

# The Buderus 500 Range



## Technical Product Guide

24 & 28kW Combi and 24kW System  
High Efficiency Gas Condensing Boilers



**Buderus**



# Buderus – About Us



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## Condensing technology developed by Europe's market leaders

Buderus was established in 1731 and is one of the largest heating brands world-wide. It currently enjoys a **market-leading position in sales of high efficiency domestic gas condensing boilers across Europe**. Buderus has had over twenty five years' experience in the European domestic and commercial condensing market to develop and refine their heating technology. This includes rigorous testing of every component to ensure that each boiler delivers high levels of fuel efficiency, consistent heating and hot water performance and a long product life. The Buderus brand has a presence in over 50 countries, most of them in Europe.

Today Buderus has an estimated **3 million reliable condensing appliances installed in European homes and offices and that number continues to grow**. Buderus domestic gas condensing boilers are manufactured in Deventer, Holland, at an ultra-modern plant that combines an industry leading research and design centre, with state of the art manufacturing and training facilities. As part of BBT Thermotechnology UK Ltd, Buderus is now in the enviable position of being able to bring a tried and tested range of high quality domestic gas condensing boilers to an expectant UK market.

## Over 25 years unrivalled experience in gas condensing boiler technology

*The first gas condensing boiler is manufactured by Nefit in Deventer, Holland.*

*Nefit taken over by Buderus.*

*800 range introduced in Europe.*

*600 domestic range introduced in Europe.*

*Buderus launches the 600 range of domestic condensing boilers in the UK.*

*Buderus extends its range of Sedbuk A rated boilers with the 500 range.*



[www.buderus-domestic.co.uk](http://www.buderus-domestic.co.uk)

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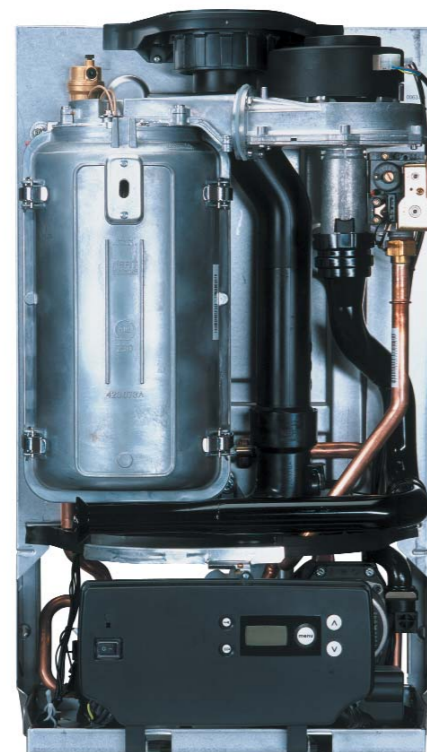


# The Buderus 500 Range Product Overview

## 500 Combi and System Boilers

The 500 range offers the complete condensing package at exceptional value for money. The boilers use proven Buderus condensing technology to achieve consistent heating and hot water performance whilst at the same time significantly reducing fuel bills for the user.

The Buderus 500 range contains a 24 and 28kW combination boiler for heating and hot water, and a 24kW system boiler. All boilers are Sedbuk A rated for efficiency, and have the best possible classification for NOx emissions. Designed to be both installer and user friendly, this reliable condensing boiler is remarkably simple to install and maintain, and provides a host of siting options to suit almost every installation situation.



With a unique and stylish scratch resistant polypropylene casing, smart glow-plug ignition for reliable first time firing, optional room temperature modulation for increased efficiency, and with Buderus 'Warmstart' on the combis, the 500 range is packed with the latest heating technology. Each boiler comes with a 2 year parts and labour warranty as standard, plus a 5 year guarantee on the heat exchanger.

Boiler Type		SYSTEM BOILER		COMBI BOILER	
		24	24	24	28
Output for central heating min/max (CH)	kW	5.7 - 23.0	5.7 - 23.0	5.7 - 23.0	5.7 - 23.0
Output for domestic hot water min/max (DHW)	kW	5.7 - 28.5*	5.7 - 23.0	5.7 - 28.5	5.7 - 28.5
SEDBUK rating		A	A	A	A
Primary flow temperature for CH min/max	°C	30 - 80	30 - 80	30 - 80	30 - 80
DHW flowrate @ 35 degrees rise	Ltr./min	n.a.	9.4	11.7	
Heat exchanger material		AlSi	AlSi	AlSi	AlSi
Expansion vessel	Ltr	7.5	7.5	7.5	7.5
Flow CH connection (compression fitting)	mm	22	22	22	22
Return CH connection (compression fitting)	mm	22	22	22	22
Mains cold water inlet connection (compression fitting)	mm	15	15	15	15
DHW outlet connection (compression fitting)	mm	15	15	15	15
Gas inlet connection (compression fitting)	mm	22	22	22	22
Condensate water outlet (compression fitting)	mm	21.5	21.5	21.5	21.5
Max. horizontal flue length <sup>†</sup>	m	35	35	35	35
Max. vertical flue length <sup>†</sup>	m	35	35	35	35
Height	mm	780	780	780	780
Width	mm	460	460	460	460
Depth	mm	330	330	330	330
Lift weight (dry)	kg	31	31	31	31
Modulation control		✓	✓	✓	✓
Convertible to LPG		✓	✓	✓	✓
Glow ignition		✓	✓	✓	✓
Multi-directional fluing		✓	✓	✓	✓
Buderus ModuLink 250 RF Programmable Room Thermostat		✓	✓	✓	✓
Buderus RC20 Programmable Room Thermostat		✗	✓	✓	✓
Compatible with external controls		✓	✓	✓	✓
Fan protection system		✓	✓	✓	✓
Inbuilt condensate trap/siphon		✓	✓	✓	✓
Inbuilt frost protection		✓	✓	✓	✓
Fault finding diagnostics		✓	✓	✓	✓
Pre-plumbing JIG		✓	✓	✓	✓

\*If a hot water cylinder is installed.

<sup>†</sup>Using the 80/125mm flue kit.



# The 500 Range – Component Guide



Gas-air unit



Heat exchanger



Glowplug



Quick clip fastening



DBA boiler control unit

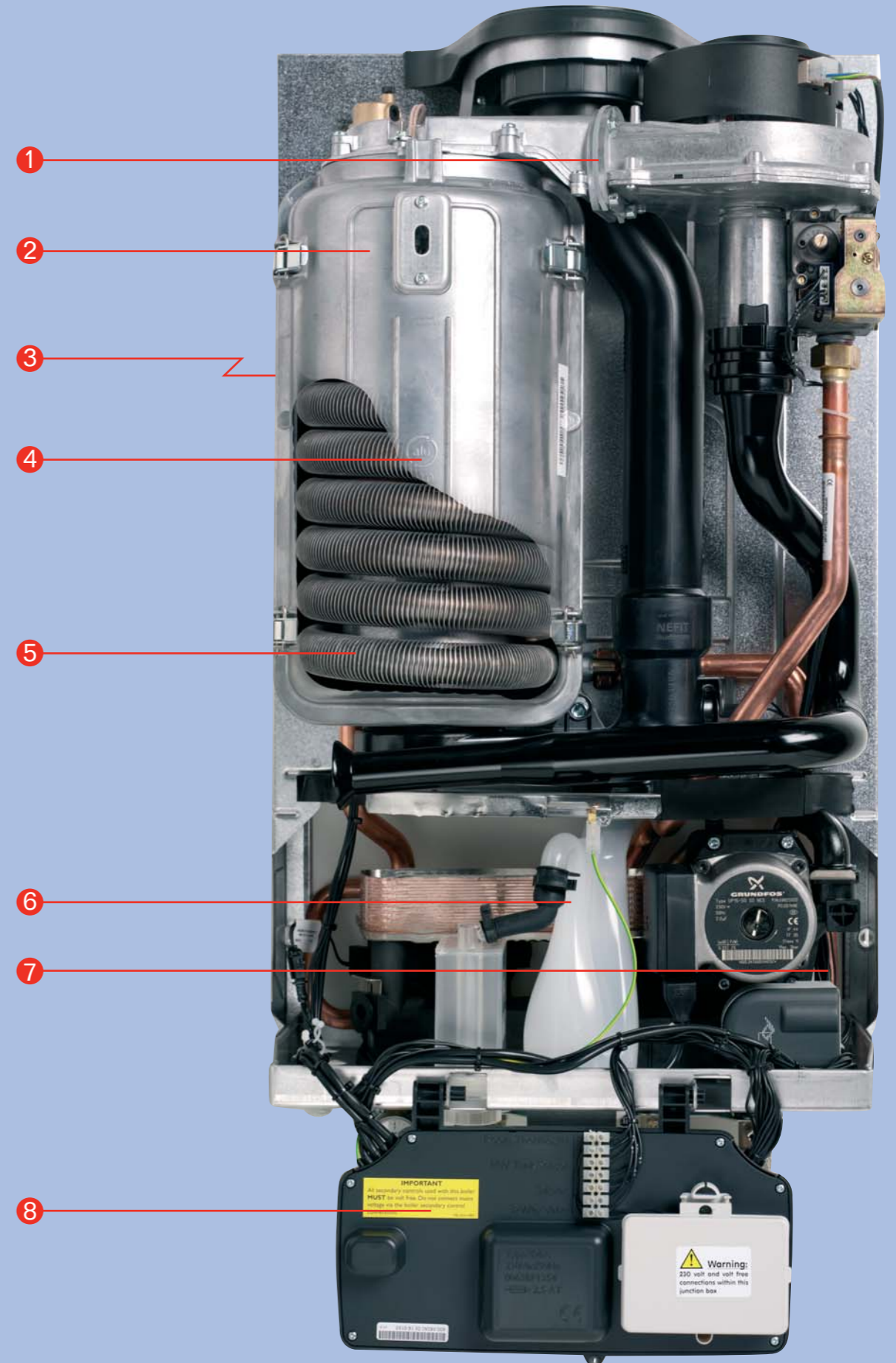
- 1 Gas-air unit**
  - The perfect mixture of gas and air for continually low CO/NOx emissions.
  - Low noise fan, gas valve and burner integrated into one simple 'twist-lock' unit for easy removal.
  - Fully modulating fan to meet the exact output and delivery requirements.
  - Fan protection system for longer flue lengths and improved durability.
- 2 Ceramic glow plug ignition**
  - Controlled and smooth first time ignition.
- 3 Expansion vessel/stand-off frame**
  - 7.5 litres.
  - To allow piping behind the boiler.
- 4 Burner**
  - Stainless steel construction.
  - Easy to service and maintain.
- 5 Heat exchanger**
  - Easy access by four quick clip fastenings.
  - Finned one-piece aluminium heat exchanger.
  - Two simple O-ring connections make removal easy.
  - Compact and lightweight.
  - Rapid heat transfer through aluminium to save more energy.
- 6 Built-in trap and syphon**
  - Low maintenance deep seal trap.
  - Efficient disposal of condensate.
  - Reduction in freezing potential.
- 7 Integrated compact hydraulic system**
  - Grundfos pump.
  - Three way valve.
  - Pressure relief valve.
  - Simple to adjust hot water flow.
  - Adjustable flow regulator with digital flow rate display.
  - 15 mm bypass included.
  - Integrated domestic hot water plate heat exchanger.
  - Warmstart control for quick domestic hot water response.
- 8 DBA boiler control unit**
  - Built in frost protection.
  - Service test button.
  - Boiler status display with diagnostic function.

### Connection block

- Connection of Buderus controls and accessories enables the installer to bypass Part P.

### Junction box

- RTH converter to connect alternative 3rd party controls.



# The 500 Range – Installation Overview

## Important general instructions for use

**500 range condensing boilers are supplied complete with all the required parts for easy installation.**

**For full installation details please refer to the installation manual supplied with each boiler.**

Items supplied within the box:

- Condensing gas boiler.
- Wall bracket.
- Pre-plumbing manifold/jig.
- Wall spacing frame – for piping behind boiler.
- Bracket for ModuLink 250 RF.
- Installation servicing and user manuals.
- Complete range of boiler fittings.

## Boiler siting

To overcome issues of plumbing and space restrictions, Buderus has developed a number of features that enable the installer and householder considerable choice when it comes to siting their boiler. Although the kitchen remains a popular option in most cases, alternative positions within the home are now available for consideration. For example, Buderus has introduced the ModuLink 250 RF controls to make loft or

garage installation an excellent and highly convenient option.

In addition to the ModuLink wireless control system, the 500 range of boilers is also compatible with Buderus 80/125 mm concentric flue kits. The use of the 80/125 mm kit enables further siting flexibility as flue lengths of up to 35 m are possible, depending on the structure and layout of the building. The standard 60/100 mm kits allow flue lengths of up to 12 m. For full details on fluing options please see page 12-17.

## Clearances

The following clearances should be allowed for installation and servicing purposes (Fig.1 and table).

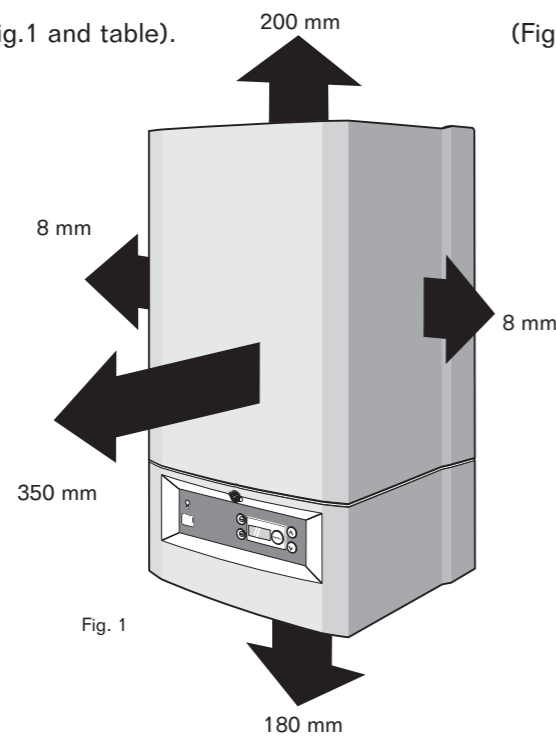


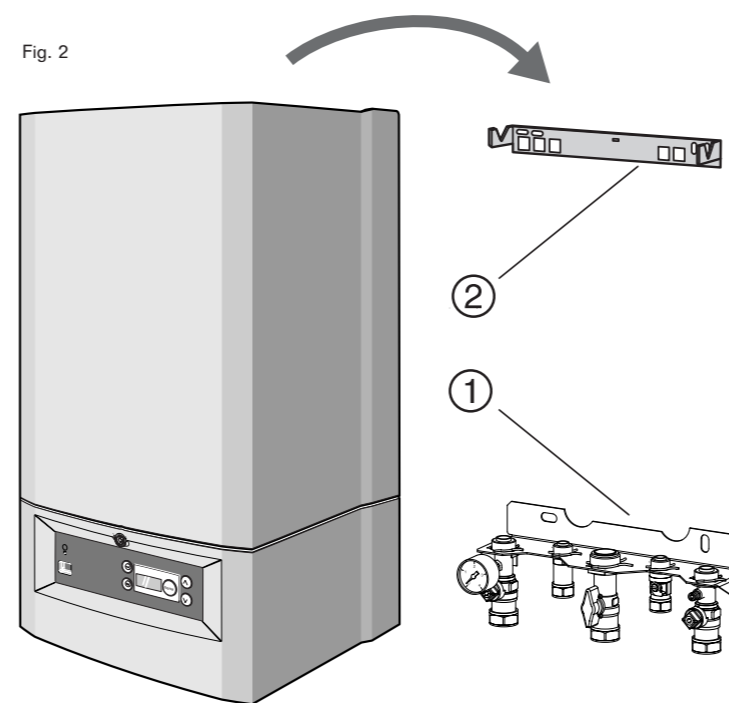
Fig. 1

Required Clearances	Servicing	Permanent
In front:	350 mm	8 mm
Below:	180 mm	21 mm
Right side:	8 mm	8 mm
Left side:	8 mm	8 mm
Above:	200 mm	21 mm

## Hanging the boiler

1. Position the wall mounting template.
2. Drill holes as required.
3. Attach the manifold assembly on to the wall (Fig. 2 item 1).

Fig. 2



4. Connect pipework to manifold.
5. Attach the wall bracket (Fig. 2 item 2) or wall spacing frame if piping behind the boiler.
6. Using the radiator key supplied, open the case locking mechanism (Fig. 3 item 1).
7. Remove the boiler casing.

8. Hang the boiler on the wall bracket (Fig. 2. item 2).
9. Connect the manifold unions to the boiler using washers supplied.
10. Re-attach the boiler casing and lock using the radiator key.

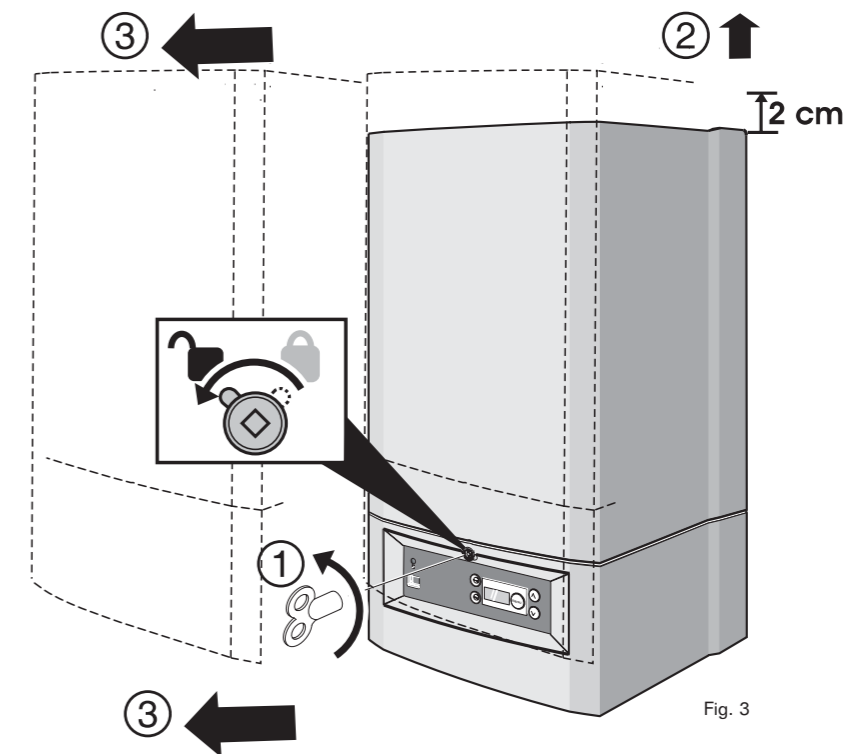


Fig. 3



# Quick Installation Overview continued

## Pipework connections and casing dimensions

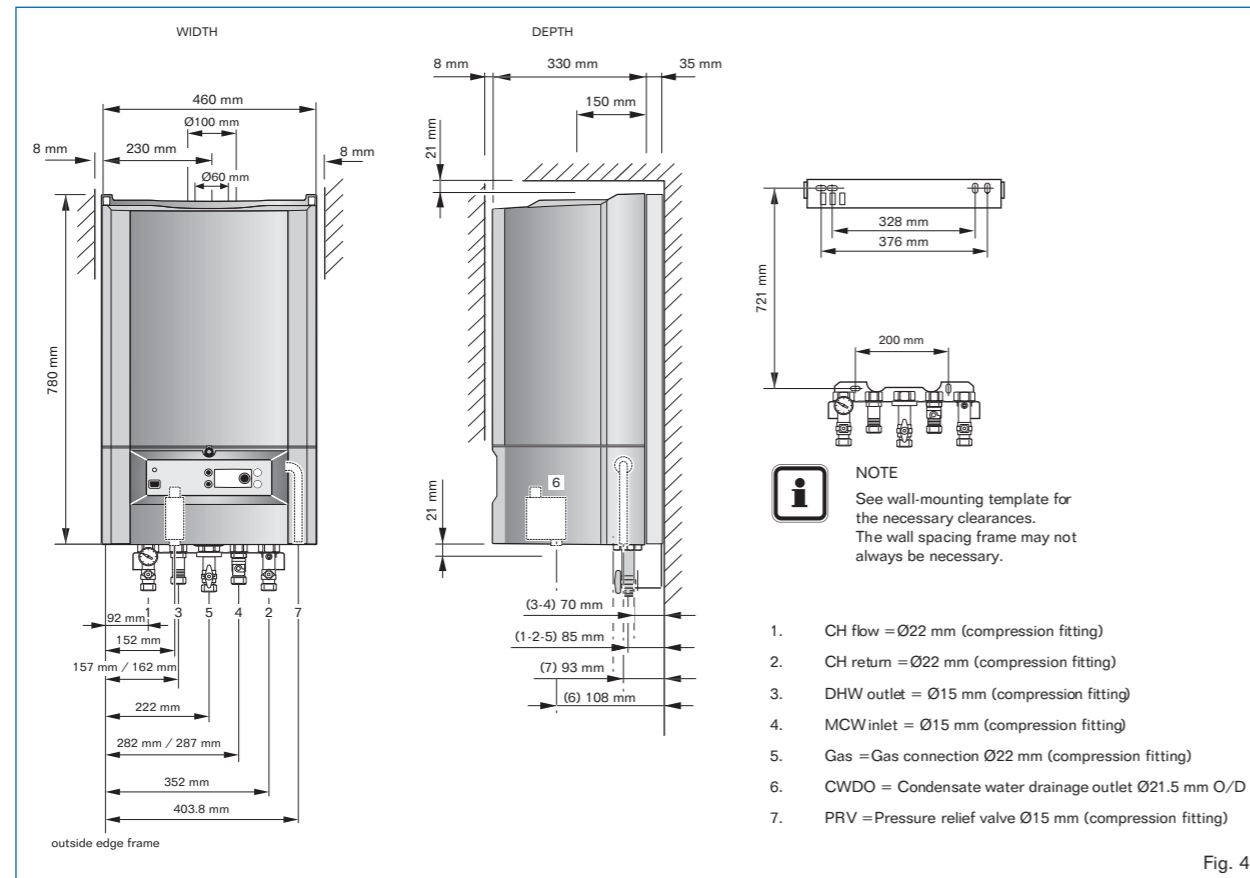
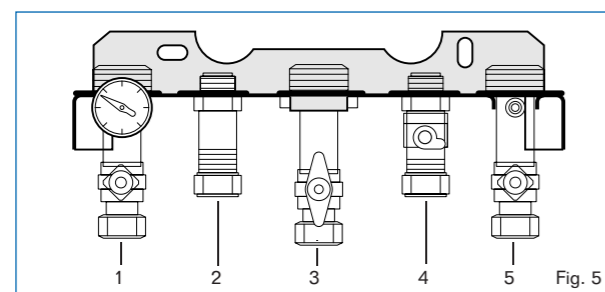


Fig. 4

## Pipe connections

All pipe connections have a compression fitting to make installation easy. Pipework from the boiler is routed downwards as standard, but may be routed upwards behind the boiler using the wall spacing frame supplied with the boiler. Connect pipes as shown in diagram (Fig. 5). Ensure that all pipework is routed so as to minimise any strain on the boiler fittings.



Key for Fig. 5  
1. CH flow 3. Gas 5. CH return  
2. DHW outlet 4. MCW inlet

All external pipe connections should be tested before operation.

## Compression fittings

To connect the discharge pipe to external pipework a small piece of copper sleeve must be fitted (as shown in Fig. 6) before the compression fitting is connected.

Both of these items are supplied with the boiler.

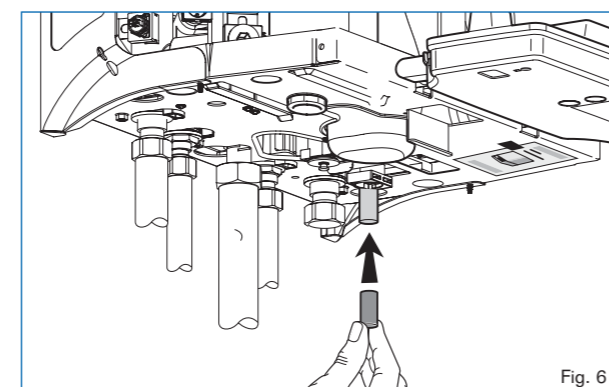


Fig. 6

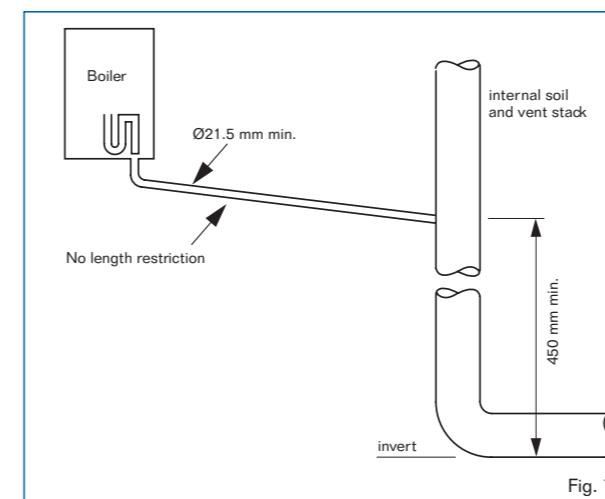
## Condensate disposal – positioning and termination of the condensate drain pipe

The condensate pipe should run and terminate internally to the house soil and vent stack or waste pipe. Alternatively, the condensate can be discharged into the rainwater system, or into a purpose-made soak away (condensate absorption point). An alternative condensate waste pipe should be considered where the system could be effected by extreme weather conditions.

All connecting drainage pipework should have a fall of at least 2.5° to the horizontal, or approximately 50 mm per metre of pipe run.

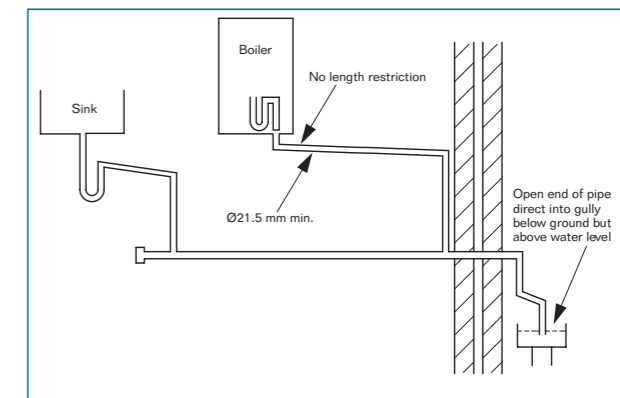
## Material for condensate

The condensate drainage pipe should be run in a standard drain pipe material, e.g. PVC (polyvinyl chloride), PVC-U (unplasticised polyvinyl chloride), ABS (acrylonitrile-butadienestyrene), PP (polypropylene) or PVC-C (crosslinked polyvinyl chloride). The condensate drain can be attached to the syphon (Fig. 7).

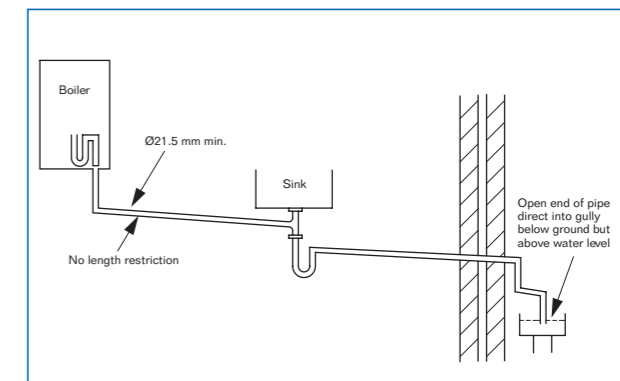


Internal termination of condensate drainage pipe to internal stack

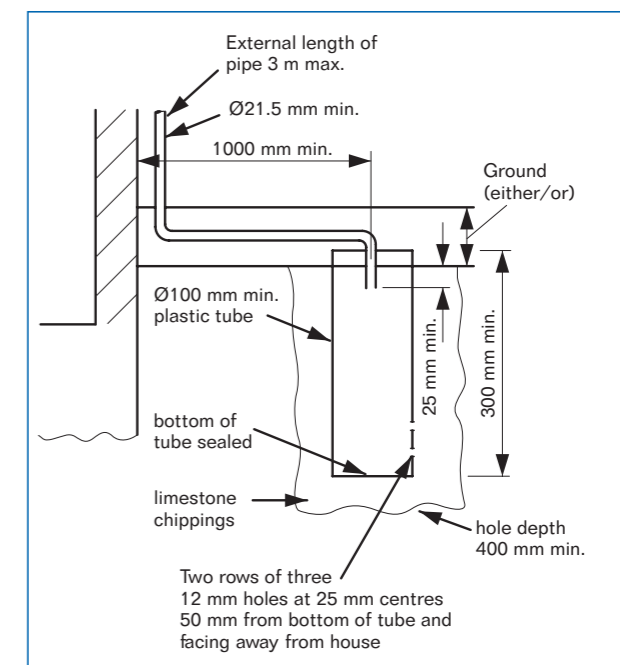
## Alternative condensate termination options



External termination of condensate drainage pipe via internal discharge branch (e.g. sink waste) and condensate syphon



External termination of condensate drainage pipe via internal discharge branch (e.g. sink waste – proprietary fitting) and condensate syphon



External termination of condensate drainage pipe to absorption point

# The 500 Range – Fluing Options

Buderus gas condensing boilers allow for a variety of fluing options to suit almost any domestic installation. This allows the installer greater flexibility in siting the appliance and makes loft or garage installations a workable alternative to the traditional kitchen installation, particularly when the boiler is used in conjunction with the ModuLink 250 wireless programmable room thermostat. This extra siting flexibility is especially useful to avoid issues of plumbing, which sometimes occurs when the boiler is operating at maximum efficiency. A complete list of all flue accessories and part numbers can be found on page 26.

## Flue terminal positioning

Plumbing can sometimes occur at the terminal, so terminal positions where this could cause a

nuisance should be avoided. The air supply and the flue gas exhaust must meet the applicable general regulations. The boiler MUST be installed so that the terminal is exposed to external air. It is important that the position of the terminal allows the free passage of air at all times. Minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in the table shown below and the diagram opposite (Fig. 8). If the lowest part of the terminal is less than 2 metres above the level of the ground, balcony, flat roof or place to which any person has access, the terminal must be protected by a guard. Ensure that the guard is fitted centrally. The flue assembly should be placed or shielded so preventing ignition or damage to any part of the building.

TERMINAL POSITION	Minimum Space
A. Directly below, above or alongside an opening window, air vent or other ventilation opening	300 mm
B. Below guttering, drain pipes or soil pipes	200 mm
C. Below eaves	200 mm
D. Below balconies or a car port roof. Not recommended!	200 mm
E. From vertical drain pipes or soil pipes	150 mm
F. From internal or external corners	300 mm
G. Above adjacent ground, roof or balcony level	300 mm
H. From a surface/boundary facing the terminal	600 mm
I. From a terminal facing a terminal	1200 mm
J. From an opening in a car port (e.g. door or window) into dwelling. Not recommended!	1200 mm
K. Vertically from a terminal on the same wall	1500 mm
L. Horizontally from a terminal on the wall	300 mm
M. Adjacent to opening	300 mm
N. Above intersection with roof	300 mm
O. From a vertical structure on the roof	500 mm

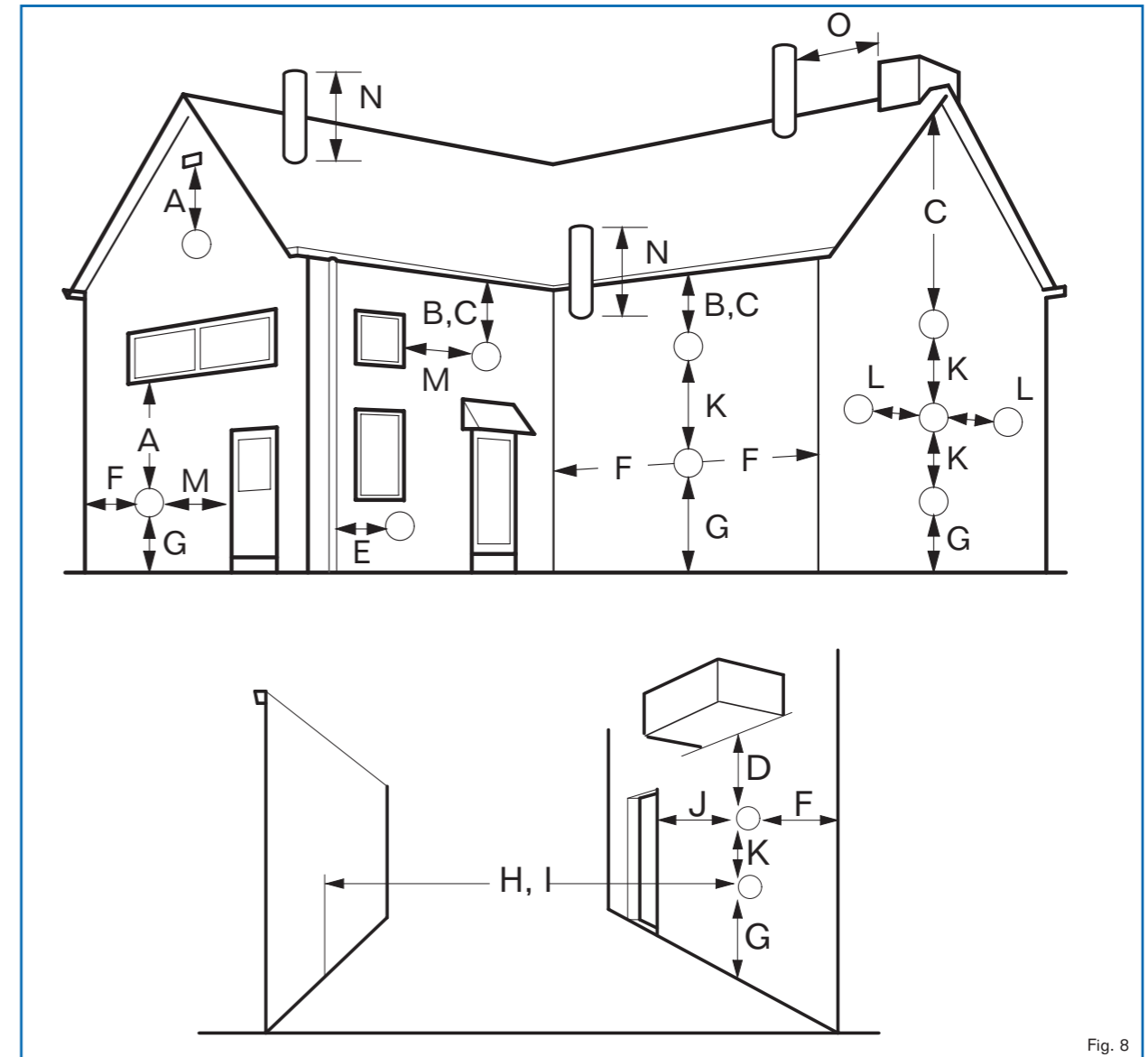


Fig. 8 The flue must be installed in accordance with the recommendations of BS. 5440-1:2000



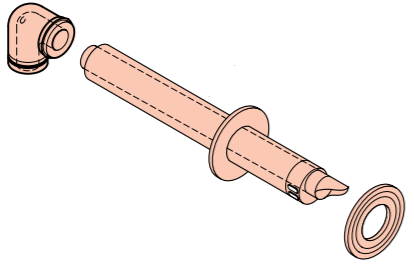
Flue outlet

# Fluing Options continued

## Introduction to flue kits

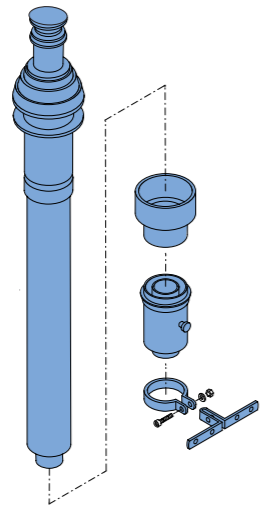
The 500 range is available with the standard horizontal or vertical 60/100 mm concentric flue kit, allowing flue lengths of up to 12 m. If longer flues are required (up to 35 m) then an 80/125 mm flue is available. All flues can be cut to length, but must be installed at a minimum incline of 3 degrees to allow any condensate to drain back to the boiler.

## Horizontal flue kit



Description	60/100 Part number	80/125 Part number
Standard horizontal flue kit	T-000-083-702	T-000-083-712 + T-000-083-723 + T-000-083-707

## Vertical flue kit



Description	60/100 Part number	80/125 Part number
Standard vertical flue kit	T-000-083-700	T-000-083-710 + T-000-083-723 + T-000-083-707

## Flue accessories

Description	60/100 Part number	80/125 Part number
500 mm extension	T-000-083-703	T-000-083-713
1000 mm extension	T-000-083-704	T-000-083-714
90° flue bend	T-000-083-705	T-000-083-715
45° flue bend (2 pieces in box)	T-000-083-706	T-000-083-716
Adaptor 60/100->80/125	T-000-083-723	
Adaptor with sample point	T-000-083-707	
Flue brackets	T-000-082-130	T-000-082-131
Weathering slate (flat roof)	T-000-083-717	T-000-083-717
Weathering slate (pitched roof)	T-000-083-909	T-000-083-909

## Flue lengths

Two adaptors (T-000-083-723 + T-000-083-707) are required for 80/125 mm systems – see accessories.

Flue diameter	60/100 mm	80/125 mm
Maximum flue length	12 m	35 m

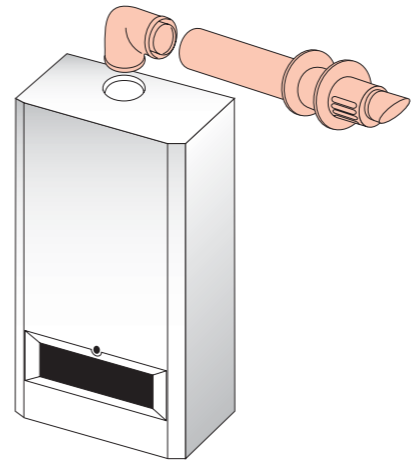
## Deductions

Total flue length must be reduced by the distances shown in the table below when adding accessories to the flue system.

Description	Deduction 60/100	Deduction 80/125
500 mm extension	0.5 m	0.5 m
1000 mm extension	1.0 m	1.0 m
90° flue bend	1.4 m	1.6 m
45° flue bend	0.7 m	0.9 m

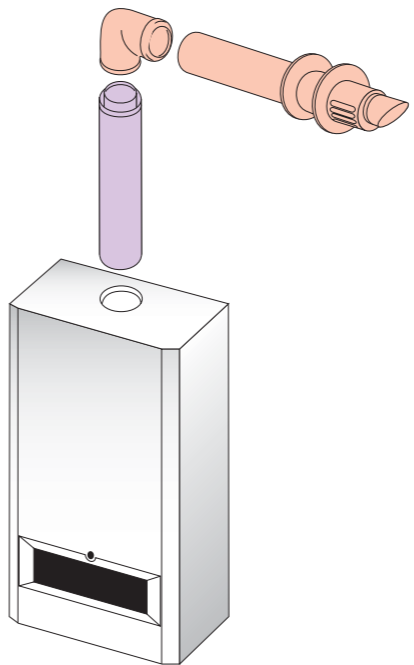
## Fluing options – horizontal

### Option 1



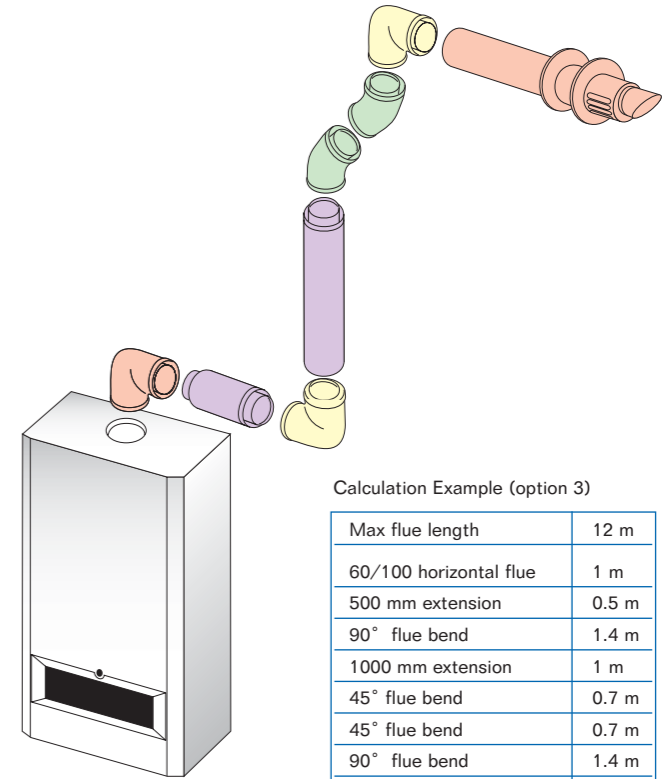
Description	60/100 Part number	80/125 Part number
Standard horizontal flue kit	T-000-083-702	T-000-083-712 + T-000-083-723 + T-000-083-707

### Option 2



Description	60/100 Part number	80/125 Part number
1000 mm extension	T-000-083-704	T-000-083-714
Standard horizontal flue kit	T-000-083-702	T-000-083-712 + T-000-083-723 + T-000-083-707

### Option 3



Calculation Example (option 3)

	Max flue length	12 m
60/100 horizontal flue	1 m	
500 mm extension	0.5 m	
90° flue bend	1.4 m	
1000 mm extension	1 m	
45° flue bend	0.7 m	
45° flue bend	0.7 m	
90° flue bend	1.4 m	
<b>Total</b>	<b>6.7 m</b>	

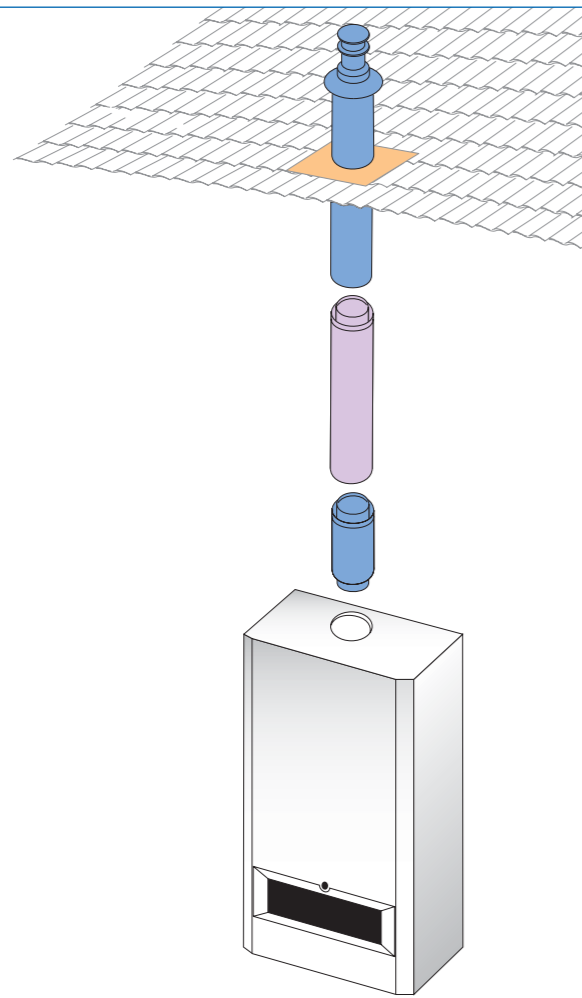
Description	60/100 Part number	80/125 Part number
Standard horizontal flue kit	T-000-083-702	T-000-083-712 + T-000-083-723 + T-000-083-707
500 mm extension	T-000-083-703	T-000-083-713
90° flue bend	T-000-083-705	T-000-083-715
1000 mm extension	T-000-083-704	T-000-083-714
45° flue bend (2 pieces in box)	T-000-083-706	T-000-083-716
90° flue bend	T-000-083-705	T-000-083-715



# Fluing Options continued

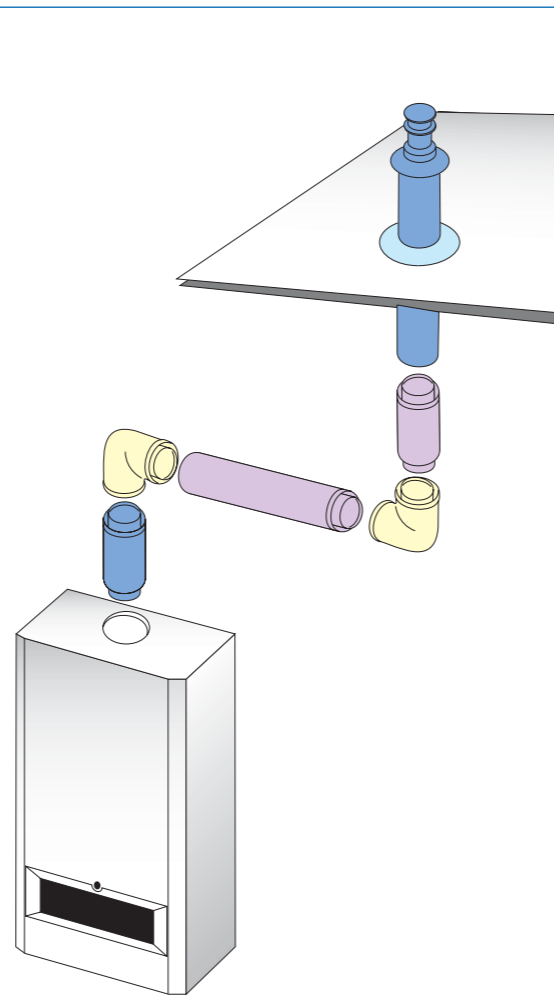
## Fluing options – vertical

Option 4 – Pitch roof



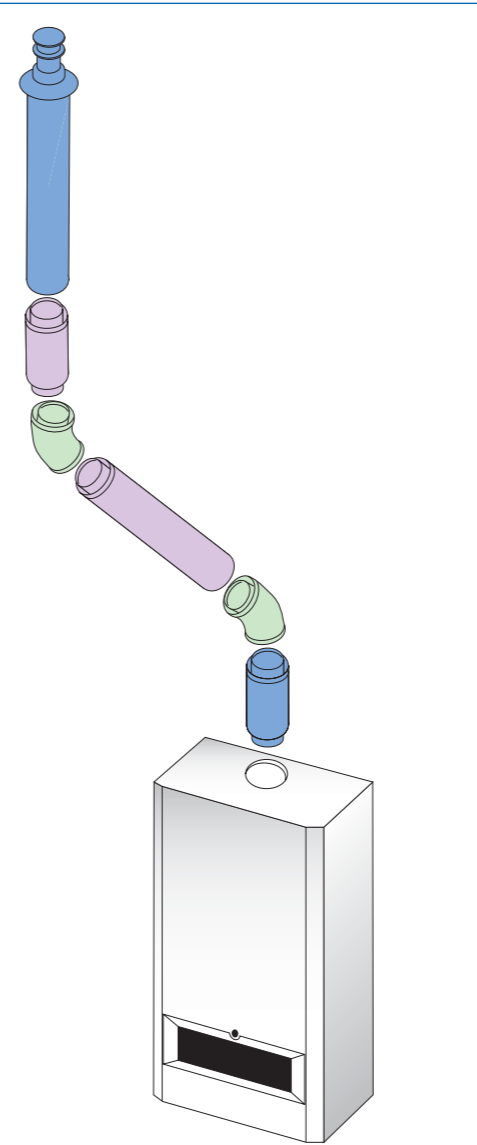
Description	60/100 Part number	80/125 Part number
Standard Vertical flue kit	T-000-083-700	T-000-083-710 + T-000-083-723 + T-000-083-707
1000 mm extension	T-000-083-704	T-000-083-714
Weathering slate (pitched roof)	T-000-083-909	T-000-083-909

Option 5 – Flat roof



Description	60/100 Part number	80/125 Part number
Standard Vertical flue kit	T-000-083-700	T-000-083-710 + T-000-083-723 + T-000-083-707
90° flue bend	T-000-083-705	T-000-083-715
1000 mm extension	T-000-083-704	T-000-083-714
90° flue bend	T-000-083-705	T-000-083-715
500 mm extension	T-000-083-703	T-000-083-713
Weathering slate (flat roof)	T-000-083-717	T-000-083-717

Option 6



Description	60/100 Part number	80/125 Part number
Standard Vertical flue kit	T-000-083-700	T-000-083-710 + T-000-083-723 + T-000-083-707
45° flue bend (2 pieces in box)	T-000-083-706	T-000-083-716
1000 mm extension	T-000-083-704	T-000-083-714
500 mm extension	T-000-083-703	T-000-083-713

# The 500 Range – Installation Requirements

Installation of the 500 range must be in accordance with the relevant requirements of the Gas Safety (Installation and Use) Regulations (as amended), current IEE Wiring Regulations, local Building Regulations, Building Standards (Scotland) (Consolidation) regulations and bylaws of the local Water company and Health and Safety Document No. 635 (Electricity at Work Regulations 1989). It should be in accordance with the relevant recommendations of the following British Standards: BS 6798; BS 5449; BS 5546:1; BS 5440:1; BS 5440:2; BS 6891.

All gas appliances must be installed by a CORGI registered person in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution.

The manufacturer's notes must not be taken in any way as overriding statutory regulations.

## Mains cold water supply

A direct mains cold water connection is permitted by local water authorities. However, it is recommended that reference be made to local requirements. In the event of difficulty contact the Buderus Technical Department on 0870 421 5944.

## Pipe sizing

Unless the mains pressure is low, a standard 15 mm diameter service pipe is normally suitable. A 15 mm hot water distribution pipe is recommended. The manifold of the boiler has a 22mm compression fitting as standard for central heating and 15mm compression fitting for domestic hot water.

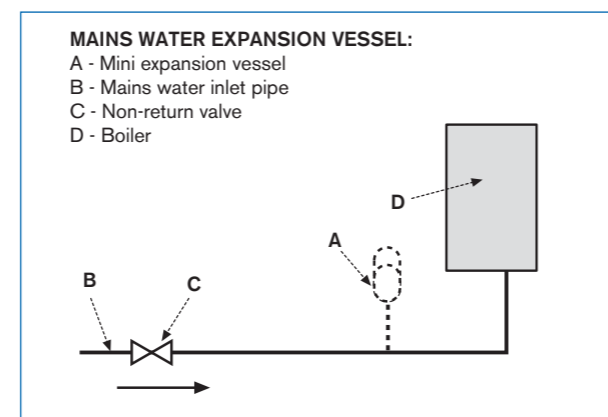
## Cold water connection

Connection should be made in accordance with the layout shown on page 10. Wherever possible

the cold supply to the appliance should be the first connection off the mains supply in order to minimise hot water flow reduction when cold water services are operated. The final 600 mm of piping to the appliance should be copper only.

## Cold water pressure

To achieve the stipulated flow rate a working cold water mains pressure of 1.3bar is required. The appliance will operate at a minimum working pressure of only 0.2bar (3 psi). However a reduced hot water flow rate should be expected. Where back-flow prevention devices, including water meters are fitted, the expansion of hot water into the cold water main will be prevented. This can result in a pressure build-up that may cause damage to the boiler and household devices such as showers, washing machines, etc. In these cases we recommend that a mini-expansion vessel be fitted adjacent to the boiler in the cold water main.



## Hot water supply

An adjustable domestic hot water flow regulator, given a maximum flow rate of 9.4 or 11.7 lts/min  $\pm 15\%$  (dependent on model) is fitted in the boiler. As with all mains fed systems, the flow rate of water obtainable from individual taps will vary in relation to the number of taps operating simultaneously, this is dependent upon the cold

mains supply available to the property.

Therefore, in order to avoid excessive starvation of flow to individual taps, flow balancing may be required.

## Hot water systems – taps and valves

Hot, cold taps and mixing valves used with the 500 range must be suitable for operating at a mains pressure and temperatures of 65°C (150°F).

## Showers

When a loose head shower with a flexible hose is used over a bath or shower tray, the hose must be fixed so that the head cannot fall closer than 25 mm above the top edge of the spill over level of the relevant bath or shower tray. Alternatively, the feed pipes to the shower should incorporate a double check valve assembly or a check valve and vacuum breaker. With fixed head showers no provision is necessary. The use of a thermostatically controlled shower will give added comfort and safeguard against high hot water temperatures. Alternatively, a pressure balancing shower valve specifically designed for constant temperature water heaters would be suitable.

## Bidet

The supply of hot and cold water mains direct to a bidet is permitted provided that the bidet is of the overrim water feed type. The outlet(s) should be shrouded and not to have any temporary hand held spray attached. No other anti-siphonage arrangements are necessary.

## Sealed primary systems

The 500 range is supplied complete with all the necessary components to form a sealed primary system. Included are a pre-plumbed expansion vessel, a pressure relief valve (set at 3bar), an automatic air vent and a pressure gauge. With an initial system pressure of 0.5 bar a system

capacity of approximately 83 litres can be accommodated. Refer to BS 7074: Part 1 for more information. The charge pressure can be increased with a decrease in system volume.

It is important with an aluminium heat exchanger that the pH level of the water does not exceed 8. Levels in excess of this could be detrimental to the heat exchanger. The use of a suitable inhibitor is recommended.

## System filling and make-up

To comply with Water Authority requirements the system should be filled via a temporary hose connection to the mains cold water supply, with a double check valve assembly and test point fitted to the mains water side of a temporary circuit. Alternatively the filling loop option (part number T-000-020-379) simply connects between the cold main connection and the heating return circuit on the wall mounting jig.

## Valves and joints

It is very important that all valves and joints are able to sustain a working pressure of up to 3bar (45 psi). Particular care should be exercised when fitting radiator valves and only those of high quality (to BS 2767:10) should be used. All other valves and fittings should comply with BS 1010. Loss of water pressure from a sealed system will require continuous recharging with fresh water and consequential introduction of air. Air is highly corrosive and will considerably reduce life expectancy of radiators, pumps, etc.



# The 500 Range – Installation Requirements

## Natural gas supply

The 500 range appliances are set for natural gas usage. The appliances, when on a hot water or full output demand, will require up to 3.02 m<sup>3</sup>/h of gas (depending on the model). The gas meter and supply pipes must be capable of supplying this quantity of gas in addition to the demand from any other appliance being served. It is important that a gas supply pipe of at least 22 mm diameter is used. Under no circumstances should the size of the gas supply pipe be less than that of the appliance inlet connection. The meter outlet governor should be capable of ensuring a dynamic pressure of 20mbar (8in wg) at the appliance. Particular consideration should be given to the resistance to gas flow created by elbows, bends, etc. Pipework should be sized to overcome this resistance. Details of this are given in the table.

Gas Discharge Rate m <sup>3</sup> /h	Total length of gas supply pipe (metres)			Pipe diameter (mm)
	3	6	9	
2.9	-	-	-	15
8.7	5.8	4.6	-	22
18.0	12.0	9.4	-	28

elbows or tees		90° bends	
metres	feet	metres	feet
0.5	2	0.3	1

Approximate additional length to be allowed (Natural Gas)

## Propane gas supply (LPG)

The 500 range may be converted to a propane gas version by using a conversion kit as shown on page 26. The appliance when on a hot water or full output demand will require up to 2.38 kg/h of gas (depending on the model). The gas tank or bottles must be capable of supplying this quantity of gas at a nominal pressure of 37 mbar (14.8 in wg) at the appliance. The table below shows the propane gas discharge through varying lengths of pipe and the resistance to flow created by elbows, bends, etc. Pipework should be sized to overcome this resistance.

Gas Discharge Rate m <sup>3</sup> /h	Total length of gas supply pipe (metres)			Pipe diameter (mm)
	3	6	9	
1.5	1.01	-	-	15
8.0	5.2	4.2	-	22
15.9	8.9	8.3	-	28

elbows or tees		90° bends	
metres	feet	metres	feet
0.6	2	0.3	1

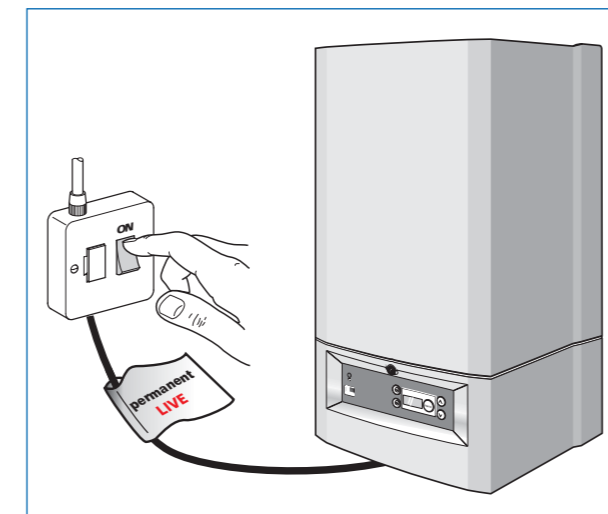
Approximate additional length to be allowed (LPG)

## Use in hard water areas

As the maximum temperature of the domestic hot water heat exchanger is limited by an electronic control circuit, there is normally no need for water treatment to prevent scale accumulation. In areas where exceptional water conditions prevail, consideration may need to be given to the fitting of a device capable of preventing scale. In such circumstances please consult your local water authority.

## Electricity supply

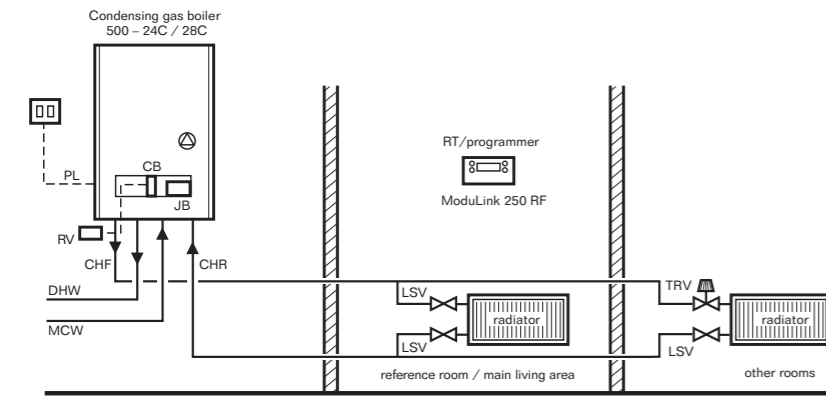
The 500 range requires a mains supply of 230V-50Hz. A 3 amp fused three pin plug and unswitched shuttered socket outlet (both complying with BS 1362) or preferably a double pole isolator with a contact separation of 3 mm in all poles supplying the appliance should be used. The appliance electrical circuits are also protected by an internal 2.5 amp fuse. The appliance must be earthed.



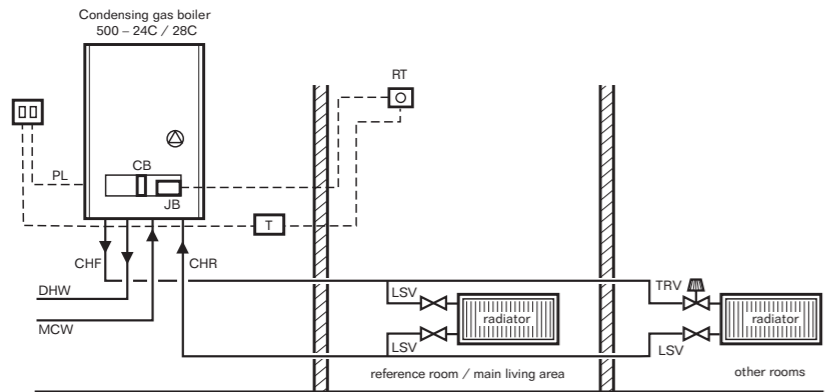
# Installation Requirements continued

## Combi boiler layouts

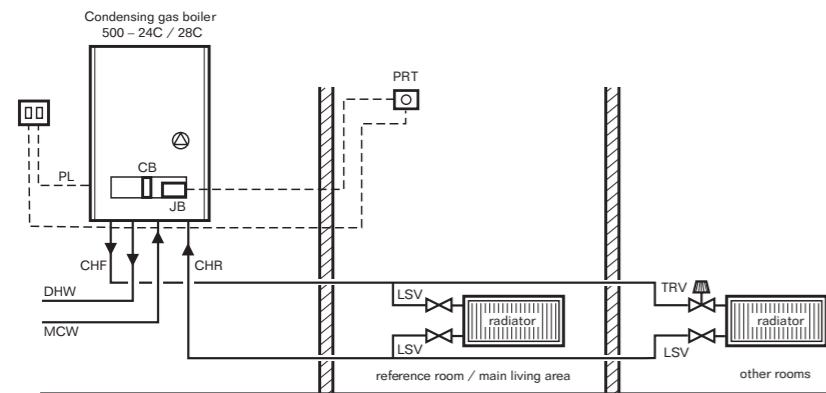
**Buderus 500-24/C or 500-28/C with Buderus controls**



**Buderus 500-24/C or 500-28/C with external 230V controls**



**Buderus 500-24/C or 500-28/C with Volt Free external control device**



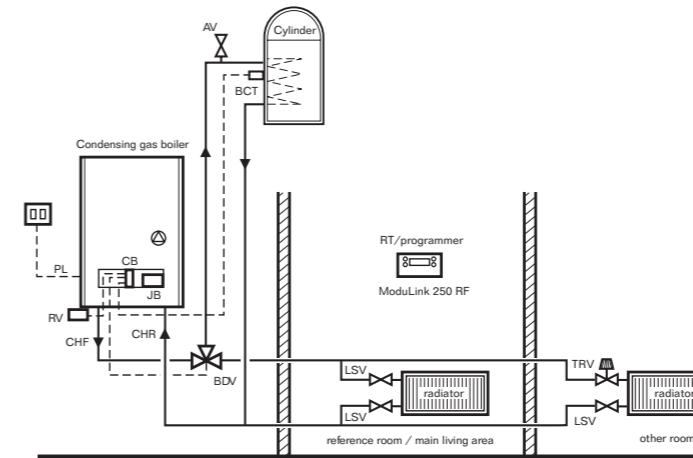
Example systems are to be regarded as schematic representations only.

### Key to abbreviations:

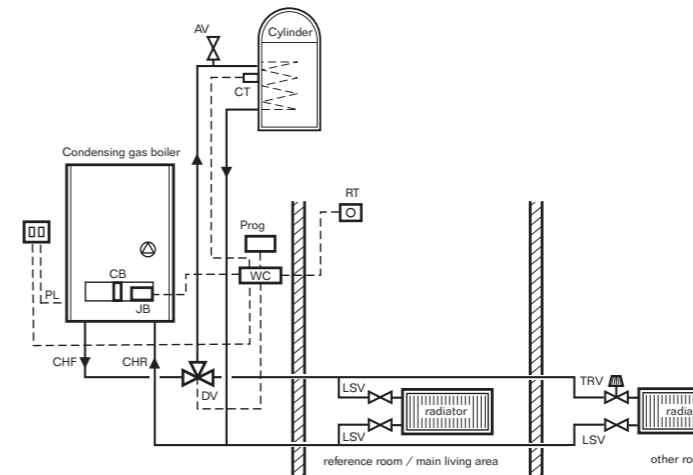
- CB = Connection Block
- CHF = Central Heating Flow
- CHR = Central Heating Return
- DHW = Domestic Hot Water
- JB = Junction Box/RTH Relay
- LSV = Lockshield Valve
- MCW = Mains Cold Water
- PL = Permanent Live
- PRT = Programmable Room Thermostat
- RT = Room Thermostat/ModuLink 250 RF
- RV = ModuLink 250 RF Receiver
- T = Timer
- TRV = Thermostatic Radiator Valve

## System boiler layouts

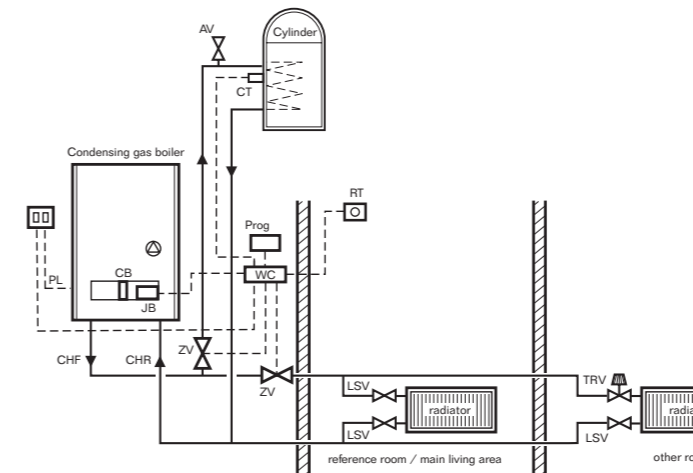
**Buderus 500 system and Buderus controls and Buderus 24V 3-way valve**



**Y-plan: Buderus 500-24S with external 230V controls**



**S-plan: Buderus 500-24S with external 230V connection and two port zone valves**



Example systems are to be regarded as schematic representations only.

### Key to abbreviations:

- AV = Air Vent
- BCT = Buderus Cylinder Thermostat
- BDV = Buderus Diverter Valve
- CB = Connection Block
- CHF = Central Heating Flow
- CHR = Central Heating Return
- CT = Cylinder Thermostat
- JB = Junction Box/RTH Relay
- LSV = Lockshield Valve
- PL = Permanent Live
- Prog = Programmer
- RT = Room Thermostat/ModuLink 250 RF
- RV = ModuLink 250 RF Receiver
- TRV = Thermostatic Radiator Valve
- WC = Wiring Centre
- ZV = Two Port Zone Valve



# The 500 Range – Controls

## Controls

To enable the user to get maximum efficiency from their condensing boiler it is important that appropriate heating controls are also fitted.

Buderus has developed a number of heating control systems to work in harmony with their range of fully modulating domestic gas condensing boilers. All controls are designed to be simple to fit, easy to operate by the user, and can significantly improve heating comfort levels and reduce energy usage throughout the home.

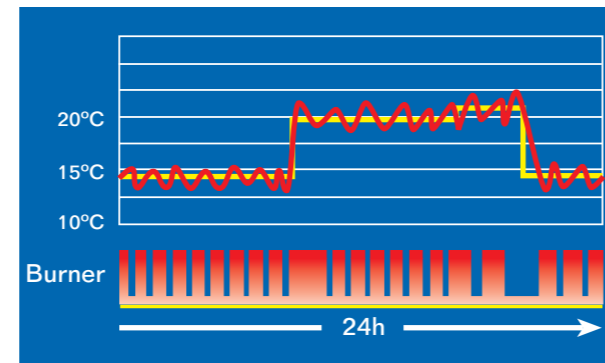
## Room temperature modulation

All Buderus gas condensing boilers and control units use a unique and efficient new technology. This technology, developed by the Buderus Group, is called "room temperature modulation". This energy saving technology controls the output of the boiler according to the temperature of the air in the room, rather than measuring the flow temperature in the boiler. This means the boiler can react almost instantaneously to even the smallest temperature fluctuations, adjust its output accordingly, and maintain comfort levels in the room.

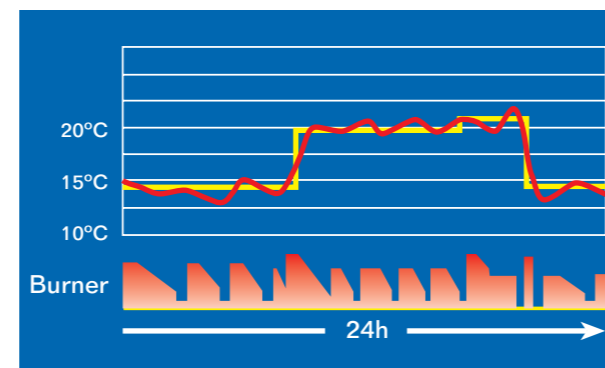
The temperature in the room will remain constant and this will result in a more comfortable climate for the user and fewer trips to the thermostat to alter the heating output. It also ensures optimal performance of the boiler as the burner is not continually turning itself on and off. Only boilers that modulate using this room temperature system will be able to achieve this level of consistency and avoid the larger temperature fluctuations that can occur using standard on/off controls.

The graphs below show the various control systems available and the resulting differences in burner output, or energy usage of the boiler.

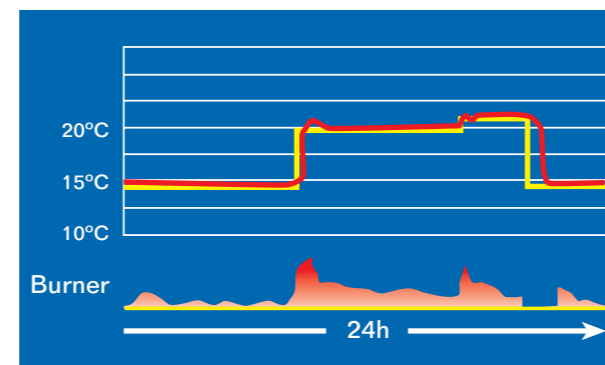
## On/off boiler with on/off controls



## Modulating boiler with on/off controls



## Modulating boiler with modulating Buderus controls



## RC20

The RC20 is designed for use with all Buderus domestic condensing combi boilers and comes with 8 pre-programmed settings to control heating and hot water.

The control unit has a frost protection programme, day and night settings, and a simple to operate multi-function dial that can be used to select the desired temperature and alter other settings. The hot water flow temperature, for example, can be regulated directly from the control unit. This function is especially useful if the boiler is located some distance from the controller.

The RC20 is a 24V controller and so is simply wired into the boiler DBA unit, bypassing Part P requirements. The RC20 can be used as a manually operated control unit.



## ModuLink 250RF

The ModuLink 250 RF is a wireless thermostat and programmer designed especially for Buderus domestic condensing boilers. This versatile unit has independent heating and hot water control, built in frost protection, a holiday function, and up to 6 different switching points allowing the user total control of their heating system.

The room temperature modulating control system can be installed up to 30 metres away from the boiler and is very simple to operate, with a menu structure that is similar to a mobile phone.

The ModuLink is 24V and so is also easy to install. The receiver can be wired straight into the boiler DBA unit, overcoming the need for complicated wiring, and therefore bypassing Part P regulations. The control unit is normally positioned in the main living area where the desired temperature can be set and altered by the user.

Using a wireless system means it is possible to site the boiler in a number of alternative locations such as the loft or garage. This is especially useful if space within the kitchen area is limited, or if there is a need to reposition the boiler to avoid instances where plumbing could cause a nuisance.



# The 500 Range – Accessories

# Training with Buderus



Standard Horizontal Flue Kit  
**T-000-083-702** - 60/100 mm  
**T-000-083-712** - 80/125 mm



Standard Vertical Flue Kit  
**T-000-083-700** - 60/100 mm  
**T-000-083-710** - 80/125 mm



500 mm Extension  
**T-000-083-703** - 60/100 mm  
**T-000-083-713** - 80/125 mm



1000 mm Extension  
**T-000-083-704** - 60/100 mm  
**T-000-083-714** - 80/125 mm



90° Flue Bend  
**T-000-083-705** - 60/100 mm  
**T-000-083-715** - 80/125 mm



45° Flue Bend (2 pieces)  
**T-000-083-706** - 60/100 mm  
**T-000-083-716** - 80/125 mm



Vertical Adaptor  
 60/100 mm - 80/125 mm  
**T-000-083-723**



Vertical Adaptor  
**T-000-083-707** - 60/100 mm



Bracket (3 pieces)  
**T-000-082-130** - 60/100 mm  
**T-000-082-131** - 80/125 mm



Weathering Slate (flat roof)  
**T-000-083-717**



Weathering Slate (pitched roof)  
**T-000-087-909**



500 Range 24/28 kW LPG  
 Conversion Kit  
**T-000-073-734**



24 Volt Three Way  
 Valve (22mm)  
**T-000-078-016**



Cylinder Thermostat  
**T-000-095-620**



Filling Loop  
**T-000-020-379**



Programmable Room  
 Thermostat RC20  
**63042051**



Programmable Room Thermostat  
 ModuLink 250 RF Twin Channel  
**T-000-018-356**

## Hands-on heating training for professionals

High quality product training is now an essential part of everyday life for the professional heating and plumbing installer. New technology, legislation and changing regulations mean that everyone working as part of the heating industry needs to stay up to date in order to meet the requirements of the government, industry bodies, and most importantly, customers.



Buderus understands this and so provides a number of high quality training courses covering the fundamental aspects of boiler installation, servicing, commissioning, maintenance and faultfinding for our entire gas condensing boiler ranges.

Buderus is aware that installers want courses that are relevant and useful and so our training programmes have been developed to reflect the type of circumstances you would find in "everyday" situations. Each course has been designed to offer practical plumbing and heating skills, building on existing knowledge, so you can be certain that you will be learning techniques that you can take straight from the classroom into your next job.

With decades of experience in the design, development and manufacture of high efficiency heating systems and with a European pedigree in

domestic condensing boilers stretching over 25 years, you know that you're getting expert product advice.

Our qualified technical training officers, who have worked for many years in the industry as heating technicians, will take you through each course on a step-by-step basis combining practical installation tips with domestic heating theory in order to provide participants with a thorough understanding of Buderus products and their application.

## Mobile training unit

If you can't come to us, we'll come to you, in our fully plumbed mobile training vehicle. On board you will find three of our best selling boilers, including the 500 & 600 Combis and the 600 Regular.

The mobile training vehicle provides the perfect introduction to the Buderus gas condensing range and allows us to take installers through the basics of installation and servicing, discuss fluing and control options and introduce some of the heating technology unique to our boilers.

To find out more details on the training options we have available or to book a training course, simply pick up the phone and call us on 0870 421 5933 and ask to speak to a member or our training team.





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Spares Tel: 01905 752576 Fax: 01905 754620

Customer Service Tel: 0870 421 5933

Technical Product Support Tel: 0870 421 5944

In the UK, Buderus is a trading name of BBT Thermotechnology UK Ltd.

Buderus' policy is one of continuous research and development and this may necessitate alterations to this specification from time to time. Therefore before preparing for the installation of the appliance it is important that the instructions issued with the unit are carefully read and adhered to. The statutory rights of the customer are not affected. All information is correct at time of going to press. Buderus reserves the right to alter any information where necessary. E&OE.



93/2339

# Buderus