



0063

Read these instructions thoroughly before commencing installation.

# AMBI-RAD Model UF Series 2 Gas-Fired Unit Heaters

Installation Form WA/004/0399

APPLIES TO: Installation, Commissioning, and Service

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**WARNING: Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. All work must be carried out by competent persons, i.e. a registered CORGI installer.**

***PLEASE READ THESE INSTRUCTIONS THOROUGHLY BEFORE COMMENCING WORK.***

### HAZARD INTENSITY LEVELS

- 1. DANGER:** Failure to comply will result in severe personal injury or death and/or property damage.
- 2. WARNING:** Failure to comply could result in severe personal injury or death and/or property damage.
- 3. CAUTION:** Failure to comply could result in minor personal injury and/or property damage.

**WARNING: The electrical isolator should only be used in an emergency and should not be used for closing down the main burner, as it switches off the fan prematurely and may damage the heat exchanger, invalidating the warranty.**

## 1.0 INTRODUCTION

### 1.1 Basic Information

The instructions in this manual apply to Model UF Series 2 gas-fired natural draught air heaters. Model UF heaters have an axial fan for air delivery.

These heaters are designed for overhead suspension and are suitable for indoor installation only.

A permanent electricity supply of 230 volts, 50 Hz, single phase is required for all UF Models.

Models UF heaters are Appliance Type **B<sub>II</sub>**, Category **I<sub>HBP</sub>**, self-contained warm air units supplied ready for installation on site. They are fitted with a permanent pilot. A thermoelectric flame supervision device monitors the pilot flame to prevent an explosive condition occurring.

When the external controls call for heat, the multifunctional control valve opens, the main burner ignites and supplies heat to the heat exchanger. After approximately 45 seconds the air delivery fan will start to run and supply warm air.

When the required room temperature is reached, the main burner will shut down leaving the fan running to cool down the heat exchanger. When cool enough, the fan thermostat will turn off the fan.

### 1.2 Warranty

**Warranty is void if . . .**

- Model UF heater is installed in atmospheres containing flammable vapours or atmospheres containing chlorinated or halogenated hydrocarbons or atmospheres containing any silicone, aluminum oxide, etc. that adheres to spark ignition flame sensing probes.
- The installation is not in accordance with these instructions.
- Model UF, axial fan-type unit heater, is connected to a duct system or fitted with a non-factory authorised air distribution device.
- Fitted in the printing industry where fine starch or sugar dusts are used.

## 2.0 TECHNICAL DATA - Model UF Series 2

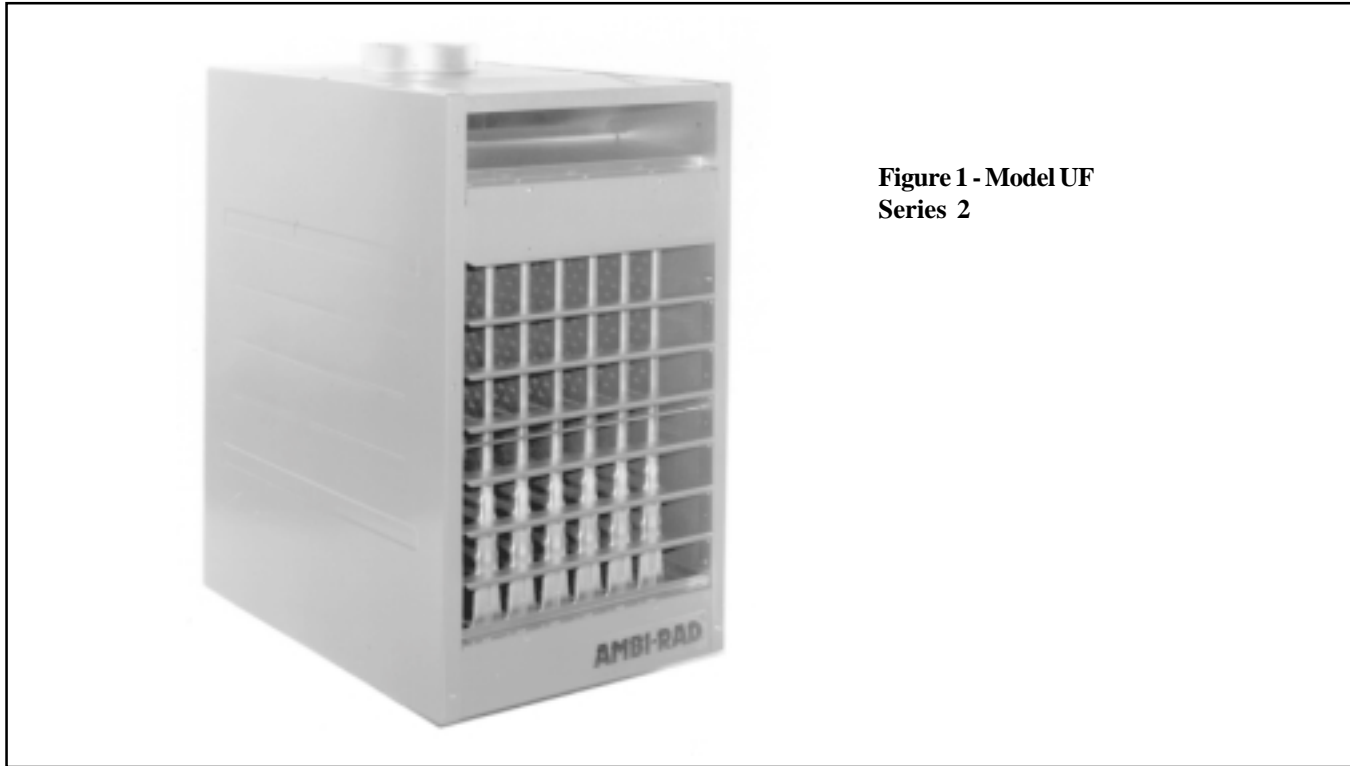


Figure 1 - Model UF Series 2

### 2.1 Specifications

Model	Heat Input		Heat Output		Maximum Gas Rate <sup>①</sup>		Air Volume		Running Amps <sup>②</sup>	Power Consumption <sup>②</sup>	Fuse Size
	kw	BTUH	kw	BTUH	m3/h	ft3/h	m3/h	ft3/min			
UF25-2	7.3	25,000	5.9	20,000	0.69	24.3	573	337	0.45	100 watts	1 Amp
UF50-2	14.6	50,000	11.7	40,000	1.38	48.5	1143	673	0.45	100 watts	1 Amp
UF75-2	22.0	75,000	17.6	60,000	2.06	72.8	1888	1111	0.50	110 watts	1 Amp
UF100-2	29.3	100,000	23.4	80,000	2.75	97.1	2516	1481	1.00	220 watts	2 Amps
UF125-2	36.6	125,000	29.3	100,000	3.44	121.4	3272	1926	1.05	240 watts	2 Amps
UF165-2	48.3	165,000	38.7	132,000	4.54	160.2	4152	2444	1.10	270 watts	2 Amps
UF200-2	58.6	200,000	46.9	160,000	5.50	194.2	5034	2963	1.20	290 watts	5 Amps
UF250-2	73.2	250,000	58.6	200,000	6.87	242.7	6293	3704	1.80	350 watts	5 Amps
UF300-2	87.9	300,000	70.3	240,000	8.25	291.3	7550	4444	2.00	450 watts	5 Amps
UF400-2	117.2	400,000	93.8	320,000	11.00	388.3	10068	5926	2.50	580 watts	5 Amps

① Gas flow rate is based on a gas with a C.V. of 39.9 MJ/m<sup>3</sup> (1030 BTUH) and includes a pilot flow rate of 264 watts (900 BTUH).

② Based on normal operation at 230 volts and 50 hertz.

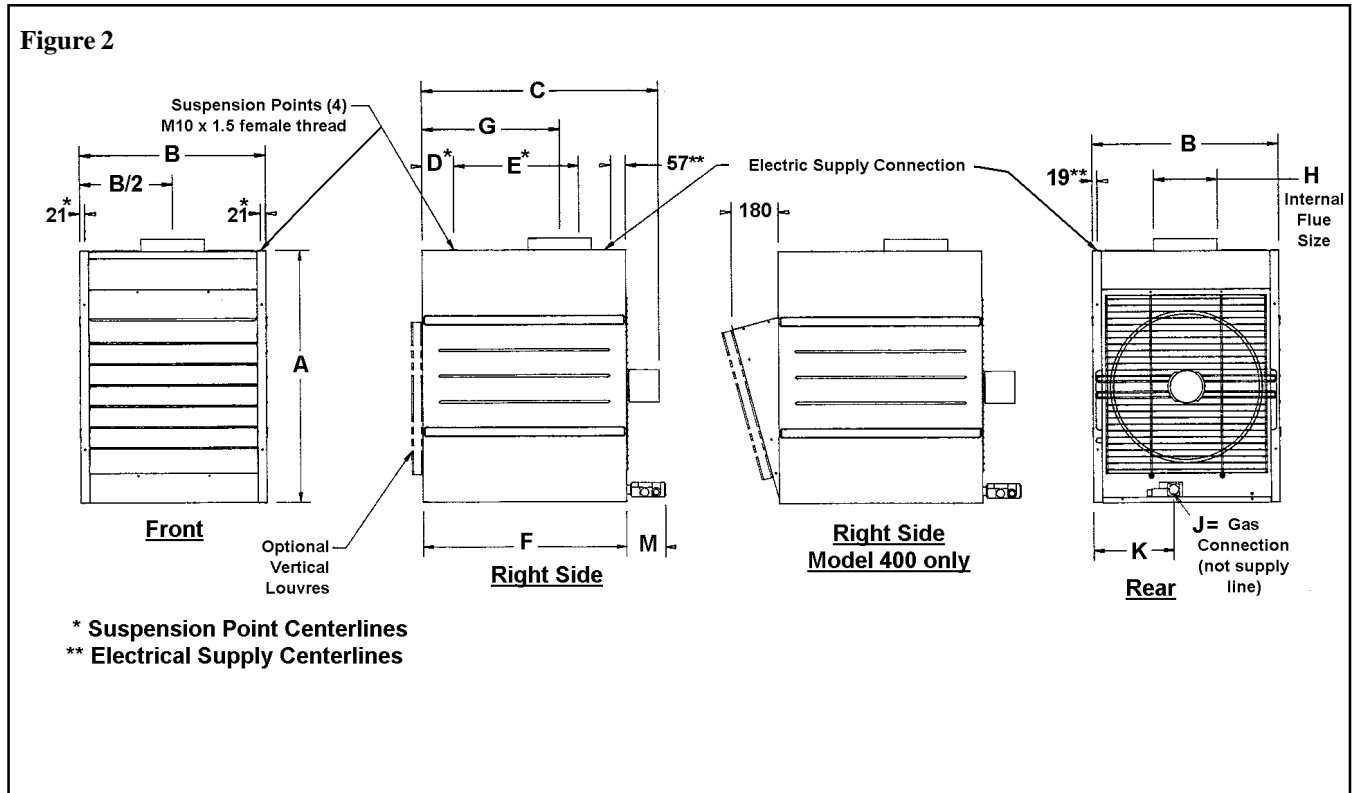
### 2.2A Burner Injector Size and Pressure - Natural Gas

Model	Qty	Injector Size	Injector Marking	Burner Pressure m bar
		mm		
UF25-2	2	1.70	51	8.8
UF50-2	3	1.99	47	8.8
UF75-2	4	2.08	45	8.8
UF100-2	5	2.18	44	8.8
UF125-2	6	2.18	44	8.8
UF165-2	5	2.79	35	9.0
UF200-2	6	2.79	35	9.0
UF250-2	8	2.79	35	9.0
UF300-2	9	2.79	35	9.0
UF400-2	12	2.79	35	9.0

### 2.2B Burner Injector Size and Pressure - Propane Gas

Model	Qty	Injector Size	Injector Marking	Burner Pressure m bar
		mm		
UF25-2	2	1.02	60	25
UF50-2	3	1.20	1.2MM	25
UF75-2	4	1.30	1.3MM	25
UF100-2	5	1.32	55	25
UF125-2	6	1.32	55	25
UF165-2	5	1.65	1.65MM	25
UF200-2	6	1.65	1.65MM	25
UF250-2	8	1.65	1.65MM	25
UF300-2	9	1.65	1.65MM	25
UF400-2	12	1.65	1.65MM	25

## 2.3 DIMENSIONS - Model UF Series 2



**Table 3**

Model	A	B	C	D	E (Hanger)	F
	mm	mm	mm	mm	mm	mm
UF25-2	737	344	687	148	367	689
UF50-2	737	344	687	148	367	689
UF75-2	737	395	687	148	367	689
UF100-2	737	446	794	148	367	689
UF125-2	737	592	794	148	367	689
UF165-2	990	516	911	124	495	802
UF200-2	990	592	911	124	495	802
UF250-2	990	732	937	124	495	802
UF300-2	990	732	937	124	495	802
UF400-2	990	941	937	124	495	802

Model	G	H (Internal)	J	K	M	Approx. Net Wt
	mm	mm	BSP inches	mm	mm	kg
UF25-2	451	102	3/4	261	213	33
UF50-2	451	102	3/4	261	213	36
UF75-2	451	127	3/4	267	213	40
UF100-2	451	153	3/4	328	149	44
UF125-2	436	178	3/4	366	149	58
UF165-2	543	203	3/4	363	149	68
UF200-2	543	203	3/4	366	149	77
UF250-2	543	254	3/4	314	187	93
UF300-2	543	254	3/4	314	225	100
UF400-2	543	254	3/4	330	225	125

## 3.0 GENERAL REQUIREMENTS

### 3.1 Related Documents

It is important that all gas appliances are installed by competent persons, i.e. a registered CORGI installer, in accordance with the relevant requirements of the following regulations.

Failure to install appliances correctly could lead to prosecution. It is in your own interest and that of safety to ensure compliance with the law.

#### THE RELEVANT REGULATIONS ARE ...

#### GAS SAFETY (INSTALLATIONS & USE) (Amendment) REGULATIONS 1990

#### THE HEALTH AND SAFETY AT WORK, ETC. ACTS

- **BS6230 1991 SPECIFICATION FOR THE INSTALLATION OF GAS FIRED FORCED CONVECTION AIR HEATERS FOR COMMERCIAL AND INDUSTRIAL SPACE HEATING OF RATED INPUT EXCEEDING 60 KW.**
- **BS5588 PART 1 (SECTION 1) 1990; PART 2 1985 AND 1990; AND PART 3 1983 AND 1989**
- **BS5440 PART 2 1989 FLUES AND AIR SUPPLY FOR GAS APPLIANCES NOT EXCEEDING 60 KW**
- **BS6891 1988 LOW PRESSURE INSTALLATION PIPES**

#### BRITISH GAS PUBLICATIONS

**IGE/UP/1 PURGING PROCEDURES FOR NON-DOMESTIC INSTALLATIONS and SOUNDNESS TESTING PROCEDURES FOR INDUSTRIAL INSTALLATIONS.**

**I.E.E. REGULATIONS FOR ELECTRICAL INSTALLATIONS AND THE REQUIREMENTS OF THE FOLLOWING...THE LOCAL REGION OF BRITISH GAS Plc**

**WARNING: Air heaters should not be installed in corrosive atmospheres, i.e., near plating or degreasing plants or in areas where there is a fire risk. Consult BS6230 for further information on hazardous areas.**

### 3.2 Heater Location

The location chosen for the heater must permit the provision of a satisfactory flue system and an adequate air supply. The location must also provide space for servicing and air circulation around the unit.

Sizes	Top	Flue	Sides	Bottom	Rear	Front
25 - 125	152	152	460	610	610	1830
165 - 250	152	152	460	610	610	2440
300 - 400	152	152	460	610	610	3050

For service purposes, rear must have 610 mm clearance. When supplied with optional downturn nozzle, bottom clearance is 1.0 m.

The location should be free of draughts.

**WARNING: Avoid installing a unit in an extremely draughty area. Extreme draughts can shorten the life of the heat exchanger and/or cause safety problems.**

Refer to Table 5 for recommended mounting height for UF Models.

UF Models	25 - 125	165 - 250	300 - 400
Mounting Height	2.5 - 3 m	2.5 - 3.5 m	3 - 5 m

Units should always be arranged to blow toward or along exposed wall surfaces, if possible. Where two or more units are installed in the same room, a general scheme of air circulation should be maintained for best results.

Suspended heaters are most effective when located as close to the working zone as possible. However, care should be exercised to avoid directing the discharge air directly on the room occupants.

Partitions, columns, counters, or other obstructions should be taken into consideration when locating the unit heater so that a minimum quantity of air will be deflected by any such obstacles. When units are suspended in the centre of the space to be heated, the air should be discharged along exposed walls. In large areas, unit should be located to discharge air along exposed walls with extra units provided to discharge air in toward the centre of the area. At those points where infiltration of cold air is excessive, such as at entrance doors and loading doors, it is desirable to locate the unit so it will discharge directly toward the source of cold air from a distance of 4.5 to 6.0 metres.

### 3.3 Flue System

Each heater must be fitted with an adequately sized flue (See Table 6). Stainless steel flue pipe is recommended.

Size	25	50	75	100	125	165	200	250	300	400
Flue Pipe Diameter	mm	100	100	125	150	175	200	200	250	250
Min. Height of Flue	M	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0

**WARNING: The flue must be installed in accordance with BS5440 Part 1 1990 for all models up to and including Size 200 or BS6230 1991 for all Models Size 250 and over.**

**Failure to provide proper flueing could result in death, serious injury and/or property damage. The unit must be installed with a flue to the outside of the building. Safe operation of any natural draught gas burning equipment requires a properly operating flue system, correct provision for combustion air, and regular maintenance and inspection.**

The unit heater is fitted with an integral draught diverter. Do not use an external draught diverter, barometric damper and/or restrictive damper.

When condensation is possible within the flue, double wall flue pipe is recommended. When double wall flue pipe is used, it should be a type complying with British Standards. Double wall flue pipe requires the use of a special flue socket adapter. Where condensation is unavoidable, provision should be made for condensation to flow freely to a point at which it can be released, preferably into a gully. The condensation pipe from the flue to the disposal point should be of non-corrodible material, not less than 19 mm diameter.

The flue must terminate outside the building in a freely exposed position so as to prevent products of combustion from entering any opening in a building.

If the flue passes through a wall or ceiling of combustible material, it must be enclosed by a sleeve of non-combustible material and separated from the sleeve by at least 25 mm air gap. The temperature of any combustible material near the flue or heater must not exceed 65° C when the heater is in operation. The flue must also be at least 50 mm from any other combustible material.

The joint between the female flue socket of the heater and the flue must be sealed. If twin wall flue piping is used, the appropriate adapter must be fitted.

The joints between the flue and the roof must be made good to prevent water ingress.

### 3.4 Air Supply

It is important to ensure that there is adequate air supply at all times for both combustion and heating requirements. Modern construction methods involve the greater use of insulation, improved vapour barriers and weather-stripping, with the result that buildings generally are much tighter structurally than they have been in the past. Combustion air supply for gas-fired equipment can be affected by these construction conditions because infiltration that would have existed in the past may not be adequate. Extensive use of extract fans aggravates the situation. It is important to ensure that there is an adequate air supply at all times. The use of doors or windows which may be closed is not allowed for the provision of ventilation.

Always ensure that adequate combustion air is provided in compliance with BS5440 and/or BS6320 dependent on heat output of unit(s).

### 3.5 Gas Supply

Model UF heaters are designed to operate on G20 natural gas. Model UF heater may be used on propane gas only if fitted with the correct propane orifices. Consult the data plate for gas type and for minimum and maximum supply pressures. A normal natural gas supply pressure of 20 mbar is recommended. Minimum inlet pressure for propane gas is 27.5 mbar; maximum inlet pressure is 35 mbar.

The natural gas meter and service must be checked by the gas supplier.

The installation must comply with British Standard 6891, and the complete installation including the meter must be purged and tested for soundness as described in the above standard and in British Gas documents IGE/UP/1.

### 3.6 Air Distribution System

Recommendations for the air distribution system are given in the document entitled "Standards of Installation for Gas Fired Industrial Warm Air Heaters".

The following notes are of particular importance...

"For free-blowing units, it must be taken into account that the buoyancy of the heated air leaving the heater and air patterns with the space being heated will modify the air throw pattern achieved.

In buildings having a low heat loss where single units are required to cover a large floor area and in buildings with high roof or ceiling heights, air recirculation may be fitted to ensure even heat distribution and minimise stratification respectively. Care should be taken to avoid impeding the air throw with racking, partitions, plant machinery, etc." Various outlet configurations are available as optional extras to modify the air throw pattern to suit particular site conditions. (See Section 5.)

If the heater is to be installed in a restricted space, adequate provision must be made for return air to avoid any interference with the operation of the flue by the air circulation fan.

### 3.7 Electrical Supply

Wiring external to the air heater must be installed in accordance with the I.E.E. Regulations and be carried out by a qualified electrician.

A constant 240V 50 Hz single phase supply is required for all UF Models. All heaters and controls must be correctly earthed. An isolator with a contact separation of at least 3 mm on all poles should be installed adjacent to the heater.

When a number of heaters are to be wired as part of a single installation, each heater must be provided with a separate isolator.

The final connection to the heater should be to the appliance terminal block (See Fig 3). Cable size should be 1.0 mm. See Section 2, Technical Data, for required fuse size.

The length of the conductors between the cord anchorage and the terminals must be such that the current-carrying conductors become taut before the earthing conductor, if the cable or cord slips out of the cord anchorage.

Figure 3 - Site Wiring Terminal Block



## 4.0 INSTALLATION

### 4.1 Uncrating and Preparation

Prior to despatch, the unit was operated and tested at the factory. If the heater has incurred any damage in shipment, file a claim with AMBI-RAD within 48 hours.

Check the data plate for the gas specifications and electrical characteristics of the heater to be sure that they are compatible with the gas and electric supplies at the installation site. Read this booklet and become familiar with the installation requirements of your particular heater. Before beginning, make preparations for necessary supplies, tools, and manpower.

Check to see if there are any site-installed options that need to be assembled on the heater prior to installation. Each of the option packages includes a list of components and complete, step-by-step instructions. For a brief explanation of frequently specified site-installed options, see Section 5. After becoming familiar with the instructions, assemble and install the options that are required for your heater.

**Do not remove the wooden pallet until after the unit has been suspended, otherwise the bottom access panel could be damaged.**

### 4.2 Suspending the Heater

Model UF heaters are designed to take combustion air via slots in the base panel. The units are therefore not suitable for base mounting and must be suspended from the roof structure or from suitable wall brackets. Before suspending the heater, check the supporting structure to be used to verify that it has sufficient load-carrying capacity to support the weight of the unit and the ancillary equipment. (See Table 7.)

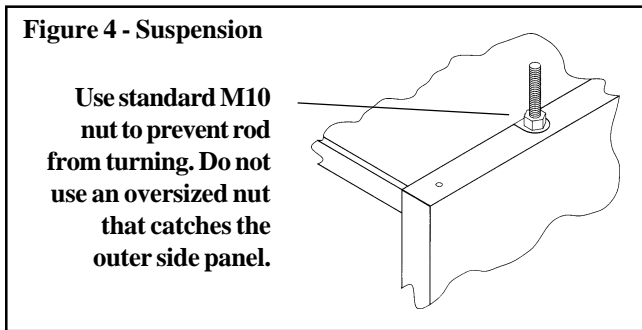
Size	25	50	75	100	125	165	200	250	300	400
kg	33	36	40	44	58	68	77	93	100	125

Each heater is equipped with four suspension brackets that are threaded to receive a M10 x 1.5 eyebolt or threaded rod. See Figure 4 for proper eyebolt or threaded rod attachment.

Material used to support the heater should be corrosion resistant and of sufficient strength. The gas supply pipe and electrical connections should not support any of the weight of the heater.

**WARNING: Suspend the heater only from the threaded hanger brackets. Do not suspend from the heater side panel.**

## 4.2 Suspending the Heater (cont'd)



Where the location of the air heater is such that it might suffer external mechanical damage, i.e., from overhead cranes, fork lift trucks, it must be suitably protected.

When the heater is being lifted for suspension, the bottom must be protected. Do not remove the heater from the wooden pallet before suspension. If the bottom is not supported, the bottom access panel could be damaged.

**WARNING: Units must be level for proper operation. Do not place or add additional weight to the suspended unit.**

## 4.3 Fitting the Flue System

The flue pipe system attaches directly to the flue socket provided on the top of the heater. The socket is sized to accept standard metric sheetmetal flue pipe. When double wall flue pipe is used, a suitable adapter is required.

It is recommended that a split socket is fitted so that if necessary, the heater may be removed for servicing.

Any joints should be secured using three pop rivets or sheradized sheet metal screws at each joint. The joints of the flue must be sound. The flue pipe should be supported so that the heater does not carry any of the flue weight. Flues must be fitted with a British Gas Plc approved flue terminal.

## 4.4 Gas Connection

To facilitate servicing, the heater must be fitted with an approved service gas cock and union or union cock.

Heaters suspended by flexible support material or drop rods must be connected to the gas service using a flexible connector. Sufficient slack must be provided in the flexible connector to allow for normal movement of the heater. Use a flexible connector of suitable size to reduce pressure drop and the possibility of flow noise.

**WARNING: Do not use the gas supply connection to balance heater or support any weight of the heater.**

## 4.5 Electrical Connections

All electrical connections should be made in the site terminal box (refer to Figure 3). Screw-type terminals are provided. Connections should be in accordance with terminal markings inside the site terminal box and the wiring diagram affixed to the heater or shown in Section 9.

The minimum control scheme must have a room thermostat, and in all cases, **it is essential that the main input to terminals L and N remains alive at all times to ensure the correct operation of the fan.**

## 4.6 Control Panel Siting

The siting of the controls is particularly important. Avoid locating the panel in draughty areas or where it may be directly exposed to heat from the sun or other heat sources. The panel should be mounted on an internal wall or column about 1.5m above the floor. Follow the manufacturer's instructions when fitting the controls. Any thermostat must be suitable for switching 240 volts. Do not attempt to control more than one heater from a thermostat unless a properly wired relay is fitted. An Ambi-Rad multi-heater panel is available to control up to four heaters.

## 5.0 AIR DISTRIBUTION SYSTEMS AND OPTIONAL COMPONENTS

### 5.1 Horizontal Louvres and Outlet Nozzle

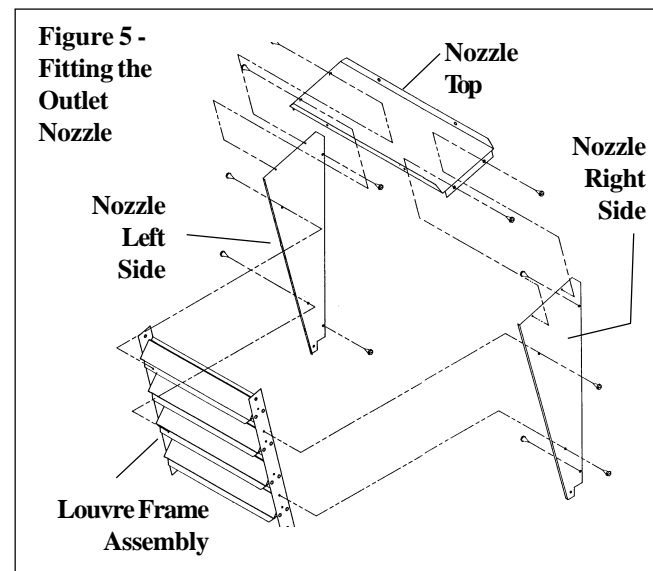
**WARNING: Model UF400 must be fitted with an outlet nozzle (canopy).**

All sizes of Model UF heaters are factory supplied with adjustable horizontal louvres. The outlet nozzle required on Size 400 heaters requires site fitting. Follow the instructions in Section 5.1.1 or 5.3.

Horizontal louvres may be adjusted from 10 to 55 degrees to direct the airflow down to the floor. **IMPORTANT: Do not adjust the louvres beyond their stops.**

#### 5.1.1 List of Components and Instructions to Fit a Standard 15° Outlet Nozzle (Canopy) on a Model UF400 (NOTE: A larger optional nozzle may be fitted rather than the 15° nozzle. See Section 5.3.)

Identify the following nozzle pieces for a Size 400 heater (Refer to the illustration in Figure 5).

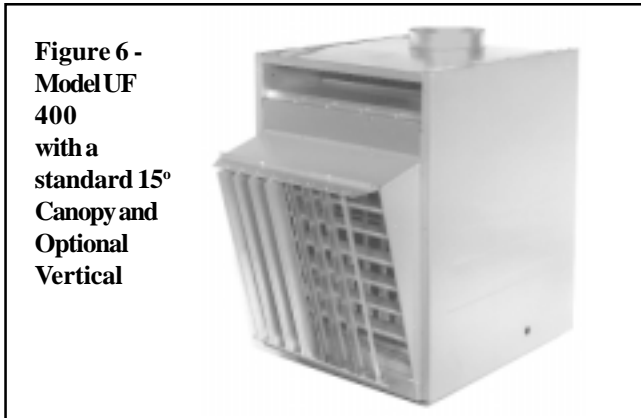


- (1) Remove the horizontal louvre assembly from the heater outlet.
  - (2) Position either the left or right nozzle side into the heater outlet. Using the screws and the same holes that held the louvres, attach the nozzle side to the heater.
  - (3) Repeat Step 2, attaching the other nozzle side.
- NOTE: All screw points should be inside the nozzle.
- (4) Position the nozzle top with the tabs down over the sides as illustrated. Attach to the front of the heater and to both nozzle sides.

- (5) With the remaining screws, fit the louvre assembly into the nozzle opening. The louvres may be adjusted from 10 to 55 degrees to direct the airflow down to the floor. **IMPORTANT: Do not adjust the louvres beyond their stops.**

## 5.2 Vertical Louvres (Option CD1)

Model UF heaters can be fitted with optional vertical louvres to increase the air pattern spread. This option is normally used on heaters that are installed at minimum mounting heights. The vertical louvre assembly is designed to be assembled and fitted at the installation site. Complete instructions including a parts list are packaged with the option. Refer to Figure 6.



**Figure 6 -  
Model UF  
400  
with a  
standard 15°  
Canopy and  
Optional  
Vertical**

## 5.3 Downturn Air Nozzles (Options CD2, CD3, and CD4)

Model UF heaters can be fitted with optional downturn nozzles to direct the discharge air toward the floor. This option is normally used with heaters that are installed at heights above the minimum recommended. Option CD2 is a 30° downturn nozzle which changes discharge air direction up to 57°. Option CD3 is a 60° downturn nozzle which changes discharge air direction up to 90°. Option CD4 is a 30° downturn nozzle with vertical louvres. Do not fit vertical louvres on a Model UF with Option CD3, 60° Nozzle.

All downturn nozzles are designed for site assembly and fitting. Each option package includes complete assembly and installation instructions.

Size 400 heaters must be fitted with an outlet nozzle (canopy).

## 6.0 COMMISSIONING AND TESTING

The commissioning and testing should only be carried out by a competent person. This section should be read completely and fully understood. A commissioning service is available from AMBI-RAD.

### 6.1 Electrical Check

After completion of the installation and before switching on the electrical supply, a preliminary check must be performed by a qualified electrician. Check the following:

- Check that all site wiring is connected in accordance with the appropriate circuit diagram in Section 9.
- Ascertain that the correct fuse and cable sizes are fitted.
- Check that the earthing of the heater has been carried out by conducting an earth continuity test. Connect a test meter, one lead to the appliance earth point and the other lead to the main incoming earth at the isolator. A resistance reading of 0.1 ohm or less must be indicated. If a higher reading is obtained, check earth connections for being clean and tight. If problem still exists, seek expert advice.

- Carry out a polarity test. Connect one lead of a suitable AC voltmeter to earth and connect the other lead to the live supply terminal at the heater. Turn on power to the heater. A reading of approximately 240 volts should be given.

The same result should be obtained by connecting the test leads from live to neutral.

Connect the voltmeter test leads to N and E. A reading of between 0-15 volts at maximum should be obtained. If these tests do not conform to the above, there is a fault which must be rectified before progressing further with the commission.

- Check that a suitable thermostat or control panel has been fitted.
- Ensure that an isolation switch has been fitted.

## 6.2 Gas Connection

The whole of the gas installation, including the meter, should be inspected, tested for soundness, and purged in accordance with BS6891 and British Gas Documents IGE/UP/1.

## 6.3 Suspension

The suspension of the heater should be checked to ensure that it is adequate to safely support the heater and that no other parts have been fitted that are not properly supported or secured. For safe heater operation, check that the heater is level in all directions.

## 6.4 Lighting the Heater (*Read and Understand All Steps Before Lighting.*)

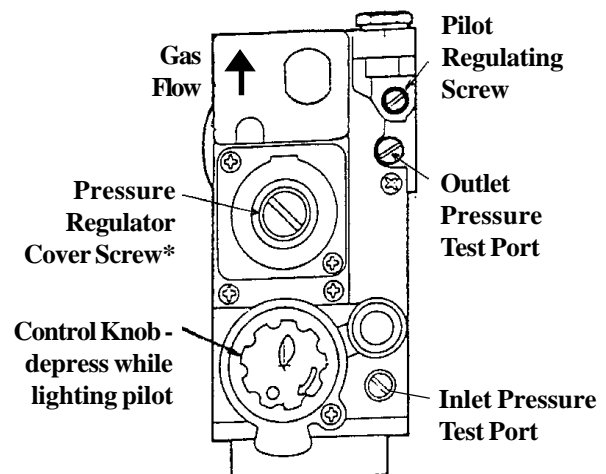
The following checks should be carried out before attempting to light the heater.

- Ensure that the electrical supply to the heater is turned on.
- Set the room temperature controller to lowest setting. If a clock control and a summer/winter switch have been fitted, ensure that they are set to "ON".
- Turn on the main gas supply to the heater.

### 6.4.1 Prepare to Light the Pilot

On the bottom rear of the heater, locate the multifunctional control valve (See Figure 7A or 7B) and the Piezo ignitor knob (Figure 8).

**Figure 7A - Multifunctional Control Valve (NOTE: Size UF400 may be fitted with this valve or the valve illustrated in Figure 7B.)**

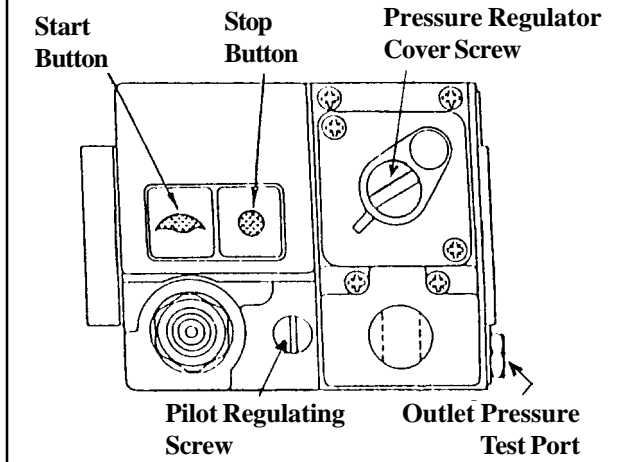


\*When measuring gas pressure, do not remove screw. Loosen enough to allow gas pressure to register.

## 6.4 Lighting the Heater (cont'd)

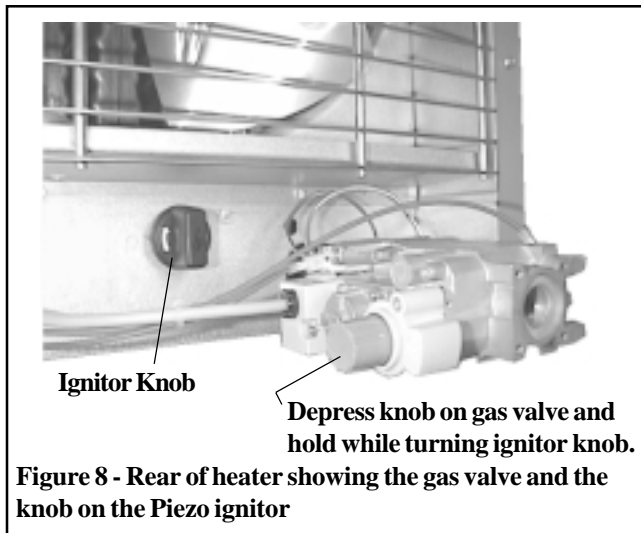
### 6.4.1 Prepare to Light the Pilot (cont'd)

**Figure 7B - Size UF400 Multifunctional Control Valve**  
(NOTE: Size UF400 may be fitted with this valve or the valve illustrated in Figure 7A.)



### 6.4.2 Light the pilot

Depress the knob or button (See Figure 7A or 7B) on the multifunction control valve. Continue to hold the knob or button depressed while turning the knob on the Piezo ignitor. **NOTE:** On initial lighting, it may take some time to purge the pilot pipework of air.



**Figure 8 - Rear of heater showing the gas valve and the knob on the Piezo ignitor**

**6.4.3** Once the pilot is established (visible through the viewing port), continue to depress the knob or button on the gas valve for 20 seconds and then release slowly.

**WARNING: If for any reason the pilot light goes out, allow three minutes before relighting.**

Close the bottom panel.

**6.4.4** Adjust room temperature control setting to above the ambient temperature. The main burners will light (the main burners can be seen through the viewing port).

### 6.4.5 TO TURN OFF THE HEATER —

Pilot and Main Burner:

**Valve in Figure 7A** - Rotate the knob on the multifunctional valve in a clockwise direction.

**Valve in Figure 7B** - Push in and release the red stop button (marked O) on the valve.

**WAIT THREE MINUTES BEFORE  
RELIGHTING THE HEATER.**

## 6.5 Heater Pipework

The soundness of the heater's pipework has been checked at the factory. However, during shipment or installation, connections may have loosened. Check the soundness of the pipework using a leak-detecting fluid such as a soap and water solution. If any leaks are found, they must be rectified immediately.

**WARNING: Never use a naked flame for checking the soundness of any gas connections.**

## 6.6 Adjustments

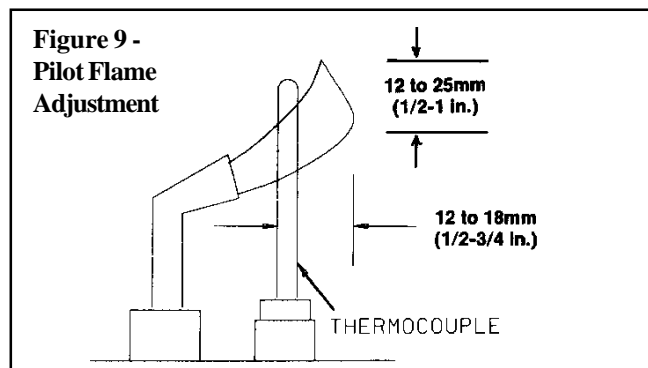
### 6.6.1 Burner Gas Adjustment

The gas pressure is set for the required heat input before the heater leaves the factory, and normally the gas pressure will not require re-setting. To check gas pressure, the following procedure should be carried out:

- 1) Ascertain from Section 2, Technical Data (Table 2), the correct burner pressure for the heater.
- 2) Turn the room temperature control to lowest temperature setting.
- 3) Loosen the screw from the outlet pressure test point of the gas valve (See Figure 7). Connect a manometer to the test point.
- 4) Light the pilot as detailed in Section 6.4. Adjust the room temperature control to above ambient temperature.
- 5) Observe the gas pressure on the manometer and compare to the required burner pressure.
- 6) If necessary, adjust the burner gas pressure. Remove the cover screw (Figure 7). Turn the regulator screw anti-clockwise to decrease the pressure or clockwise to increase the pressure.
- 7) Set the room temperature control to the lowest setting to turn off the main burners. Tighten the pressure test point screw and cover screw (if removed) and with the main burner turned on, test for gas soundness using a leak-detection fluid such as a soap and water solution.

### 6.6.2 Pilot Flame Adjustment

The pilot regulating screw is contained in the multifunctional control valve (Figure 7). The pilot regulating screw leaves the factory set for maximum pilot rate. If the gas inlet pressure to the heater exceeds 25 mbar, the pilot rate should be reduced. Remove the cover screw. To adjust the pilot flame, screw the adjusting screw clockwise to reduce the flow. Figure 9 shows the approximate flame length. Replace the cover screw after pilot adjustment is completed.



## 6.7 Draught Diverter

Ascertain that there is no spillage of products of combustion from the heater draught diverter by carrying out a spillage test, as detailed by BS5440, Part 1, ensuring that any extract fans in the area are turned "on".

## 6.8 Air Distribution System

The system should be checked to ensure that the installation work has been carried out in accordance with the design requirements.

Adjust the discharge louvres to provide a satisfactory spread of heated air. Direct the heated air to the floor avoiding direct draught on personnel who may be working nearby.

**CAUTION: To avoid getting burned, adjust louvres prior to heater operation. If louvres need re-adjusting after startup, wear protective gloves.**

## 6.9 Heater Controls

Check heater operation after all adjustments have been carried out. Set the room temperature control to above ambient temperature. The main burner should light. Within approximately 30 seconds, the fan thermostat control will sense a rise in the temperature of the heat exchanger and energize the fan motor. (The fan control has a fixed setting and cannot be adjusted.)

Continue to operate the heater for several minutes to ensure the limit switch does not operate. If for any reason, the limit switch is tripped, the cause must be determined. See Paragraph 8.8 and Fault Finding Chart, Section 10.3.

Turn the room temperature control to lowest temperature setting. The main burners should extinguish while the fan continues to cool the heat exchanger. When the heat exchanger is sufficiently cooled (usually within five minutes), the fan control will de-energize the fan motor.

## 6.10 Handing Over

Upon the satisfactory completion of commissioning and testing, hand the instructions to the user or purchaser. Advise the user/purchaser how to safely use and operate the heater, including all associated equipment and controls. Ensure that the user/purchaser understands how to light the heater and turn it off.

Suggest that the instructions be placed close to the heater for future reference. Instruct the user/purchaser not to place the instructions adjacent to a hot surface or in a place where they may restrict air flow.

Advise the user/purchaser that for safe and efficient operation, the heater must be serviced at least annually.

# 7.0 SERVICING INSTRUCTIONS

**WARNING: Only competent and qualified engineers should carry out servicing and fault finding on this equipment. Complete after-sale service is available from AMBI-RAD.**

**Before maintenance is carried out, ensure that both gas and electrical supplies are turned off and the appliance is cold.**

This heater will operate with a minimum of maintenance. To ensure long life, satisfactory performance and continued safety, a heater that is operated under normal conditions should be inspected and cleaned annually. Heaters that are operated in areas where an unusual amount of dust or impurities are present in the air, require more frequent maintenance.

**NOTE 1: Check all pipe joints for gas soundness. Any leaks found must be repaired before leaving the heater in operation.**

**NOTE 2: After routine maintenance, the commissioning procedure, Section 6, should be carried out to ensure efficient and safe operation.**

## 7.1 Servicing Procedure

The following procedures should be carried out at least annually:

1. Remove the Burner Assembly as in Section 8.1.

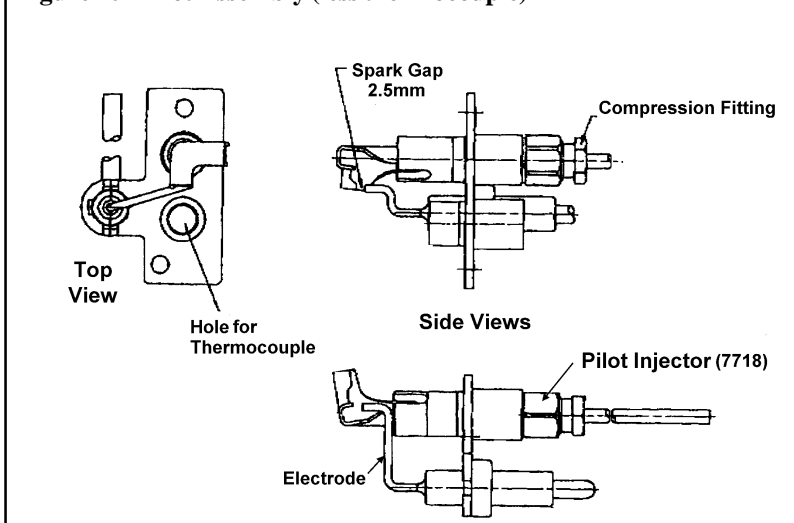
- a) Check the condition of the pilot burner and clean off any deposits which may have formed. Clean the inside of the burner hood with an emery cloth. Clean the pilot injector with solvent and compressed air. **CAUTION: Wearing eye protection is recommended.**
- b) Check the condition of the electrode and clean with an emery cloth. Remove all deposits. Check the spark gap at the tip of the electrode; spark gap should be 2.5mm.

- c) Check the condition of the thermocouple and clean off any deposits. If signs of erosion are visible, renew the thermocouple as in Section 8.2.
- d) Clean any deposits from the main burner, paying particular attention to lint or fluff, etc., which may have formed around the injectors in the venturi of the burner. Clean using compressed air and a soft brush. **CAUTION: Wearing eye protection is recommended.**

d) Clean any deposits from the burner tray.

2. The heat exchanger should remain clean unless some problem has developed with combustion. Examine the heat exchanger internally and externally for any sign of deterioration.
3. The fan blade, fan guard and motor should be cleaned to remove any build up of dust, fluff, etc.
4. Ensure that any purpose-provided air vents for ventilation and combustion are free from obstruction.
5. The flue system should be checked for soundness. Reseal/replace any parts that do not appear sound.
6. Check the wiring for any signs of damage. Replace wiring with an equivalent specification.
7. When service is complete, carry out commissioning procedure, Section 6.0-6.8.

**Figure 10 - Pilot Assembly (less thermocouple)**



## 8.0 REMOVAL AND REPLACEMENT OF PARTS

**WARNING:** To comply with legislation, only certificated spares may be fitted to heaters supplied after 1/1/96. A full spares service is provided by AMBI-RAD. Only a competent and qualified engineer should carry out servicing on this equipment. Before maintenance is carried out, ensure that both gas and electrical supplies are turned off and the appliance is cold.

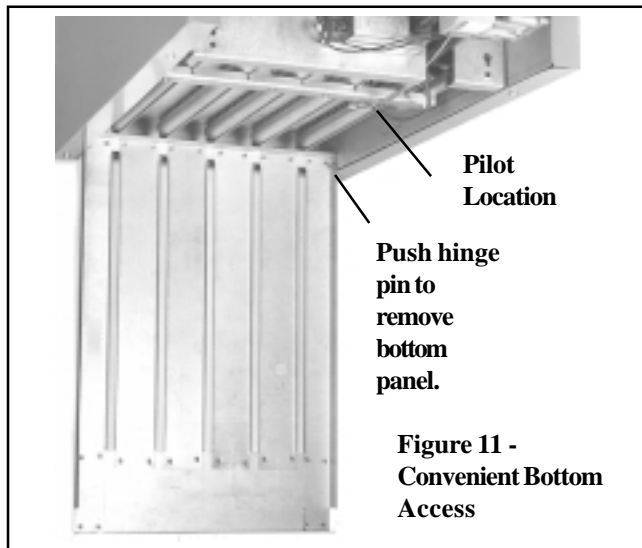
After maintenance work, the heater **MUST** be fully commissioned (See Section 6).

### 8.1 Main Burner Removal

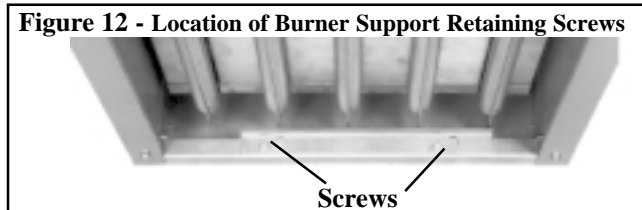
Model UF units have been designed with convenient bottom access. The pilot is attainable with the bottom access panel open. With the access panel removed, the burner rack assembly will hinge down for removal. Use the following step-by-step instructions for removal of the bottom access panel and the burner rack assembly.

**Instructions for Burner rack Removal (Refer to Figures 11 to 17 inclusive):**

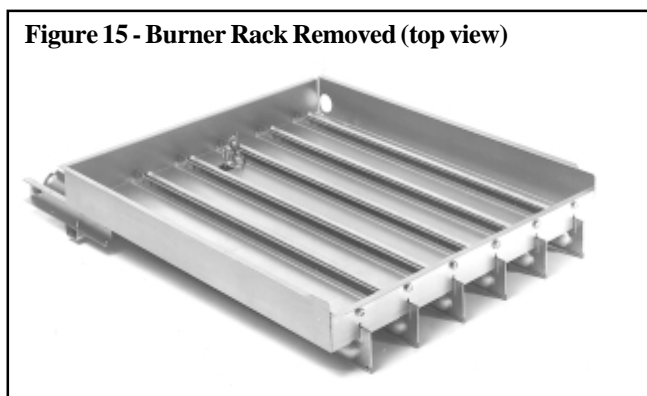
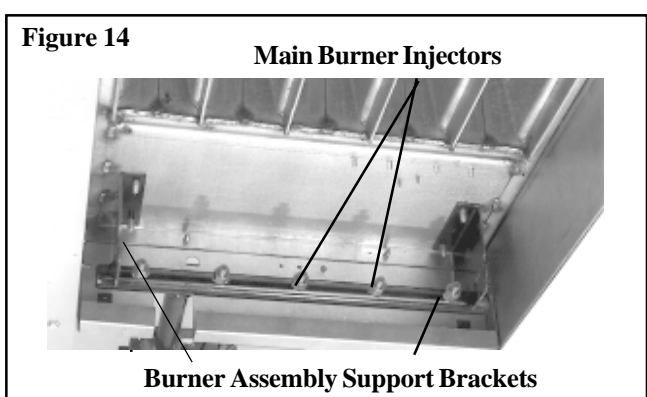
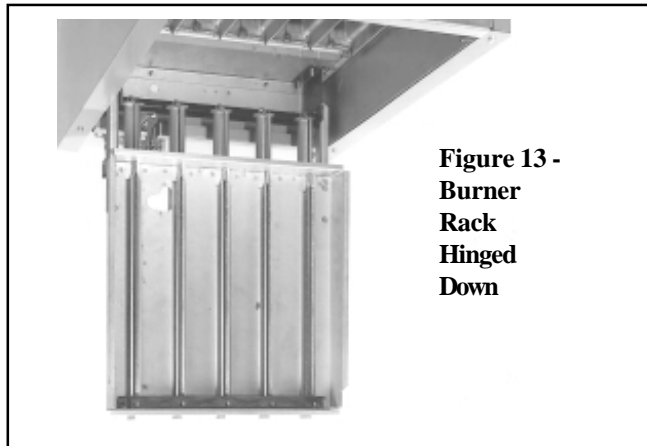
1. Remove the two screws located at the rear bottom panel.
2. Allow bottom panel to hinge down from the front. Refer to Figure 11.
3. Push in one of the two spring-loaded hinge pins located at the front of the bottom panel (inside), and completely remove the bottom panel.
4. The bottom of the pilot is now visible (See Figure 11).



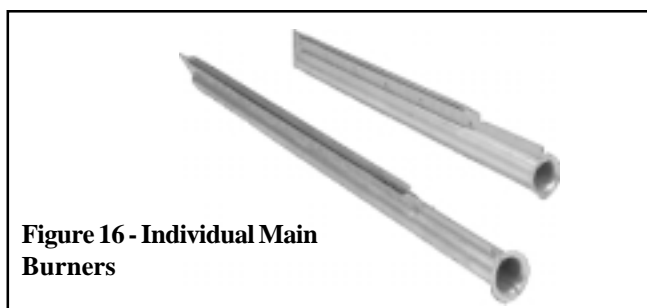
- a) Disconnect the pilot tubing from the multifunctional control valve and the pilot burner taking care not to lose the pilot injector which is located inside the pilot burner and fitted over the pilot burner tube.
  - b) Disconnect the thermocouple from the multifunctional gas control valve and from the pilot burner assembly.
5. Remove the sheetmetal screws (two or three) located at the front of the burner assembly. (See Figure 12.) These screws retain the slotted burner support bracket. Remove the bracket taking care to support the burner assembly.



6. Allow the front of the burner assembly to drop down. Lift up on the rear part to disengage it from the locating slots at the manifold, and slide the whole assembly out.



7. To remove the individual burners from the burner assembly:
- a) With the burner assembly upside down, remove the screws (located at the rear) that secure the retaining bracket.)
  - b) Lift the front of the burner upwards slightly and pull it back, removing the individual burner (a slight tap with a wooden mallet is sufficient to dislodge it).



Clean individual burners using air pressure or soft brush. Use an air nozzle to blow out scale and dust accumulation from the burner ports. **CAUTION: Wearing eye protection is recommended.** Alternately blow through burner ports and venturi. Use fine wire to dislodge any stubborn particles. Do not use anything that might change the port size.

8. Re-assemble in reverse order.
9. When lighting, always follow the lighting instructions on the heater. After any service work, the heater must be fully commissioned. See Section 6.0-6.8.

**NOTE:** Use only factory-authorized replacement parts. Heaters supplied after 1/1/96 must use certificated spares to comply with legislation. A complete spares service is available from AMBI-RAD.

## 8.2 Thermocouple

1. Carry out Steps 1 to 2 of Section 8.1.
2. The bottom of the pilot is now visible. (See Figure 11.)
  - a) Disconnect the thermocouple from the multifunctional control valve.
  - b) Disconnect and remove the thermocouple from the pilot burner assembly.
3. To fit a new thermocouple, push fully home up to the shoulder and tighten the compression nut to secure the thermocouple in place. Re-assemble by reversing the above procedure, bending the thermocouple to follow its original path. (Do not use excessive force when fitting a thermocouple into the valve. This is an electrical connection which must be kept clean. Do not over tighten).

## 8.3 Pilot Burner Injector

1. Carry out Steps 1 to 2 of Section 8.1.
2. The bottom of the pilot is now visible (See Figure 11). Disconnect the pilot tubing from the pilot burner.

**CAUTION: Take care that the pilot injector does not fall out of the pilot burner (located on the end of the pilot supply tube.)**

3. Fit a new pilot burner injector. The injector for natural gas is stamped #7718.
4. Re-assemble in reverse order.

## 8.4 Pilot Burner Assembly (See Figures 14 and 17)

1. Carry out Steps 1 to 2b of Section 8.2.
2. To remove the pilot assembly, remove its two fixing screws.
3. Refit the new pilot burner by re-assembling in reverse order.
4. Check relationship of the pilot burner with the adjacent main burner. Refer to Figure 17.

## 8.5 Main Burner Injectors

1. Remove the two screws located at the rear of the bottom panel. Allow the bottom panel to hinge down from the front.
2. Unscrew the main burner injectors (See Figure 14).
3. Re-fit new injectors
4. Re-assemble in reverse order.

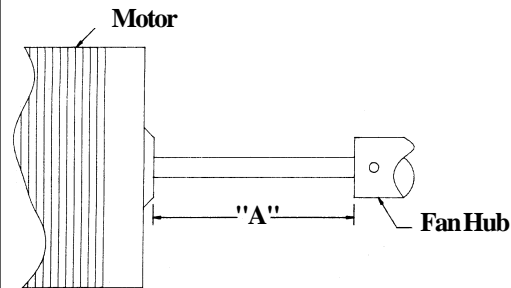
## 8.6 Fan Motor/Blade

### Replacement of Fan Motor and/or Blade — Model UF

Follow these instructions for removal and replacement of fan motor and/or fan blade.

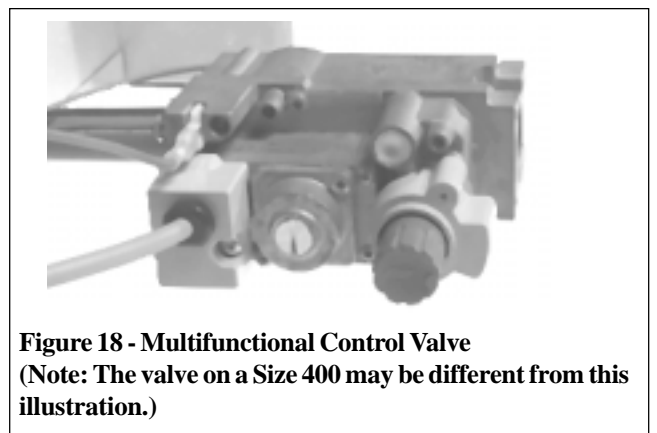
1. Remove left hand side panel (left when facing the rear of the unit) by unscrewing its seven fixing screws (4 front and 3 back).
2. Disconnect the fan motor wires and push out the cable retaining gland.
3. To remove the sub-assembly including the fan motor, the blade, and the fan guard, remove the eight screws that attach the fan guard to the heater.
4. Either the fan motor, fan blade or both may now be replaced. Space the fan blade on the shaft as shown in Figure 17.

**Figure 17 - Correct Spacing of the Fan Blade on the Motor Shaft**



Model	"A" -- Hub to Motor Spacing
UF	mm
25	32
50	10
75	16
100 - 400	63

## 8.7 Multifunctional Control Valve (See Figure 18)



**Figure 18 - Multifunctional Control Valve**  
(Note: The valve on a Size 400 may be different from this illustration.)

1. Ensure the electrical supply is isolated.
2. Disconnect the thermocouple and the pilot supply tube.
3. Remove the terminal cover and disconnect the electricity connections.
4. Disconnect the union between the multifunctional control valve and the gas service cock. Remove the valve.
5. Re-fit the replacement valve making all the required connections including flange connections with O-rings. Replace O-rings when fitting a new valve.
6. Carry out a complete commissioning procedure. Refer to Sections 6.0 to 6.8.

## 8.0 REMOVAL AND REPLACEMENT OF PARTS (cont'd)

### 8.8 Limit Control Switch (Overheat Thermostat)

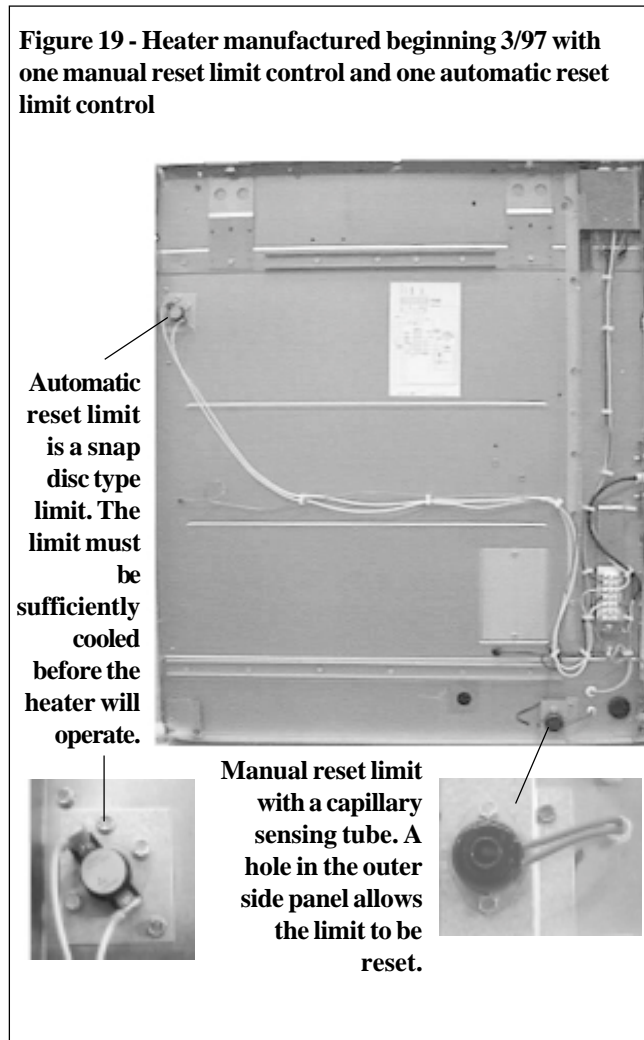
This heater is fitted with two temperature-activated limit control switches that when activated will interrupt the electrical power to the gas valve. The limit in the "lower" portion of the airstream is a manual reset type limit switch, which if activated, must be reset before the pilot light can be relit. The manual reset limit is reset by depressing the small button in the center of the switch body. The reset button is accessible without removing the heater outer side panel. The limit in the "upper" portion of the airstream is an auto reset switch. If the auto reset limit is activated, it must be sufficiently cooled before the pilot can be relit. (See Section 8.0).

If it is determined that either limit control switch needs replacing, use only a factory-authorized replacement.

#### 8.8.1 Instructions for Replacement of Limit Switch Control

Model UF heaters manufactured prior to 3/97 have only a manual reset limit control; see Figure 20. Model UF heaters manufactured beginning 3/97 have a manual reset limit control and an automatic recycling limit control; see Figure 19.

**Instructions for Replacement of the Limit Switch Controls on Model UF Series 2 heater with both a manual reset limit and an automatic recycling limit (manufactured beginning 3/97). Refer to Figure 19.**



1. Remove the outer side panel (left when facing the rear of the heater).
2. Remove the limit switch and replace with a replacement switch listed above.

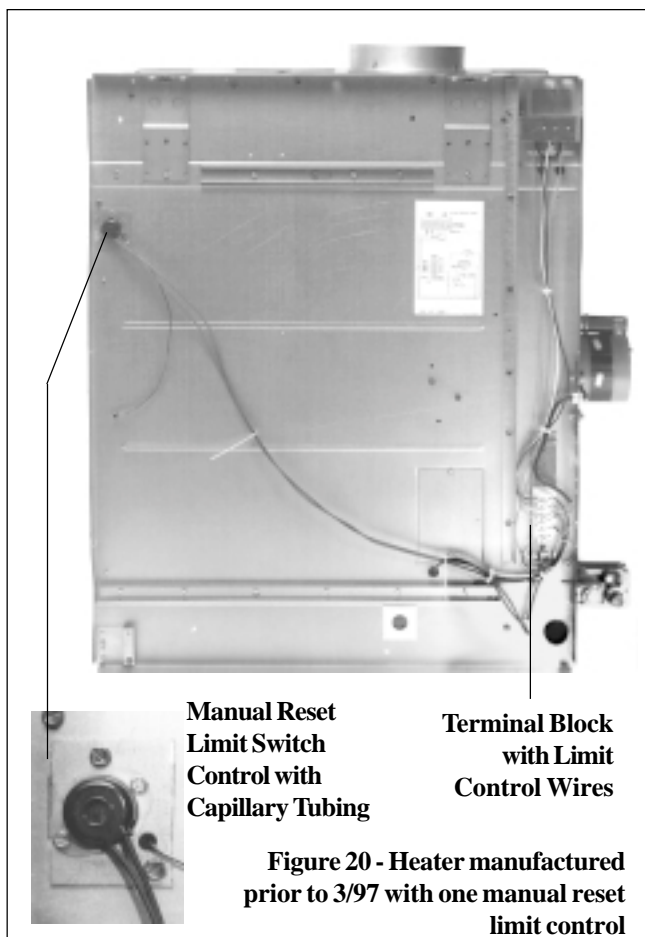
#### Automatic Reset Limit (located on the upper left corner of the side panel)

- a) Disconnect the wires from the limit control switch.
- b) Remove the screws holding the limit control switch.
- c) Fit the replacement limit switch by reversing the procedure.

#### Manual Reset Limit (located on the lower right corner of the side panel)

- a) Disconnect the limit switch wires from the gas valve.
  - b) The manual reset limit switch has a capillary sensing tube that stretches across the air discharge. To remove the switch and capillary -- (1) pull the copper-coloured capillary tubing out of the tube that is fitted across the heater discharge; (2) remove the screws holding the limit switch; (3) pull the capillary tubing out through the plastic retainer clips on the side of the heater.
  - c) Fit the replacement limit switch by reversing this procedure. Be sure that the capillary tube is stretched across the full width of the discharge opening. Depending on the heater size and tube length, a loop may have to be made in the capillary tube between the plastic retainer clips and where it enters the heater side panel. Be careful not to kink or squeeze the capillary tube.
3. Replace the outer side panel. Carry out a complete commissioning procedure. Refer to Section 6.0-6.8 in the heater installation manual.

**Instructions for Replacement of the Limit Switch on a heater with only a manual reset limit located on the upper left corner of the side panel (manufactured prior to 3/97). Refer to Figure 20 below.**



1. Remove the outer side panel (left when facing the rear of the heater).
2. Remove the small access plate on the inner side panel.
3. Remove the retaining bush holding the two limit wires
4. Disconnect the limit wires from the gas valve and feed wires through.
5. Remove the two retaining screws holding the limit control switch capillary assembly bracket to the inner side panel and withdraw the assembly.
6. Remove the limit switch control from the bracket by removing the two retaining screws.
7. Replace the limit control switch and assembly in reverse order, ensuring that the capillary tube extends across the full width of the heat exchanger.
8. Carry out a complete commissioning procedure. Refer to Section 6.0 to 6.8.

## 8.9 Fan Temperature Control

The fan temperature control senses the temperature of the heat exchanger. The fan temperature control has a fixed setting and may not be site adjusted. If it is determined that the fan temperature control needs replacing, use only a factory-authorized replacement part. (See Section 8.0.)

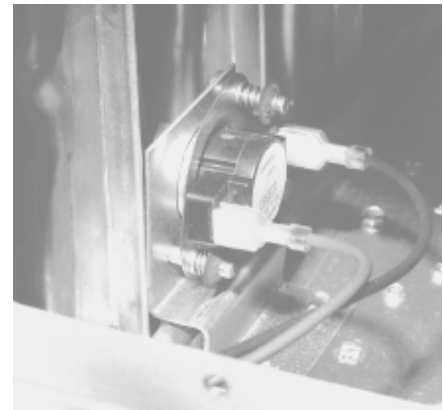
### Instructions for Replacement of Fan Temperature Control (See Figure 21)

1. Remove the outer left side panel (left when facing the rear of the heater).
2. Remove the small access plate on the inner side panel.
3. Remove defective control and install new control in the same mounting holes
4. Re-fit access panel and outer side panel.
5. Turn on the electricity supply and the gas service valve. Carry out a complete commissioning procedure. Refer to Sections 6.0 to 6.8.



**Figure 21 - Fan Control**

**The Fan Control is seated on the heat exchanger**



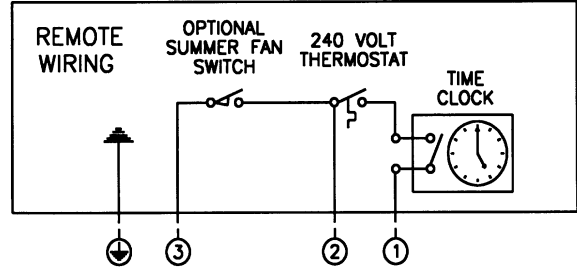
**Remove Access Panel**

# 9.0 CIRCUIT DIAGRAMS

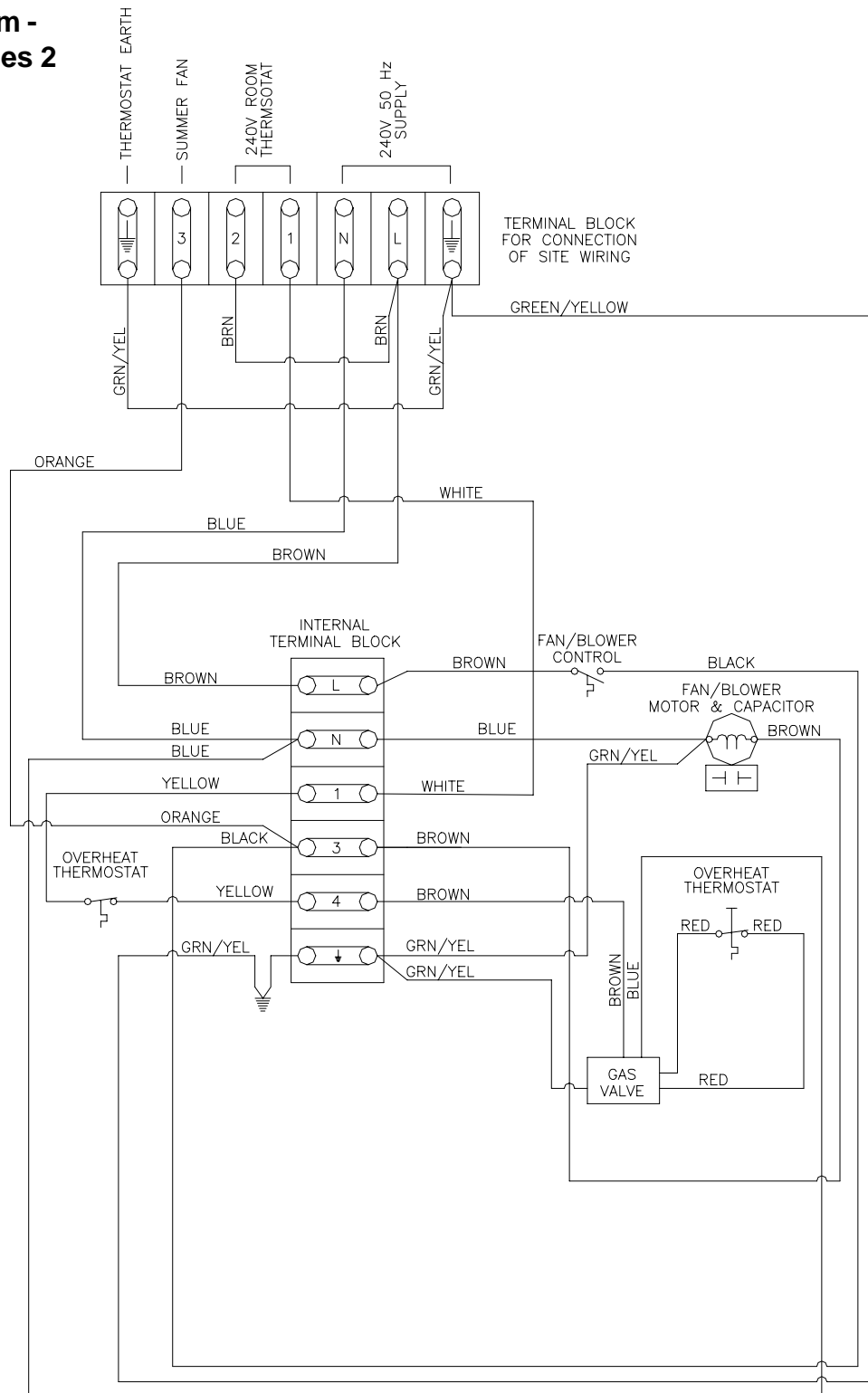
## 9.1 Remote Diagram - Model UF Series 2

NOTE: Where an Ambi-Rad panel is used, consult the wiring diagram supplied with the panel.

CONNECTIONS AT HEATER'S SITE WIRING TERMINAL STRIP  
 IMPORTANT -- THE MAIN FEED L/N/E MUST NOT BE SWITCHED BY TIME CLOCK OR THERMOSTAT.  
 CONTROLS MUST BE CONNECTED ACROSS 1 AND 2 FOR TIME AND TEMPERATURE CONTROL.



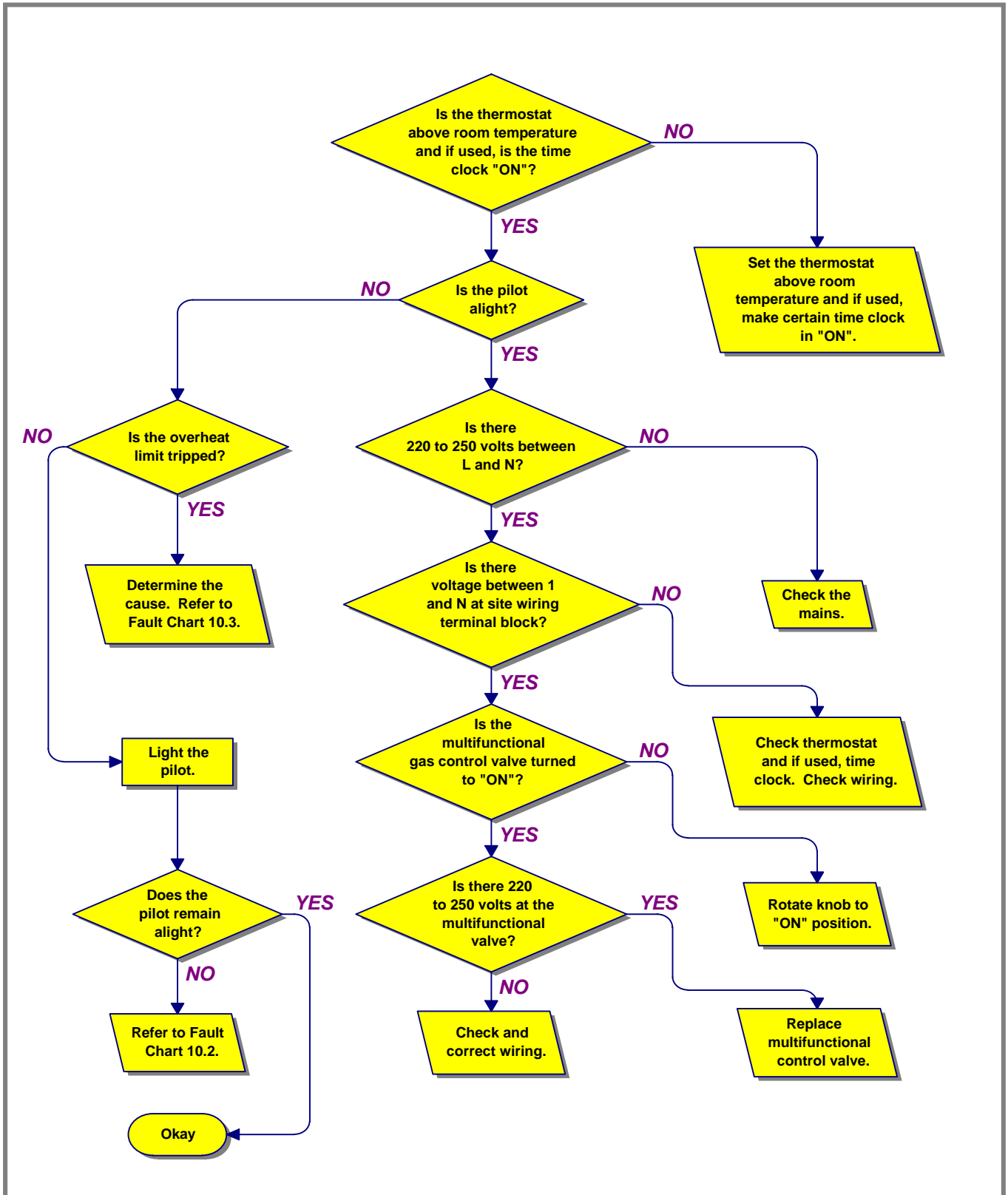
## 9.2 Circuit Diagram - Model UF Series 2



# 10.0 FAULT FINDING CHARTS

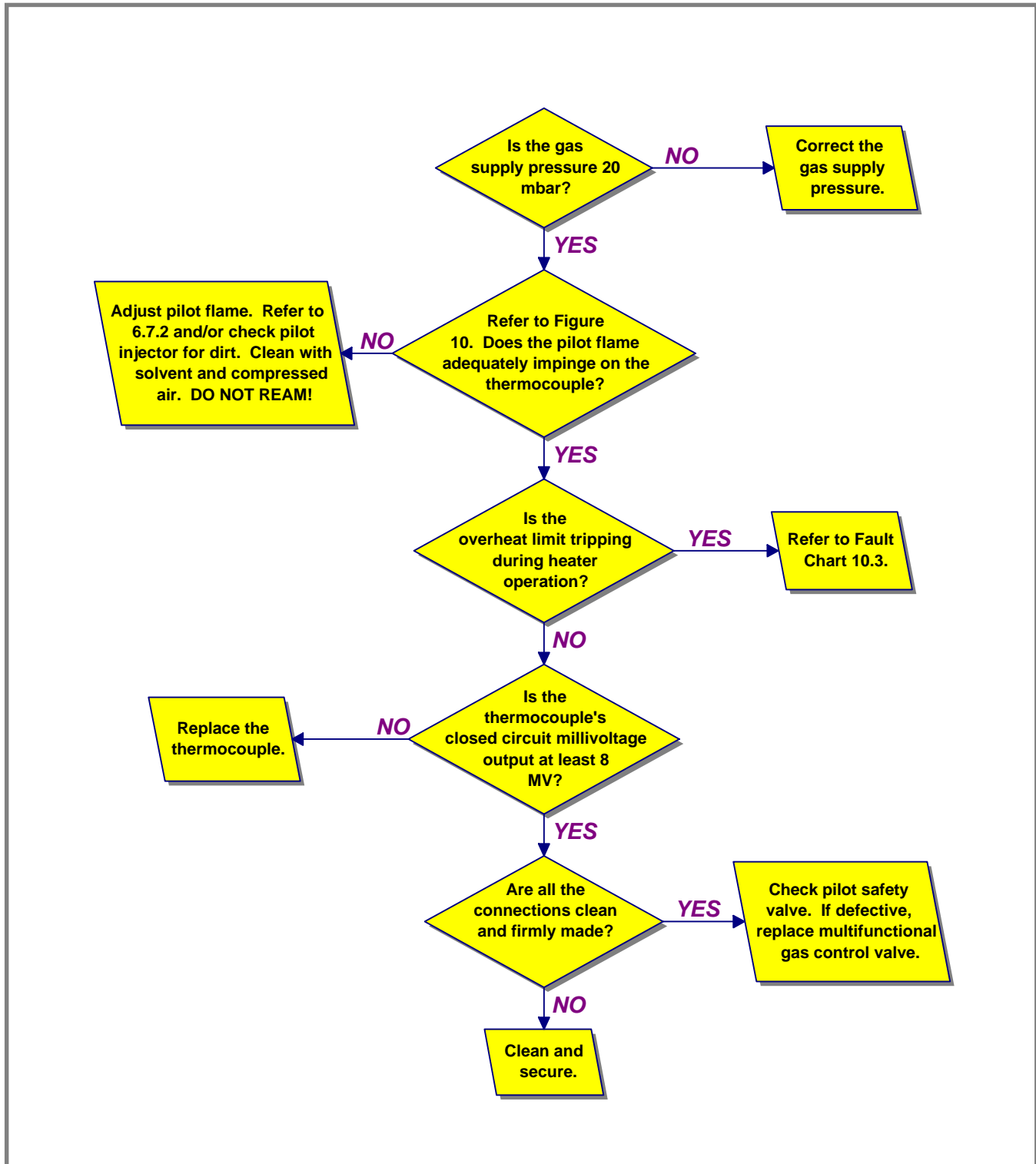
**WARNING:** Fault finding should only be carried out by a competent service engineer.

## 10.1 Main Fault Finding Chart



# 10.0 FAULT FINDING CHARTS (cont'd)

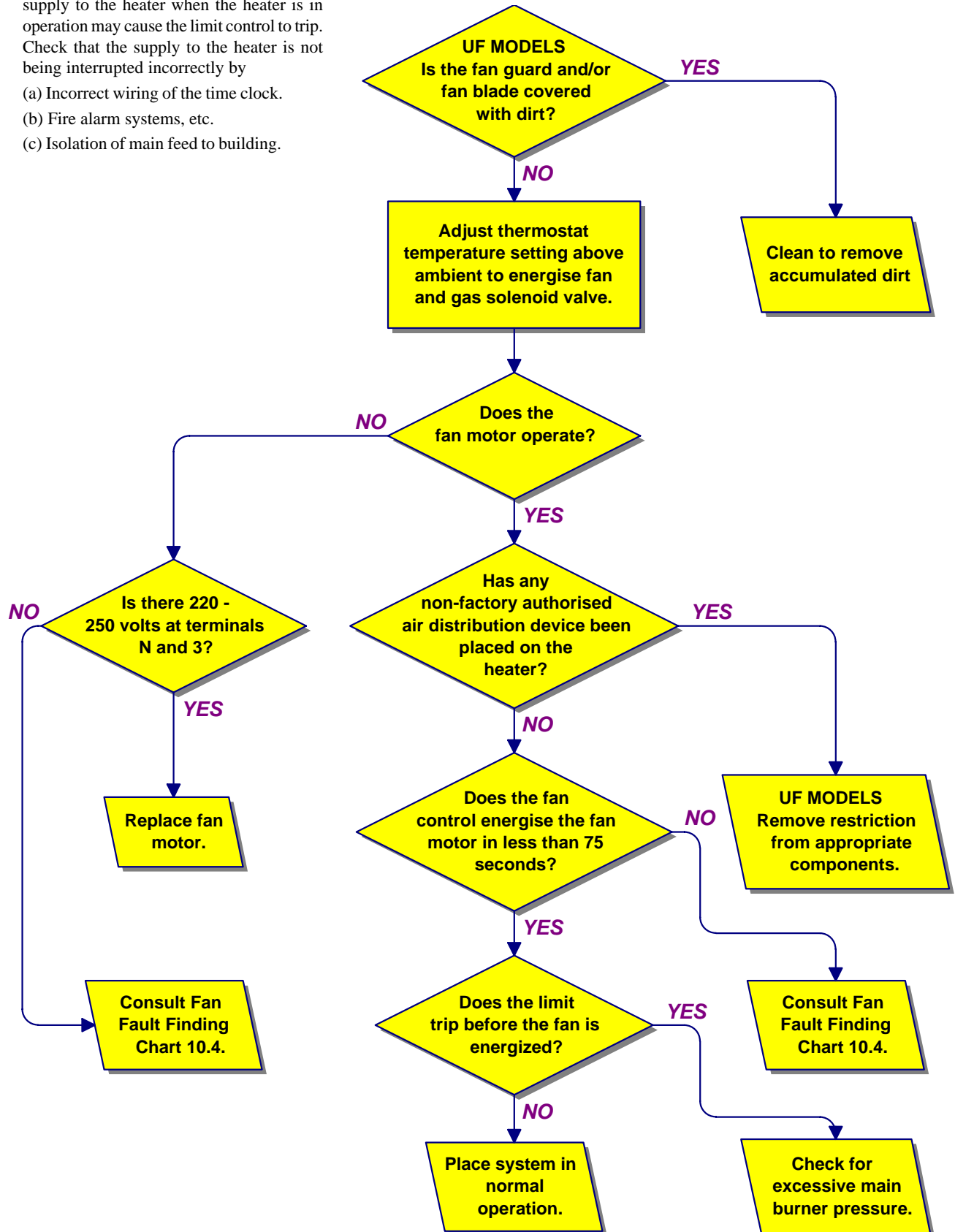
## 10.2 Pilot Does Not Remain Alight



### 10.3 Limit Control Fault Finding Chart (Limit Control Trips)

**NOTE:** Interruption of the main electrical supply to the heater when the heater is in operation may cause the limit control to trip. Check that the supply to the heater is not being interrupted incorrectly by

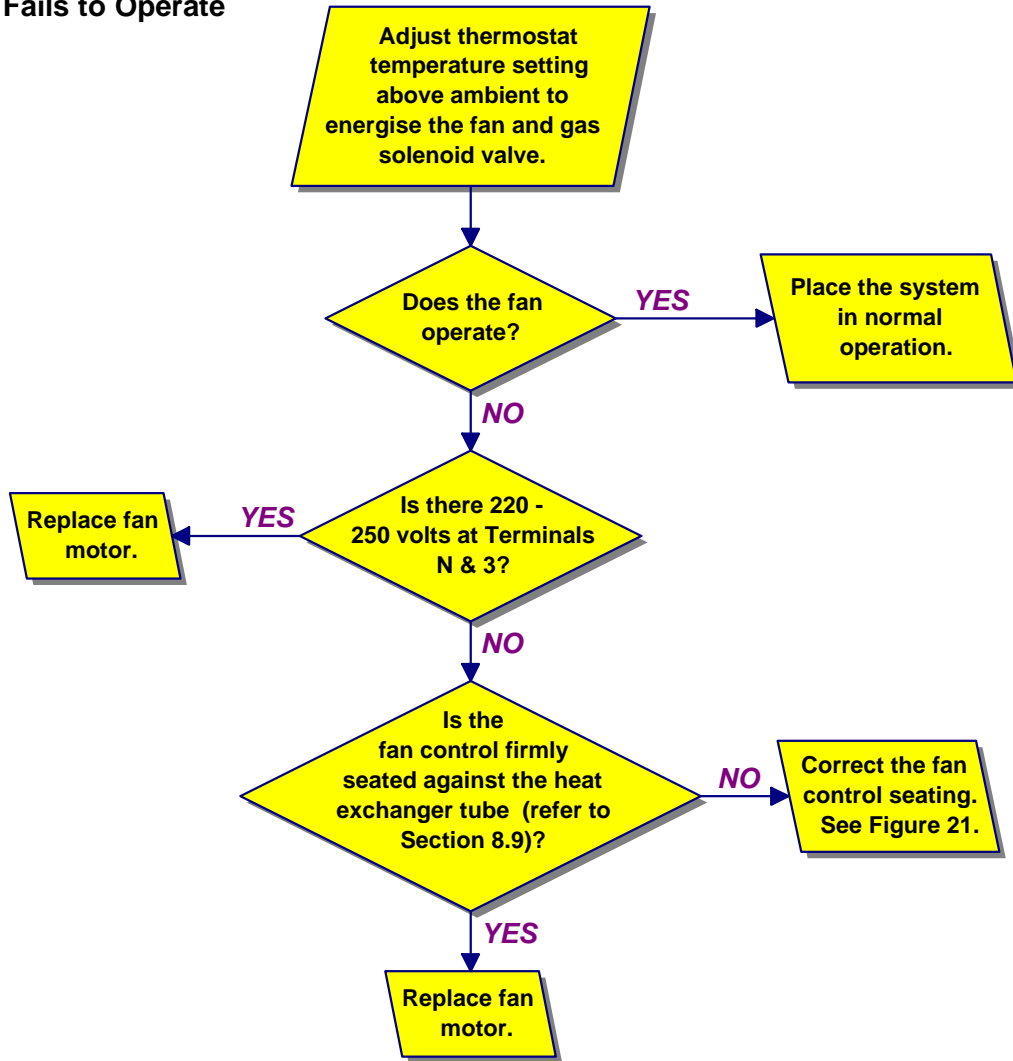
- (a) Incorrect wiring of the time clock.
- (b) Fire alarm systems, etc.
- (c) Isolation of main feed to building.



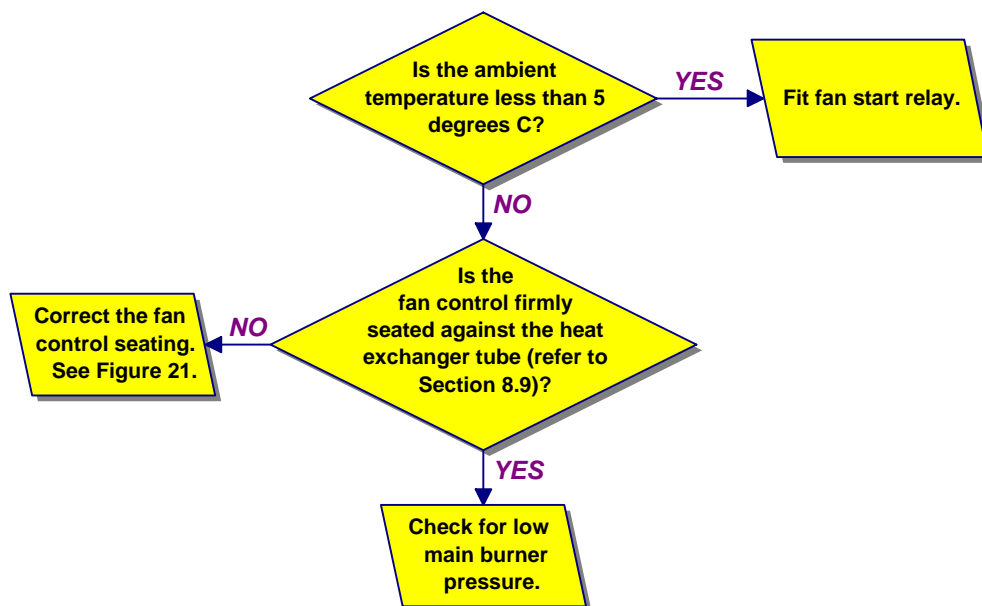
# 10.0 FAULT FINDING CHARTS (cont'd)

## 10.4 Fan Fault Finding Chart

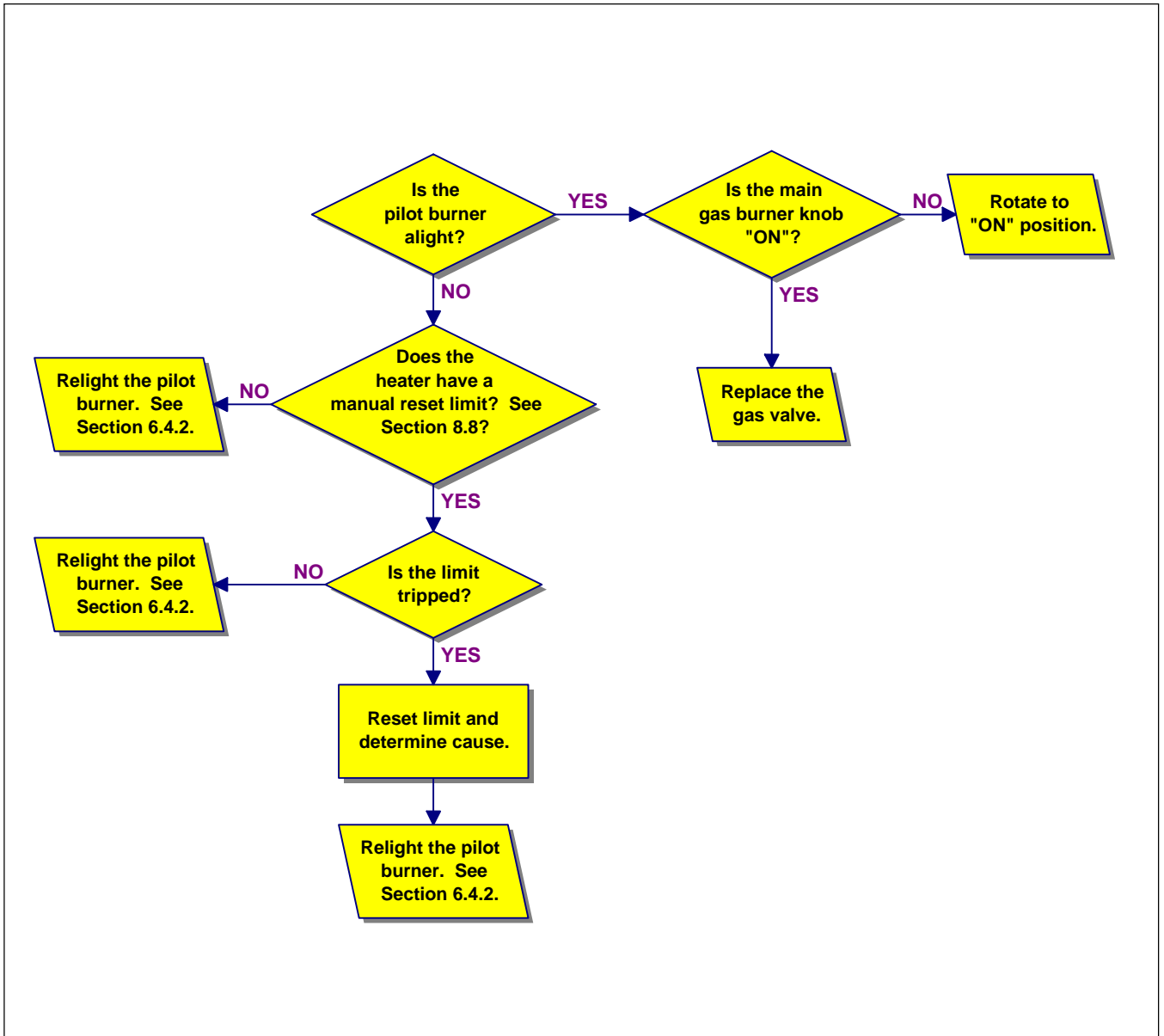
### 10.4.1 Fan Fails to Operate



### 10.4.2 Fan Motor Cycles During Operation



10.5 No Main Burner Gas Flow Fault Finding Chart (220/250 volts at multifunctional control valve.)



# 11.0 SHORT LIST OF PARTS

A "replacement parts tag" listing the most common replacement parts is affixed to the rear of the heater. Each tag is "custom made" for that particular size and style of heater. See Figure 22 for an example of a Replacement Parts Tag.

The list below includes only controls used on currently manufactured Model UF-2 heaters. For other Model UF-2 replacement parts, see replacement parts lists on pages 21-23.

Component	SIZE									
	25-2	50-2	75-2	100-2	125-2	165-2	200-2	250-2	300-2	400-2
Pilot Burner Assembly including Injector and Thermocouple for units with a Piezo ignitor - <b>Natural Gas</b>	173039	173039	173039	173039	173039	173039	173039	173039	173039	173039
Thermocouple	125835	125835	125835	125835	125835	125835	125835	125835	125835	125835
Pilot Injector only - <b>Natural Gas</b>	103034	103034	103034	103034	103034	103034	103034	103034	103034	103034
Pilot Injector only - <b>Propane Gas</b>	--	98695	98695	98695	98695	98695	98695	98695	98695	98695
Piezo Ignitor (less Knob)	173036	173036	173036	173036	173036	173036	173036	173036	173036	173036
Piezo Ignitor Knob	173037	173037	173037	173037	173037	173037	173037	173037	173037	173037
Fan Control with Bracket	123974	123976	123976	123976	123976	123976	123974	123974	123974	123974
Fan Control only	146465	146464	146464	146464	146464	146464	146465	146465	146465	146465
Manual Reset Limit Control with Capillary Sensor	151789	151789	151789	151789	151789	151790	151790	151791	151791	151791
Automatic Reset Limit Control	50418	57953	57953	57953	57953	15792	57953	57953	57953	57953
Main Burner Assembly	94777	94777	94777	94777	94777	94781	94781	94781	94781	94781
No. of Burners	(2)	(3)	(4)	(5)	(6)	(5)	(6)	(8)	(9)	(12)
Injector - Main - <b>Natural Gas</b>	36950	84853	38678	11833	11833	11831	11831	11831	11831	11831
Injector - Main - <b>Propane Gas</b>	--	63003	64676	11830	11830	96344	96344	96344	96344	96344
No. of Injectors	(2)	(3)	(4)	(5)	(6)	(5)	(6)	(8)	(9)	(12)
Gas Control (Valve) - <b>Natural Gas</b>	113766	113766	113766	113766	113766	113766	113766	113766	113766	113766
Fan Motor	133789	133789	133789	121277	121277	121277	121277	172794	172794	172794

**Figure 22 -- Example of a Replacement Parts Tag**

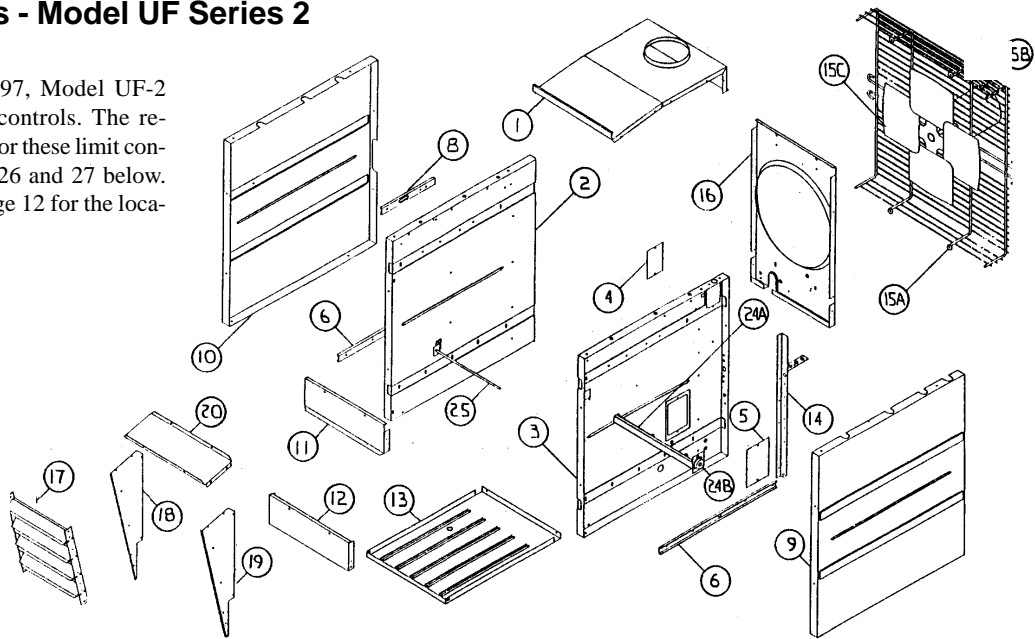
(Example applies to Model UF200. Each heater has a Replacement Parts Tag.)

<b>COMMON REPLACEMENT PARTS FOR:</b>	
<b>MODEL:</b>	<b>UF200</b>
<b>SERIAL NUMBER:</b>	
WHEN ORDERING PART, ALWAYS GIVE THE FULL MODEL NUMBER AND SERIAL NUMBER	
<b>FAN OR BLOWER MOTOR .....</b>	<b>121277</b>
<b>FAN CONTROL .....</b>	<b>123974</b>
<b>MANUAL RESET LIMIT CONTROL .....</b>	<b>151790</b>
<b>AUTOMATIC LIMIT CONTROL SWITCH .....</b>	<b>57953</b>
<b>PILOT .....</b>	<b>133636</b>
<b>THERMOCOUPLE .....</b>	<b>125835</b>
<b>GAS VALVE .....</b>	<b>113766</b>
<b>HEAT EXCHANGER .....</b>	<b>102287</b>

# 12.0 EXPLODED DIAGRAMS

## 12.1 Cabinet Parts - Model UF Series 2

**\*\*NOTE:** Beginning 3/97, Model UF-2 heaters have two limit controls. The replacement part numbers for these limit controls are listed as Items 26 and 27 below. Refer to Figure 19 on page 12 for the location of these controls.

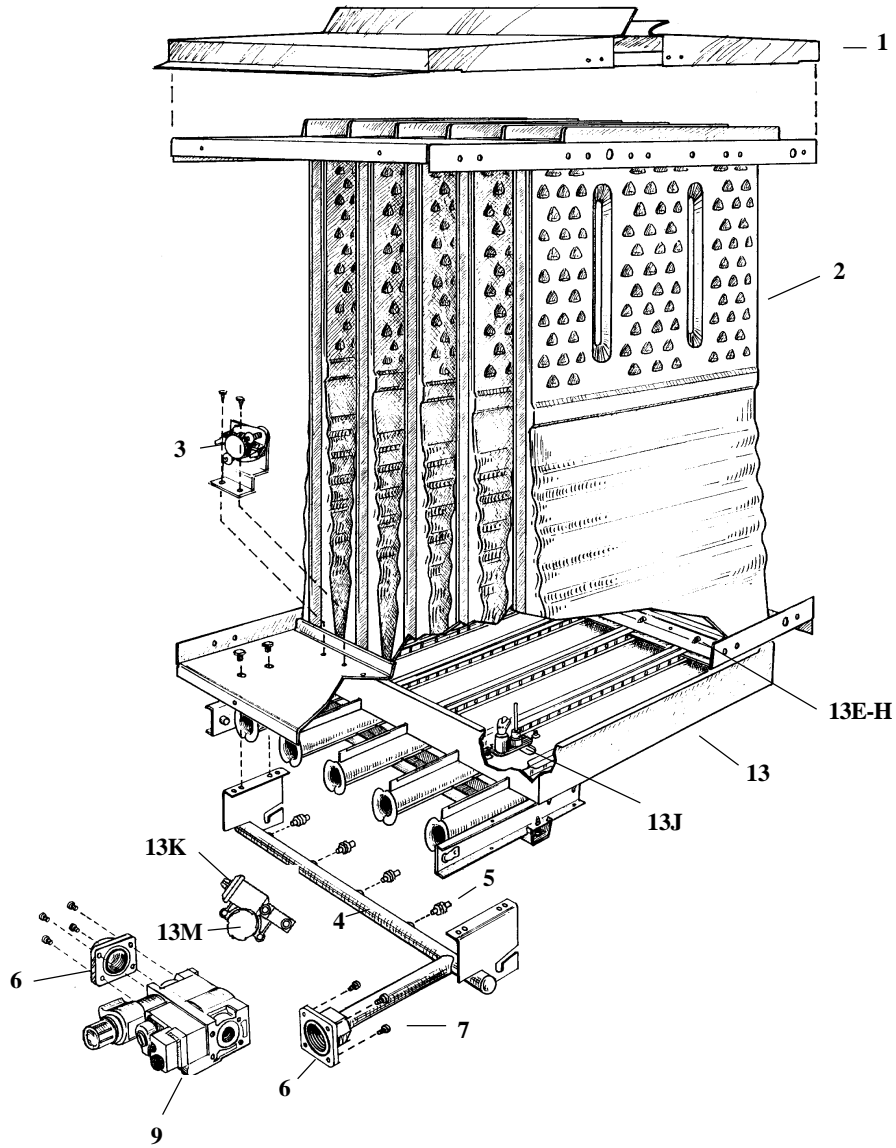


Item No.	Description	Qty (each)	25-2	50-2	75-2	100-2	125-2	165-2	200-2	250-2	300-2	400-2
1	Drafthood Assembly	1	133657	133657	133658	133659	133660	133661	133662	133663	133663	133664
2	Inner Left Side Panel Assembly	1	134444	134445	134445	134446	134446	134447	134448	134448	134448	134449
3	Inner Right Side Panel Assembly	1	174079	174079	174079	174079	174079	174080	174080	174080	174080	174080
4	Wiring Access Panel	1	94897	94897	94897	94897	94897	94897	94897	94897	94897	94897
5	Fan/Limit Access Panel	1	94898	94898	94898	94898	94898	94898	94898	94898	94898	94898
6	Lower Stiffening Channel	2	100868	100868	100868	100868	100868	100870	100870	100870	100870	100870
8	Upper Stiffening Channel	2	100867	100867	100867	100867	100867	100869	100869	100869	100869	100869
9	Outer Side Panel Right	1	133727	133727	133727	133727	133727	133728	133728	133728	133728	133728
10	Outer Side Panel Left	1	104969	104969	104969	104969	104969	104871	104871	104871	104871	104871
11	Top Front	1	133694	133694	133695	133696	133697	133698	133697	133699	133699	133700
12	Bottom Front with insulation	1	170156	170156	170157	170158	170159	170160	170159	170161	170161	170162
13	Bottom Panel	1	133714	133715	133716	133717	133718	133719	133720	133721	133722	133723
14	Vertical Barrier & Top Terminal Bracket Assembly	1	136197	136197	136197	136197	136197	136198	136198	136198	136198	136198
15	Fan and Motor Assembly	1	133915	133916	135856	130898	133676	130900	130901	130902	130903	130904
15A	Fan Guard	1	114639	114639	114640	114681	132365	114682	114683	114684	114684	114685
15B	Fan Motor	1	133789	133789	133789	121277	121277	121277	121277	172794	172794	172794
15C	Fan Blade	1	132465	129853	121354	41004	131970	96380	96381	96383	96383	96384
16	Fan Back	1	94675	94675	94676	161181	161184	161182	94680	161183	161183	94682
17	Louvre Frame Assembly	1	94851	94851	94855	94857	131803	94863	94865	94867	94867	94869
18	Nozzle Left Side	1	--	--	--	--	--	--	--	--	--	115623
19	Nozzle Right Side	1	--	--	--	--	--	--	--	--	--	115622
20	Nozzle Top	1	--	--	--	--	--	--	--	--	--	115621
21	Hinge Pin Assembly (not illustrated)	Right	1	96445	96445	96445	96445	96445	96445	96445	96445	96445
		Left	1	99351	99351	99351	99351	99351	99351	99351	99351	99351
22	Hanger Assembly (not illustrated)	4	130869	130869	130869	130869	130869	130869	130869	130869	130869	130869
24	Limit and Limit Bracket Assembly for units manufactured prior to 3/97 (includes 24A-24C)	1	134803	134803	134803	134803	134803	134803	134804	134804	134805	134805
24A	Limit Bracket Assembly	1	130523	130523	130523	130523	130523	130524	130524	130524	130524	130524
24B	Limit Control	1	134806	134806	134806	134806	134806	134807	134807	134808	134808	134808
24C	Snap Bushing	*	130233	130233	130233	130233	130233	130233	130233	130233	130233	130233
		(5)	(5)	(5)	(5)	(5)	(7)	(7)	(7)	(7)	(7)	(7)
25	Bottom Limit Bracket Assembly with Capillary Tubing	1	114409	114409	114410	114411	114413	114412	114413	114414	114414	114415
**26	Manual Reset Limit with Capillary Sensor on units manufactured beginning 3/97	1	151789	151789	151789	151789	151789	151790	151790	151791	151791	151791
**27	Automatic Reset Limit Control on units manufactured beginning 3/97											

\* Quantity in parenthesis

# 12.0 EXPLODED DIAGRAMS (cont'd)

## 12.2 Heat Exchanger/Burner Rack - Model UF Series 2



Item No.	Description	Qty (each)	25-2	50-2	75-2	100-2	125-2	165-2	200-2	250-2	300-2	400-2
1	Flue Baffle Assembly	1	133533	133534	133535	133536	133537	133538	133539	133540	133541	133542
2	Heat Exchanger Subassembly - Aluminized	1	174081	174082	174083	174084	174085	174086	174087	174088	174089	174090
	Heat Exchanger Subassembly - Stainless	1	174091	174092	174093	174094	174095	174096	174097	174098	174099	174100
3	Fan Control with Bracket	1	123974	123976	123976	123976	123976	123976	123974	123974	123974	123974
4	Manifold	1	133618	133619	133620	133621	133622	133621	133622	133623	133624	133625
5	Burner Injector - <b>Natural Gas</b>	39650	84583	38678	11833	11833	11831	11831	11831	11831	11831	11831
		*	(2)	(3)	(4)	(5)	(6)	(5)	(6)	(8)	(9)	(12)
5	Burner Injector - <b>Propane Gas</b>		63003	64674	11830	11830	96344	96344	96344	96344	96344	96344
		*	--	(3)	(4)	(5)	(6)	(5)	(6)	(8)	(9)	(12)
6	Flange	2	133913	133913	133913	133913	133913	133913	133913	133913	133913	133913
7	Socket Head Screw	8	125843	125843	125843	125843	125843	125843	125843	125843	125843	125843
8	O-Ring (not illustrated)	2	125842	125842	125842	125842	125842	125842	125842	125842	125842	125842
9	Gas Valve - Natural Gas	1	113766	113766	113766	113766	113766	113766	113766	113766	113766	113766
10	ECO Connector	1	125837	125837	125837	125837	125837	125837	125837	125837	125837	125837
11	Valve Terminal Cover	1	122109	122109	122109	122109	122109	122109	122109	122109	122109	122109
12	Strain Relief Bushing	1	123204	123204	123204	123204	123204	123204	123204	123204	123204	123204
13	<b>Natural Gas Burner Rack Assembly with Piezo Ignitor</b> (includes 7A-7M and hardware)	1	173041	173042	173043	173044	173045	173046	173047	173048	173049	173050
13A	Aeration/Radiation Panel (not illustrated)	1	133702	133703	133704	133705	133706	133707	133708	133709	133710	133711
13B	Burner Assembly	94777	94777	94777	94777	94777	94777	94781	94781	94781	94781	94781
		*	(2)	(3)	(4)	(5)	(6)	(5)	(6)	(8)	(9)	(12)
13C	Burner Rack Bracket Assembly	2	96363	96363	96363	96363	96363	96363	96363	96363	96363	96363
13D	Burner Holddown	1	94762	94763	94764	94765	94766	94765	94766	94767	94768	94769
13E	Carryover Assembly	1	96769	47690	63128	96042	96044	96042	96044	N/A	N/A	N/A
13F	Right Carryover Assembly	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96045	96046	96045
13G	Left Carryover Assembly	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96047	96047	96047
13H	Center Carryover Assembly	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	63156
13J	Natural Gas Pilot Assy including thermocouple	1	173039	173039	173039	173039	173039	173039	173039	173039	173039	173039
13K	Piezo Ignitor less Knob	1	173036	173036	173036	173036	173036	173036	173036	173036	173036	173036
13M	Piezo Ignitor Knob (see page 8)	1	173037	173037	173037	173037	173037	173037	173037	173037	173037	173037
14	<b>Natural Gas Burner Rack Assembly without Piezo Ignitor</b> includes burner assemblies, aeration panel, bracket, burner holddown, carryover assemblies, and pilot assembly including thermocouple	1	133666	133667	133668	133669	133670	133671	133672	133673	133674	133675
14A	Natural Gas Pilot Assembly only for unit <b>without a Piezo ignitor</b>	1	133636	133636	133636	133636	133636	133636	133636	133636	133636	133636
15	Thermocouple only	1	125835	125835	125835	125835	125835	125835	125835	125835	125835	125835
16	Burner Rack Support	1	113936	113936	113936	113936	113936	113936	113936	113937	113937	113937

\* Quantity in parenthesis.

## 13.0 SUPPLEMENTARY INFORMATION

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