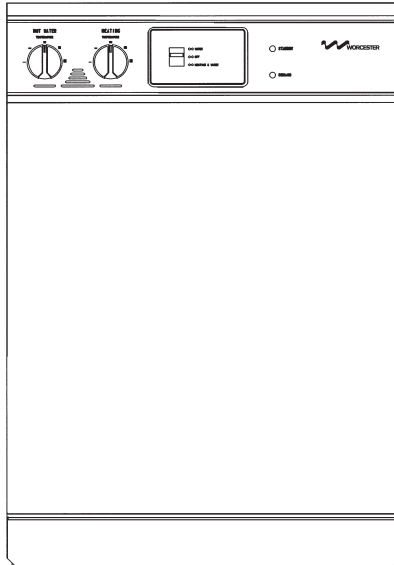


# WORCESTER

Bosch Group



## HIGHFLOW 400 SERIES



*Worcester Bosch supports the  
Benchmark code of practice*

### G.C. NUMBERS

APPLIANCE	NATURAL GAS	L.P.G.
Fanned Flued (RSF)	47 311 18	47 311 21
Balanced Flued (BF)	47 311 19	47 311 22
Open Flued (OF)	47 311 20	47 311 23

# USER INSTRUCTIONS & CUSTOMER CARE GUIDE



# EXCELLENCE COMES AS STANDARD

Thank you for purchasing a Highflow 400 Series gas-fired combination appliance.

Highflow 400 Series appliances are made by Worcester Heat Systems and the strictest quality control standards are demanded throughout every stage of production.

Indeed, Worcester Heat Systems have led the field in innovative appliance design and performance for more than 30 years.



The result is that your new Highflow 400 appliance offers you the very best of everything - quality, efficiency, economical running costs, proven reliability and value for money.

What's more, you also have the assurance of our no-nonsense 1 year parts and labour guarantee.

And it's backed up by Worcester Care Call - a complete maintenance scheme to keep your boiler operating at peak condition and efficiency.

No wonder that more and more people are agreeing that when it is gas, it has to be Worcester Highflow 400 Series.

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# GENERAL INFORMATION

## **GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1994**

It is the law that all gas appliances must be installed by a competent person in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your interest and that of safety to ensure compliance with the law. The manufacturers notes must not be taken, in any way, as over-riding statutory obligations.

**WARNING:** This appliance must be earthed and protected by a 3 amp fuse.

**ELECTRICITY SUPPLY:** 230V ~ 50Hz

**IMPORTANT:** To get the best from your Highflow please read these instructions carefully.

**NOTE:** In the event of a fault the appliance should not be used until the fault has been corrected by a competent person.

## **GENERAL DESCRIPTION**

(See Fig.1.)

The HIGHFLOW 400 MODELS are combined domestic hot water and central heating appliances. They consist of a gas fired boiler having a varying output of between 8.8 kW and 24 kW, a heatbank containing stored primary water, a heat-exchanger to provide domestic hot water via the boiler, a circulating pump, water diverting valve and all necessary controls to provide mains fed domestic hot water and central heating.

The appliances are fitted with a manual Operating Switch.

The appliances can operate in one of two modes. Hot water only or hot water and central heating.

### **Hot Water Mode:**

When a demand is made for hot water by opening a tap or shower; the flow switch will energise the pump and circulate primary hot water around the boiler and water to water heat exchanger. The burner will light at its maximum setting to maintain the temperature of the heatbank.

When hot water is no longer required the appliance will continue to operate, the burner will cycle a number of times, until the heatbank has returned to temperature. The pump will continue to run for a few minutes to dissipate the residual heat around the appliance.

If no hot water demand is made then the boiler will only use enough energy to maintain the temperature of the heatbank.

The maximum temperature of the water drawn off from the heatbank is governed by the setting of the Hot Water Temperature Control Knob. (See Fig.2.)

A flow restrictor is fitted within the appliance which limits a hot water delivery rate to a maximum of 18 ( $\pm 15\%$ ) litres/minute (4.0 gallons/minute).

The restrictor is removed by the installer if a cistern feed hot water system is installed.

### Hot Water and Central Heating mode:

When a demand is made for heating by the system controls (i.e. a programmer or room thermostat).

The water diverter valve will open, the pump will energise circulating primary water around the heating system and the burner will light. The heat output from the appliance in this mode will have been set by the installer to match the requirements of the system. The appliance will operate as necessary to maintain the temperature of the radiators at the level set by the adjustment of the Heating Temperature Control Knob. (See Fig. 2.)

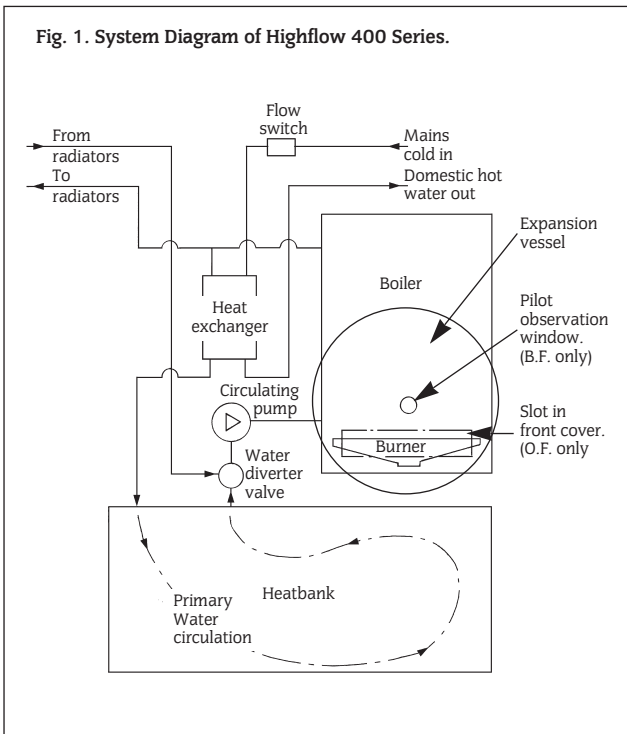
If the system no longer requires output to maintain the desired room temperature, the burner will extinguish. The pump will continue to run for a short period to dissipate the residual heat from the appliance and then switch off.

The appliance will supply heat to the central heating system as required. A demand for hot water at a tap or shower will override the central heating function for the period of the domestic hot water demand.

When domestic hot water is no longer required the burner and pump will continue to operate until the heatbank is back to the required temperature.

The appliance will return to the central heating state and its normal mode of operation. Similarly the hot water is occasionally diverted from the central heating system into the heatbank to maintain the stored primary hot water temperature.

**NOTE:** If in doubt about the use of the controls ask your installer to assist you.





# GENERAL NOTES

## CENTRAL HEATING SYSTEM

During the first few hours of operation of the central heating system, check that all radiators are being heated at an even rate. Should the upper area of a radiator be at a lower temperature than the base of the radiator, it should be vented by releasing air through the venting screw at the top of each radiator. Make sure your installer shows you how to carry out the operation. 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 be required from any radiator, a service engineer should be contacted and the system corrected.

## SEALED HEATING SYSTEM

The appliance can be fitted to a sealed heating system which is pre-pressurised. In this case your installer will advise you on the minimum and maximum pressure that should be indicated on the pressure gauge. See Figs 3 and 4. Check regularly that this pressure is maintained and contact your installer or maintenance engineer if there is a permanent significant drop in pressure indicated on the gauge. If the system loses pressure it should be re-pressurised as instructed by the installer.

**NOTE:** Some sealed systems do not require pre-pressurisation. If this type of system has been used by your installer he will advise you of any special maintenance that is required to ensure that the system is always full of water.

Should any water leaks be found in the system or excessive venting be required from any radiator, a service engineer should be contacted and the system corrected.

## OPEN VENTED HEATING SYSTEM

The appliance may be fitted to an open vented heating system your installer will advise you. There is no need to observe the pressure gauge.

## CLEARANCES

Your installer will have provided adequate space around the appliance for safety and servicing. Do not restrict this space by the addition of cupboards, shelves etc. close to the appliance.

Minimum clearances in millimetres.

	<b>BF Models</b>	<b>OF Models</b>	<b>RSF Models</b>
Left-hand side	5	5	5
Right-hand side	5	70	5
In Front	600	600	600
Above	10	10	10

## **ROOM THERMOSTAT**

A room thermostat may be fitted for control of the central heating temperature. It will be located in one room of the home. The method of setting a room thermostat varies with the type and manufacture. Refer to the instructions supplied with the room thermostat.

## **THERMOSTATIC RADIATOR VALVES**

If thermostatic radiator valves are to be fitted to the system then they must conform to the requirements of BS2767:1972. It is advisable to leave one valve permanently set at maximum to prevent the boiler short cycling.

## **SHOWERS, BIDETS, TAPS AND MIXING VALVES**

Standard hot and cold taps and mixing valves used with the appliance must be suitable for operating at mains pressure. The use of 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 direct to an overrim flushing bidet subject to local water company requirements.

With all mains fed systems the flow of water from the 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.

## **HOT AND COLD FLOW**

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

## **WATER MAINS FAILURE**

It is important to note that in the event of a mains water supply failure, no tap water will be available until the mains supply is restored. Cistern fed hot water supply will stop once the cistern has emptied but the appliance can still be used for heating provided that the system is of the sealed system type. Open vent central heating systems should be turned off until the supply is restored.

## **USE IN HARD WATER AREAS**

In areas of exceptionally hard water supply it is recommended that an In-Line scale inhibitor be fitted.

Installation should be strictly in accordance with the requirements of the local Water Company. An isolating valve to facilitate servicing should be incorporated.

The water hardness may be determined using the standard test paper or by reference to the local Water Company.

Further information may be obtained from Worcester Heat Systems Limited.

## **AIR SUPPLY FOR OPEN FLUED (O.F.) APPLIANCES**

Your installer will have made arrangements for an adequate supply of fresh air to the appliance. Fresh air is required for combustion. Do not block up any air ways which may be let into a wall or door. Do not hang clothes or other combustible materials over the appliance or against the flue pipe.

**NOTE:** Do not place anything on top of the appliance. If the appliance is fitted in a compartment do not use the compartment for storage purposes unless it conforms to the requirements of BS 6798:1987: Section 6. In particular, the flue pipe should not pass through an airing cupboard space unless protected by a guard (such as wire mesh) concentrically spaced 25mm (1in), as described in BS 6798:1987.

## **VENTILATION OF BALANCED FLUED (BF) AND ROOM SEALED FANNED FLUE (RSF) APPLIANCES**

These are room sealed appliances and any ventilation openings in a wall or door must not be obstructed. Do not allow the flue terminal fitted on the outside wall to become obstructed or damaged.

**NOTE:** Do not place anything on top of the appliance. If the appliance is fitted in a compartment do not use the compartment for storage purposes unless it conforms to the requirements of BS 6798:1987: Section 6. It is essential that the airing space is separated from the boiler space by a perforated non-combustible partition as described in BS 6798:1987.

## **CIRCULATING PUMP**

This may be fitted with a speed adjuster. If so it will be factory set at maximum and should not be changed.

## **FROST PRECAUTIONS**

If the appliance is not to be used for a long period of time and there is a likelihood of freezing, then the appliance should be drained. Your British Gas Engineer, or any service engineer will advise you on suitable frost precautions. For short periods leave the appliance on a low temperature setting.

## **SERVICE**

Annual servicing is important in order to ensure continuing high efficiency and long life for your appliance. In the event of any difficulty in making suitable servicing arrangements, Worcester Heat Systems Limited, your British Gas Engineer or other competent persons will discuss regular servicing arrangements and offer a comprehensive maintenance contract.

## **WARNING**

If a gas leak exists, or is suspected, turn off the gas supply to the appliance at the service cock and consult your local British Gas Engineer or service engineer.

Do not touch any electrical switches to turn them either on or off. Open all windows and doors. Do not smoke. Extinguish all naked lights.

## **CLEANING**

Do not use abrasive cleaners on the outer casing. Use a damp cloth and a little detergent.

# OPERATION OF CONTROLS

The appliance is fitted with either an operating switch or an electronic programmer on the fascia panel for the control of domestic hot water and central heating.

## OPERATING SWITCH

One of three positions can be selected:

**HOT WATER ONLY.** The appliance will operate at any time there is a demand for hot water.

**OFF.** Both hot water and central heating will remain off.

**HEATING AND HOT WATER.** Hot water will be supplied when a demand is made. Central heating will operate continuously in response to a demand from a room thermostat or thermostatic radiator valves if fitted.

**NOTE:** The switch is connected so that it is not possible to turn on the central heating without the hot water.

## ELECTRONIC PROGRAMMER

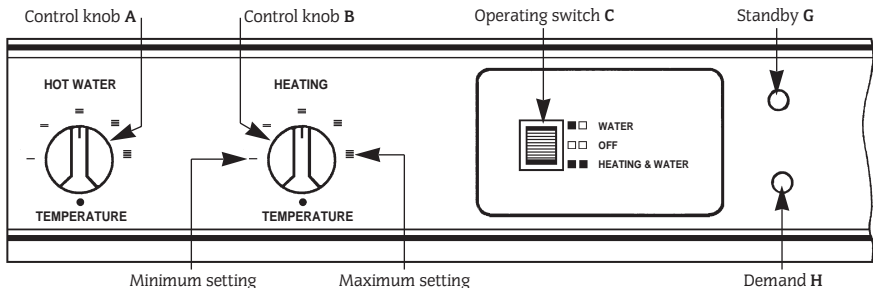
Your Installer will have mounted the optional electronic programmer on the appliance fascia panel. Operating instructions are supplied with the programmer.

## TEMPERATURE CONTROLS

The Central Heating Temperature Control Knob gives control over the temperature of water supplied to the radiators when the boiler is serving the central heating system. This control does not influence the temperature of the Hot Water which is set by the Hot Water Temperature Control Knob. The control knobs have a range as indicated in Fig. 2.

The operating temperatures may be set anywhere within the range. With a high central heating temperature setting the radiators will get hotter and high room temperatures will be achievable. Similarly the temperature of the hot water can be controlled. With lower settings the radiators and hot water will be cooler but in winter conditions the central heating and hot water may not reach their design temperatures.

Fig. 2. Fascia panel.







# TO LIGHT AND STOP THE APPLIANCE

## TO LIGHT THE APPLIANCE (RSF ONLY)

See Figs 2 and 3.

Set the Operating Switch **C** (or programmer) to OFF. Switch off the electricity supply. Remove the cabinet front panel by lifting off its mountings. Turn the gas service cock **D** on. Check that the white needle on the pressure gauge is not below the required pressure (sealed systems only).

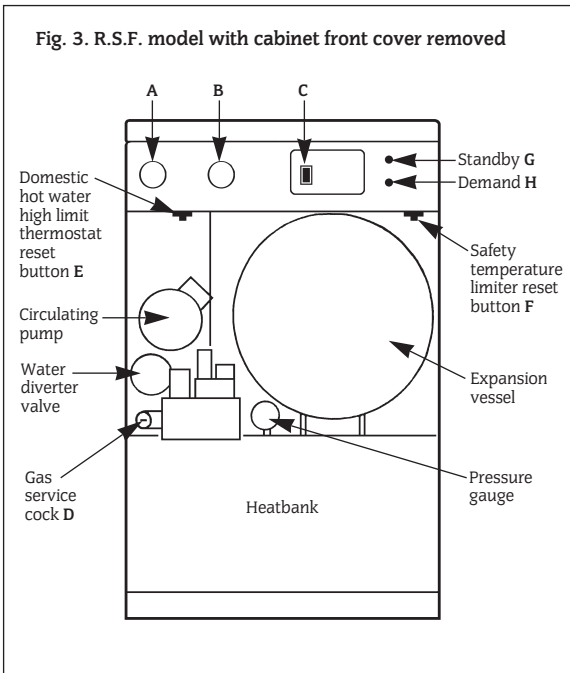
Switch on the mains electricity indicated by the Standby light **G**.

Turn the central heating temperature control **B** to max. Set the Operating Switch **C** (or programmer) to HEATING AND WATER and the burner will light (not visible).

Set the Operating Switch (or programmer) to the required position.

Set the room thermostat, if fitted, to the desired temperature. Set the central heating temperature control **B** to the required position.

Fig. 3. R.S.F. model with cabinet front cover removed



## TO STOP THE APPLIANCE

For Short Periods; Set the Operating Switch (or programmer) to OFF as indicated by the Demand light **H** going out.

For Long Periods; Set the Operating Switch (or programmer) to OFF as indicated by the Demand light going out. Switch off the mains electricity indicated by the Standby light **G** going out.

The facia mounted programmer will retain its settings for about 4 weeks after which it will return to the factory set programme. The display will disappear after approx. 12 hours.

## ELECTRICITY SUPPLY FAILURE

The appliance will not operate without an electricity supply. Normal operation of the appliance will resume after the electricity supply is restored.

## OVERHEAT THERMOSTAT

Two overheat thermostats **E** and **F** are fitted to the appliance which interrupt the electricity supply in the event of overheating. The thermostats are reset manually.

If the appliance fails to light, check that the overheat thermostats have not operated by pressing the reset buttons **E** and **F**. If the overheat thermostats stop the appliance again call a service engineer.

**NOTE:** If the electrical supply to the appliance is interrupted at the isolation switch or a power failure occurs whilst the burner is firing, the boiler will normally relight automatically when the power supply is restored. However, depending upon circumstances it may be necessary to reset the overheat thermostats before the appliance will operate.

## TO LIGHT THE APPLIANCE (O.F./B.F. ONLY)

See Figs 2 and 4.

Set the Operating Switch **C** (or programmer) to OFF. Switch off the electricity supply. Remove the cabinet front panel by lifting off its mountings. Turn the gas service cock **D** on. Check that the white needle on the pressure gauge is not below the required pressure (sealed systems only).

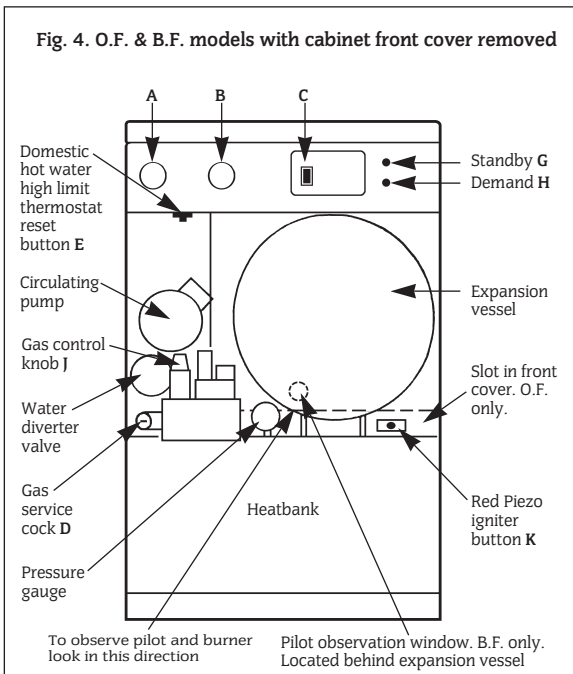
Push the grey gas control knob **J** fully in and hold. At the same time repeatedly press and release the red piezo igniter button **K** until the pilot lights. The pilot can be seen either through the pilot window **L** (BF) or under the combustion

chamber door baffle (OF). When the pilot lights, continue to hold the grey gas control knob in for a further 15 seconds and then slowly release it.

**CAUTION:** If the pilot light goes out at this, or any other stage, twist the grey knob clockwise and release. Wait three minutes, then repeat the lighting procedure, holding in the grey gas control knob for a little longer than before.

Switch on the mains electricity indicated by the Standby light **G**. Turn the central heating temperature control **B** to max. Set the Operating Switch **C** (or programmer) to HEATING AND WATER and the burner will light. Set the Operating Switch (or programmer) to the required position. Set the room thermostat, if fitted, to the desired temperature. Set the central heating temperature control **B** to the required position.

Replace the cabinet front panel.



## **TO STOP THE APPLIANCE**

For Short Periods; Set the Operating Switch (or programmer) to OFF as indicated by the Demand light **H** going out.

For Long Periods; Set the Operating Switch (or programmer) to OFF as indicated by the Demand light going out. Switch off the mains electricity indicated by the Standby light **G** going out. Remove the cabinet front panel by lifting off its mountings. Twist the grey gas control knob clockwise (shown by an arrow) and release. To relight follow the above instructions.

The fascia mounted programmer will retain its settings for about 4 weeks after which it will return to the factory set programme. The display will disappear after approx. 12 hours.

## **ELECTRICITY SUPPLY FAILURE**

The appliance will not operate without an electricity supply. Normal operation of the appliance will resume after the electricity supply is restored.

## **OVERHEAT THERMOSTAT**

Two overheat thermostats are fitted to the appliance which interrupt the appliance operation in the event of overheating. Thermostat **E** is reset manually. The second thermostat resets automatically.

If the appliance fails to light, check that the overheat thermostat has not operated by pressing the reset button **E**. If the overheat thermostat stops the appliance again call a service engineer.

**NOTE:** If the electrical supply to the appliance is interrupted at the isolation switch or a power failure occurs whilst the burner is firing, the boiler will normally relight automatically when the power supply is restored. However, depending upon circumstances it may be necessary to reset the overheat thermostat before the appliance will operate.

## **FLUE SPILLAGE DEVICE (O.F. ONLY)**

The appliance is fitted with a device which detects the spillage of combustion products from the draught diverter. In the event of the flue becoming wholly or partially blocked this device will cut the gas supply to the burner. The device automatically resets after a waiting period of approximately 10 to 15 minutes. If the blockage remains the appliance will relight briefly before the device operates again. Should the problem persist consult your service engineer.



# APPLIANCE FAILS TO OPERATE

More than 30% of all calls made to Worcester Heat Systems to report appliance faults or breakdowns prove to be false alarms, as there is often a simple explanation for the apparent malfunction.

So, to help you save time and money – not to mention frustration and inconvenience – please refer to the General Information, Notes and Lighting Instructions ensuring all controls are set correctly.

If, after following the instructions the appliance still fails to operate correctly call your local Worcester Heat Systems Service Centre. Arrangements will be made for an engineer to call as soon as possible.

## CALL-OUT CHARGES

All of our field service engineers are factory trained.

If you request a visit from an engineer and your appliance has been installed within the last 12 months, no charge will be made for parts and/or labour, providing:

- The appliance was commissioned correctly on installation.
- An appliance fault is found and the appliance has been installed within the past 12 months.

A call-out charge will be made where:

- The appliance has been installed for over 12 months, or
- Our Field Service Engineer finds no fault with the appliance (see note), or
- The cause of breakdown is with other parts of your plumbing/heating system, or with equipment not supplied by Worcester.

**NOTE:** Invoices for attendance and/or repair work carried out on your appliance by any third party will not be accepted.

# MAINTAINING YOUR APPLIANCE

Your new Worcester Highflow 400 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, competent servicing and annual maintenance checks beyond the initial 12 month guarantee period.



Regular service contracts can be arranged with your installer - however if you have difficulty making a satisfactory arrangement simply contact Worcester Heat Systems on **0345 256206** for help.

If you would like to know more about Worcester's extended warranty options please tick the appropriate box on your warranty registration card.



**CONTACT NUMBERS:**

UK Call Centre	Tel.	08457 256 206
UK Call Centre	Fax.	01905 757536
Scotland only	Fax.	01506 441 687

**OPERATING HOURS:**

Mon - Fri	8.00am to 6.00pm
Sat	8.30am to 1.00pm

Please contact our UK Call Centre number where our friendly operators will book your call with one of our team of nationwide engineers.

**NOTE:**

Sunday and Bank Holiday cover is not available

**IMPORTANT**

Do not touch or adjust any sealed component



# YOUR WORCESTER HIGHFLOW 400 SERIES GUARANTEE

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

1. That during the currency of this guarantee any components of the unit which are proved to be faulty or defective in manufacture will be exchanged or repaired free of material charges and free of labour charges by Worcester Heat Systems Limited or British Gas.
2. That the householder may be asked to prove the date of installation, that the appliance was correctly commissioned and, where appropriate, the first 12 month service has been carried out to the satisfaction of Worcester Heat Systems Limited when requested.
3. That any product or part thereof returned for servicing under the guarantee must be accompanied by a claim stating the Model, Serial Number, Date of Installation.
4. That Worcester Heat Systems Limited will not accept responsibility for damage caused by faulty installation, neglect, misuse or accidental damage, the non-observance of the instructions contained in the installation and Operating Instructions Leaflets.
5. That the appliance has been used only for normal domestic purposes for which it was designed.
6. That this guarantee applies only to equipment purchased and used in mainland Great Britain.

This guarantee is given in addition to all your normal statutory rights.



# GUARANTEE REGISTRATION

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

The card will register you as the owner of your new Worcester Highflow 400 appliance and, while this will not affect your statutory rights in any way, it will assist us to maintain an effective and efficient customer service by establishing a reference and permanent record for your boiler.

**IMPORTANT: SERIAL NUMBER.** Copy the number off the Guarantee Card.

## FOR YOUR OWN RECORD

MODEL

SERIAL NUMBER

(See identity label inside appliance casing)

TYPE/SIZE

DATE OF INSTALLATION

## CORGI CONTACT

All **CORGI Registered** installers carry a **CORGI ID** card and have a registration number. Both should be recorded in your central heating log book. You can check your installer is **CORGI Registered** by calling **CORGI** on **01256 372300**



# WORCESTER

**Bosch Group**

## EXCELLENCE COMES AS STANDARD

Worcester Heat Systems Limited. Cotswold Way, Warndon, Worcester WR4 9SW.

Telephone: (01905) 754624. Fax: (01905) 754619.

Technical Service Helpline 08705 266241.

[www.worcester-bosch.co.uk](http://www.worcester-bosch.co.uk)

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