

Installation instructions

Passive flue gas heat recovery device

Greenstar Xtra

For use with Greenstar CDi Compact, Si Compact and i combi boilers

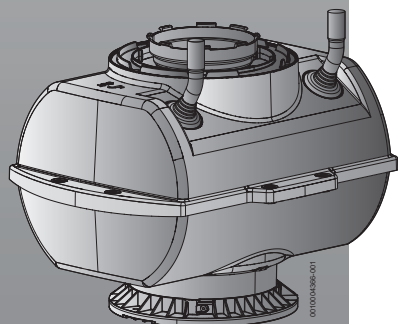


Table of contents

1 Key to symbols and safety instructions 2

1.1 Key to symbols 2

1.2 General safety instructions 3

2 General Information 4

2.1 Standard Package 4

2.1.1 Technical data 4

2.1.2 Appliance information 5

2.1.3 Installation and servicing clearances 6

3 Installation 6

3.1 Template 6

3.2 Boiler installation 7

3.3 Greenstar Xtra fitting 7

3.3.1 Plume management 9

3.4 Commissioning 10

4 Servicing 10

5 Replacement of parts 11

1 Key to symbols and safety instructions

1.1 Key to symbols

Warning symbols

Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:



DANGER:

DANGER indicates a situation that will result in severe injury or death.



WARNING:

WARNING indicates a situation that could result in severe injury or death.



CAUTION:

CAUTION indicates a situation that could result in minor to medium injury.

NOTICE:

NOTICE indicates a situation that could result in damage to property or equipment.

Important information



This symbol indicates important information where there is no risk to people or property.

Additional symbols

Symbol	Meaning
1.	a numbered step in an action sequence
▶	a step in an action sequence
→	a reference to a related part in the document or to other related documents

Symbol	Meaning
①	a reference number to identify or refer to a part or item
•	a list entry
–	a list entry (second level)

Table 1 Additional symbols

Examples of additional symbols used

A numbered step in an action sequence

A sequence of numbered steps or actions carried out in a specific order to complete a task.

1. First action
2. Second action
3. Third action
- etc.

A step in an action sequence

A sequence of defined actions or steps carried out in order to complete a task.

- ▶ Action
- ▶ Next action
- ▶ etc

A reference to a related part in the document or to other related documents.

To refer the reader to a specific figure/table/section within the manual.

→ e.g. figure 1.

A reference number to identify or refer to a part or item.

In a related figure, items or parts identified by a sequential number.

List entries, first and second levels

- A single component/item
- A component/list, made up of multiple parts/items.
 - Sub component or sublist of main component/list.
 - etc.

1.2 General safety instructions

These installation instructions are intended for gas fitters, plumbers, heating engineers and electricians.

- ▶ Read any installation instructions (boiler, heating controls, etc.) carefully before starting the installation.
- ▶ Observe the safety instructions and warnings.
- ▶ Observe national and regional regulations, technical rules and guidelines.
- ▶ Record all work carried out.

⚠ If you smell gas

A gas leak could potentially cause an explosion. If you smell gas, observe the following rules.

- ▶ Prevent flames or sparks:
 - Do not smoke, use a lighter or strike matches.
 - Do not operate any electrical switches or unplug any equipment.
 - Do not use the telephone or ring doorbells.
- ▶ Turn off the gas at the meter.
- ▶ Open windows and doors.
- ▶ Warn your neighbours and leave the building.
- ▶ Prevent anyone from entering the building.
- ▶ Well away from the building: call the National Gas Emergency Service on 0800 111 999.

⚠ Intended use

This unit must only be used as a heat appliance in a sealed hot water heating system for domestic purposes.

Any other use is considered inappropriate. Any damage that results from such use is excluded from liability.

⚠ Installation, commissioning and servicing

Installation, commissioning and servicing must only be carried out by a competent, Gas Safe registered engineer.

- ▶ Carry out a gas tightness test after completing work on gas-carrying components.
- ▶ Only use original spares.

The Greenstar Xtra unit can be installed by a competent, Gas Safe engineer without the need for any additional training.

⚠ Handover to the user

When handing over, instruct the user how to operate the heating system and inform him about its operating conditions.

- ▶ Explain how to operate the heating system and draw the user's attention to any safety-relevant action.
- ▶ Explain that modifications and repairs must only be carried out by an authorised contractor.
- ▶ Advise the user to have the system serviced annually by a competent, Gas Safe registered engineer.
- ▶ Leave the installation instructions with the completed Benchmark Checklist (or a certificate confirming compliance with IS 813, Eire only) and the operating instructions with the user or at the gas meter.

2 General Information

The Greenstar Xtra is a PFGHRD (Passive Flue Gas Heat Recovery Device) designed to help further reduce fuel consumption in conjunction with our Worcester gas-fired condensing combination wall hung boilers.

This appliance uses the latent heat energy from the flue exhaust gases produced by the condensing combi boiler when it fires, to preheat the domestic cold water. By preheating the domestic cold water before it enters the boiler it reduces the energy needed by the boiler to raise the temperature to the required level.



The Greenstar Xtra unit is listed in SAP in the FGHR database as "Worcester Greenstar Xtra".



This unit is intended for use with Greenstar CDI & Si Compact, i combi LPG and natural gas fired appliances

2.1 Standard Package

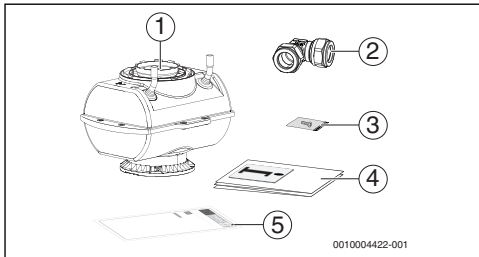


Fig. 1 Standard package contents

- [1] Greenstar Xtra PFGHRD unit with adaptor
- [2] 15 mm Brass connection elbows (2x)
- [3] Screw pack for flue pipe connection
- [4] Installation manual
- [5] Greenstar Xtra label for boiler control panel

2.1.1 Technical data

Technical data - Greenstar Xtra

Description	Unit	Value
DHW System		
Water connections	mm	15
Maximum water pressure	bar	10 ¹⁾
Minimum mains inlet pressure (working)	bar	0.25
Minimum mains inlet pressure (working) for maximum flow	bar	2.4
Weights		
Empty	kg	3.0
Full	kg	3.4
Boiler Applications		
Condensing boilers only		Combi
General		
DHW HE-core		Stainless steel and copper
Inner casing		FPP 30 GF-C
Outer casing		FPP 30 GF-C
Water content	litres	0.4
Flue Outlet		
Flue size	mm	60/100 or 80/125

1) If necessary fit a pressure reducing valve

Table 2 Technical data Greenstar Xtra

2.1.2 Appliance information

Dimensions

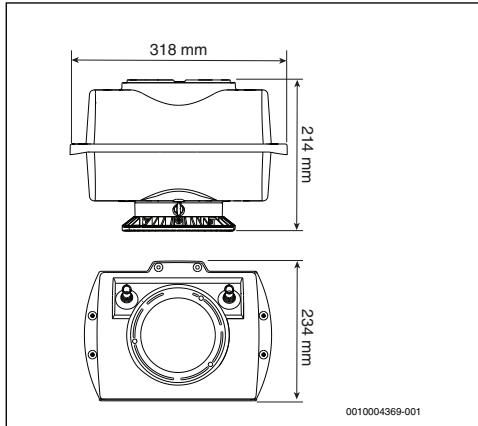


Fig. 2 Dimensions

Domestic water connections

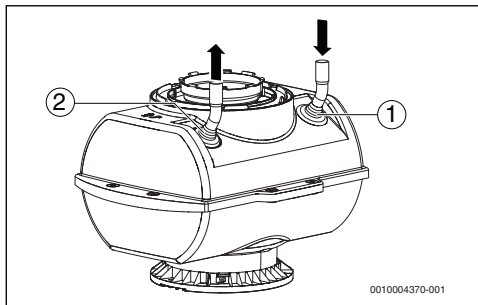


Fig. 3 Inlet & outlet connections

- [1] Inlet connection (In)
- [2] Outlet connection (Out)



There is a DHW filter assembled inside the inlet connection.

- ▶ Do not put the unit into operation without it.

Use in hard water areas:

In areas where temporary water hardness exceeds 200 ppm, consideration may need to be given to the fitting of a scale prevention device. In such circumstances, the advice of the local water authority should be sought.

Layout example



Non return, back flow prevention devices (including those associated with water meters) fitted to the mains water supply can cause a pressure build up which could damage the boiler, the Greenstar Xtra unit and other household appliances.

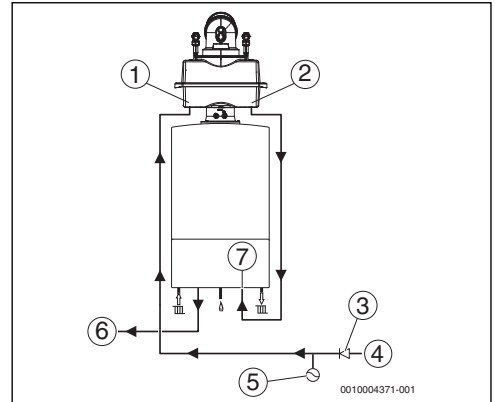


Fig. 4 Example layout

- [1] Greenstar Xtra DW inlet connection
- [2] Greenstar Xtra DW outlet connection
- [3] Non-return valve (may be present, see notice below)
- [4] Cold mains supply
- [5] Mini expansion vessel (may be required, see notice below)
- [6] Boiler DHW outlet
- [7] Boiler DW inlet

Where the mains water supply has a non-return, back flow prevention valve fitted, a mini expansion vessel [5] (part number 7 716 192 105) should be connected to the mains water inlet pipe [4] as shown above.

2.1.3 Installation and servicing clearances

Clearances of the Greenstar Xtra FGHR unit

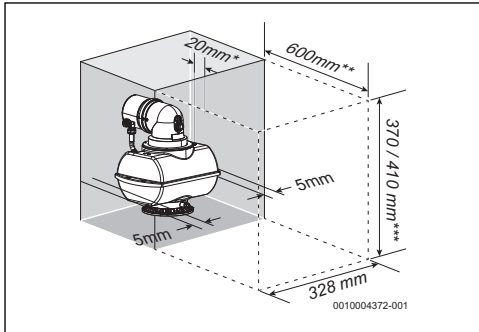


Fig. 5 Clearances

- * Minimum clearance to removable door
- ** Minimum clearance required for servicing (flue access)
- *** Height for either 60/100 flue or 80/125 flue from the top of the boiler

Clearances boiler

The templates provided show the side, bottom and top clearances (grey shaded area) for the installation of the boiler with the Greenstar Xtra.

- ▶ Refer to the Installation Commissioning and Servicing Instructions of the boiler being installed for the full installation and servicing clearances.

Compartments

Follow the requirements of BS6798 and BS5440 Part 2 and note:

- Minimum clearances must be maintained.
- An access door is required to install, service and maintain the boiler and any ancillary equipment.
- If the installation is in an airing cupboard use a non-combustible material to separate the appliances from the airing space.
The material can be perforated up to a maximum hole size of 13mm.

3 Installation

3.1 Template



WARNING:

Damage to property!

Damage caused by drilling into pipes, electrical cables, damp proof course or other hazards.

- ▶ Before drilling ensure that there are no obstructions.
- ▶ Select the boiler template from the boiler literature pack.
- ▶ Fix the template onto the wall in the desired position [1].
- ▶ Drill the fixing holes for the boiler.

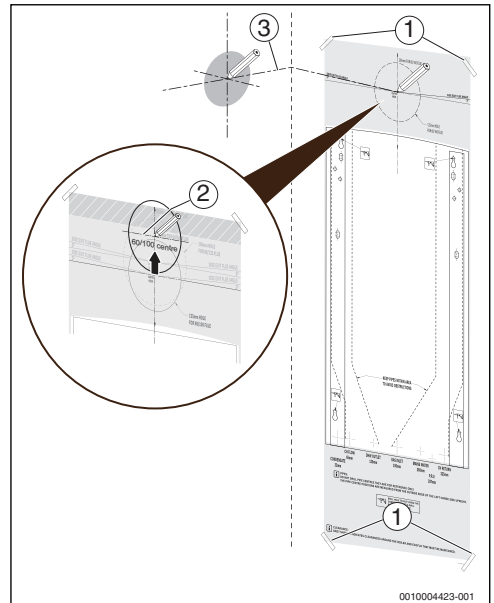


Fig. 6 Marking the flue position

Rear flue outlet

The Greenstar Xtra unit will raise the flue.

To mark the centre for the flue:

- ▶ Fix the boiler wall template to the wall [1].
- ▶ Measure an additional height (a in table 3) for the flue above the centre line, depending on the flue size that you are installing.
- ▶ Mark the centre line [2].

Alternatively the flue centre can be measured from the top of the boiler. In this case use measurements b in table below:

Flue size	Unit	Above wall template flue centre (a)	Above top of boiler (b)
60/100	[mm]	214	308
80/125	[mm]	282	376

Table 3 Measurements of rear flue outlet

- ▶ If a 100 mm diameter flue is to be used, a 125 mm diameter hole is required. However, if using the weather sealing collar by pushing it through from inside the property, then a 150 mm diameter hole is required to accommodate this.
- ▶ The flue turret of the 100 mm flue has an in-built 3° angle. If extensions are to be added then the complete flue must rise at an angle of 3°. Drill the hole, preferably using a core drill.

Side flue outlet

- ▶ Mark from the centre line [3] of the wall mounting template to the wall that the flue will pass through. (see installation manual of the boiler for dimensions).
- ▶ Allow for a rise of 52 mm per metre length of flue, to give a 3° angle.

In order to allow the Greenstar Xtra unit to raise the flue:

- ▶ Measure an additional height above [3] (see table 3, page 7).
- ▶ Mark this as the centre point for drilling the hole for the flue.

3.2 Boiler installation

- ▶ Hang the boiler following the installation section of the boiler manual.



For optimum performance of the Greenstar Xtra please ensure that the boiler and unit are properly leveled.

3.3 Greenstar Xtra fitting

Fitting the adaptor

NOTICE:

Flue integrity!

Flue integrity failure if “O” ring seal seatings are disturbed during connection.

- ▶ Take care when making flue connections not to disturb “O” ring seals.
- ▶ Disassemble the adapter from the Greenstar Xtra by removing the front fixation screw [1].

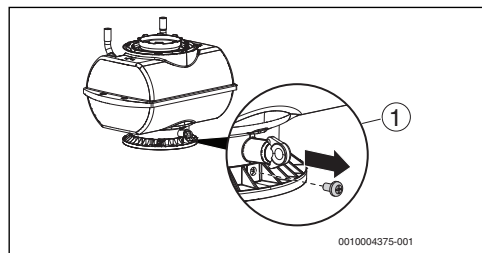


Fig. 7 Disassembling the adaptor

- ▶ Using the 3 screws provided [1], secure the adaptor [2] to the boiler [3].

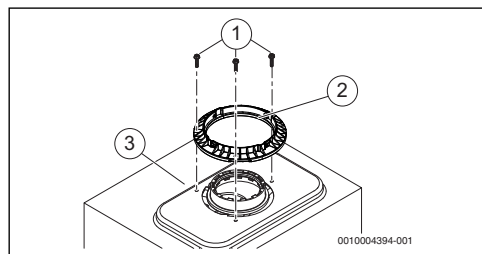


Fig. 8 Securing the adaptor to the boiler

Connecting the Greenstar Xtra to the boiler

- ▶ Slide the Greenstar Xtra into the adapter and rotate counter clockwise to correctly position it on the adapter.

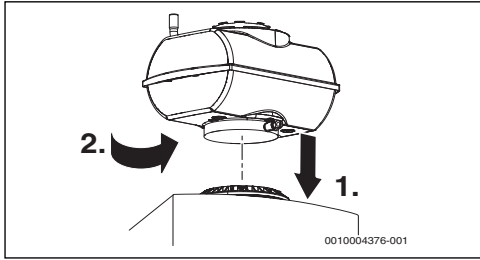


Fig. 9 Fitting Greenstar Xtra

- ▶ Attach the Greenstar Xtra to the adaptor using the included unit fixing screws [1].
- ▶ Connect the water pipes using the 90° compression joint elbows provided. Cold [1] (inlet) and hot [2] (outlet).



Use the compression fittings provided to enable easy removal of the unit for maintenance. Do not use soldered fittings due to the risk of damaging the unit during soldering.

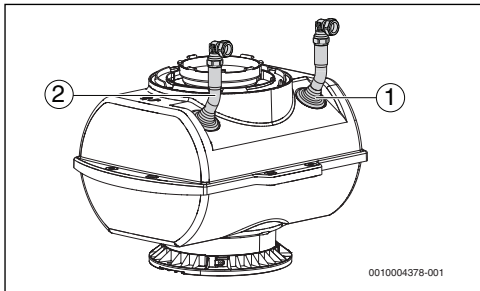


Fig. 10 Water connections

Flue connections



Maximum flue length is defined in Table 2 - Technical Data, page 4, this includes the effective flue length of the Greenstar Xtra FGHR unit.

NOTICE:

Flue supports

- ▶ Flues require adequate support throughout their entirety. It is advised to support the flue at every one metre and changes of direction.

NOTICE:

Flue integrity!

Flue integrity failure if “O” ring seal seatings are disturbed during connection.

- ▶ Take care when making flue connections not to disturb “O” ring seals.

The Greenstar Xtra is compatible with Worcester standard horizontal and vertical Condensit II flue kits.

- ▶ Fit the horizontal or vertical flue adaptor [1] into the Greenstar Xtra unit flue connection point [2].
- ▶ Using the 3 screws provided, secure the flue adaptor to the Greenstar Xtra unit.

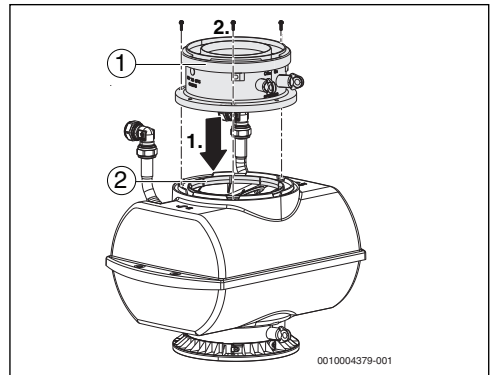


Fig. 11 Flue connection

Flue connection examples

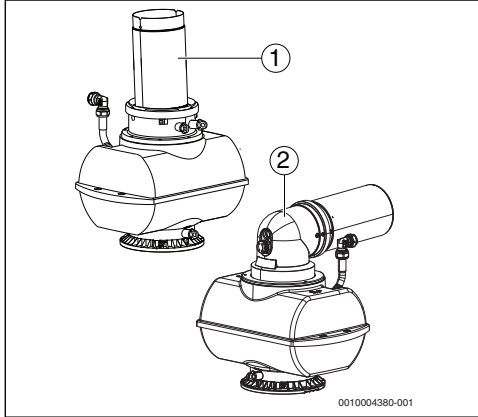


Fig. 12 Example flue options

- [1] Vertical flue option
- [2] Horizontal flue option

3.3.1 Plume management

The lengths for both plume and flue are the effective lengths, which include the effective length of any bends plus the straight lengths.

The graph (→ figure 13) can be used to calculate:

- **Effective flue length** if a specific effective plume length is required.
- **Effective plume length** if a specific effective flue length is required.

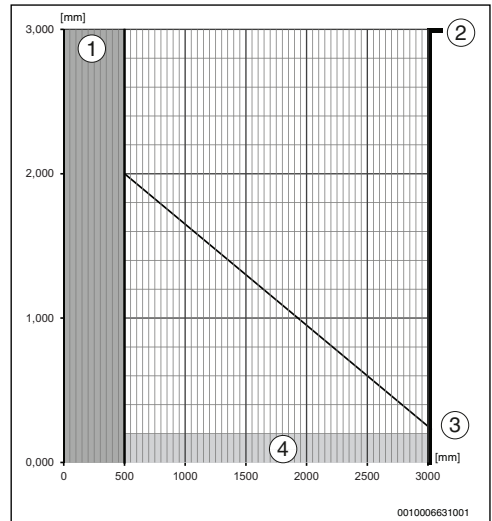


Fig. 13 Effective flue lengths versus plume management lengths

- [1] Minimum plume kit length 500 mm
- [2] Maximum plume length for all boilers
- [3] Greenstar i combi data and Greenstar CDi & Si Compact combi data
- [4] Minimum flue length 200 mm (cut terminal section in elbow)

	Horizontal		Vertical	
	60/100	80/125	60/100	80/125
Greenstar Compact ErP with Xtra	3000	12000	3000 plus terminal	12000 plus terminal
Greenstar i ErP with Xtra	2300	10000	4000 plus terminal	12000 plus terminal

Table 4 Maximum flue length [mm]

3.4 Commissioning

- ▶ Open the cold water supply and check all connections for leaks.
- ▶ Open the hot water supply and flush the Greenstar Xtra until it is completely filled with water and no noise is audible.
- ▶ Fit the Greenstar Xtra sticker to the boiler control panel.

The Greenstar Xtra is ready to use.



An information sticker is provided to inform energy assessors that a Greenstar Xtra is fit to the boiler. The label should be stuck somewhere easily visible, for example on the control panel.

4 Servicing

Annual inspection

- ▶ An annual visual check of the Greenstar Xtra must be carried out in addition to the checks stated in the appliance Installation, Commissioning and Servicing Instructions.

When the inner flue has been opened and reassembled during maintenance on the Greenstar Xtra, a flue gas analyser can be inserted into the air intake sample point [1] on the bottom front of the unit, in order to check that there is no cross leakage of flue gas into the air intake.

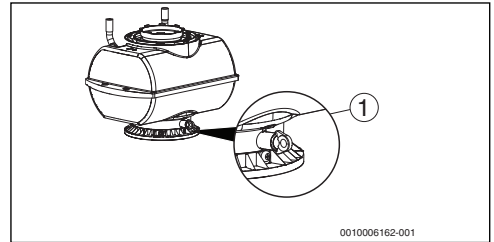


Fig. 14 Flue analyser measurement position



All seals that are removed during a service action should be replaced to ensure the performance and safety of the Greenstar Xtra unit.



The heat exchanger is not serviceable and does not require cleaning.

- ▶ Do not use any cleaning solvents on the flue gas or water paths!

5 Replacement of parts

Ordernumber	Name of the item
8-718-643-837-0	PHE Replacement kit
8-718-647-079-0	Pipe Replacement kit
8-718-644-038-0	Side cover replacement kit
8-718-646-950-0	Recuperator adaptor replacement kit
8-718-644-033-0	Upper outer case replacement kit
8-718-644-039-0	Bottom outer Casing replacement kit
8-716-763-266-0	O ₂ measurement hole plug
2-912-451-152-0	Screw M5 x 10 Pan Head Pozi ZP
8-718-644-814-0	Outer Case Sealing
8-711-004-232-0	Seal
8-716-113-906-0	Filter DCW
8-716-109-363-0	Screw No. 10 x 20 Lg Hex. Flange (3x)
8-713-401-061-0	Screw DIN 6900 M5X20 4.8 (10x)
8-718-647-266-0	90 degree elbow
6-720-812-478-0	Document set
8-722-880-163-0	PHE inlet/outlet O-ring (10x)
8-718-642-146-0	Clip (10x)
8-713-401-061-0	Screw (10x)
8-716-116-508-0	Literature pack

Table 5 Replacement of parts

WORCESTER, BOSCH GROUP:

TECHNICAL SUPPORT:0330 123 3366

APPOINTMENTS:0330 123 9339

SPARES:0330 123 9779

LITERATURE:0330 123 9119

TRAINING:0330 123 0166

SALES:0330 123 9669

Worcester, Bosch Group
Cotswold Way, Warndon, Worcester WR4 9SW.
Tel. 0330 123 9559
Worcester, Bosch Group is a brand name of
Bosch Thermotechnology Ltd.
worcester-bosch.co.uk



6 720 830 021