

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