Installation and Servicing Instructions

E-Tec 20S, 30S and 35S

Wall Mounted, Fan Assisted, Room Sealed, Gas Fired, High Efficiency Condensing System Boiler

For Technical help or for Service call ...
ALPHA HELPLINE Tel: 0344 871 8764
website: www.alpha-innovation.co.uk

Alpha
HEATING INNOVATION

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

Alpha E-Tec 20S	G.C. No. 41 532 47
Alpha E-Tec 30S	G.C. No. 41 532 48
Alpha E-Tec 35S	G.C. No. 41 532 52

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

Set for use with Natural Gas

Leave these instructions with the User

These instructions have been carefully prepared but we reserve the right to alter the specification at any time in the interest of product improvement.
© Alpha Therm Limited 2020.

Part No. 1.043049 rev. ST.004615/002
1020/D415

BENCHMARK SCHEME

To comply with Building Regulations Part L1 (Part 6 in Scotland) the boiler should be installed in accordance with the manufacturer's instructions. Self-certification that the boiler has been installed to comply with Building Regulations can be demonstrated by completing and signing the Benchmark Checklist at the back of these instructions.

Code of Practice

For the installation, commissioning and servicing of domestic heating and hot water products.

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. Installers are required to carry out work in accordance with the following:

Standards of Work

- Be competent and qualified to undertake the work required.
- Install, commission, service and use products in accordance with the manufacturer's instructions provided.
- Ensure that where there is responsibility for design work, the installation is correctly sized and fit for purpose.
- Meet the requirements of the appropriate Building Regulations. Where this involves notifiable work be a member of a Competent Persons Scheme or confirm that the customer has notified Local Authority Control (LABC), prior to work commencing.
- Complete all relevant sections of the Benchmark Checklist/Service Record when carrying out commissioning or servicing of a product or system.
- Ensure that the product or system is left in a safe condition and, where possible, in good working order.
- Highlight to the customer any remedial or improvement work identified during the course of commissioning or servicing work.
- Refer to the manufacturer's helpline where assistance is needed.
- Report product faults and concerns to the manufacturer in a timely manner.

Customer Service

- Show the customer any identity card that is relevant to the work being carried out prior to commencement or on request.
- Give a full and clear explanation/demonstration of the product or system and its operation to the customer.
- Hand over the manufacturer's instructions, including the Benchmark Checklist, to the customer on completion of an installation.
- Obtain the customer's signature on the Benchmark Checklist to confirm satisfactory demonstration and receipt of manufacturer's instructions.
- Advise the customer that regular product servicing is needed, in line with manufacturers' recommendations, to ensure that safety and efficiency is maintained.
- Respond promptly to calls from a customer following completion of their work, providing advice and assistance by phone and, if necessary, visiting the customer.
- Rectify any installation problems at no cost to the customer during the installer's guarantee period.

* The use of the word "installer" is not limited to installation itself and covers those carrying out installation, commissioning and/or servicing of heating and hot water products, or the use of supporting products (such as water treatment or test equipment).

** Customer includes householders, landlords and tenants.

Benchmark Commissioning and Servicing Section

It is a requirement that the boiler is installed and commissioned to the manufacturers instructions and the data fields on the commissioning checklist completed in full.

To instigate the boiler guarantee the boiler needs to be registered with the manufacturer within one month of the installation.

To maintain the boiler guarantee it is essential that the boiler is serviced annually by a Gas Safe registered engineer who has been trained on the boiler installed. The service details should be recorded on the Benchmark Service Interval Record and left with the householder.

www.centralheating.co.uk

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

Useful contact details: **Gas Safe Register** - 0800 408 5577 - www.gassaferegister.co.uk

Alpha Heating Innovation: General Sales Enquiries - 0344 871 8760
Technical Helpline - 0344 871 8764

CONTENTS

1 Introduction....3
2 Safety symbols and information 4
3 Technical data 6
4 General boiler information 12
5 Installation 19
6 Commissioning....29
7 Routine servicing....38
8 Component replacement 44
9 Wiring diagram 48
10 Error codes and fault finding....49
11 Short parts list 52
12 Energy classification....53
Benchmark Checklist....60
Service Record....61

1 INTRODUCTION

The E-Tec 20S, 30S and 35S are wall mounted, room sealed, fan assisted, high efficiency, condensing boilers. The burner is lit electronically and the heat output is controlled by a modulating fan and gas valve.

The E-Tec 20S, 30S and 35S are boilers that provided central heating only, on a sealed system.

The boiler is supplied with a pump, pressure relief valve, expansion vessel and pressure gauge fully assembled and tested. It is designed for use with a fully pumped, sealed and pressurised central heating system.

IMPORTANT

Failure to install and commission this appliance in compliance with the manufacturer's instructions may invalidate the warranty.

It is the law that all gas appliances are installed by a competent person, ie Gas Safe registered personnel, 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 L26.

Building Standards (Scotland) (Consolidation) Regulations issued by the Scottish Development Department

UK Water Regulations/Byelaws (Scotland)

Health & 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: 2008.....Flueing and Ventilation Requirements
BS 5440-2: 2009.....Installation and Maintenance of Flues and Ventilation
BS 5546: 2010.....Specification for Water Heating Appliances
BS 6798: 2009.....Specification for Installation gas fired boilers up to 70 kW
BS 6891: 2005 + A2: 2008.....Installation of low pressure Gas Pipework
IGEM/UP/2 .....Installation of pipework
IGEM/UP/4 .....Commissioning of gas fired plant
IGE/UP/10 .....Installation of Flued gas appliances
IGEM/UP/16 .....Design for natural gas installations
IGE/UP/1 and 1B.....Strength Testing and tightness testing Natural Gas Installations

Reference should also be made to any other standards and requirements relating to the installation depending on the location and use.

Reference should be made to DEFRA document 'Guide to condensing boiler installation assessment procedures for dwellings'.

If installation is in a timber framed building, refer to the Institute of Gas Engineers document IGE/UP/7.

This appliance meets the requirements of IPX5D, ie degree of protection against moisture.

This appliance contains no asbestos and no substances have been used in the construction process that contravene the COSHH Regulations (Control of Substances Hazardous to Health).

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

Manufacturer's instructions must **NOT** be taken in anyway as over-riding statutory obligations.

Notes:
1. Ensure that the Benchmark Checklist has been completed after the boiler has been installed and commissioned.
2. It is the law that all domestic boiler installations are registered by the installer through the Gas Safe Notification Scheme.
3. The boiler must only be used with Alpha CD condensing flue components.

Propane Gas (LPG) - In addition to the regulations and requirements stated, the boiler **must be** installed in accordance with BS 5482:1 - The Installation of Propane Burning Appliances in Permanent Dwellings.

2 SAFETY SYMBOLS and INFORMATION

GENERIC HAZARD
Strictly follow all of the indications next to the symbol. Failure to follow the indications can generate hazard situations resulting in possible harm to the health of the operator and user in general.

ELECTRICAL HAZARD
Strictly follow all of the indications next to the symbol. The symbol indicates the appliance's electrical components or, in this manual, identifies actions that can cause an electrical hazard.

MOVING PARTS
The symbol indicates the appliance's moving components that can cause hazards..

HOT SURFACES
The symbol indicates the appliance's very hot components that can cause burns.

SHARP SURFACES
The symbol indicates the appliance's components or parts that can cause cuts if touched.

EARTH TERMINAL CONNECTION
The symbol identifies the appliance's earth terminal connection point.

READ AND UNDERSTAND THE INSTRUCTIONS
Read and understand the appliance's instructions before performing any operation, carefully following the indications provided.

INFORMATION
Indicates useful tips or additional information.

RECOVERABLE OR RECYCLABLE MATERIAL

The user must not dispose of the appliance at the end of its service life as municipal waste, but send it to appropriate collection centres.

PERSONAL PROTECTIVE EQUIPMENT

SAFETY GLOVES

SAFETY GOGGLES

SAFETY FOOTWEAR

2.1 ELECTRICAL SUPPLY

ATTENTION:

The power supply cable must be connected to a 230 V ±10% / 50 Hz mains supply respecting L - N polarity and earth connection; ⏚, this must be connected to a fused 3 A double pole switch with class III overvoltage category (contact separation of at least 3 mm in both poles) or a fused 3 A 3-pin plug and unswitched shuttered socket outlet (both complying with BS 1363) in compliance with installation regulations.

The boiler is supplied with a 'Special X' type electrical connection with a PVC <HAR> H05VV-F 3 x 0.75 cable without a plug.

If the power cable is damaged or replaced, it must be replaced with a cable supplied by Alpha or authorized After-Sale Technical Service. Replacement is recommended using a qualified company in order to prevent any risk.

The boiler must be earthed.

There must only be one common isolator, providing complete electrical isolation, for the boiler and any external controls.

Wiring external to the boiler must be in accordance with the current IEE Wiring Regulations (BS 7671).

Note: If a room thermostat is fitted, it must be suitable for 230 V switching.

If the boiler is locked out and an error code is shown on the display, the **RESET** button can be pressed to try and clear the fault. If the fault still occurs after pressing the **RESET** button, then contact an approved engineer or Alpha service support department.

2.2 PHYSICAL DATA

Boiler flow and return connections		mm	22
Gas connection diameter		mm	22
Boiler dimensions	Height	mm	712
	Width	mm	440
	Depth	mm	256
Clearances for servicing	Bottom	mm	150
	Bottom (with jig)	mm	250
	Top (horizontal flue)	mm	235
	Top (vertical flue)	mm	150
	Sides	mm	5
	Front	mm	450
Recommended hole size for flue pipe		mm	110
Recommended hole size for instalation from inside the building		mm	130
Boiler dry lift weight	E-Tec 20S	kg	32.2
	E-Tec 30S	kg	34.1
	E-Tec 35S	kg	36.7
Boiler operating weight (full of water) approx.	E-Tec 20S	kg	33.9
	E-Tec 30S	kg	36.0
	E-Tec 35S	kg	40.5
Max. total flue length	Horizontal	m	12
Max. total flue length	Vertical	m	14
Flue system diameter		mm	60/100

3 TECHNICAL DATA

3.1 TECHNICAL PERFORMANCE DATA - NATURAL GAS (Cat I2H 2H - G20 20 mbar)

		E-Tec 20S	E-Tec 30S	E-Tec 35S
Heat input gross - DHW*	kW	32.0	36.2	43.3
Heat input gross - CH	kW	27.3	31.7	36.3
Heat input net - DHW*	kW	28.8	32.6	39.0
Heat input net - CH	kW	24.6	28.6	32.7
Heat output condensing (50/30°C) - CH	kW	26.1	29.7	34.4
Heat output non condensing (80/60°C) CH	kW	24.1	28	32
Heat output min. - CH	kW	4.3	4.9	6.1
Heat output nominal - DHW*	kW	28.3	32	37.9
Gas rate at max. output	m^3/h	3.05	3.45	4.13
Gas supply pressure	mbar	20	20	20
Max. CH temperature - Set point	°C	85	85	85
Gas burner injector diameter	mm	5.00	6.00	6.70
Dry NOx weight (net calorific value)	mg/kWh	35	30	39
Dry NOx	ppm	20	17	22
NOx	Class	6	6	6
Factory set CO_2				
CO_2 at maximum CH output	%	9.7	9.5	9.2
CO_2 at maximum DHW output	%	9.7 (+0.5/-0.2%)	9.5 (±0.2%)	9.2 (+0.4/-0.2%)
CO_2 at minimum output	%	8.8 (+0.2/-0.3%)	8.6 (+0.2/-0.3%)	8.5 (+0.1/-0.3%)
CO (max)	ppm	450	450	450
Maximum CO/CO_2	Ratio	0.004	0.004	0.004
SAP/SEDBUK seasonality efficiency 2005	%	90.2	90.2	90.2
SAP/SEDBUK seasonality efficiency 2009	%	89.0	89.0	89.0
ErP Seasonal space heating efficiency	%	93	93	93
Max. primary system pressure	bar (MPa)	2.5 (0.25)	2.5 (0.25)	2.5 (0.25)
Min. primary system pressure	bar (MPa)	0.5 (0.05)	0.5 (0.05)	0.5 (0.05)
Recommended system pressure - Cold	bar (MPa)	1.0 (0.1)	1.0 (0.1)	1.0 (0.1)
System pressure relief valve setting	bar (MPa)	3.0 (0.3)	3.0 (0.3)	3.0 (0.3)
Expansion vessel size	litres	8.0	8.0	8.0
Expansion vessel charge pressure	bar (MPa)	1.0 (0.1)	1.0 (0.1)	1.0 (0.1)
Electrical power consumption - Max.	Watts	80	105	120
Electrical power consumption - Standby	Watts	2	2	2
Max. temperature of combustion products	°C	75	75	75
Max. flue overheating temperature	°C	120	120	120
Ambient operating temperature	°C	-5 to +50	-5 to +50	-5 to +50
Category		II 2H3P	II 2H3P	II 2H3P
Type of installation		C13, C33, C43, C53, C63, C83, C93		

* with Alpha Diverter Kit fitted

3.2 TECHNICAL PERFORMANCE DATA - LPG - PROPANE GAS (Cat I3P 3P - G31 37 mbar)

		E-Tec 20S	E-Tec 30S	E-Tec 35S
Heat input gross - DHW*	kW	31.3	35.4	42.4
Heat input gross - CH	kW	26.7	31.1	35.5
Gas supply pressure	mbar	37	37	37
Gas burner injector	mm	3.80	4.30	4.90
CO_2 at maximum CH output	%	11.4	11.2	10.85
CO_2 at maximum DHW output	%	11.4 (+0.1/-0.3)	11.2 (+0.2/-0.4)	10.9 (+0.4/-0.2)
CO_2 at minimum output	%	10.6 (+0.3/-0.1)	10.0 (+0.4/-0.2)	9.9 (+0.4/-0.2)
Gas rate at maximum output	kg/h (g/s)	2.24 (0.62)	2.53 (0.7)	3.03 (0.84)

* with Alpha Diverter Kit fitted

Note: OtherTechnical data is the same as NG data.

3.3 FLUE LENGTHS

A 500 mm or 1000 mm Easy-Flue terminal kit with 90° bend or horizontal terminal is available.

CD 750 mm and 1000 mm flue extensions are available.

Length of Flue Required:-

Rear Flue = wall thickness + 180 mm (includes terminal).

Side Flue = wall thickness + distance between wall and side of boiler + 265 mm (includes terminal).

Vertical Flue = distance from top of boiler side panel to required roof position minus 1000 mm for vertical terminal assembly.

Maximum horizontal flue length = 12 m.

Maximum vertical flue length including terminal is 14 m.

Each additional CD 90° Bend is equivalent to 1.3 m of flue length.

Each CD 45° Bend is equivalent to 0.9 m of flue length.

The CD Vertical Flue terminal assembly is equivalent to 1 m of flue length.

3.4 PUMP

Both pump with UPM3 electronics and pump with LED and UPM3 W3 (Wave 3) electronics

The boiler is equipped with a variable speed low power consumption pump.
During the DHW mode, the pump always runs at the maximum speed.
During the CH mode, three different functioning modes of the pump are available, Proportional, Fixed and Constant T.

Proportional - The pump speed is controlled automatically in order to give a proportional pump head, the pump speed varies based on the heat output supplied by the burner - the greater the heat output the higher the pump speed. See parameter A3 in Section 6.13.
It is possible to adjust the pump speed range in the boiler parameter menu.

Fixed - The pump runs at a constant speed by setting the same minimum and maximum speeds. See parameters A1 and A2 in Section 6.13.

Constant - The pump speed is controlled to give a set T. See parameter A3 in Section 6.13.
The boiler is factory set to Constant - to achieve a T of 15°C (parameter A3 is set to 15)

By-pass Regulation - The boiler leaves the factory with the by-pass open.

If necessary, the by-pass can be adjusted to the system requirements from maximum (by-pass open) to minimum (by-pass closed). Adjust using a flat head screwdriver, turn anticlockwise to close the by-pass, and clockwise to open.

With the by-pass in the closed position the system must have a continuous open circuit.

If zone valves are used in the system an external by-pass must be fitted.

Pump with LED and UPM3 W3 (Wave 3) electronics ONLY

When the pump is running, the LED lights with a steady green light.

When the pump switches on, the green LED flashes at a higher intensity and then returns to normal intensity with a steady green light.

If the pump detects an alarm, the LED switches from green to red which can mean one of the following:

a - Low supply voltage.

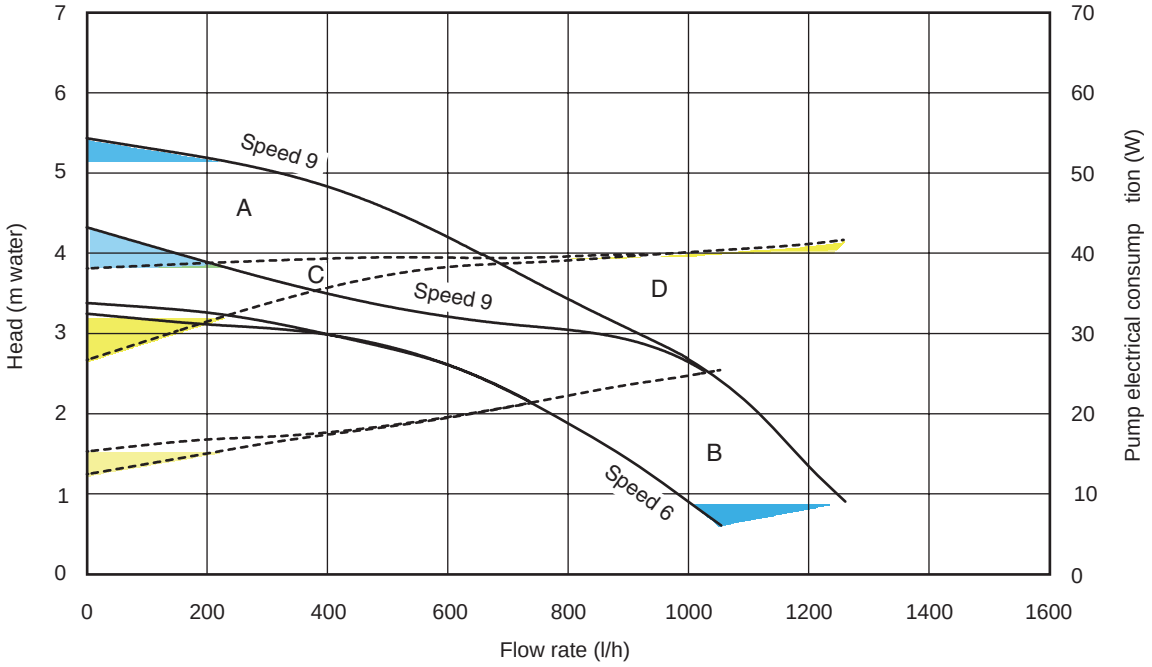
b - Seized rotor.

c - Electrical fault.

To see in detail the meaning of the red LED, please refer to the end of Section 10.2 under pump fault.

The LED in addition to being green or red, can also remain off. It is normal for the LED to be off when the pump is not running whereas with the pump running the LED must be lit, if it is not it means there is a fault.

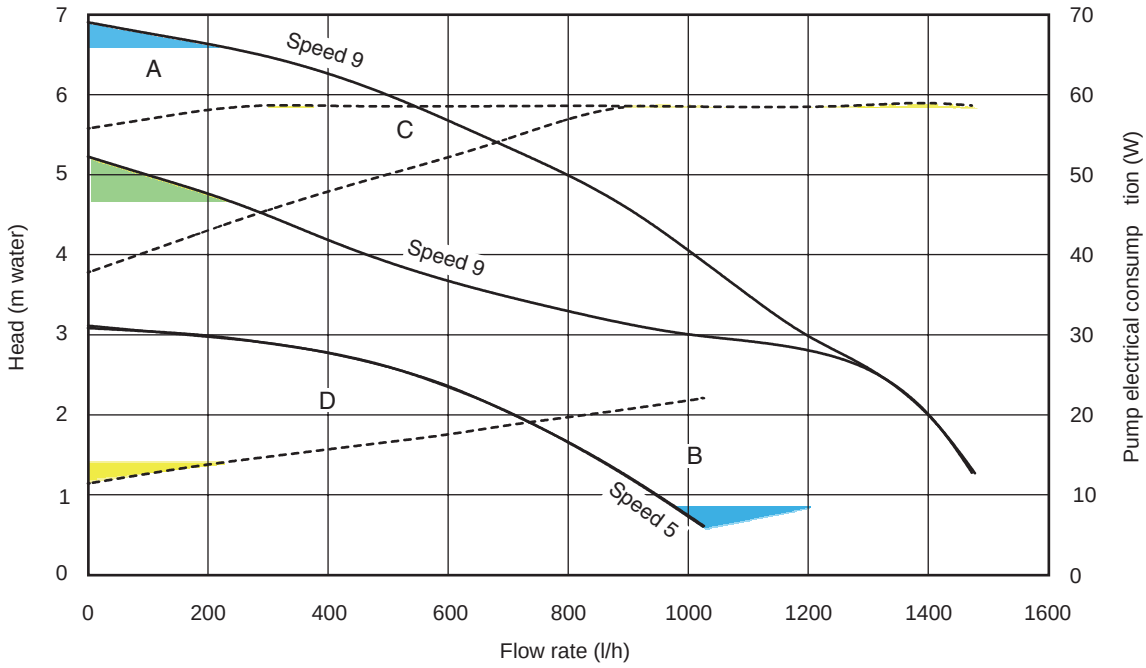
3.5.1 E-Tec 20S Available Pump Head and Power Consumption



A+B = Head available with by-pass closed
B = Head available with by-pass open
C+D = Power consumed by the pump with by-pass open (dotted area)
D = Power consumed by the pump with by-pass closed (dotted area)

Fig. 3.1

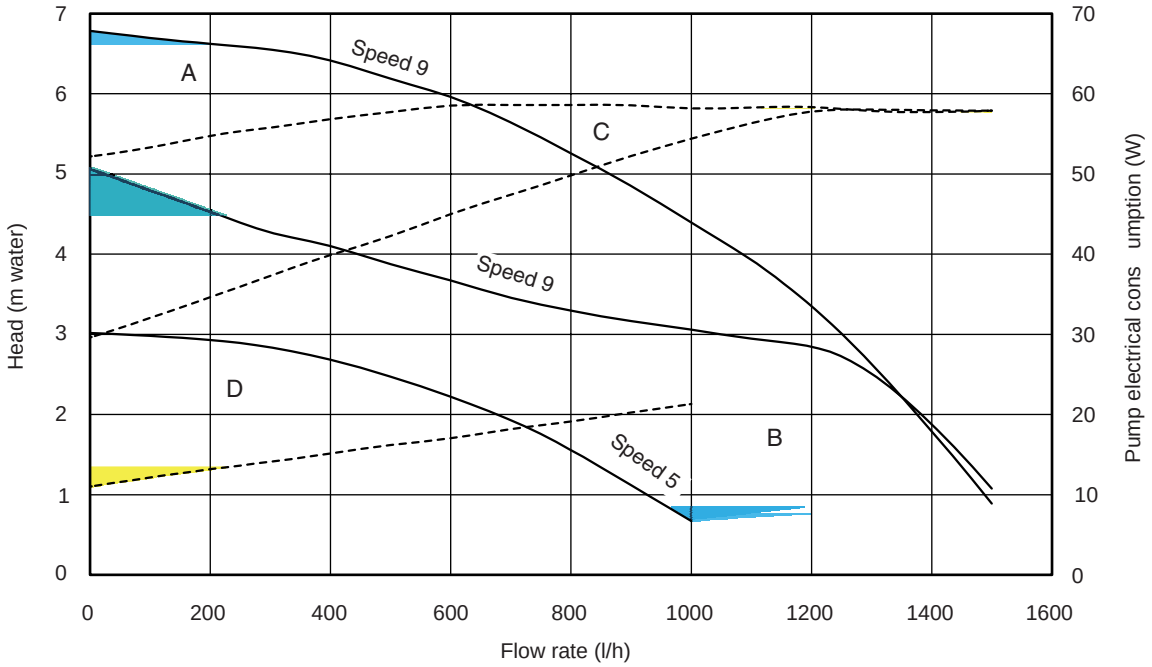
3.5.2 E-Tec 30S Available Pump Head and Power Consumption



A+B = Head available with by-pass closed
B = Head available with by-pass open
C+D = Power consumed by the pump with by-pass open (dotted area)
D = Power consumed by the pump with by-pass closed (dotted area)

Fig. 3.2

3.5.3 E-Tec Plus 35S Available Pump Head and Power Consumption



A+B = Head available with by-pass closed
B = Head available with by-pass open
C+D = Power consumed by the pump with by-pass open (dotted area)
D = Power consumed by the pump with by-pass closed (dotted area)

Fig. 3.3

3.6 ELECTRICAL CONNECTIONS

Note: This Appliance Must Be Earthed

Optional integral single channel controls are available if required.

Note: Only use the Alpha two channel controls. **Do not fit any single channel controls*.**

Fig. 3.3 shows the Internal two channel clock option for S or Y plan. Alternatively bring a Switched Live from external controls to terminal 1.

DO Not connect an Alpha Climatic control when the proprogrammer clock is connected.

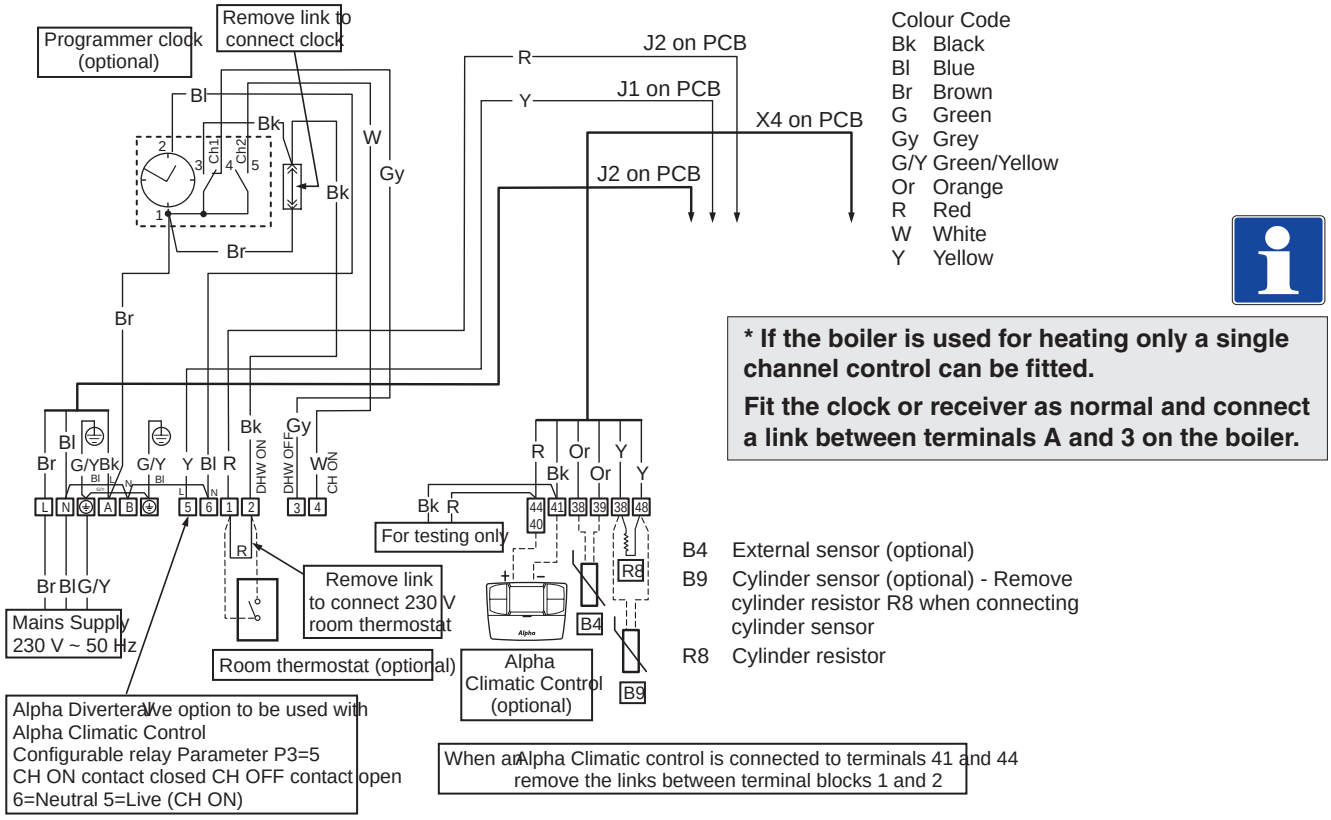


Fig. 3.3

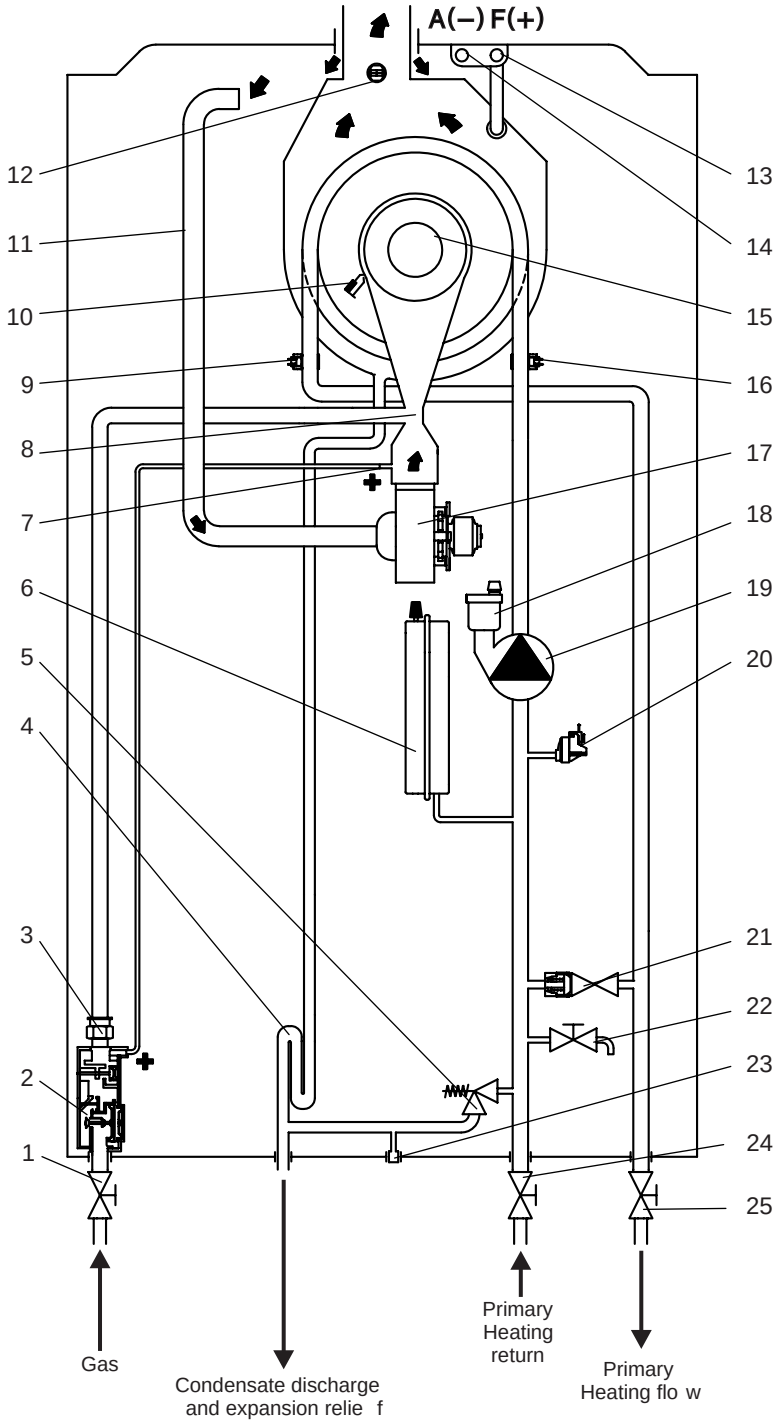
3.7 DATA BADGE ANNOTATION

NOTE: Technical data is provided on the boiler data label and in Section 3.1.

Md		Cod. Md	
Sr N°		Cod. PIN	
Type			
Qnw/Qn min.	Qnw/Qn max.	Pn min.	Pn max.
PMS	PMW	D	TM
NOx Class			
			CONDENSING

Md.....Model
Cod. Md .....Model code
Sr N° .....Serial number
CHK.....Check
Cod. PIN .....PIN code
Type .....Type of installation (ref. CEN TR 1749)
Qnw min. .....DHW minimum heat input
Qn min. .....CH minimum heat input
Qnw max. .....DHW maximum heat input
Qn max. .....CH maximum heat input
Pn min. .....Minimum heat output
Pn max.....Maximum heat output
PMS.....Maximum system pressure
PMW.....Maximum DHW pressure
D .....Specific flow rate
TM .....Maximum operating temperature
NOx Class.....NOx Class
CONDENSING .....Condensing boiler

3.8 BOILER SCHEMATIC



1	Gas isolation valve	10	Ignition/sensing electrode	19	Boiler pump
2	Gas valve	11	Air supply pipe	20	Primary pressure switch
3	Gas injector	12	Flue temperature sensor	21	By-pass
4	Condensate trap	13	Flue test point (pressure point +)	22	Drain point
5	3 bar safety valve	14	Air test point (pressure point -)	23	Safety valve indicator
6	Expansion vessel	15	Burner	24	Heating return isolation valve
7	Venturi positive pressure point (+)	16	Primary return sensor	25	Heating flow isolation valve
8	Venturi	17	Fan		
9	Primary flow temperature sensor	18	Automatic air vent		

Fig. 3.4

4 GENERAL BOILER INFORMATION

4.1 GAS SUPPLY

The meter and supply pipes must be capable of delivering the required quantity of gas in addition to the demand from any other appliances connected to the same gas supply.

Refer to Technical performance data in Section 3.1 and 3.2.

The complete installation, including the meter, must be tested for gas tightness and purged as described in BS 6891.

4.2 AIR SUPPLY

The boiler does not require any air vents for cooling in the room in which it is installed or when installed in a cupboard or compartment. The minimum clearances for servicing must always be maintained.

Note: A cupboard or compartment used to enclose the boiler must be designed and constructed specifically for the purpose, i.e. comply with the Building Regulations.

4.3 FLUE SYSTEM - Figs. 4.1, 4.2

The flue system must be installed in accordance with BS 5440:1.

When using a horizontal flue kit ensure that the flue outer duct is installed horizontally (please note that the flue inner duct already has a pre-determined slope towards the boiler for condensate to run back towards the boiler).

When additional flue extensions are used, ensure the flue slopes downwards towards the boiler by a minimum of 25 - 30 mm per metre of flue.

Horizontal and vertical flue assemblies should be supported every metre with access provided to the joints.

All joints between flue sections should be connected using the clamps provided. It is not required to add additional screws through the clamps and into the flue sections.

Additional flue components are available as follows:-

CD EasyFlue 500 mm telescopic terminal - Part No. 6.12000510.

CD EasyFlue 1000 mm telescopic terminal - Part No. 6.12001010.

CD 750 mm flue extension - Part No. 6.2000750.

CD 1000 mm flue extension - Part No. 6.2001050.

CD 100 mm flue support brackets (pack of 5) - Part No. 6.1000355.

CD 90° bend - Part No. 6.2000590.

CD 45° bend - Part No. 6.2000545.

CD Vertical flue terminal kit - Part No. 6.2000520. Refer to the separate installation instructions supplied with the kit.

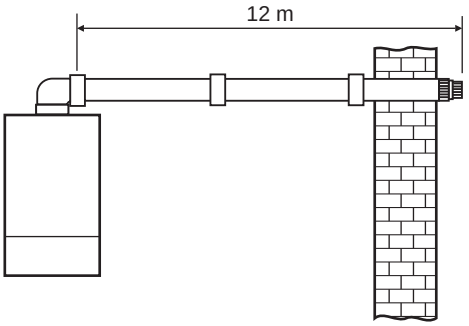
Flue support brackets - Part No. 6.1000355.

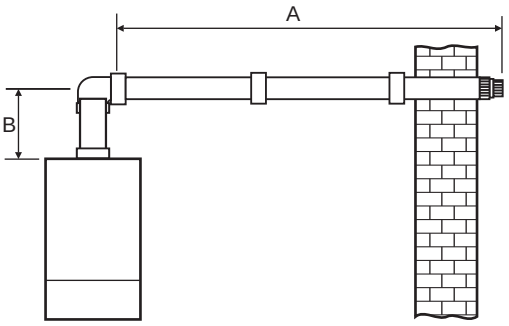
Terminal guard - Part No. 6.2000570.

Additional flue accessories and plume management are also available.

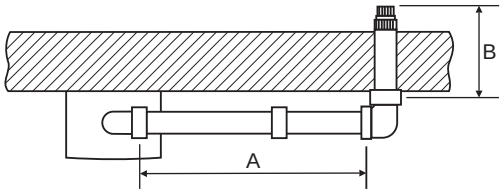
Note:
1. If an extra 90° bend is used, this reduces the maximum flue length by 1.3 m. Each 45° bend used reduces the maximum flue length by 0.9 m.
2. Under no circumstances must the flue length (including allowances for extra bends) exceed 12 metres horizontally and only 14 metres vertically.
3. Failure to use Alpha flue components with the boiler will invalidate the boilers CE approval, guarantee and may be unsafe.

HORIZONTAL FLUE OPTIONS - Lmax - 12 metres

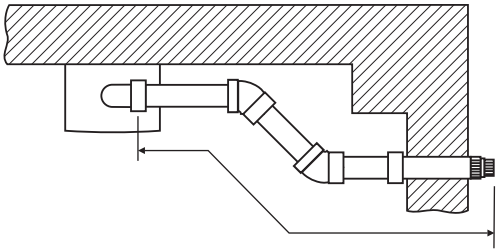




L = A + B = 12m max.



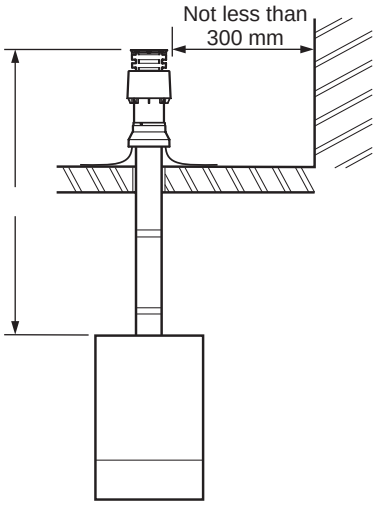
L = A + B + (90° bend = 1.3 metre)



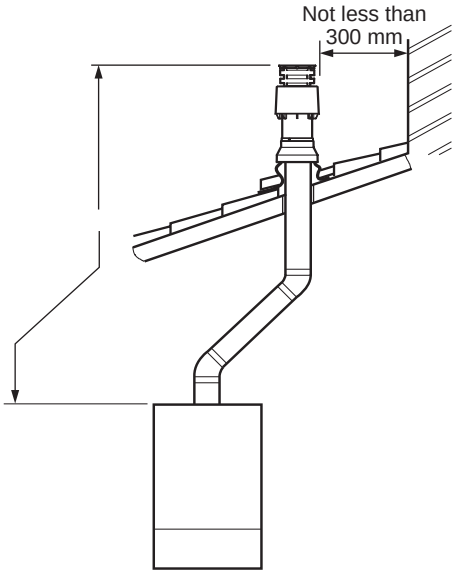
L = A + (2 x 45° bends = 1.8 metre)

Fig. 4.1

VERTICAL FLUE OPTIONS



Hmax = 14 m



Hmax = 12.2 m (14 m - 1.8 m)

Fig. 4.2

4.4 FLUE TERMINAL LOCATION - Figs. 4.3 and 4.4

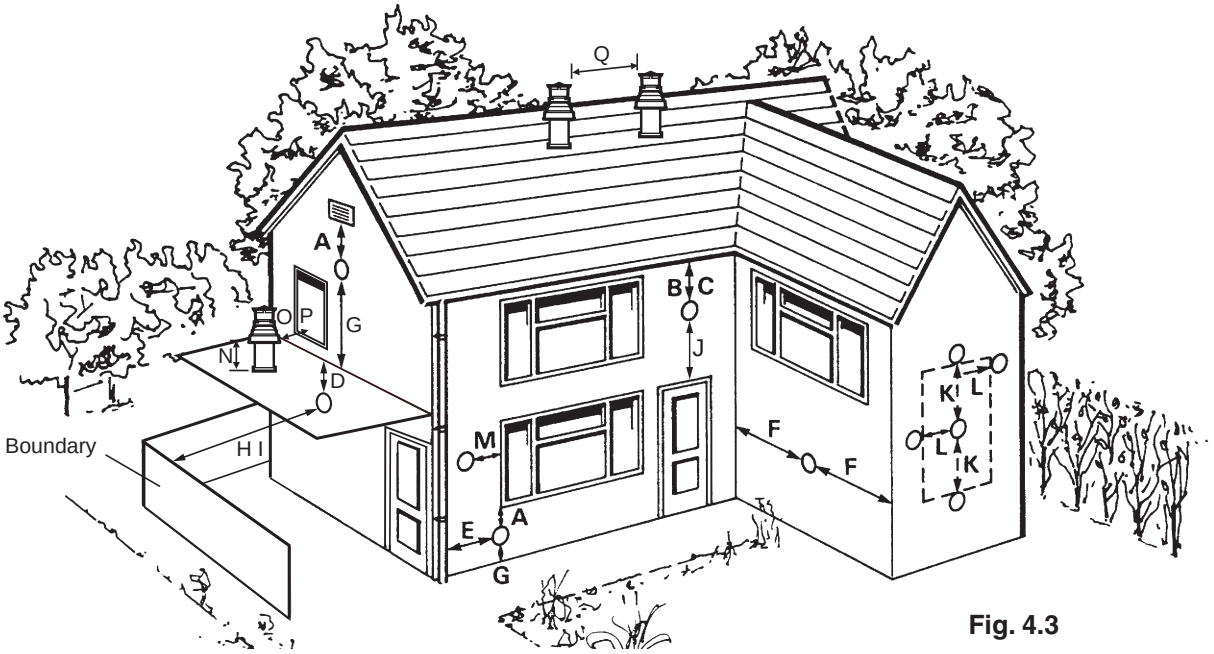


Fig. 4.3

	Terminal position	Min. distance (mm)
A	Directly below an opening, air brick, windows, etc.	300 (See Note 1)
B	Below gutters, soil pipes or drain pipes	75 (See Note 3)
C	Below eaves	200 (See Note 3)
D	Below balconies	200 (See Note 3)
E	From a vertical drain pipe or soil pipe	150 (See Note 3)
F	From an internal or external corner	300 (See Note 2)
G	Above ground, roof or balcony level	300 (See Note 9)
H	From a surface or boundary facing the terminal	600 (See Note 4)
I	From a terminal facing the terminal	1200 mm
J	Above an opening, air brick, window etc.	300 (See Note 1)
K	Vertically from a terminal on the same wall	1500 mm
L	Horizontally from a terminal on the same wall	300 mm
M	Horizontally from an opening, air brick, window etc.	300 mm (See Note 1)
N	Minimum protrusion through a roof	300 mm
O	From a vertical obstruction	300 mm
P	From an openable window	600 mm
Q	From an adjacent vertical terminal	600 mm

Notes:

1. In addition, the terminal should not be nearer than 150 mm to the framework of an opening into the building, i.e. a window surround or door surround.
2. This clearance may be reduced to 25 mm without effecting the performance of the boiler. However, to ensure the condensate plume does not affect adjacent surfaces a clearance of 300 mm is preferable.
3. These clearances may be reduced to 25 mm without effecting the performance of the boiler. However, to ensure the condensate plume does not affect adjacent surfaces the terminal can be extended beyond gutters, pipes, eaves, balconies etc. by upto 500 mm. If the flue is extended more than 500 mm outside, it should be boxed and insulated.
4. To reduce the possibility of nuisance to neighbouring buildings etc. it is recommended the terminal should not be less than 2500 mm from car parking spaces, building boundary walls, fences etc.
5. A terminal must not be sited under a car port roof.
6. In certain weather conditions the terminal will emit a plume of steam. If possible avoid positioning the terminal where this may cause a nuisance, i.e. positions A, D, G, H, J or M.
7. The flue terminal must be exposed to the external air and the position must allow the free passage of air across it at all times.
8. The flue terminal must be positioned where products of combustion will freely disperse and not cause a nuisance.
9. Where a terminal is sited below 2 m from the ground or floor level, the terminal must be protected by a terminal guard. In these situations, consideration should also be given to prevent nuisance plume and fumes in areas such as access routes, passageways, patios, balconies etc.

Proximity of flue duct outlets to boundaries

The flue duct shall be sited so that it is at least 600 mm (see Fig. 4.4) from the boundary line when facing it and at least 300 mm from the boundary line when running parallel to it.

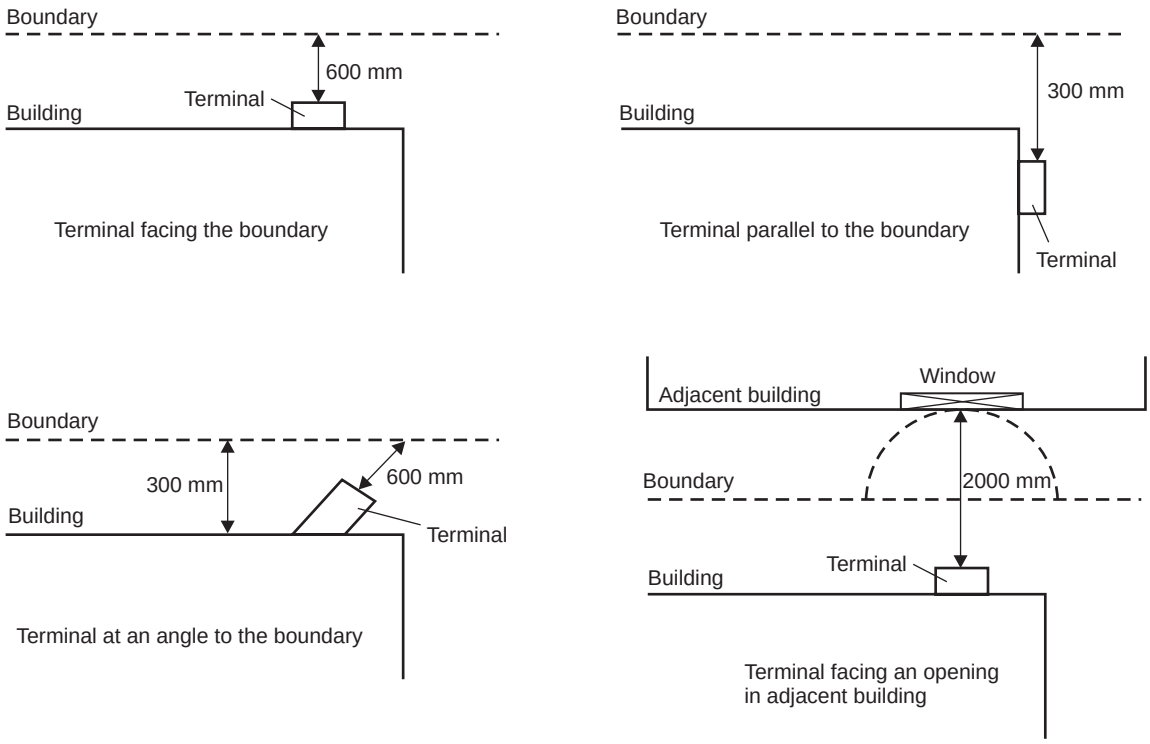


Fig. 4.4

4.5 BOILER LOCATION

The boiler is not suitable for external installation unless it is installed within a purpose designed weatherproof building.

The boiler must be installed on a flat vertical wall which is capable of supporting the weight of the boiler. The boiler can be fitted to or adjacent to a wall comprising of a combustible material without the need for a special thermal insulation barrier.

If the boiler is to be fitted in a timber framed building, it should be fitted in accordance with the Institute of Gas Engineers 'Guide for Gas Installations in Timber Frame Housing', reference IGE/UP/7.

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current IEE Wiring (BS 7671) Regulations, and in Scotland, the electrical provisions of the Building Regulations applicable in Scotland, with respect to the installation of the boiler in a room or internal space containing a bath or shower. Where a room-sealed boiler is installed in a room containing a bath or shower, it must not be possible for a person using the bath or shower to touch any electrical switch or boiler control utilising mains electricity.

The boiler may be installed in a cupboard or compartment, provided it is correctly designed for that purpose, i.e. complies with the Building Regulations and the requirements of BS 6798.

4.6 CENTRAL HEATING SYSTEM - Fig. 4.5

The boiler is designed for use in a sealed central heating system in accordance with the requirements of BS EN 12828 and BS 6798.

The system should be designed to operate with flow temperatures of up to 90°C. When designing the system, the pump head, expansion vessel size, mean radiator temperature, etc. must all be taken into account. Refer to the pump performance table for guidelines.

System volume - The expansion vessel incorporated into the boiler is suitable for a sealed heating system with a maximum water content of 80 litres (18 gal). Above 80 litres, consideration should be given to fitting an additional expansion vessel fitted in the position shown in Fig. 4.5. To check correct operation of the expansion vessel(s) the system pressure should not be more than 2.5 bar when the system is at maximum operating temperature (for further guidance refer to BS 7074:1).

The boiler is supplied with the following components built in:-

Pressure gauge - To indicate the system pressure to be maintained.

Expansion vessel - Conforming to EN 13831 with a capacity of 8 litres and pre-charged with air to a pressure of 1.0 bar.

By-pass - The boiler incorporates an automatic by-pass, an automatic by-pass is required for the system when zone valves are used.

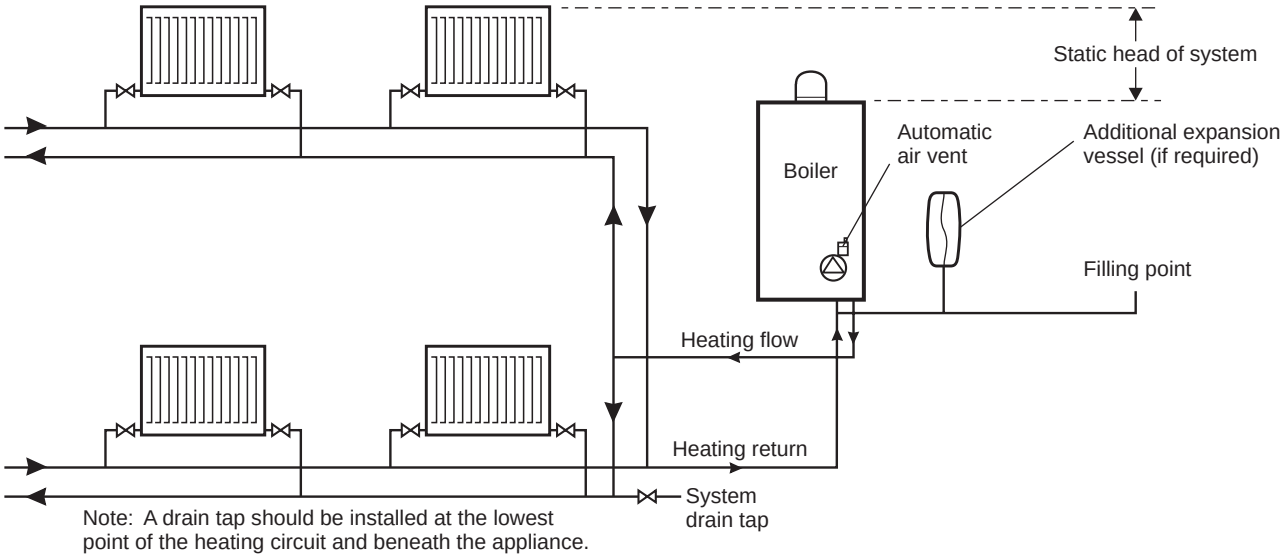


Fig. 4.5

4.7 FILLING THE CENTRAL HEATING SYSTEM - Fig. 4.6

The system design pressure (cold) should be set to 1.0 bar. This pressure is equivalent to a static head (see Fig. 4.5) of 10.2 metres of water.

Provision must be made for filling the system. This is done by the use of a filling loop. See Fig. 4.6. A filling loop is not supplied with this boiler.

Filling of the system must be carried out in a manner approved by the local Water Undertaking. Where allowed, the system may be filled via a temporary connection as shown in Fig. 4.6. After filling, always disconnect the flexible hose of the filling loop.

All fittings used in the system must be able to withstand pressures up to 3 bar. Drain taps (to BS 2879) must be used to allow the system to be completely drained.

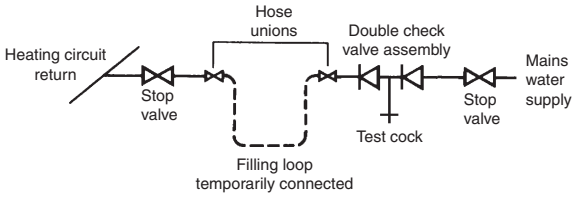


Fig. 4.6

4.8 FLUSHING THE HEATING SYSTEM

It is essential that the central heating system is thoroughly cleaned and flushed before fitting an Alpha E-Tec S boiler. Failure to do so will invalidate the warranty. The primary condensing heat exchanger is constructed in stainless steel and therefore is compatible with most materials used in a heating system.

Where possible, the heating system should be cleaned before installing the boiler. A proprietary cleaner should be used following the product manufacturers' instructions. After installation the system should then be filled and flushed before final filling. A corrosion inhibitor approved by Alpha must be added to ensure that the heating system operates effectively and efficiently, it is important to maintain the correct level of corrosion inhibition at all times.

The corrosion inhibitor should be checked annually at the time of the boiler service, and topped up if necessary. A further dose of corrosion inhibitor should be added to the system every five years.

It is important to ensure that the correct level of inhibitor has been added, and that any cleaner residues have been adequately removed to maintain the operation of the boiler and heating system. Failure to correctly clean and treat the system will invalidate the boiler warranty.

If it is not possible to clean the system before fitting the new boiler, the system should be cleaned using a proprietary cleaner and a magnetic filter connected in the return before the boiler as this is the most effective method of ensuring that any magnetite and rust particles are prevented from entering and damaging the boiler.

Once the system condition has been restored, an effective magnetic filter and strainer should be fitted permanently to the system as a method of collecting any magnetite and rust from the system during operation.

4.9 DISPOSAL OF CONDENSATE

Provision must be made for the safe disposal of condensate produced by the flue gases of the Alpha boilers and reference should be made to BS 6798 for the requirements on the disposal of condensate.

The boilers incorporate a condensate trap which has a seal of greater than 75 mm, therefore no additional trap is required.

The condensate should ideally be discharged internally into an internal waste pipe (washing machine/sink waste) or soil pipe to avoid the possible risk of freezing. The pipework must be in 22 mm pipe (minimum).

External pipe runs should be avoided, but if it is necessary, the pipework should be protected from the risk of freezing with waterproof insulation and the length should be kept to a maximum of 3 m and the condensate pipework should be increased to a minimum of 32 mm diameter. Termination should be into an external gulley or soakaway as shown in Figs. 4.7 and 4.8.

Note: All pipework must have a continuous fall (see Figs. 4.7 and 4.8) from the boiler and must be of an acid resistant material such as plastic waste pipe. (copper or steel is not suitable).

The condensate pipe is combined with the expansion relief discharge. The flexible condensate hose supplied meets the requirements for use with both condensate and expansion relief. This should be connected to a suitable waste pipe and fittings with approval for hot and cold water, i.e. BS EN1451-1PP Waste piping, BS EN1455-1 ABS piping or BS EN 1566-1 MUPVC piping.

The condensate and discharge should be connected to a drain for sewage and foul waste or a dedicated soak away with neutraliser added.

It should be noted that the connection of a condensate pipe to a drain may be subject to local building control requirements.

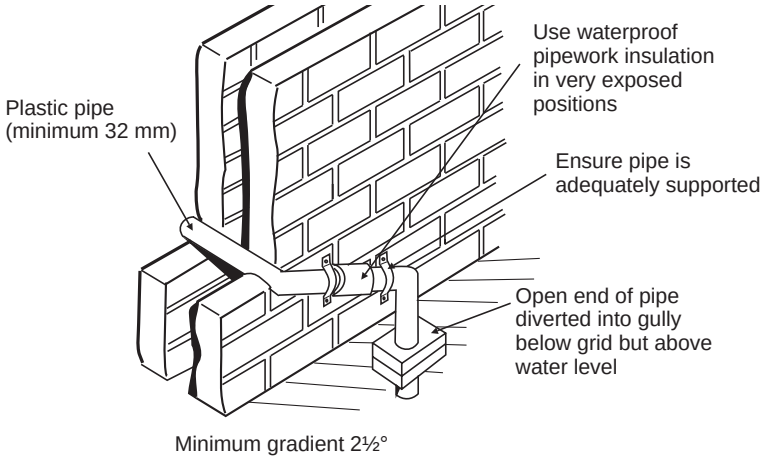


Fig. 4.7 - External gully

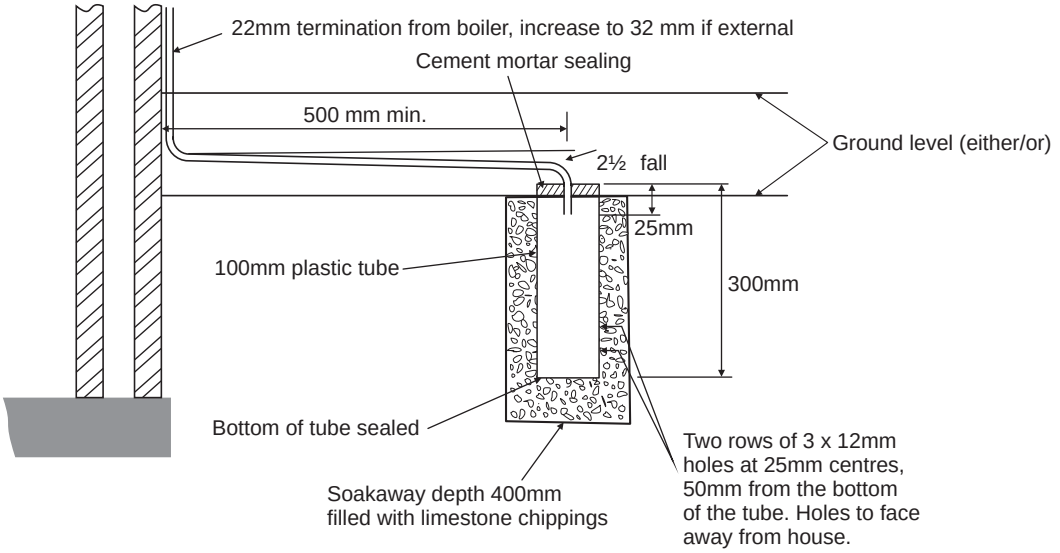


Fig. 4.8 - External soakaway

5 INSTALLATION

5.1 UNPACKING

1. The boiler carton also contains the following:-
   Connection kit (union bends, washers and valves)
   Mounting bracket plus screws and wall plugs
   Condensate discharge pipe
   Literature pack and Wall template

A suitable Alpha flue system must be selected to use with the boiler.

Notes: a. All flues must be suitable for Alpha condensing boilers.
b. CD 750 mm and 1000 mm flue extensions are available, if required.

Damaged products must not be used.

2. Unpack boiler and remove the loose items, packs and mounting bracket.
   Note: The boiler can be stood in an upright position (only while the valves and union bends are not fitted).

It is recommended that two persons lift the boiler.

5.2 CLEARANCES REQUIRED - Fig. 5.1

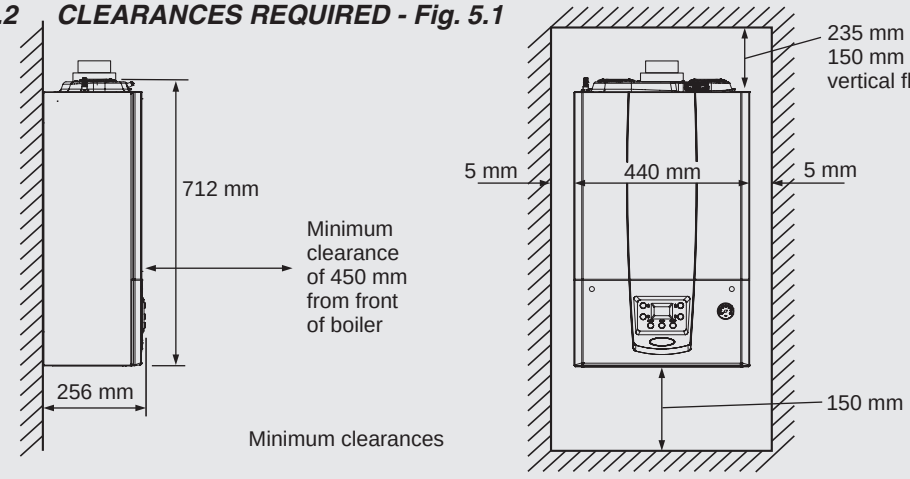


Fig. 5.1

5.3 PREPARE THE WALL - Fig. 5.2

1. Decide upon the position of the boiler taking into account the clearances required for servicing and the flue terminal position.
2. Tape the template to the wall (ensure it is level and the right way up) and mark the position of the holes for the boiler mounting bracket. If rear exit flue is used, mark the position of the hole for the flue.
3. **Side exit flue -** Continue the horizontal centre line of the flue across the wall to the side wall, then along the side wall 135 mm (ensure the lines are horizontal). This will give the position of the centre of the hole for the flue.
4. Cut the 110 mm diameter hole (or use a 107 mm core drill) in the wall for the flue.
   Notes: 1. Ensure the hole is horizontal.
   2. For internal fitting of the flue, using the flue sealing collar supplied, cut a 130 mm dia. flue hole using a 127 mm core drill.
5. Drill the fixing holes (10 mm dia.) to accept the No.10 plugs supplied. Using the screws supplied, fit the mounting bracket.

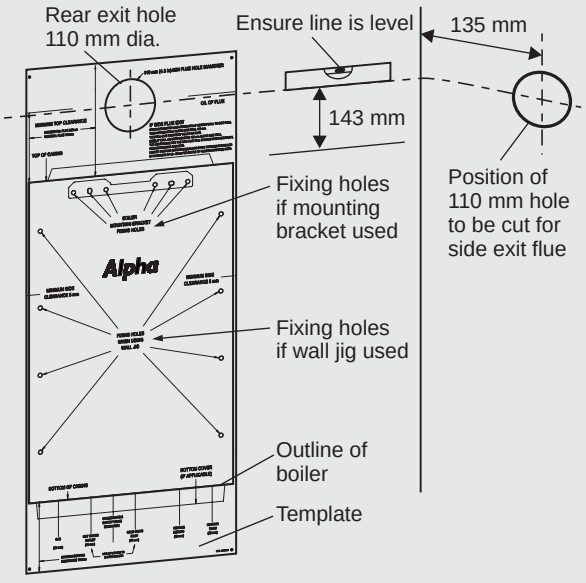


Fig. 5.2

5.4 FIT THE BOILER - Refer to Figs. 5.2 and 5.3

Lift the boiler and locate it on the mounting bracket - the boiler should be lifted by **two** persons.

Note: When handling or lifting always use safe techniques - keep your back straight, bend your knees, don't twist - move your feet, avoid bending forwards and sideways and keep the load as close to your body as possible.
Where possible transport the boiler using a sack truck or other suitable trolley.
Always grip the boiler firmly, and before lifting feel where the weight is concentrated to establish the centre of gravity, repositioning yourself as necessary.

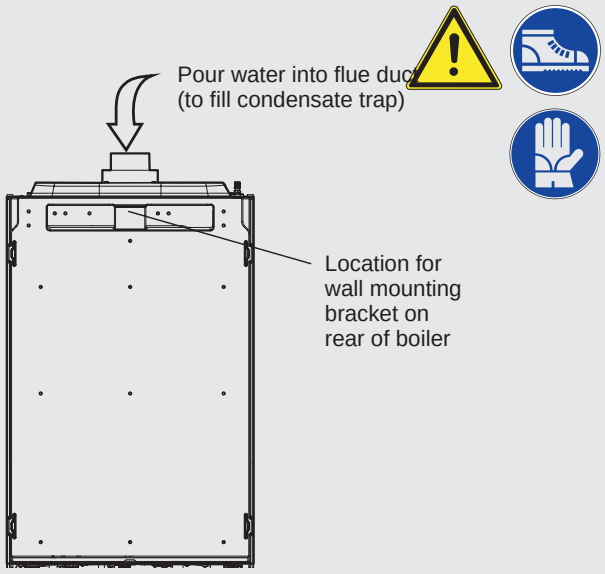


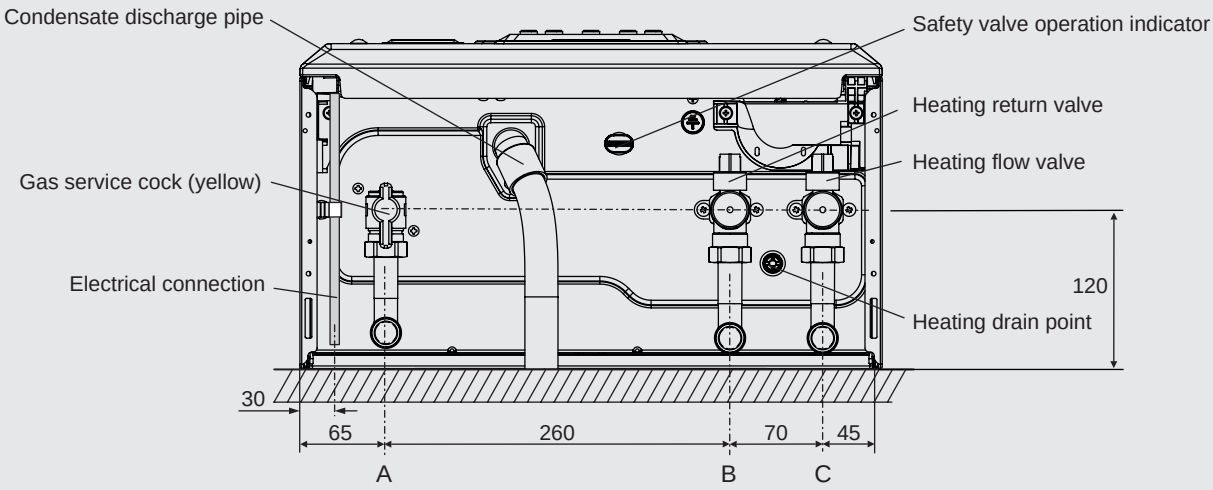
Fig. 5.3 - rear of boiler

5.5 CONNECT THE PIPEWORK - Fig. 5.4

1. Thoroughly flush out all the water pipework. Refer to Section 4.9.
2. Fit the valves to the boiler connections as shown in Fig. 5.4 - note the colours of the operating levers.
3. Connect the system pipework to the union fittings on the valves just fitted.

   Note: When soldering bends, ensure they are not connected to the valves, otherwise the internal seals may be damaged.

   One metre of copper pipe must be fitted to the boiler before connecting to any plastic pipework conforming to BS 7291.
4. Connect the flexible condensate pipe to the rubber connector as shown in Fig. 5.4. Using the adaptor supplied, connect the flexible pipe to the condensate drain.
   Ensure that the condensate discharge pipe is as required in Section 4.9.
5. Ensure that all the valves are closed (operating lever at right angle to valve) and do not turn on the water or gas supplies at this stage.



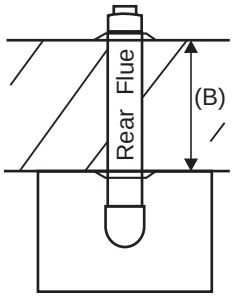
A - Gas inlet - (22 mm)
B - Heating return - (22 mm)
C - Heating flow - (22 mm)

Fig. 5.4

5.6 FIT THE FLUE - Figs. 5.5 and 5.6

The following procedure applies to fitting an Alpha CD Easy-Flue to both rear or side exit flue - horizontally only.

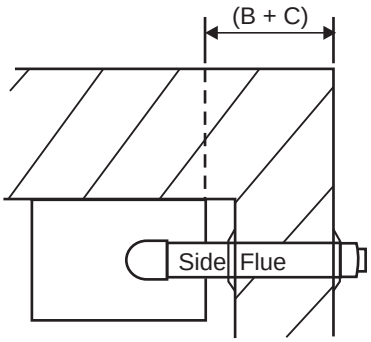
1. The CD Easy-Flues are suitable for use in the flue length ranges shown in the tables below.
   Note: Where the length is less than the minimum or more than the maximum, refer to Section 5.7.



CD Easy-Flue	B (mm)	
	Max	Min
500 mm	530	305
1000 mm	975	765

Note: Add 45 mm to dimension B if the wall jig is used.

Fig. 5.5



CD Easy-Flue	B + C (mm)	
	Max	Min
500 mm	440	215
1000 mm	885	675

Fig. 5.6

2. Determine the overall length (L) of flue required, (see Fig. 5.7) as follows:-

   Rear flue — L = wall thickness (B) + 60 mm (105 mm if the wall jig is used)

   Side flue — L = wall thickness (B) + distance between boiler and wall (C) + 145 mm

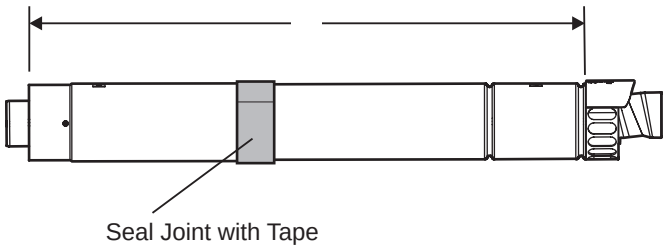


Fig. 5.7

3. Adjust the telescopic section of the flue to the distance 'L', ensuring that the two labels marked 'TOP' are aligned, then seal and secure the joint between the ducts with the sealing tape supplied.
   Note: Always ensure that there is a minimum overlap of 25 mm when fully extending the telescopic section.
4. Pass the flue assembly through the wall (from inside or outside).
   Note: Internal fitting - If there is no access to make good the outside wall, locate the outside (black) flue sealing collar onto the outer duct of the flue immediately before the terminal grille onto the location provided. Push the flue assembly through the 130 mm flue hole, so that the collar completely passes through the wall. Then pull the flue assembly back into the correct position. Visually check that the collar is sealing the outside wall and that it is not restricting any of the openings of the flue terminal.
   Note: Silicone grease or other lubricants must not be used on the flue joints or seals.

   Where a flue terminates less than 150 mm below a gutter, eaves or other obstructions it is possible to extend the flue to allow the flue termination to clear the obstruction, providing the flue is not extended beyond the first joint. For situations below balconies or large eaves where extensions may be required, the flue must be supported using the correct brackets. Alternatively plume management components can be used with supports where necessary.

   All joints between flue sections should be connected using the clamps provided. It is not required to add additional screws through the clamps and into the flue sections.

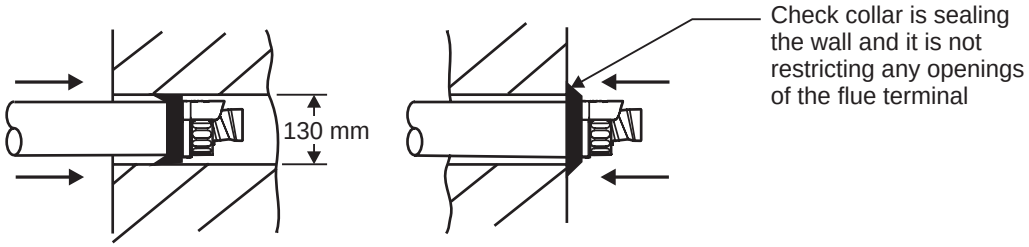


Fig. 5.8 - Fitting the flue from inside

5. Position the smaller Easy-Flue 40 mm clamp (with seal) supplied, over the bend. Fit the bend to the boiler and rotate to the correct position. Secure in position using the clamp. Ensure the clamp is located centrally over both the bend and boiler adaptor.
6. Fit the inside (white) flue sealing collar over the Easy-Flue. If it was not previously fitted, fit the outside (black) flue sealing collar onto the flue immediately before the terminal grille onto the location provided.
7. Slide the larger Easy-Flue 45 mm clamp over the outer duct and pull the flue assembly towards the bend, locating the inner duct into the seal joint on the bend. Ensure the labels marked 'TOP' are positioned at the top before securing the flue assembly to the bend with the clamp (two screws) located centrally over the joint.
   Note: Check the flue terminal protrudes 120 mm out of the wall and the inner duct of the terminal is positioned correctly (see Fig. 5.9).
8. Make good the inside wall by pushing the inside flue sealing collar up to the wall.

   The hole around the flue can be made good using the flue sealing collars supplied or using a suitable sealant/cement if required.

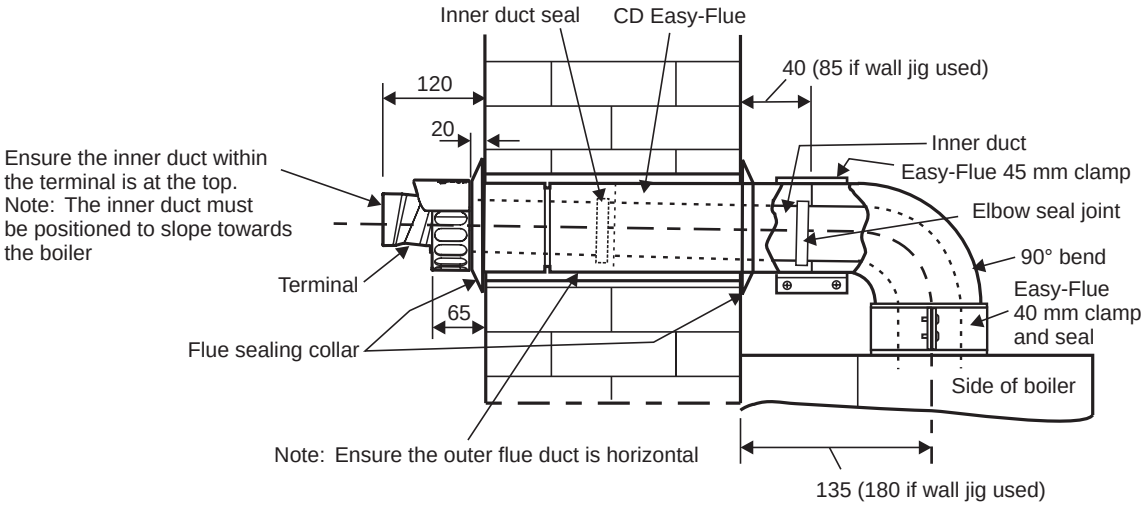


Fig. 5.9 - Rear flue

5.7 REDUCING THE FLUE - Fig. 5.10

When the flue length required is less than the minimum stated in Section 5.6, paragraph 1, refer to Fig. 5.10.

Discard the first telescopic section (**not** the section with the terminal) of the Easy-Flue 1000 mm or 500 mm and cut to the required length.

Note: Ensure that all cuts are square and free from burrs.
Once assembled with the components pushed home, the flue is fully sealed.

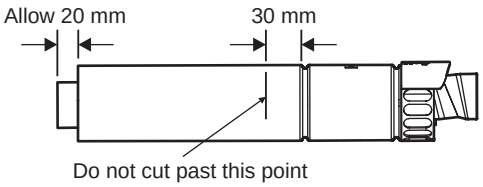


Fig. 5.10

5.8 EXTENDING THE FLUE - Fig. 5.11

Note: The flue assembly length must not exceed the maximum length stated, including the equivalent lengths of any extensions, bends etc. used for plume management components. **E-Tec boilers must not exceed the maximum of an equivalent horizontal flue length of 12 m.**

All joints between flue sections should be connected using the clamps provided. It is not required to add additional screws through the clamps and into the flue sections.

1. When the flue length required is more than the maximum stated in Section 5.6, paragraph 1, refer to the table below and Figs 5.5 and 5.6.

Rear Flue length (B)	Side Flue length (B + C)	Comments
Up to maximum:- 11.890 m (Subtract 45 mm if the wall jig is used)	Up to maximum:- 11.805 m	Alpha CD 750 mm flue extension (Part No. 6.2000750) or 1000 mm extension (Part No. 6.2001050) is required to extend the range of telescopic flue. Refer to Section 5.8 for instructions on how to extend the flue. **Note:** A 130 mm flue hole (127 mm core drill) may be required in the wall. This is when the extended flue is passed through the wall.

Additional support brackets are required when extending the flue. These are available from Alpha, Part No. 6.1000355.

2. Use the template (supplied with the boiler) to mark the required flue position, ensure the slope towards the boiler is correct.
3. Determine the overall flue length as described in Section 5.6, paragraph 2 to determine the number of Alpha CD 750 or 1000 mm flue extensions required.
4. Assemble the flue extensions together by locating the inner duct into the seal joint and secure each extension together with the extension clamps supplied (three screws). Ensure that the clamps are positioned centrally over the joints.
   Note: If it is required to cut an extension, **DO NOT** cut the end of the inner duct that incorporates the seal joint. Ensure the inner duct end without the seal joint is cut so that it is 20 mm longer than the outer duct.
   Ensure that all cuts are square and free from burrs.
   Once assembled with the components pushed home, the flue is fully sealed.
5. Adjust the telescopic section of the Easy-Flue to the required length and secure the Easy-Flue with the sealing tape supplied. Fit the Easy-Flue to the extensions by locating the inner duct into the seal joint and secure with the clamp (three screws), ensuring it is located centrally over the joint.
6. Mark the end of the flue assembly 'TOP' where it is connected to the boiler, so that the 'TOP' of the flue terminal is aligned with the 'TOP' at the boiler end of the flue assembly.
7. Pass the complete flue assembly through the wall.
8. Position the smaller Easy-Flue 40 mm clamp (with seal) supplied, over the bend. Fit the bend to the boiler and rotate to the correct position and secure in position. Ensure the seal is located centrally over both the bend and boiler adaptor. If the inside sealing collar (white) is being used to make good the inside wall, then it will need to be fitted before assembling the flue.
9. Slide the larger Easy-Flue 45 mm clamp (two screws) over the outer duct and pull the flue assembly towards the bend, locating the inner duct into the seal joint on the bend.

   All joints between flue sections should be connected using the clamps provided. It is not required to add additional screws through the clamps and into the flue sections.

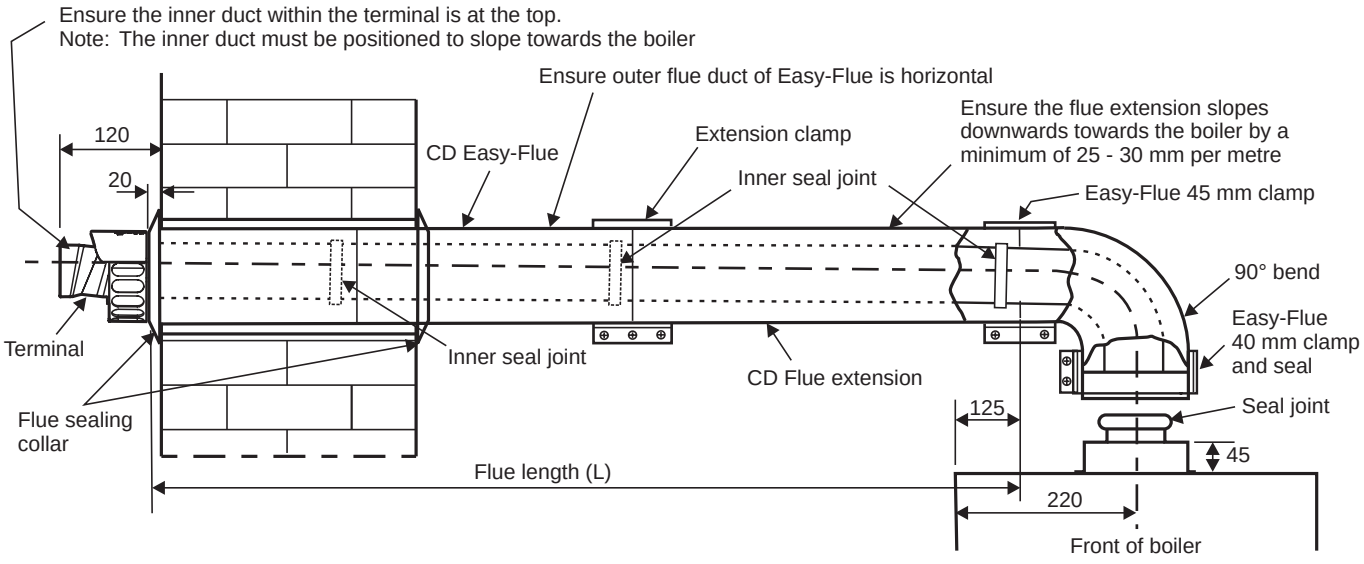


Fig. 5.11 - Side flue

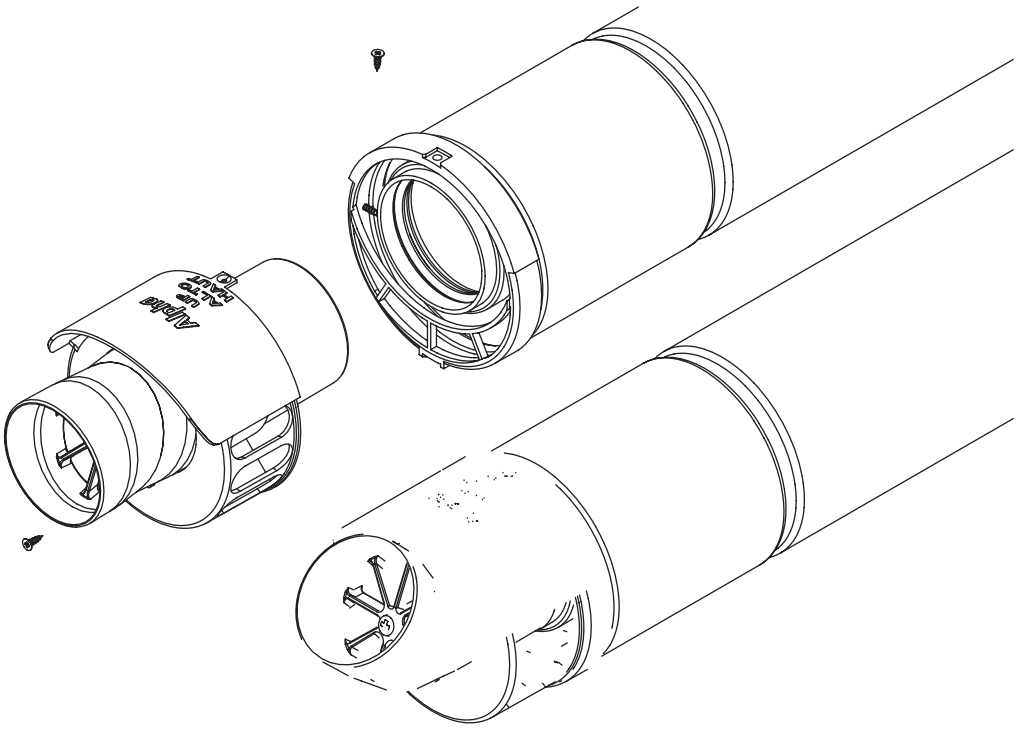


Fig. 5.12