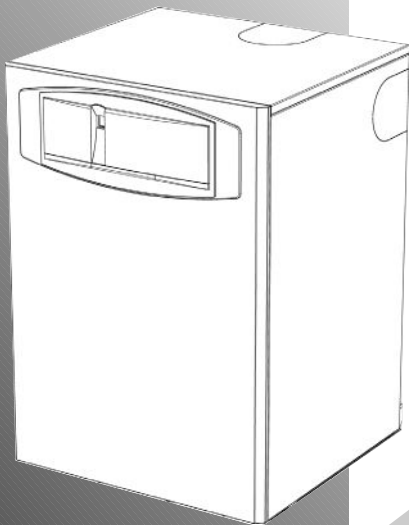


Greenstar Highflow 440

FLOOR STANDING RSF GAS-FIRED COMBINATION BOILER
FOR SEALED CENTRAL HEATING SYSTEMS AND MAINS FED DOMESTIC HOT WATER



THIS APPLIANCE IS FOR USE WITH
NATURAL GAS OR LPG (Cat II 2H3P TYPE C13 & C33)

NATURAL GAS: 47 311 82

LIQUID PETROLEUM GAS: 47 311 83

GB/IE

USER INSTRUCTIONS & CUSTOMER CARE GUIDE

 **WORCESTER**
Bosch Group

 **benchmark**[™]

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www.betzdearborn.com/sentinel

FLUE TERMINAL GUARDS:

TOWER FLUE COMPONENTS
Vale Rise, Tonbridge TN9 1TB

USER INSTRUCTIONS & CUSTOMER CARE GUIDE

PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE OPERATING YOUR APPLIANCE

THESE INSTRUCTIONS ARE APPLICABLE TO THE WORCESTER BOSCH APPLIANCE MODEL(S) STATED ON THE FRONT COVER OF THIS MANUAL ONLY AND MUST NOT BE USED WITH ANY OTHER MAKE OR MODEL OF APPLIANCE

THE INSTRUCTIONS APPLY IN THE UK ONLY AND SHOULD BE FOLLOWED EXCEPT FOR ANY STATUTORY OBLIGATION.

IF YOU ARE IN **ANY DOUBT** CONTACT WORCESTER BOSCH TECHNICAL HELPLINE.

DISTANCE LEARNING AND TRAINING COURSES ARE AVAILABLE FROM WORCESTER BOSCH.

THIS APPLIANCE MUST BE INSTALLED BY A COMPETENT PERSON. FAILURE TO INSTALL CORRECTLY COULD LEAD TO PROSECUTION.

PLEASE LEAVE THIS GUIDE, THE INSTALLATION INSTRUCTIONS AND THE COMPLETED BENCHMARK LOG BOOK WITH THE USER OR AT THE GAS METER AFTER INSTALLATION.

DO NOT INTERFERE WITH ANY SEALED COMPONENTS.

ABBREVIATIONS USED IN THIS BOOK:

NG - Natural Gas
LPG - Liquid Petroleum Gas
CH - Central Heating
DHW - Domestic Hot Water
SEDBUK - Seasonal Efficiency of Domestic Boilers in the United Kingdom

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INTRODUCTION

USING YOUR
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EXCELLENCE COMES AS STANDARD

Thank you for purchasing a Greenstar Highflow 440 gas-fired condensing boiler manufactured by Worcester Bosch. The company prides itself on manufacturing boilers to the strictest quality control standards throughout every stage of production. Worcester Bosch has led the field in innovative appliance design and performance for more than 40 years. This heritage means all products are of exceptional quality and proven reliability.

The Greenstar range in particular, is extremely energy efficient converting up to 97% of gas consumed into heat offering you economical running costs and value for money. It sits in the SEBUK Band A – amongst the top energy rated appliances available.

There is also the assurance of our no-nonsense 2 years parts and labour guarantee - backed up by Worcester Total Cover, an optional complete maintenance scheme to keep your boiler operating at peak condition and efficiency.

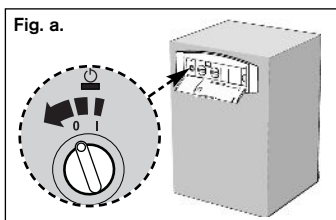
To find out more about Worcester Bosch log onto www.worcester-bosch.co.uk.

IF YOU SMELL GAS:

DO NOT operate any electrical switches
 Extinguish any naked flame
 Turn off the gas service cock at the meter
 Open windows and doors
 Telephone your gas company

IF YOU SMELL FUMES FROM THE APPLIANCE:

Switch off the appliance, as shown in Fig. a.
 Open windows and doors

**BENCHMARK STANDARD** *benchmark*

'Benchmark' is a code of practice for correctly installing, commissioning and servicing of domestic water heating appliances

A Benchmark Log Book is provided by the manufacturer for the installer to complete ALL details together with their CORGI registration number and sign to confirm that the boiler has been installed and commissioned according to the manufacturer's instructions

IMPORTANT: The completed Benchmark Log Book will be required in the event of any warranty work and may be required by the local Building Control Inspector.

HEALTH & SAFETY

The appliance contains no asbestos and no substances used in the construction process to contravene the COSHH Regulations (Control of Substances to Hazardous Health Regulations 1988)

SAFETY PRECAUTIONS**COMBUSTIBLE AND CORROSIVE MATERIALS**

Do not store or use any combustible materials (paper, thinners, paints etc.) inside or within the vicinity of the appliance

Chemically aggressive substances, such as halogenated hydrocarbons containing chlorine or fluorine compounds can corrode the appliance and invalidate any warranty.

FITTING & MODIFICATIONS

Fitting the appliance and any controls to the appliance may only be carried out by a competent engineer in accordance with the Gas Safety (Installation and Use) Regulations.

Flue systems must not be modified in any way other than as described in the fitting instructions and any misuse or unauthorised modifications to the appliance, flue or associated components and systems could invalidate the warranty. The manufacturer accepts no liability arising from any such actions. This does not effect your statutory rights

SERVICING

The user is recommended to have the system regularly serviced by a competent, qualified engineer (such as British Gas or CORGI registered personnel) using original spares, to help maintain the economy, safety and reliability of the appliance and to have the Service Record completed in the Benchmark Log Book

The appliance should be serviced once each year after installation unless the particular installation conditions and usage demand more frequent services

IMPORTANT - ensure that the service engineer completes the Service Record in the Benchmark Log Book after each service

To get the best from your appliance please read these instructions carefully

SEALED HEATING SYSTEMS

The appliance is fitted to a sealed heating system which is pressurised. Your installer will tell you of the minimum and maximum pressure which must be indicated on the pressure gauge.

Check regularly that the pressure is maintained and contact your installer or maintenance engineer if there is a permanent significant drop in pressure. If the system loses pressure it should be repressurised and the cause of the fall investigated.

CENTRAL HEATING SYSTEMS

During the first few hours of operation of the central heating system, check that all radiators are being heated at an even rate. If the top of a radiator is at a lower temperature than the bottom then it should be vented by releasing air through the venting screw at the top of the radiator. Ask your installer to show you how this is done. Repeated venting will reduce the quantity of water in the system and this must be replenished for safe and satisfactory operation of the appliance.

Should water leaks be found in the system or excessive venting is required then a service engineer must be contacted to inspect the installation and rectify any fault.

Only additives that are compatible with aluminium may be used in the system. Any incompatible additive used will invalidate the guarantee.

FLUE OUTLET

This is a condensing appliance and the terminal will, at times give out a plume of water vapour. This is quite normal.

GENERAL NOTES

CONDENSATE DRAIN

The appliance also produces quantities of condensate which is discharged regularly by a pump within the boiler to drain.

ROOM THERMOSTAT

A room temperature controller (eg. Worcester TR2 room temperature controller with night setback module) should be fitted to control the central heating. Refer to the instructions supplied with the thermostat for information on siting and setting.

THERMOSTATIC RADIATOR VALVES

It is recommended that this type of valve is fitted to all but one of the radiators (or at least those in the sleeping accommodations). The remaining radiator, which must be where the room thermostat is located, should be uncontrolled and must be left open. They should conform to the requirements of BS2767:10.

SHOWERS, BIDETS, TAPS & MIXING VALVES

Standard hot and cold taps and mixing valves must be suitable for operating at mains pressure. Thermostatically controlled or pressure equalising shower valves will guard against the flow of water at too high a temperature.

Hot and cold mains fed water can be supplied directly to an over-rim flushing bidet subject to local water company requirements.

With all mains fed systems the flow of water from individual taps will vary with the number of outlets operated simultaneously and the cold water mains supply pressure to the property. Flow balancing using "ball-o-fix" type valves is recommended to avoid an excessive reduction in flow to individual outlets.

For further information contact Worcester Heat Systems Ltd. Technical Department.

GENERAL NOTES

HOT AND COLD FLOW

The flow of water demanded from both hot and cold service outlets is dependent on the mains supply, it may not be possible in some installations to operate all outlets simultaneously.

WATER MAINS FAILURE

If there is a failure of the mains water supply then no water will be available at a tap or shower until the mains supply is restored. The appliance will still operate in the central heating mode.

USE IN HARD WATER AREAS

In exceptionally hard water areas a device to prevent scale formation may be fitted. Installation of a scale inhibitor assembly should be in accordance with the requirements of the local water company. An isolating valve should be fitted to allow for servicing.

Alternatively the maximum temperature of the domestic hot water may be reset to about 45°C which will reduce the risk of scale formation in these hard water areas.

VENTILATION

This is a room sealed appliance and does not require any air for combustion from inside the house. If the appliance is fitted into a cupboard or a compartment is built around the appliance after installation then the compartment must be separated from the boiler space by a perforated non-combustible partition as described in BS 6798 and BS 5440.

Notwithstanding the requirements of BS 6798, there is no need for ventilation openings to be provided in the compartment because of the low heat loss from the appliance casing if clearances on the next page are observed.

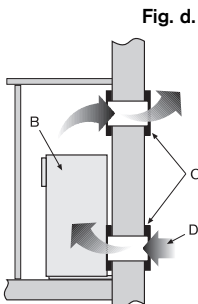
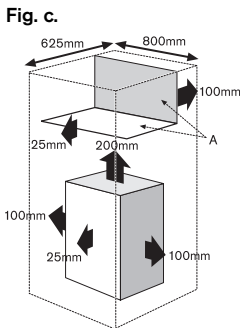
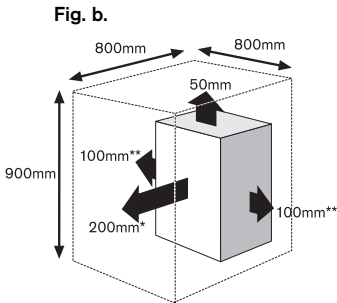
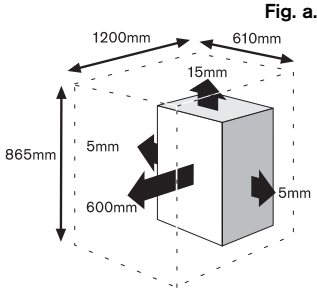
Do not operate the appliance if the flue terminal fitted on the outside wall or roof is obstructed or damaged.

PUMP

The pump is set by the manufacturer and must not be adjusted.

PUMP ANTI-SEIZURE

If there has been no heating demand for 24 hours, the pump will run for a few seconds to reduce the possibility of pump seizure, which is possible during long periods of inactivity.



GENERAL NOTES

BOILER LOCATION AND CLEARANCES

This boiler is only suitable for installing internally within a property at a suitable location onto a fixed, rigid non-combustable surface at least the same size of the boiler and capable of supporting the boiler weight.

Compartments:

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

- ▶ Minimum clearances must be maintained.
- ▶ An access door is required for servicing and maintenance of the boiler.
- ▶ If fitting the boiler into an airing cupboard use a non-combustable perforated material (maximum hole sizes of 13mm) to separate the boiler from the air space.

Service clearances. See Fig. a.

The diagram opposite shows the minimum space required to service the boiler only.

Unvented compartment clearances. See Fig. b.

The diagram opposite shows the minimum space required to install and service the boiler inside an unvented compartment.

*Space required for unvented areas with a removable door or panel.

**This space can be reduced to 50mm for one side only as long as both the side clearances add up to the total of both the side measurements shown or more.

Airing cupboard clearances. See Fig. c.

The diagram opposite shows the minimum space required to install and service the boiler within an airing cupboard.

Venting compartments. See Fig. d.

If the clearances are less than those stated for options c & d then ventilation must be provided as described in BS5440:

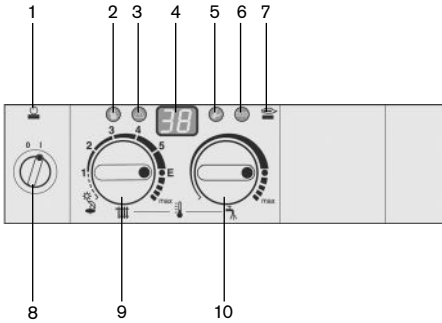
A minimum of 2 air vents (C) must be fitted, one at low level and another at high level onto the same wall using the same air for circulation.

Minimum free air required for both vents:

For air directly from outside: 148cm² per vent.

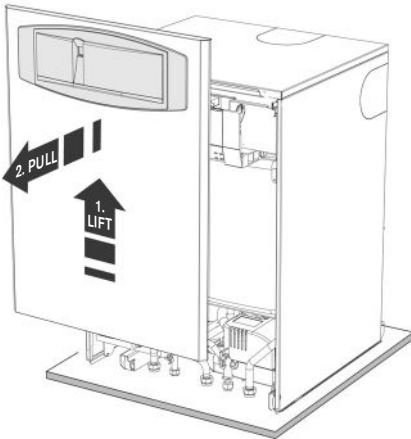
For air from internal space/room: 296cm² per vent.

CONTROLS

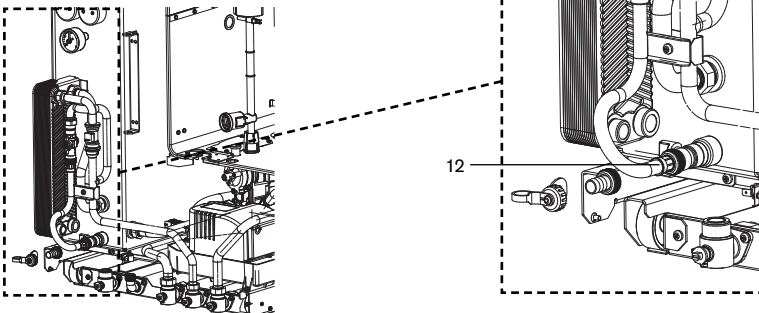


1. INDICATOR LAMP FOR "OFF/ON"
2. "INSTALLER SERVICE FUNCTION" BUTTON
(For use only by service engineer)
3. RESET BUTTON
4. DISPLAY
5. SERVICE BUTTON
6. "ECO" MODE INDICATOR
7. INDICATOR LAMP FOR "BURNER ON"
8. MASTER SWITCH
9. CENTRAL HEATING TEMPERATURE CONTROL
10. HOT WATER TEMPERATURE CONTROL
11. SYSTEM PRESSURE GAUGE
12. FILLING LOOP CONNECTION

USING YOUR APPLIANCE



REMOVE THE BOILER CASING FRONT PANEL TO GAIN ACCESS TO THE SYSTEM PRESSURE GAUGE & FILLING LOOP CONNECTION



OPERATING THE APPLIANCE

SWITCHING THE APPLIANCE ON/OFF

Switching on

- ▶ Switch on the appliance at the master switch (I).

The indicator lamp shows green and the display will show the central heating flow temperature, when the appliance is operating in the central heating mode.

Note: If the display alternates between -II- & the central heating flow temperature, the condensate trap filling programme is active. If the display shows "t" the tank heat up programme is running.

The condensate trap filling programme ensures that the condensate trap is filled after the appliance has been installed or after the appliance has been out of use for a long period. For that reason, the appliance remains at minimum heating output for approximately 15 minutes.

Switching off

- ▶ Switch off the appliance at the master switch (0).

The green indicator lamp goes out. The display on the optional timer (if fitted) will continue to operate until the battery back-up is exhausted.

SETTING THE CENTRAL HEATING TEMPERATURE

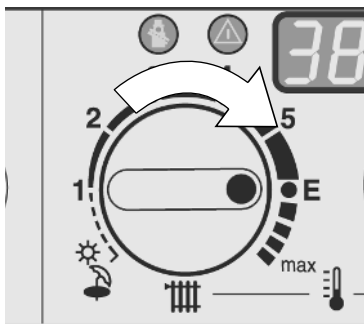
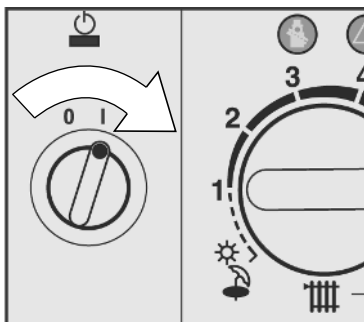
- ▶ Turn the central heating temperature control IIII to the desired level:

Control Setting	Water Temperature
Anti-clockwise limit	approx. 35°C
'E'	approx. 75°C
Clockwise limit	approx. 88°C

When the burner is lit, the red indicator lamp is illuminated.

CONTROLLING CENTRAL HEATING

- ▶ Set the timer (if fitted) to the correct time.
- ▶ Set room thermostat to the desired room temperature.
- ▶ Set temperature driven control unit, if fitted. Refer to the instructions with the control.
- ▶ Set the thermostatic radiator valves to the desired settings.




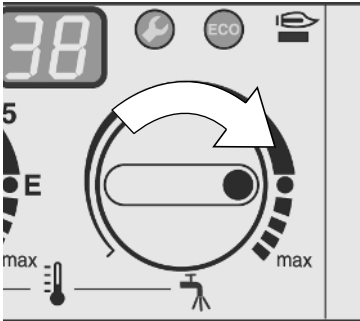
OPERATING THE APPLIANCE

SETTING THE HOT WATER TEMPERATURE

Hot water temperature


The hot water temperature can be set to between approx. 45°C and 65°C using the temperature control

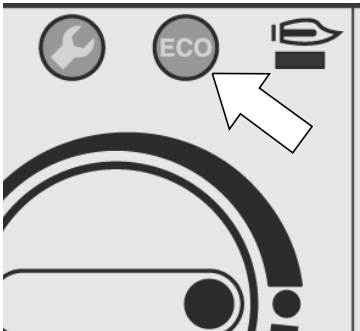
The domestic hot water temperature is not shown on the display. 



Control Setting	Water Temperature
Anti-clockwise limit	approx. 45°C
●	approx. 58°C
Clockwise limit	approx. 65°C

"ECO" indicator

A lit  indicator shows there is no DHW demand from the integral or external programmer and indicates a night time setting. In this state the boiler will not fire when there is a DHW demand but will produce a limited amount of warm water depending on store temperature. During this demand the boiler pump will be operated.




USING YOUR
APPLIANCE

OPERATING THE APPLIANCE

SUMMER MODE, HOT WATER ONLY

With room temperature controller fitted

- ▶ Turn temperature control  on the appliance anti-clockwise as far as the stop.

The central heating is now turned off. The hot water function and the power supply for the programmer and thermostat remain switched on.

FROST PROTECTION


- ▶ Leave master switch switched on.

If the temperature falls to 5°C the boiler will fire to avoid the possibility of freezing.


- ▶ Add a suitable anti-freeze fluid to the water in the central heating system.

FAULT CONDITION

In the unlikely event of a fault occurring while the appliance is in operation:

The display shows a fault code and the button  may also flash.

If the button  flashes:

- ▶ Press and hold the button  until the display shows “- -”. The appliance will then start up again and the display will show the central heating flow temperature.

If the button  does not flash:

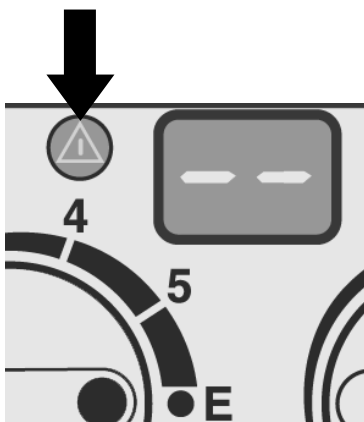
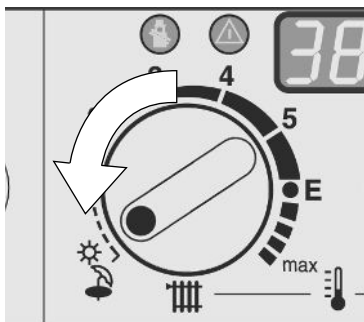
- ▶ Switch the appliance off and then on again at the master switch.

The appliance will start up again and the central heating flow temperature will be displayed.

If the fault remains and cannot be cleared:

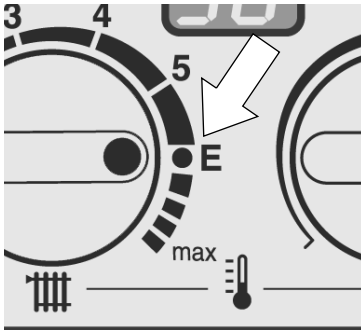
- ▶ Call Worcester Heat Systems Ltd. for assistance, giving a description of the fault and, if possible the fault code from the fascia display.

USING YOUR
APPLIANCE



Heating economically

The boiler is designed to provide a high level of comfort while keeping gas consumption and the resulting environmental effect as low as possible. The gas supply to the burner is controlled according to the level of demand for heat. The boiler continues to operate with a low flame if the demand for heat reduces. The technical term for this process is modulating control. Modulating control reduces temperature fluctuations and provides even distribution of heat throughout the home. This means that the boiler may stay on for relatively long periods but will use less gas than an appliance that continually switches on and off.



Central heating systems with room thermostats/thermostatic radiator valves

The central heating control on the boiler should be set to the maximum rated temperature of the central heating system or to position "E", when the maximum central heating water temperature obtained is 75°C.

The temperature of each room can be set individually (except primary room with the room thermostat) using the thermostatic radiator valves. If you wish to have a lower temperature in the primary room than in the other rooms, leave the room thermostat at the set temperature and turn down the radiator using the radiator valve.

Roof insulation

Around 30% of the heat loss from a property is through the roof. Replace any old insulation with new insulation, preferably of around 200mm thickness or more.

Window frames

Single glazed windows, particularly those with steel frames, can lose a great deal of heat. Consideration should be given to replacement with PVCu or wooden framed double glazed units.

Curtains

Lined curtains, or heavier full length curtains can provide excellent insulation. However, always ensure that the curtains do not drape over radiators.

Draughts

Try to ensure that draughts around doors, windows, letterboxes and keyholes etc., are reduced by using a suitable draught excluder. Warning - do not block or seal any air vents that are installed to ensure the central heating boiler operates safely.

Room thermostats

Reducing the setting of the room thermostat by 1°C can reduce fuel consumption by up to 10%.

New control systems

Upgrade your heating control system with the latest equipment available. The minimum level of control for a combi boiler or fully pumped system is a programmer, interlocking room thermostat and thermostatic radiator valves.

TIPS ON ENERGY SAVING

Radiators

More often than not radiators will be sited underneath a window, so the warm air from the radiator heats the colder incoming air from the window. The performance of the radiator will be affected if the curtains are allowed to drape over the radiator or shelves are fitted above it. The positioning of furniture and tables in front of the radiator should also be avoided.

It is advisable to manually adjust all radiator valves every 2-3 months to prevent them from sticking. It is also important that the plastic tops of all valves are always in position and not cracked or damaged so as to prevent accidents. Care should be taken when vacuum cleaning carpets so as to avoid damage to valves and pipework.

The heating system and the outputs of the radiators have been carefully selected by your installer. The temperature obtainable in any given room is dependent on all radiators being operated at the same time. If you decide to turn off radiators in unused rooms, spare bedrooms etc., you may experience slightly lower room temperatures in rooms adjacent to unheated rooms.

MAINTAINING YOUR APPLIANCE

Your new Greenstar Highflow 440 gas-fired appliance represents a long term investment in a reliable, high quality product.

In order to realise its maximum working life, and to ensure it continues to operate at peak efficiency and performance, it is essential that your boiler receives regular, servicing and maintenance checks from a competent person beyond the initial 2 year guarantee period.

If you would like to know more about a Worcester Bosch service contract, please tick the appropriate box on your warranty registration card.

If your Greenstar Highflow 440 should fail to operate correctly or requires servicing please contact the Worcester Bosch Service Department, see inside front cover for details.

FAULT FINDING

Problem	Cause	Remedy
Desired room temperature is not reached	Thermostatic radiator valve(s) set too low	Increase thermostatic radiator valve setting(s)
	Temperature control for CH flow on boiler set too low	Increase CH flow temperature control setting
	Air trapped in heating system	Bleed radiators and recharge heating system
Desired room temperature exceeded by large amount	Radiators are too hot	Turn down thermostatic radiator valves / room stat
Temperature rises instead of falling	Clock is incorrectly set	Check setting
No display or display unit does not respond	Momentary power failure	Switch off appliance at master switch, wait a few seconds then switch on again
Hot water temperature too low	Hot water temperature dial set too low	Check setting

FAULT OR BREAKDOWN

This appliance is supported in the UK by Worcester Heat Systems Ltd. - part of the Bosch Group.

Specialist factory trained Service Engineers are available to attend a breakdown occurring on this appliance.

No charge will be made for parts and/or labour providing:

- ▶ An appliance fault is found and the appliance has been installed within the past 24 months. Reasonable evidence of this must be supplied on request.

A call-out charge will be made where:

- ▶ The appliance has been installed for over 24 months
- OR**
- ▶ Our Field Service Engineer finds no fault with the appliance (see **Note**).
- OR**
- ▶ The cause of breakdown is misuse or with other parts of your plumbing/heating system, or with equipment not supplied by Worcester Heat Systems Ltd.

Note. NO APPLIANCE FAULT IS FOUND ON OVER 30% OF ALL SERVICE CALL OUTS.

Please read this guide carefully to gain a good understanding of the operation of your appliance. In the case of a suspected fault, refer to the fault finding section of this guide.

If in doubt contact our Technical Helpline

In the event of an appliance fault or breakdown please contact our Service Department. Your service administrator will arrange for an Engineer to call with the minimum of delay. Under normal circumstances this will be from 1 to 3 working days (excluding weekends) for priority breakdown situations (no hot water and/or heating).

Invoices for attendance and repair work carried out on this appliance by any third party will not be accepted.

YOUR GUARANTEE

This appliance is guaranteed against faulty material or workmanship for a period of 24 calendar months from the date of installation subject to the following terms and conditions.

- ▶ During the period of this guarantee any components of the unit which are proven to be faulty or defective in manufacture will be exchanged or repaired free of charge by Worcester Heat Systems Ltd.
- ▶ The householder may be asked to prove the date of installation, that the appliance was correctly commissioned and, where appropriate, the first years service has been carried out to the satisfaction of Worcester Heat Systems Ltd. when requested.
- ▶ Any product or part returned for servicing under the guarantee must be accompanied by a claim stating the model, serial number, date of installation.
- ▶ Worcester Heat Systems Ltd will not accept responsibility for damage caused by faulty installation, neglect, misuse or accidental damage, or the non observance of the instructions contained in the installation and servicing manual and users instructions.
- ▶ The appliance has been used only for normal domestic purposes for which it was designed.
- ▶ This guarantee applies only to equipment purchased and used in the United Kingdom.

This guarantee does not affect your statutory rights.

GUARANTEE REGISTRATION

You should complete and return the postpaid Guarantee Registration Card within 14 days of purchase.

Returning the card will register you as the owner of your new Greenstar Highflow 440 appliance and will assist us in maintaining an effective and efficient customer service by establishing a reference and permanent record for your boiler.

This does not affect your statutory rights.

For your own record:

Model _____

Serial No. _____

(See identity label inside appliance casing)

Type / size _____

Date of installation _____

Check that the Benchmark “Log Book” has been completed by your installer or service engineer.

USER INSTRUCTIONS & CUSTOMER CARE GUIDE

EXCELLENCE COMES AS STANDARD

Worcester Heat Systems Ltd (Bosch Group)
Cotswold Way, Warndon, Worcester WR4 9SW.
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www.worcester-bosch.co.uk

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