

Atmos



Multi



Installation & Servicing Instructions 24/80, 24/80 Plus, 32/80 Plus, 38/80 Plus

**Atmos Heating Systems
West March
Daventry
Northants, NN11 4SA
Tel: 01327 871990
Fax: 01327 871905
e-mail: sales@atmos.uk.com
internet: www.atmos.uk.com**

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The information provided applies to the product in the standard model. Atmos Heating Systems can therefore not be held liable for any damage resulting from the product specifications that deviate from the standard model.

The information provided has been compiled with the utmost care. However, Atmos Heating Systems cannot be held liable for any faults in the information nor for the consequences thereof.

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To be changed without prior notice

Building Regulations and the Benchmark Checklist

Building Regulations (England & Wales) require notification of the installation of a heating appliance in a dwelling to the relevant Local Authority Building Control Dept. This can be achieved via a Competent Persons Self Certification Scheme as an option to notifying the Local Authority directly. Similar arrangements apply in Scotland and Northern Ireland.

Atmos Heating Systems is a member of the Benchmark Scheme and the Benchmark Checklist is included at the back of these Instructions. The Benchmark Checklist provides a Commissioning Checklist and Service Record to be completed by the Installer/ Service Engineer.

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Refer to www.centralheating.co.uk for more information.



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NOTE The Benchmark Checklist & Service Record are included at the back of the Manual.

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.

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 Note: Where appropriate and always in areas of Hard Water (hardness in excess of 200ppm), an approved water conditioner device must be fitted in accordance with the Building Regulations. Atmos can supply a suitable conditioner for fitting to the cold feed of the boiler.

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

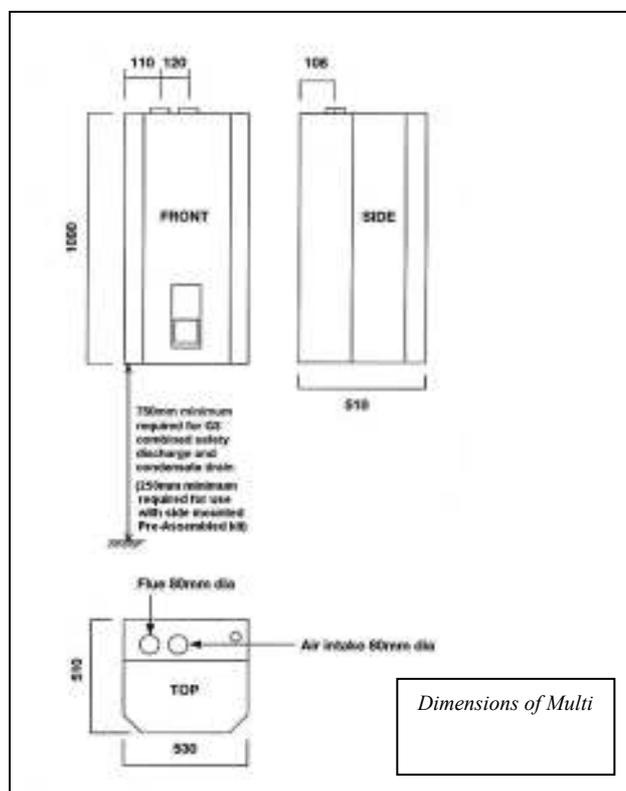
2.7 Where the boiler is intended for use on **Propane gas**, the boiler must not be installed in a room or internal space below ground level.

3. Technical Data

	Natural Gas & Propane (Propane in brackets where different)			
	24/80	24/80 Plus	32/80 Plus	38/80 Plus
Heat power input (gross) kW min - max	7.5 – 25.0	7.5 – 25.0	10.0 – 32.7	11.3 – 37.8
CONDENSING MODE (Return < 55°C)				
Heat output to radiators kW min - max	7.3 – 23.0	7.3 – 23.0	9.8 – 29.0 (29.9)	10.9 – 34.4
Maximum heat to radiators Btu/hr	78,500	78,500	99,000 (102,000)	117,400
Gross efficiency max- min	98 – 91%	98 – 91%	98 – 91%	96.7 – 91%
NON-CONDENSING MODE (80/60°C flow/return)				
Heat output to radiators kW min - max	6.9 – 22.0	6.9 – 22.0	9.3 – 27.6 (28.5)	10.5 – 32.0
Maximum heat to radiators Btu/hr	75,000	75,000	94,200 (97,300)	109,200
Gross efficiency max- min	93 - 87%	93 - 87%	93 - 86%	93 - 85%
Seasonal efficiency (Sedbuk certified) %	91.3	91.3	91.0	TBA
Gas flow rate m3/hr natural gas min/max	0.8 – 2.6	0.8 – 3.3	1.0 – 3.5	1.2 – 4.0
Gas flow rate m3/hr propane gas min/max	(0.3 – 0.9)	(0.3 – 1.2)	(0.4 – 1.5)	(0.5 – 1.7)
Flue gas temperature min/max °C	35/110	35/110	40/115	35/110
HOT WATER SYSTEM				
Maximum heat to hot water kW	17.4	26.4	27.6 (28.5)	32.2
Hot water flow rate maximum litres/min at 2 bar	25	25	25	25
Reheat time from 10 to 60°C minutes	20	12	11 (10)	9
70% reheat time minutes	17	10	9	8
Hot water at 40°C instantaneously (litres)	133	133	133	133
Hot water per hour at 40°C (litres)	450	700	725 (750)	840
Hot water per hour at 40°C (gallons)	100	150	160 (165)	185
EMISSIONS				
NOx (average) emission ppm	18	18	19	TBA
CO (average) emission ppm	10	10	20	TBA
GC Number	41 – 249 - 02	41 – 249 - 03	41 – 249 - 04	TBA

COMMON DATA

Hot water temp 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 supply volts	220/240V
Outlet pressure hot and cold water	3.5 bar
Air supply pipe diameter	80mm
Flue pipe diameter	80mm
Heating flow & return connection	22mm
Hot water outlet connection	15mm
Cold water supply pipe (to PRV)	22mm
Cold water supply appliance connection	15mm
Gas supply pipe (min for Natural Gas)	22mm
Gas pipe appliance connection	½ inch BSPM
Safety valve discharge connection	22mm
Condensate discharge drain connection	32mm
Auxiliary heating flow connection	½ inch BSPF
Height	1090mm
Width	530mm
Depth	507mm
Weight empty (full)	75kg (150kg)
Protection Class	IP44



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 VK 4115 V 220/240 VAC
6	AUTOMATIC AIR VENT	TACO 3/8"
7	CASING	ATMOS
8	HIGH LIMIT THERMOSTAT	THERM-O-DISC 36TX E31 L 105 ⁰ C
9	IONISATION PROBE	ATMOS
10	INLET CASTING	ATMOS
11	IGNITION ELECTRODE	ATMOS
12	IGNITION TRANSFORMER	HONEYWELL RAC1
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: 505.91540
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 90 ⁰ 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

Note: The ignition transformer (12) is now fitted to the gas valve (5).

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.

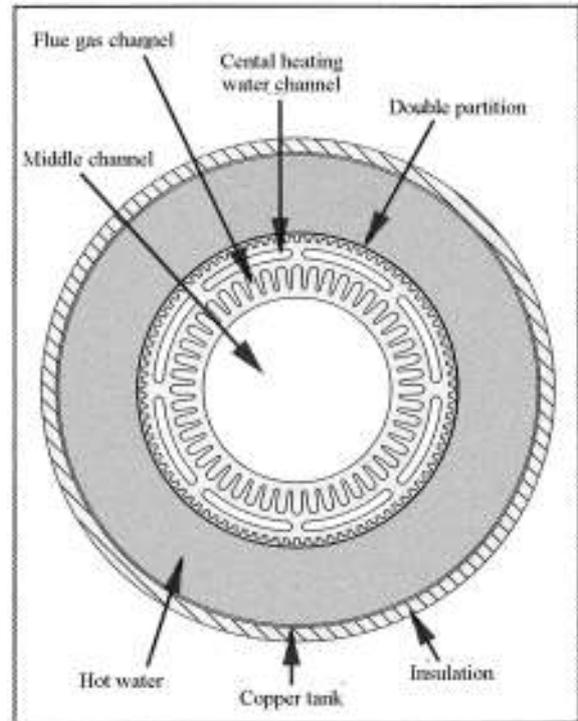


Figure 1 : Appliance Cross-Section

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), 9 to 29kW (32/80), or 10 to 34kW (38/80) 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 mins during which the burner will not re-ignite. This period may be changed via the control panel to 6 mins 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.

❑ OpenTherm Modulating Thermostat

Instead of an on/off thermostat, an OpenTherm modulating thermostat can be connected to the control unit (see 7.13). In this case the desired CH flow temperature is set by the thermostat.

❑ Weather-dependent control

(Not available if using an OpenTherm thermostat).

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.

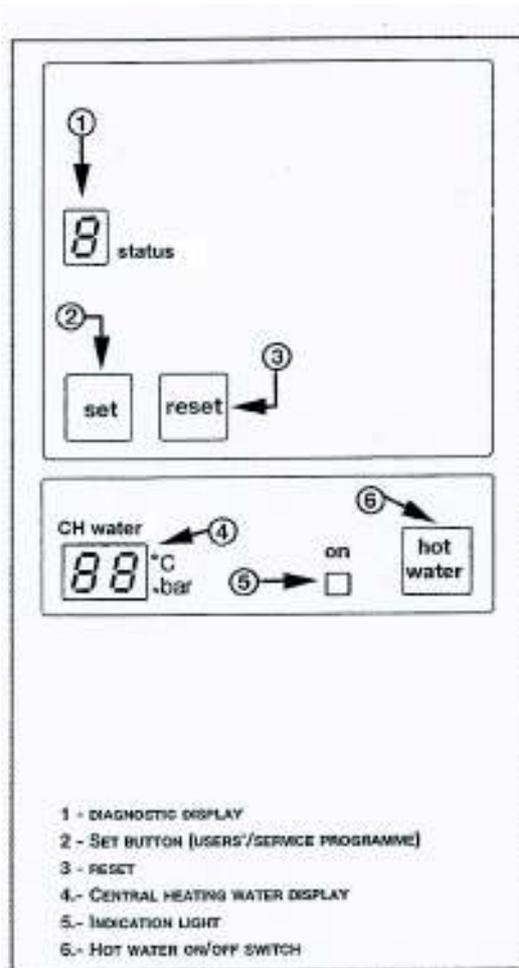


Figure 2 : Control Unit Fascia

□ 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 PRIORITY TO HW
4	HEAT DEMAND HW AND CH, SUPPLY TO BOTH
1 st 4	SEE 1-4 WITH BURNER IN OPERATION
5	FROST PROTECTION ACTIVE
6	PRE AND POST PURGE TIME
7	IGNITION PHASE
8	SELF TEST (S.E. 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	[Bars]
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. We do not recommend terminal position A (Fig 3).

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 50mm/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.

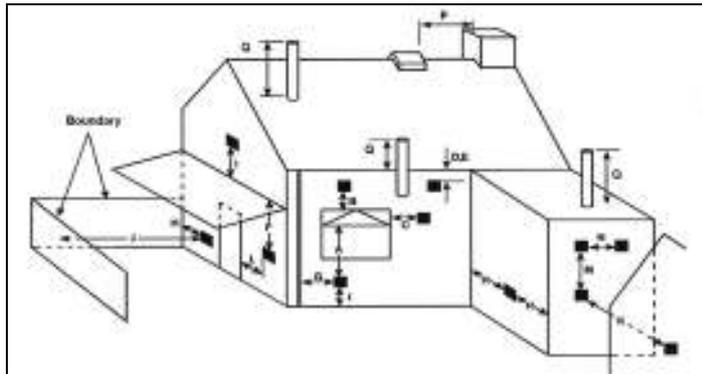


Figure 3: Flue terminal locations

TERMINAL POSITION	MIN DISTANCE
A ⁽¹⁾ - Directly below an opening window or other opening, eg air brick	300mm
B ⁽¹⁾ - Directly above an opening window or other opening, eg air brick	300mm
C ⁽¹⁾ - Horizontally to an opening window or other opening, eg air brick	300mm
D - Below gutters, soil pipes or drain pipes	75mm(2)
E - Below eaves	200mm(2)
F - Below balconies or car port roof	Not allowed
G - From a vertical drain pipe or soil pipe	150mm(2)
H - From an internal or external corner or to a boundary alongside the terminal	300mm
I - Above ground, roof or balcony level	300mm
J - From a wall, fence, building or boundary line facing the terminal	2500mm
K - From a terminal facing a terminal	2000mm
L - From an opening in a car port (eg door, window) into a dwelling	Not allowed
M - Vertically from a terminal on the same wall	1500mm
N - Horizontally from a terminal on the same wall	300mm
P - From a vertical structure on the roof	500mm
Q - Above intersection with roof	300mm

NOTES

- (1) In addition, the terminal should not be nearer than 150mm to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame.
- (2) Minimum distance is reduced to 25mm from a terminal guard.
- (3) Terminals must be sited above 2.1m from ground for walkway or patio; also for car parking area less than 2.5m from terminal.

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 concentric length of 18m for 24kW, 14m for 32kW or 12m for 38kW. Note that the terminal has already been allowed.
- ❑ 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. Note that the terminal has already been allowed.

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.

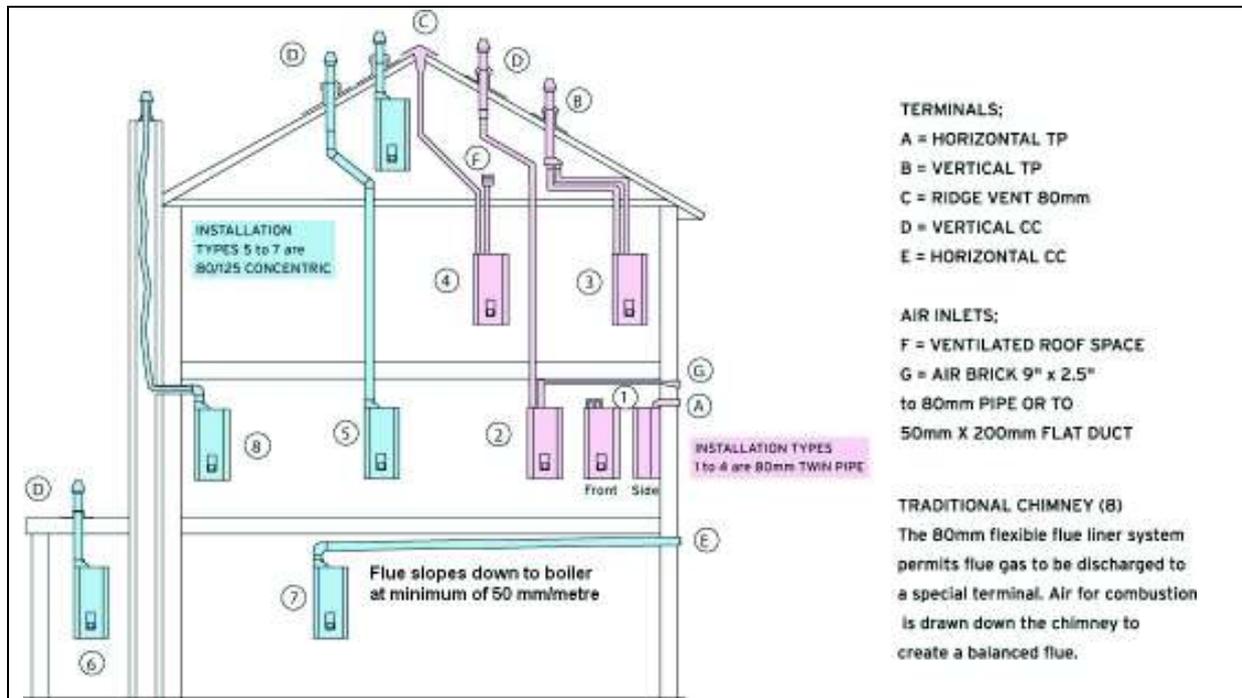


Figure 4: Examples of flue installation options

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	Equivalent Distance metres	
	80 single	80/125 conc
Pipe	80	80/125
Straight length of 1m	1.0m	1.0m
Bend 90 deg	3.0m	3.0m
Bend 45 deg	1.5m	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.

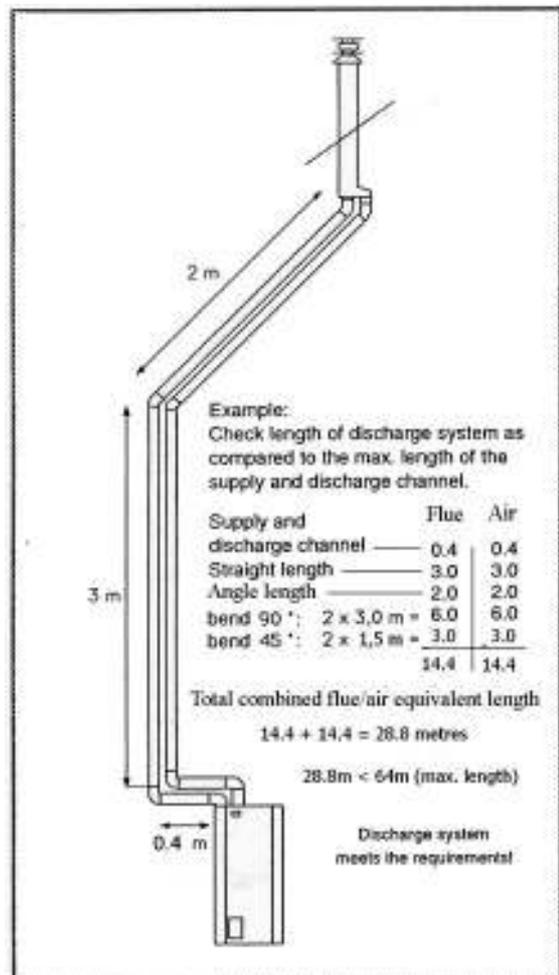


Figure 7: Worked flue length example.

Note regarding internal air-flue systems

It is recommended that the boiler is sited on or next to an external wall so as to negate the need to use a void or enclosure as a route for the flue system. Where this is not possible the following applies:

CORGI have issued a Guidance Document on the safe installation of flue systems within a dwelling. This is a Technical Bulletin reference TB200, and can be downloaded from the CORGI web site www.trustcorgi.com by registered installers. In brief this requires the air-flue system to be ***accessible for visual inspection*** by a service engineer. Particular concern focuses on the joints, supports, material and correct slope of the flue installation, which should all be in accord with the instructions given in this document and with good practice. We recommend that the guidance given in this document is adhered to, especially in the case of twin pipe flue systems.

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.

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

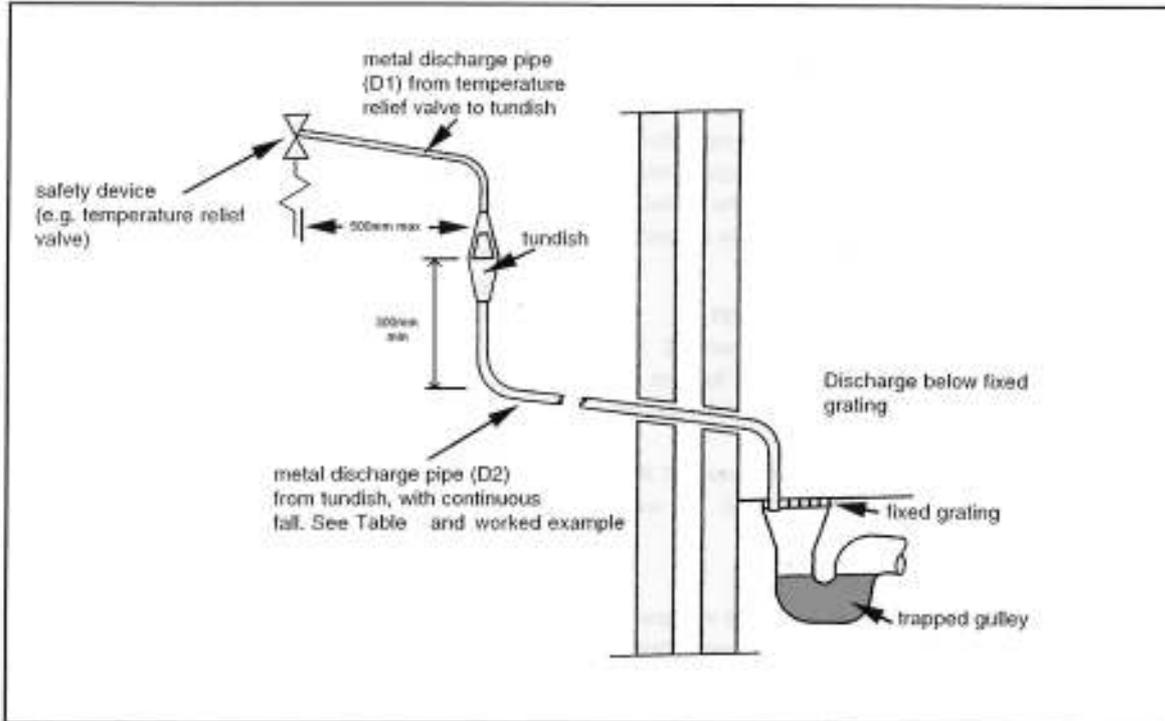


Table 4. Sizing of copper, discharge pipe, D2 for common temperature relief valve outlet sizes

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 ¹ / ₂	15mm	22mm	up to 9m	0.8m
		28mm	up to 18m	1.0m
		35mm	up to 27m	1.4m
G 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 6.7 and Fig 6

Worked example:

The example below is for a G ½ 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 ½ 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 ½ 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:-

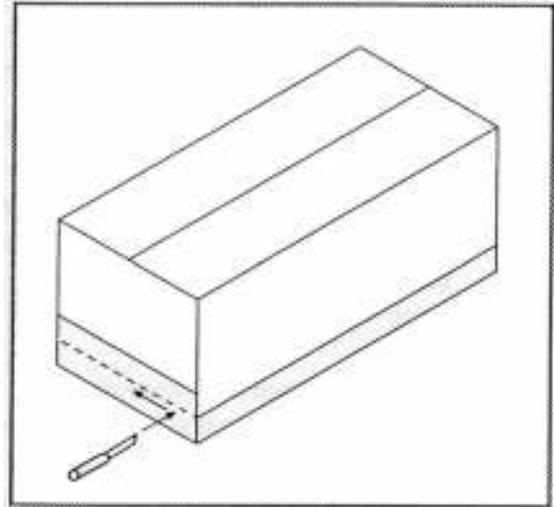
- ❑ Mounting bracket
- ❑ Fixing pack consisting of 2 wall plugs, 2 bolts and 2 washers
- ❑ Automatic de-aerator
- ❑ Condensate trap
- ❑ Fixing Template
- ❑ Warranty card, User Operating Instructions and Installation Instructions

In addition the boiler is supplied with (or with the optional Pre-Assembled Pipework kit as shown in Section 7.14, if ordered):-

- ❑ WRC mains water kit, including UV3 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



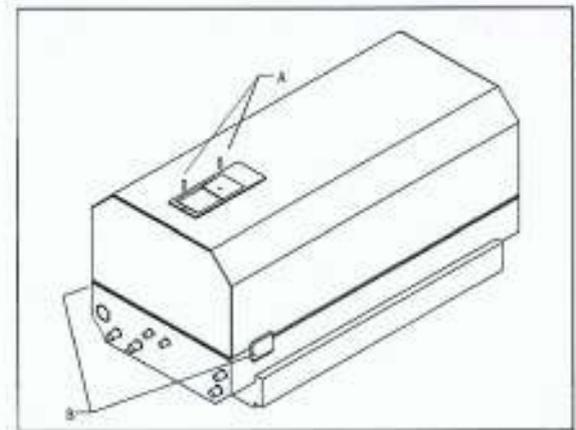
Check the appliance immediately after unpacking. Any damage must be reported immediately to your supplier.

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), or 250mm below for use with side mounted Pre-Assembled kit, and 100mm to either side of the boiler case is required. (fig. 10 & fig 11)

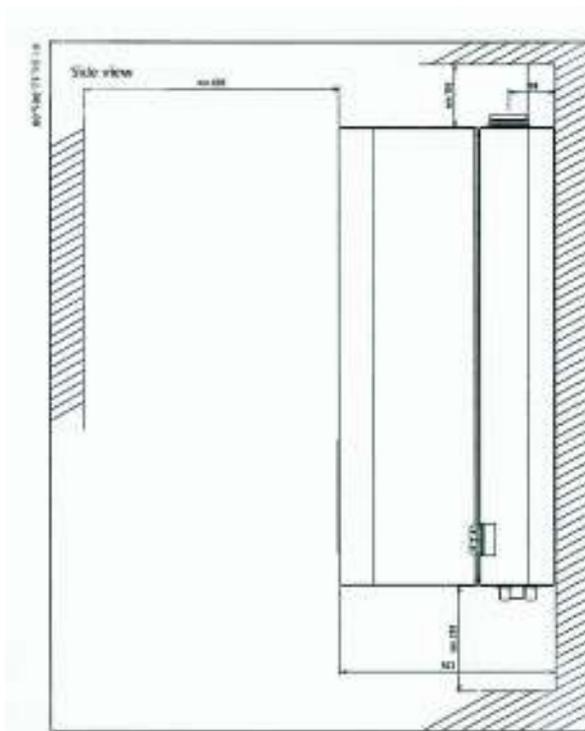
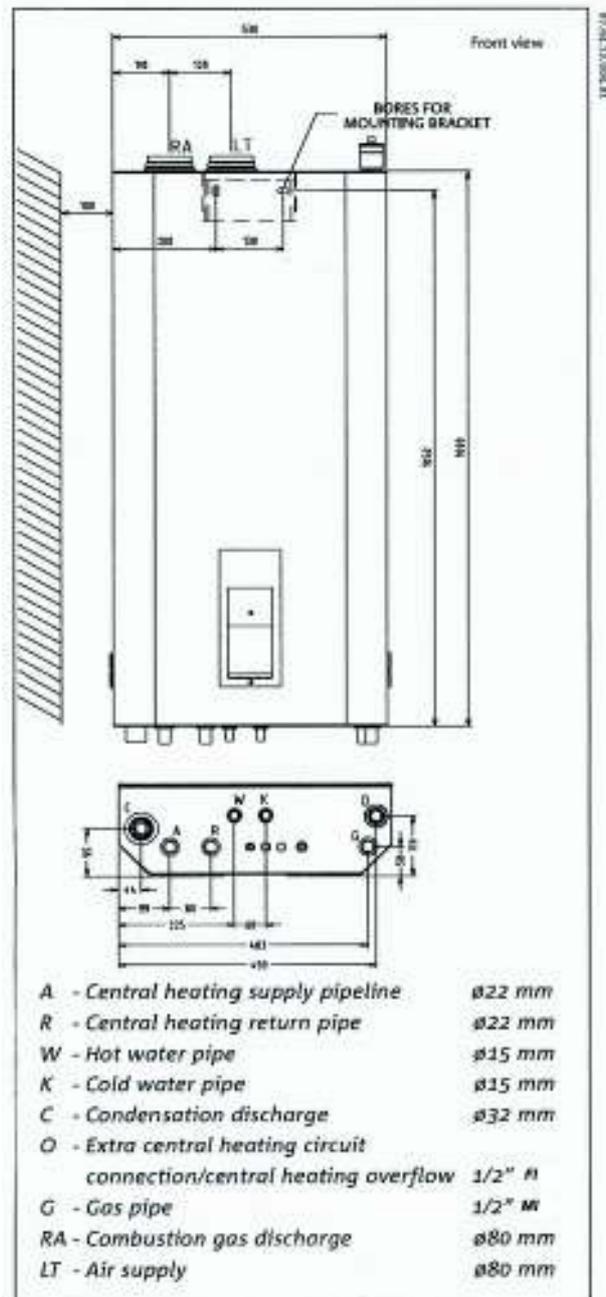


Figure 10: Dimensions & minimum clearances

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.

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):

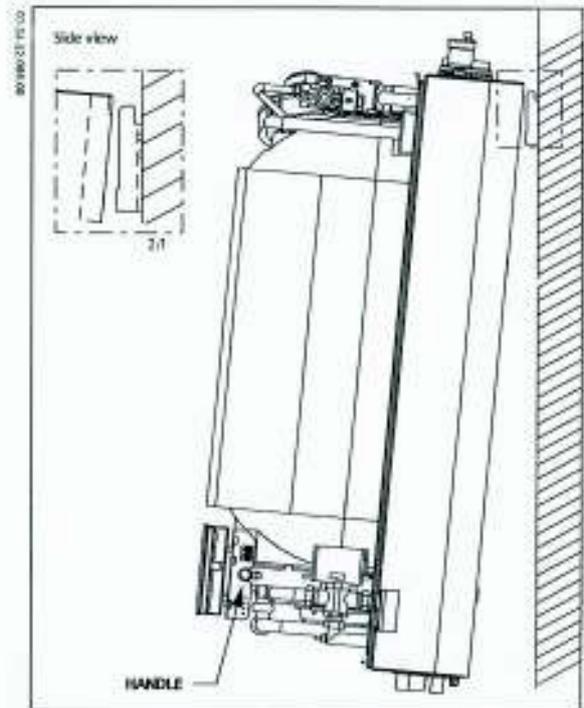
- Place the mounting indication point level with the top side of the mounting bracket and position the corners of the back of the casing level with each end of the mounting bracket.
- Put the bottom of the boiler against the wall.
- Carefully lower the appliance onto the wall bracket.

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.

WEIGHT EMPTY IS 75 KG.

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.

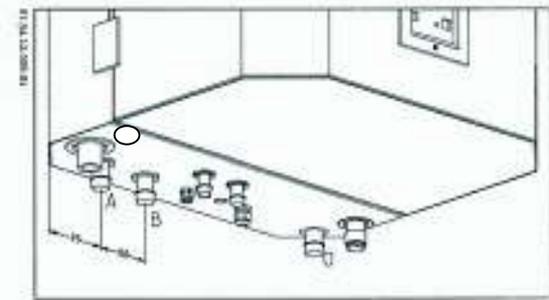
7.6.Connecting the central heating circuit.

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.

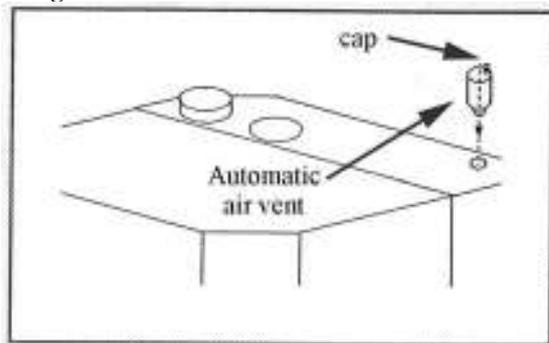
The 22mm diameter connections for the central heating circuit flow and return pipes are located on the underside of the appliance. (Fig 14). The flow pipe (A) is colour coded red and the return pipe (B) is colour coded blue.

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.

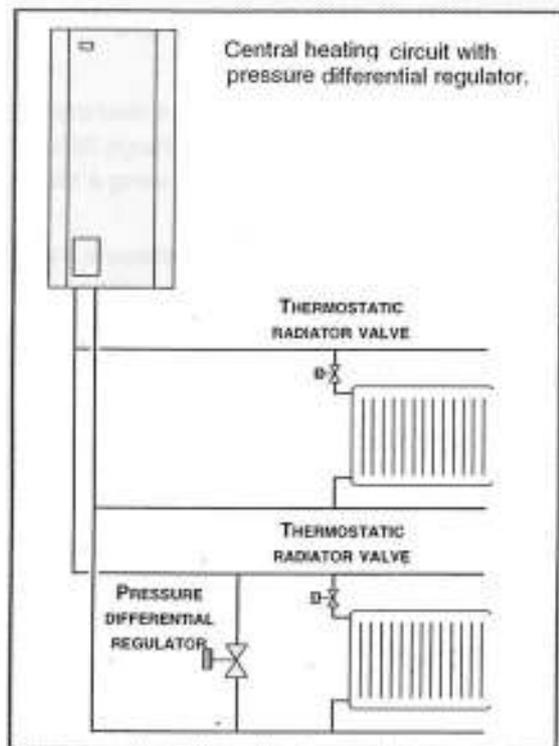
When connecting the boiler to a heating system containing plastic pipework the following must be noted:-

- 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



Note: Set the pressure differential regulator valve (supplied by Atmos) to 0.2

For the optional Pre-Assembled Pipework kit, the bypass is included and should be set to 0.1

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, with a maximum power of 5kW. 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. The heating of the towel rail should be controlled by a thermostatic radiator valve.

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.

The following components are for the cold water supply to the boiler and the hot water outlet from the boiler:

1. UV3 cold water inlet manifold c/w pressure reducing valve pre-set at 3.5 bar and safety relief valve set at 6bar.
2. 5 litre potable expansion vessel (hot water).
3. Expansion vessel mounting bracket.
4. 22mm x 15mm compression reducing set.
5. Black plastic tundish.
6. 15mm Thermostatic mixing valve
7. ¼" BSPM drain cock.
8. 22mm butterfly isolating valve blue
9. ¾ to ½" Bush
10. 1 ¼ to 1" Bush
11. 1" Straight Nipple
12. HepVo Trap

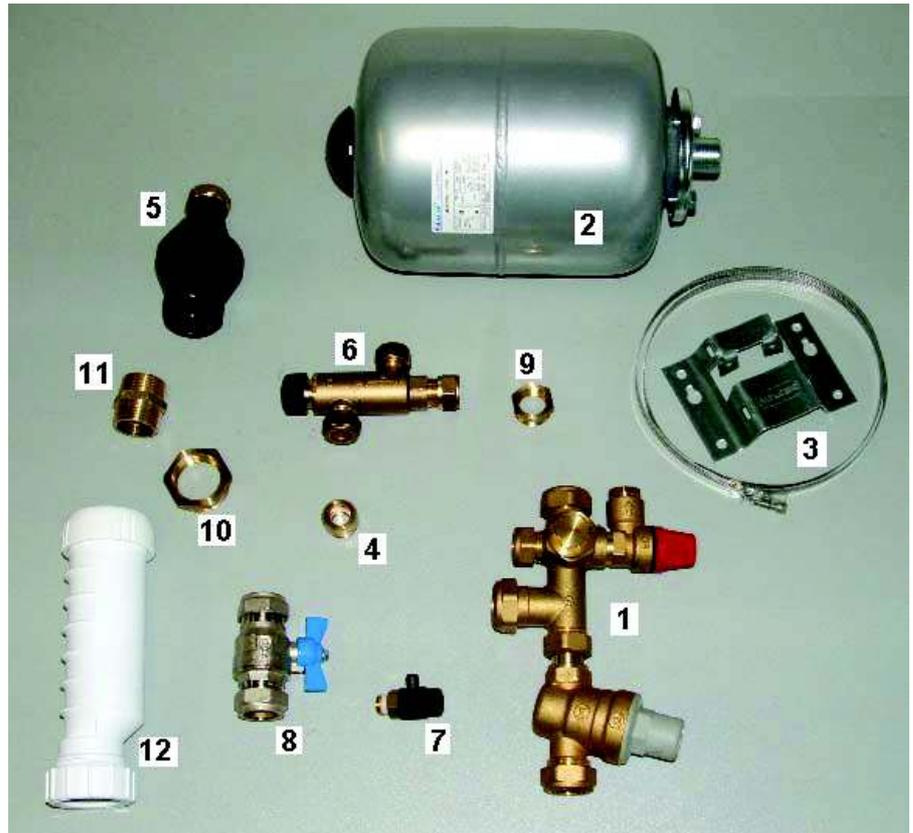


fig 1.

7.8 Assembly Instructions using loose components.

Note: Atmos supply the components listed under 7.7 and also the following:-

1. Central Heating Y pattern filter.
2. Gas Union Valve
3. Multifit connector for condensate
4. Robokit (not pictured).

The Robokit consists of:

- 12 ltr expansion vessel
- Expansion vessel mounting bracket
- Filling loop complete with isolating valves
- Pressure relief valve
- Pressure gauge



fig 2.

Mains cold water and hot water connection to the boiler

Connect the UV3 cold water inlet manifold to the boiler cold inlet using the 22x15mm reducer supplied. Ensure that the discharge of the 6 bar safety relief valve points horizontally as shown in fig 4 and then 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. Fit the 15mm thermostatic mixing valve to the manifold as shown in fig 3 and fig 4. Do this by removing the nut and olive from the cold water inlet (K) of the thermostatic mixer valve and connecting to the UV3 manifold using the 3/4 to 1/2" bush.



fig 3.

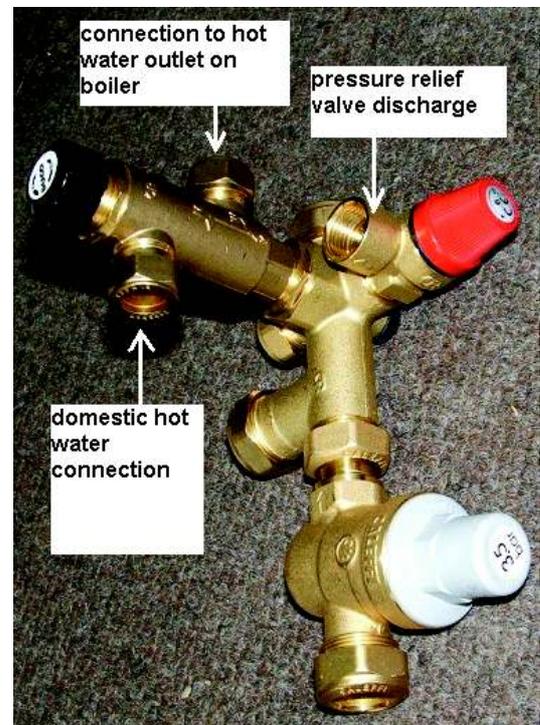


fig 4.

Now connect the complete block to the cold water inlet pipe and the hot water outlet pipe on the boiler as shown in fig 5.

Bring the cold mains water to the boiler in 22mm pipe. Fit the 22mm butterfly isolation valve and connect to the 3.5 bar pressure reducing valve.

Connect the hot water in 15mm pipe to the mixed outlet (M) on the thermostatic mixer valve.



Fig 5.

Fit a 15mm Tee joint to the discharge pipe connection from the T&P relief valve on the boiler and make a connection in 15mm pipe from the outlet of the 6 bar cold water pressure relief valve to this T joint as shown in fig 6.

Drain cock

The connection point for the 1/4" BSPM drain cock (item 7 in fig 1) on the UV3 manifold is opposite the connection point for the thermostatic mixer valve. See fig 3. Remove the 1/4" BSPM black plastic plug and fit the 1/4" BSPM drain cock onto the UV3 manifold.

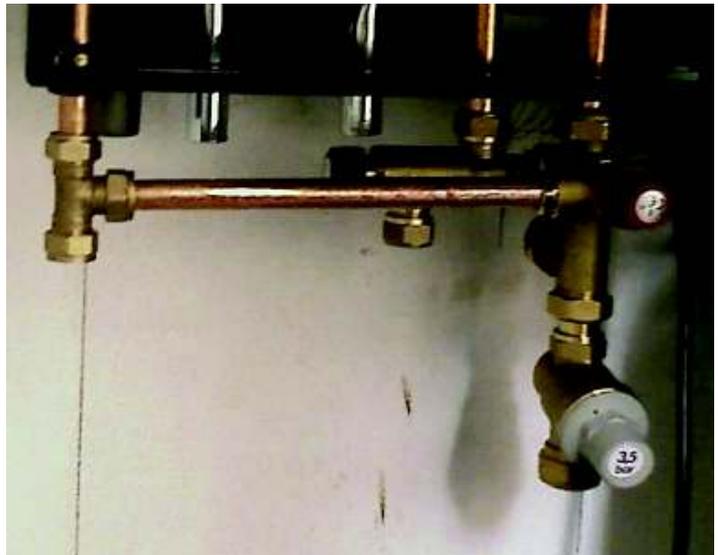


fig 6.

Equal pressure cold water out (Optional extra kit)

Where an equal pressure cold water supply is required, there is a 22mm connection on the side of the UV3 manifold for this purpose. If this is not required, use the 22mm cap which is provided in the UV3 kit to blank off this port.

Gas connection

Fit the gas union valve with loose part of union to boiler as shown in fig 5. Connect to 22mm gas supply.

Auxiliary (comfort loop) connection

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. A balancing valve must be fitted in this circuit and if required an isolating valve can be fitted. Note that the return connection must be the last connection on the heating circuit return pipe.

Heating system flow and return connection

The heating flow and return are connected in 22mm copper to the boiler connections (flow and return). The following connections must be made to the return pipe:-

- 1) Cold filler loop connection.
- 2) Heating system 12 ltr expansion vessel and pressure relief valve (part of the Robokit)
- 3) Towel rail return (if used) must be the last return connection on the system.

The 22mm Y pattern filter (item 1 in fig 2) must be fitted in the CH return pipe to protect the boiler.

If mostly thermostatic valves are used on the heating system it will be necessary to fit a by-pass valve between the flow and return pipes

Heating system expansion vessel and safety valve discharge system

Connect the heating system 12 ltr expansion vessel and 3 bar pressure relief valve together with the pressure gauge (components of the Robokit) to the heating return pipe near the boiler. A bracket is supplied with the Robokit for mounting the expansion vessel on the wall. Assemble the components as per instructions given with the Robokit. Under no circumstances must an isolating valve be fitted between the expansion vessel and the circuit which it serves.

The 15mm discharge from the pressure relief valve should be Teed into the pipe that carries the discharge from the boiler temperature and pressure relief valve and the cold water safety relief valve. The discharge from the three safety valves must be carried in 22mm pipe and connected to the tundish. The tundish and safety discharge pipe must be fitted in accordance with the G3 regulations, as described in paragraph 6.7 of the Multi installation manual. Fit the HepVo trap below the tundish as shown in fig 7.

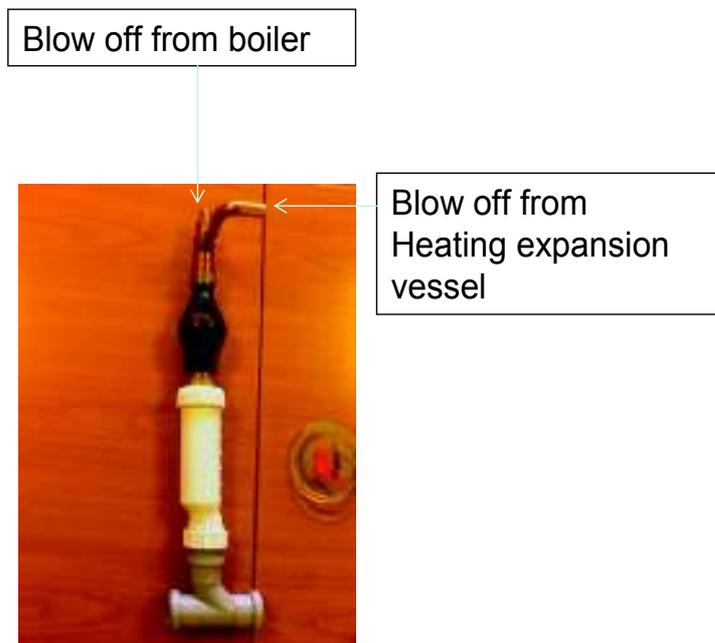


Fig 7

Central heating system cold fill valve

Use the filler loop provided with the Robokit expansion vessel. Connect this according to the instructions between the cold supply and the heating system. Ensure that the double check valve is connected to the heating side. One of the connections on the 4-way connector manifold supplied with the Robokit can be used for the filler loop connection. If this connection is not used it needs to be blanked off. The flexible filling loop hose must be disconnected at one end once the system is filled.

Hot water expansion vessel

The 5 ltr hot water expansion vessel has a $\frac{3}{4}$ " BSPM connection and is also supplied with a wall mounting bracket. This expansion vessel must be connected to the UV3 manifold. Use the connection point on the UV3 manifold opposite the pressure relief valve connection point. See fig 4. Fit a 15mm street elbow to this connection point and then connect to the hot water expansion vessel via 15mm copper pipe or use a flexible hose. Under no circumstances must an isolating valve be fitted between the expansion vessel and the circuit which it serves.

Condensate discharge

The Multi boiler comes complete with a condensate trap. Two different traps are supplied. The condensate trap supplied with your boiler can be either grey or white.

The 32mm **grey condensate trap** needs to be fitted on the condensate outlet on the boiler. Ensure that the trap is pushed fully home (some lubricant will assist). Take the white 32mm compression connector (item 3 in fig 2) 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. See figures 9 and 10. 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)

Remove elbow from condensate trap and slide on 1.1/4" nut. Throw away rubber seal.



Fig 9



Locate elbow over inner connection and tighten nut.

Fig 10

The **white condensate trap** must be connected to the condensate outlet on the boiler. A 1” grey plastic flexible pipe is supplied with the white trap and must be connected to the outlet on the trap. The flexible pipe can be inserted into the open end of a vertical piece of waste pipe.

Finally

Tighten all joints, check over, fill system with water, and test for water tightness. Test for gas tightness.

NOTE!

hot water secondary circulation

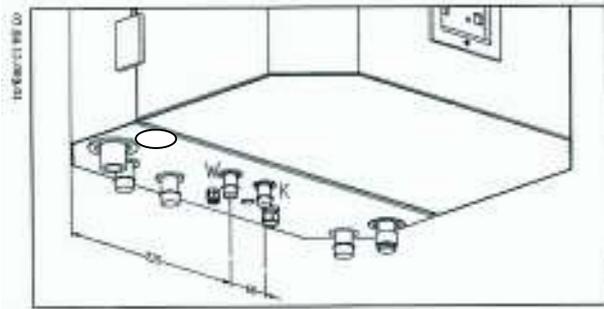
If a hot water re-circulation loop is used, the instructions given in paragraph 7.10 apply, except for one amendment.

Because the UV3 manifold is now connected directly to the boiler it is not possible to connect the return pipe of the hot water secondary circulation to a point between the UV3 and the boiler. Instead the hot water return pipe must now be teed into the pipe connection between the UV3 manifold and the hot water expansion valve.

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 UV3 manifold. The hot water supply to the property is connected to the boiler via the 15mm diameter hot water outlet connection.

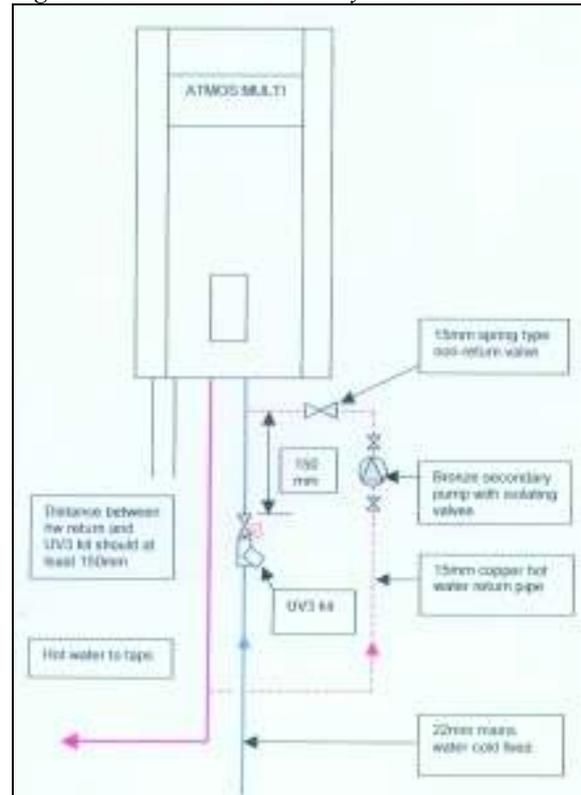
As the boiler's minimum domestic hot water temperature setting is 60°C., the installation of a thermostatic mixing valve is necessary to reduce the hot water temperature at the tap.

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 UV3 manifold. The return must not pass through the UV3 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)

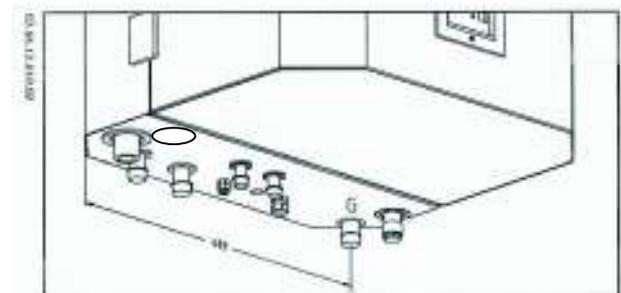
Figure 20a Hot water secondary circulation



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.

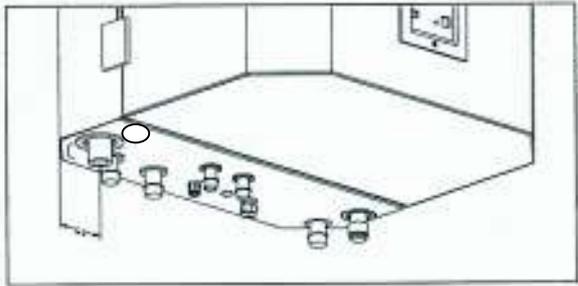
To prevent the ingress of foreign matter and possible damage to the gas-regulating block, the gas supply pipe must be checked for contaminants prior to connection to the boiler.

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.

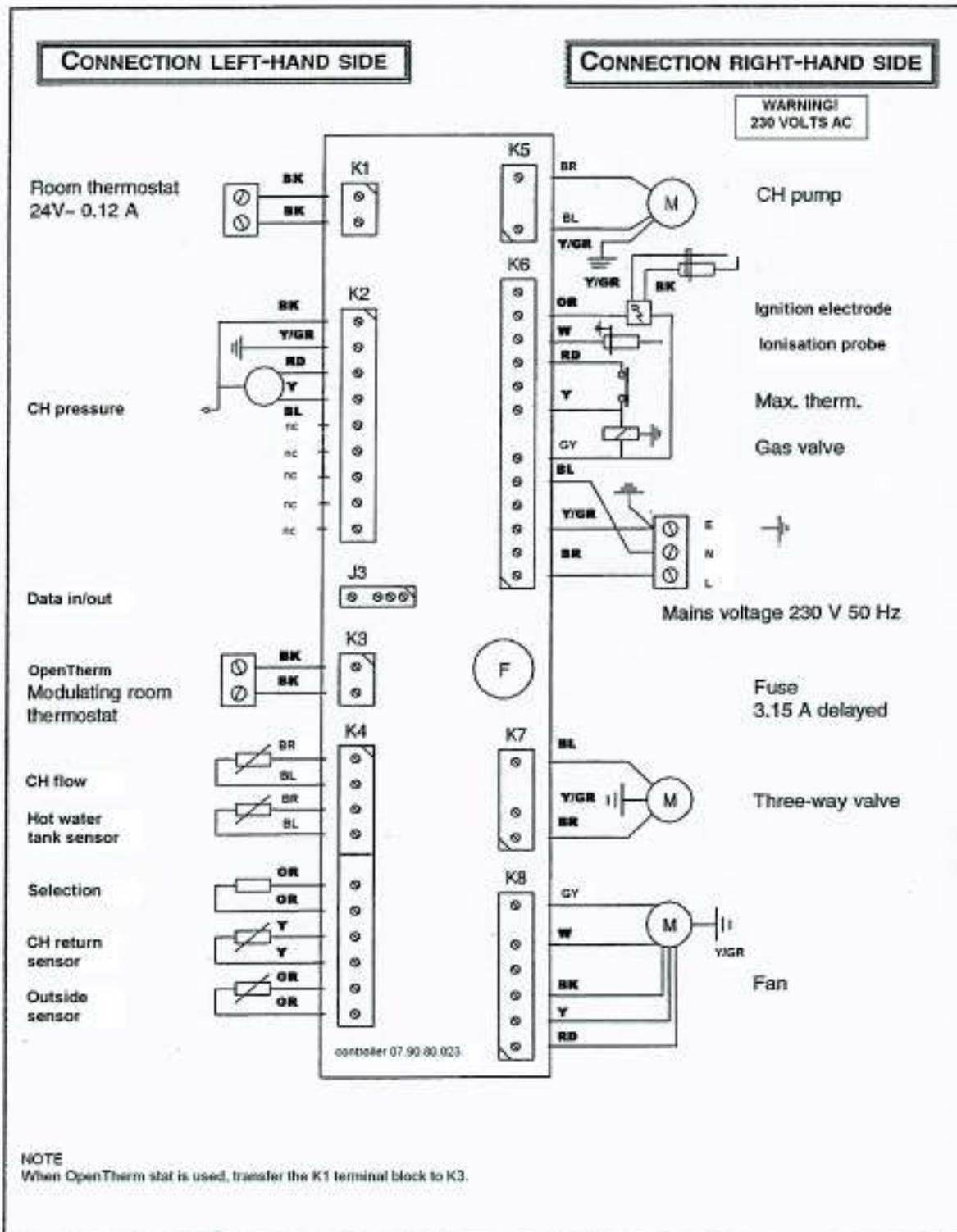
It is recommended that the room thermostat is not set lower than 15°C during the winter months.

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

The appliance is suitable for connecting an OpenTherm modulating thermostat instead of an on/off thermostat. The modulating thermostat calculates the CH flow temperature at a required room temperature in order to make optimum use of the modulating function (ie minimum energy). The manual supplied with the OpenTherm thermostat should be consulted for more information.

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	RD	= RED
BR	= BROWN	GY	= GREY	W	= WHITE
Y	= YELLOW	OR	= ORANGE	BK	= BLACK

7.14 Boiler with Pre-Assembled Pipework kit.

As an option, Atmos can supply the boiler with pre-assembled pipework kit. This includes the following:-

- ❑ UV3 manifold including pressure reducing valve pre-set at 3.5 bar.
- ❑ Cold water safety relief valve set at 6 bar.
- ❑ Central heating safety relief valve set at 3 bar.
- ❑ 5 litre potable expansion vessel.
- ❑ 12 litre central heating expansion vessel.
- ❑ Central heating pressure gauge.
- ❑ Central heating filler loop and bypass valve.
- ❑ Central heating filter.
- ❑ Isolation valves
- ❑ Hep_vO self sealing waste valve & plastic pipe kit to provide combined condensate & safety valve discharge system
- ❑ 2 x Black plastic tundish.
- ❑ Hot water thermostatic mixing valve.
- ❑ Cold water drain cock.
- ❑ Pipework assembly mounting bracket.

Assembly

1. Using the supplied Template, mark the drilling holes for the pipework assembly mounting bracket and the boiler mounting bracket.
2. Mount the boiler on its bracket as given in section 7.4.
3. Mount the pipework assembly on its bracket with front cover removed.
4. Make the connections to the boiler.
5. Fit the black tundish and Hep_vO self sealing waste valve.
6. Fit the boiler siphon trap and the plastic pipe kit to provide combined condensate & safety valve discharge system.

Figure 18a: Pipework Assembly Components

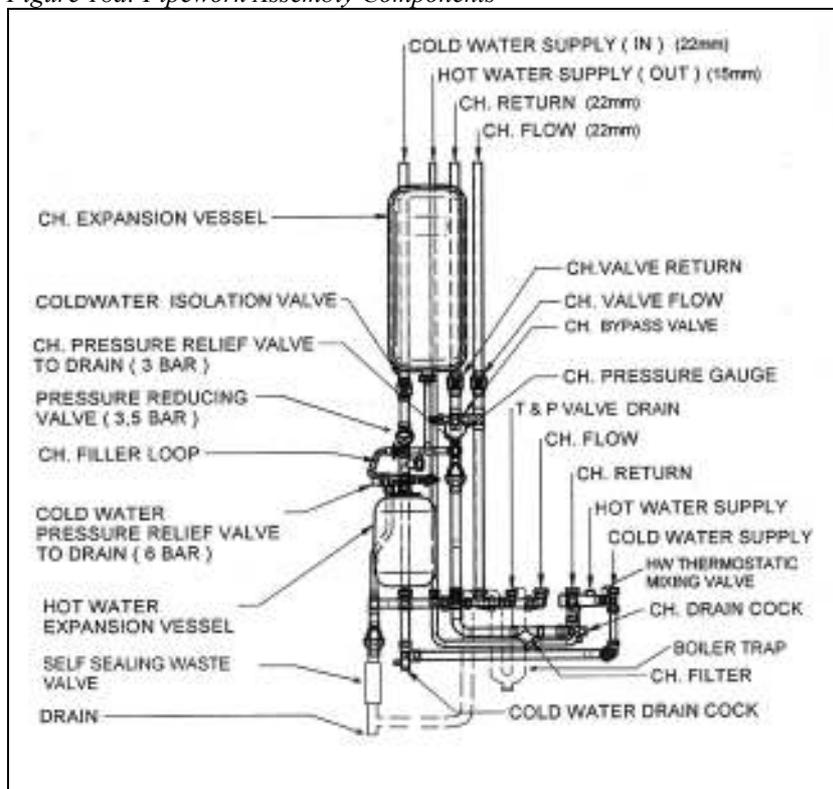


Figure 18b: Dimensions

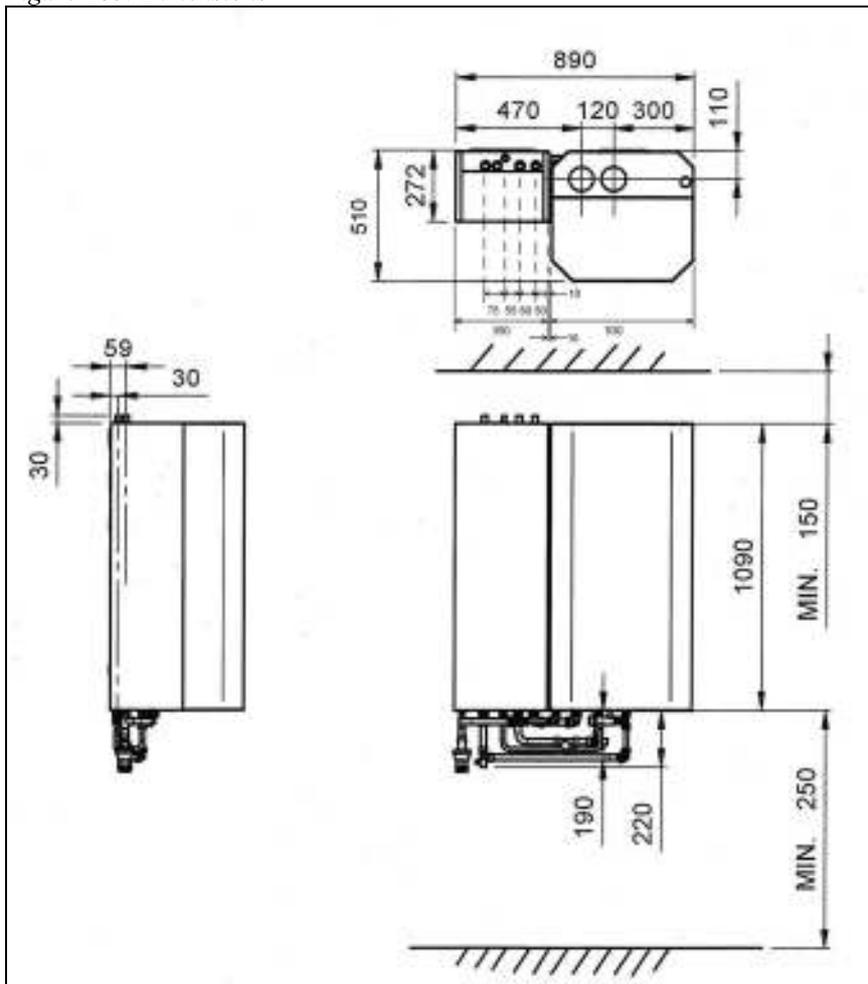


Figure 18c: Isometric Arrangement

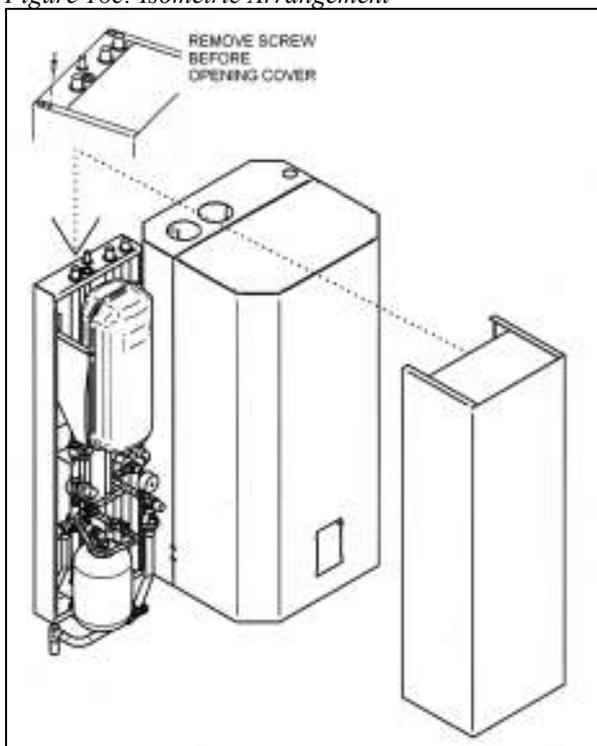
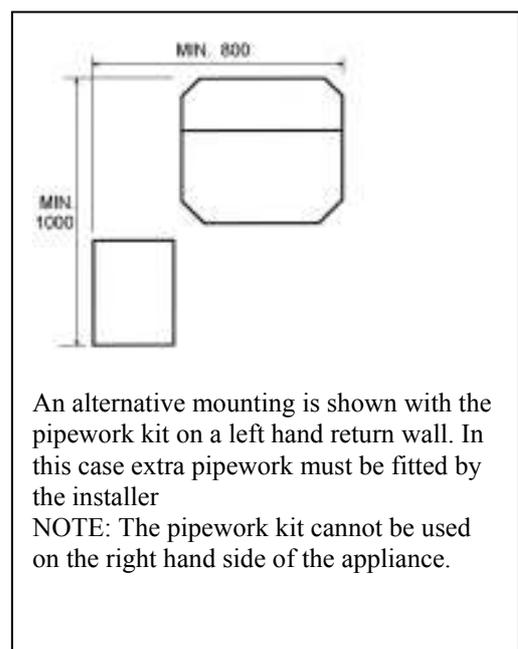


Figure 18d: Alternative Mounting



8. Commissioning.

Note: The appliance must be installed and commissioned in accordance with the manufacturer's instructions in order to comply with the Building Regs. To demonstrate compliance, the Benchmark Checklist (located at the back of this Manual) should be completed and signed at the time of commissioning, and left with the customer. **Failure to flush and add a suitable inhibitor to the system will invalidate the Appliance Warranty.**

8.1 Filling the heating system.

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

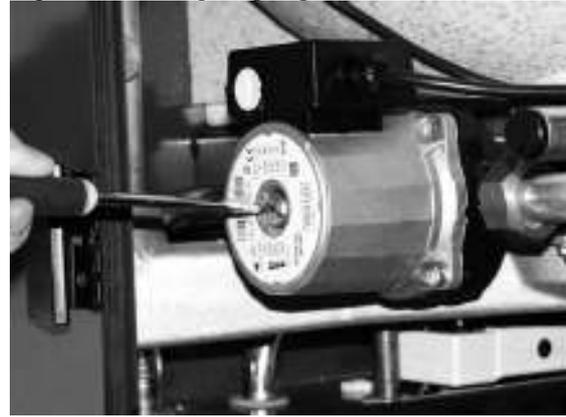
Warning! All new and existing systems must be thoroughly drained and flushed out in accordance with BS7593 requirements. A suitable cleaning agent is Sentinel X400, following the manufacturer's instructions. A corrosion inhibitor should be added and the concentration level checked. The only suitable product recommended by Atmos is Sentinel X100, following the manufacturer's instructions. Atmos do not recommend any other inhibitor.

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 optional Pre-Assembled Pipework kit, open the cold fill valve in the filling loop.

On filling:-

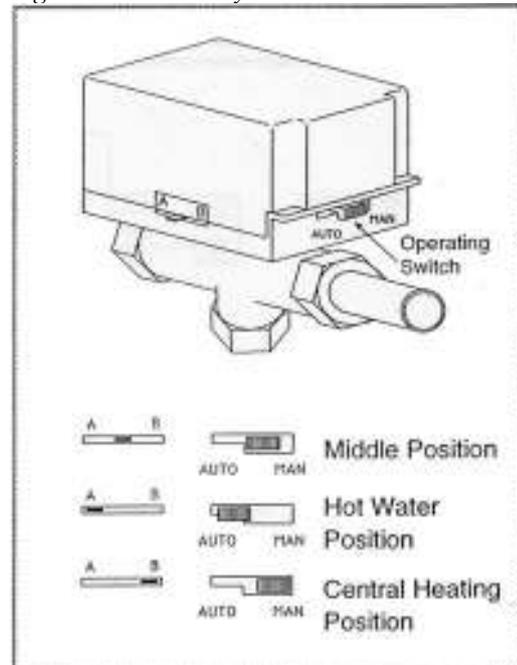
- ❑ Ensure that the boiler's automatic air vent sealing cap is loose.
- ❑ Slowly fill the installation until a system pressure of 1.5 bar is obtained.
- ❑ Vent each radiator and purpose fitted air vent in turn starting with the lowest in the system. The system pressure should be regularly monitored during 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 leaks, rectifying where necessary and disconnect the system filling hose.
 - ❑ If using a pressure differential regulator valve (supplied by Atmos) for the bypass, set to 0.2
- Note: For the optional Pre-Assembled Pipework kit, the bypass is included and should be set to 0.1

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.

As stated at the beginning of 8.1, a suitable inhibitor must be added to the system water.

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 UV3 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 leaks, rectifying where necessary.

Note! If there was any possibility of debris entering the domestic hot water circuit during filling, the filter on the UV3 pressure-reducing valve must be removed and cleaned as necessary.

8.3 Appliance operation.

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

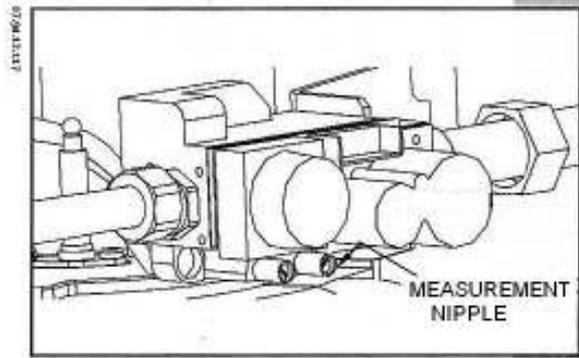
- With the appliance manual gas tap in the 'Off' position, switch on the electrical supply to the boiler. If a letter 'L' appears on the diagnostic display the boiler has been wired with reversed Live and Neutral connections, and must be corrected.

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 CO/CO₂ ratio.
5. Measurement of the gas inlet pressure.

❑ The procedure required to undertake inspections 1, 2, 3 and 4 are detailed in Section 10 of these instructions. The procedure for inspection 5 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, 32kW or 38kW (depending on boiler model), the time taken to use 0.024 m³ (0.847 ft³), 0.032 m³ (1.130 ft³), or 0.0378 m³ (1.335 ft³) of gas respectively should be 33 seconds (± 2seconds).

When timing 1 ft³ on the meter, the equivalent is 39 secs (24kW), 29 secs (32kW) or 25 secs (38kW).

When counting the litres over 2 min period for a metric meter, this is equivalent to 87 litres (24kW), 116 litres (32kW), or 137 litres (38kW).

❑ 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:-

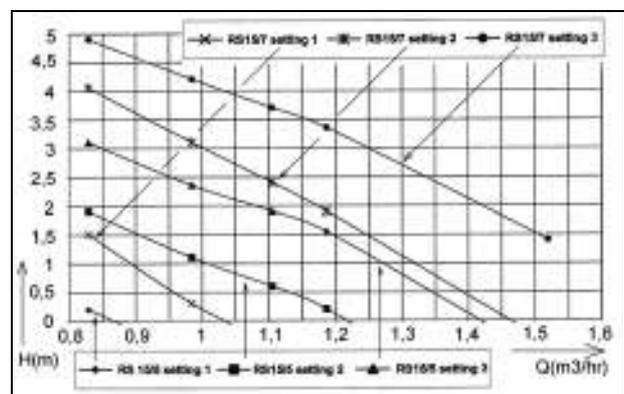
- (1•) Heat demand water heater
- (2•) Heat demand central heating
- (3•) Heat demand water heater and C/heating, priority water heater heating
- (4•) Heat demand water heater and C/heating, supply to both.

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, 1.2 m³/h and 1.5 m³/h. for the Atmos Multi 24, 32 and 38 models respectively. The maximum permissible system resistance to enable the boiler pump to achieve these flow rates is 3.3m, 1.5m and 1.5m respectively. (Fig 30, noting that only the 38 model has the RS15/7 pump).

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 UV3 manifold (or from the cold water drain cock in the optional Pre-Assembled Pipework kit), 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.

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. Measuring the O₂ or CO₂ concentration in the flue gas.
4. Measuring the CO/CO₂ ratio.
5. Inspecting the ionisation flow.
6. 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, 32kW or 38kW (depending on boiler model), the time taken to use 0.024 m³ (0.847 ft³), 0.032 m³ (1.130 ft³) or 0.0378 m³ (1.335 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.

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. 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

NOTE: The above is for Natural gas. Atmos provide a separate sheet covering propane (Propane Conversion).

4. Carbon monoxide : carbon dioxide ratio

Atmos recommends that a carbon dioxide : carbon monoxide ratio test is carried out each time the boiler is serviced. This is best done after the O₂ and the CO₂ content of the flue gasses has been measured and the gas valve regulator adjusted.

Measure the CO/CO₂ ratio first with the burner set at the low rate (LL) and then again with the burner set at the high rate (HH).

The CO/CO₂ ratio at low or high burner rate should be no higher than 0.004.

A CO/CO₂ ratio between 0.004 and 0.008 means that the appliance is '**At Risk**' (**AR**).

A CO/CO₂ ratio above 0.008 means that the appliance is '**Immediately Dangerous**' (**ID**)

Where an 'at risk' or 'immediately dangerous' situation is encountered, measures **must** be undertaken to rectify the situation. Particular attention should be given to the gas/air ratio, the integrity of the flue, or blockage in the heat exchanger. **Contact the manufacturer for assistance.**

Replace the dust cap and the flue gas test cap when finished. Record the data on the Service card.

5. 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.

6. 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 UV3 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.
6. Cleaning the central heating filter in the optional Pre-Assembled Pipework kit if included (as shown in Section 7.14).

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

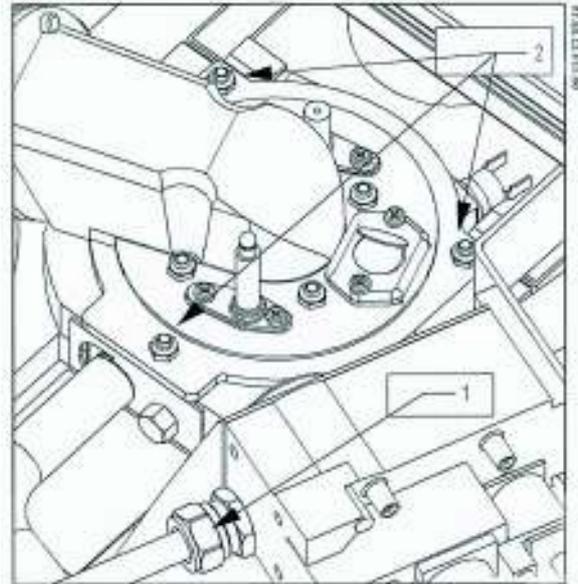


2. Inspecting the burner unit

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.

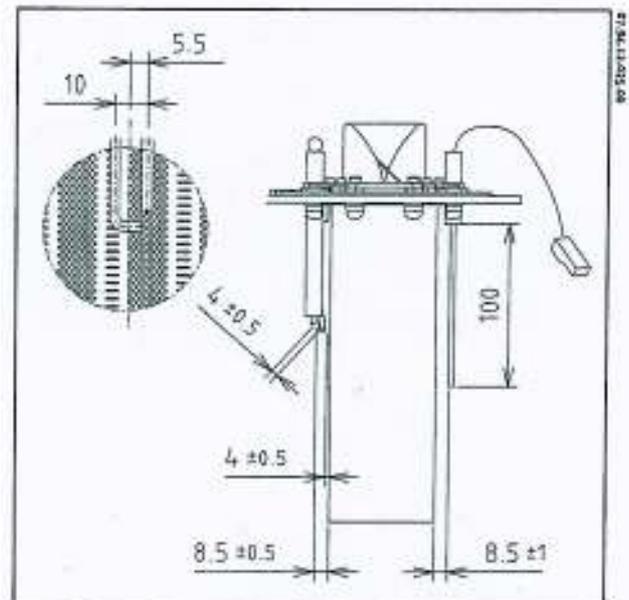


Lift and remove the burner assembly from the appliance.

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.

6. Cleaning the CH filter in the optional Pre-Assembled Pipework kit (see also 7.14).

Close the CH flow and return isolation valves. Open the CH drain cock to drain the pipes with the filter. Open the filter cover and clean the filter. Refit the cover, close the drain and open the isolation valves. Check for any leakage.

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 3 Section 6). Check the inhibitor concentration level within the system water, topping up when necessary.

Note: After servicing, the Benchmark Checklist Service Record (located at the back of this Manual) should be completed, signed and returned to the customer.

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.

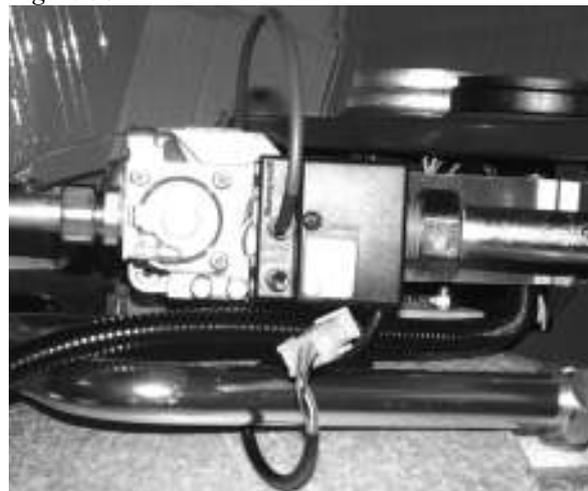
The replacement of the following components does not require draining of the boiler.

11.1 Gas Valve and Ignition Transformer.

Isolate the electrical supply to the boiler.

□ **Ignition Transformer.** Detach the ignition transformer from the valve by releasing the retaining screw. Disconnect the lead to the ignition electrode and disconnect the 4 way connector. Fit the new transformer in reverse order.

Figure 36



□ **Gas Valve.** Detach the ignition transformer as described above. Disconnect the gas injector nozzle tube between the gas valve and the mixing chamber via the union (Fig 36).

Detach the valve from the fixing bracket by releasing the two retaining bolts, disconnect the union and remove the gas valve.

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

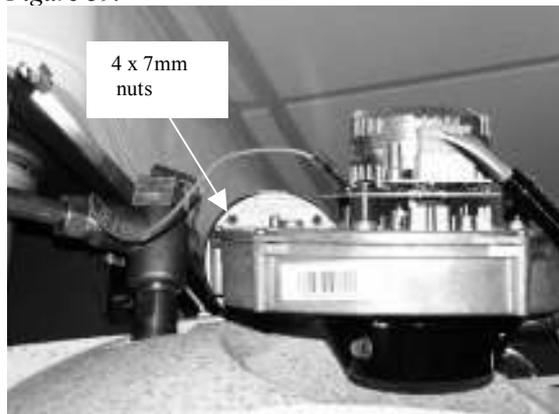
11.2 Fan

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 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).

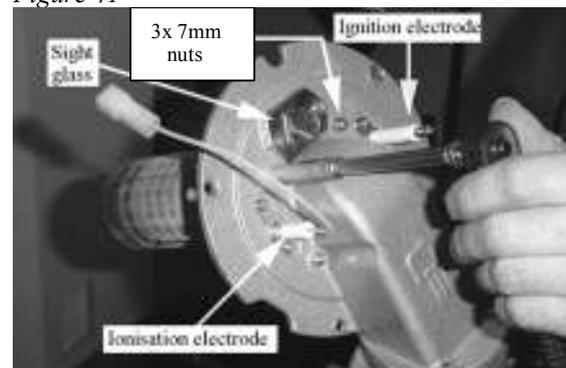
□ **Burner.** Detach the burner from the manifold by releasing the three fixing nuts using a 10mm socket (Fig 41). Fit the new burner in reverse order replacing the burner manifold gasket.

□ **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

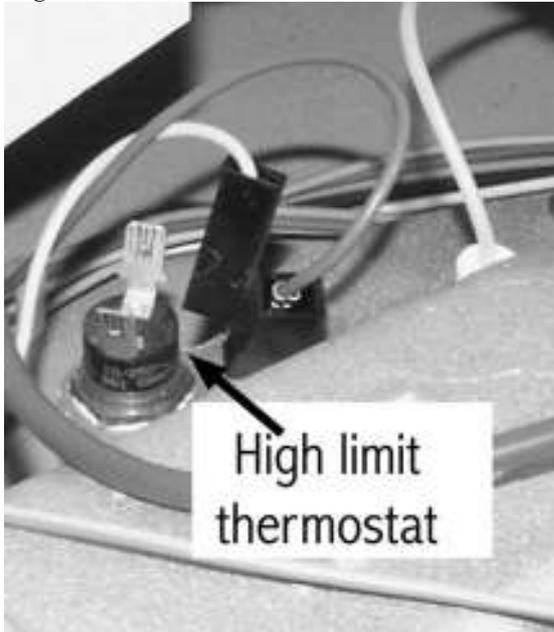


11.4 High limit thermostat.

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.



11.5 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



11.6 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.

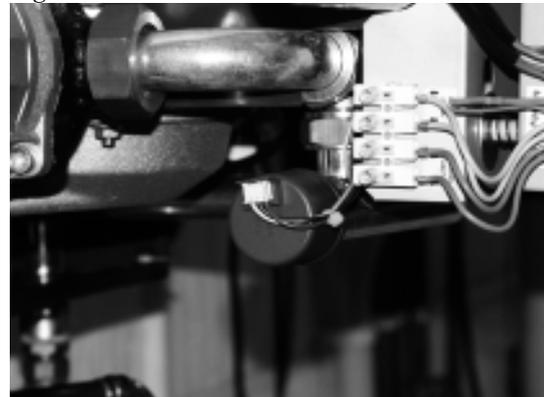
11.7 Pressure sensor.

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



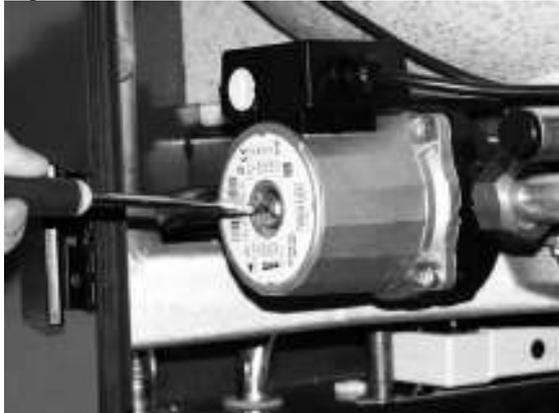
11.8 Pump head.

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



11.9a. 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.

11.9b. 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

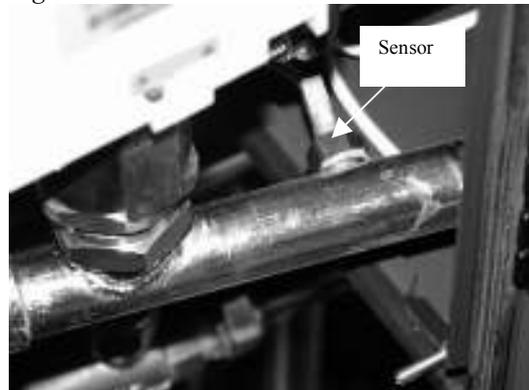


11.10 Central heating water temperature sensor.

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



11.11 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



1.12. 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.

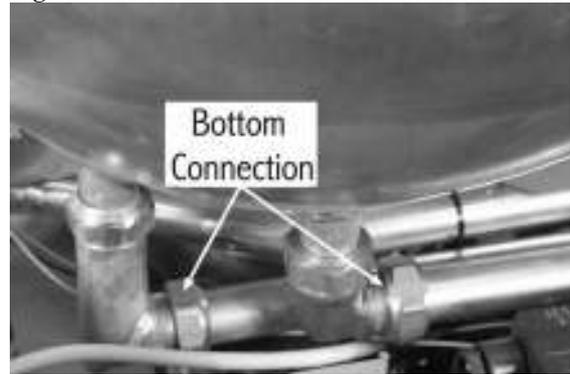
Cut the domestic cold and hot water pipes approx 50mm above where they penetrate the boiler case.

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.