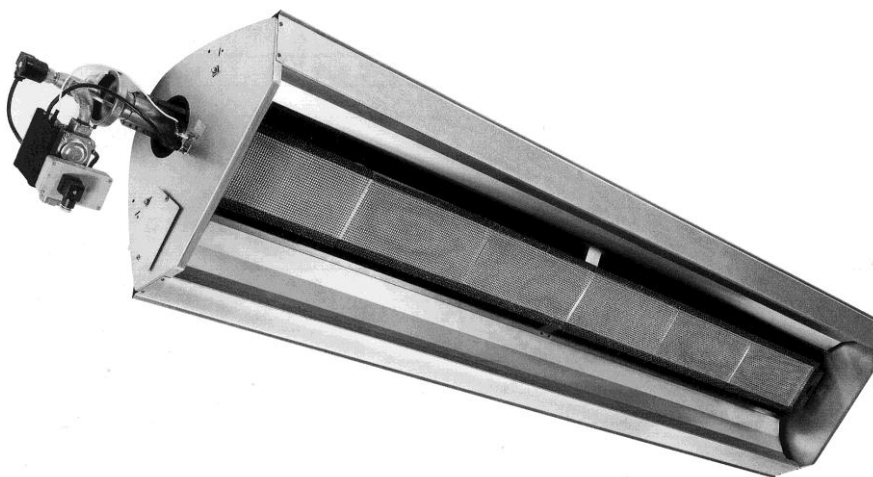


SPACE-RAY

INSTALLATION, SERVICING & OPERATING INSTRUCTIONS

"ULTRA" SERIES OVERHEAD RADIANT PLAQUE HEATER



MODELS

Ultra 7	Ultra 7/3.5	- HI/LO
Ultra 14	Ultra 14/7	- HI/LO
Ultra 21	Ultra 21/10.5	- HI/LO
Ultra 28	Ultra 28/14	- HI/LO
Ultra 42	Ultra 42/21	- HI/LO

Gas Fired Products (UK) Ltd
Chapel Lane, Claydon, Ipswich
Suffolk IP6 0JL, England
Tel: 01473 830551 Fax: 01473 832055
E-mail: Info@spaceray.co.uk
www.spaceray.co.uk



INSTALLATION, SERVICING AND OPERATING INSTRUCTIONS

Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of appliance are compatible.

INDEX

Section Title	Page
1. Technical Data	2 - 5
2. Un-Packing	6
3. Installation	6 - 10
3.1 Suspension	6 - 7
3.2 Gas Supply	7 - 8
3.3 Electrical Supply	8 - 10
3.4 Ventilation	10-11
4. Assembly	11-12
4.1 Assembly Burner Assy to Basic Body Assy	11
4.2 Ultra 7, 14, 21, 28, 42	11-12
4.3 Ultra 7/3.5, 14/7, 21/10.5, 28/14, 42/21	12
5. Commissioning	12 - 14
5.1 Ignition	12-13
5.2 Shut Down	13
5.3 Checking Gas Pressure	13
5.4 Flame Supervision	14
6. Servicing	14 - 15
6.1 Electrode Assembly	14
6.2 Injector	14
6.3 Electrical Wiring	14-15
6.4 Reflector	15
6.5 Emitter Assembly (ceramic plaque)	15
6.6 Auxiliary Controls	15
7. Replacing Components	15 - 16
7.1 Electrode Assembly	15
7.2 Ignition Control	15
7.3 Injector	15
7.4 Twin Solenoid Control Valve	15-16
7.5 Reverberatory Screen	16
7.6 Emitter Assembly (ceramic tiles)	16
7.7 Replacement Parts List	16
8. Operating Instructions	16-17
9. Fault Finding Chart	18

INSTALLATION , SERVICING & OPERATING INSTRUCTIONS

1. TECHNICAL DATA

Table 1

MODEL	Ultra 7-N	Ultra 7-L
Heat Input Qn	6.66 kW (Hs)	6.0 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	19.0 mbar	37 mbar
Injector	2 x Ø1.30 mm	2 x Ø0.9 mm
Orifice Plate	None	None
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 0.48m W = 0.58m H = 0.35	
Weight	14 Kg	

Table 2

MODEL	Ultra 14-N	Ultra 14-L
Heat Input Qn	13.33 kW (Hs)	12.0 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	18.8 mbar	36.3 mbar
Injector	2 x Ø1.85mm	2 x Ø1.20mm
Orifice Plate	Ø38mm	Ø40mm
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 0.85m W = 0.58m H = 0.35m	
Weight	22 Kg	

Table 3

MODEL	Ultra 21-N	Ultra 21-L
Heat Input Qn	19.98 kW (Hs)	18.0 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G30 20 mbar	3P G31 37 mbar
Setting Pressure	18.7 mbar	36 mbar
Injector	2 x Ø2.25mm	2 x Ø1.45mm
Orifice Plate	Ø44mm	Ø42mm
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 1.22m W = 0.58m H = 0.35m	
Weight	30 Kg	

Table 4

MODEL	Ultra 28-N	Ultra 28-L
Heat Input Qn	26.64 kW (Hs)	24.0 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	18.2 mbar	35.8 mbar
Injector	2 x Ø2.55mm	2 x Ø1.75mm
Orifice Plate	Ø52	Ø52
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 1.59m W = 0.58m H = 0.35m	
Weight	39 Kg	

Table 5

MODEL	Ultra 42-N	Ultra 42-L
Heat Input Qn	39.96 kW (Hs) 36.0 kW (Hi)	37.74 0 kW (Hs) 34.0kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	17.5 mbar	35.5 mbar
Injector	2 x Ø3.20mm	2 x Ø2.05mm
Orifice Plate	None	Ø58
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 2.33m W = 0.58m H = 0.35m	
Weight	54 Kg	

Table 6

MODEL	Ultra 7/3.5 (HI/LO) - N	Ultra 7/3.5 (HI/LO) - L
Heat Input Qn	6.66 kW/3.33 kW (Hs)	6.0 kW/3.0 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	19.0 mbar	37 mbar
Injector	2 x Ø1.30 mm	2 x Ø0.9 mm
Orifice Plate	None	None
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 0.48m W = 0.58m H = 0.35m	
Weight	14 Kg	

Table 7

MODEL	Ultra 14/7 (HI/LO) - N	Ultra 14/7 (HI/LO) - L
Heat Input Qn	13.33 kW/6.66 kW (Hs)	12.0 kW/6.0 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	18.8 mbar	36.3 mbar
Injector	2 x Ø1.85mm	2 x Ø1.20mm
Orifice Plate	Ø38mm	Ø40mm
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 0.85m W = 0.58m H = 0.35m	
Weight available	22 Kg	

Table 8

MODEL	Ultra 21/10.5 (HI/LO) - N	Ultra 21/10.5 (HI/LO) - L
Heat Input Qn	19.98 kW/9.99 kW (Hs)	18.0 kW/9.0 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	18.7 mbar	36 mbar
Injector	2 x Ø2.25mm	2 x Ø1.45mm
Orifice Plate	Ø44mm	Ø42mm
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 1.22m W = 0.58m H = 0.35m	
Weight	30 Kg	

Table 9

MODEL	Ultra 28/14 (HI/LO) - N	Ultra 28/14 (HI/LO) - L
Heat Input Qn	26.64 kW/13.33 kW (Hs)	24.0 kW/12.0 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	18.2 mbar	35.8 mbar
Injector	2 x Ø2.55mm	2 x Ø1.75mm
Orifice Plate	Ø52	Ø52
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 1.59m W = 0.58m H = 0.35m	
Weight	39 Kg	

Table 10

MODEL	Ultra 42/21 (HI/LO) - N	Ultra 42/21 (HI/LO) - L
Heat Input Qn	39.96 kW/19.98 kW (Hs)	37.74 kW/18.87kW (Hs)
	36.00 kW / 18.00 kW (Hi)	34.00 kW / 17.00 kW (Hi)
Appliance Type	A ₁	
Appliance Cat.	I _{2H}	I _{3P}
Adjusted for	2H G20 20 mbar	3P G31 37 mbar
Setting Pressure	17.5 mbar	35.5 mbar
Injector	2 x Ø3.20mm	2 x Ø2.05mm
Orifice Plate	None	Ø58
Electrical Supply	230v~50Hz 25W	
Fuse Externally	3A	
Gas Connection	Rc - ½	
Dimensions	L = 2.33m W = 0.58m H = 0.35m	
Weight	54 Kg	

2 **UN-PACKING**

The appliance is supplied in a carton, broken down into two sub-assemblies, i.e. Basic Body Assembly and Burner Assembly.

Where an Orifice Plate is required, it will be found, together with Qty 4- M5x6 set screws (for securing the Burner Assembly to the Basic Body Assembly) packed with the Burner Assembly.

Any optional equipment supplied is packed inside the carton also.

3 **INSTALLATION**

Notwithstanding their limited scope, the appliance should be installed in accordance with the relevant provisions of any National Gas Safety (Installation and Use Regulations). Due account should also be taken of any obligations arising from any National Health and Safety at Work Regulations, National and Local Building Regulations and National Electrical Wiring Regulations. The appliance must be installed, and where necessary, converted for use on other gases, by a qualified installer.

3.1 **SUSPENSION**

- 3.1.1 The appliance should be located with respect to building construction and other equipment, to permit access to the appliance for servicing etc.
- 3.1.2 For suspending the appliance, it is recommended that suitable protected welded chain ($\varnothing 3\text{mm} \times 65$ links/m) or $\varnothing 6\text{mm}$ (minimum) mild steel drop rods and suitable brackets are used. Attach the chains or drop rods to the 4 suspension screws of the appliance, and secure with the hexagon nuts provided,
- 3.1.3 The appliance must be suspended with its longitudinal axis horizontal, but may have its lateral axis either horizontal or at an angle of up to 60° (maximum) from the horizontal, in either direction, as shown in Fig. 1. below.
- 3.1.4 The appliance may be mounted off a vertical surface (wall or building support) in which case it is recommended that use is made of the purpose designed brackets which are available as optional equipment. The angle of the appliance to the horizontal may be varied up to 60° (maximum) by adjusting the length of the suspension chains.
- 3.1.5 The brackets should first be fixed to the vertical surface by means of M8 (minimum) bolts, (not provided) through pre-formed holes in the brackets. Attach the appliance to the lower arms of the suspension brackets using 2 of the suspension screws of the appliance, as shown below, and secure with the hexagon nuts provided.
- 3.1.6 Attach chains to both the brackets and the 2 remaining suspension screws of the appliance and secure with the hexagon nuts provided. (see below)

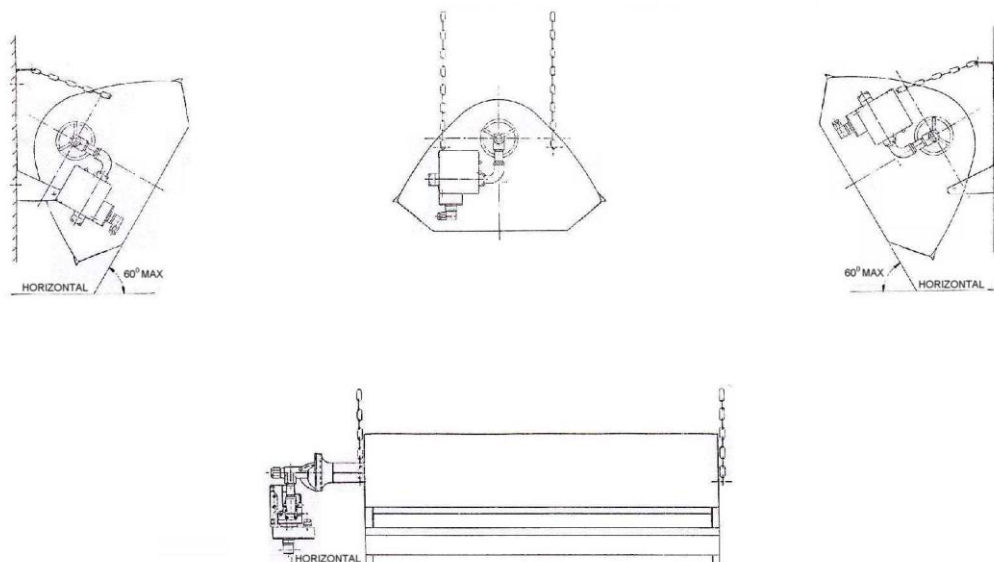


Fig. 1.

3.1.6 Minimum clearance from combustibles.

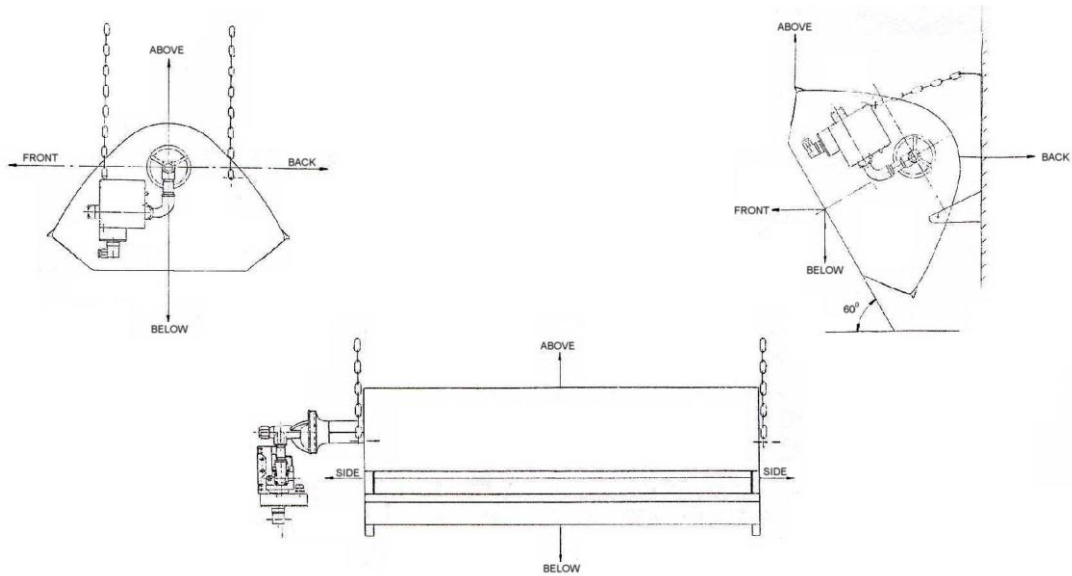


Fig. 2

Table 11

MODEL	HORIZONTAL		60°		ABOVE	BELOW	SIDE
	FRONT	BACK	FRONT	BACK			
Ultra 7 & 7/3.5	670	670	950	225	1000	1340	670
Ultra 14 & 14/7	1000	1000	2000	335	1000	2840	1255
Ultra 21 & 21/10.5	1365	1365	2480	365	1090	3080	1365
Ultra 28 & 28/14	1510	1510	2590	405	1210	3680	1670
Ultra 42 & 42/21	2260	2260	3890	500	1505	5520	2510

3.2 GAS SUPPLY

3.2.1 Natural Gas - G20 at 20mbar nominal supply pressure (appliance cat 2H).

Model	Max. Supply Pressure	Min Supply Pressure	Setting Pressure	Gas Connection
Ultra 7	25 mbar	17 mbar	19.0 mbar	Rc - 1/2
Ultra 14	25 mbar	17 mbar	18.8 mbar	Rc - 1/2
Ultra 21	25 mbar	17 mbar	18.7 mbar	Rc - 1/2
Ultra 28	25 mbar	17 mbar	18.2 mbar	Rc - 1/2
Ultra 42	25 mbar	17 mbar	17.5 mbar	Rc - 1/2

3.2.1.1 Installation pipes should be fitted in accordance with National and Local Regulations. Pipes of a smaller size than the appliance connection (Rc - 1/2) should not be used and the pipework must be designed to achieve the nominal gas supply pressure of 20 mbar, measured at the appliance inlet pressure test point.

A union service cock MUST be fitted as close as practicable upstream of the appliance to enable the gas train to be removed for maintenance or repair.

It is essential to provide a flexible metallic hose, which must conform to National or Local Regulations, to connect the appliance to the gas supply. Minimum size to be 1/2" (12.7mm) bore.

3.2.2 LPG - G31 (Propane) at 37mbar nominal supply pressure (appliance cat 3P).

Model	Max. Supply Pressure	Min Supply Pressure	Setting Pressure	Gas Connection
Ultra 7	44.5 mbar	29.5 mbar	37.0 mbar	Rc - 1/2
Ultra 14	44.5 mbar	29.5 mbar	36.3 mbar	Rc - 1/2
Ultra 21	44.5 mbar	29.5 mbar	36.0 mbar	Rc - 1/2
Ultra 28	44.5 mbar	29.5 mbar	35.8 mbar	Rc - 1/2
Ultra 42	44.5 mbar	29.5 mbar	35.5 mbar	Rc - 1/2

3.2.2.1 The appliance should be connected to a permanent supply of LPG (propane), with pipes of adequate size to achieve the nominal gas supply pressure to the appliance stated at 3.2.2. above, measured at the appliance inlet pressure test point.

3.2.3 A union service cock MUST be fitted as close as practical upstream of the appliance to enable the gas train to be removed for maintenance or repair.

3.2.4 The complete installation MUST be tested for soundness in accordance with National or Local regulations.

3.3 ELECTRICAL SUPPLY

WARNING: THIS APPLIANCE MUST BE EARTHED

3.3.1 The electrical wiring to the appliance must be installed in accordance with the latest or current National Regulations and any Local Regulations that apply.

Electrical supply 230v ~ 50Hz 25W
 Current rating 0.11A
 Fuse externally 3A

3.3.2 Ultra 7 - 42: Twin core and earth PVC covered flexible supply cable (0.5mm² - to National or Local standard specification) must be used, with connections made as shown in Fig. 3.

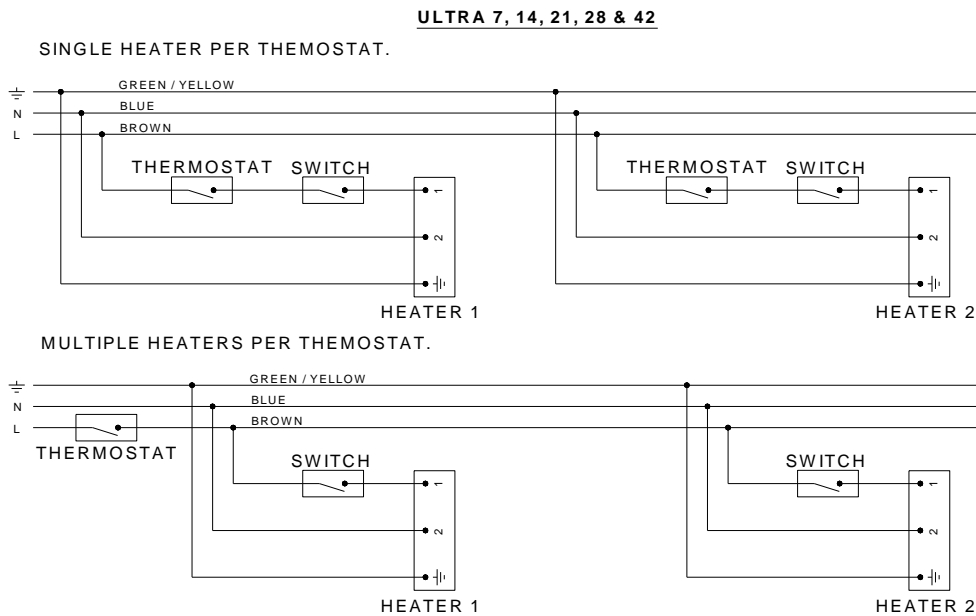
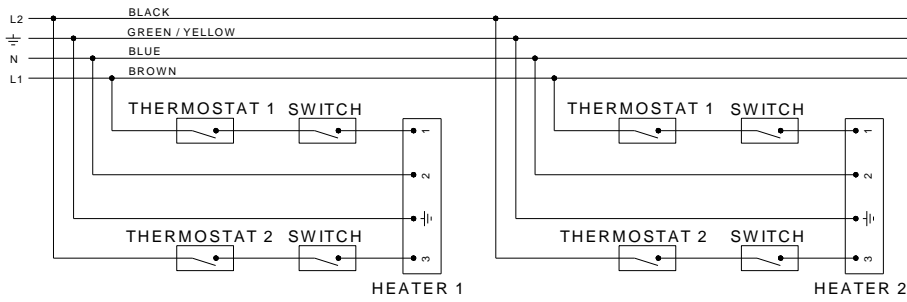


Fig. 3

3.3.3 Ultra 7/3.5 - 42/21 (Hi/Lo): Three core and earth PVC covered flexible supply cable (0.5mm² - to National or Local standard specification) must be used, with connections made as shown in Fig. 4.

ULTRA 7/3.5, 14/7, 21/10.5, 28/14 & 42/21 Hi/Lo

SINGLE HEATER PER THERMOSTAT.



MULTIPLE HEATERS PER THERMOSTAT.

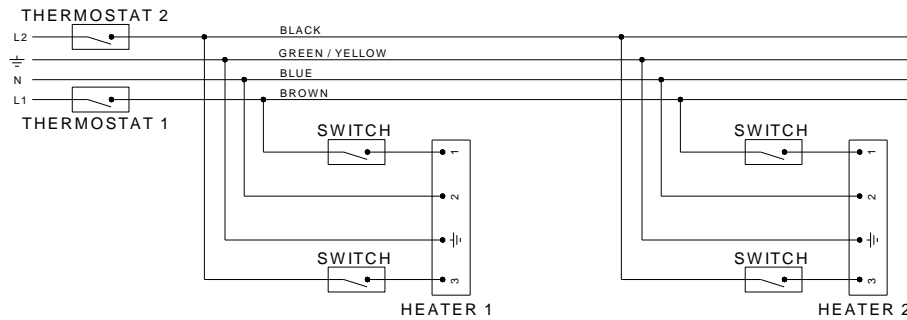


Fig. 4.

Notes:

The method of connection to the electrical supply must facilitate complete isolation and should preferably be via a fused double pole isolator having a constant separation of at least 3mm in all poles and supplying the appliance ONLY.

Alternatively connections may be made via a 3 pin plug and unswitched socket, both complying with the requirements of National or Local Regulations. Neither thermostat nor switches are supplied as standard equipment.

N.B. In the event of an electrical fault after installation of the appliance, preliminary system checks are required to be carried out, i.e. earth continuity, polarity and resistance to earth.

3.3.4 Internal Wiring Diagram

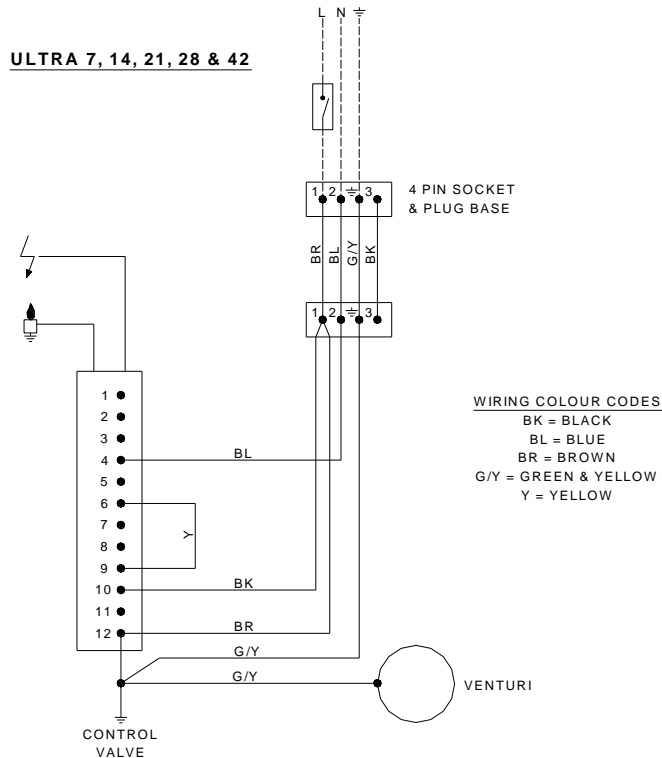


Fig 5.

3.3.5

Internal Wiring Diagram

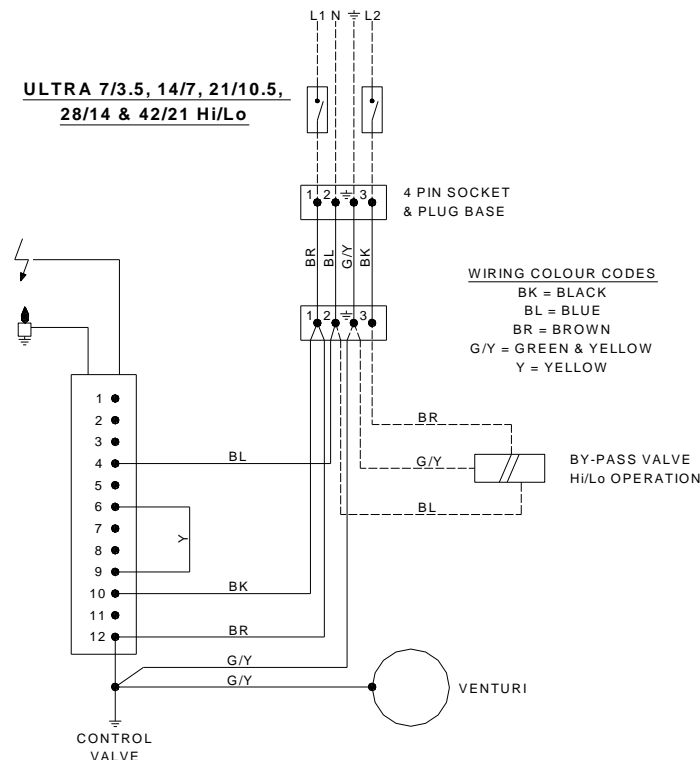


Fig. 6

3.4 VENTILATION

The installation room should have a volume of at least 10m³/kW of installed nominal input of the radiant heater.

The ventilation requirements and calculation methods for unflued appliances are set out in the European Standard **EN 13410:2001** and must be applied. The following is guidance to the standard:

Ventilation may be achieved by any of the three following different means:

- Thermal evacuation of the products of combustion/air mixture
- Mechanical evacuation of the products of combustion/air mixture
- Natural air change.

3.4.1.1 Ventilation by Thermal Evacuation

Ventilation by thermal evacuation is sufficient if 10m³/h of exhaust air per kW of operating heat input are ventilated out of the installation room.

The air/products of combustion mixture must be evacuated above the radiant heaters, if possible near the ridge, by means of exhaust mixture opening(s), (vents).

Where the exhaust mixture opening(s) can be closed, it shall only be possible to operate the radiant heaters when they are open.

The maximum horizontal distance between a radiant heater and a vent opening shall be:

- 6(six) times the vent height in the case of wall openings
- 3(three) times the vent height in the case of roof openings

3.4.1.2 Ventilation by Mechanical Evacuation

Ventilation by mechanical evacuation is sufficient if **10m³/h of exhaust air per kW of operating heat input** are ventilated out of the installation room.

The air/products of combustion mixture must be evacuated above the radiant heaters using fan(s)

It shall only be possible to operate the radiant heaters whilst the exhaust airflow is proven.

The Maximum horizontal distance between a radiant heater and a fan shall be:
6(six) times the fan mounting height in the case of wall openings
3(three) times the fan mounting height in the case of roof openings.

Total minimum proven ventilation airflow in m³/h will be:

Total installed kW input X10

Note: Mechanical exhaust air openings must be positioned such that the burner stability of the nearest appliance is unaffected.

3.4.1.3 Ventilation by Natural Air Change

Gas-Fired radiant heaters may be operated without any special exhaust system if the exhaust gases are discharged to the outside atmosphere by a sufficient natural air change in the installation room

Furthermore, no provision for thermal or mechanical ventilation is required in the following particular cases:
Buildings with natural air change greater than 1.5 volumes per hour
Buildings with a density of operating heat input not greater than 5W/m³

3.4.1.4 Air Supply

Air supply openings are required to admit air and shall be located below the radiant heaters.

The total area of the unobstructed cross-sections of all the air supply openings shall not be smaller than the total area of the unobstructed cross-sections of all the exhaust openings.

Slits and gaps of **fixed** cross-sections can also be used as air supply openings.

Where the air supply openings can be closed, it shall only be possible to operate heaters when they are open.

4. ASSEMBLY

4.1 ASSEMBLY BURNER ASSY TO BASIC BODY ASSY

- 4.1.1 Place the Orifice Plate (when supplied) into the venturi inlet of the Basic Body Assembly and press into position against the shoulder. Insert the Burner Assembly spigot into the venturi inlet and align the Control Valve/Ignition Control as shown in Fig 7 below:

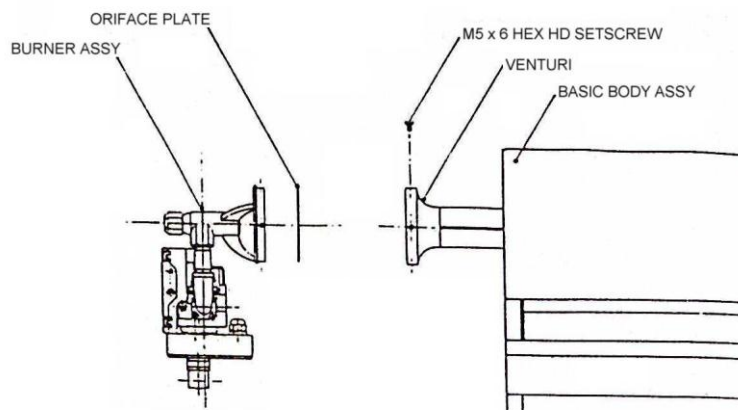


Fig. 7

IMPORTANT: CORRECT ALIGNMENT OF THE BURNER ASSEMBLY IS CRUCIAL TO THE SAFE OPERATION OF THE APPLIANCE.

- 4.1.2 Position the Burner Assembly spigot in the Venturi inlet to align the M5 tapped holes in the spigot with the clearance holes in the Venturi and secure with the Qty 4 - M5x6 set screws provided.

4.2 Ultra 7, 14, 21, 28, 42

- 4.2.1 The appliance should be raised and suspended from chains or drop rods or from brackets fixed to vertical surfaces which have been previously installed in accordance with section 3.1 - Suspension.
- 4.2.2 Connect the gas supply in accordance with Section 3.2. - Gas Supply, of these Installation Instructions.
- 4.2.3 Using twin core and earth flexible supply cable, as specified in Section 3.3.2, suitable for 230V ~ 50Hz 25W supply, connect the 4 pin electrical socket provided (fitted to junction box, attached to the Control Valve) as follows:-

Brown	-	to terminal marked 1
Blue	-	to terminal marked 2
Green/Yellow	-	to terminal marked \oplus

External fuse required - 3 amp.
See section 3.3 for electrical supply requirements.

4.3 Ultra 7/3.5, 14/7, 21/10.5, 28/14, 42/21 (HI/LO)

- 4.3.1 The appliance should be raised and suspended from chains or drop rods, or from brackets fixed to vertical surfaces which have been previously installed in accordance with Section 3.1. - Suspension.
- 4.3.2 Connect the gas supply in accordance with Section 3.2. - Gas supply, of these Installation Instructions.
- 4.3.3 Using three core and earth flexible supply cable as specified in section 3.3.3, suitable for 230v ~ 50Hz 25W supply, connect the 4 pin electrical socket provided (fitted to junction box, attached to the Control valve) as follows:-

Brown	-	to terminal marked 1
Blue	-	to terminal marked 2
Black	-	to terminal marked 3
Green/Yellow	-	to terminal marked \oplus

External fuse required - 3 amp
See Section 3.3 for electrical supply requirements

5. COMMISSIONING

It is essential that all new pipework installations are purged and tested for soundness using a suitable leak detection fluid prior to attempting to ignite any appliance. This work should be carried out in accordance with National or Local Regulations.

N.B. DO NOT TEST FOR SOUNDNESS BY USE OF NAKED FLAMES.

5.1 Ignition.

- 5.1.1 Turn on the gas supply to the appliance.
- 5.1.2 Switch on the electrical supply to the appliance.
- 5.1.3 If the appliance has a thermostat fitted in the electrical supply circuit, ensure that it is set high enough to demand heat. Ultra HI/LO (e.g. Ultra 7/3.5): ensure that the second thermostat (T2 - see Fig. 4) is set high enough to call for heat also.
- 5.1.4 After a waiting time of 1 second, the solenoid valves and the spark ignition electrode will be energised simultaneously.
- 5.1.5 Upon successful ignition the flame will be detected by the flame sensor and the ignition spark electrode will be de-energised.
- 5.1.6 Should the flame fail to permanently establish during the 25 seconds ignition period, the solenoid valves and ignition spark electrode will be de-energised and the appliance Ignition Control will go to "lockout" condition.
- 5.1.7 To repeat the ignition sequence it will be necessary to switch off the electricity supply to the appliance for a period of 10 seconds to reset the ignition control. If a first reset is not successful, wait at least 15 seconds before repeating the procedure. After reset, an extended waiting time will occur.
- 5.1.8 If the burner fails to ignite following a second ignition sequence, turn off the gas supply at the gas isolation valve and investigate the fault.

5.1.9 If gas failure occurs after successful ignition the appliance ignition control will attempt one re-ignition before going to "lockout" condition.

5.1.10 Ultra HI/LO (e.g. Ultra 7/3.5) only: with the burner ignited, turn down the temperature setting of the second thermostat (T2-see Fig. 4) and observe that the tile colour changes from bright cherry red to dull red. (Low burn condition - LO - heat input reduced to 50%). To increase the heat input to 100% (HI), turn up the temperature setting of the second thermostat (T2).

IMPORTANT: Thermostat T1 must be set at a higher temperature than thermostat T2 to achieve the High/Low mode of operation.

5.2 Shut Down

5.2.1 To shut down the appliance for short periods of time, switch off the electrical supply to the appliance.

5.2.2 To shut down the appliance for a period of time in excess of one week, switch off the electrical supply to the appliance and turn off the gas supply at the gas isolation valve.

Note: concise operating instructions are contained on Instruction Label (4260460) that should be affixed adjacent to a low level user control.

5.3 Checking Gas Pressure

5.3.1 To check the gas supply pressure.

5.3.1.1 Unscrew the sealing screw (2 turns) of the control valve test nipple marked 'IN' and connect a manometer to this test nipple.

5.3.1.2 Ignite the appliance burner by switching on the electrical supply to the appliance and check that the manometer reading is as stated below, for the gas type the appliance is adjusted for (see Data Label affixed to the appliance adjacent to controls).

Category 2H: gas type G20 (natural): supply pressure	20mbar (nom) 17mbar (min) 25mbar (max)
--	--

Category 3P: gas type G31 (propane): supply pressure	37.0 mbar (nom) 44.5 mbar (min) 29.5 mbar (max)
--	---

5.3.1.3 Switch off the electrical supply to the appliance and remove the manometer tube from the Control Valve test nipple marked 'IN'. Screw in the test nipple sealing screw.

5.3.2 To check the burner setting pressure:

5.3.2.1 Unscrew the sealing screw (2 turns) of the Control Valve test nipple marked 'OUT' and connect a manometer to this test nipple.

5.3.2.2 Ignite the burner by switching on the electrical supply to the appliance and check that the manometer reading is as stated below, for the gas type the appliance is adjusted for (see Data Label, affixed to the appliance adjacent to the Controls).

Category 2H: gas type G20 (natural): setting pressure -	Ultra 7 & Ultra 7/3.5	- 19.0mbar
	Ultra 14 & Ultra 14/7	- 18.8mbar
	Ultra 21 & Ultra 21/10.5	- 18.7mbar
	Ultra 28 & Ultra 28/14	- 18.2mbar
	Ultra 42 & Ultra 42/21	- 17.5mbar

Category 3P: gas type G31 (propane): setting pressure -	Ultra 7 & Ultra 7/3.5	- 37.0mbar
	Ultra 14 & Ultra 14/7	- 36.3mbar
	Ultra 21 & Ultra 21/10.5	- 36.0mbar
	Ultra 28 & Ultra 28/14	- 35.8mbar
	Ultra 42 & Ultra 42/21	- 35.5mbar

5.3.2.3 In the event that the burner setting pressure is incorrect remove the cap from the integral pressure governor of the control valve. Adjust the pressure (using a suitable screwdriver) by turning the pressure governor adjusting screw clockwise to increase, or anti-clockwise to decrease the burner setting pressure.

- 5.3.2.4 Upon obtaining the correct burner setting pressure, switch off the electrical supply to the Appliance, remove the manometer tube from the control valve test nipple marked 'OUT' and screw in the test nipple sealing screw. Replace the cap on the integral pressure governor of the control valve.

5.4 Flame Supervision.

- 5.4.1 To check the operation of the flame supervision equipment, run the appliance normally, remove the flame sensor (grey) lead from the ignition control by gently pulling the connector using insulated pliers. Observe that the burner flame is extinguished within 1 second.
- 5.4.2 After a 'waiting time' of 1 second, the solenoid valves and the ignition spark electrode will be re-energised and with the flame sensor lead still disconnected, the Ignition Control will go to 'lockout condition' after a further 25 seconds.
- 5.4.3 Switch off the electrical supply to the appliance and reconnect the flame sensor lead to the ignition control.

NOTE: an ionisation current equal to or greater than 0.9µA (On/Off) or 0.4µA (Hi/Lo) is required to maintain the operation of the appliance.

6. **SERVICING**

It is essential that at least once a year, preferably before the heating season, the appliance is serviced by a qualified person. In exceptionally dirty conditions, such as may occur in a foundry, more frequent servicing may be desirable.

IMPORTANT:

1. Do not rest anything, especially ladders, against the appliance.
2. Gas and electrical supplies must be isolated before commencing servicing work or replacement of components.
3. Unless instructed to the contrary, re-assemble components in reverse order.
4. Check all joints for gas soundness after carrying out any servicing of the appliance.
5. On completion of a service/fault finding task which has required the breaking and re-making of electrical connections, the following checks, using a multimeter must be made.
 - 5.1 Earth continuity check.
 - 5.2 Polarity check.
 - 5.3 Resistance to earth check.

6.1 Electrode Assembly

- 6.1.1 Disconnect the black HT lead from the ignition electrode, by gently pulling the plastic shroud from the Raja connector of the electrode.
- 6.1.2 Disconnect the grey flame sensor lead from the flame sensor rod by gently pulling the connector, using pliers.
- 6.1.3 Unscrew the two M5 nuts securing the electrode mounting plate to the appliance side panel and withdraw the assembly.

IMPORTANT: DO NOT ATTEMPT TO REMOVE THE TWO M5 SETSCREWS FROM THE APPLIANCE SIDE PANEL. THESE SCREWS SUPPORT THE PLENUM BOX ASSEMBLY ALSO.

- 6.1.4 Remove any foreign matter from the ignition electrode and earth rod, check the condition of the ceramic insulator and check that the spark gap is 3.5mm. If the electrode is badly oxidised or the ceramic insulator is cracked, replace the electrode assembly. (see section 7.1).
- 6.1.5 Remove any foreign matter from the flame sensor rod and check the condition of the ceramic insulator. If the rod is badly oxidised or the ceramic insulator cracked, replace the electrode assembly (see section 7.1).

6.2 Injector

- 6.2.1 Unscrew the injector from the injector holder (attached to the venturi) and remove. Inspect and clean as necessary with a soft bristle brush.

DO NOT DAMAGE THE INJECTOR ORIFICE BY USE OF SOLID OBJECTS

6.3 Electrical Wiring

- 6.3.1 Inspect the wiring inside the junction box. (attached to the gas control valve) To open the junction box, first slacken the gland nut securing the electrical cable for the Honeywell ignition control. (the Ultra HI/LO series of appliances has a second gland nut, securing the electrical cable for the HI/LO solenoid actuator). Secondly, unscrew the 4

screws securing the cover to the junction box. Carefully lift away the cover. Replace any damaged wiring as necessary.

- 6.3.2 Unscrew the fastener securing the Honeywell ignition control to the Honeywell gas control valve and remove the connection cover. Check that the electrical connections are sound and the wiring undamaged. Replace any damaged wiring as necessary.

6.4 Reflector

- 6.4.1 The reflective surfaces of the two adjustable reflector panels should be cleaned with a soft cloth and detergent in water. A mild non-abrasive metal polish may be used where extra discolouration has occurred.

6.5 Emitter Assembly

- 6.5.1 Ignite the appliance and observe the colour of the emitter surface. If there are pronounced dark areas on the surface, it probably indicates an accumulation of dirt on the inside surface of the ceramic plaque.
- 6.5.2 To remove any dirt accumulated on the inside surface of the ceramic plaque, direct a supply of compressed air into the plenum chamber via the venturi.

IMPORTANT: DO NOT DIRECT COMPRESSED AIR AT THE CERAMIC PLAQUE SURFACE AS IT MAY DAMAGE THE CERAMIC TILES.

6.6 Auxiliary Controls

- 6.6.1 Room thermostats, time switches, frost thermostats, etc should be checked to ensure correct functioning and are set to the user requirements.

7. REPLACING COMPONENTS

IMPORTANT: Disconnect gas and electricity supplies to the appliance before carrying out any repair work. This work can be carried out at high level using a purpose designed access tower, but it is preferable that this work should be carried out at ground level.

7.1 Electrode Assembly

- 7.1.1 Disconnect the black HT ignition lead from the ignition electrode by gently pulling the plastic shroud from the Raja connector of the electrode.
- 7.1.2 Disconnect the grey flame sensor lead from the flame sensor rod by gently pulling the connector, using pliers.
- 7.1.3 Unscrew the two M5 nuts securing the electrode mounting plate to the appliance side panel and withdraw the electrode assembly.
IMPORTANT: DO NOT ATTEMPT TO REMOVE THE TWO M5 SETSCREWS FROM THE APPLIANCE SIDE PANEL. THESE SCREWS SUPPORT THE PLENUM BOX ASSEMBLY ALSO.
- 7.1.4 Before fitting a replacement electrode assembly, check that the spark gap is 3.5mm. Insert the re-placement electrode assembly into the appliance side panel and onto the two M5 setscrews. Secure with the two M5 nuts.

7.2 Ignition Control

- 7.2.1 Disconnect both the grey flame sensor lead and black HT ignition lead from the ignition control.
- 7.2.2 Remove the screw securing the ignition control to the Honeywell gas control valve and remove the connection cover.
- 7.2.3 Disconnect the 10 way Molex electrical connector from the ignition control and gently pull the ignition control from the gas control valve.

7.3 Injector

- 7.3.1 Using a 24mm A/F spanner, unscrew the injector from the injector holder (attached to the venturi) and remove.

7.4 Twin Solenoid Control Valve

- 7.4.1 Remove the ignition control (see section 7.2) and disconnect the gas supply pipe from the control valve by unscrewing the four M4 screws securing the flange connector to the control valve inlet port.

- 7.4.2 Disconnect the electrical supply to the appliance by unscrewing the M3 screw securing the electrical supply socket to the 4 pin plug attached to the electrical junction box (secured to the gas control valve).
- 7.4.3 Unscrew the four M4 screws securing the flange connector to the control valve outlet port and lift off the control valve.
- 7.4.4 To remove the electrical junction box from the gas control valve, first slacken the gland nut securing the electrical cable for the Honeywell ignition control (the Ultra HI/LO series of appliances has a second gland nut, securing the electrical cable for the HI/LO solenoid actuator) Secondly, unscrew the four screws securing the cover to the junction box and carefully lift away the cover. Unscrew the two screws securing the junction box to the gas control valve and remove the junction box.
- 7.4.5 When assembling a replacement control valve, ensure that the 'O' rings, located in the flange connectors are in sound condition and correctly positioned in the 'O' ring grooves of the connectors.

7.5 Reverberatory Screens

- 7.5.1 To replace sections of reverberatory screen, it is necessary for the work to be carried out at ground level.
- 7.5.2 Disconnect both the black H.T. lead and the grey flame sensor lead from the electrode assembly.
- 7.5.3 Unscrew the four M4 screws securing the injector holder to the venturi inlet and remove the complete control assembly. Take care to retain the orifice plate, (if fitted) located between the injector holder and the venturi.
- 7.5.4 Disconnect the appliance from its suspension means, lower to ground level and place on a workbench with the emitter uppermost.
- 7.5.5 Unscrew the two M5 nuts securing the electrode mounting plate to the appliance side panel and withdraw the electrode assembly.
- 7.5.6 Support the plenum box assembly and remove the two M5 setscrews securing it (and the electrode assembly) to the appliance side panel. Lower the plenum box assembly to rest on the reflector cowling.
- 7.5.7 Unscrew the M5 nut securing the plenum box support bracket to the opposite side panel of the appliance and, lifting this end of the plenum box assembly clear of the appliance side panel, withdraw the plenum box assembly, taking care when passing the venturi through the adjacent side panel.
- 7.5.8 Place the plenum box assembly on the bench with the reverberatory screen uppermost and remove the screen panels, as necessary by twisting the securing tabs (at underside of plenum box flange) in line with the slots in the flange, through which they pass, and lift off.

7.6 Emitter Assembly (ceramic tiles)

- 7.6.1 In the unlikely event that a ceramic tile is damaged and requires replacement, contact Space-Ray at the address shown on the front cover of this manual.

7.7 Replacement Parts List

The following is a list of replacement parts which may be required during the life of the appliance.

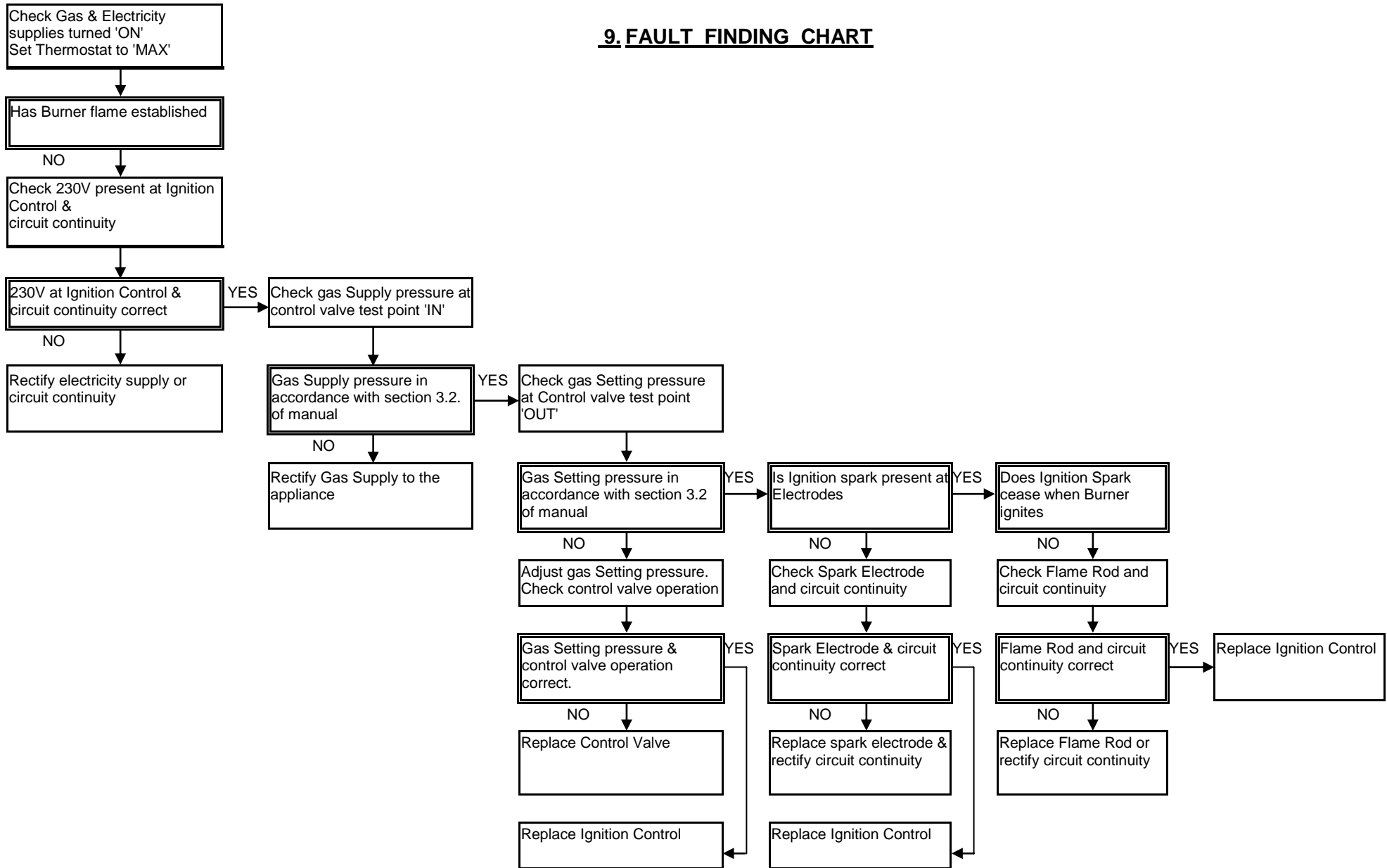
Description	Part Number	Description	Part Number
H.T. Lead Assembly	4250584A	Solenoid Actuator - HI/LO	4262706
Flame Sensor Lead	4250584J	Reverb. Screen Panel	4262731
Ignition Control	4262534	Electrode Assembly	4262732
Control Valve	4262586		

8. OPERATING INSTRUCTIONS

- 8.1 Turn on the gas supply to the appliance.
- 8.2 Set any time switch or thermostats to demand heat.
- 8.3 Switch on the electrical supply to the appliance.
- 8.4 The burner should ignite within 25 seconds.
- 8.5 Failure to ignite will result in the ignition controller going to "Lockout" condition.

- 8.6 If 'Lockout' occurs, switch off the electrical supply to the appliance, wait for 10 seconds before switching on the electrical supply to the appliance to repeat the ignition sequence.
- 8.7 If the appliance fails to ignite after a second sequence, switch off the electricity supply to the appliance and call the service engineer.
- 8.8 If gas failure occurs after successful ignition, the appliance will attempt one re-ignition before going to "Lockout" conditions.
- 8.9 To shut down the appliance for short periods of time, switch off the electricity supply to the appliance.
- 8.10 To shut down the appliance for longer periods of time switch off the electricity supply to the appliance and turn off the gas supply at the gas isolation valve.

9. FAULT FINDING CHART



NOTES: