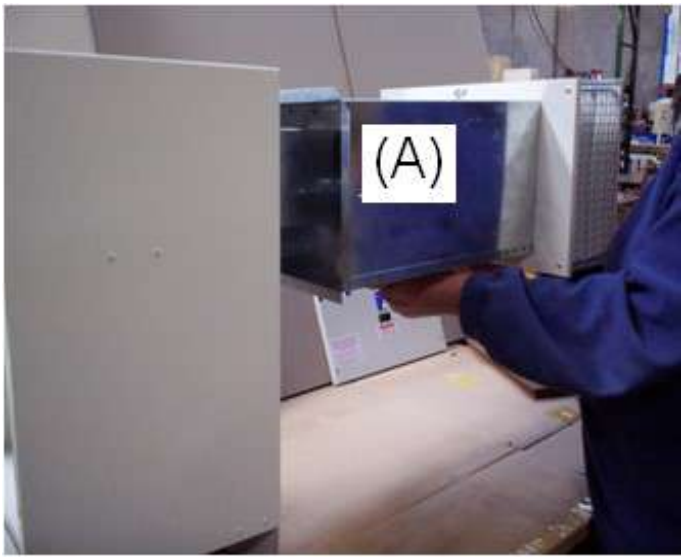
Installation User Instruction Manual

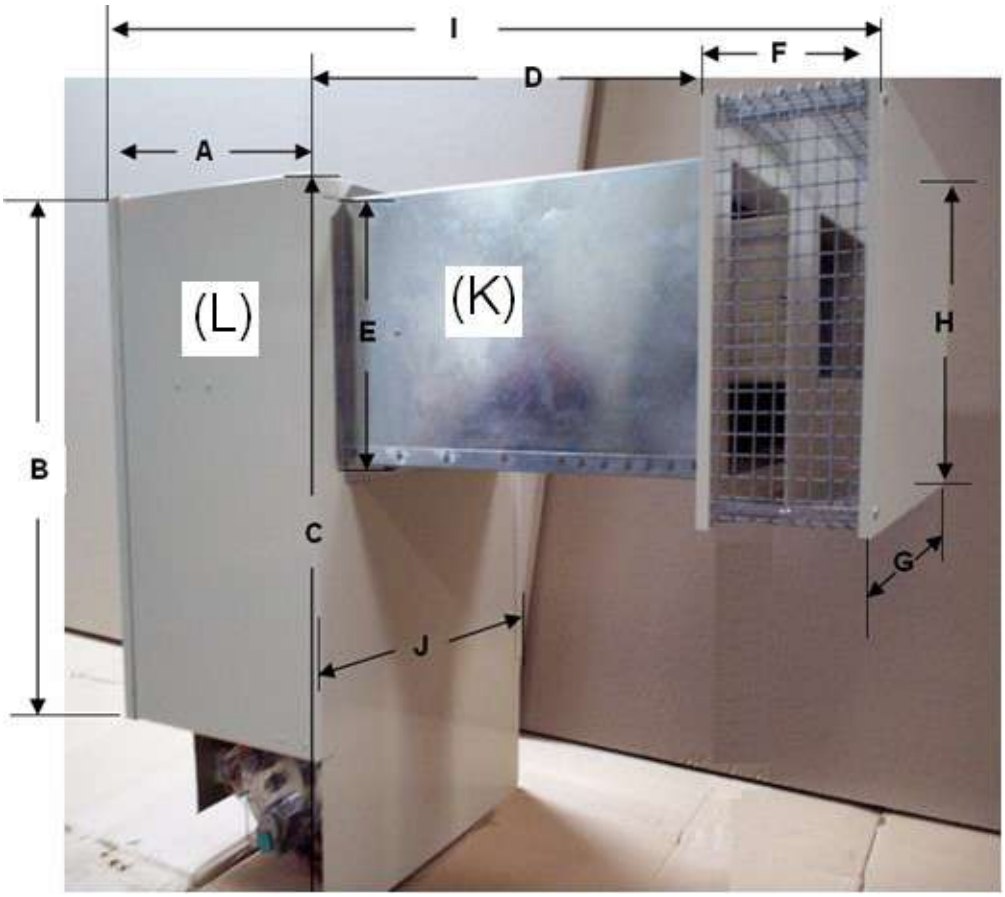
This appliance should not be operated in any circumstances
This appliance is not recommended to be installed in a marine environment

Capacity	**9.5 Litres/Minute @ 25 deg C rise**
Maximum & Minimum inlet water pressure	**500Kpa/60Kpa**
Relief Pressure	**1400 Kpa**

Natural Gas	Injector Size mm	NHGC	Inlet Pressure	Burner Test Point Pressure
Main Burner	6 X 1.25 + 6 X 1.30	70 Mj/h	1.13 Kpa	0.55 Kpa
Pilot Burner	0.45	0.7 Mj/h		

(A) Installation of external flue terminal. The outer air duct is secured with 4 self tapping screws to the outer case, holes provided





in mm

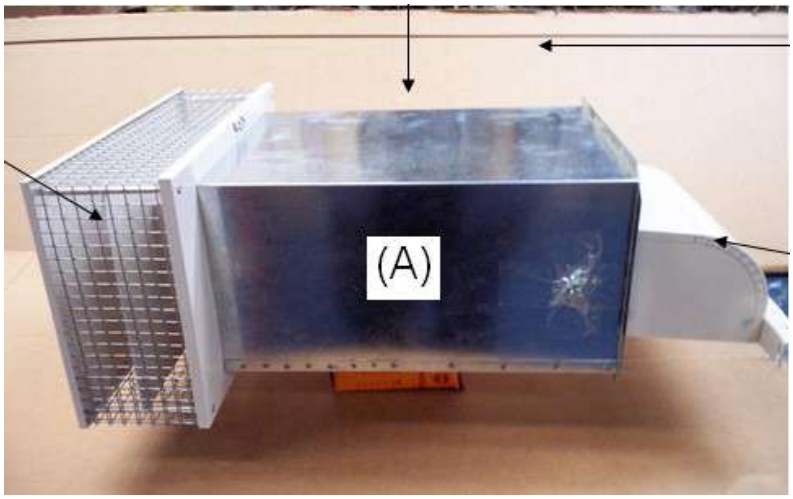
Dimensions *A*	B	C	D	E	F	G	H	I	J
260	450	590	360	205	115	405	255	740	370

The External flue terminal (K) is installed into the water heater housing (L). The flue terminal can extend to a maximum distance of 360mm. The flue terminal (K) can be cut to suit wall thickness of a lesser thickness.

DOUGLAS & Co. B.F 10 H INSTALLER SECTION.

INSTALLATION INSTRUCTIONS: - Flue assembly component identification

Assembly Installation, Typical



Top of Heater & flue outlet at this point.

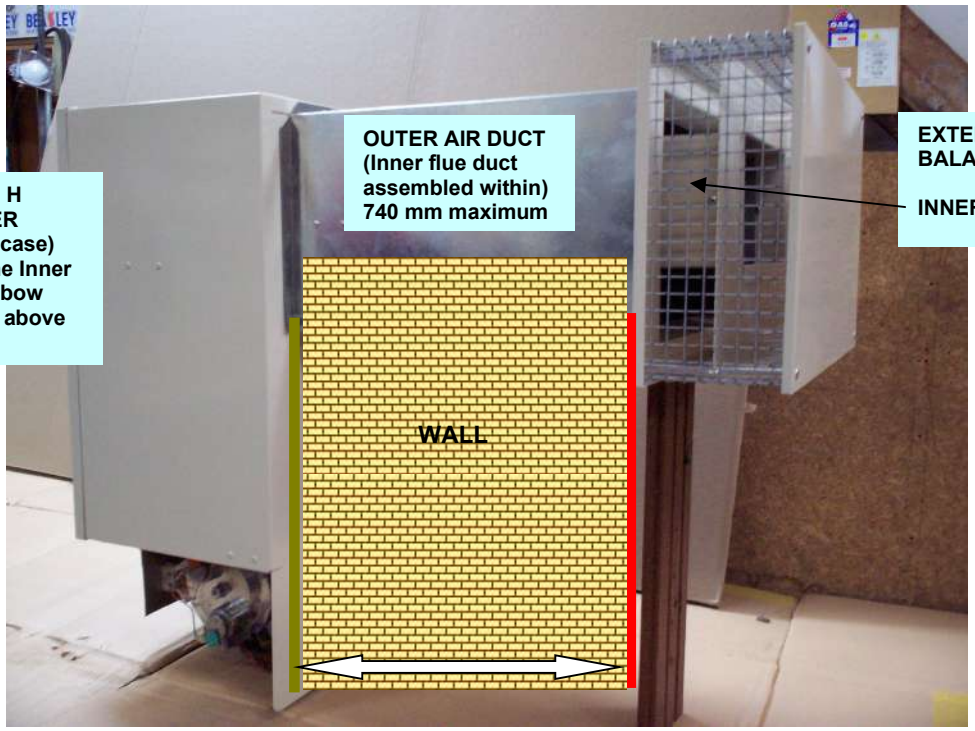
INNER FLUE ELBOW onto Heater flue outlet. Sits within Heater box casing

OUTER AIR DUCT (Inner flue duct assembled within)

(A) Outer duct can be cut (refer page 5) to suit wall thickness.

BF 10 H Heater to Flue assembly component identification

Illustration of flue terminal installed



Typical Alignments of Inner & Outer Walls

DOUGLAS & Co. BF 10 H INSTALLER SECTION.
HEATER & BALANCED FLUE ASSEMBLY

1. GENERAL DESCRIPTION :

The design of this balanced flue system is intended for situations where access to the external wall face may be limited. This may be due to height or limited location access to boundary.

THE EXTERNAL WALL BALANCED FLUE MUST BE FREE FROM ANY COMBUSTIBLE MATERIALS (SUCH AS TREES, LEAVES, ETC.).

Install in accordance with AS5601, AS/NZS3500.4.2, NZS5261 and all local building, water and gas fitting regulations.

2. LOCATION :

The appliance should be installed in a frost-protected, well ventilated room, as near as possible to the most frequently used tap. In order to prevent corrosion, make sure that the combustion air is kept free of aggressive substances. Substances that especially contribute to corrosion are halogenated hydrocarbons (e.g chlorine, fluorine), which are contained in solvents, paint, adhesives, propellant gases, various household cleaners, etc. Provide a clearance of 25 mm around the top and both sides and 150 mm underneath the appliance

3. WATER SUPPLY :

Pipes of suitable bore according to local conditions and in compliance with pertinent regulations to be used.
Cold water inlet, and hot water outlet, are marked in accordance with AGA requirements.
Use only Gate Valve or Full Flow Ball Valve. Non-Return Valves MUST NOT BE USED.

Cold water - flush all lines prior to connection.
Make sure water filter is fitted to inlet point of water valve. Fit inline water strainer where appropriate.

4. GAS CONNECTION :

Size gas supply pipe as per AS5601. Note: inadequate pipe sizing may void the warranty.

5. INSTALLATION OF BALANCED FLUE UNIT :

There are four parts to the BF 10 H Balanced Flue Unit.

They are : 1. **External Wall Assembly**. This assembly comprises the external and internal flue chambers pre-assembled by Douglas & Co. with the leaf protection grille.

2. **Outer Air Duct**. This duct carries air to the Heater burners and also provides a physical support and atmosphere seal to the System.

3**. Inner Flue Elbow**. This heat exchange elbow mounts above the burner chamber within the Heater and carries hot burner exhaust gases into the inner flue duct.

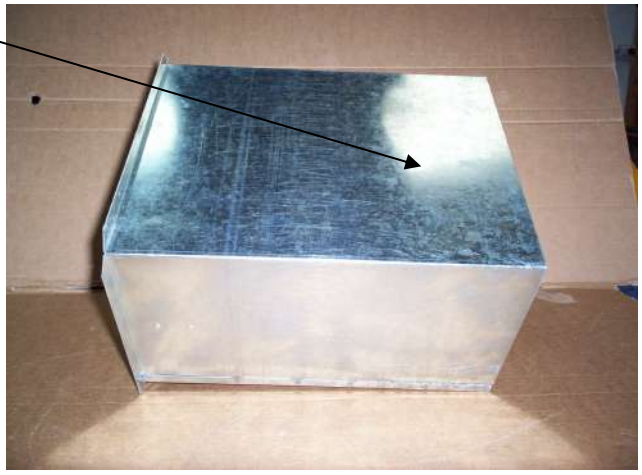
4. **Inner Flue Duct**. This duct carries hot burner exhaust gases to the external flue outlet. Both 3 & 4 also exchange heat with the entry air thereby assisting with combustion preheat.

5 Installation of flue systems : (Continued)

The following photo sequence is intended to assist in simple installation without mistakes.

The Outer Air Duct is positioned through the wall first. This is cut so that it is flush with the inner wall or mounting escutcheon and may be flush with outer wall or extended slightly to suit external siting requirements.

The Outer Air Duct is cut at the outer non-flanged end and the amount cut is measured.

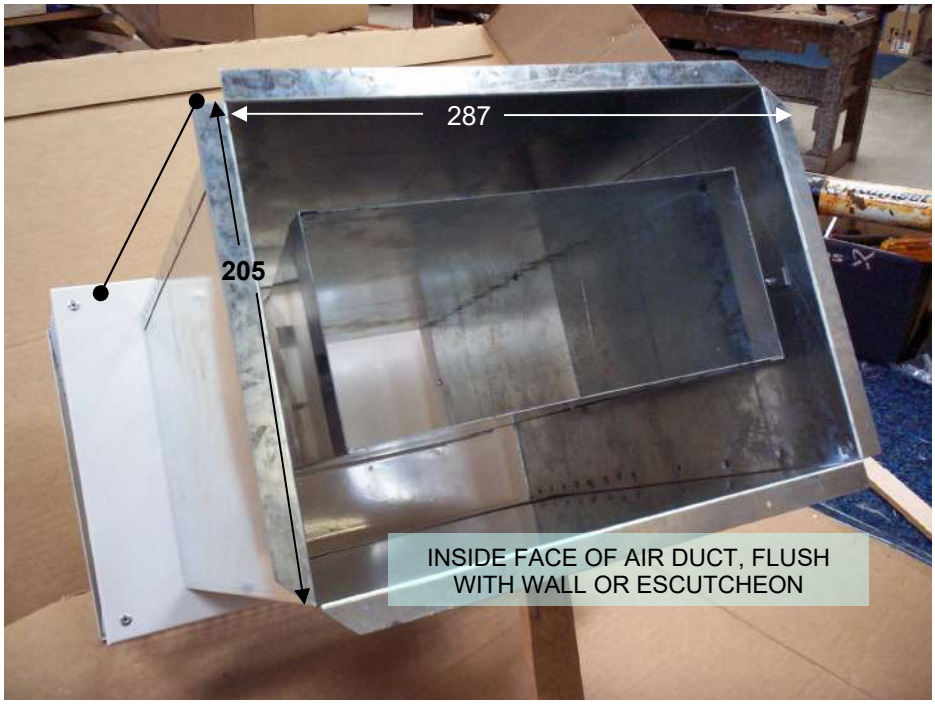


Cut the equivalent amount from the non-flared end of the Inner Flue Duct. This will ensure balanced fitting distances.

The External Wall Balanced Flue Assembly may be passed carefully through the outer air duct after it has been located in place. The Assembly is positioned centrally and the attached spring loaded chains are pulled back and hooked over the chain holding brackets on the Outer Air Duct

Picture shows spring loaded chains stretched Into place and hooked over brackets. External Balanced Flue Assembly is not supported and Inner Flue Duct may be slid into place with non-flared end Engaging against stops on inside of Assembly Inner Chamber. (A stop is shown here).

5 Installation of flue systems : (Continued)
DIMENSIONS FOR PLANNING FLUE CUT-OUT : All dimensions are in mm.



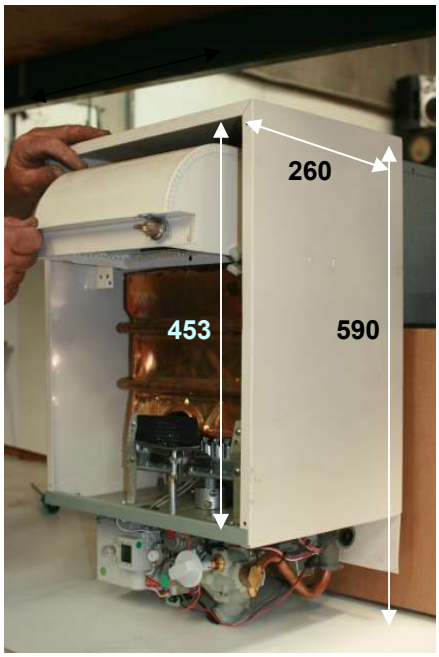
NOTE : **Outer Air Duct distance to Face of External Wall (for Balanced Flue Assembly) as shown is 360 mm before any Air Duct is cut to suit actual wall thickness . The minimum length of the flue is 545 (do not cut past the internal taper. The maximum length of the flue is 745 mm.**

SIZE OF EXTERNAL WALL BALANCED FLUE ASSEMBLY ON OUTER WALL

5. Installation of flue systems : (Continued)

The BF 10 H Heater Body (Wall box) may be separated from the Heater for attachment to the Wall or escutcheon, and alignment of the Flue System. This is not a part of the flue system however it is referred to in flue installation at this point. The front panel removes from the Heater Body for set up of the Inner Flue Duct and Elbow through the Wall box, after positioning is checked and mounting points are determined.

BF 10 H Heater before removal of front cover & internals. Case referred to as Wall box.
UNIT OVERALL DIMENSIONS : All dimensions are in mm.

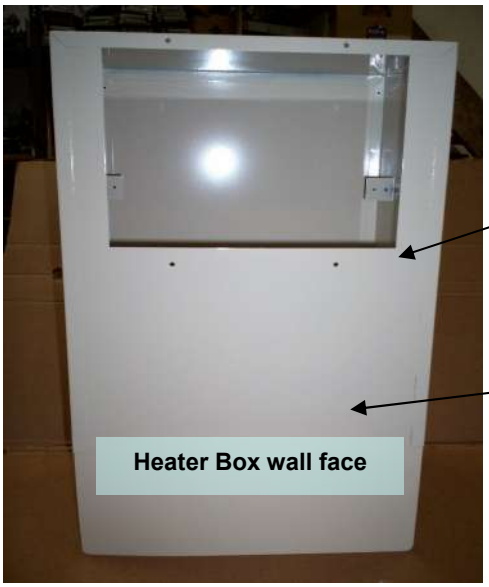


Heater showing face of Wall box which is fitted to Wall.

The screws are removed from the bottom of the Heater box and bottom plate is slid out. Gas burner module, water section with heat exchanger all slide out in one. This allows the Wall box to be positioned without any weight on the Outer Air Duct. The Wall box mounting points should be determined and brackets positioned into studs or escutcheon support. The Heater should not be self supporting of the Outer Air Duct alone.

BF 10 H Heater after removal of front cover.

BF 10 H



Note the screw holes for connection of Outer Air Duct and tabs for securing Inner Flue Elbow. Heater Internals are removed.

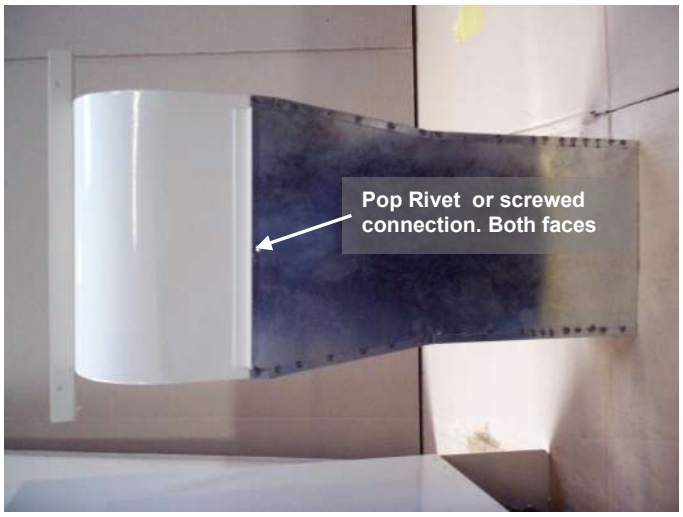
This face is against Wall and bracketed to mounting points before Heater Internals are replaced

When the connections are made to the Outer Air Duct, the Wall box is completely mounted and bracketed.

The Heater Internals should now be refitted and bottom plate slid into place in preparation for the fitting and alignment of the Inner Flue & Elbow Assembly.

5. Installation of flue systems : (Continued)

The Inner Flue Duct (correctly cut to length) has the Flared end connected to the Inner Flue Elbow by means of self tapping screws or pop rivets as shown :



Ensure that there are no air gaps in the connection of the components as this will result in the Pilot burner going out.

Now the Inner Flue Duct & Elbow Assembly is slid through the Outer Air Duct and the non flared end is located into the Internal Flue Chamber of the External Wall Balanced Flue Assembly. (as shown below)

The Inner Flue Elbow is very carefully located over the top of the Water Chamber Heat Exchanger so as to fully cover the chamber and align, with the copper top rim of the Heat Exchanger true and square within the Elbow.

The elbow is secured with the self tappers screws to the tabs on the Wall box casing. The exhaust flue assembly thus created should be examined to ensure good alignment, seal and support.

The bottom plate is now secured in the properly aligned position and screws re-fastened. The hot and Cold Water Supply and Gas Supply Connections are made at this stage.

Heater appearance at this stage is shown.

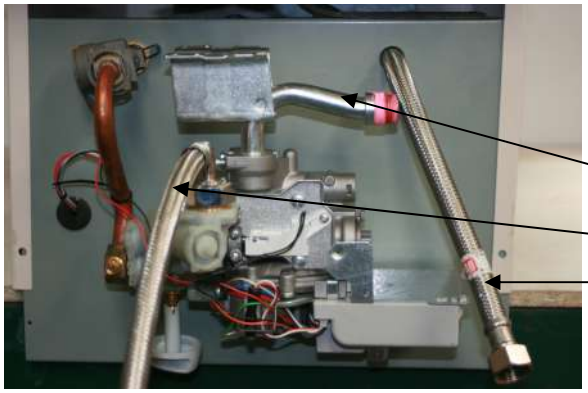
Note : All connections are made in accordance with AS/NZS 3500.4 & AS 5601. All Water & Gas connections are leak tested. It is most important to replace front cover before operating lighting sequence and test operation of burner fire-up.

The following notes apply to Connections, Testing & Hand over.

6. Pipe Connections, Water Pressure, Testing, and Hand over advice.

Pipe Connections :

Cold water 12 mm flexible tail pipe. Hot water 12 flexible mm pipe. Gas 12 mm tail pipe. A gas cock must be installed in the supply line with provision to disconnect the appliance for service. A gate valve or full flow ball valve (fixed mechanism) must be installed on the cold water supply line. A non-return valve MUST NOT be fitted.



Heat Exchanger / Controls Module viewed from Underside out of Wall Box. Note for reference point : Control Knob

Gas Inlet 12 mm Connection

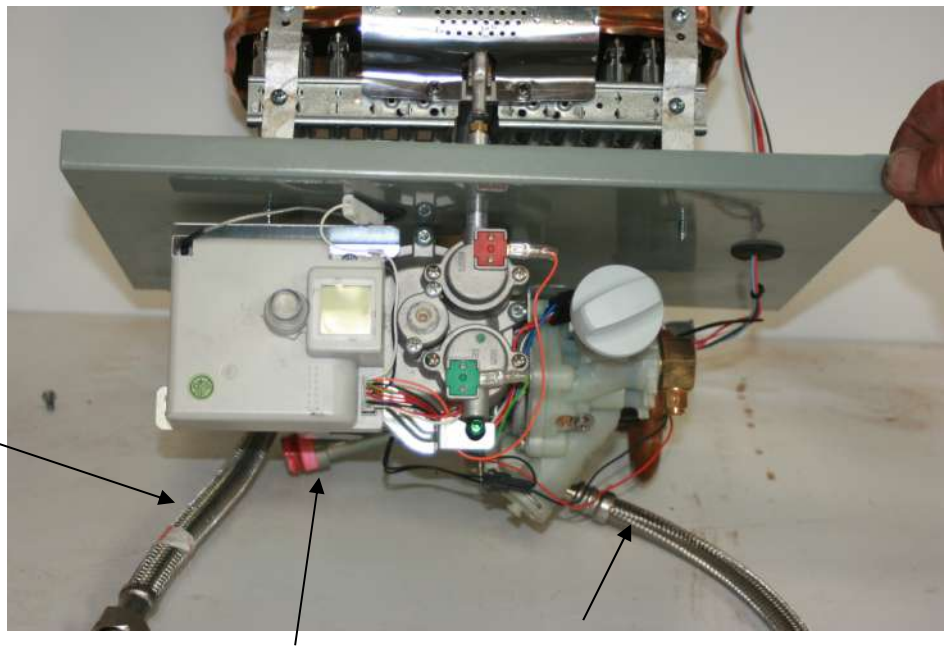
Cold Water 12 mm flexible Connection

Hot Water 12 mm flexible Outlet

DO NOT MIX UP WATER & GAS CONNECTIONS

View of Connector Tails on Cold Water Inlet & Gas Inlet from front of Heat Exchanger / Controls Module.

<u>Viewed from front, out of Wall box</u>



Hot water outlet

Gas Inlet 19 mm Connection. Cold Water 12 mm Connection

DO NOT MIX UP WATER & GAS CONNECTIONS

6. Pipe Connections, Water Pressure, Testing, and Hand over advice. (cont'd)

Water Pressure :

The water valve pressure rating (refit rating label) should be compatible with local supply conditions with Maximum/Minimum inlet water pressure 500Kpa/60 Kpa at the Heater. If water supply exceeds 500 Kpa install a pressure limiting valve. In areas of extreme water pressure, two stage sequential pressure limit at boundary supply point and then at Heater appliance will be required.

Water Temperature Adjustment :

To increase the water temperature (decrease water flow), turn the knob clockwise. To reduce water temperature (increase water flow), turn the knob anti-clockwise.

Purging of the pilot.

To establish pilot, turn the hot tap on and off till pilot is established. The heater has automatic ignition which will self purge the pilot each time the heater is used.

Maintenance :

Douglas & Co. recommend that the Heater is inspected for condition and the burner chamber / heat exchanger, operating components and flue system is cleaned periodically. The frequency is dependent upon use and should be carried out by authorized service person. The minimum recommended frequency is annually.

Hot Water Safety :

Scalding occurs above 50 deg C. As this appliance is capable of heating above 50 deg C. hot water safety should be observed.

Final Testing & Commissioning :

If the Pilot burner will not light, turn off the hot tap, wait for 5 minutes before attempting relight. If the appliance does not light or burns with a yellow flame, leaks water or a gas smell is evident, turn off and investigate to remedy installation. All hot water taps should be off when attempting relight. The installer shall test the appliance to ensure that it operates according to the manufacturer's specification. The installer must demonstrate the operation of the appliance to the consumer and hand the instructions to the consumer on completion.

Check List should be handed to Customer with the following indicators / tests completed :

GAS LINE CHECKED. WATER SUPPLY AND CONNECTIONS CHECKED. FLUE SEALING & FUNCTIONING. HEATER FULLY COMMISSIONED. DATE OF INSTALLATION RECORDED. CUSTOMER ADVISED ON OPERATION. OPERATION / LIGHTING BOOKLET HANDED TO CUSTOMER. COMMISIONING OF MAIN BURNER AS PER INSTRUCTIONS ON PAGE 11.& 12

Customer to be advised that at any time gas smell is evident, the gas valve should be turned of to isolate and either the local gas authority, or authorized service person contacted.

FAILURE TO HAVE APPLIANCE INSTALLED BY QUALIFIED INSTALLER IN ACCORDANCE WITH THESE INSTALLATION GUIDELINES WILL VOID WARRANTY.

Commissioning

Inlet pressure adjustment

Burner pressures have been adjusted in the factory, however adjustment may be required upon installation.

Attach a manometer to the inlet pressure test point located on the gas inlet pipe.

Inlet gas pressure should be adjusted at the appliance regulator to 1.13 Kpa for Natural Gas

These measurements must be set while the unit is operating.

Burner pressure adjustment

Accessing the adjusting screw

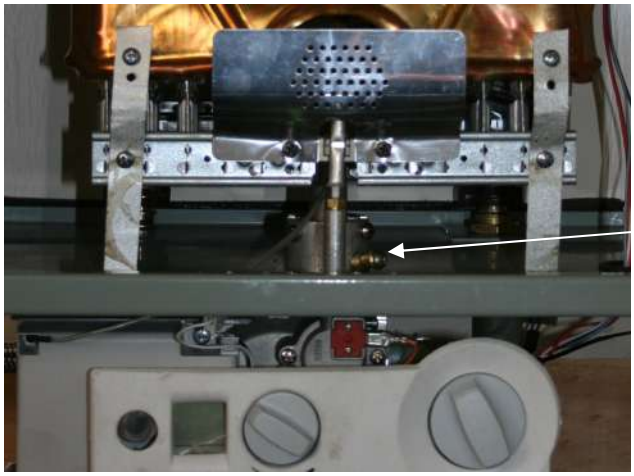
Remove the front cover from the heater.

Connecting the manometer

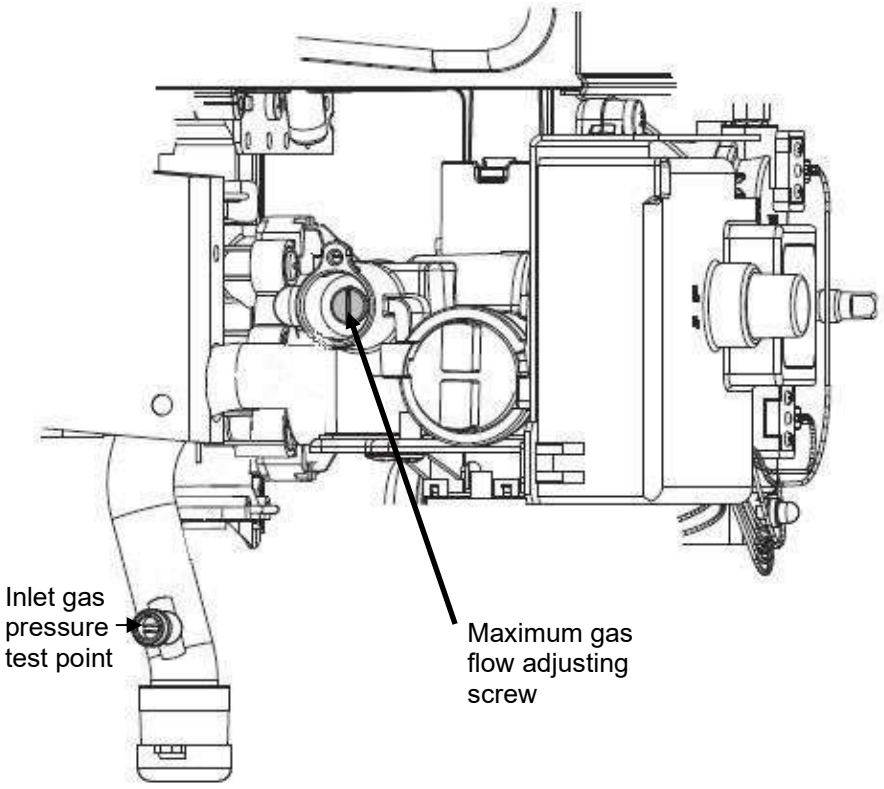
Loosen the burner test point captive screw (Picture A)

Connect the manometer to the burner pressure measuring point.

Burner Test Point **Picture A**



Maximum gas flow adjustment



Remove the seal from the adjusting screw

Turn on the heater with the gas selector set to the left (maximum position).

Open various hot water taps.

Using the adjusting screw regulate the gas pressure until the values indicated in the table C are achieved.

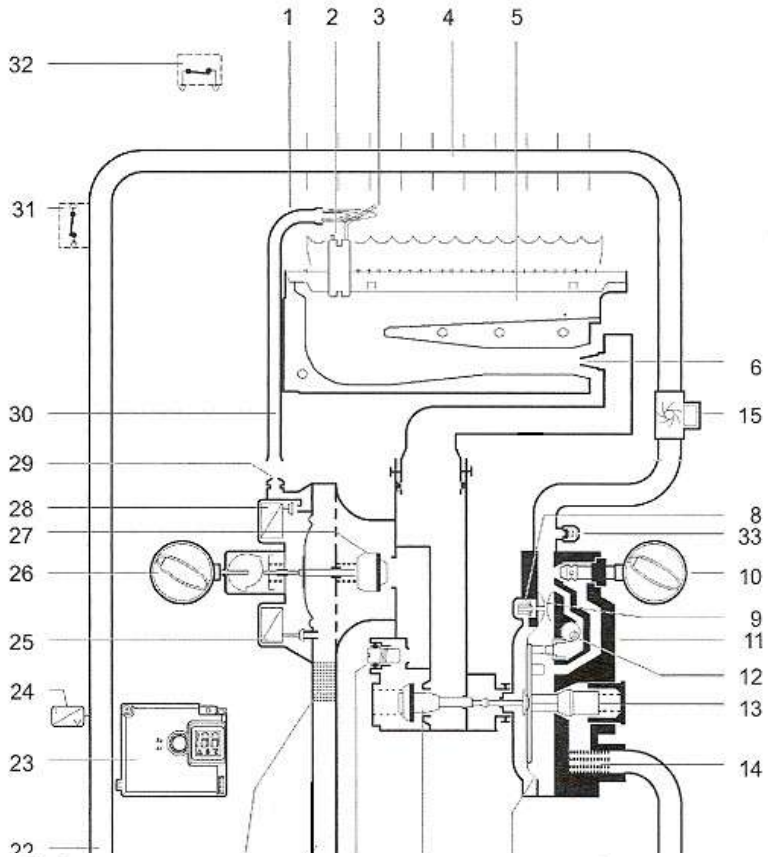
Seal the adjusting screw once again.

Minimum gas flow adjustment

The minimum gas flow adjustment is performed automatically after the adjustment of the maximum gas flow

	Model	**Natural Gas**	
MAX Burner Pressure	BF10H	0.55 (Kpa)	

Gas System



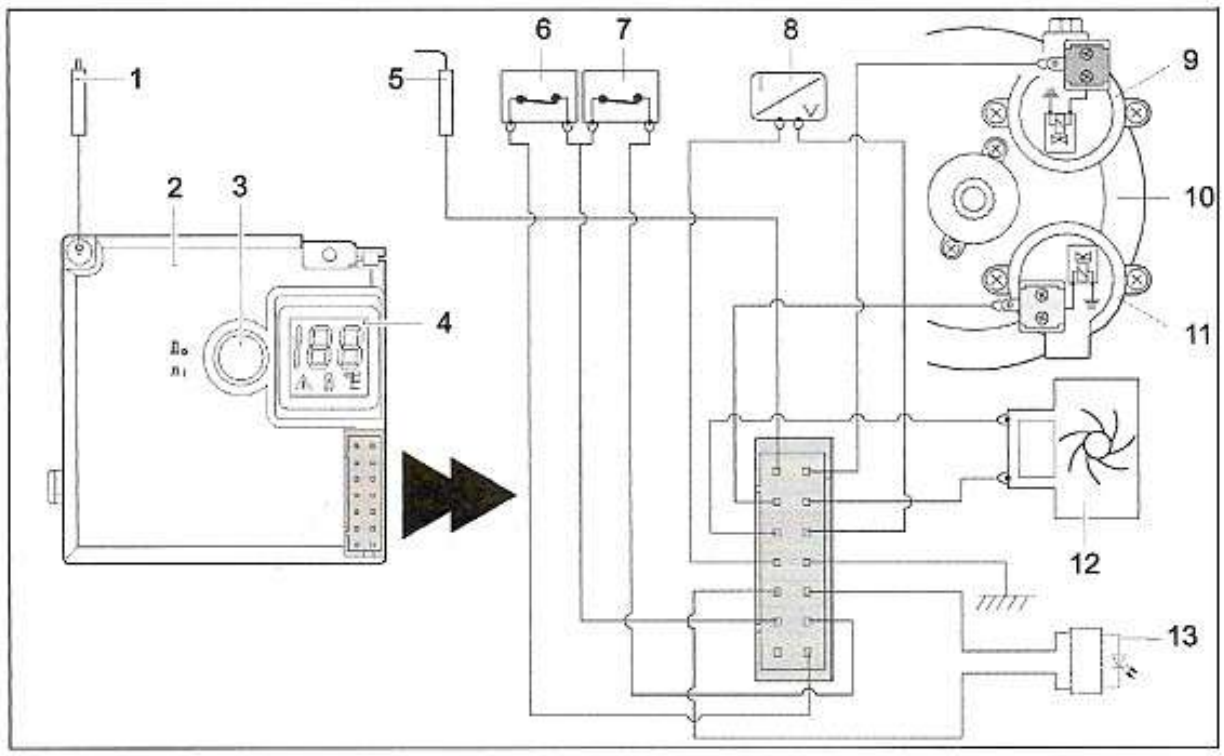
1	Pilot burner
2	Ignition Electrode
3	Ionisation probe
4	Heat exchanger
5	Main burner
6	Injector
8	Slow ignition valve
9	Venturi
10	Temperature/volume selector
11	Water valve
12	Plunger
13	Water flow regulator
14	Water filter
15	Hydrogenerator
16	Cold water pipe
17	Diaphragm
18	Main gas valve
19	Maximum gas adjusting screw
20	Gas supply pipe
21	Gas filter
22	Hot water pipe
23	Ignition unit
24	Temperature sensor
25	Servo valve
26	Power selector
27	Gas valve
28	Pilot valve
29	Pilot injector
30	Pilot gas pipe
31	Overtemperature switch
32	Flue gas safety device
33	Relief Valve/Drain screw

Flue Gas Safety Device.

The probe must never be turned off, modified or replaced with a different part under any circumstances,

The user must never touch the flue gas safety device.

Electrical System



1	Ignition electrode
2	Ignition unit
3	Switch/LED - Low water pressure indicator
4	Digital display
5	Ionisation probe
6	Flue gas safety device
7	Overtemperature switch
8	Temperature sensor
9	Pilot solenoid (Normally Closed)
10	Diaphragm valve
11	Main Solenoid (Normally Open)
12	Hydrogenerator
13	LED - Burner status check

Function

This gas heater is equipped with automatic electronic ignition to simplify operation. To activate, just turn on switch. After this, automatic ignition occurs whenever a hot water tap is opened. First the pilot burner is lit and approximately four seconds later the main burner lights. Once the main burner lights, the pilot burner is extinguished, the flame is supervised by the main burner.

Principle of operation

When a hot water outlet is opened, water flows into the inlet of the appliance traveling through a fine mesh water filter.

The water then passes through the volumetric water governor into the bottom chamber of the water section. Water is then released through 2 passages (one determined by setting screw and one via the volume selector), which then passes through the venture on the outlet of the water valve.

This venture effect draws the water off the top chamber of the water valve and the pressure of the water in the bottom chamber pushes the diaphragm up and in turn opens the gas valve.

When the water passes out of the water valve, this then flows through the hydro generator, which generates 3VAC to activate the ignition and check the safety devices of the appliance.

The voltage then passes through 2 safety devices, over the temperature cutout and the flue safety device. Provided both devices are sound, the voltage then passes to the ICU (Ignition Control Unit). Simultaneously the ICU starts ignition and sends power to the Pilot Solenoid valve, which in turn opens.

Once a flame is established, the ICU then sends power to the main solenoid which closes, this allows the pilot burner to burn the gas off the top chamber of the gas valve and in turn allows the gas valve to open and the main burner to ignite.

Once the main burner has ignited and rectified, the pilot will eventually extinguish, and the burner is monitored via the flame rod.

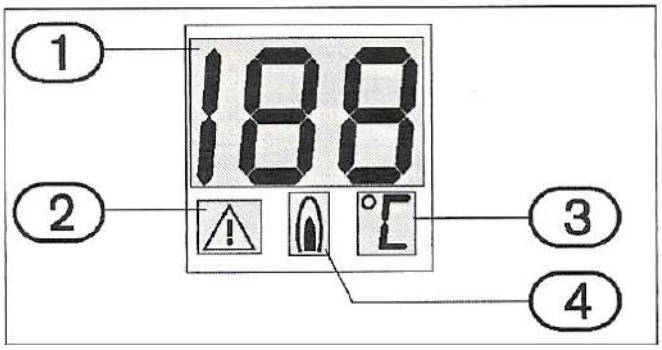
At all times while the unit is in operation, the safety devices monitor the appliance and the outlet temperature is displayed on the ICU and if an error occurs, a code is displayed on the ICU.

DANGER: Make sure that all flue connections are sealed.

Failure to follow this requirement may cause dangerous exhaust gases to enter the living space which may result in personal injury or loss of life.

DANGER: The complete flue kit provided with the heater must be installed as per instructions. Failure to do this will void the warranty .

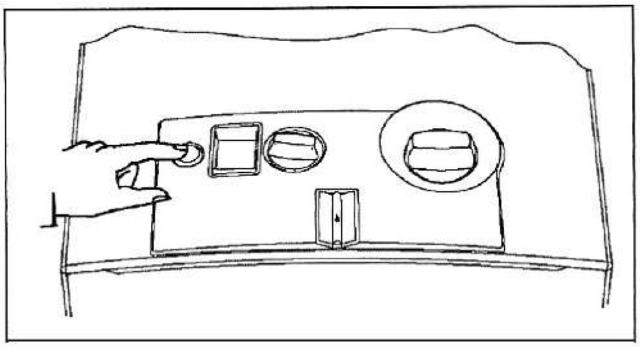
Operating Instructions



1 Temperature/Error code
2 Malfunction Indicator
3 Temperature Measurement Units
4 Heater ON indicator

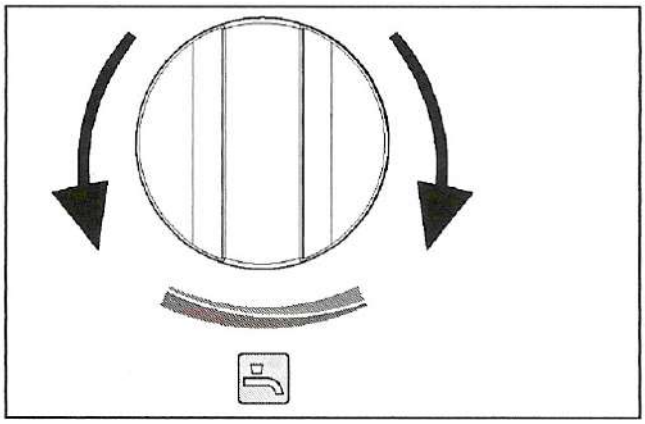
Turning ON/OFF

Press button to turn ON or OFF



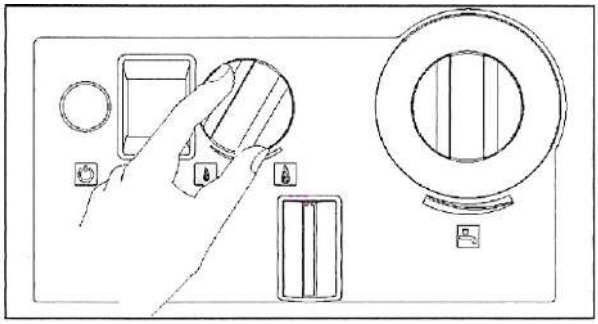
Water Flow Adjustment

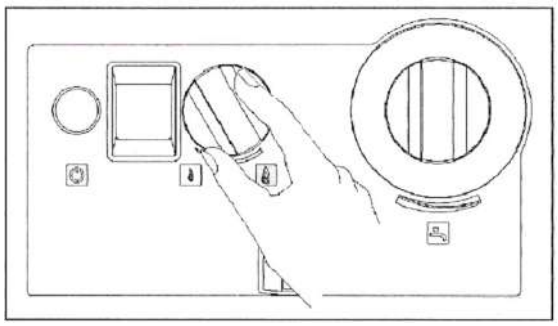
Turn anti clockwise to decrease water flow & increase temperature



Operating Instructions Continued

Gas Adjustment

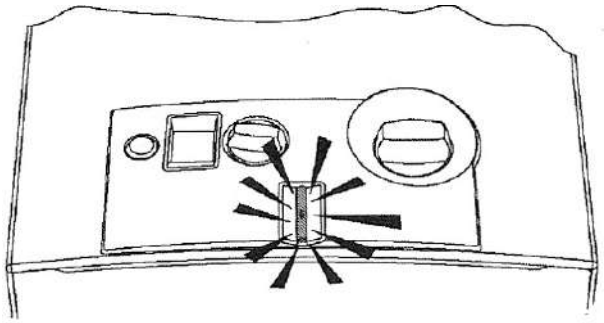




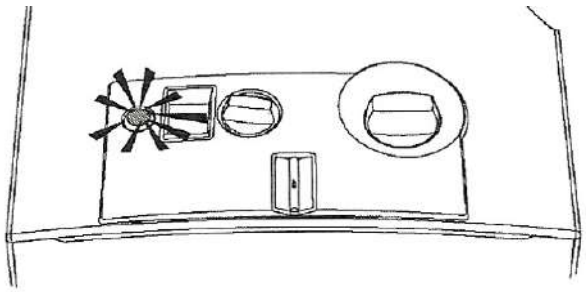
Turn Clockwise to use less gas (Lower water temperature) Turn Anti clockwise to use maximum Gas (Higher water temperature)

Indicator Lamps

Hot water tap ON, LED ON



If RED LED flashes during operation, check water flow



Fault Diagnosis

Problem	Cause	Solution
The heater does not ignite and digital display is turned off.	Switch turned off.	Check switch position.
Slow and difficult ignition of the burner.	Reduced water flow.	Call a qualified technician.
Red LED in switch flashes.	Reduced water flow.	Call a qualified technician.
Water at low temperature.		Check the temperature selector position and adjust it according to the desired water temperature.
Water is not heated, no flame.	Insufficient gas supply. Gas Cylinders may be empty	If sufficient gas appears to be available call a qualified technician.
Digital display shows **"E9"**.	Temperature limiter has tripped	Wait 10 minutes and restart the heater. If the problem persists, call a qualified technician.
Digital display shows **"A4"**.	Flue gas safety device has tripped	Vent the area. Wait 10 minutes and restart the heater. If the problem persists, call a qualified technician.
Incorrect temperature information in the appliance digital display.	Insuficient contact of the temperature sensor.	Call a qualified technician.
Digital display shows "**E1**".	Water temperature sensor has tripped (outlet water temperature above 85 °C).	Reduce the water temperature using the gas and/or temperature adjustment selector. If the problem persists, call a qualified technician.
Digital display shows "**A7**".	Temperature sensor incorrectly connected.	Call a qualified technician.
	Temperature sensor defective.	Call a qualified technician.
Digital display shows "**F7**" or "**E0**".	Blocked Heater.	Turn the heater off and on, if the problem persists, call a qualified technician.
Digital display shows **"EA"**.	There is spark but the main burner does not ignite, heater blocked.No ionisation probe signal .	Check: • Gas supply, position of valves, empty LPG cylinders.
Digital display shows "**F0**".	Power was activated with a hot water tap running.	Turn the water off and on. If the problem persists, call a qualified technician.
Reduced water flow.	Insufficient water supply pressure.	Call a qualified technician.
	Dirty taps or mixers.	Call a qualified technician
	Gas valve blocked.	Call a qualified technician
	Heat exchanger blocked (limescale).	Call a qualified technician

8.

WARRANTY.

Douglas & Co., (The Company), as manufacturer of the BF 10 H Balanced Flue Heater and Flue System, Warrants its products to be free from faults and defects in workmanship and materials. Its obligations pursuant to this Warranty being limited to the repair or replacement, at the option of the manufacturer, and subject to the terms and conditions stated below, of any component part which shall be defective for use under normal conditions of use.

Terms and Conditions

1. The manufacturer is at liberty to alter the design or construction for the products not withstanding that the product may have been sold by description or sample, even though alterations made have been introduced from the date of Contract and the date of Delivery provided that the products are of the same or similar Quality and are fit for the purposes for which they are purchased.

   Such alterations shall not constitute a defect in design or construction under this Warranty.

2. The Warranty shall be limited to the replacement or repair, at the option of the manufacturer, of any defective products and of such parts as have been damaged in consequence of the defect. The company is excluded to the extent allowable by law from responsibility for any consequential loss including :

   injury to persons,

   injury to property,

   economic loss,

   pain and suffering,

   any legal or other expenses or other damages flowing from any manufacturing fault or defect.

3. The company shall be under no obligation to return parts replaced at the option of the company pursuant to this Warranty.

4. This Warranty shall not apply to the following :

   if the product is sold and repaired or altered by any third party without the manufacturers consent,

   any parts not manufactured or sold by the manufacturer are used in replacement or repair,

   if the products are not used with proper care for a purpose for which they are sold in accordance with specified instructions for use,

   if changes occur in the condition or the operation or Quality of the products due to incorrect storage or mounting or due to climate or other influences,

   in respect of fault in construction or defects due to the use of unsuitable materials if such method of construction or use of material has been specified by the Purchaser

5. If the heat exchanger fails during the Warranty period, the heat exchanger must be forwarded to the manufacturers office for a Warranty claim, parts only. Freight charges are not covered by the manufacturer.

6. This Warranty does not cover the replacement of parts when such replacement parts are necessitated by lack of maintenance or as a result of normal wear and tear.

7. No servant or authorized servant has the authority to add to or alter the terms of this Warranty.

8. In the event that any part of this Warranty is held unenforceable by a Court due to an interpretation of the Court or any legislative provisions such clause is severable from the remainder of the Warranty to the extent allowable by law.

9. This Warranty only applies: Within the Commonwealth of Australia,

   9.1 To the original purchaser to whom the product was originally sold,

   9.2 From the date of purchase

10. The Purchaser must produce proof of the date of purchase when making a claim. The above Warranty does not restrict or modify any Warranty specified by law in the state or territory of sale.

11. We recommend the system be serviced regularly to ensure it functions reliably and safely.

    The installer is responsible for the safety and environmental compatibility of the installation.

    The heater should be serviced annually.

    Only original spare parts must be used.

PLEASE NOTE :If a Service call is requested and it is found that the defect is not a Warranted fault, the purchaser may be charged for the Service call even during the Warranty period.

THIS HEATER HAS A WARRANTY PERIOD OF 12 MONTHS, PARTS AND LABOUR. THE HEAT EXCHANGER HAS A WARRANTY PERIOD OF 5 YEARS, PARTS ONLY.

THIS HEATER MUST BE INSTALLED IN AN ACCESSIBLE POSITION FOR MAINTENANCE AND REPLACEMENT OF PARTS.

INSTALLER / CONTRACTOR TO HAND OVER OPERATION AND LIGHTING MANUAL TO OWNER AFTER COMPLETING INSTALLATION CHECKLIST.

DOUGLAS & CO.
1/47 RUSHDALE STREET
KNOXFIELD VIC 3180

PH: 03 9763 1254
EMAIL: office@douglasandco.com.au

Weight of heater: 13 kgs.

Weight of flue: 6 kgs.