Installation and Servicing Instructions

Alpha FlowSmart

Hot Water System incorporating an Alpha InTec 30/40GS Condensing Combination Boiler with Integrated Flue Gas Heat Recovery Device and wall mounted or floor standing Primary Store.

For Technical help or for Service call ...
ALPHA HELPLINE
Tel: 0844 871 8764

Alpha
HEATING INNOVATION

Nepicar House, London Road,
Wrotham Heath, Sevenoaks,
Kent TN15 7RS

Zenex SuperFlow Technology
Patent Protected No. 2420174
Other Patents Pending

Leave these instructions with the User

Contents

1 Introduction

The Alpha FlowSmart system is a domestic hot water system designed to provide a high level of heating and hot water performance more efficiently.
The combination boiler provides hot water at mains pressure and central heating via a sealed heating system.
The complete FlowSmart package consists of an Alpha InTec 30 or 40GS combination boiler with built in GasSaver, wall or floor mounted cylinder. A diverter valve, cylinder sensor and pipe kit are supplied with the wall mounted version.
For floor mounted cylinder options the optional Alpha system diverter kit is required alternatively a standard S or Y plan kit can be used.

It is important to purchase the correct products when choosing the Alpha FlowSmart solutions; the options are as follows;

Alpha InTec 30 or 40GS Boiler with ;-

1. FlowSmart wall hung Primary store (3.022470) and recommended optional Climatic controller (3.022143 - Wireless or 3.022144 - hard wired)

2. FlowSmart 25 (6.2003010) or 50 (6.2003020) floor standing cylinder with top connection kit (3.022913) and recommended optional system diverter kit 3.022382 with Climatic controller (3.022143 Wireless or 3.022144 hard wired)

3. .FlowSmart 25 or 50 floor standing cylinder with top connection kit (3.022913) and standard S or Y plan 2 channel kit.

Note: When using the weather compensation feature with external probe only options 1 and 2 above can be used.

Important

The Alpha FlowSmart must be installed as described in these instructions. The Alpha InTec30/40GS must be installed in accordance with the instructions supplied the boiler. Failure to do so will negate the warranty supplied with this unit.
The FlowSmart system has been approved to the relevant requirements of the building regulations for primary hot water storage systems and the UK Water Regulations.
It is the law that all gas appliances are installed by a competent person, i.e. Gas Safe registered engineer, in accordance with the following recommendations:-
Current Gas Safety (Installation and use) Regulations
All current Building Regulations issued by the department of the environment, i.e. Approved Document L1.
Building Standards (Scotland) (Consolidation) Regulations issued by the Scottish Development Department UK Water Regulations/Byelaws (Scotland)
Health and Safety Document No. 635 (The electricity at work Regulations 1989)
The installation should also be in accordance with the following British Standard Codes of Practice:-

BS 5440:1	Flues
BS 5449	Forced circulation hot water systems
BS 5546	Installation of hot water supplies for domestic purposes
BS 6700	Design, installations, testing and maintenance of services supplying water
BS 6798	Installation of gas fired hot water boilers
BS 6891	Gas installation
BS 7593	Code of practice for treatment of water in heating systems
BS 7671	Requirements for electrical installations, IEE Wiring Regulations

Failure to install any part of the FlowSmart system correctly could lead to prosecution. It is in your own interest and that of safety to ensure that the law is complied with.

Manufactures instructions must **not** be taken in any way as over-riding statutory obligations.

Notes: 1. Alpha InTec flue components must be used.
2. It is essential that the primary system is thoroughly cleaned and flushed when fitting the FlowSmart system. All cleaning agent must be removed and inhibitor added to the system - failure to do so will invalidate the warranty.

2 Technical Data

		Floor Standing	Wall Mounted
Cylinder External Dimensions	25L	345mm Dia x H530mm	NA
	50L	470mm Dia x H650mm	H1000 x W360 x D360mm
Outer Case		Steel - White Paint	Steel - White Paint
Cylinder Insulation Material		PUR Foam	Polyester Fibre
Cylinder Insulation Thickness		50mm	50mm
Standing Energy Loss Of Cylinder	25L	0.6KW/24hr (0.8 Watts/litre)	NA
	50L	1.1KW/24hr (0.8 Watts/litre)	0.85 Watts/litre
Mains Water Inlet Pipe Connection		3/4" BSP to 15mm (Fittings supplied)	1/2" BSP (fittings and pipes supplied)
Mains Water Outlet Pipe Connection		3/4" BSP to 15mm (Fittings supplied)	1/2" BSP (fittings and pipes supplied)
Coil Material		Copper	Stainless Steel
DHW Coil Water Capacity	25L	2L	NA
	50L	3.5L	5 L
Secondary Circulation Connections	50L	3/4" BSP	NA
Secondary Circulation Coil Capacity	50L	0.28L	NA
Maximum Water Inlet Pressure		5bar*	5bar*
Minimum Inlet Water Pressure		0.2bar	0.2bar
Maximum Water Flow Rate 30GS / 40GS		16 L/min 18L/min #	16 L/min 18L/min #
Minimum Water Flow Rate		2.5L/min	2.5L/min
Outlet Water Temperature (approx max)		62ºC	62ºC
Primary System			
Maximum Working Pressure		2.5bar	
Minimum System Pressure		0.5bar	
Maximum System Temp. (approx)		82ºC	
Boiler Pressure relief Valve Setting		3bar	
Boiler Exp. Vessel (pre-charge press)		8L at 1bar	
Recommended System Pressure (cold)		1bar	
Flow and Return connections		3/4"BSP to 22MM (fittings supplied)	3/4"BSP (fittings and pipes supplied)
Cylinder Material		Mild Steel	Stainless Steel
Cylinder Capacity	25L	24L	NA
	50L	50L	50L
Blending Valve Setting (Inside Boiler)		30ºC	30ºC
Blending Valve Connections		15mm	3/4"
Additional Primary Expansion Vessel		5L	NA**
Expansion Vessel Connection		1/2" BSP	NA
Pre-charge pressure		1bar	NA**

** If the mains water inlet is higher than 5bar then a pressure reducing valve must be fitted.*
*** If the primary heating system volume is above 40 litres then an additional expansion vessel must be added and pre-charged to 1bar.*

 # The system is designed to deliver these flow rate providing there is sufficient incoming mains flow rate.

3 System Operation

The Alpha FlowSmart system has been designed to deliver domestic hot water at a high level of performance more efficiently, for example 18 l/min for temperatures of 50°C and above for long periods of demand using less energy than a typical hot water storage system utilising a large cylinder.
The cold water supply first passes through the GasSaver where the reclaimed heat from the hot flue gasses is used to pre-heat the cold water supply. This pre-heated water then passes through the coil in the primary store where it is heated to a higher temperature. This hot water then passes to the blending valve where it is mixed with cold water direct from the supply and enters the cold inlet of the combination boiler at a temperature of approximately 30°C. The boiler then heats the water to the required temperature. See the performance graph Fig. 1. When the flow of hot water is stopped, the FlowSmart store is reheated and then the system is ready to provide the same performance again.

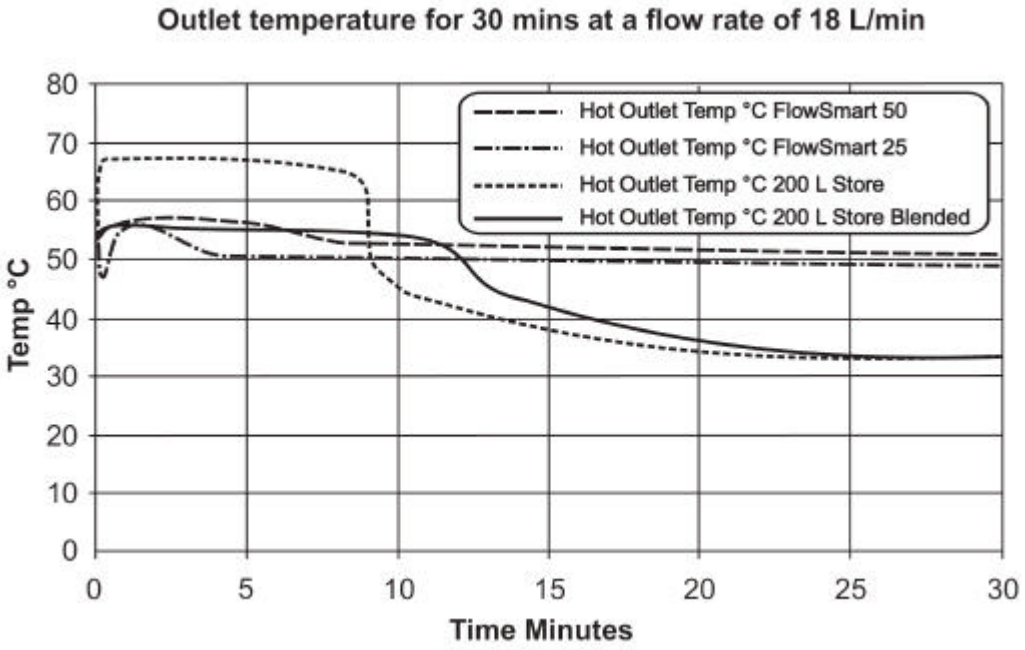


Fig 1 - FlowSmart vs. 200L store performance

FlowSmart Function

When using the InTec GS boilers with the wall hung FlowSmart the boiler will automatically recognize the cylinder connection and activate the cylinder heating function. This is confirmed with the word “BOOST” on the boiler display. To de-activate or activate this function press the reset and info buttons on the boiler simultaneously for three seconds and the “BOOST” symbol will be shown when activated and not shown when de-activated. The cylinder temperature will be maintained when the “BOOST” symbol is activated; alternatively the cylinder heating periods can be timed if the boiler is fitted with an Alpha Climatic controller. (The “BOOST” function must be kept activated to control the cylinder heating). This feature also applies if a floor standing cylinder is fitted together with the Alpha system diverter kit with cylinder sensor. When using an S or Y plan kit with the floor standing models this feature will not function and the boiler is controlled by the switched live from the external controls.

Cylinder Temperature setting

When using the FlowSmart system with the diverter valve kit the cylinder temperature setting can be adjusted by pressing the info button on the boiler “d0” will be displayed on the boiler display alternating with a value indicating the cylinder set temperature, turning the CH thermostat knob will adjust this temperature reading. Pressing the info button to escape and store the new reading.

For a FlowSmart system using a standard “Y” or “S” plan system the cylinder temperature is adjusted by the cylinder thermostat, however the cylinder thermostat must be set at a reading lower than the boiler CH thermostat value in order to achieve the required temperature.

3.1 Types of installation

Depending on the type of control system used the FlowSmart should be installed as shown in one of the following schematics. The floor standing FlowSmart cylinders should be positioned as close as possible to the boiler with the primary flow and return pipe work to the store no more than 1.5m in length. The pipe work must be insulated.
When installing a floor standing cylinder to an InTec GS boiler a pipe kit must be used to convert the top connections to accept 15mm copper, part number 3.022913.
Installation pipe work can be installed behind the boiler if required.

Wall mounted with Alpha diverter valve and cylinder sensor (supplied)

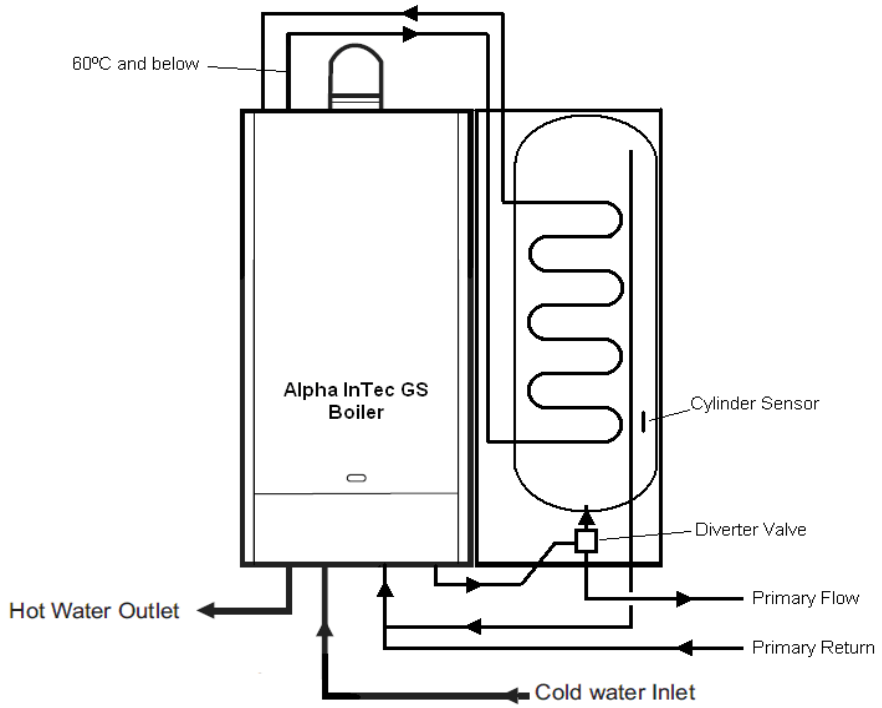


Fig 2

InTec GS with floor standing cylinder

Using the 'S' plan control system

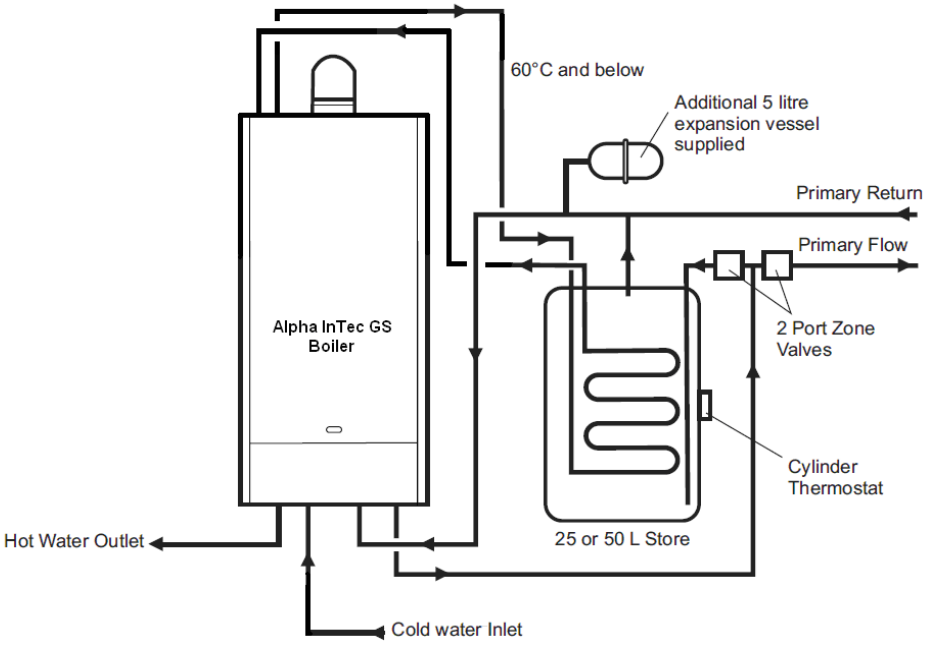


Fig 3

Using the 'Y' plan control system or an Alpha diverter valve kit

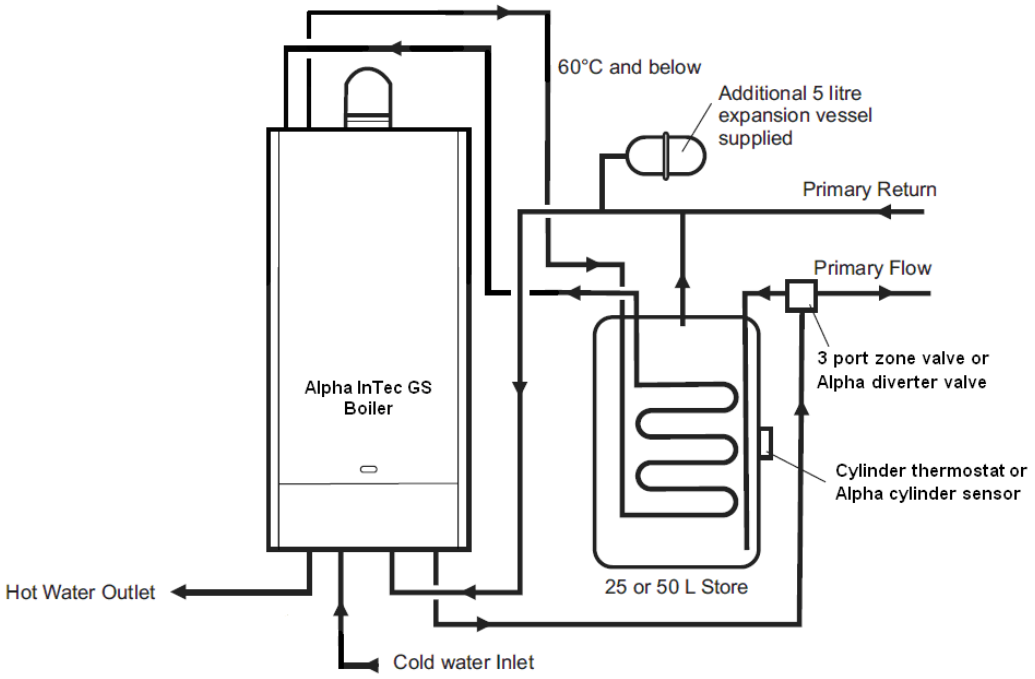


Fig 4

4 Installation (wall mounted)

Minimum clearances for servicing	Top	150mm vertical flue, 235mm horizontal flue
	Front	450mm
	Side	10mm
Lift weight (empty)		37kg
Weight full inc DHW and Primary circuit		89kg

FlowSmart Cylinder location and connections

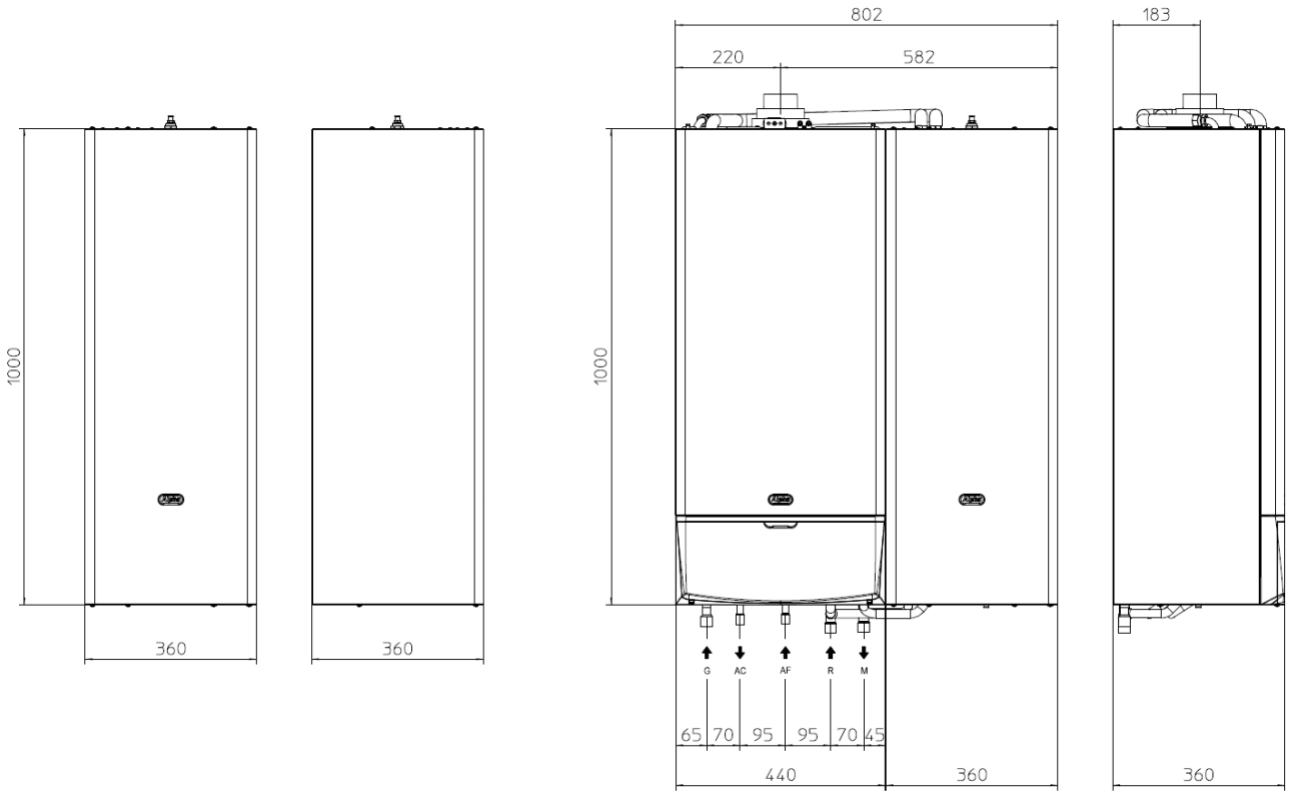


Fig 5

Connections between boiler and cylinder

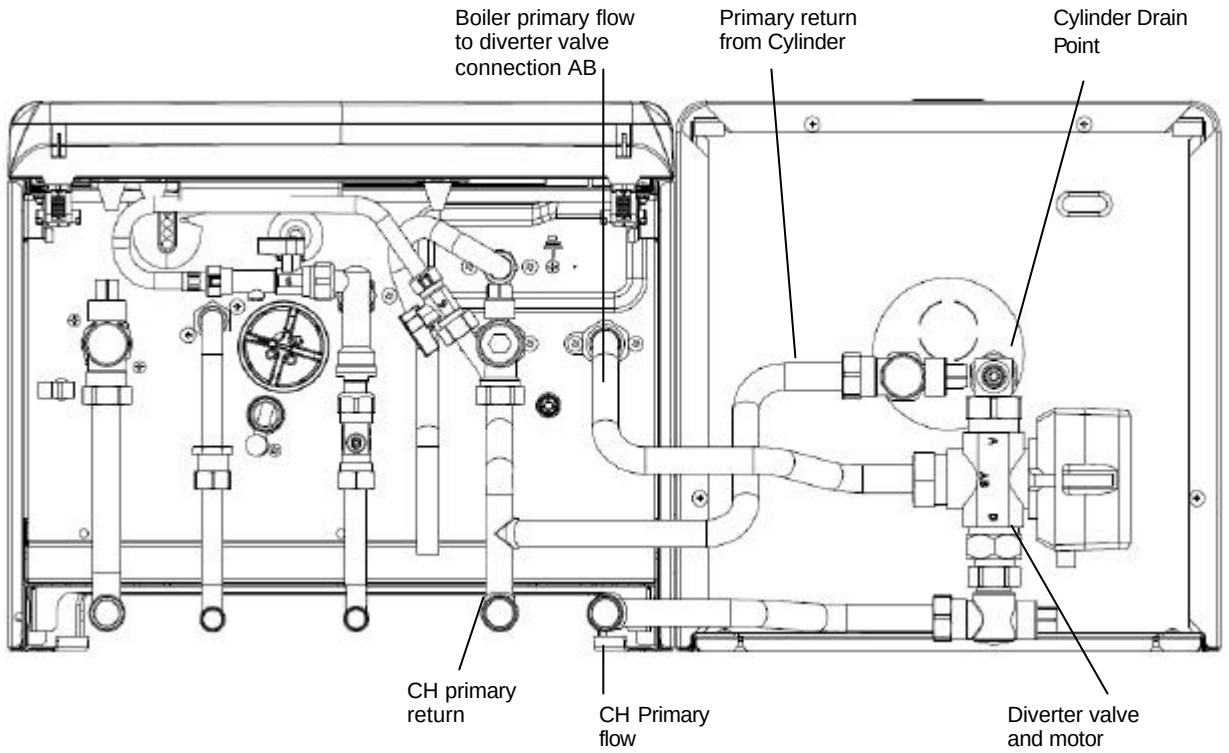


Fig 6

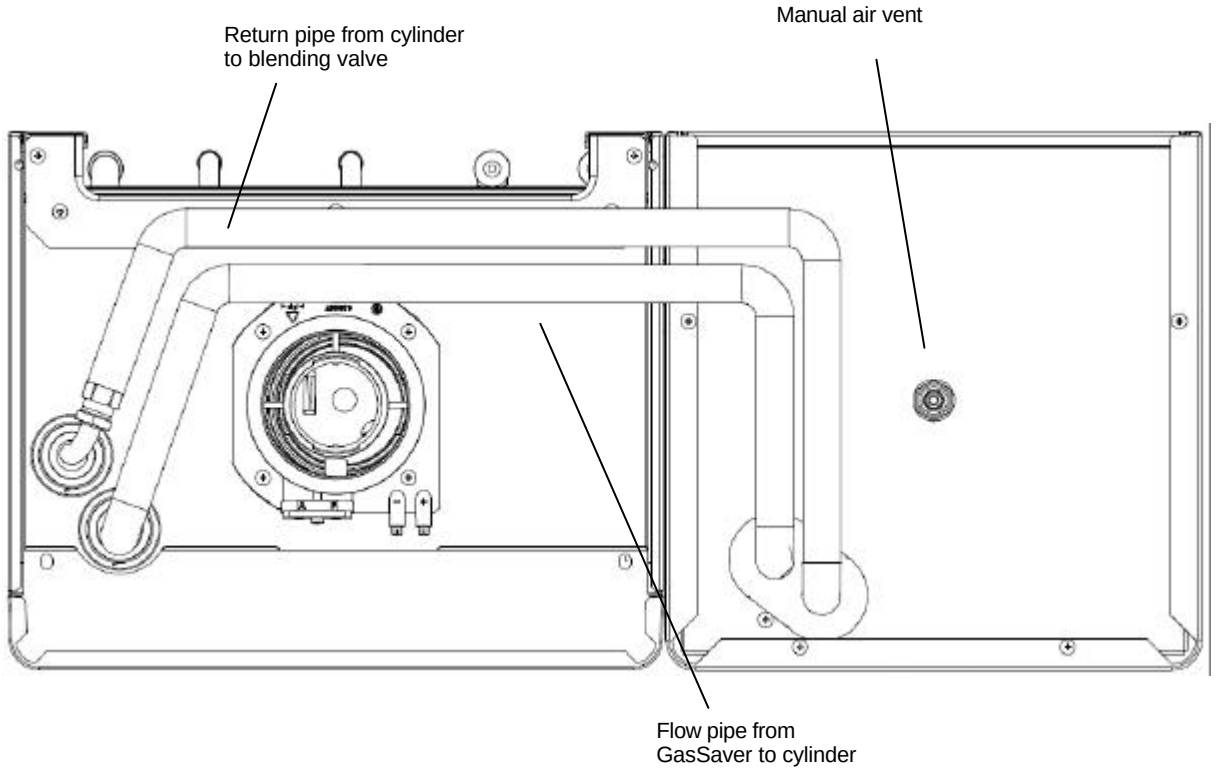


Fig 7

Electrical connections (Alpha Climatic controller is recommended to program heating and hot water)

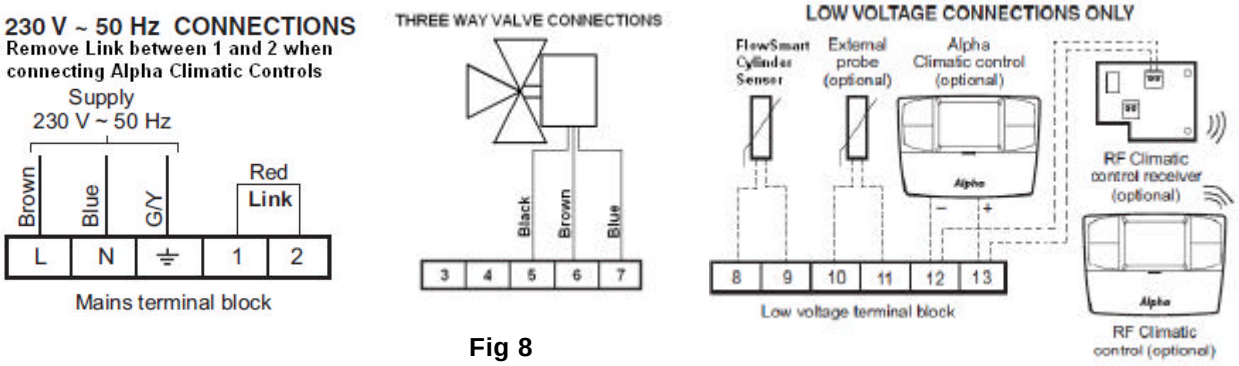


Fig 8

Unpacking

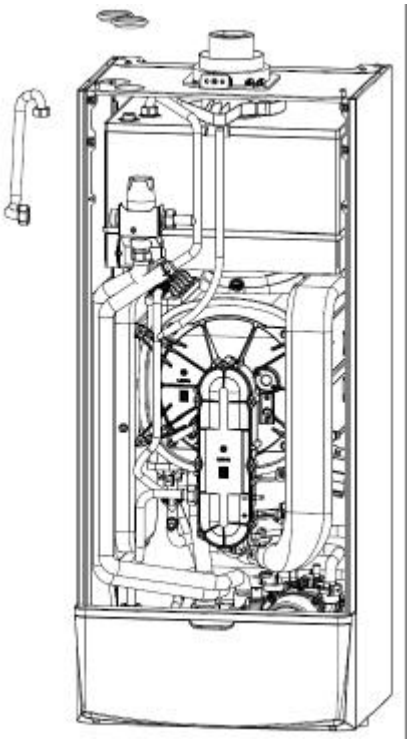
The following items are supplied with the wall hung FlowSmart system.

A. An Alpha InTec 30/40GS boiler
B. A 50 litre wall hung cylinder and thermostat
C. Three port Diverter valve
D. Pipe fitting kit and washers
E. Wall template

Hang the boiler on the wall as described in the boiler installation manual making sure there is enough space to its right to accommodate the FlowSmart cylinder. But the FlowSmart template up to the right hand side of the boiler making sure the top and bottom of the casing line up with the top and bottom of the boiler. Mark the screw hole positions for the hanging bracket marked on the template.
Drill the wall and secure the bracket using the plugs and screws provided.
Hang the FlowSmart cylinder on the wall making sure it is tight against the side of the boiler.

Top Connections

1. Remove the left hand pipe that joins the flue heat recovery box to the hot connection of the blending valve and remove the two grommets in the top of the boiler casing.
2. Pass the new pipe and grommet through the left hand hole in the top of the boiler and connect the other end to the blending valve hot in connection.
3. Pass the GasSaver to cylinder pipe through the top of the boiler and connect to the GasSaver and left hand cylinder union.
4. Connect the cylinder to blending valve pipe inserting the strainer from the boiler inlet connection.
5. Always use new sealing washers and make sure the pipe grommets are correctly fitted to the boiler casing.



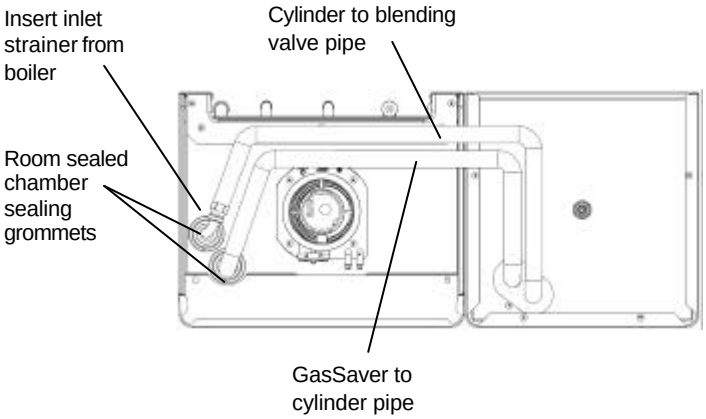


Fig 9

Bottom Connections

1. Remove the primary flow and return tails from the boiler and remove the primary flow isolation valve (this will be used later).
2. Remove the mains water strainer and flow restrictor from the brass housing located at the mains inlet of the boiler.
3. Connect the previously removed primary flow valve to the return connection of the cylinder (left hand connection) and connect the cylinder and primary return pipe assembly to it and the boiler return isolation valve.
4. Connect the cylinder/drain valve adapter to the cylinder flow connection (right hand connection).
5. Connect port A of the diverter valve to the cylinder/drain valve adapter and connect the boiler flow to the diverter valve flow connection AB using the connection pipe supplied.
6. Connect the heating primary flow pipe to the diverter valve B connection with the 1" to ¾" BSP adaptor and tighten all connections.
7. Connect the wires for the diverter valve and cylinder sensor to the main boiler panel as shown in Fig 8
8. When filling the heating system and cylinder vent the cylinder using the top vent connection point.

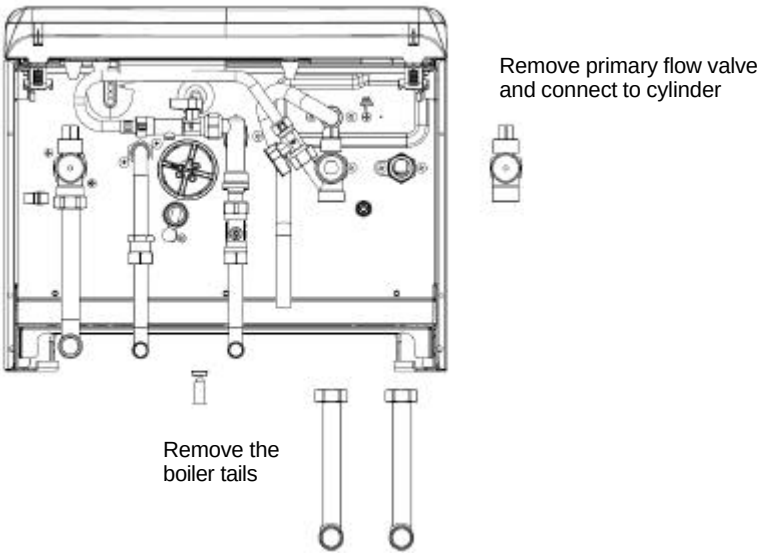


Fig 10

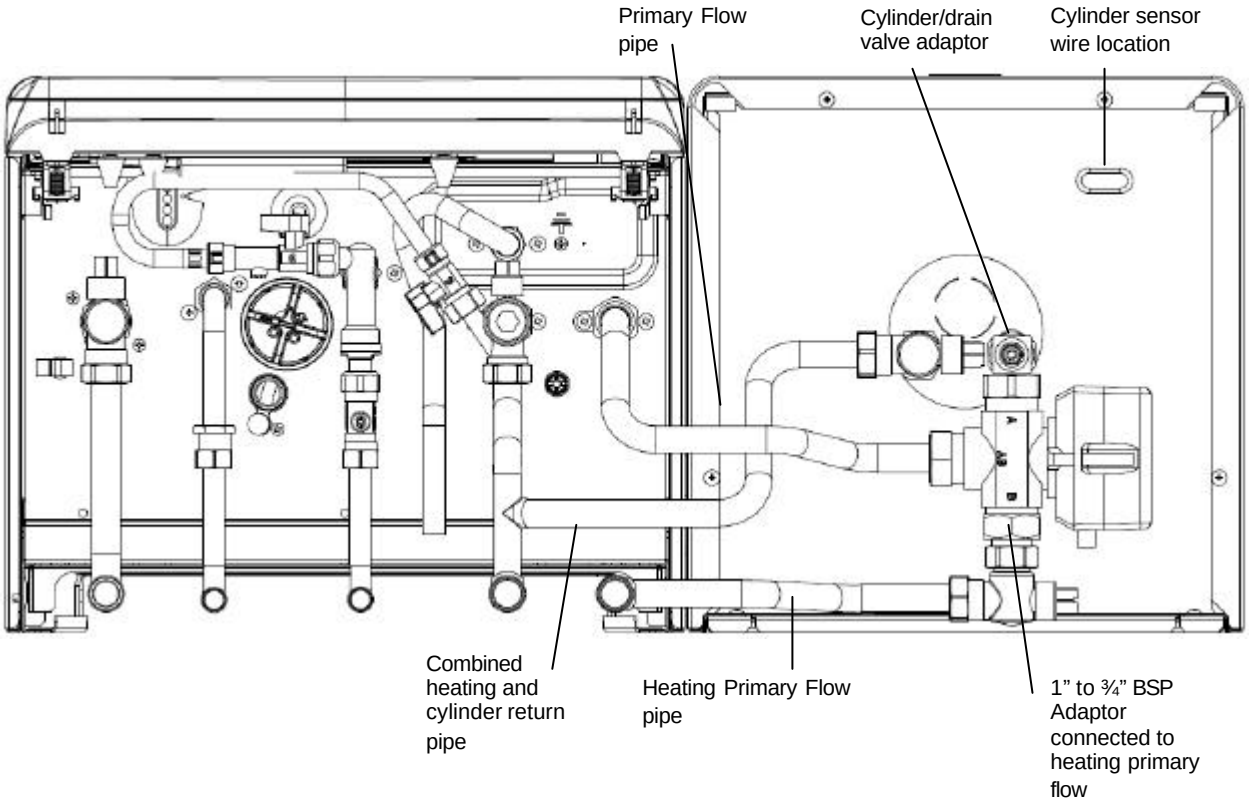
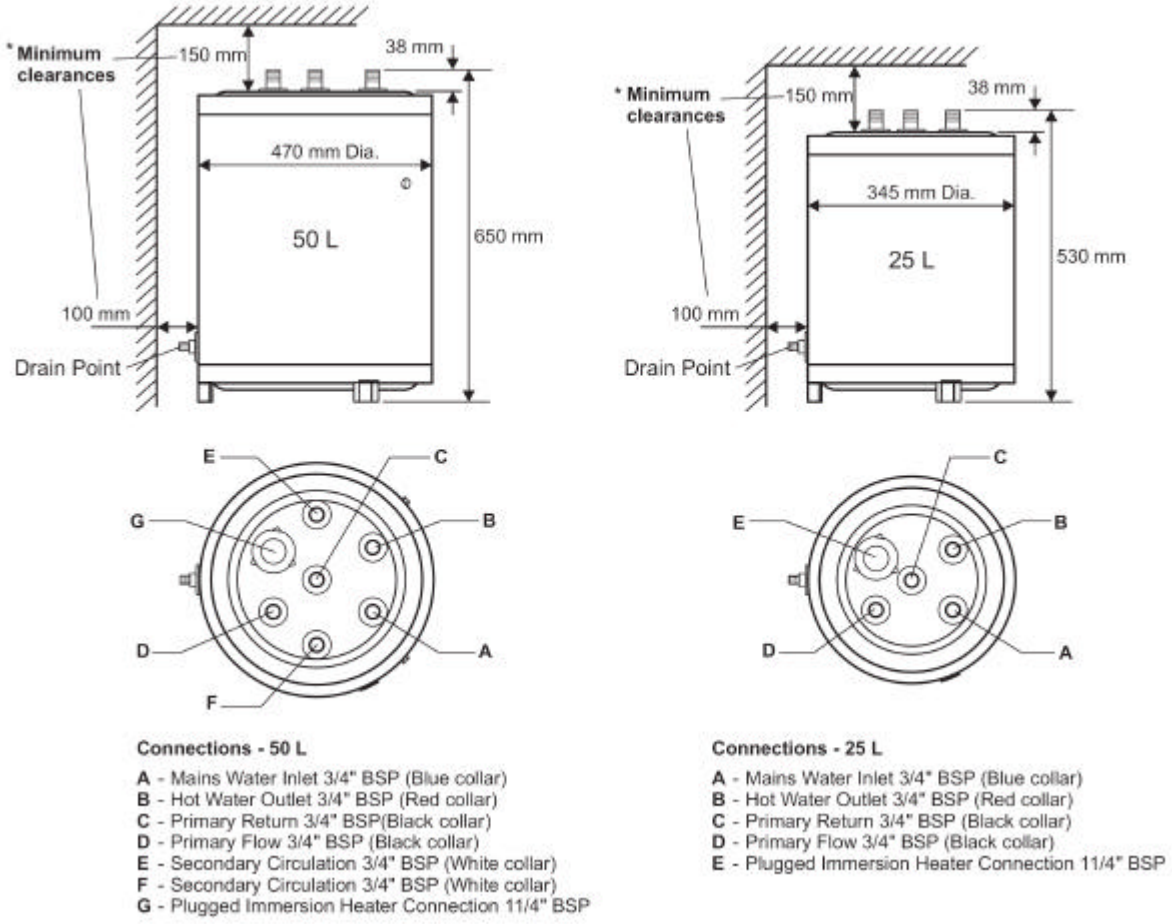


Fig 11

5 Installation (floor standing)

Minimum clearances for servicing	Top	150mm
(Ref Fig. 12)	Side	10mm
	Side at Drain Point Position	100mm
Lift weight (empty)		25L - 16kg / 50L – 29kg
Weight full inc DHW and Primary circuit		25L 42kg / 50L - 82kg

FlowSmart Cylinder location and connections



Connections - 50 L

A - Mains Water Inlet 3/4" BSP (Blue collar)
B - Hot Water Outlet 3/4" BSP (Red collar)
C - Primary Return 3/4" BSP(Black collar)
D - Primary Flow 3/4" BSP (Black collar)
E - Secondary Circulation 3/4" BSP (White collar)
F - Secondary Circulation 3/4" BSP (White collar)
G - Plugged Immersion Heater Connection 11/4" BSP

Connections - 25 L

A - Mains Water Inlet 3/4" BSP (Blue collar)
B - Hot Water Outlet 3/4" BSP (Red collar)
C - Primary Return 3/4" BSP (Black collar)
D - Primary Flow 3/4" BSP (Black collar)
E - Plugged Immersion Heater Connection 11/4" BSP

Fig 12

Electrical connections

When a floor standing FlowSmart is used you will have two options for the controls that can be connected. The Optional Alpha Diverter valve kit (includes cylinder sensor) part number 3.022382 can be connected directly into the boiler relay PCB and with an Alpha Climatic controller either hard wired or RF (Radio Frequency) version to control both heating and cylinder heat up time periods. An Alpha Comfort or EasyStat can be used but this will not time the hot water store and so will maintain the temperature from the cylinder sensor reading only.
Alternatively an S or Y plan kit can be used but an External Weather Compensation Probe cannot be used with this wiring arrangement.

S or Y plan wiring connections to the boiler

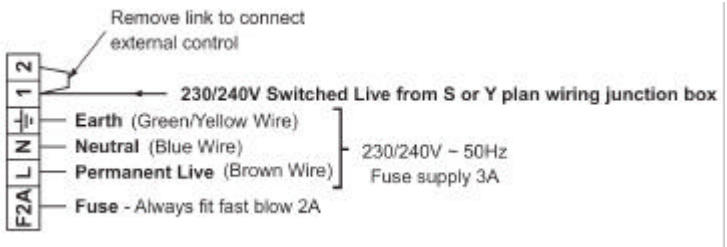


Fig 13

6 General Information

Domestic Hot Water System

Note: Before installation, check that the incoming mains water supply is adequate to provide the required flow rates. High outlet flow rates can only be achieved with a good mains supply pressure and flow.
The minimum flow rate needed for the flow switch and burner to operate is 2.5 litres/min.
The incoming mains water pressure should be between 0.2 and 5 bar to ensure efficient operation. If the pressure is above 5 bar a pressure reducing valve must be fitted.
Pipe runs should be in 15 mm copper pipe and be as short as possible, the pipework should also be insulated to reduce heat loss.
All taps and mixing valves used with the hot water system must be suitable for operating at a mains pressure of up to 8 bar.
Showers - A shower may be used with the boiler if required.
If a loose or flexible head type shower is used it may require the fitting of a double check valve, to comply with Water Bye Law 17.
Bidets - No anti-siphonage arrangements are necessary, provided the outlets are shrouded and it is not possible to attach a temporary hand held spray. A supply of direct mains fed hot and cold water is permitted provided the appliance is of the over-rim flushing type.
Before the mains water supply pipe is connected to the boiler, it should be thoroughly flushed out to avoid the danger of dirt or foreign matter entering the boiler.

FLUSHING THE HEATING SYSTEM

It is essential that the primary system is thoroughly cleaned and flushed when fitting the FlowSmart system. If a cleaning agent is used, it must be flushed out before inhibitor is added to the primary system. Cleaning agent and inhibitor must be applied in accordance with the manufacturers instructions. Only Fernox and Sentinel are acceptable for use. Further information can be obtained from Fernox (Tel: 0179 9521133) or Sentinel (Tel: 0800 3894670).
All cleaning agent **must** be removed and inhibitor added to the system, failure to do so will invalidate the warranty.
The system should be flushed in accordance with BS 7593 and BS 5449. The following procedures are recommended:

1. Installing onto a new system:-

a. Fill the system, vent at high points, at pump and radiators.
b. Check for leaks.
c. Rapidly drain the system.
d. If required, chemically clean the system as instructed by the recommended cleaner manufacturer.
Note: Ensure that the system is flushed to remove any remains of the cleaner.
e. If chemical cleaner is not used to clean the system:-
    i) Refill the system.
    ii) Switch on the boiler and allow the system to heat up to the normal operating temperature.
    iii) Rapidly drain the system while the water is still hot.
    iv) Refill the system.
f. As required, add the recommended inhibitor to the system as instructed by the inhibitor manufacturer.
g. Recheck for leaks.

2. Installing onto an existing system, clean the system before fitting the new boiler:-

a. If the old boiler is still working:-
    i) Switch on the boiler and allow the system to heat up to the normal operating temperature.
    ii) Rapidly drain the system while the water is still hot.
    iii) Refill and chemically clean the system as instructed by the recommended cleaner manufacturer.
    iv) Ensure the system is flushed to remove any remains of the cleaner.
    v) Fit the new boiler.
b. If the old boiler is not working:-
    i) Rapidly drain the system.
    ii) Remove the old boiler.
    iii) Flush the system through.
    iv) Fit the new boiler.
    v) Refill and chemically clean the system as instructed by the recommended cleaner manufacturer.
    vi) Ensure the system is flushed to remove any remains of the cleaner.
c. As required, add the recommended inhibitor to the system as instructed by the inhibitor manufacturer.
d. Check for leaks.

CENTRAL HEATING SYSTEM

Refer to the instructions supplied with the boiler for full information. However when fitting the FlowSmart an additional expansion vessel will be required if the water volume of the heating circuit exceeds 40L this should be fitted to the primary return pipework as close as possible to the FlowSmart primary store and the boiler. As a guide 1litre of expansion should be added for every 10 litres of additional heating water volume over 40 litres (i.e. if the volume of the heating circuit is 90 litres then an additional vessel of at least 5L should be added). This is to allow for the additional expansion required when fitting the FlowSmart primary store. The pre-charge of the expansion vessel should be 1 bar.

Secondary Circulation (Alpha FlowSmart 50 floor standing only)

1. If a DHW secondary circulation circuit is required, you must use the floor standing FlowSmart 50 because it incorporates a secondary circulation coil in the store.
2. A DHW expansion vessel of the correct size must be fitted to the secondary circulation system. The vessel must be a minimum of 10% of the secondary pipe work volume e.g. if the secondary circulation circuit has a water volume of 20 litres then the vessel size must be 2 litres. The vessel pre-charge must be set to the same pressure as the static mains water supply.
3. The secondary circulation pump should be controlled by a timer and correspond with the timer settings of the FlowSmart system i.e. do not operate the pump when the store is not heated.
4. Ensure the setting of the secondary circulation thermostat does not exceed the FlowSmart cylinder thermostat setting.
5. Ensure there are no dead areas or areas where there is no circulation within the pipe work of the secondary circulation system.

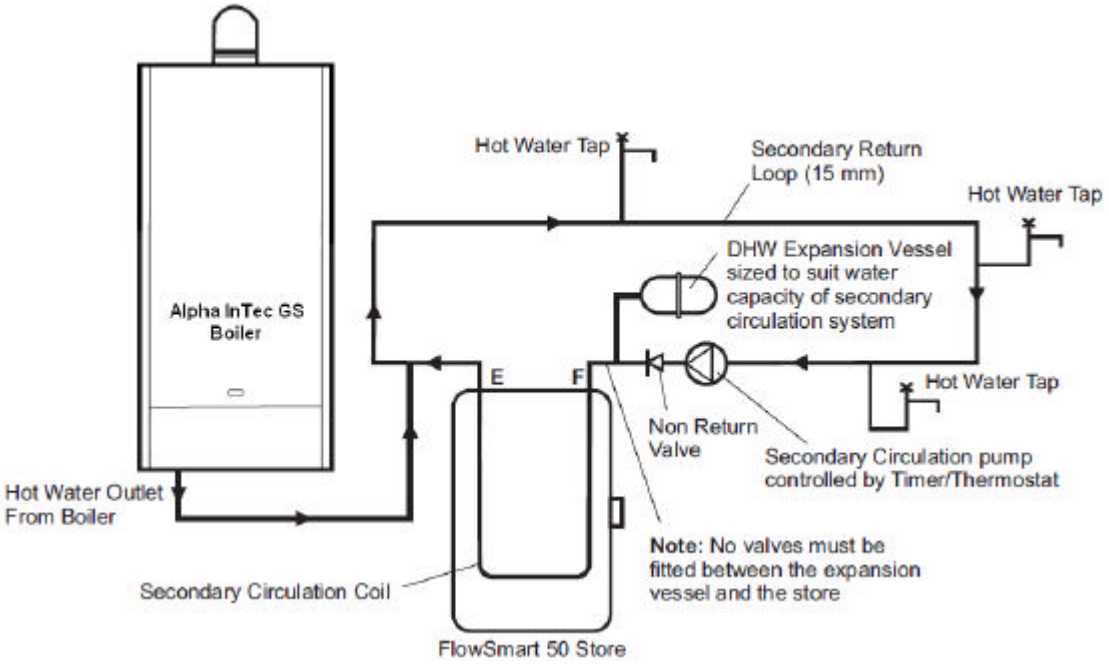


Fig 14

Maintenance Servicing

The cylinder has a drain connection fitted to the manifold underneath. Before removing any connections or the cylinder cover the cylinder should be fully drained using this connection.

It is recommended that the FlowSmart cylinder and connections should be subject to a general condition inspection at each boiler maintenance interval.