

Atmos Multi



Installation & Servicing Instructions

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Introduction

The Atmos Multi gas fired storage combination boiler meets the requirements of Statutory Instrument 'The Boiler (Efficiency) Regulations' and is deemed to meet the requirements of:

- ❑ Gas Appliance Directive 90/396 EEC
- ❑ Efficiency Directive 92/42/ EEC
- ❑ Low Tension Directive 73/23 EEC (modified from 93/68) and;
- ❑ Electromagnetic Compatibility Directive 89/396 EEC (modified from 93/68)

Atmos Heating Systems declare that the materials used in the manufacturer of this appliance are non-hazardous and that no substances harmful to health are contained within the appliance.



The Atmos Multi must be installed in accordance with these instructions and the regulations currently in force. Please read these instructions fully before installation and leave with the boiler for future reference.

Atmos Heating Systems accepts no responsibility for unsatisfactory performance of the appliance or flue arising from the failure to comply with these installation instructions.

On completion of installation the appliance must be commissioned and the following explained to the user:

- ❑ The operating principle of the appliance
- ❑ The appliance controls and display
- ❑ Starting up, filling and de-aerating the appliance
- ❑ Shutting down and draining
- ❑ Annual inspection and maintenance

Atmos Heating Systems have a policy of continuing improvement in the design and performance of its products. The right is therefore reserved to vary specifications without notice.

For advice or information contact Atmos Heating Systems by telephone or e-mail.

Atmos Heating Systems is part of the Benchmark scheme. All our boilers include the Benchmark Logbook and we advise all our installations to be carried out to Benchmark standards.

1. Installation Regulations.

1.1 The appliance must be installed by a qualified registered installer in accordance with the Gas Safety (Installation and Use) Regulations; October 1994. Failure to install appliances correctly could lead to prosecution.

1.2. The manufacturer instructions must not be taken as overriding statutory requirements.

1.3 The installation of this appliance must be in accordance with the relevant requirements of the Gas Safety (Installation and Use) Regulations 1984 as amended, Building Regulations, Building Standards (Scotland), IEE Wiring Regulations (BS 7671), Health and Safety Document No.635 (Electricity at Work Regulations) and local Water Authority bye laws.

1.4 Installation should also be in accordance with the relevant recommendations contained within the current versions of the following British Standards:-

- ❑ BS 6798 Specification for installation of gas fired hot water boilers of rated input not exceeding 60 kW.
- ❑ BS 5449 Central Heating for Domestic Premises.
- ❑ BS 5546 Installation of gas hot water supplies for domestic purposes.
- ❑ BS 5440 Flues and Ventilation for gas appliances of rated input not exceeding 60 kW. (Part 1 Flues).
- ❑ BS 5440 Flues and Ventilation for gas appliances of rated input not exceeding 60kw (Part 2 Air Supply).
- ❑ BS 6891 Installation of low pressure gas pipework installations up to 28mm (R1).

Reference should also be made to British Gas Guidance Notes for the Installation of Domestic Gas Boilers.

1.5. To ensure that the installation will perform to the highest standards, the system and components should conform to any other relevant British Standards in addition to those mentioned in these instructions.

1.6. For Installation in Ireland, the appliance must be installed in compliance with I.S.813 'Installation of gas appliances'.

1.7. Asbestos and CFC's are not used in the manufacture of these products.

2. General Information.

2.1 The Atmos Multi is a wall mounted, fully automatic gas fired condensing combination boiler designed to provide 'unvented' domestic hot water at mains pressure via an integral hot water storage cylinder.

2.2 Classified as an 'Unvented hot water system', the installation of the Atmos Multi falls within the scope of the Building Regulations 1995 (Part G.). These require that a competent person as defined in the Approved Document G3 must only undertake the installation of an unvented system.

2.3 For central heating applications the Atmos Multi is suitable only for use on a fully pumped, pressurised, sealed primary system with a design (cold) pressure of between 0.5 and 2.5 bar.

2.4 The boiler may be installed in any room or internal space without the need for purpose made ventilation, although attention is drawn to the current IEE Wiring Regulations with respect to installation in a room containing a bath or shower. In such installations, it must not be possible for a person using the bath or shower to touch any mains electricity fed switch or boiler control.

2.5 In areas where the temporary hardness of the supplied water exceeds 200mg/litre, a proprietary in-line scale control device such as the 'Hydroflow' (available from Atmos Heating Systems) should be fitted in the cold feed to the boiler.

2.6 The Atmos Multi is suitable to accept pre-heated water such as that supplied from solar panel installations.

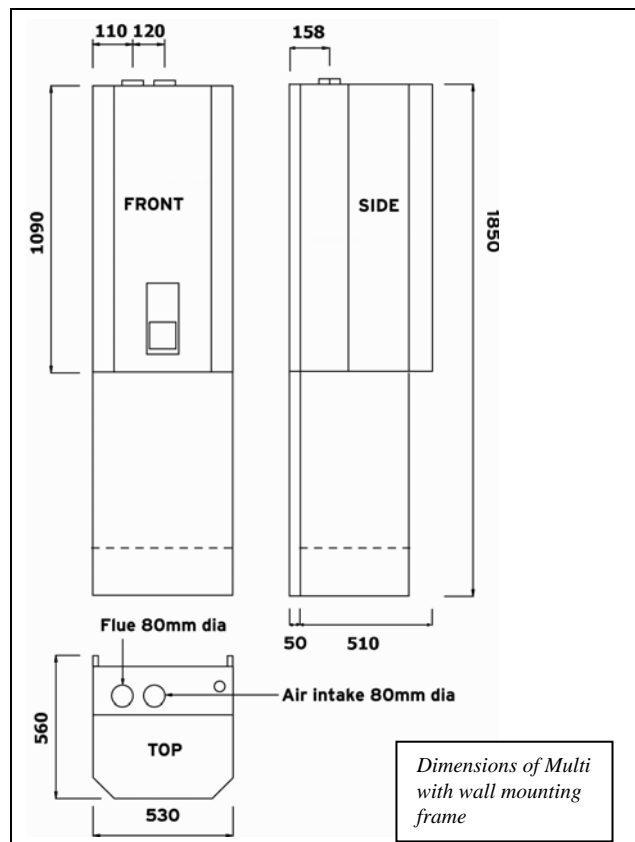
2.7 Where the boiler is intended for use on **Propane gas**, the boiler must not be installed in a room or internal space below ground level.

3. Technical Data

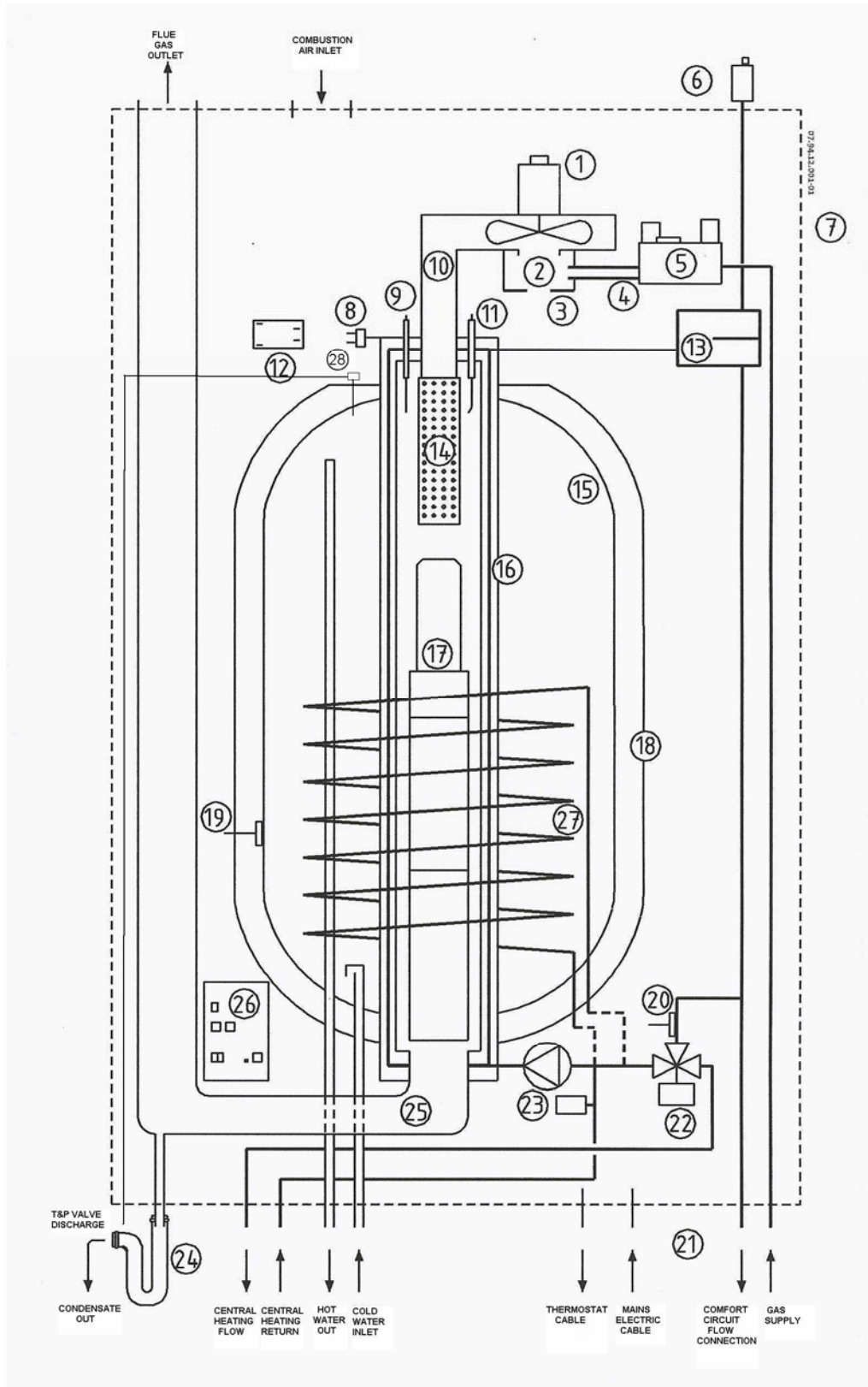
	Natural Gas & Propane		Natural Gas	Propane
	24/80	24 / 80 Plus	32 / 80 Plus	32 / 80 Plus
CONDENSING MODE (Return < 55°C)				
Heat Output to radiators kW min - max	7.3 - 22.5	7.3 - 22.5	9.8 - 29	9.8 - 29.9
Maximum heat to radiators Btu/hr	76,800	76,800	99,000	102,000
Gross efficiency max - min	98 - 91%	98 - 91%	98 - 91 %	98 - 91%
NON-CONDENSING MODE (80/60°C flow/return)				
Heat Output to radiators kW min - max	6.9 - 21.5	6.9 - 21.5	9.3 - 27.6	9.3 - 28.5
Maximum heat to radiators Btu/hr	73,400	73,400	94,200	97,300
Gross efficiency max - min	93 - 87%	93 - 87%	93 - 86%	93 - 86%
Seasonal efficiency (Sedbuk certified) %	91.3	91.3	91	91
Gas flow rate m3/hr natural gas min/max	0.8 - 2.6	0.8 - 3.3	1.1 - 3.5	
Gas flow rate m3/hr propane min/max	0.3 - 0.9	0.3 - 1.2		0.4 - 1.5
Flue gas temperature min/max°C	35/110°C	35/110°C	40/115°C	40/115°C
HOT WATER SYSTEM				
Maximum heat to hot water kW	17.4	26.4	27.6	28.5
Hot water flow rate maximum litres/min at 2bar	25	25	25	25
Reheat time from 10 to 60°C minutes	20	12	11	10
70% reheat time minutes	17	10	9	9
Hot water at 40°C instantaneously (litres)	133	133	133	133
Hot water per hour at 40°C (litres)	450	700	725	750
Hot water per hour at 40°C (gallons)	100	150	160	165
EMISSIONS				
NOx (average) emission ppm	18	18	19	19
CO (average) emission ppm	10	10	20	20
GC Number	41-249-02	41-249-03	41-249-04	41-249-04

COMMON DATA

Hot water temperature setting range	60 to 70°C
Central heating setting range	60 to 90°C
Hot water tank capacity	80 litres
Primary water capacity	2.2 litres
Hot water expansion vessel capacity	5 litres
C/ heating expansion vessel capacity	8 to 18 litres
Maximum supply pressure	12 bar
Electrical Connection	220/240V
Outlet pressure hot and cold water	3.5 bar
CONNECTIONS	
Air supply pipe diameter	80 mm
Flue pipe diameter	80 mm
Heating flow and return	22 mm
Hot water outlet	15 mm
Cold water supply	22 mm
Gas pipe connection	½" BSPM
Safety Valve discharge connection	22 mm
Condensate discharge drain connection	32 mm
Underfloor heating flow connection	½" BSPF
DIMENSIONS AND WEIGHT	
Height	1090 mm
Width	530 mm
Depth	507 mm
Weight empty (full)	70 kg (150kg)
Protection Class	IP44



4. Schematic of Atmos Multi Boiler



Key	Components	Type
1	FAN	MVL RG 148/1200-3612, 325 Vdc
2	GAS/AIR MIXING CHAMBER	ATMOS
3	CATCHMENT PLATE	ATMOS
4	GAS INJECTION NOZZLE	ATMOS
5	GAS VALVE	HONEYWELL VR 4605 VA1009 220/240 VAC
6	AUTOMATIC AIR VENT	TACO 3/8"
7	CASING	ATMOS
8	HIGH LIMIT THERMOSTAT	THERM-O-DISC 36TX E31 L 105°C
9	IONISATION PROBE	ATMOS
10	INLET CASTING	ATMOS
11	IGNITION ELECTRODE	ATMOS
12	IGNITION TRANSFORMER	ANSTOSS ZIG 2, 25 HZ
13	AIR SEPARATOR	ATMOS
14	BURNER	FURIGAS PREMIX
15	WATER HEATER VESSEL	ATMOS – 80 LITRE, COPPER
16	HEAT EXCHANGER	ATMOS – EXTRUDED ALUMINIUM
17	FLUE GAS RESTRICTOR	ATMOS
18	INSULATION SHELL	ATMOS (PS)
19	HOT WATER TEMPERATURE SENSOR	ATMOS
20	HEATING WATER TEMPERATURE SENSOR	ATMOS
21	CENTRAL HEATING PRESSURE SENSOR	HUBA CONTROL TYPE: 502.99009
22	THREE-WAY VALVE	ERIE TYPE 679 220/240 VAC
23	CENTRAL HEATING PUMP	WILO RS 15/5-3-PR-130-3-L
24	SIPHON TRAP	ATMOS
25	OUTLET CASTING	ATMOS
26	CONTROL UNIT	ATMOS
27	HEAT EXCHANGER FOR EXTRA HOT WATER	ATMOS (only for 24/80 Plus & 32/80 Plus)
28	TEMP. & PRESSURE RELIEF VALVE	½" x 15 mm, 7 bar 93°C
	FLUE GAS OUTLET CONNECTION	Ø 80 mm
	AIR SUPPLY CONNECTION	Ø 80 mm
	TEMP. & PRESS. VALVE DISCHARGE PIPE	Ø 15 mm
	CENTRAL HEATING FLOW PIPE	Ø 22 mm
	CENTRAL HEATING RETURN PIPE	Ø 22 mm
	HOT WATER OUTLET PIPE	Ø 15 mm
	COLD WATER INLET PIPE	Ø 15 mm
	CONDENSATION DISCHARGE	Ø 32 mm
	COMFORT CIRCUIT HEATING CONNECTION	½" BSPF
	GAS CONNECTION	½" BSPM
	ROOM THERMOSTAT CABLE CONNECTION	24 VAC/ 0.12 A (or modulating)
	MAINS CABLE	220/ 230 V

5. Operation and Construction

The Atmos Multi is a fully automatic, gas fired, high efficiency central heating boiler providing unvented domestic hot water at mains pressure via an integral 80 litre copper hot water storage tank.

5.1 Appliance construction

A heat exchanger consisting of three concentric channels is positioned in the centre of the boiler's integral hot water tank. (Fig.1).

- ❑ Hot flue gas released from a fully modulating, pre-mix burner positioned at the top of the heat exchanger, is driven downwards through the heat exchanger's middle channel.
- ❑ The second surrounding channel is divided into eight smaller central heating water channels, which together promote the transfer of heat from the heat exchanger to water within the boiler's primary circuit.
- ❑ The third surrounding channel is divided into small air channels. These together with the inner copper wall of the hot water tank form a double partition between the central heating and stored hot water.

While the hot water tank is completely insulated by means of insulation shell sections, the hot water tank itself along with the boiler's other components is housed behind a removable outer steel appliance casing, constructed in such a manner to ensure the enclosed appliance space is ventilated.

Operation of the Atmos Multi boiler is controlled and monitored by an electronic control unit that sends and processes information to and from the boiler's various temperature and control components. Along with controlling the boiler's operation, the control unit also provides a diagnostic programme that simplifies fault finding by automatically sending a fault code to a 'Status/error code display' window located on the control unit's fascia.

Central heating & Hot water circuit

When there is a demand for domestic hot water or central heating, the water within the boiler primary circuit is pumped through the heat exchanger from the bottom to top via the central heating water channels to a three way valve.

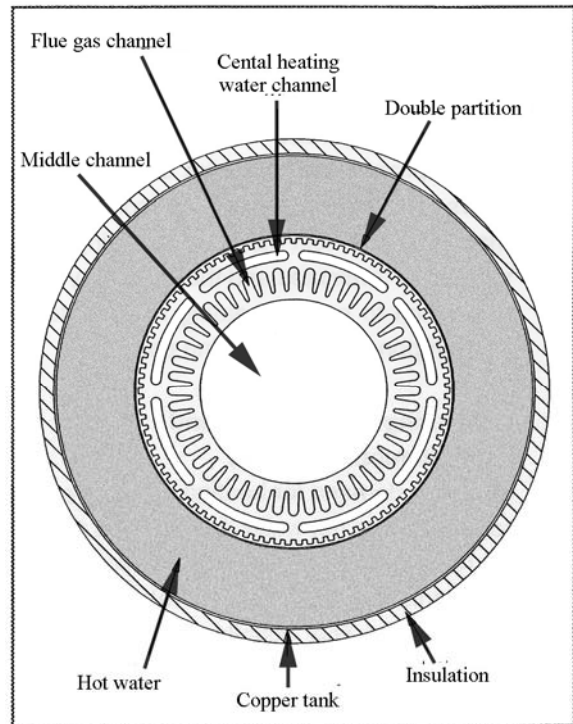


Figure 1 : Appliance Cross-Section

If there is a demand for hot water only, water within the primary circuit circulates through the heat exchanger only.

If there is a demand for central heating only, the three-way valve changes position allowing the heated primary water to flow from the heat exchanger to the central heating system.

Where there is a demand for both domestic hot water and central heating the three-way valve stays in a mid-position, supplying heated water to both the heat exchanger and the central heating system.

Flue gas circuit

The burner's combustion air fan drives hot flue gases produced by the combustion process from the top to the bottom of the heat exchanger. Cooling of the flue gases occur as they flow through the flue gas channels towards their point of exit. On cooling, the water vapour suspended within the flue gas condenses, transferring its latent heat as sensible heat to the cooler water within the heat exchanger. The resultant condensate then falls to the bottom of the heat exchanger where it is automatically discharged via the boiler's condensate drain point.

Due to the thorough premixing of gas and air, the burner has a very low flame height, which results in a very low NOx emission.

5.2 Operating principle

❑ No heat demand

The appliance will carry out a self-test when the electrical supply is switched on and then once every 24 hours (if there has been no heat demand). For this test, the boiler's integral central heating pump will run for 3 minutes and the three-way valve will switch to central heating in order to prevent the pump from seizing.

❑ Meeting the heat demand (Continuous Comfort mode)

When there is demand for heating and domestic hot water at the same time, the appliance will generally deal with both simultaneously. In this case, approx. 7 to 22kW (24/80) or 9 to 29kW (32/80) is available for heating the home, depending on the hot water demand. The three-way valve is then set at the mid-position, so that one part of the heated primary water is pumped to the radiators and one part to the water heater. This unique three-way valve output regulation prevents a drop in the temperature of the home when the water heater is heating up. The 'continuous comfort' mode may be switched off if not required.

The central heating is controlled using a volt free room thermostat. The domestic hot water temperature is controlled by a 'User' setting, which is adjusted via the control unit, and external thermostatic mixing valve.

❑ Heat supply

When there is a demand for central heating, the boiler's integral central heating pump and combustion fan are automatically switched on. Burner ignition occurs on the combustion fan reaching its regulated speed. If no flame signal is detected after 5 seconds, two more attempts for burner ignition will be made within a 15-second period, after which the appliance will shut down.

On loss of flame, the appliance will carry out two restart attempts, after which the appliance will shut down. If the temperature of the central heating water reaches 90°C, the burner will automatically be extinguished. The appliance has an anti-cycling time of 3 minutes during which the burner will not re-ignite. The anti-cycling period may be changed via the control panel to 6 minutes or alternatively, switched off.

On reaching the heating demand, the burner will be switched off, and the central heating pump continues to run for a further one-minute period, after which the three-way valve will switch to the heat exchanger (ie. domestic hot water heating). The pump will then run in hot water heating mode for 10 minutes (Factory setting). The pump running times may be adjusted to suit individual system requirements (see Appendix).

An insufficient heating water flow rate will be detected by the high limit thermostat, which on activation will cause the appliance to shut down.

❑ Combustion

The appliance is equipped with a continuously modulating burner. The burner's heat input may be manually set to suit individual system requirements. Using the mechanical gas/air coupling, the burner capacity can be controlled by adjusting the speed of the fan. The appliance heat input automatically reduces as the central heating flow temperature reaches 80°C or higher.

❑ Most Efficient Start

Most Efficient Start is a comfortable energy saver, which ensures that the home is heated as efficiently as possible. When there is a central heating demand the appliance always starts heating the home on a low burner heat input. The amount of time at which the burner continues to operate at low input depends upon the heating demand of the heating system.

After either, first connecting the appliance to the power supply, resetting following shut down, or following a 180 minute period with no heat demand, the burner will operate on a low heat input for 3 minutes, thereafter it is self adjusting.

❑ Weather-dependent control

Using an extra kit available from Atmos, comprising an external temperature sensor and a central heating return temperature sensor, the Multi can be easily controlled in a weather dependent manner by changing a number of control settings.

❑ Comfort loop circuit

The Multi is equipped with a second independently controlled heating circuit that can be used as a comfort loop (eg. bathroom floor heating or towel rail heating).

5.3 Controls and function.

The function mode of the appliance and the central heating water pressure are indicated on the electronic control unit's front fascia (fig 2), located at the bottom centre of the appliance

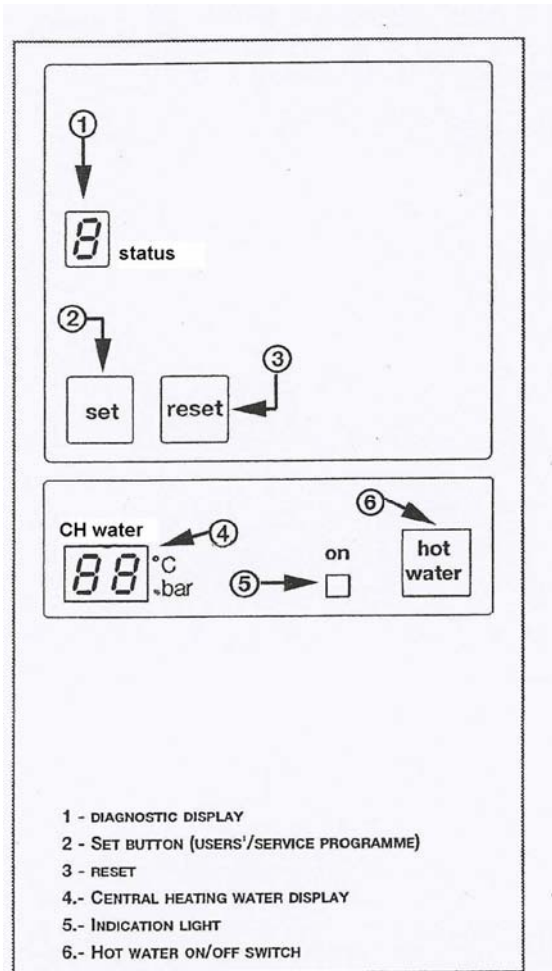


Figure 2 : Control Unit Fascia

□ Diagnostic display (fig 2 (1))

The boiler's operating status is indicated on the status display. The various status codes are explained in table 1. A flashing display or letter symbol indicates that a boiler malfunction or appliance lockout has occurred. The procedure to follow is given in Section 12 of these instructions.

0-	STANDBY, NO HEAT DEMAND
1-	HOT WATER DEMAND
2-	CENTRAL HEATING DEMAND
3-	HEAT DEMAND HW AND CH
4-	HEAT DEMAND HW AND CH, SUPPLY TO BOTH
1 TO 4-	SEE 1-4 WITH BURNER IN OPERATION
5-	FROST PROTECTION ACTIVE
6-	PRE AND POST PURGE TIME
7-	IGNITION PHASE
8-	SELF TEST (8.8. APPEARS ON THE CENTRAL HEATING DISPLAY AND THE BOILER INDICATION LIGHT COMES ON)
-	ANTI-CYCLING SWITCHING ON
-	(ALTERNATED BY NUMBERS 1 - 4)
⊖	PUMP OVER RUN INTERNAL - HOT WATER
-	(4 ROTATING SEGMENTS)
⊖	PUMP OVER RUN EXTERNAL - CH
-	(6 ROTATING SEGMENTS).

Table 1 : Status Reports

□ Central Heating Display (fig 2 (4))

The central heating display may be set to indicate either the central heating water pressure (factory setting) or central heating water temperature. (See 'User's program').

If the central heating water pressure is too low or too high, a warning symbol 'C' is shown on the status display. Further information is given in Section 12 of these instructions.

□ Hot water button (fig 2 (6))

If required the heating of domestic hot water may be switched off using the hot water button. Pressing the button once will turn off the indicator light and curtail the hot water demand.

□ Set button (fig 2 (2))

The set button is used to enter the User's program to allow changes to be made to the boiler's factory settings and for other installation and service activities. To protect against accidental use, the set button has to be depressed for a period of 5 seconds before activation occurs. (See 'User's program').

❑ **Reset button.** (fig 2 (3))

A lockout situation following a malfunction is cancelled using the reset button. The button is also used to exit the 'User's program' or 'Installer program'.

5.4 User's program

Along with giving operation and fault status codes down to component level, the electronic control also permits the manual setting of the boiler's operational parameters.

The Atmos Multi in-built 'User's program' allows the user or installer to tailor certain operational parameters such as the maximum heating water temperature and the domestic hot water temperature, to the end user's requirements. (Note: As the boiler's minimum domestic hot water temperature setting is 60°C., the installation of a thermostatic mixing valve is necessary to reduce the hot water temperature at the tap).

Access to the User's program is gained by pressing the control unit's 'Set' button for a period of 5 seconds until a letter 'b.' appears in the status display window. Incremental scrolling through the operational parameters is then obtained by re-pressing the 'Set' button.

The current setting for the selected operational parameter appears in the central heating water display window. Pressing the 'Hot water' button enables the setting to be changed to the required value.

The User's program is terminated automatically after five minutes from when the last input action was carried out. Alternatively, exit from the program is achieved by pressing the 'Reset' button.

Operational parameters accessible via the Users' program are given in Table 2, the factory settings being underlined.

Hot water temperature control	<u>1</u> - 2 - 3 (<u>60</u> - 65 - 70 °C)
Maximum heating temperature	60 - 75 - <u>90</u> [°C]
Standard CH-Water press. indication	<u>[Bars]</u>
Continuous comfort:	OFF - <u>ON</u>
MES maximum low combustion time	OFF-5 - <u>10</u> -15 [MIN]
Anti-cycling mechanism for central heating	OFF - <u>3</u> - 6 [MIN]

Table 2 : User's program settings

Further information on setting operational parameters is given in the Appendix.

6. Installation Requirements.

6.1 Gas supply

The gas meter and supply pipe must be capable of delivering the required quantity of gas to the boiler (refer to Technical Data in Section 3) in addition to the demand from any other appliances within the property. On final connection of the gas supply to the boiler, the property's complete gas installation, including the meter, must be tested for gas soundness and purged as described in BS6891.

6.2 Electrical supply

The boiler requires a 230/240 V~50 Hz mains supply fused at 3amp.

The Atmos Multi is supplied factory wired complete with 1.2m of mains cable. All electrical connections to the mains supply must be made in full accordance with the current I.E.E. regulations.

The boiler must be earthed and connected via a double pole isolating switch fused to 3 amp. The switch must be readily accessible, within 1m of the appliance and provide complete electrical isolation for the boiler and control system.

6.3 Flue terminal clearances.

The flue terminal must be sited with minimum clearance distances as specified in figure 3.

A terminal guard must be fitted if the terminal is sited less than 2m above ground level.

Where the flue terminates within 1m of a plastic or painted gutter or within 500mm of painted eaves then protection should be provided in the form of an aluminium shield at least 1m in length, fitted to the underside of the gutter or painted surface.

Please note !

Due to the low flue gas temperature, 'pluming' will occur at the flue terminal. Care should be taken to ensure that the discharge plume will not cause annoyance to the customer or neighbours. It is generally recommended that flues should discharge vertically at roof level. In this position, pluming is not normally a problem.

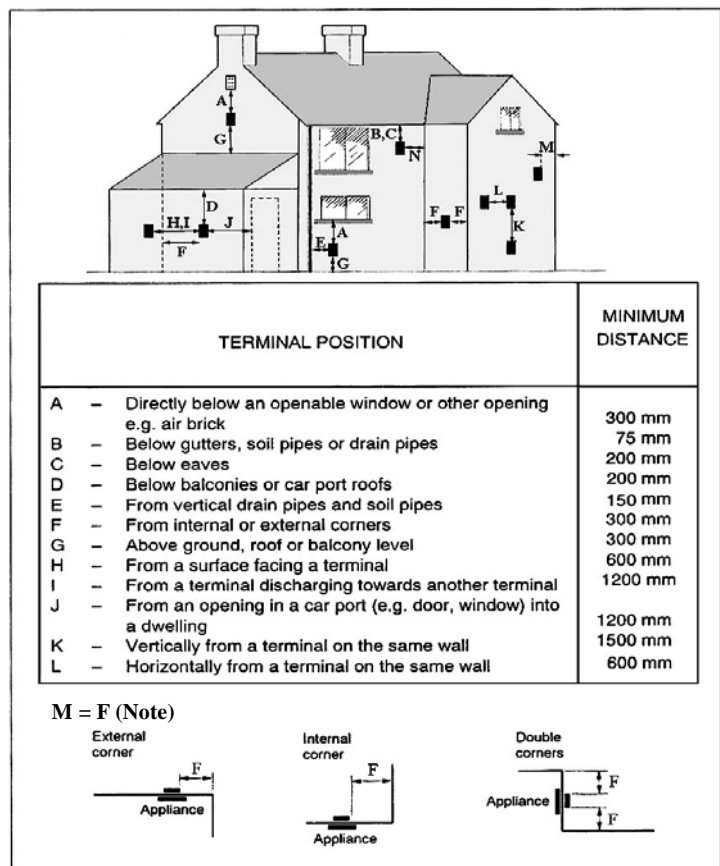


Figure 3: Flue terminal locations

6.4 Flue system.

The flue system must be installed in accordance with BS5440:1. Horizontal flue pipe runs must always be installed with a minimum slope of 5mm/metre towards the boiler. This will prevent condensation from gathering in the flue pipe, and will also reduce the chance of icicles forming over horizontal pipe ends in the Winter. On horizontal terminations, the air supply pipe must be led to the outside with a minimum slope of 3mm/metre to prevent the ingress of rainwater.

Depending upon the boiler location and flue configuration required, two different flue systems are available for use with the Atmos Multi boiler:

- ❑ 125/80mm concentric system up to a maximum equivalent length of 64m. **Note – This means that the concentric pipe must never exceed 32m in actual length.**
- ❑ 80mm twin pipe system which enables separate air intake and flue pipes to be fitted to the appliance, allowing a combined total equivalent flue length of 64m.

The maximum equivalent flue length of the flue system must not be exceeded. If exceeded the boiler will not malfunction but its heat-output capacity will be reduced. The connected gas/air regulator will however, always ensure optimum combustion is maintained.

Examples of various flueing options and configurations are given in figure 4.

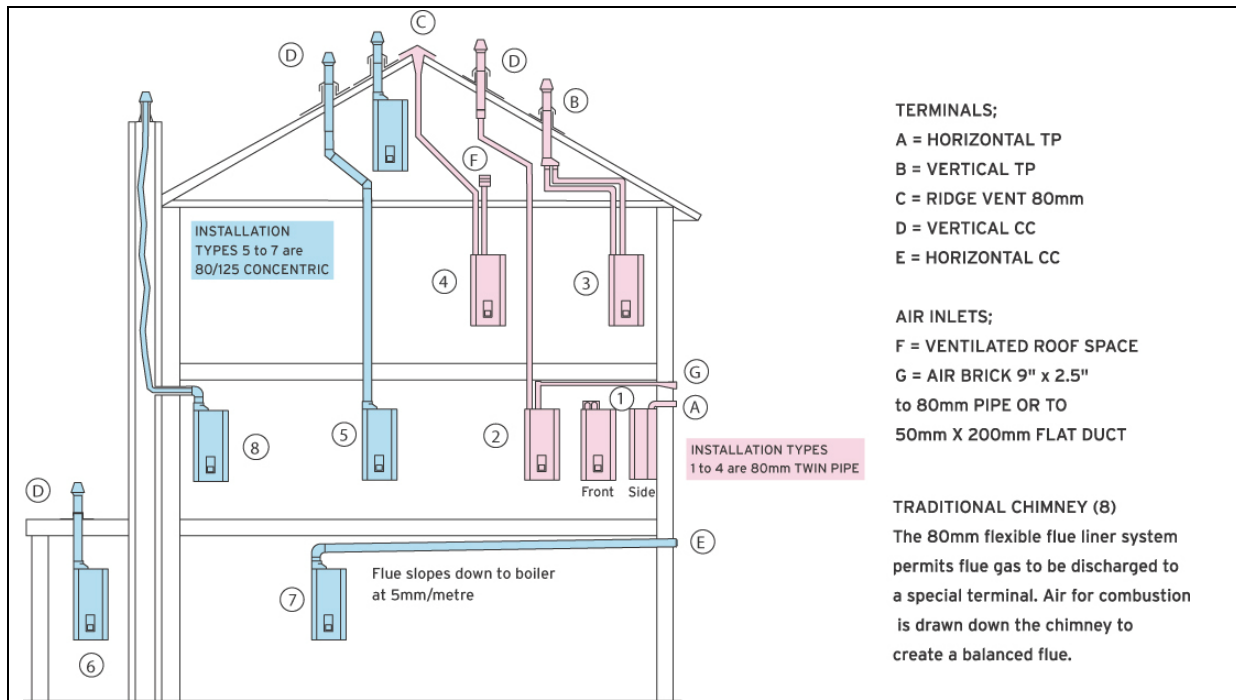


Figure 4: Examples of flue installation options

The equivalent length of the required flue system's configuration can be calculated from the resistance factors given for the individual flue components in Table 3. In the worked example (Fig 7), the maximum permitted combined length for a 80mm dia. twin flue is 64metres at a pressure of 100 Pa. Account has already been taken of the resistance of the balanced flue terminal. This can therefore be ignored in the calculation.

Flue Component	Dia mm	Equivalent Distance/Resistance
Straight length of 1m	80	1.0m
Bend 90 deg	80	3.0m
Bend 45 deg	80	1.5m

Table 3. Flue resistance factors

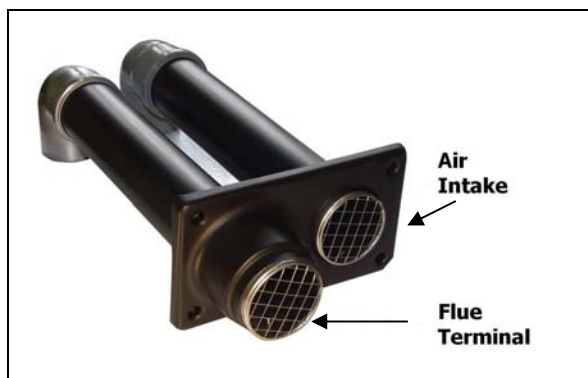


Figure 5: Twin pipe terminal plate

The twin pipe horizontal wall terminal comprises a terminal plate, two 500mm lengths of 80mm dia. plastic pipe and internal plate. In addition, two 90° bends are required

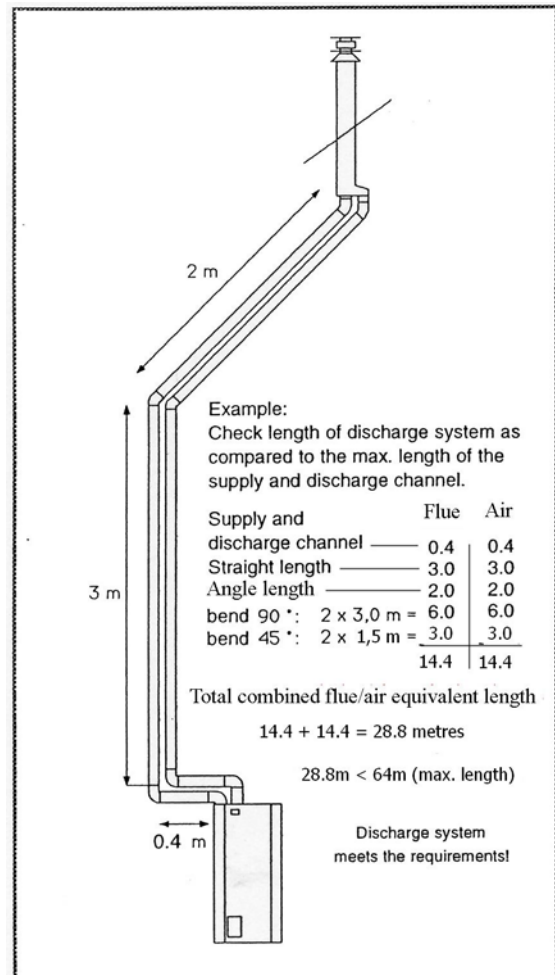


Figure 7: Worked flue length example.

6.5 Condensate disposal.

Provisions must be made for the safe disposal of condensate. The condensate drainage pipework must be run in an acid resistant material such as plastic waste pipe. Copper or steel pipe must not be used. The pipework must incorporate a minimum 1:20 downward slope towards its point of termination, which ideally should be an internal soil or waste pipe to avoid the possible risk of freezing. Where this not possible, the condensate may be discharged into an external gully or purpose-built soakaway. The condensate pipework must be protected against freezing and any pipework external to the property must be encased in waterproof insulation and be restricted to a maximum length of 3m.

6.6 Combined Safety discharge and condensate pipe

Subject to the approval of the Local Building Inspector, the Safety discharge pipe and condensate discharge pipe may be combined into a single common discharge pipe. Atmos have provisional approval for such an arrangement (copy of letter available on request) and is offered as an option with the Wall frame and Pipework Assembly kit, shown in Section 7.8.

6.7 Standard Safety Discharge pipes.

It is a requirement of Building Regulation G3 that any discharge from the safety valve of an unvented system should be visible at both the tundish and final point of discharge. Where this is not possible or practical however, the discharge must be clearly visible at one of these locations.

The discharge pipe from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge.

While a minimum 300mm of vertical discharge pipe must exist below the tundish, the discharge pipe itself should be of metal construction and, unless its total equivalent length exceeds 9m, be one pipe size larger than the nominal outlet of the combined temperature & pressure relief valve.

Where the total equivalent length of the discharge pipe exceeds 9m, the pipe must be increased by one pipe size for each additional 9m length. For example a discharge pipe having an equivalent length of between 9 and 18m must be two pipe sizes larger than the nominal outlet of the combined temperature & pressure relief valve, between 18 and 27m three pipe sizes larger, and so on. Bends must be taken into account when calculating the flow resistance. See Figure 6 and Table 4 for a typical discharge arrangement and worked example.

Note. An alternative approach for sizing discharge pipes would be to follow BS 8700: 1987 *Specification for design installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. Appendix E, section E2 and tables 21.*

The discharge pipe must be installed with a continuous fall towards its point of termination, which ideally should be below a fixed grating and above the water seal in a trapped gully. Where this is not possible, or practical, then the discharge pipe may terminate either:-

- At low level discharge above external surfaces such as car parks, hard standings, grassed areas and so on, providing that termination is a maximum of 100mm above the surface and a wire cage or similar guard is fitted to prevent contact with any discharge, while still maintaining visibility, OR,
- At high level into a metal hopper and metal down pipe with the end of the discharge pipe being clearly visible, or alternatively, onto a flat roof capable of withstanding high temperature discharges of water. Such termination however, must not be within 3m of any plastic guttering and the tundish must be clearly visible in order to detect any occurrence of discharge.

In cases where a single common discharge pipe serves a number of units, such as in a block of flats, the number of units served should be limited to a maximum of six. The common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe to be connected.

Where the Atmos Multi is installed in a property where discharge from the unit may not be apparent, such as in the case of blind, infirm or disabled people, then consideration should be given to the installation of an audible electronically operated device to warn when discharge takes place.

Figure 6: Typical discharge arrangement

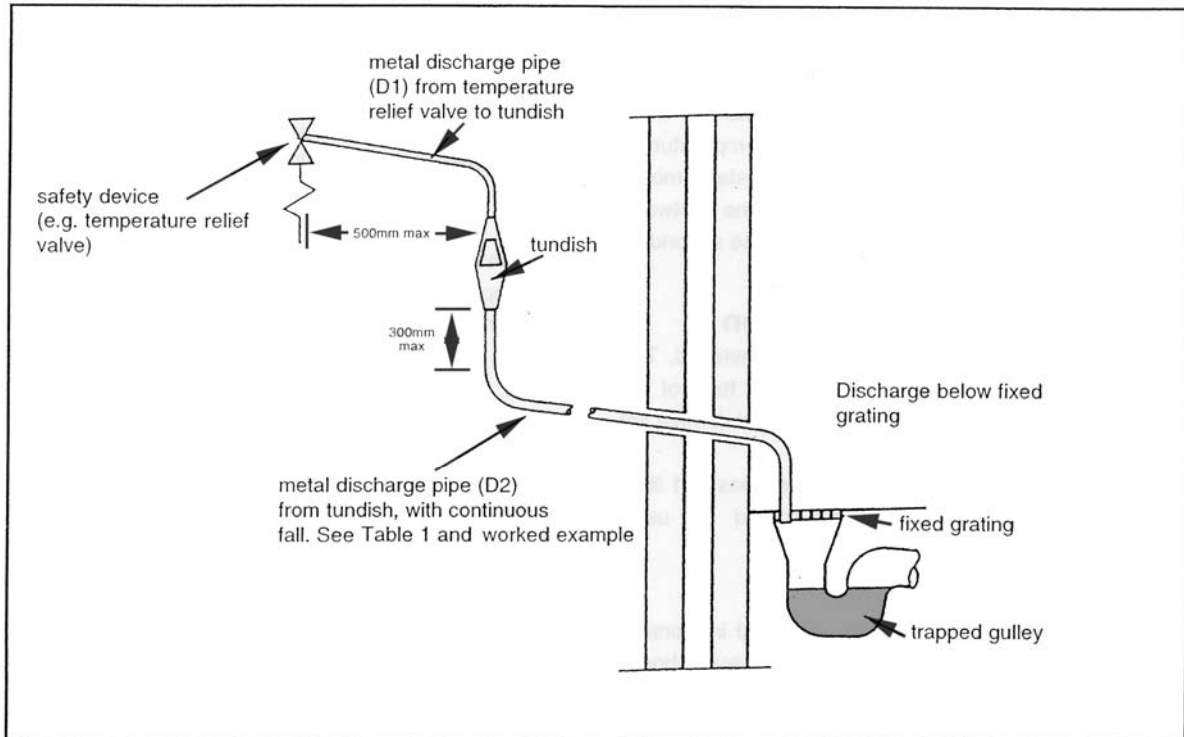


Table 4. Sizing of copper, discharge pipe. D2 for common temperature relief valve outlet sizes

Valve outlet size	Minimum size of discharge pipe D1*	Minimum size of discharge pipe D2* from tundish	Maximum resistance allowed, expressed as a length of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend
G $\frac{1}{2}$	15mm	22mm	up to 9m	0.8m
		28mm	up to 18m	1.0m
		35mm	up to 27m	1.4m
G $\frac{3}{4}$	22mm	28mm	up to 9m	1.0m
		35mm	up to 18m	1.4m
		42mm	up to 27m	1.7m
G1	28mm	35mm	up to 9m	1.4m
		42mm	up to 18m	1.7m
		54mm	up to 27m	2.3m

*See 3.5. 3.9. 3.9(a) and Diagram 1

Worked example:

The example below is for a G $\frac{1}{2}$ temperature relief valve with a discharge pipe (D2) having 4 No. 22mm elbows and length of 7m from the tundish to the point of discharge.

From Table 1

Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G $\frac{1}{2}$ temperature relief valve is: 9.0m.

Subtract the resistance for 4 No. 22mm elbows at 0.8m each =3.2m

Therefore the maximum permitted length equates to 5.8m, which is less than the actual length of 7m.

Therefore calculate the next largest size (28mm) .

Maximum resistance allowed for a straight length of 28mm-pipe (D2) from a G $\frac{1}{2}$ temperature relief valve is: 18m.

Subtract the resistance for 4 No. 28mm elbows at 1.0 m each = 4m.

Therefore the maximum permitted length equates to 14m. As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

6.8 Existing systems.

All re-circulatory water systems are subject to corrosion unless an appropriate water treatment is applied. To prevent the risk of accumulated corrosion sludge, within an existing system, causing boiler noise and circulation problems along with possible pump and valve damage, the existing heating systems must be thoroughly flushed to ensure that all sludge and debris are removed prior to installation of the boiler.

Where a cleaning agent is used for this purpose, only Sentinel X400 is recommended.

Note. When, after flushing and cleaning of the system has taken place, there is any possibility of any debris remaining in the system, it is recommended that a 'Y' strainer is fitted on the boiler RETURN pipe.

7. Boiler Installation.

7.1 Unpacking the boiler

Due to the boilers dry weight of 75kg it is recommend that either a sack barrow or two men are employed to carry the boiler to its chosen position. The boiler must be carried and stored horizontally on the wooden pallet provided.

The appliance is protected by a cardboard box and delivered as standard with:-

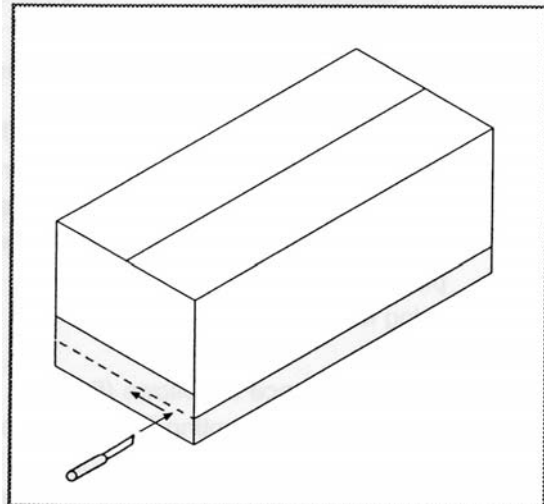
- ❑ Mounting bracket
- ❑ Fixing pack consisting of 2 wall plugs, 2 bolts and 2 washers
- ❑ Automatic de-aerator
- ❑ Condensate trap
- ❑ Fixing Template
- ❑ Guarantee Registration card, Operating instructions and Installation instructions

In addition the boiler is supplied with;

- ❑ WRC mains water kit, including UV4 cold water inlet manifold, a white expansion vessel, safety valve and pipe connections and;
- ❑ Red expansion vessel including wall bracket and safety valve.

Using a knife, cut open the bottom tray of the box and remove the top box from the bottom tray (Fig. 8).

Figure 8: Unpacking boiler



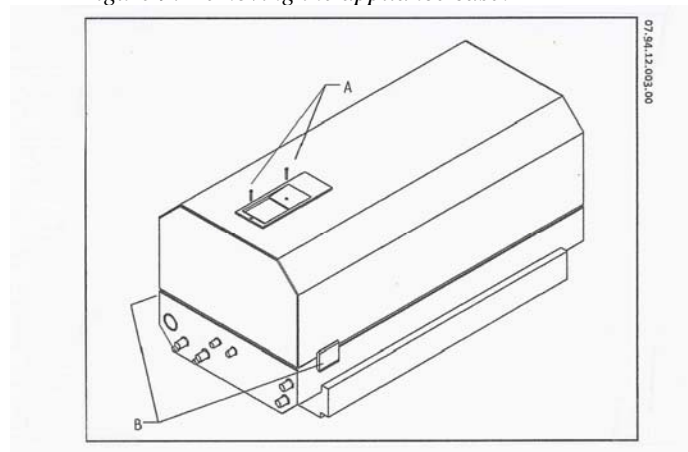
Check the appliance immediately after unpacking. Any damage must be reported immediately to your supplier.

The packaging consists of corrugated cardboard, wood and polystyrene, and can therefore be recycled as waste paper. Do not throw away the packaging, but ask the local refuse collection service where it can be taken.

Remove the appliance casing to prevent accidental damaged during installation as follows (Fig. 9):-

- i) Remove the two screws 'A' of the control panel.
- ii) Unlatch the catches 'B' near to the bottom of the appliance and remove the case by lifting upwards.

Figure 9: Removing the appliance case.



Warning : When removing the red caps from the boiler pipes, dead water will come out, which can cause stains. Take care!

7.2. Minimum clearances.

For servicing and maintenance purposes, a minimum clearance of 600mm to the front, 150mm above, 750mm below (allowing for installation of the expansion vessels) and 100mm to either side of the boiler case is required. (fig. 10 & fig 11)

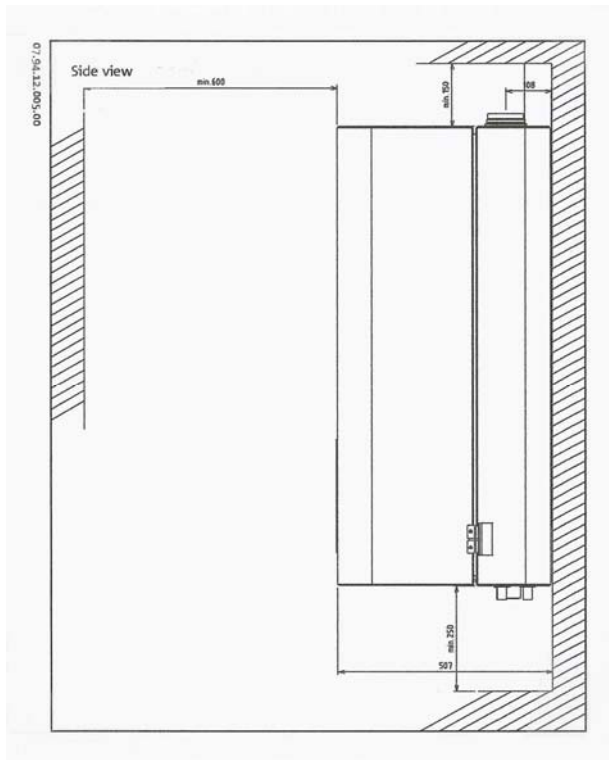
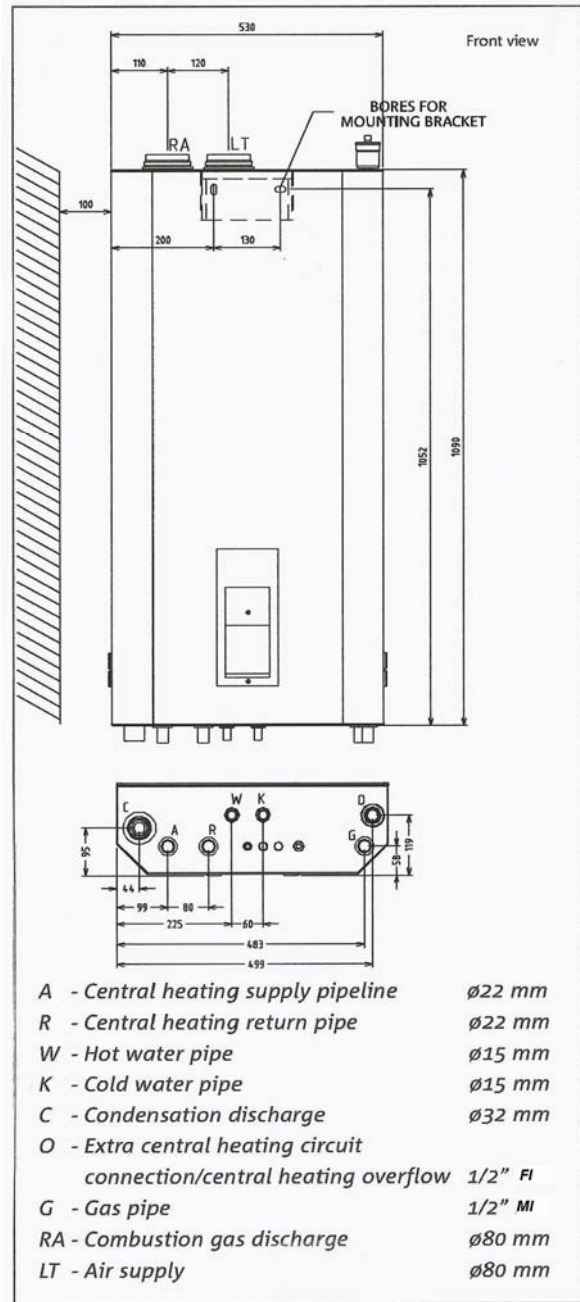


Figure 10: Dimensions & minimum clearances

Figure 11: Dimensions & minimum clearances
Note The T & P valve discharge pipe is not shown (on LHS).



7.3 Boiler location.

The Atmos Multi is not suitable for external installation.

While the appliance itself is provided with integral frost protection, it must be installed in a room that stays free of frost. This is to prevent pipes or the safety valves from freezing. If the selected room does not meet this requirement, measures must be taken to prevent freezing.

The appliance must be installed on a flat vertical wall that is capable of taking the weight of the boiler. Do not fix directly on to low load bearing or plasterboard walls. In such cases, a sheet of 18mm plywood, reaching to the floor, can be used to overcome the problem. Alternatively, a special mounting frame is available from Atmos as an optional item.

On a lightweight block wall, heavy duty Rawplugs must be used in place of the supplied wall plugs and bolts.

The boiler may be fitted on or adjacent to a wall comprising of a combustible material without the need for a special thermal insulation barrier.

Due to the appliance being self-ventilating, it remains relatively cool during operation. Generally there is no requirement to provide purpose made ventilation to an airing cupboard or compartment in which the appliance is installed

A compartment used to enclose the appliance must be designed and constructed to comply with the Building Regulations. The compartment must be of sufficient size to permit access for inspection and servicing of the boiler.

7.4. Wall mounting the boiler

Taking into account the clearances required for servicing and maintenance, tape the supplied template onto the chosen wall position, ensuring it is level and the correct way up.

Mark the position of the fixing holes for the boiler mounting bracket. Drill the fixing holes using a 16mm drill bit and fit the mounting bracket using the supplied fixing plugs and bolts.

Warning : The fixings supplied are suitable only for brick or solid block walls. When full the Atmos Multi weighs 150kg and must not be fitted directly onto walls with low load bearing capacities.

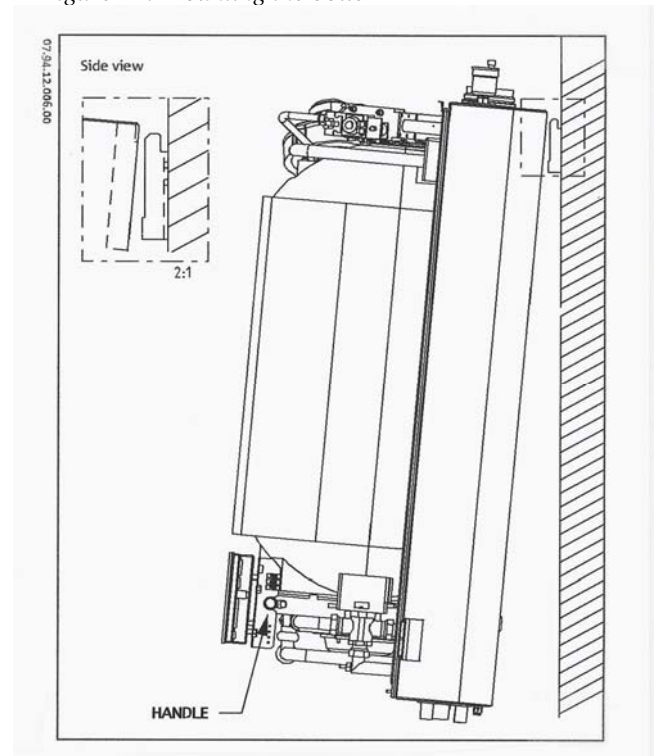
Fit the appliance onto the mounting bracket as follows (Fig. 12):

- Place the mounting indication point level with the top side of the mounting bracket and position the corners of the back of the casing level with each end of the mounting bracket.
- Put the bottom of the boiler against the wall.
- Carefully lower the appliance onto the wall bracket.

Note!

A lifting handle with black plastic covers on each end is provided for lifting the boiler onto the mounting bracket. Do not lift with other parts of the boiler, as it may cause damage. To comply with Health & Safety Regulations, Atmos Heating Systems recommend that the boiler be lifted into position by the use of two men.

Figure 12: Mounting the boiler



7.5. Connecting the flue system.

Prior to connection of the boiler's flue system, please refer to sections 6.3 & 6.4 of these instructions.

The flue and air duct are an integral part of the boiler and care must be taken on their installation to ensure that all joints are airtight and correctly made.

The flue and fittings are push fitted together being sealed by the fittings integral 'O' ring.

On assembly, it must be ensured that the aluminium pipe is cut square, and burr free, prior to being pushed into the fitting. Failure to do so may result in damage to the 'O' ring seal.

When connecting to the twin pipe terminal plate, it is important to ensure that the plate is fitted the correct way up and the flue discharge and air inlet ducts are connected to the correct terminal. (Fig 5).

It is recommended that a 85mm diameter core drill is used for cutting through the external wall.

For concentric and vertical roof systems, refer to separate installation instructions supplied with the flue assemblies.

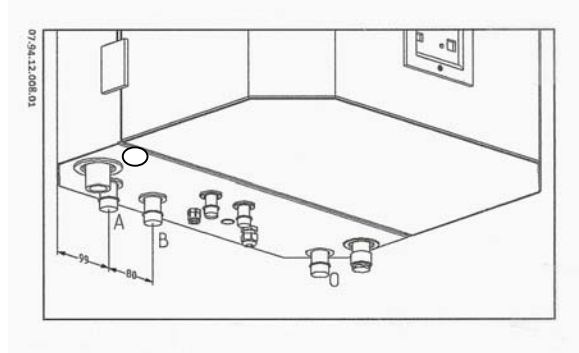
7.6.Connecting the central heating circuit.

Important Note!

The Atmos Multi is suitable for use on a sealed heating system only. It must not be connected to an open vented heating system.

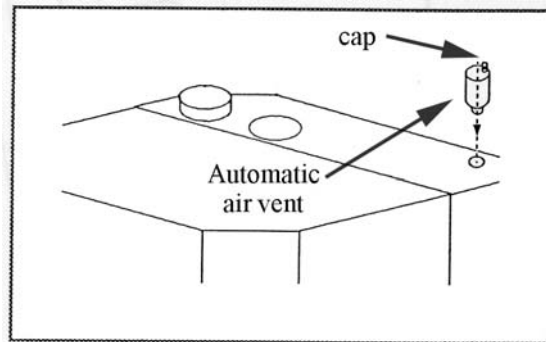
The 22mm diameter connections for the central heating circuit flow and return pipes are located on the underside of the appliance. (Fig 14). The flow pipe (A) is colour coded red and the return pipe (B) is colour coded blue.

Figure 14: Boiler flow & return connections.



Locate and fit the separately supplied automatic air vent to the boiler's top right corner (Fig 15). Once fitted, loosen the automatic air vent's cover cap.

Figure 15: Automatic air vent



Before connection to the central heating system, the system must be thoroughly flushed in accordance with the guidance given in BS7593.

The system must comply with the requirements of BS5449, and to avoid corrosion and leaks, be airtight, closed and connected in accordance with Benchmark procedure.

When connecting the boiler to a heating system containing plastic pipework the following must be noted:-

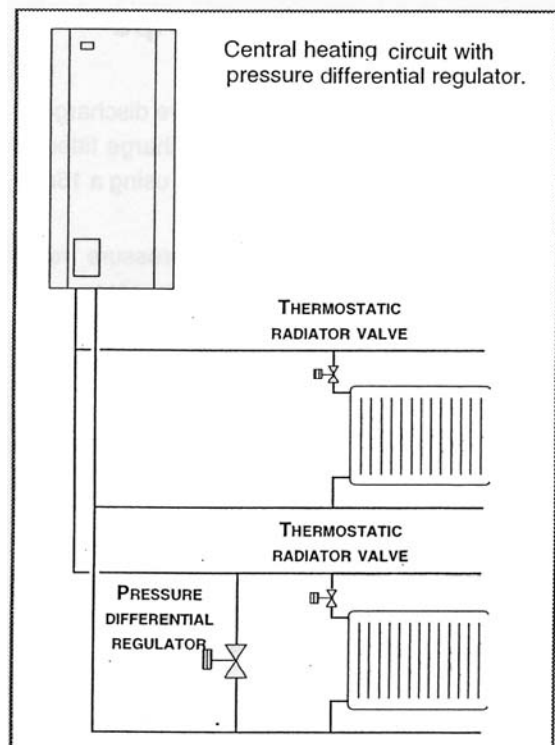
□ In a floor heating system, the plastic hoses/pipes used must either meet BS7291 having a class 'S' rating or DIN 4726/4729 having an air permeability less than 0.1 g/m³ at 40°C.

□ In a radiator system, the plastic hoses/pipes used must either meet BS7291 having a class 'S' rating or DIN 4726/4729 having an air permeability less than 0.1 g/m³ at 85°C in a twenty four hour period.

Connection of the Atmos Multi to a heating system containing non-diffusion barrier oxygen permeable plastic pipe or class 'H' plastic pipe will invalidate the boilers guarantee.

It is important that there is a by-pass on the central heating circuit to ensure that the system water is able to flow through the boiler's heat exchanger at all times. This may be achieved by leaving at least one radiator permanently open. Alternatively, a pressure differential regulator valve (Fig16) that provides an automatic system bypass is available from Atmos Heating Systems.

Figure 16: Pressure differential regulator valve



Where required, the boiler offers the facility for an independent towel rail circuit to be installed via the extra central heating connection (Connection O in Fig 11). This allows for the separate heating of a radiator when the boiler is operating in either central heating or hot water mode. To prevent hot water circulation within the central heating system when the boiler is operating in domestic hot water only mode, the towel rail circuit return must be the last connection on the return pipe to the boiler.

Note. When utilised, the towel rail circuit must be carefully balanced to avoid short-circuiting of the main central heating system.

A 'Robokit' sealed system kit is required for the Atmos Multi boiler. The kits with filler loop and RED expansion vessel in 8,12 or 18 litre sizes are available from Atmos Heating Systems.

Table 5 provides guidance to the size of expansion vessel required for systems fitted with steel panel radiators in a two-storey house. Consult Atmos Heating Systems for further information and advice for non-standard systems.

Note. *The red primary expansion vessel must not be confused with the white secondary expansion vessel intended for use on the domestic hot water circuit.*

Table 5: Required expansion vessel

Expansion vessel size in litres	System primary water capacity	Approx system output	Approx no of radiators
8	90 litres	10kw (34,000 Btu/hr)	8
12	140 litres	15kw (51,000 Btu/hr)	12
18	200 litres	20kw (68,000 Btu/hr)	18




7.7.Connecting the mains water.




Each Atmos Multi boiler is supplied with a mains pressure kit comprising the following components:




- UV4 manifold including pressure reducing valve pre-set at 3.5 bar.
- ½" Caleffi safety relief valve set at 6bar.
- 5 litre white potable expansion vessel.
- Expansion vessel mounting bracket.
- 22mm x 15mm compression reducing set.
- Black plastic tundish.
- Thermostatic mixing valve, AND
- ¼" BSPM drain cock.




Note. For Wall frame and Pipework Assembly kit, the above components are included.

7.8 Wall Frame Assembly.

Picture for wall frame and pipework assembly kit <i>Figure 18.1, etc</i>	Assembly instructions for wall frame and pipework assembly kit	Assembly instructions using loose components
1. Mains Cold water supply		
	<p>Open Bag 1. Take the cold water inlet assembly and fit in the position shown, not forgetting the washer on the bottom union. Tighten loosely to allow for adjustment. Note: It is important to check that the safety valve grub screw is tightly fixed, otherwise the valve can blow off.</p>	<p>Bring the cold mains water to the boiler in 22mm pipe. Fit a 22mm stop tap. Assemble the Altechnic UV4 valve and manifold with Locktite as illustrated. Connect to the boiler cold inlet utilising the 22x15mm reducer supplied. Fit the safety valve by inserting into the hole, taking care not to damage the O ring seal. When the safety valve position has been correctly determined, clamp in position using the small grub screw with the Allen key provided. It is IMPERATIVE that this screw is tightly fixed, otherwise the valve can blow off.</p>
2. Equal pressure cold water out (Optional extra kit)		
	<p>Where an equal pressure cold water supply is required, use the optional equal pressure cold water kit. Remove the 22mm compression nut and cap from the side inlet port of the manifold. Assemble the pipe with the compression nut and olive to the manifold, and the union to the CW valve. Joints can be loosely tightened until the whole assembly is ready for final tightening, and don't forget the washer on the lower union.</p>	<p>Where an equal pressure cold water supply is required, there is a 22mm connection on the side of the UV4 manifold for this purpose. If this is not required, use the 22mm cap which is provided in the UV4 kit to blank off this port.</p>
3. Gas connection		
	<p>Open Bag 2 with two pipes. The 22mm pipe is for the gas, and the 15mm pipe for the towel rail return connection. Take the 22mm gas pipe and connect the gas union valve ½" bsp to the boiler gas inlet with suitable gas sealant. There is no valve on the valve plate, so connect the gas pipe directly to the incoming 22mm gas pipe through the hole provided.</p>	<p>Fit gas union with loose part of union to boiler. Connect to 22mm gas supply.</p>

Picture for wall frame and pipework assembly kit	Assembly instructions for wall frame and pipework assembly kit	Assembly instructions using loose components
4. Auxiliary (comfort loop) connection		
	<p>The auxiliary or towel rail connection is blanked off on the boiler with a hexagonal chrome plug. If this option is required, take the 15mm pipe from Bag 2 with a 15mm x 1/2" bsp male threaded compression fitting and a union. Remove the chrome plug (take care as residual water sometimes dribbles out) and fit the compression fitting. Connect to the towel rail flow union on the valve plate. If this is not required, simply discard the pipe or use elsewhere.</p>	<p>The auxiliary or towel rail connection is blanked off on the boiler with a hexagonal chrome plug. If this circuit is required, remove this plug and connect 15mm copper pipe as a flow to the towel rail circuit. An isolating valve may be fitted for convenience. Note that the return connection must be the last connection on the heating circuit return pipe.</p>
5. Hot water and Secondary hot water return		
	<p>From Bag 1 take the 15mm pipe assembly with the thermostatic mixing valve. Assemble the pipework from the cold water manifold 15mm port, and connect to the 15mm hot water return valve on the valve plate. Loosely tighten joints.</p> <p>If there is no secondary hot water circulation system, TURN OFF this valve fully as it will not be required. To be absolutely certain of no future leakage, we recommend that a 15mm pipe with a soldered end cap is used to blank off this port.</p> <p>Take the short 15mm hot water inlet pipe and the 15mm compression elbow. Connect from the boiler to the thermostatic mixing valve (port W).</p>	<p>The upper right 15mm connection on the UV4 manifold is used for the following purposes :-</p> <ol style="list-style-type: none"> 1) Feed to the central heating filler loop or connector. 2) Cold feed to the hot water thermostatic mixing valve. 3) Return port for a secondary hot water re-circulation system where required (optional) 4) Connection to the hot water expansion vessel. There must be no valve between the expansion vessel and the UV4.
6. Hot water supply		
	<p>Fit the longer 22mm hot water outlet pipe from the 15mm port M to the hot water out valve on the valve plate. Don't forget the washer.</p> <p>At this point all hot and cold water connections are in place, and final tightening of all unions and connectors can be done.</p>	<p>Take the thermostatic mixing valve. Connect cold water inlet to rear port marked K. Connect the 15mm hot from the boiler to the side port marked W. Connect the hot water out (marked M = Mixed) to the domestic hot water supply. Supply size can be 15mm or 22mm, depending on the load, but 22mm will be required for more than one bathroom.</p>

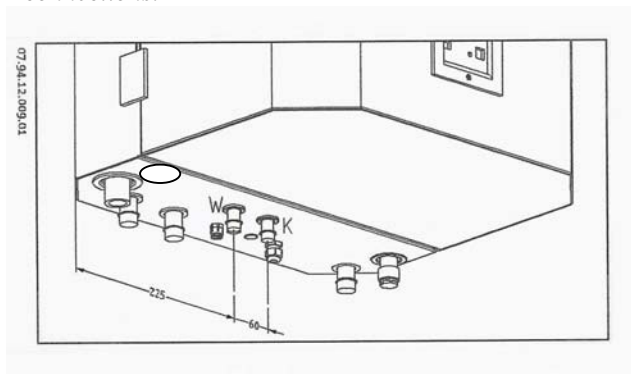
Picture for wall frame and pipework assembly kit	Assembly instructions for wall frame and pipework assembly kit	Assembly instructions using loose components
7. Heating system return connection		
	<p>Open bag 3. Fit the 22mm return pipe using the 22mm compression connector of the filter at the boiler, and the two unions to the Valve plate. Remember the washers for both unions.</p> <p>Note: If there is no towel rail circuit, TURN OFF the towel rail return valve fully as it will not be required. To be absolutely certain of no future leakage, we recommend that a 15mm pipe with a soldered end cap is used to blank off this port.</p> <p>TIGHTEN ALL JOINTS WHEN ASSEMBLED AND DON'T FORGET THE UNION WASHERS.</p>	<p>The heating flow and return are connected in 22mm copper to the boiler connections (flow and return). The following connections must be made :-</p> <ol style="list-style-type: none"> 1) Cold filler loop connection. 2) Safety valve with discharge pipe 3) By-pass valve if mostly thermostatic valves are used on the heating system. 4) Towel rail return (if used) must be the last return connection on the system. 5) 22mm filter on return pipe (optional means of protection)
8. Heating system flow pipe		
	<p>Fit the 22mm flow pipe using the 22mm compression connector at the boiler, and the union to the Valve plate. Remember the washer!</p> <p>Fit the 22mm by-pass valve between the flow and return in the correct direction, as shown in the photo (head to right)</p>	<p>Connect 22mm flow pipe to heating system.</p>
9. Safety valve discharge system		
	<p>Take the 15mm safety discharge pipe with one bend, and connect to the 6 bar cold water pressure relief valve at the back of the boiler. Ensure that the pipe is fully inserted into the valve port, so that the compression olive grips the pipe.</p> <p>Take the second discharge pipe (with tees). Connect as follows;</p> <ol style="list-style-type: none"> 1) Connect to the cold water discharge pipe with the 15mm compression elbow. 2) Connect to the 15mm safety discharge from the boiler with the 15mm compression straight connector. 3) Connect to the heating system safety valve discharge. 4) The black tundish should be pointing down, and the open part facing forward for clear visibility. 	<p>Fit the 3 bar heating system safety valve to the heating return pipe near the boiler, together with a pressure gauge. The 15mm discharge should be linked to a 22mm common discharge pipe connecting the boiler temperature and pressure relief valves, and the cold water safety relief valve. The tundish and safety discharge pipe must be fitted in accordance with the G3 regulations, as described in the Multi installation manual.</p>

Picture for wall frame and pipework assembly kit	Assembly instructions for wall frame and pipework assembly kit	Assembly instructions using loose components
10. Central heating system cold fill valve		
	<p>A ½" filler valve is supplied, which fits between the cold supply and the safety discharge pipe on the heating flow. Fit this as shown, with the flow arrow from right to left, and the small discharge orifice pointing down. Connect each end to the flat face tap washers provided, not forgetting the sealing washers. Take the silicone tube and push over the discharge orifice. Push the other end into the back entry opening of the tundish.</p> <p>Cold fill valve - This valve may be left permanently connected. However, the lever operated fill valve must be turned off once the system is up to pressure.</p> <p>Autofill valve – If this option is used, fit this valve on the cold feed side to the filler valve (inlet side). The filler valve can then be left open.</p>	<p>Use the filler loop provided with the Robokit expansion vessel. Connect as instructions between the cold supply and the heating system. Ensure that the double check valve is connected to the heating side.</p> <p>The flexible hose must be disconnected at one end once the system is filled.</p>
11. Expansion vessels		
	<p>Fit the expansion vessel mounting plate (EVMP) to the frame (not shown in this picture). To do this, remove the lower two bolts holding the valve plate. Insert mounting plate and refit the two bolts to hold both the valve plate and EVMP in position.</p> <p>Sit the red expansion vessel in the left hole and connect to the ¾" tap connector, not forgetting to insert the sealing washer. Sit the white expansion vessel in the right hand hole and connect to the ¾" tap connector, not forgetting to fit the sealing washer.</p>	<p>The red heating system expansion vessel is supplied as a Robokit. This includes a wall mounting bracket, a filler loop, safety discharge valve and a system connection. Assemble as per instructions given with the Kit.</p> <p>The white hot water expansion vessel is also supplied with a wall mounting bracket. This must be connected to the secondary pipework as described in section 4 above. Under no circumstances must an isolating valve be fitted between the expansion vessel and the circuit which it serves.</p>
12. Combined condensate waste and safety valve discharge system (Optional extra kit)		
	<p>Fit the 32mm grey condensate trap to the boiler outlet, ensuring that the trap is pushed fully home (some lubricant will assist) The outlet should face forward. Take the white 32mm compression connector and remove the nut, ring and olive from one end. Discard the olive and ring. Fit the white ring over the female end of the black elbow supplied with the trap. Push the elbow on to the trap outlet. Then screw the white compression connector on to the elbow.</p> <p>Connect the HepVO trap to the tundish using the 1" brass nipple and 1.25" bush, and screw together tightly. Assemble the grey push fit pipe, elbows and tee as illustrated. The discharge pipe should be in polypropylene with push fit fittings, and can be taken to a soil pipe or other drain. The outlet must be protected.</p>	<p>Condensate waste only</p> <p>Fit the 32mm grey condensate trap to the boiler outlet, ensuring that the trap is pushed fully home (some lubricant will assist) The outlet should face forward.</p> <p>Take the white 32mm compression connector and remove the nut, ring and olive from one end. Throw away the olive and ring. Fit the white ring over the female end of the black elbow supplied with the trap. Push the elbow on to the trap outlet. Then screw the white compression connector on to the elbow. The 32mm waste pipe can then be connected and run to the selected drainage outlet. (Note: the trap connection is a different size to a standard UK 32mm pipe)</p>
13. Finally Tighten all joints, check over, fill system with water, and test for water tightness. Test for gas tightness.		

7.9. Connecting the domestic hot water supply.

The cold water inlet and hot water outlet connection points for supplying domestic hot water are located on the underside of the appliance (Fig 20). The cold water inlet (K) is colour coded blue, the hot water outlet (W) colour coded red, and both are 15mm.

Figure 20: Mains-side hot & cold water connections.



The cold water inlet to the boiler must be made via the UV4 manifold. The hot water supply to the property is connected to the boiler via the 15mm diameter hot water outlet connection.

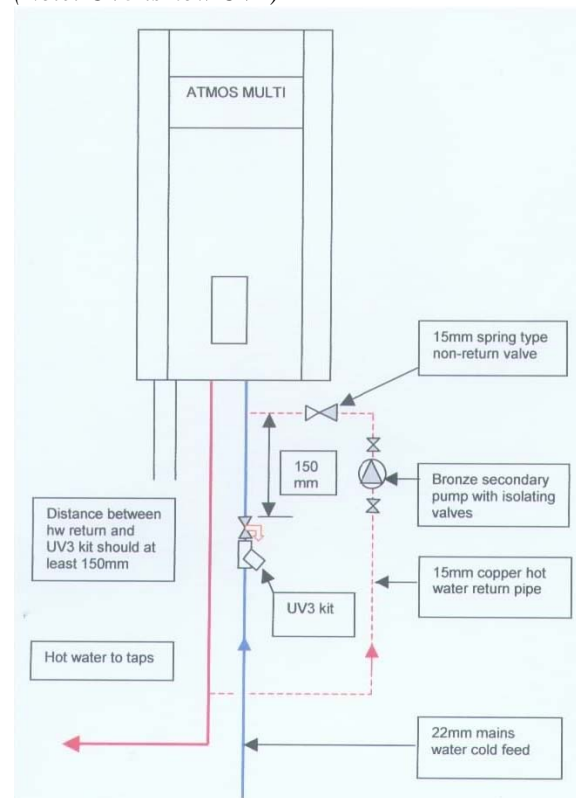
As the boiler's minimum domestic hot water temperature setting is 60°C., the installation of a thermostatic mixing valve is necessary to reduce the hot water temperature at the tap (see Fig 18).

7.10 Hot water secondary circulation.

While there is no separate secondary return connection on the boiler, a secondary re-circulation loop may be installed. Where required, the secondary return should be taken to the cold water feed of the storage tank, immediately after the UV4 manifold. The return must not pass through the UV4 manifold. If the secondary return loop has a volume in excess of 1 litre, a larger potable expansion vessel should be used. Contact Atmos Heating Systems for further advice.

A non-return valve must be fitted to the return loop to prevent the back flow of cold water to the hot water taps. (Fig 20a)

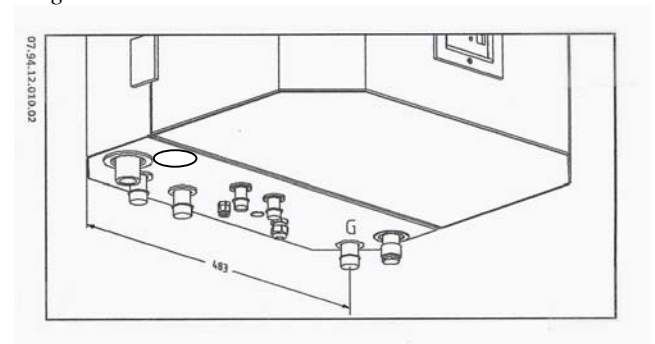
Figure 20a Hot water secondary circulation (Note: UV3 is now UV4)



7.11. Connecting the gas supply.

The gas pipe inlet connection is located on the underside of the appliance being colour coded in yellow (G). (Fig 21).

Figure 21: Gas inlet connection



Check the boiler's data plate to ensure that the appliance has been set for the correct gas supply. The boiler is available for either Natural Gas (G20) or propane (G31).

For Natural gas, the supply pipe must have a minimum diameter of 22mm. The meter governor should deliver a dynamic pressure of 20mbar for natural gas or 37mbar for propane.

The ¼ turn gas tap provided must be fitted in the supply immediately before the boiler to enable complete gas isolation to the boiler during maintenance and servicing work.

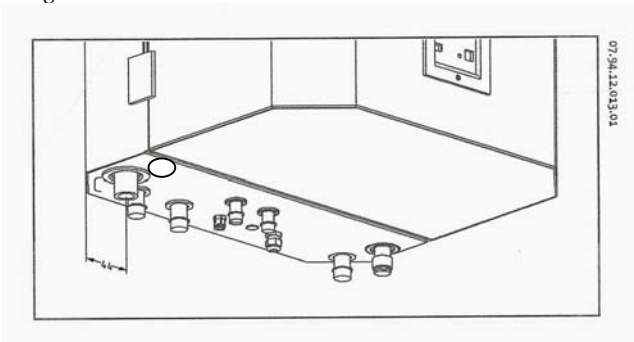
To prevent the ingress of foreign matter and possible damage to the gas-regulating block, the gas supply pipe must be checked for contaminants prior to connection to the boiler.

On final connection of the gas supply to the boiler, the complete gas installation, including the meter, must be tested for gas soundness and purged as described in BS6891.

7.12. Connecting the condensate siphon

The connector for the condensate water discharge is located on the underside of the appliance (C). (Fig. 22).

Figure 22: Condensate connection.



Locate and connect the supplied siphon to the boiler's condensate drain connection via 32mm dia plastic pipe.

For condensate drainage pipework, refer to Section 6.5 of these instructions.

7.13. Connecting the electrical supply.

Warning! The internal electrical wiring of the Atmos Multi is complete and must not be changed or adapted in any way.

All electrical connections to the mains supply must be made in full accordance with the current I.E.E. regulations.

The boiler must be earthed and connected via a double pole isolating switch fused to 3 amp or alternatively, by the use of a 3 amp fused three pin plug and unswitched shuttered socket outlet.

Where possible, it is recommended that the appliance is protected against electrical surges by the fitting of an anti-surge device.

It is essential that the Live and Neutral connections are the correct way round. If they are reversed, the control unit will lock and a malfunction alert 'L' will be displayed on the control panel. Should this occur, the wiring must be reversed to its correct state and the boiler re-started.

The terminal block for the connection for a volt free room thermostat, or time clock, is located behind the control unit. The terminals are wired to the input circuit of the control unit, which has its own 'wetting voltage'.

Important Note!

Under no circumstances must any electrical power be input to the room thermostat terminals. It is a volt-free switch.

Care must also be taken to avoid induced voltages caused by the running of the thermostat cables along side other main voltage cables.

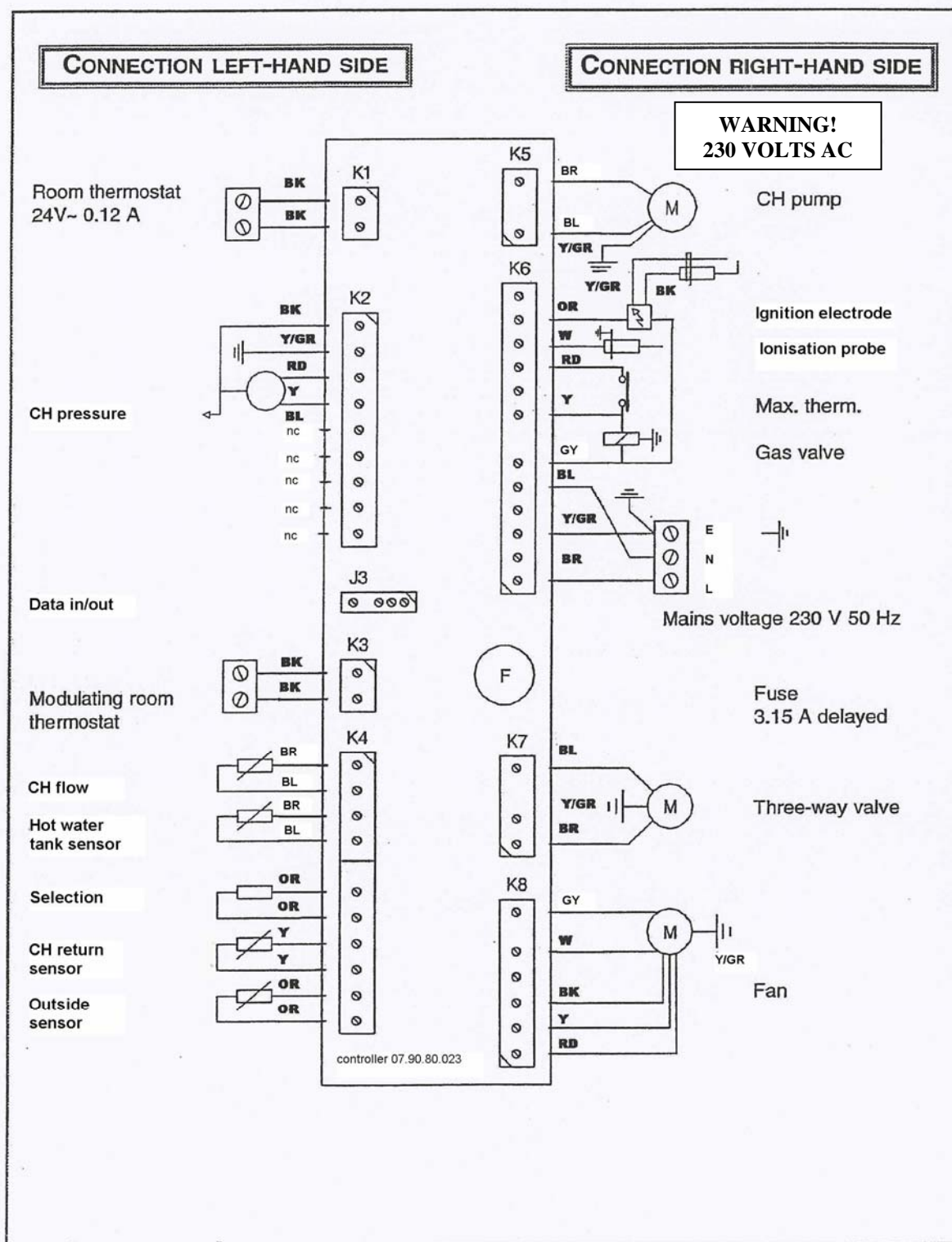
If using a room thermostat with heat accelerator, this must be set at 0-12A. The maximum permissible resistance of the room thermostat circuit is 22 Ohms. Where a clock thermostat is employed, the closed-circuit current must not exceed 20mA when there is no demand for heat.

It is recommended that the room thermostat is not set lower than 15°C during the winter months.

Where a 'wireless' room thermostat is employed, consult the manufacturer's instructions for installation.

A wiring diagram of the Atmos Multi is given in Fig 24.

Figure 24: Atmos Multi wiring diagram.



KEY		
BL	= BLUE	Y/GR = YELLOW/GREEN
BR	= BROWN	RD = RED
Y	= YELLOW	W = WHITE
	GY = GREY	BK = BLACK
	OR = ORANGE	

8. Commissioning.

Note: We include Benchmark Logbooks with every boiler and advise that they are filled in during the commissioning procedure.

8.1 Filling the heating system.

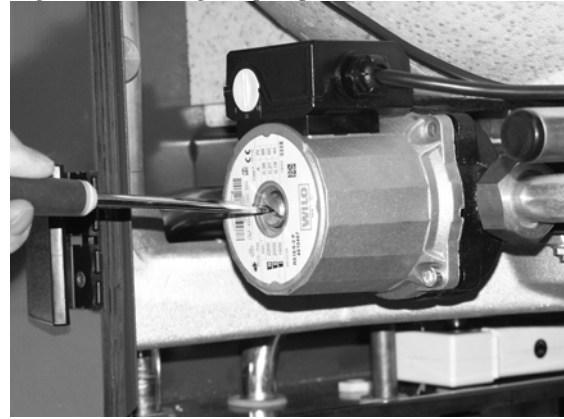
Warning! The Atmos Multi must not be operated without filling with water.

On completion of the boiler installation and ensuring that all water connections are correctly made and tight, the boiler may be filled with clean water by fitting the supplied filling hose and opening the manual filling valves, or in the case of the Wall frame and Pipework Assembly kit, open the cold fill valve in the filling loop. See also Section 7.8, part 10.

On filling:-

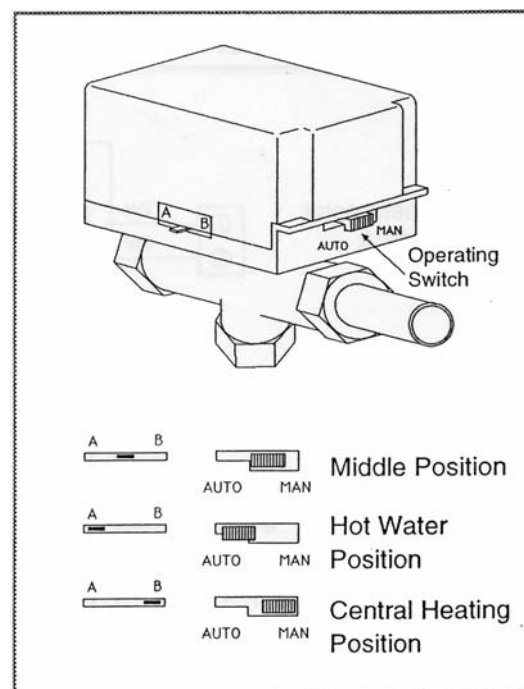
- ❑ Ensure that the boiler's automatic air vent sealing cap is loose.
- ❑ Slowly fill the installation until a system pressure of 1.5 bar is obtained.
- ❑ Vent each radiator and purpose fitted air vent in turn starting with the lowest in the system. The system pressure should be regularly monitored during this process and topped up when required.
- ❑ Air must be vented from the boiler pump by unscrewing the pump's integral vent plug (Fig 26) and allowing water to bleed for a few seconds, taking care not to allow water to splash onto the boiler's electric parts. This process may have to be repeated two or three times during the filling process.
- ❑ Check that the pump shaft rotates freely:-
With the plug out, insert a narrow flat screwdriver into the end of the shaft and rotate. Replace the plug.

Figure 26: Venting the pump



- ❑ Test the operation of the heating system's 3 bar safety valve by turning the valve knob anti-clockwise until water is released, at which point the valve must be closed.
- ❑ Continue to fill the system until all air has been expelled, leaving the system pressure at a nominal 1.5bar.
- ❑ Check the system for water soundness, rectifying where necessary and disconnect the system filling hose.

Figure 27: Three-way valve



NOTE!

To aid filling, the boiler is supplied with its integral three way valve locked in the middle position. Once full, the valve must be unlocked by lightly pressing and then pulling the black button located on the rear of the valve. (Fig. 27). The three way valve will then return to the 'Auto' position.

Where required, Sentinel X100 may be added to the system water in accordance with the manufacturer's instructions. Atmos Heating Systems do not recommend the use of any other inhibitor or additive. The use of a non-recommended inhibitor or additive will invalidate the boiler guarantee.

Note! For existing central heating systems, the final system water must have a pH value of between 6.5 and 8.

8.2 Filling the domestic hot water system.

- ❑ Open the UV4 combined stop tap and pressure reducing valve and allow the storage tank to fill with water. Check the pipework and connections up to the safety valves for leaks.
- ❑ Vent the domestic hot water system by opening all hot water outlets until water is discharged.
- ❑ Turn off the hot water outlets once the discharge water is clear and free from impurities.
- ❑ Check the system for water soundness, rectifying where necessary.

Note! If there was any possibility of debris entering the domestic hot water circuit during filling, the filter on the UV4 pressure-reducing valve must be removed and cleaned as necessary.

8.3 Appliance operation.

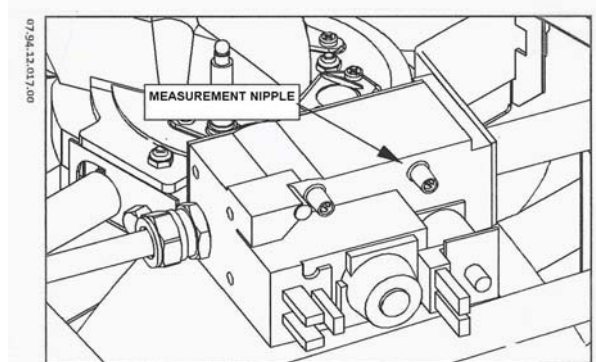
The appliance may be put into operation by the following procedure:-

- ❑ With the appliance manual gas tap in the 'Off' position, switch on the electrical supply to the boiler. If a letter 'L' appears on the diagnostic display the boiler has been wired with reversed Live and Neutral connections, and must be corrected.
- Check that the water pressure in the central heating circuit is approximately 1.5 bar at the appliance. If the central heating water pressure is below 0.5 bar, or higher than 3 bar, a letter 'C' alternating with the work status of the appliance will be shown by a warning report on the diagnostic display. (see Section 12.). If this report is shown, the appliance will only run at its minimum capacity. Correct the pressure before proceeding.

- ❑ Switch off the domestic hot water heating by pressing the 'Hot water' button on the operating panel. The 'On' indication light will go out.

- ❑ Open the appliance gas tap and purge the gas supply if necessary via the measurement nipple provided for measuring the inlet pressure (Fig. 29).

Figure 29:



- ❑ Set the room thermostat at its highest position. The appliance will now start (status report Code 2•). If the hot water temperature is under 10°C, the frost protection will cut in and the boiler will automatically revert to raising the hot water temperature above 15°C (status report Code 3•).

Note! If air is still present in the gas supply, the boiler's burner may attempt to ignite several times. After four start attempts, a flame malfunction will be indicated (flashing 3•). If this occurs, unlock the control unit by pressing the 'Reset' button. Once fired, the appliance will run for the first 3 minutes at the lowest capacity and will then switch to its maximum capacity until the central heating water temperature reaches 80°C. The appliance modulates between 80°C and 90°C.

The boiler is preset to give a maximum heating flow temperature of 90°C. On most installations, it may be advisable to change this to 75°C, in which case the appliance will modulate between 70°C and 75°C.

To set heating flow temperature, press and hold 'Set' button for 10 secs, or until a capital 'A' appears in the status display (to access the Installer's Program). Press the 'Set' button 3 times to obtain a capital 'C' in the status display. The lower display will show 90. Press the 'Hot water' button twice to change to 75°C. Press the 'Reset' button twice to exit the program.

❑ If the boiler's burner fails to ignite after 3 reset attempts, re-purge the gas supply, using the inlet pressure measurement nipple. Otherwise consult the Atmos Heating Systems.

❑ Ensure that the appliance is functioning correctly by undertaking the following inspections and noting the results and work carried out on the Service Card (located on the front of the boilers storage tank insulation shells):-

1. Visual inspection of the combustion flame.
2. Measurement of the gas flow rate by stopwatch & meter.
3. Measurement of either the O₂ or CO₂ percentage concentration within the flue gases by flue gas analysis.
4. Measurement of the gas inlet pressure.

❑ The procedure required to undertake inspections 1, 2 & 3 are detailed in Section 10 of these instructions. The procedure for inspection 4 is as follows:-

❖ The measurement of gas inlet pressure must be taken during burner operation at maximum heat input via the measurement nipple provided on the gas valve. (Fig 29). The gas inlet pressure reading must be at least 20mbar.

❑ Check the burner's gas rate by stopwatch and meter. On the maximum input of 24kW or 32kW (depending on boiler model), the time taken to use 0.024 m³ (0.847 ft³) or 0.032 m³ (1.130 ft³) of gas respectively should be 33 seconds (± 2seconds.) When timing 1 ft³ on the meter, the equivalent is 39 secs (24kW) or 29 secs (32kW).

When counting the litres over 2 min period for metric meter, this is equivalent to 87 litres (24kW) or 116 litres (32kW).

❑ Set the room thermostat to its minimum setting.

❑ Switch on the hot water heating by pressing the hot water button. The 'On' indication light will illuminate. The three-way valve will switch over to the water heater position and the burner will ignite to heat the stored domestic hot water. (status report Code 1•).

❑ Reset the room thermostat back to the desired position.

Note!

If during the heating of the stored domestic water, the room thermostat also makes a demand for heating, the hot water and central heating demand will be met simultaneously (status report Code 4•).

The following codes may also appear on the diagnostic display during the commissioning process:-

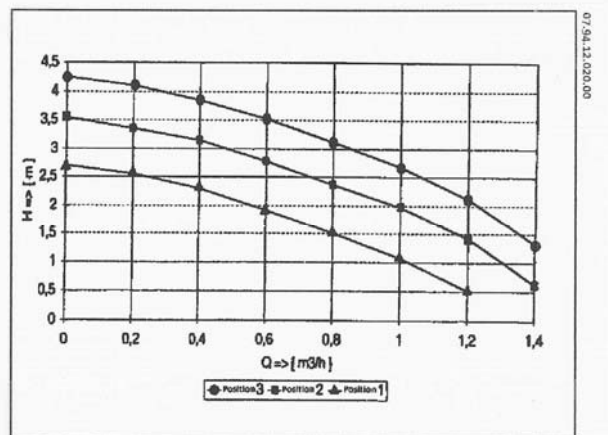
- (1•) Heat demand water heater
- (2•) Heat demand central heating
- (3•) Heat demand water heater and C/heating, priority water heater heating
- (4•) Heat demand water heater and C/heating, supply to both.

8.4 System balancing.

For efficient boiler operation, the heating system must be correctly balanced to ensure that all radiators are heating up evenly and a required temp. differential of about 20°C is present between the boiler's heating flow and return connections.

The required water flow rate through the appliance is 0.8 m³/h and 1.2 m³/h for the Atmos Multi 24 and 32 models respectively. The maximum permissible system resistance to enable the boiler pump to achieve these flow rates is 3.1m and 2.1m respectively. (Fig 30).

Figure 30: Available pump outputs



9. System shutdown.

9.1 Central heating circuit.

- ❑ Leave the appliance connected to the main electrical supply.
- ❑ Turn the room thermostat to its minimum setting. The domestic water heater will remain at its set temperature setting.

Note! On shutting down the central heating system, it is recommended not to set the room thermostat lower than 10°C during the winter months. To prevent the installation from freezing, it is recommended that all radiator valves be left fully or partially open.

9.2 Domestic hot water.

- ❑ Leave the appliance connected to the main electrical supply.
- ❑ Switch off the domestic hot water by pressing the 'Hot water' button. The 'On' indication light will go out. (The stored water is protected against freezing in winter months by an automatic frost protection that activates on a water temperature of 15°C).

Note! The heating and domestic hot water installation must be independently protected from frost. The boiler's built-in frost protection facility will only safeguard the appliance itself.

9.3 Draining the boiler

Hot water tank

- ❑ Turn off the cold water mains stop tap and open the domestic hot taps.
- ❑ Connect a flexible hose from the drain cock in the pipe from the UV4 manifold, into the tundish or nearest waste outlet. Open the drain cock, and the water from the hot water tank will flow into the waste pipe.

Central heating circuit.

- ❑ Switch off the boiler electrical supply.
- ❑ Set the three-way valve (Fig 27) at the middle position by pressing in the black button until it locks
- ❑ Allow the installation to drain using purpose fitted drain cocks.

9.4 Disposal of the appliance

The Atmos Multi is made of a number of primary materials, especially copper, aluminium and steel. These materials can easily be separated and recycled at the end of the life span of the appliance. Therefore do not throw away the appliance, but make enquiries at your local council or a scrap dealer about disposal.

10. Routine Inspection and Servicing.

To ensure continued efficient operation of the Atmos Multi, it must be checked and serviced as necessary at regular intervals. The frequency of servicing depends upon the individual installation conditions and usage, but must be a minimum of once per year.

The extent of the servicing required is determined by the operating condition of the appliance when tested by a fully qualified engineer.

Only competent engineers such as a CORGI registered installer must carry out any service work.

10.1 Boiler pre-service inspection.

Warning!

Turn off the boiler electrical supply before removing the appliance casing. The fan, gas valve, three-way valve and central heating pump are mains fed with 230 volts AC.

The annual inspection of the boiler comprises the following:-

1. Visual inspection of the flame
2. Measuring the gas rate.
3. The measurement of the O₂ or CO₂ concentration in the flue gas.
4. Inspecting the ionisation flow.
5. Inspecting the siphon.

Note! The inspection results and any servicing work undertaken should be noted on the Service card located on the front of the hot water storage tank insulation shells.

1. Visual inspection of the flame

The flame must be assessed after one minute of combustion at the low position or high position.

□ *Low position*

Viewed from top to bottom on the combustion seat, the burner flame picture must have the presence of a light blue flame.

A completely red flame indicates that the supplied air/gas mixture is gas rich; an entirely dark blue flame indicates an air rich mixture.

If the flame picture is correct, there is no need to measure the O₂ or CO₂ concentration of the flue gas, and point 3 of the inspection can be left aside. If the flame picture is not correct, the O₂ or CO₂ percentage of the flue gas must be measured.

□ *High position*

Viewed from top to bottom on the combustion seat, the burner flame picture must have the presence of an entirely blue flame. When the low position flame is set correctly, the high position flame will be correct. No separate adjustment is made.

If the flame picture is not correct, the O₂ or CO₂ percentage of the flue gas must be measured.

2. Measuring the gas rate.

Check the burner's gas rate by stopwatch and meter. On the boiler's maximum burner input of 24kW or 32kW (depending on boiler model), the time taken to use 0.024 m³ (0.847 ft³) or 0.032 m³ (1.130 ft³) of gas respectively should be 33 seconds (± 2seconds). See also Section 8.3 for alternative figures for 1 ft³ (or litres for metric meter).

Note! If the flue's 80mm diameter gas discharge duct is longer than 10 metres, the gas rate can be reduced. The measured time will in this case increase by up to 2%.

Record the measured value on the appliance service card. Compare the measured time with the value(s) recorded last time the appliance was put into operation and/or the previous annual inspection.

If the measured time falls outside of the tolerances, inspect the air supply and flue gas discharge system and the heat exchanger of the appliance for soiling, and clean where necessary (see Section 10.3).

3. Measuring the O₂ or CO₂ concentration of the flue gas.

The O₂ or CO₂ measurement of the flue gas must be undertaken using an analyser calibrated to a precision of < 0.2%.

Flue gas samples can be taken from the test hole at the left-hand side of the outlet casing. (See Fig. 19)

Set combustion at high or low rate by entering the service program.

1) Press and hold the 'Set' button on the controller for 10 secs until a capital 'A' appears on the central heating display.

2) By pressing the 'Hot water' button, it is possible to scroll between the low rate, high rate and an indication of the strength of flame ionisation. (See inspection point 4).

3) With the burner set to a low rate (LL), sample the flue gases. The CO₂ measurement should be within the limits given in Table 6. Correct the measured value by adjusting the gas valve regulator (Fig 36). Remove the dust cap using a 4mm hexagonal wrench (or No 25 Torx driver). Turn the regulator screw beneath by small increments to bring the figure within the range of Table 6; clockwise to increase the gas supply and thus the CO₂ content, and anticlockwise to decrease the CO₂ content. Once the low rate is set, check the CO₂ content is correct at the high rate (HH). Should the high position be outside the range tolerated, return to the low position, correct the setting and return to high to recheck the CO₂ measurement. Replace the dust cap and the flue gas test cap when finished. Record the data on the Service card.

Table 6. O₂ and CO₂ limits

	O ₂ %	CO ₂ %
HIGH POSITION	4,5 - 5,5	8,6 - 9,2
LOW POSITION	5,5 - 7,0	7,8 - 8,6

4. Inspecting the Ionisation flow.

The ionisation flow of the burner can be read off via the Installer Programme of the control unit. The ionisation flow should be greater than 40 for both the low and high positions. If there are differences the ionisation probe must be examined and replaced as necessary (see Section 11.4). Press and hold the 'Set' button on the controller for 10 secs until a capital 'A' appears on the central heating display. Press the 'Hot water' button once. The ionisation flow alternating with 'LL' for low burner rate will be displayed. Press the 'Hot water' button again. The fan will speed up, the burner will go to high output, and 'HH' alternating with the ionisation flow will be displayed. Press the 'Reset' button twice to restore to normal operation. Record the data on the Service card.

5. Inspecting the siphon.

Remove the siphon. Remove the cap from the siphon at the bottom of the appliance and drain contents into a suitable container. Replace cap firmly, refill siphon with water and refit to boiler. Check the deposits for the presence of aluminium oxide. If a quantity of aluminium oxide is present, this could indicate that the outlet casting requires removal and cleaning (see Section 10.3). These deposits, if excessive, could indicate that the boiler heating output is not sufficient to meet the system demand.

10.2 Auxiliary equipment inspection.

The annual inspection of the boiler's auxiliary equipment comprises checking the following:-

1. Operation of safety relief valves.
2. Operation of pressure reducing valve.
3. Expansion vessels pre-charge.

1. Safety relief valves.

Three safety relief valves are fitted to the system, two are external to the boiler and one internal. The operation of the two external pressure relief valves may be checked by rotating the cap of the valve through 90°. The internal temperature and pressure relief valve can be checked by lifting the lever. In each case water should be discharged. This can be heard and also seen in the discharge tundish. If there is no discharge, check that the system is correctly pressurised, and if so, replace the defective valve. Finally, check that there is no leakage when the valves are returned to their closed position.

Note: Where HepVo trap is used, it is important requirement to run water through it during the annual inspection, to maintain its correct functioning.

2. Pressure reducing valve

Turn off the cold water supply and remove the pressure reducing valve's head from the UV4 manifold. Check the gauze filter and clean or replace as necessary.

Turn the water supply back on and use a suitable gauge to check that the water pressure at a hot water tap is no higher than 3.5 bar (the correct pre-set pressure). If the pressure is higher than 3.5 bar, then replace the pressure reducing valve.

3. Expansion vessels

□ Domestic hot water vessel. (Blue)

Turn off the mains cold water supply stop tap and depressurise the domestic hot water system. Apply a suitable air pressure gauge to the air valve on the end of the vessel. The pressure should be 3.0 bar. If less, restore the pressure. If the vessel fails to pressurise, check and replace.

□ Heating system vessel (Red)

Isolate the boiler and depressurise the heating system. Follow the procedure for the domestic hot water vessel ensuring the pre charge pressure is as stated on the expansion vessel label. (Normally 1.5 bar).

10.3 .Servicing the boiler.

Warning! Before servicing the boiler, isolate the electrical supply and close the boiler's gas service control tap. Allow the boiler to cool before commencing work.

Gas soundness checks must always be carried out following servicing of any gas-carrying component. Following servicing work, electrical system safety checks must always be undertaken using a suitable instrument prior to reinstating the electrical supply to the appliance.

Correct boiler servicing comprises the following:-

1. Cleaning the appliance outlet casting.
2. Inspecting the burner unit.
3. Cleaning the heat exchanger.
4. Inspect air supply/flue gas discharge system.
5. Unvented hot water tank inspection.

1. Cleaning the appliance outlet casting

Using a 10mm socket, release the 3 fixing nuts securing the outlet casting to the base of the heat exchanger and remove the casting by gently separating it from the push fit connection with the condensate trap and the flue gas discharge pipe. (Fig 31).

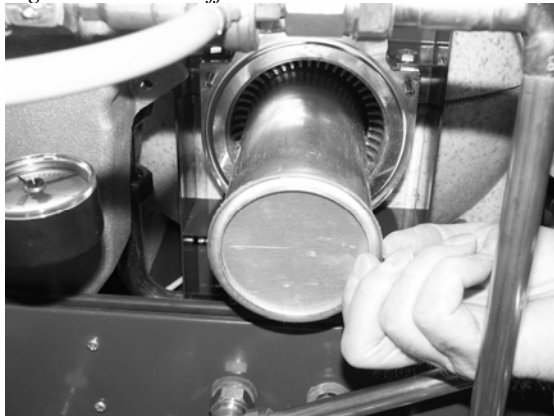
Remove the flue baffle and take care of the ceramic core.

Inspect the outlet casting and baffle, cleaning where necessary. Replace in reverse order.

Figure 31: Outlet casting



Figure 32: Flue baffle

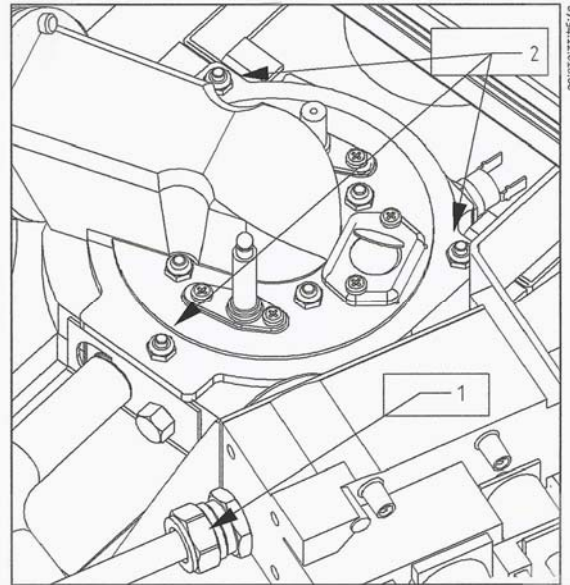


2. Inspecting the burner unit

Disconnect the gas injector nozzle tube between the gas valve and the mixing chamber via the union, and release the 3 fixing nuts securing the burner to the inlet casting, using an 10mm socket. (Fig 33 items 1 and 2)

Disconnect the push on electrical connections to the fan, high temperature thermostat, ignition electrode and ionisation electrode.

Figure 33: Removing burner assembly.

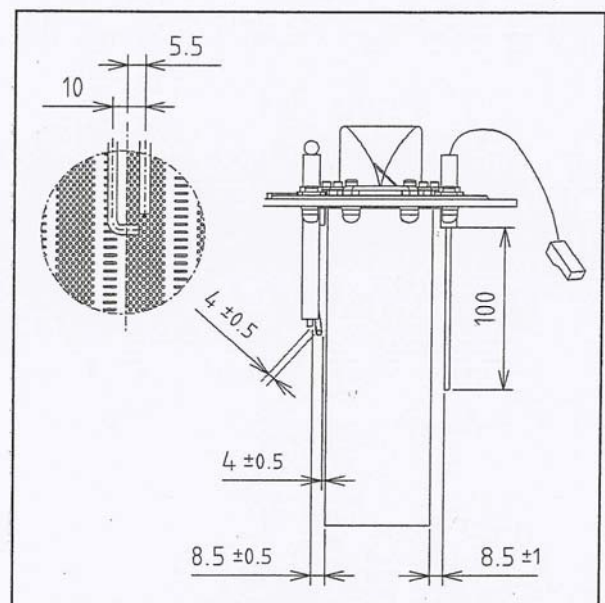


Lift and remove the burner assembly from the appliance.

Inspect the ignition electrode and check that the electrode's gap between the burner and earth pin are 8.5mm and 4mm respectively. (Fig 34). Replace or adjust the electrode as necessary

Inspect the ionisation probe and check the distance between the electrode and the burner is 8.5mm. Replace or adjust the electrode as necessary

Figure 34: Settings of ignition/ ionisation electrodes.



Inspect the fan and the inner grating of the burner and clean where necessary using a soft brush or compressed air.

Inspect the inlet casting sealing gasket and change if necessary. Replace in reverse order.

3. Cleaning the heat exchanger.

Inspect the heat exchanger from the topside of the appliance and remove any deposits from the heat exchanger and fins using a soft brush.

Important!

The heat exchanger may need cleaning on every third service inspection.

Do not use a brush with metallic bristles, as this will damage the heat exchanger.

A purpose made heat exchanger cleaning brush (article number 93.98.12.410) is available to purchase from Atmos Heating Systems.

Re-assemble the boiler, fitting the burner assembly, flue baffle and outlet casting in reverse order to dismantling. Ensure all components are correctly sealed and located, making sure that the flue tube is pushed fully home into the outlet casting.

4. Inspect air supply/flue gas discharge system.

Inspect the air supply /flue discharge system throughout its entirety ensuring that it is in sound condition with no damage to the pipework or joints.

Inspect the terminals and their position ensuring they are clear and unobstructed, taking remedial action where necessary.

5. Unvented hot water tank inspection.

Remove the hot water tank's insulation shell, ensuring it is intact and free from damage. Replace if necessary.

Visually examine the domestic hot water tank for signs of damage or water leaks, taking remedial action where necessary.

10.4. Completion of inspection and servicing.

On completion of the annual inspection and service, the boiler must be checked for correct operation and all controls returned to their original settings, as found. The service identification number should be increased by 1 after each service (as described in the Appendix 2 Section 6).

Where applicable, check the Sentinel X100 inhibitor concentration level within the system water, topping up when necessary.

11. Component Replacement.

Warning! When replacing components, isolate the electrical supply and close the boiler's gas service control tap. Allow the boiler to cool before commencing work.

The replacement of the following components does not require draining of the boiler.

11.1 Gas Valve.

Disconnect the gas injector nozzle tube between the gas valve and the mixing chamber via the union and remove the valves 'push' on electrical connections (Fig 36 & 37).

Release the valve's fixing bracket retaining bolt using an 8mm spanner and remove gas valve
Figure 36

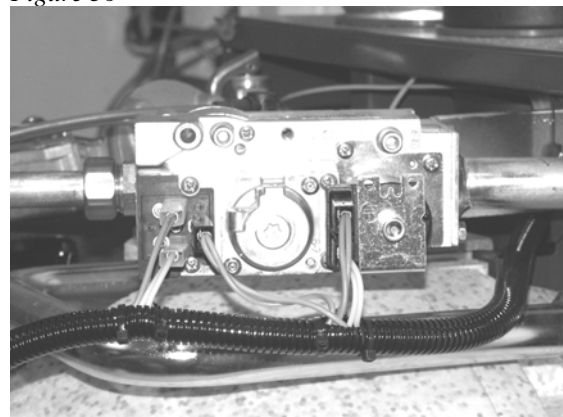


Figure 37



Fit replacement gas valve in reverse order. Reinststate boiler operation and check gas valve settings (Refer to section 10.1)

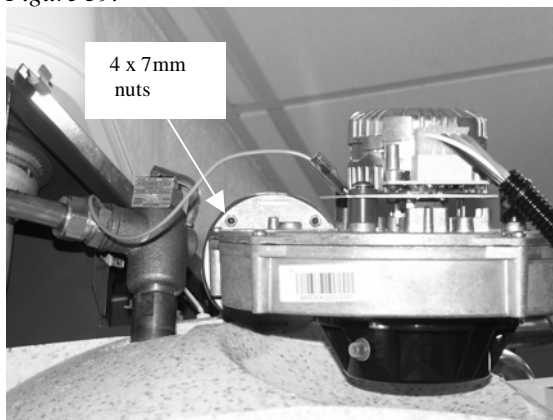
11.2 Fan

Disconnect the connecting tube from the gas valve to the fan via the union. (Fig 36) and remove gas supply tube from the fan inlet connection.

Release the four nuts securing the fan to the burner manifold using a 7mm socket (Fig 39). Unscrew the cross-headed screws to remove the gas/air mixing chamber.

Fit replacement fan in reverse order.

Figure 39.



11.3 Ignition transformer.

Isolate the electrical supply to the boiler. Disconnect the 'push' on electrical connections and release the transformer's two cross-headed fixing screws (Fig 40).

Fit new transformer in reverse order, ensuring correct connection of the power supply to terminals 1 & 2 and ignition out from terminals 3 & 4.

Warning! Incorrect connection to the transformer terminals will result in damage to the boiler control unit.

Figure 40



11.4 Burner, Ignition electrode, Ionisation electrode and Sight glass.

Isolate the electrical supply to the boiler. Disconnect and remove the burner assembly. (Refer to section 10.3).

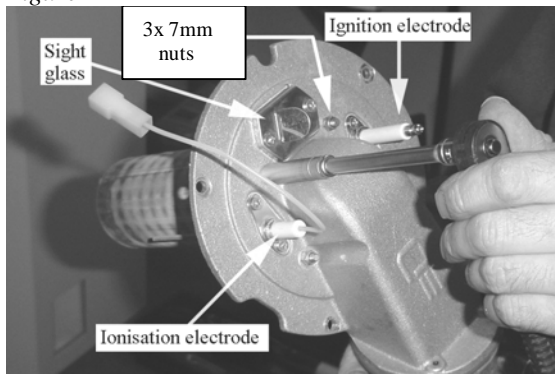
❑ **Burner.** Detach the burner from the manifold by releasing the three fixing nuts using a 10mm socket (Fig 41). Fit the new burner in reverse order replacing the burner manifold gasket.

❑ **Ignition electrode.** Detach the ignition electrode from burner manifold by releasing the two cross-headed fixing screws (Fig 41). Fit the new electrode in reverse order, checking that the electrode's distances between the burner and earth pin are 8.5mm and 4mm respectively.

❑ **Ionisation electrode.** Detach the ionisation electrode from burner manifold by releasing the two cross-headed fixing screws (Fig 41.) Fit new electrode in reverse order, checking that a 8.5mm gap exists between the electrode and burner.

❑ **Sight glass.** Detach the sight glass from burner manifold by releasing the two cross-headed fixing screws (Fig 41.) Fit new sight glass in reverse order, replacing the sealing gasket.

Figure 41

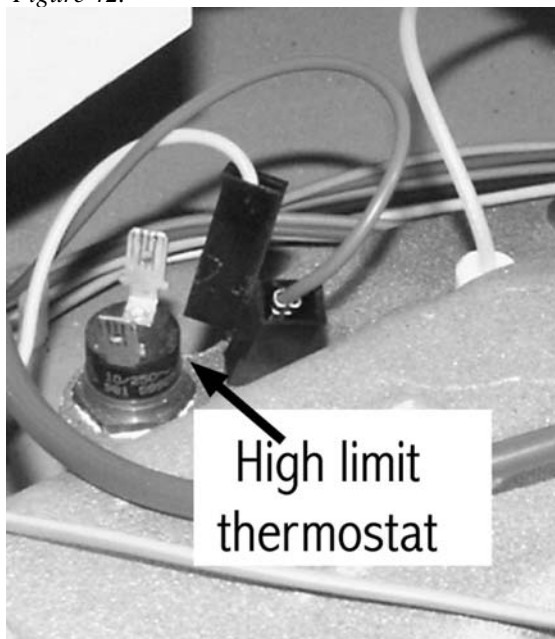


11.5 High limit thermostat.

Isolate the electrical supply to the boiler. Disconnect the thermostat's 'push' on electrical connections and unscrew the thermostat from its fitting using a 17mm socket (Fig 42).

Fit replacement thermostat in reverse order, using heat sink paste to ensure good conductivity.

Figure 42.



11.6 Hot water temperature sensor.

Isolate the electrical supply to the boiler. Disconnect the sensor's electrical connections and unscrew the hot water temperature sensor from its fitting using an 8mm spanner (Fig 43).

Fit the replacement sensor in reverse order.

Figure 43

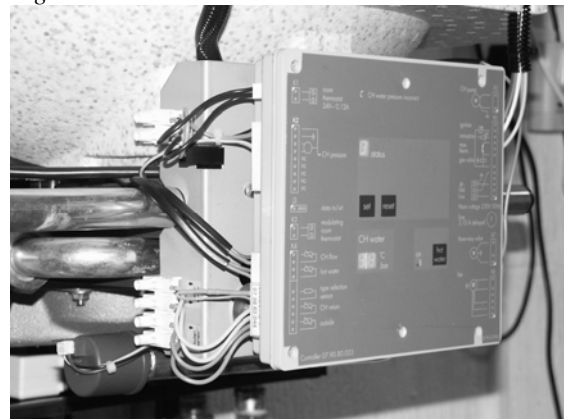


11.7 Control Unit.

Isolate the electrical supply to the boiler. Unplug all leads from the control panel. Press the control panel in, twist anticlockwise, and gently pull forwards and away (Fig 44).

Fit replacement control panel in reverse order, checking that correct polarity is maintained on connection to the mains isolation switch.

Figure 44



Note! The replacement of the following components requires the boiler to be drained.

For draining the boiler refer to section 9.3 and section 8.1 for re-filling the boiler.

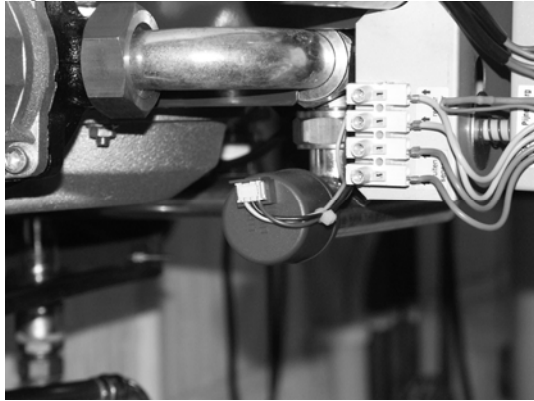
11.8 Pressure sensor.

Isolate the electrical supply to the boiler. Disconnect the pressure sensor 'push' on electrical connections. Isolate the central heating flow and return connections, depressurise and drain the primary circuit within the boiler. Gently unscrew the pressure sensor from its fitting by hand (Fig 45).

Fit replacement pressure sensor in reverse order.

Note: Do not overtighten the connection!

Figure 45



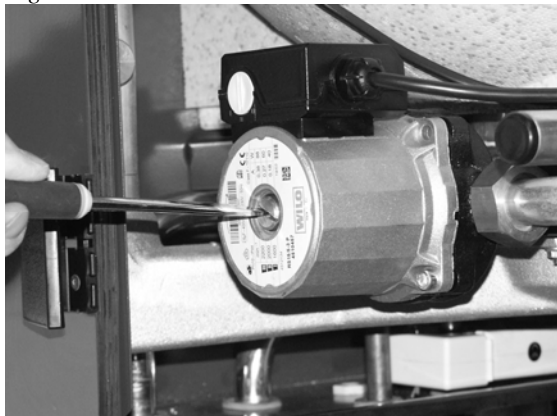
11.9 Pump head.

Isolate the electrical supply to the boiler. Disconnect the electrical connections from the pump terminal block (Fig 46).

Release the two bolts securing the pump head using a 5mm-hexagon key, and remove the pump head from the pump body.

Fit replacement pump head in reverse order. The pump must be vented via its vent plug on refilling of the boiler (venting shown in Fig 46) .

Figure 46



11.10a. Three way valve.

Isolate the electrical supply to the boiler. Unplug the three-way valve's electrical connections from the boiler control unit (Fig 44).

Disconnect the three compression pipe connections to the valve and remove valve (Fig 47).

Fit replacement three way valve in reverse order.

11.10b. Three way valve (head only).

Isolate the electrical supply to the boiler. Unplug the three-way valve's electrical connections from the boiler control unit (Fig 44).

Press button on left side of the valve head and lift off (Fig 47).

Fit replacement valve head in reverse order.

Figure 47

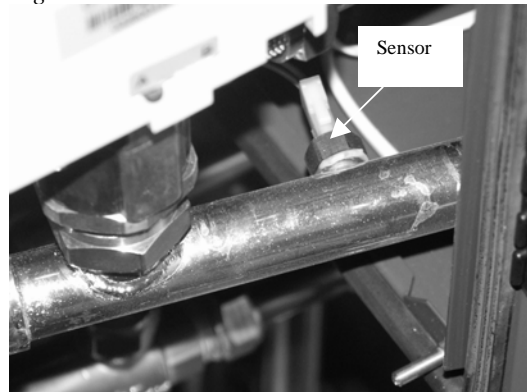


11.11 Central heating water temperature sensor.

Isolate the electrical supply to the boiler. Disconnect the central heating water temp. sensor electrical connections and unscrew the sensor from its fitting using a 15mm spanner (Fig 48).

Fit the replacement sensor in reverse order. (Beware of over-tightening the sensor! 1/4 turn more than hand tight is normally sufficient).

Figure 48



11.12 Temperature & pressure relief valve.

Drain the domestic hot water system (refer to section 9.3)

Release the valve's outlet 22mm compression fitting to the discharge pipe and remove the 1/2 fitting from the valve (Fig 49).

Unscrew the temperature & pressure relief valve and remove.

Fit replacement valve in reverse order using a sealant suitable for potable water.

Figure 49



11.13. Hot water tank.

Disconnect and remove the following boiler components:-

- Gas valve
- Fan/burner assembly
- High limit thermostat
- Temperature & pressure relief valve
- Boiler control unit
- Pump
- Front section of insulation shell.

Disconnect the top water connection (Fig 50) and bottom water connections at the rear of the tank.

Disconnect and remove the tank's top and bottom retaining brackets by releasing their fixing screws situated on both sides of the tank.

Cut the domestic cold and hot water pipes approx 50mm above where they penetrate the boiler case.

Remove hot water tank and fit replacement in reverse order, using the two 15mm compression fittings provided to reconnect the domestic hot and cold water pipes.

Figure 50

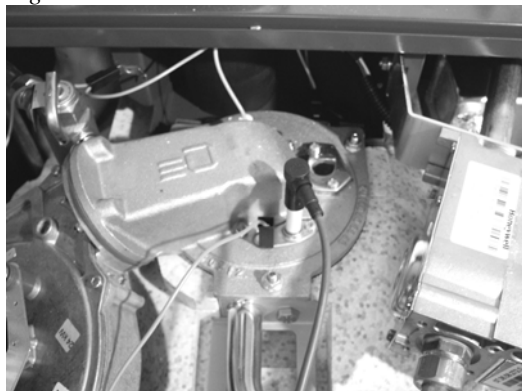
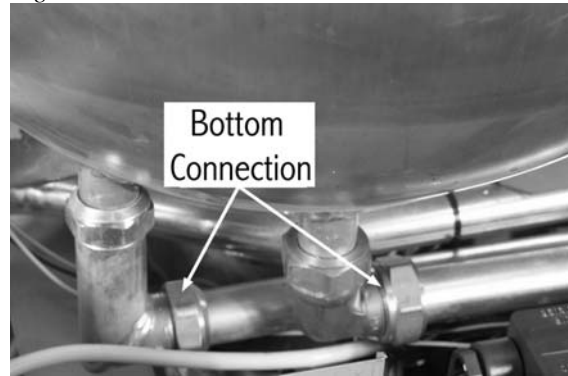


Figure 51



Multi Plus Model only

In addition, disconnect the connections to the fast recovery coil (Fig 51).

12. Malfunctions.

The Atmos Multi has three types of malfunctions that can be reported via the diagnostic display, as follows :-

- Warning report
- Block report
- Malfunction report

□ **Warning report.** A letter appearing on the diagnostic display for 1 second in every 5 seconds identifies a warning report. The appliance continues to operate, but the function to which the report relates will be switched off or ignored (Table 7).

Table 7: Warning report

Status message (Number) 8 = status report	Warning every 5 secs	Message
8	b	Incorrect hot water tank temperature reading, value <-10°C or > 118°C
8	c	Incorrect central heating water pressure, value between 0 and 0.5 bar or 3 and 4 bar (capacity is limited to low setting)
8	d	Incorrect central heating return sensor reading, value <-10°C or > 118°C
8	h	Incorrect outside sensor reading, value <-15°C or >118°C

□ **Block report.** A block is an error that occurs, without causing a malfunction. The appliance waits until the block has been resolved and then continues to operate normally. A block is indicated by a permanently lit letter on the diagnostic display (Table 8).

Table 8: Block report

Diagnostic display	Central heating water display	Message
c	HH	Central heating water temperature sensor error value >118°C
c	LL	Central heating water temperature sensor error, value <-10°C
C*		Central heating pressure lower than 1 bar (occurs when the plug is inserted into the power socket)
F		Mains frequency error
H		Internal error
L		Electrical mains plug error-correct supply polarity
n		Mains or reference voltage too low
t		Appliance type recognition error

□ **Malfunction report.** A malfunction is a fault that causes the appliance to be shut down by the control unit and locked. The appliance can only be unlocked by pressing the 'Reset' button. A flashing number or letter on the status display indicates a malfunction (Table 9).

Table 9: Malfunction report

Diagnostic display	Message
2	Fan defective (5Hz deviation per minute)
3	Incorrect ionisation (flame) signal
3.	No ionisation (flame) signal during start-up procedure
4	Ionisation signal absent during heat supply
4.	Ionisation signal remains present too long after heat supply stops
6	Gas valve control defective
7	Insufficient flow of central heating water during hot water heating
7.	Insufficient flow of central heating water during radiator heating
8	Maximum thermostat cuts out and central heating water pressure was lower than 0.5 bar
9	Maximum thermostat cuts out and central heating water sensor was higher than 80°C
9.	Safety internal malfunction in control unit
Letter	Internal malfunction in control unit
(Dark display)	Appliance receiving no voltage

First attempt to remove the malfunction by pressing the 'Reset' button once. If the appliance does not unlock, press the 'Reset' button again after approximately 15 seconds. For more information., refer to the Appendix.