



Worcester GB162 wall mounted gas-fired condensing boiler series



Authorised User No. 00571



Worcester, Bosch Group
commercial training

Worcester and you, making a difference

As part of the Bosch Group, Worcester products are designed and manufactured to provide its customers with the high levels of quality and reliability which are synonymous with the Bosch name throughout the world.

As part of Europe's largest supplier of heating products, Worcester, Bosch Group has the UK-based resources and support capability to offer you the value-added solutions we feel you deserve. We employ more than 2,000 people, including a nationwide network of Service Engineers and technically trained Field Sales Managers.

These are supported by an experienced technical services team which is able to provide comprehensive support and advice from system layout through to installation.

We are dedicated to providing high performance, energy efficient heating and hot water systems for a wide range of installations, including large domestic properties and commercial applications such as offices, schools, sports centres and hotels.

"At Worcester we recognise the vital role you, our customer, has in the specification and installation, of energy efficient appliances in the UK. We will continue to invest in our products, people, facilities and added value services such as training, to give you the support you require in providing a total solution for your customers'."

Carl Arntzen,
Managing Director, Worcester, Bosch Group

Contents	Page
The Worcester GB162 condensing boiler series	4 - 5
The features of the Worcester GB162 condensing boiler series	6 - 7
Cascade – quick and simple	8
Flexible system solutions	9
Inside story	10 - 11
Technical data	12
Energy management controls	13 - 14
4000 series boiler management	15 - 16
Installing the Worcester GB162 series	17 - 21
Wiring diagram	22 - 23
The Worcester GB162 series fluing options	24 - 31
The Worcester GB162 cascade options	32 - 37
The Worcester GB162 boiler series and accessories	38 - 41
Worcester training	42 - 44
After-sales	45



The Worcester GB162 condensing boiler series

The Worcester GB162 is part of a market leading range of energy-saving condensing wall mounted gas-fired boilers.

The GB162 is an extremely versatile and compact wall hung condensing boiler that can be installed on its own or as part of a multi-boiler 'cascade' system. The boiler is available with individual outputs of 45, 65, 80 and 100kW and outputs of up to 800kW can be achieved when multiple units are connected as part of a cascade installation.

Precise energy management

Each boiler in the GB162 series can automatically modulate its output down to less than 20% for 65kW and 100kW boilers and 25% for 45kW and 80kW boilers in order to precisely match the demand for heat. This considerably reduces fuel consumption and improves overall seasonal efficiency.

The GB162 is fully compatible with the Energy Management System (EMS) modular controls platform. This optimises performance by keeping the boiler in condensing mode for

as long as possible. EMS also provides comprehensive heating system functionality and ensures minimal energy usage at all times.

High efficiency, low emissions

The GB162 provides net efficiencies of up to 110% (NCV) with ultra low class 5 levels of CO and NOx emissions. Its compact dimensions make it especially suitable for installations where space is restricted, but demand for a modern heating solution is high.

Tax relief with the Carbon Trust

All GB162 boilers are registered on the Carbon Trust's ECA scheme (Enhanced Capital Allowance). This will enable businesses to claim 100% of the first year capital allowance on investments in energy saving technology. For more details on how to register a claim please visit www.etl.decc.gov.uk or follow the links on the commercial section of the Worcester website.



The Worcester GB162 series at a glance

Boiler		GB162 45kW	GB162 65kW	GB162 80kW	GB162 100kW
Heat output at 50/30°C	Min	10.4kW	15.6kW	20.8kW	20.5kW
	Max	44.9kW	65.0kW	84.5kW	99.5kW
Heat output at 80/60°C	Min	9.6kW	14.2kW	18.9kW	19.0kW
	Max	42.5kW	60.5kW	80.0kW	94.5kW
Net efficiency*		110.0%	108.0%	110.0%	110.0%
Seasonal efficiency		97.1%	95.5%	95.7%	96.1%
Natural gas		•	•	•	•
LPG conversion kit		•	•	•	•
Integral pump		•	-	-	-
Single boiler installation		•	•	•	•
Cascade installation		•	•	•	•

*Temperatures of 50/30°C for 65/80/100kW and temperatures of 40/30°C for 45kW

Features	Benefits
Individual outputs of 45, 65, 80 & 100kW	Choice of boilers to meet customer heating needs
Condensing technology with up to 110% net efficiency	Saves fuel compared to standard efficiency boiler
Modulation to just 20% of total output†	Year round efficiency according to seasonal demand
Cascade outputs up to 800kW per frame kit	Modular package providing energy saving flexibility and maintenance backup
Extremely compact cascades (400kW in just 1m ²)	Space saving
Award winning ALU-Plus heat exchanger	Added durability and low cost servicing
Ultra low emission levels	Cleaner combustion and increased carbon savings
Quick and easy installation	Time saving
Integrates with solar thermal installations	Maximise savings from solar hot water
Individual lift weight starting at only 45kg	Aids installation
Whisper quiet	Can be sited near occupied rooms
Intuitive user controls	Increased system functionality and reduced running costs
LPG conversion available	Ideal for off mains locations
2 years parts and labour guarantee, 5 years on the heat exchanger	Peace of mind

†Depending on model

The features of the Worcester GB162 condensing boiler series

Worcester boilers are built to withstand heavy and constant use, so only the most reliable and efficient components are used in the design and manufacture of our products. The GB162 benefits from the very latest in high efficiency technology with a patented, award winning ALU Plus heat exchanger, and a host of energy saving features.

ALU-Plus heat exchangers

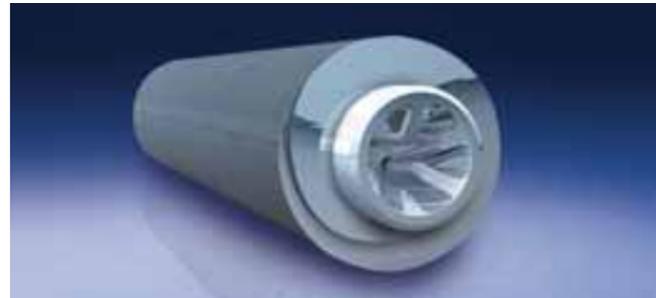
The precision engineered heat exchanger in the GB162 is constructed from a cast aluminium silicate compound which is lightweight, durable and allows for a rapid transfer of heat. The heat exchanger also uses the very latest ALU-Plus technology that has been developed by Bosch Thermotechnology Ltd. to increase durability and optimise heating efficiency.

Fins on the outside of the aluminium tubes increase the exterior surface area so that more hot flue gas comes into contact with the heat exchanger. A spiral channel on the inside of the tube increases the internal surface area and creates turbulence which brings more water into contact with the heating surface ensuring an optimum transfer of heat.

Wide heat exchanger channels ensure that flow resistance is minimised and this, combined with a substantially insulated case make the GB162 incredibly quiet in operation. This is a particular benefit for those boilers being installed in, or in close proximity to, living or working areas.

Plasma-polymerisation

The surface of the heat exchanger tubes is treated using a patented plasma-polymerisation process which leaves the surface so smooth that no deposits can adhere to it. The heat exchanger effectively stays clean. Extremely high efficiency is maintained and there is no need for mechanical cleaning; the heat exchanger can be simply flushed through during servicing.



Multi boiler cascade systems

For larger heat demands, the GB162 can be easily combined as part of a multi-boiler cascade system. Any combination of 1 to 8 boilers can be connected either in-line (TL) or back-to-back (TR) to provide condensing boiler outputs of up to 800kW with modulation down to around 2.5% of total output. This ensures that high levels of efficiency can be achieved all year round, even when demand for heat is low. Boilers can be cycled to come into and out of operation as and when required.



Cascade controls

Worcester offer a range of advanced modular controls designed specifically for the GB162 cascade system. The 4121/4122 control system can be mounted remotely of the cascade framework and easily wired to the boiler or fitted on the wall of the boiler room. For further details on this control system please see page 15.

The modular control system provides a comprehensive solution for any heating system and is a cost-effective alternative to installing a Building Management System. A low loss header should be installed to separate the boilers from the rest of the heating system. This, together with the recommended Worcester modulating boiler pump group accessory (65/80/100kW) or integral pump on the 45kW, ensures that flow volumes are balanced, efficiency is high and hydraulic performance is optimised.

The GB162 cascade kit includes:

- Mounting frames
- Support legs
- Main gas pipe
- Flow and return headers (reversible for either left or right orientation)
- Low loss header
- Boiler connecting pipe work
- Full insulation.

The picture below shows each boiler fitted with a pump group which is available separately. For full technical details on each individual back-to-back (TR) or in-line (TL) GB162 cascade kit please see pages 32-37 at the back of this brochure.



No minimum flow rate required

GB162 boilers do not require a minimum flow rate, and this makes the design and specification of a heating system much simpler, removing the need for additional components and reducing installation time. Savings are also made on the electrical running costs. Modulating fans and recommended Worcester pump groups (65/80/100kW) or integral pump on the 45kW, mean that output is precisely matched to the actual requirement of the user at all times, and as such, electricity consumption can fall by up to 40% in some cases.

Using Worcester accessories in the system will help to ensure that the best solution is provided for optimum energy savings, and reduced installation costs.

Cascade – quick and simple to install

The innovative, low weight cascade design used with the GB162 series means that it is particularly installation-friendly, saving fitting time and costs. The cascade boiler connection kit is supplied with all the necessary fittings and accessories all of which can easily be transported to the boiler room. The installer builds the framework and constructs the pipe system in a few simple steps as shown below. After installation everything fits together perfectly, pipe work is tidy, and the boilers are connected to the main heating system, without the need to install additional hydraulic equipment.



1st step:
The sturdy floor standing cascade framework is bolted together.



2nd step:
Low-loss header, flow, return and gas pipes are fitted.



3rd step:
Individual GB162 boilers are mounted securely on the framework.



4th step:
Pump groups (additional accessory) and valves are connected to boilers and flow and return pipe work attached to the headers.



5th step:
Custom-fit insulation is added to pipe work and fitted around each pump group to minimise heat loss.

Cascade features at a glance:

- Assemble freestanding, fixed to the floor
- Boilers hung directly on the frame
- Uses the GB162 pump group
- Complete unit with high quality, custom fit robust insulation
- Integrated gas pipe, flow and return with low loss header
- Up to 8 boilers with one control
- The cascade will modulate from lowest output of smallest boiler in cascade up to total load of all boilers, e.g. 20kW to 800kW for 8 x 100kW boilers and 10kW to 360kW for 8 x 45kW boilers
- Neutral flow conditions due to use of low loss header
- Best use of condensing technology due to low return temperature.

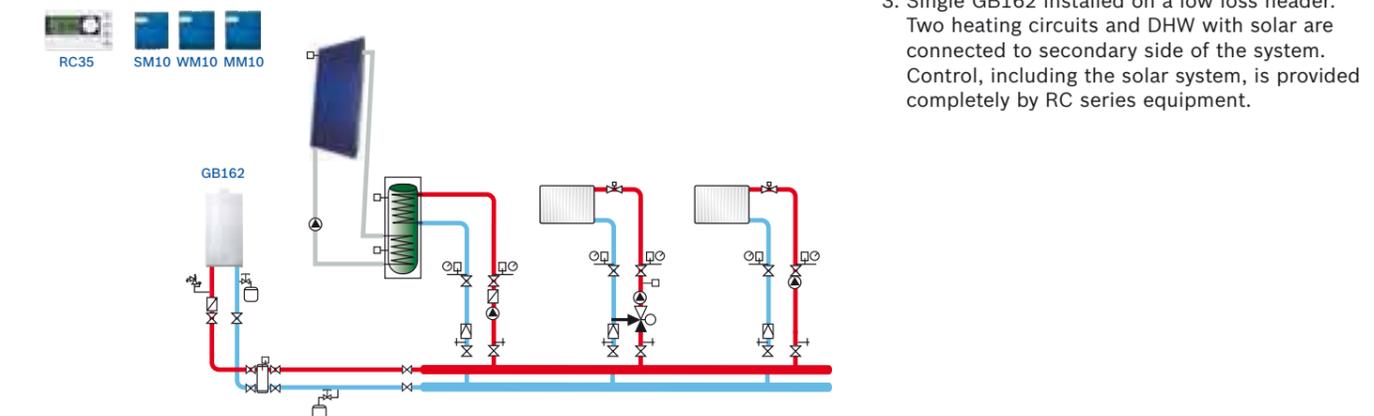
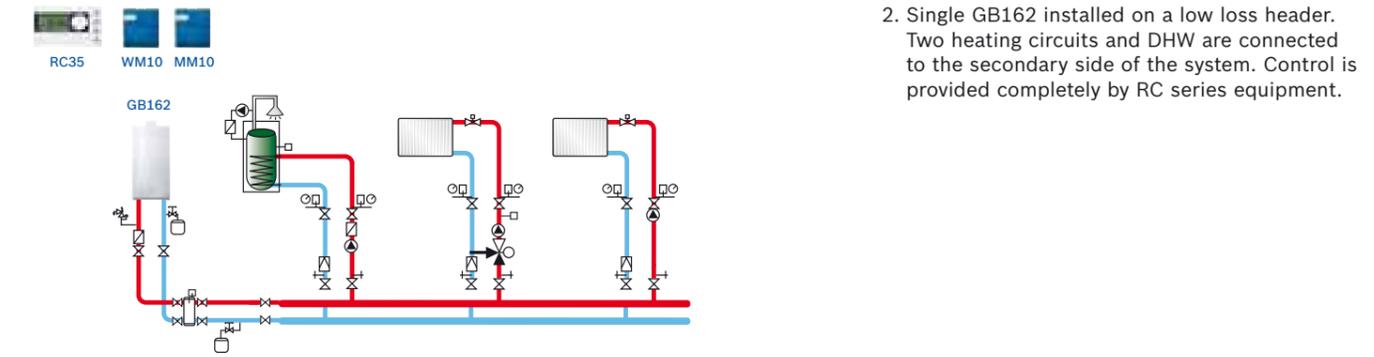
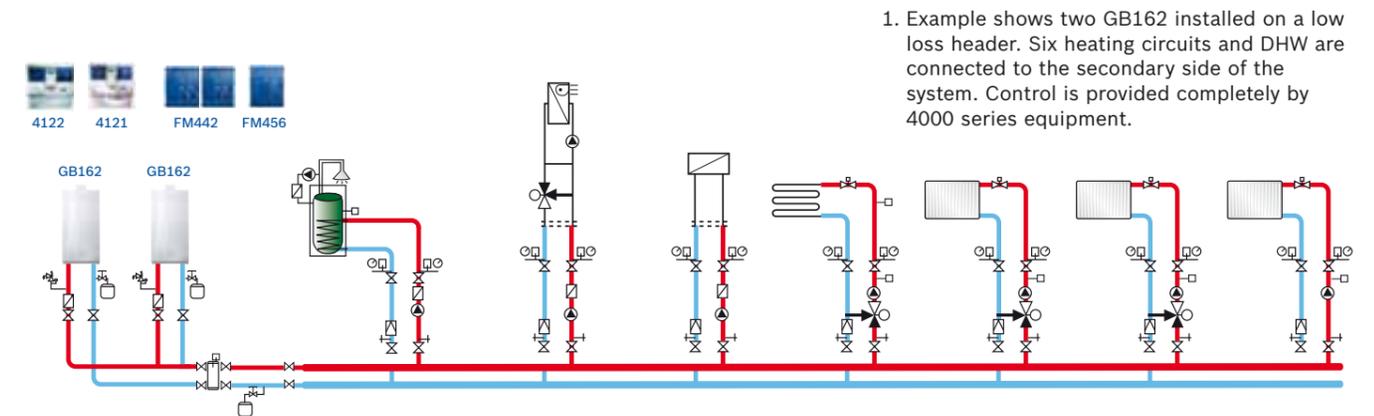
Flexible system solutions

GB162 boilers have been developed to allow specifiers and heating engineers greater flexibility to design heating systems, providing reliability and efficient performance whatever the scale of the project.

In addition, Worcester also offers a comprehensive on-site technical service where our system specialists can visit and discuss the best heating system solutions for your particular needs.

The following hydraulic schematics show just some of the many options that are available for individual and cascade installations. For support on hydraulics and controls please contact our technical support team on 0844 693 3028.

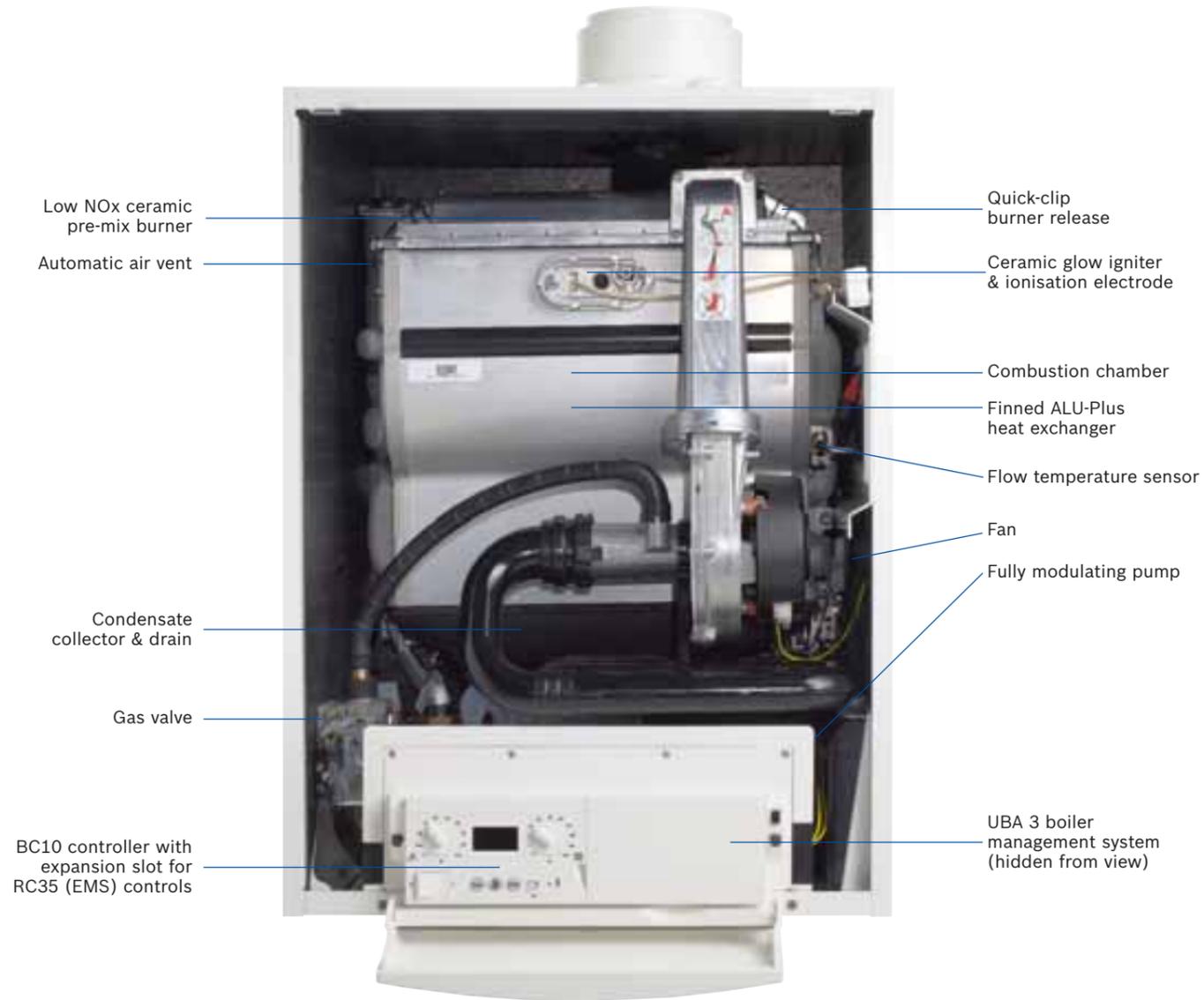
In all instances the pump group is not shown.



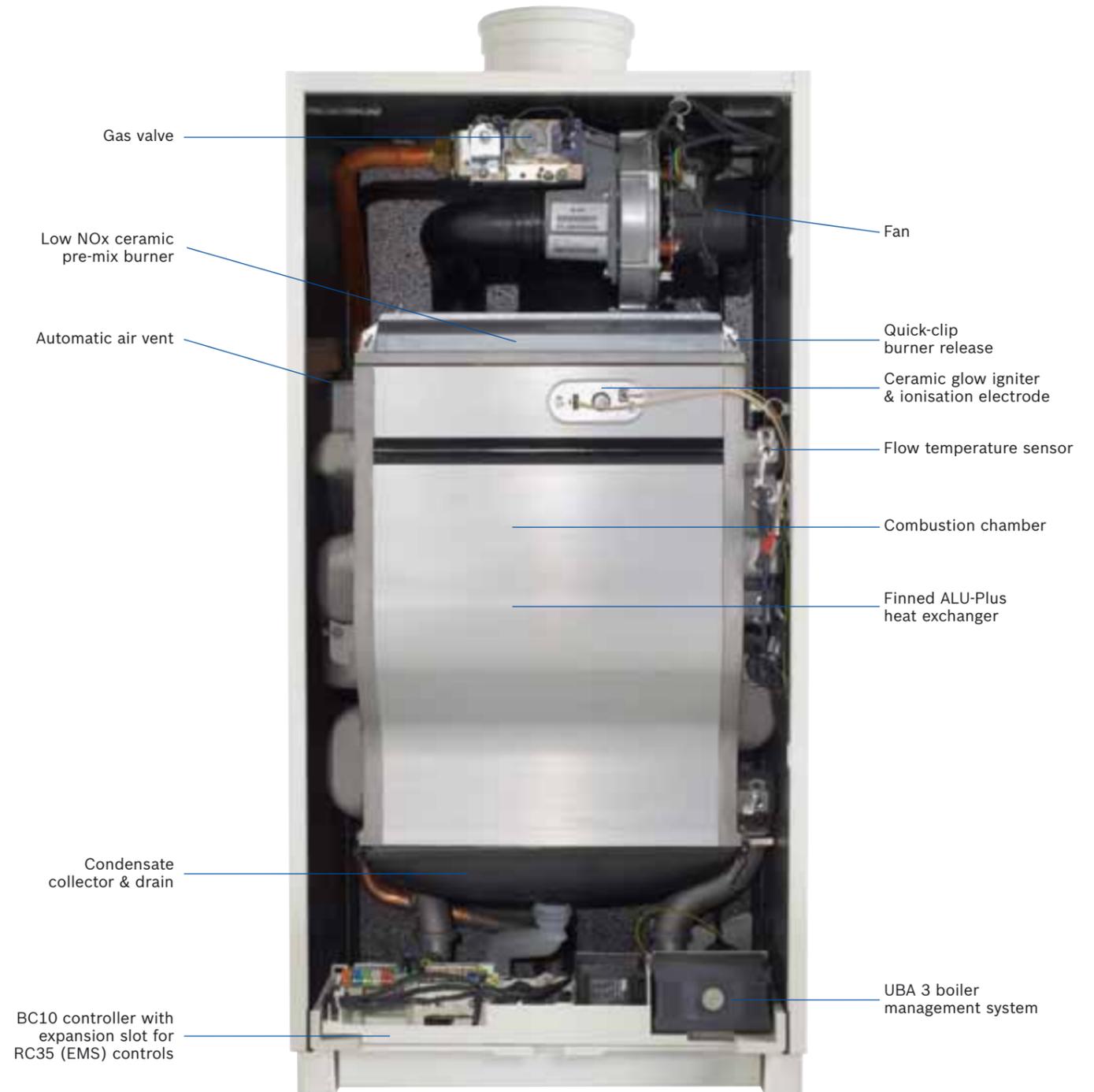
Inside story

The GB162 has been designed to provide engineers with quick and easy access to the main heating components from the front of the boiler. The heat exchanger and burner plate is secured with quick-clip fastenings so can be removed for servicing without the need for special tools.

GB162 – 45kW model



GB162 – 65, 80 & 100kW models



Worcester GB162 technical data

Energy management controls



Boiler	GB162 45kW	GB162 65kW	GB162 80kW	GB162 100kW
Height without pump group	695mm	980mm	980mm	980mm
H x W x D (with pump group)	695x520x465mm	1310x520x465mm	1310x520x465mm	1310x520x465mm
Dry weight (without a pump group)	48kg	70kg	70kg	70kg
Boiler flow and return connections	R1"	G1 1/2" union nut free female thread enclosed	G1 1/2" union nut free female thread enclosed	G1 1/2" union nut free female thread enclosed
Concentric room sealed flue	80/125mm dia.	80/125mm dia. or 100mm/150mm dia.	80/125mm dia. or 100mm/150mm dia.	80/125mm dia. or 100mm/150mm dia.
Gas connection	R1/2"	R1"	R1"	R1"
Condensate drain	Ø 30mm	Ø 24mm	Ø 24mm	Ø 24mm
Nominal heat output at 80/60°C	9.6 - 42.5kW	14.2 - 60.5kW	18.9 - 80.0kW	19.0 - 94.5kW
Nominal heat output at 50/30°C	10.4 - 44.9kW	15.6 - 65.0kW	20.8 - 84.5kW	20.5 - 99.5kW
Safety valve connection	15mm	R1"	R1"	R1"
Rated heat input	9.7 - 43.5kW	14.5 - 62.0kW	19.3 - 82.0kW	19.3 - 96.5kW
Net efficiency (NCV)	97.4%	108%	110%	110%
Seasonal efficiency (as L2B)	97.1%	95.5%	95.7%	96.1%
SEDBUK	A	A	N/A	N/A
Standby heat loss	0.11%	0.05%	0.05%	0.06%
Maximum working pressure	3bar	4bar	4bar	4bar
Flow temperature	30 - 90°C	30 - 90°C	30 - 90°C	30 - 90°C
Water content	3.5l	5l	5l	5l
Pressure drop rate	230mbar	150mbar	210mbar	320mbar
Noise level at 1m, full load	40dB(A)	46dB(A)	47dB(A)	52dB(A)
NOx rating at 0% oxygen, dry mg/kWh	39	28	38	38
Maximum flue length 80/125mm	11.0m	7.7m	N/A	N/A
Maximum flue length 100/150mm	N/A	20m*	18m	18m
Flue gas mass flow rate, full load	20.3g/s	27.2g/s	35.3g/s	44.9g/s
Flue gas temperature 80/60°C, full load	69°C	64°C	67°C	76°C
Flue gas temperature 80/60°C, part load	58°C	57°C	61°C	57°C
Flue gas temperature 50/30°C, full load	49°C	43°C	48°C	51°C
Flue gas temperature 50/30°C, part load	36°C	33°C	34°C	34°C
Free feed pressure of fan	140Pa	120Pa	195Pa	220Pa
CO2 content at full load, natural gas G20	9.3%	9.4%	9.3%	9.4%
Condensate water rate natural gas G20, 50/30°C	4.8l/h	6.9l/h	9.0l/h	10.8l/h
pH value of condensate water	approx. 4.1	approx. 4.1	approx. 4.1	approx. 4.1
Gas pressure	17 - 24mbar	17 - 24mbar	17 - 24mbar	17 - 24mbar
Gas rating at 15°C 1013mbar	4.50m³/h	6.96m³/h	8.95m³/h	10.53m³/h
Current rating	230 VAC, 50 Hz, 10A	230 VAC, 50 Hz, 10A	230 VAC, 50 Hz, 10A	230 VAC, 50 Hz, 10A
Electrical supply, number of phases	1	1	1	1
Maximum fuse rating	10	10	10	10
Electrical power consumption, full load	145W	99W*	97W*	147W*
Electrical power consumption, part load	53W	21W*	30W*	28W*
Electrical ingress protection	IPX4D	IPX4D	IPX4D	IPX4D

*100/150 adaptor required. *Electrical consumption does not include pump group.

It is vitally important when fitting any energy efficient heating equipment that controls are not overlooked. The controls are designed to maximise system efficiency and allow the heating engineer quick and easy access to all functions of the boiler and heating system.

EMS (Energy Management System)

EMS is a state of the art intelligent control system that uses a standard operating structure to ensure smooth and continuous communication between the automatic firing of the boiler, and the heating system controls. This improves overall efficiency and allows the heating engineer a large degree of flexibility and control over the heating system, so that individual circuits and zones can be more effectively managed. EMS is equipped as standard in the GB162 and is fully compatible with the high performance range of 4121 and 4122 modular controls as well as the RC35 digital programmer.



BC10

Supplied with the GB162, it is a controls platform that has a simple, easy to navigate menu structure that allows quick access to all of the major boiler functions including boiler test functions, DHW and heating temperature and status display (for one boiler only).



UBA3

The boiler is also equipped with a UBA3 digital, automatic burner control which monitors and controls all the electronic components of the appliance to ensure the most efficient combustion.



RC25

The RC25 can be used in conjunction with the RC35 as a remote room or zone control. It allows precise setting and programming of room temperature as well as acting as a thermostat. The unit is very simple to use and removes the need to visit the boiler to change temperature.



RC35

The RC35 is the latest generation of digital controls technology for single boilers. It offers comprehensive functionality for single boiler systems operating with EMS, and takes full advantage of the control modules that can be added to the GB162. The RC35 can be integrated into the boiler next to the BC10, has a detailed text display and uses a intuitive push-and-turn system to navigate users through the various functions and menus. The RC35 is also compatible with the RC25 room controllers* and enables separate heating circuits to be fine tuned to ensure optimum fuel efficiency, straightforward servicing and rapid fault diagnosis.

Control modules for use with RC35 and Building Management Systems (BMS)

RC35 control modules

The RC35 is compatible with several individual control modules that are easily wired into the connections on the tray underneath the GB162. These modules extend the functionality of the RC35 and GB162 considerably, providing control for low loss headers, solar and additional mixed heating circuits. All wiring has colour coded plugs for quick installation into the main control unit.

WM10 low loss header module

For use with GB162 boilers and heating systems with a low loss header, the WM10 controls one unmixed heating circuit. The WM10 is always necessary when adding modules.

The flow temperature is controlled by weather compensation heating control in conjunction with the RC35 either mounted in the boiler or as a room controller. The WM10 comes supplied with a low loss header temperature sensor and a wall mounted bracket. It is only possible to use one WM10 module per control system.

MM10 mixed heating circuit module

For heating systems with additional mixed or unmixed heating circuits. This module controls a rotary mixing valve and has a sensor to control flow temperature when used in conjunction with an RC35 controller. It is also possible to connect to an RC25 remote control for room temperature compensation, contact technical support for further information. Up to 3 modules can be used per heating system.

SM10 solar circuit module

For use with GB162 boilers with RC35 controller. The SM10 fully controls a solar thermal system for DHW preparation. This module is linked into the boiler control and automatically supervises the DHW backup by the boiler in relation to the available solar energy. When there is heat available from the solar collectors the controller will prevent the boiler from firing to optimise the use of free solar energy.

Single boiler or cascade installations with BMS (Building or Energy Management System)

The EM10 module is used in GB162 boilers and interfaces with an existing BMS. It can create a fault report, 230V signal or a volt free fault signal. It has a 0-10V contact for signals from the BMS to control boiler flow temperature. Diagram Fig. 1 shows control options compatible with BMS.

MCM10 cascade sequencer

The MCM10 simplifies the optimum running of a cascade system when interfacing with an existing BMS. The MCM10 sequences the lead boiler to eliminate excessive wear in any one unit but it also interprets the 0-10V input signal from the BMS to modulate the heat output of the cascade. This is all achieved without the need for programming or complex set up. It is a true 'Plug & Play' control. An individual MCM10 can control up to 4 boilers and up to 16 boilers when 4 units are linked together.

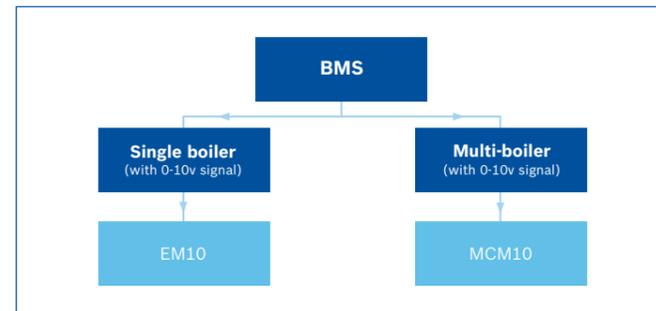
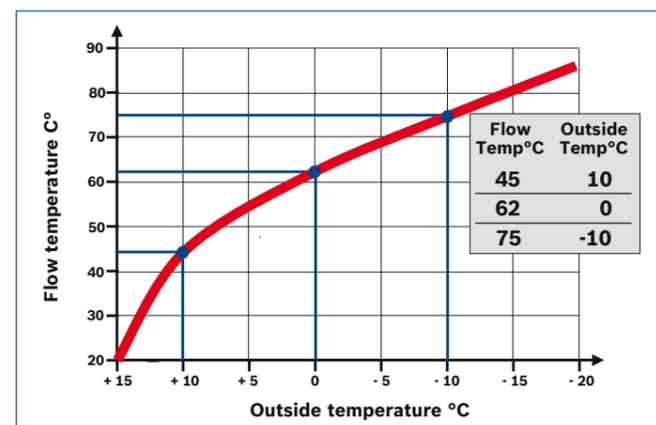


Fig. 1. Compatible BMS controls

The benefits of weather compensation

The RC35 controller can change the required temperature for different heating circuits according to the outside temperature, which is measured using a small external sensor. With mixed heating circuits this means that each individual circuit has its own characteristics and the boiler will supply only the heat needed for certain parts of the system. This is particularly effective in Spring and Autumn as temperatures for the heating circuits can be reduced significantly to save fuel and get highest efficiency from the condensing process.



The heating curve on the graph above can be modified at any time using the RC35 controller to provide maximum comfort for the user.

4000 series boiler management

Cascade/multi boiler control options

4000 series modular, digital boiler control units secure the safe function of the boilers and allow for the optimum control of the heating system to maximise efficiency. The 4121 comes supplied with a MEC2 digital programmer with clear text display which provides external weather compensated heating control, perfect for maximising the condensing efficiency of the boilers. The 4122 control unit can house the FM 456/457 cascade control module which controls the sequencing of the boilers within the cascade. All additional control modules as listed on the following page, can also be integrated with the 4122 system.



4121 Control Unit

The 4121 can control two heating (one mixed/one unmixed) circuits and DHW and has space to allow the connection of an additional module.



4122 Control Unit (with/without MEC2)

This can be used as an extension to the 4121 or as a stand alone controller and has space to allow the connection of two additional modules.



MEC2

The MEC2 digital programmer is supplied with the 4121/4122 controls. Its simple 'press and turn' operation makes setting and changing heating options easy. A plain text display allows input of system operations and communicates boiler diagnostics. They can be fitted directly to the main control unit or wired to the boiler from the living or working space (as a room thermostat).



BFU Room Thermostat

The BFU is a remote control which allows the temperature to be adjusted from the living or working space. It is supplied with a room temperature sensor, and works in conjunction with 4121/FM442.

Installing the Worcester GB162 series

The GB162 series is the perfect replacement boiler for many installations where old and inefficient heating systems have come to the end of their life. By investing in condensing technology with a fully compatible controls system, fuel savings can be achieved from day one, and the higher fuel prices go, the bigger your saving will be.

With its compact dimensions, relative light weight and modular design the GB162 is an excellent choice where access to the boiler or plant room is restricted, or where floor space is limited. A smaller physical footprint for the heating system will increase planning flexibility for the specifier, speed up the installation process, improve access for maintenance, and reduce the need for large boiler rooms.



FM441 Heating and DHW Control Module

For use in 4000 series controls this module controls one mixed heating circuit (with circulation pump and mixing valve) and one DHW circuit (with cylinder load and circulation pump). Includes manual controls to switch circuits between on/off/automatic. It comes supplied with a 9mm DHW temperature sensor. All wiring has colour coded plugs for quick installation into the main control unit (BFU as accessory). (Not for use with 4121).



FM442 Heating Circuit Control Module

For use in 4000 series controls this module controls up to two mixed heating circuits (with circulation pump and mixing valve). Includes manual controls to switch circuits between on/off/automatic. It comes supplied with one FV/FZ temperature sensor.

All wiring has colour coded plugs for quick installation into the main control unit (BFU up to 2x as accessory). An additional FV/FZ sensor is required if using with two mixed circuits.



FM443 Solar Module

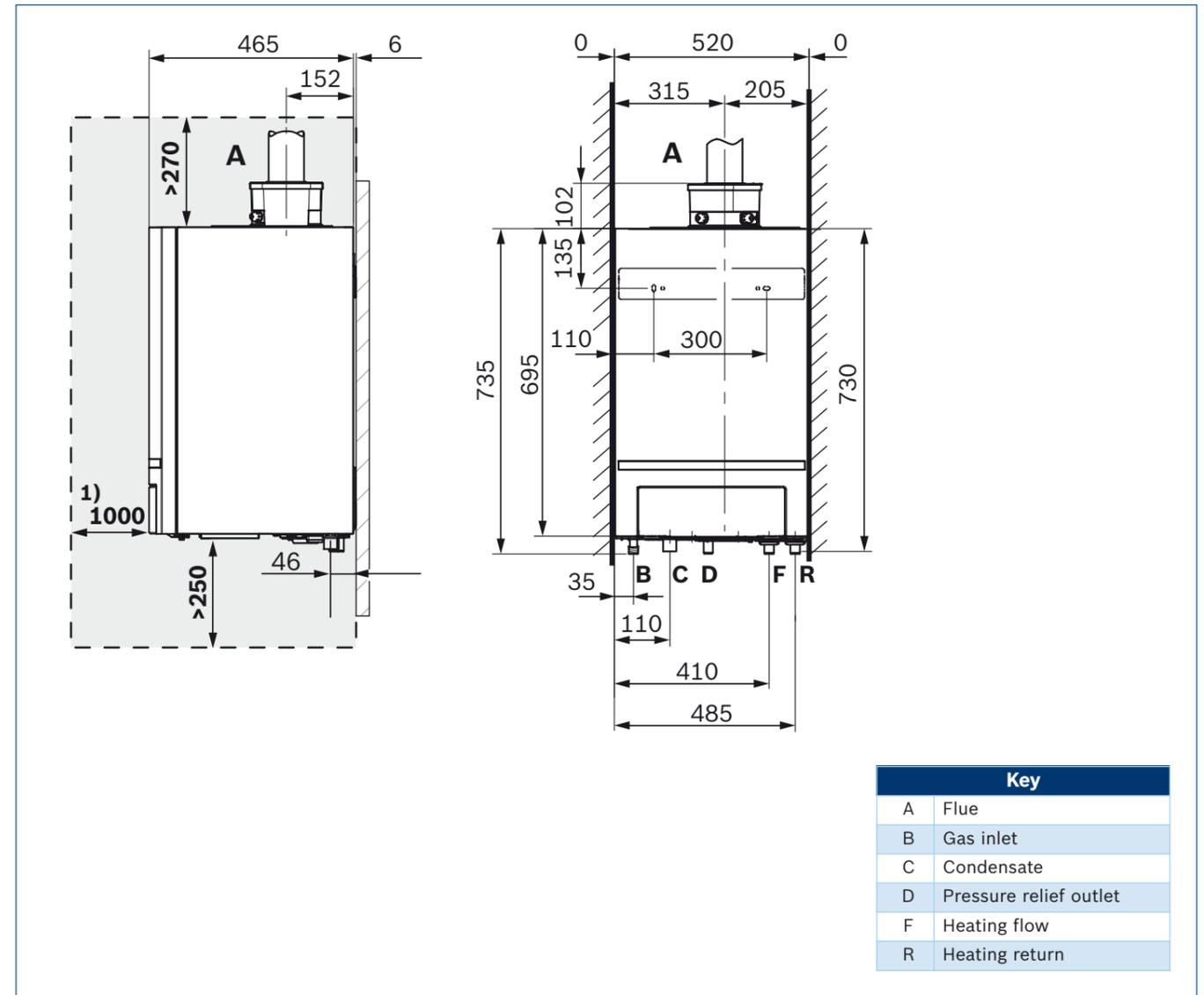
The intelligent FM443 solar module allows optimum solar and heating functionality. With this fully integrated Energy Management System the boiler recognises the solar output and delays firing the boiler for as long as possible by continuously monitoring changes in heat demand. This not only reduces the wear and tear on the heating system, by reducing burner start ups, by up to 24%, but can also provide an additional 10% of energy savings.



FM456 and FM457 Cascade Control Module

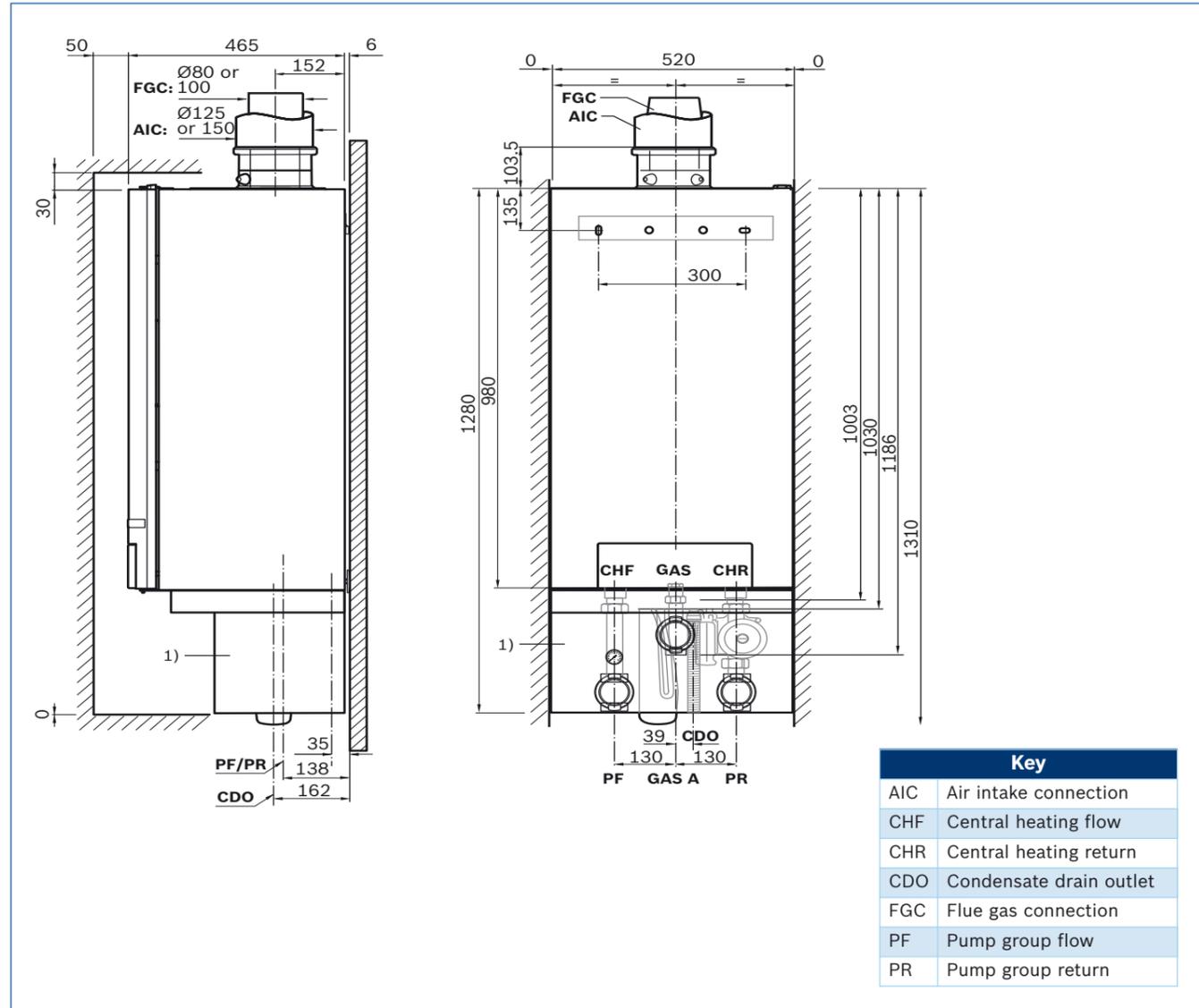
The FM456 and FM457 can control the modulation and sequencing strategy from 2 to 4 boilers, and can control one additional unmixed heating circuit. A 0-10V input with provision for a common alarm signal, for use with the BMS control.

GB162 - 45kW



Installation requirements

GB162 – 65, 80 & 100kW



Clearances

The minimum clearances shown below should be allowed for installation and servicing.

	Permanent clearances			
	GB162 45kW	GB162 65kW	GB162 80kW	GB162 100kW
In front	50mm	50mm	50mm	50mm
Below	0mm	0mm*	0mm*	0mm*
Right side	0mm	0mm	0mm	0mm
Left side	0mm	0mm	0mm	0mm
Above	30mm	30mm	30mm	30mm

*250mm with pump group

	Service clearances			
	GB162 45kW	GB162 65kW	GB162 80kW	GB162 100kW
In front	1,000mm	550mm	550mm	550mm
Below	250mm	350mm	350mm	350mm
Right side	0mm	0mm	0mm	0mm
Left side	0mm	0mm	0mm	0mm
Above	270mm	40mm	40mm	40mm

These pages provide an overview of the main installation and system requirements for the GB162. The full installation instructions supplied with the boiler must be adhered to before any work on the heating system takes place.

Worcester technical support teams are available to offer system design advice or if necessary make site visits. For more details call 0844 693 3028.

Frost protection

The boiler has integrated frost protection. The frost protection switches the boiler on at a central heating flow temperature of 7°C and switches it off at a central heating flow temperature of 15°C.

Designated use

The boiler may only be used to heat water for sealed heating systems up to 4 bar (65/80/100kW) or up to 3 bar (45kW). For greater system pressures or open vented systems separate the boiler from the heating system with a plate heat exchanger.

Quality of the heating system water

Thoroughly flush the system before filling it. Use only untreated tap water when filling the system. The use of dirty water will lead to build-ups of sludge and corrosion, which can in turn result in malfunctioning of the boiler and damage to the heat exchanger.

DO NOT treat the water with products such as pH-adjusting substances (chemical additives), antifreeze or water softeners. Sentinel X100 can be used to achieve the desired water quality. The concentration of Sentinel should be at least 1% of the volume of water in the system.

The pH of the heating system water MUST be between 7 and 8.5. If this is not the case, please contact Worcester Customer Service before proceeding.

Wiring diagram

A detailed wiring diagram showing how to wire the boiler and controls can be found on page 22. Use either dedicated controls which maximise efficiency or control the GB162 with an existing 0 to 10V BMS signal.

Quality of the pipe work

When using plastic pipe work in the heating system, e.g. for under floor heating, it has to be oxygen-tight according to relevant UK-standards. If the plastic pipes do not comply with these standards, the system parts must be separated using heat exchangers.

Maintenance schedule

The activities to be included in an annual inspection and maintenance contract can be found in the service section of the installation manual. If inspection reveals a situation that makes maintenance activities necessary, these activities have to be carried out.

Connection of gas and water

GB162 – 65/80/100kW

These models do not contain a factory installed circulation pump. We recommend that the boiler be installed together with a GB162 accessory pump group. This will ensure that the volumetric flow through the boiler is sufficient to handle the maximum boiler capacity. The pump group also makes for an easier and quicker install.

If the boiler is being wall mounted rather than frame mounted, a connection set (Part no. 558 4552) is required in order to connect the flow and return.

Pump group part numbers	
Modulating pump group	7 114 070
3 speed pump group	7 114 080
Connection set (for using pump group without cascade set)	558 4552

GB162 – 45kW

The boiler incorporates a modulating circulation pump.

When connecting the boiler as part of a cascade we recommend using the cascade pipe kit (7 746 900 898) which includes isolating valves.

For a single boiler installation or installations without a cascade frame set, an accessory pack is available containing gas and heating flow and return isolation valves. An under boiler cover (7 746 900 350) is available to complete a neat installation.

LPG conversion

The boiler can be converted to LPG use with the appropriate kit.

LPG conversion kit part numbers	
45kW	7 746 901 425
65kW	7 746 900 509
80/100kW	8 718 601 980

Pump group options (65/80/100kW only)

We recommend installing the Worcester GB162 with either the modulating or 3 speed pump group accessory. The high quality pump groups ensure quick, easy and reliable connection of the boiler to main flow, return and gas headers. The Worcester pump groups are correctly sized to ensure that the flow rate through the GB162 heat cell never exceeds the limit of 4300l/h @ ΔT 20K. Our pump group options will also help to prolong the life of the boiler by minimising wear and tear on the appliance and its components. As a result, system efficiency is improved and running costs and installation time are reduced. When using our pump groups a low loss header should also be used to simplify hydraulic design of the heating circuit.

3 speed pump

The 3 speed pump group for each GB162 boiler is supplied with a Grundfos pump, 1" gas pipe with isolating valve, flow and return isolating valves, pressure gauge, pressure relief valve, drain valve, non-return valve, connection for the expansion vessel (expansion vessel not supplied) condense trap and an insulated cover. Thermometers are not supplied with the 3-speed pump.

Modulating pump

The modulating pump group includes flow and return connections with valves and thermometers, a pressure relief valve, a gas valve, a modulating pump, condense trap and custom-fit insulated casing.

Both pumps can be directly mounted under the boiler to feed a low loss header or in the case of a single 65kW boiler supply the system directly. Due to different flow resistances inside a heating system, the modulating pump can decrease or increase its pressure. This lowers power consumption and helps to reduce noise.



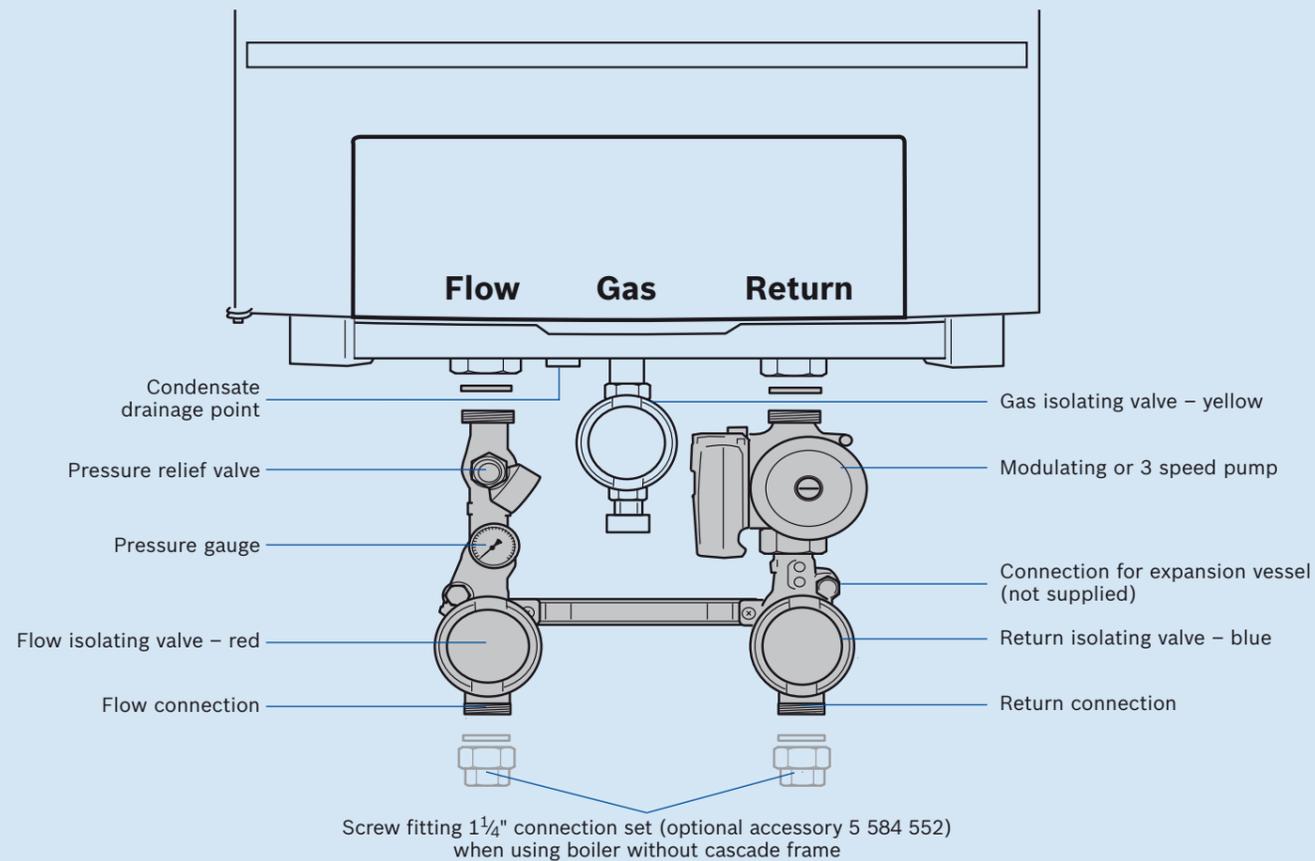
Positioning and termination of the condensate drain pipe

The condensate pipe should be routed internally to prevent freezing. If an internal routing of the condensate pipe work is not possible then to reduce the prospect of freezing we would advise the use of a trace heating device or an auxiliary syphon.

The condensate pipe should run and connect to the internal sewage pipe in the building or waste pipe. Alternatively, the condensate can be discharged into the rainwater system if connected to a foul water draining system.

All connecting drainage pipe work should generally have a fall of at least 2.5° to the horizontal, or approximately 50mm per metre of pipe run. If this can not be achieved, consider the use of a condensate pump. It should be noted that the connection of a condensate pipe to a drain may be subject to local building control.

GB162 pump group at a glance

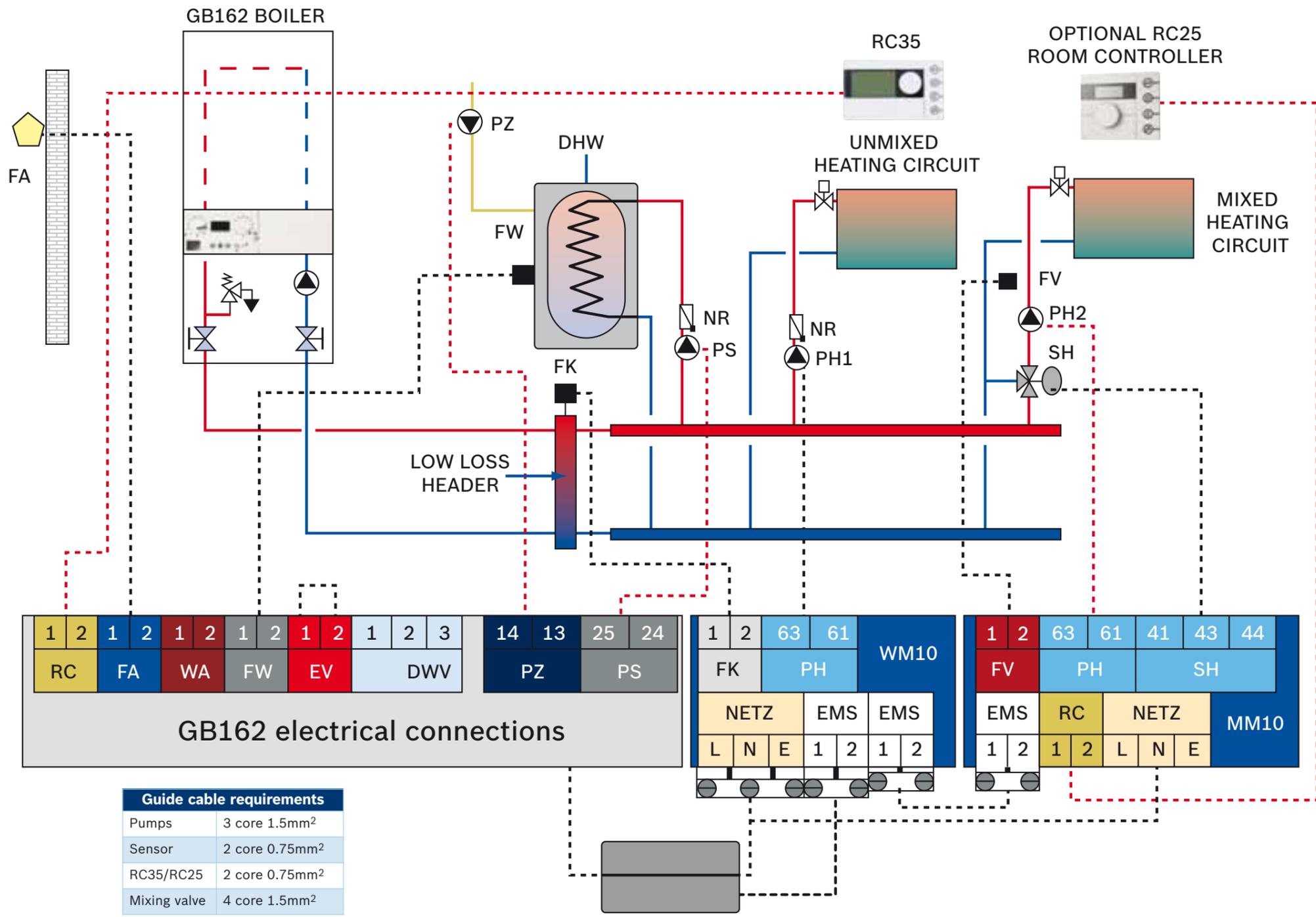


Wiring diagram

The schematic shows a standard GB162 hydraulic, complete with low loss header. Connecting the sophisticated energy saving controls to the GB162 is simplified by the use of colour coded plugs.

The RC35 programmer, outdoor weather sensor and domestic hot water tank sensor are all wired back to their respective plugs which are then simply clicked into the coded connections on the GB162. For systems with an additional unmixed or mixed heating circuit, the MM10 with flow temperature sensor can be used to control a pump and mixing valve. As shown in the schematic, it is possible to connect an RC25 to this module to provide room temperature influence to the weather compensating heating curve. The WM10 module for the low loss header and unmixed heating circuit pump is connected in the boiler tray via the 'energy management system' EMS bus.

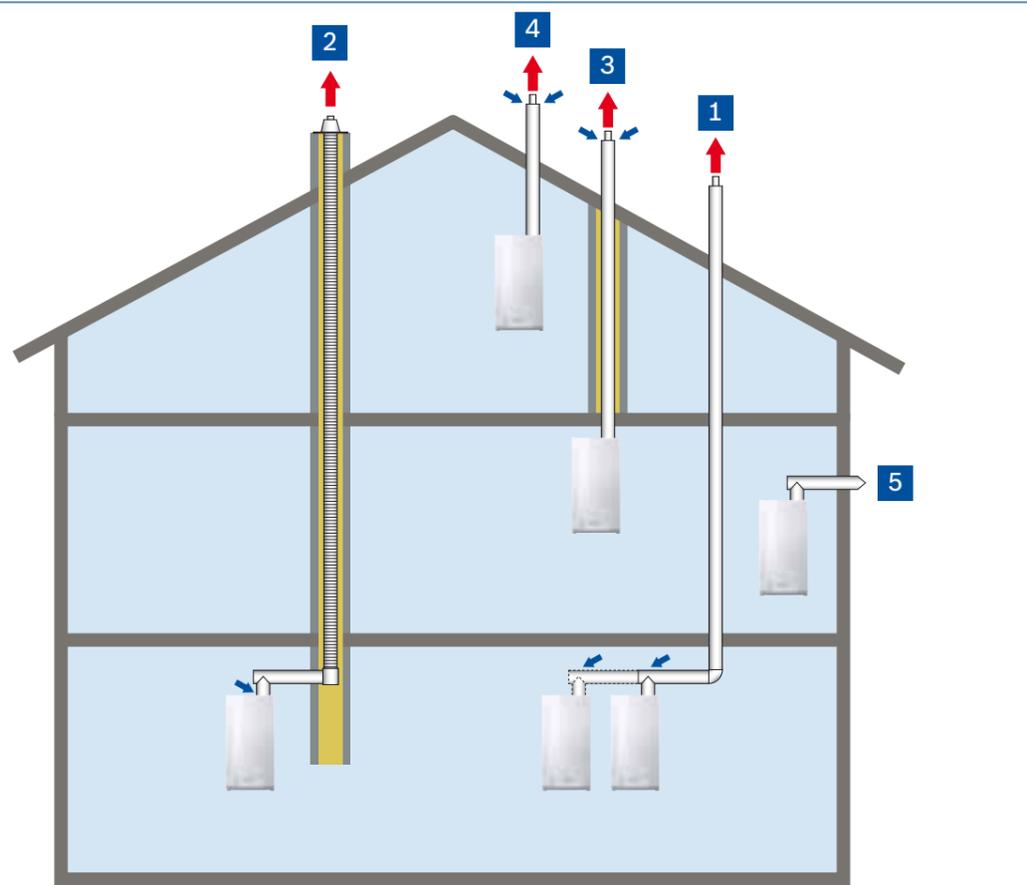
Key	
RC	Room controller RC and EMS bus
FA	Outdoor temperature sensor
WA	On/off temperature controller, potential free
FW	DHW sensor
EV	External safety contact, e.g. external safety chain
DWV	External three-way valve
PZ	DHW circulation pump 230 VAC max. 250W
PS	DHW pump 230VAC max. 250W
FK	Low loss header temperature sensor
PH	Heating pump 230 VAC max. 250W
FV	Flow temperature sensor
SH	Mixing valve
NETZ	Mains connection 230 VAC 50Hz, max. permissible: 10A
EMS	Energy Management System



Worcester GB162 boiler series fluing options

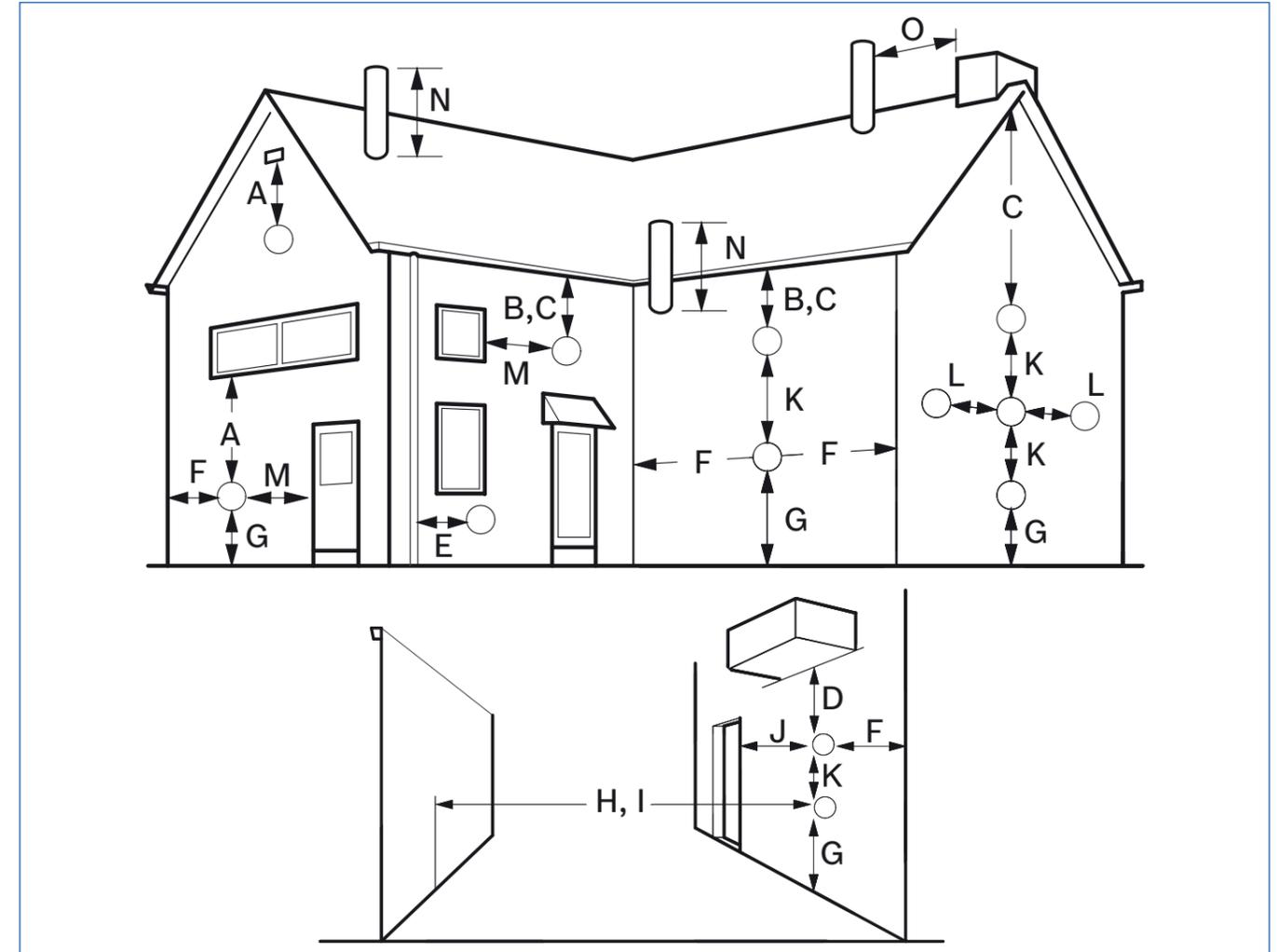
The flexibility of the GB162 series also extends to the fluing options allowing the specifier to site the boiler in a number of different positions. The GB162 is suitable for either room sealed or open flues. To ensure maximum reliability, quality and safety all Worcester flue gas systems are rigorously tested to the latest industry standards.

The diagram opposite shows flue systems that can be supplied for GB162 installations. Full installation instructions and relevant building regulations must be adhered to prior to installation of any flue system. Additional fluing solutions are possible and should be discussed with your fluing specialist.



Key	
Open flue	
1	Cascade, B23
2	Flexi flue, B23
Room sealed	
3	C33
4	C33
5	C33

Horizontal and vertical flue terminal positioning



Note – boilers less than 70kW

- The flue must be installed in accordance with the recommendations of IGE UP10.
- Plumbing will 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. Please consult the instructions provided with the flue terminal kits prior to installation.
- 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 above, for domestic situations in accordance with BS 5440.

Key to illustration

Balanced flue terminal position		
Terminal position		Minimum spacing
A	Directly below, above or alongside an opening window, air vent or other ventilation opening	300mm
B	Below guttering, drain pipes or soil pipes	200mm
C	Below eaves	200mm
D	Below balconies or a car port roof.*	200mm
E	From vertical drain pipes or soil pipes	150mm
F	From internal or external corners	300mm
G	Above adjacent ground, roof or balcony level	300mm
H	From a surface facing the terminal	600mm
I	From a terminal facing a terminal	1,200mm
J	From an opening in a car port (e.g. door or window) into dwelling.*	1,200mm
K	Vertically from a terminal on the same wall	1,500mm
L	Horizontally from a terminal on the wall	300mm
M	Adjacent to opening	300mm
N	Above intersection with roof	300mm
O	From a vertical structure on the roof	500mm

*Installations in car ports are not recommended

Worcester GB162 boiler series horizontal room sealed fluing options

Horizontal room sealed flue

Flue diameter	80/125mm	100/150mm
GB162 45kW		
Maximum flue length	4,000mm*	N/A
GB162 65kW		
Maximum flue length	7,700mm	20,000mm
GB162 80kW		
Maximum flue length	N/A	18,000mm
GB162 100kW		
Maximum flue length	N/A	18,000mm

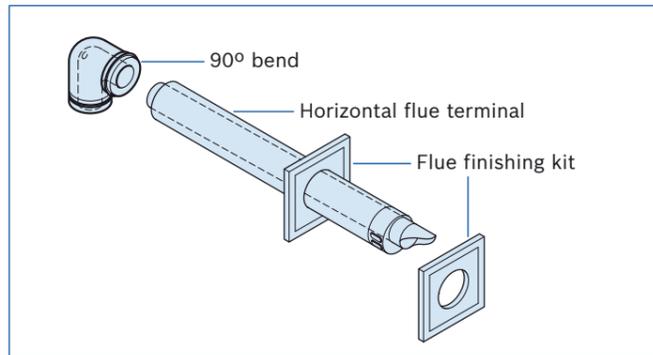
*No additional bends are permitted on horizontal flues for GB162 45kW

80/125mm horizontal room sealed flue accessories

Components	Part No.	Description
	7 716 191 116	80/125mm dia. horizontal flue kit
	7 716 191 118	80/125mm dia. 1m flue extension (cutable)
	7 716 191 117	80/125mm dia. 0.5m flue extension (cutable)
	7 716 191 119	80/125mm dia. 90° bend
	7 716 191 120	80/125mm dia. 45° bends (pair)
	T0000 82 131	80/125mm dia. flue support bracket (3 pack)

100/150mm horizontal room sealed flue accessories

Components	Part No.	Description
	7 716 191 094	100/150mm dia. horizontal flue kit
	7 716 191 096	100/150mm dia. 1m flue extension (cutable)
	7 716 191 097	100/150mm dia. 1m flue extension (non-cuttable)
	7 716 191 095	100/150mm dia. 0.5m flue extension (cutable)
	7 716 191 098	100/150mm dia. 90° bend
	7 716 191 099	100/150mm dia. 45° bends (pair)
	8 720 011 6	100/150mm dia. adaptor (GB162 65kW only)
	7 716 191 102	100/150mm dia. flue support bracket (3 pack)
	7 716 191 103	100/150mm dia. clamp with EPDM seal



Standard horizontal flue kit

80/125mm dia. horizontal flue kit

- 1 x 90° bend
- 1 x horizontal flue terminal
- 1 x flue finishing kit

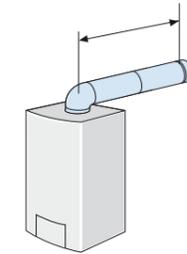
Part No. 7 716 191 116

100/150mm dia. horizontal flue kit

- 1 x 90° bend
- 1 x horizontal flue terminal
- 1 x flue finishing kit

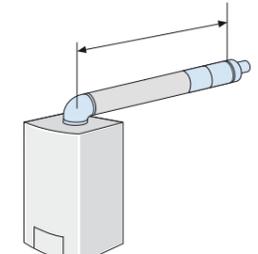
Part No. 7 716 191 094

Standard horizontal flue assembly



Components			
Part No. 125mm	7 716 191 116	N/A	
Part No. 150mm	7 716 191 094	8 720 011 6	
Maximum lengths (mm) & no. of components required			
GB162 45kW			
125mm	540	1	N/A
GB162 65kW			
125mm	540	1	N/A
150mm	550	1	1
GB162 80kW			
150mm	550	1	N/A
GB162 100kW			
150mm	550	1	N/A

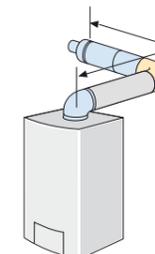
Extension flue horizontal



Components				
Part No. 125mm	7 716 191 116	7 716 191 116	N/A	
Part No. 150mm	7 716 191 094	7 716 191 094	8 720 011 6	
Maximum lengths (mm) & no. of components required				
GB162 45kW				
125mm	4,000	1	up to 4	N/A
GB162 65kW				
125mm	7,700	1	up to 8	N/A
150mm	20,000	1	up to 20	1
GB162 80kW				
150mm	18,000	1	up to 18	N/A
GB162 100kW				
150mm	18,000	1	up to 18	N/A

Note: The short 0.5m flue extension may be used as an alternative to the standard extension.

Extension flue horizontal using a second 90° bend



Components					
Part No. 125mm	7 716 191 116	7 716 191 118	7 716 191 119	N/A	
Part No. 150mm	7 716 191 094	7 716 191 096	7 716 191 098	8 720 011 6	
Maximum lengths (mm) & no. of components required					
GB162 45kW					
125mm	N/A	N/A	N/A	N/A	
GB162 65kW					
125mm	5,800	1	up to 6	1	N/A
150mm	17,900	1	up to 18	1	1
GB162 80kW					
150mm	15,900	1	up to 16	1	N/A
GB162 100kW					
150mm	15,900	1	up to 16	1	N/A

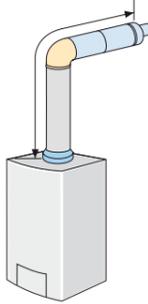
Note: The maximum flue length must be reduced by the following amounts for each bend used.

	GB162 45kW 80/125mm flues*	GB162 65kW 80/125mm flues	GB162 65, 80, 100kW 100/150mm flues
45° bend	N/A	0.9m	1.2m
90° bend	N/A	1.9m	2.1m

*No additional bends are permitted on horizontal GB162 45kW flues

Worcester GB162 boiler series vertical room sealed fluing options

Extension flue horizontal and upwards



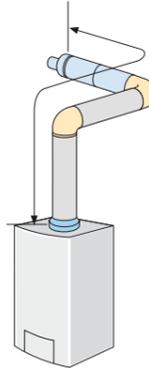
Components				
Part No. 125mm	7 716 191 116	7 716 191 118	7 716 191 119	N/A
Part No. 150mm	7 716 191 094	7 716 191 096	7 716 191 098	8 720 011 6

Maximum lengths (mm) & no. of components required

Boiler Power	Flue Diameter	Maximum Length (mm)	Terminal	Extension	90° Bend	Clamp
GB162 45kW	125mm	4,000	1	up to 4	N/A	N/A
	150mm	7,700	1	up to 8	0*	N/A
GB162 65kW	125mm	7,700	1	up to 8	0*	N/A
	150mm	20,000	1	up to 20	0*	1
GB162 80kW	125mm	7,700	1	up to 8	0*	N/A
	150mm	18,000	1	up to 18	0*	N/A
GB162 100kW	125mm	7,700	1	up to 8	0*	N/A
	150mm	18,000	1	up to 18	0*	N/A

*Horizontal flue kit includes 1 90° bend

Extension flue upwards and horizontal using a second 90° bend



Components				
Part No. 125mm	7 716 191 116	7 716 191 118	7 716 191 119	N/A
Part No. 150mm	7 716 191 094	7 716 191 096	7 716 191 098	8 720 011 6

Maximum lengths (mm) & no. of components required

Boiler Power	Flue Diameter	Maximum Length (mm)	Terminal	Extension	90° Bend	Clamp
GB162 45kW	125mm	N/A	N/A	N/A	N/A	N/A
	150mm	N/A	N/A	N/A	N/A	N/A
GB162 65kW	125mm	5,800	1	up to 6	1*	N/A
	150mm	17,900	1	up to 18	1*	1
GB162 80kW	125mm	5,800	1	up to 6	1*	N/A
	150mm	15,900	1	up to 16	1*	N/A
GB162 100kW	125mm	5,800	1	up to 6	1*	N/A
	150mm	15,900	1	up to 16	1*	N/A

*Horizontal flue kit includes 90° bend, therefore only 1 additional bend needs to be ordered

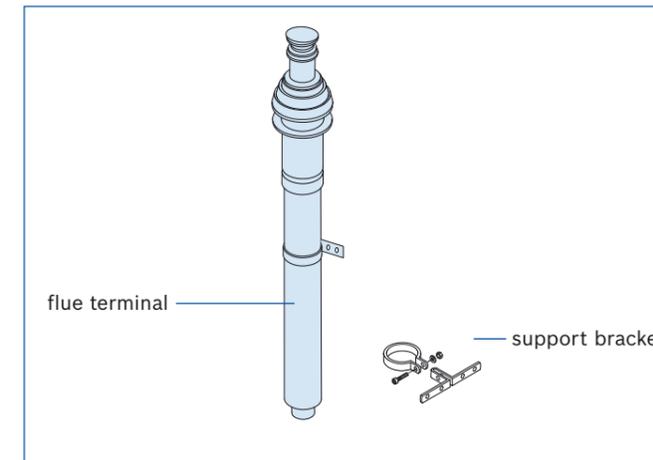
Note: The maximum flue length must be reduced by the following amounts for each bend used.

	GB162 45kW 80/125mm flues*	GB162 65kW 80/125mm flues	GB162 65, 80, 100kW 100/150mm flues
45° bend	N/A	0.9m	1.2m
90° bend	N/A	1.9m	2.1m

*No additional bends are permitted on horizontal GB162 45kW flues

Vertical room sealed flue

Flue diameter	80/125mm	100/150mm
GB162 45kW		
Maximum flue length	11,000mm	N/A
GB162 65kW		
Maximum flue length	7,700mm	20,000mm
GB162 80kW		
Maximum flue length	N/A	18,000mm
GB162 100kW		
Maximum flue length	N/A	18,000mm



Standard vertical flue kit

80/125mm dia. vertical flue kit

- 1 x flue terminal
- 1 x support bracket
- 1 x sealing clamp

Part No. 7 716 191 115

100/150mm dia. vertical flue kit

- 1 x flue terminal
- 1 x support bracket
- 1 x sealing clamp

Part No. 7 716 191 093

80/125mm vertical room sealed flue accessories

Components	Part No.	Description
	7 716 191 115	80/125mm dia. vertical flue kit (1,545mm)
	7 716 191 118	80/125mm dia. 1m flue extension (cutable)
	7 716 191 117	80/125mm dia. 0.5m flue extension (cutable)
	7 716 191 119	80/125mm dia. 90° bend
	7 716 191 120	80/125mm dia. 45° bends (pair)
	T0000 82131	80/125mm dia. flue support bracket (3 pack)
	7 716 191 090	80/125mm dia. flat roof flashing
	7 716 191 091	80/125mm dia. pitched roof flashing

100/150mm vertical room sealed flue accessories

Components	Part No.	Description
	7 716 191 093	100/150mm dia. vertical flue kit
	7 716 191 096	100/150mm dia. 1m flue extension (cutable)
	7 716 191 097	100/150mm dia. 1m flue extension (non-cuttable)
	7 716 191 095	100/150mm dia. 0.5m flue extension (cutable)
	7 716 191 098	100/150mm dia. 90° bend
	7 716 191 099	100/150mm dia. 45° bends (pair)
	8 720 011 6	100/150mm dia. adaptor (GB162 65kW only)
	7 716 191 102	100/150mm dia. flue support bracket (3 pack)
	7 716 191 103	100/150mm dia. clamp with EPDM seal
	7 716 191 100	100/150mm dia. flat roof flashing
	7 716 191 101	100/150mm dia. pitched roof flashing

Minimum height

Components			
Part No. 125mm	7 716 191 115		N/A
Part No. 150mm	7 716 191 093		8 720 011 6

Maximum lengths (mm) & no. of components required

GB162 45kW				
125mm	750	1		N/A

GB162 65kW				
125mm	750	1		N/A
150mm	790	1		1

GB162 80kW				
150mm	790	1		N/A

GB162 100kW				
150mm	790	1		N/A

Vertical balanced flue system maximum height

Components				
Part No. 125mm	7 716 191 115	7 716 191 118		N/A
Part No. 150mm	7 716 191 093	7 716 191 096		8 720 011 6

Maximum lengths (mm) & no. of components required

GB162 45kW				
125mm	11,000	1	up to 11	N/A

GB162 65kW				
125mm	7,700	1	up to 8	N/A
150mm	20,000	1	up to 20	1

GB162 80kW				
150mm	18,000	1	up to 18	N/A

GB162 100kW				
150mm	18,000	1	up to 18	N/A

Vertical balanced flue system with two 45° bends

Components					
Part No. 125mm	7 716 191 115	7 716 191 118	7 716 191 120		N/A
Part No. 150mm	7 716 191 093	7 716 191 096	7 716 191 099		8 720 011 6

Maximum lengths (mm) & no. of components required

GB162 45kW					
125mm	10,000	1	up to 10	2	N/A

GB162 65kW					
125mm	5,900	1	up to 6	2	N/A
150mm	17,600	1	up to 18	2	1

GB162 80kW					
150mm	15,600	1	up to 16	2	N/A

GB162 100kW					
150mm	15,600	1	up to 16	2	N/A

Vertical balanced flue system with two 90° bends

Components					
Part No. 125mm	7 716 191 115	7 716 191 118	7 716 191 119		N/A
Part No. 150mm	7 716 191 093	7 716 191 096	7 716 191 098		8 720 011 6

Maximum lengths (mm) & no. of components required

GB162 45kW					
125mm	8,000	1	up to 8	2	N/A

GB162 65kW					
125mm	3,900	1	up to 4	2	N/A
150mm	15,800	1	up to 16	2	1

GB162 80kW					
150mm	13,800	1	up to 14	2	N/A

GB162 100kW					
150mm	13,800	1	up to 14	2	N/A

Note: The maximum flue length must be reduced by the following amounts for each bend used.

	GB162 45kW 80/125mm flues	GB162 65kW 80/125mm flues	GB162 65, 80, 100kW 100/150mm flues
45° bend	0.5m	0.9m	1.2m
90° bend	1.5m	1.9m	2.1m

Note: The short 0.5m flue extension may be used as an alternative to the standard extension.

Note: The maximum flue length must be reduced by the following amounts for each bend used.

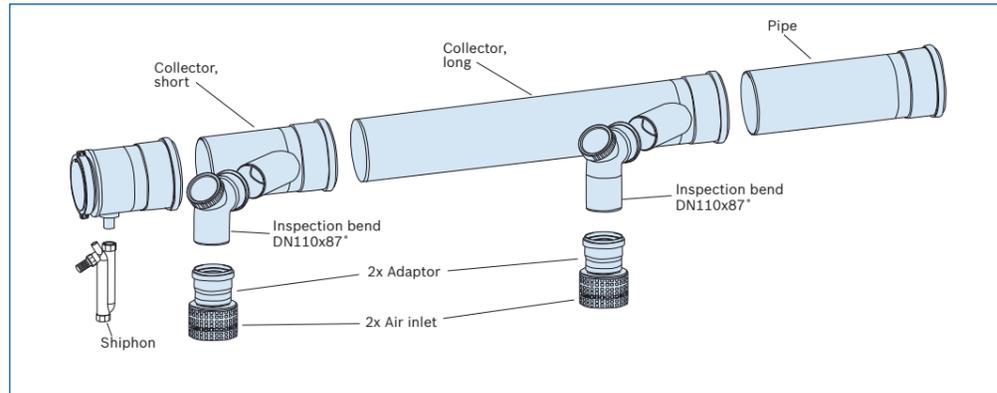
	GB162 45kW 80/125mm flues	GB162 65kW 80/125mm flues	GB162 65, 80, 100kW 100/150mm flues
45° bend	0.5m	0.9m	1.2m
90° bend	1.5m	1.9m	2.1m

Note: The short 0.5m flue extension may be used as an alternative to the standard extension.

Worcester GB162 cascade options – technical information

Basic kit cascade two boilers for GB162

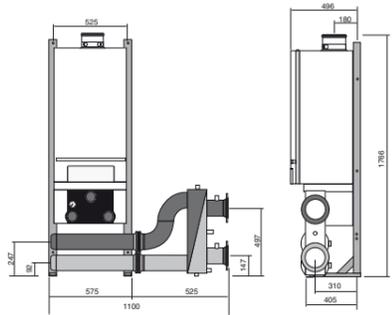
Worcester supplies a range of cascade flue kits for GB162 systems of up to 600kW. For further details on bespoke flue systems for the GB162 please visit our website or contact a member of the Worcester technical team on 0844 693 3028.



This example shows a typical Buderus flue header kit for a 2 boiler in-line cascade system.

GB162 Cascade in-line (TL) systems

TL1 configuration



Specification	Value
Cascadable outputs (max.)	45 to 100kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	1,100mm
Depth	496mm

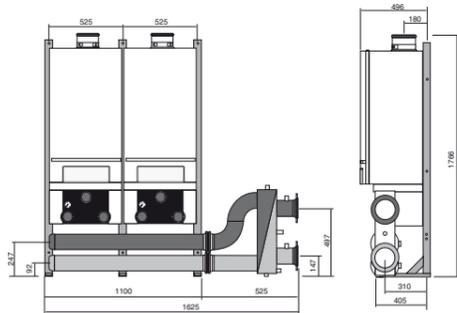
Parts List	Quantity
Main flow and return pipe TL1 NW65	1
Main gas pipe	1
Boiler piping set TL configuration	1
2½" Low loss header	1
TL configuration supports	2
Connecting frame	1

Required accessories

Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	1

Controls and fluing as required.

TL2 configuration with pump groups



Specification	Value
Cascadable outputs (max.)	90 to 200kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	1,625mm
Depth	496mm

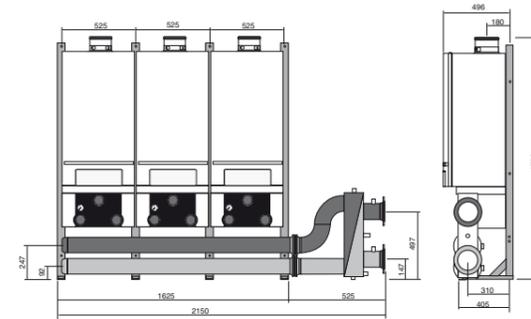
Parts List	Quantity
Main flow and return pipe TL2 NW65	1
Main gas pipe TL2 – 2"	1
Boiler piping set TL configuration	2
2½" Low loss header	1
TL configuration supports	3
Connecting frame	2

Required accessories

Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	2

Controls and fluing as required.

TL3 configuration with pump groups



Specification	Value
Cascadable outputs (max.)	135 to 300kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	2,150mm
Depth	496mm

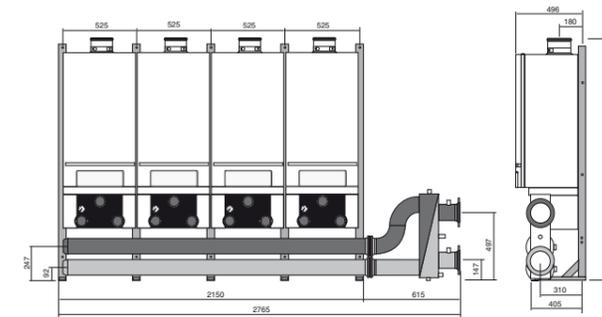
Parts List	Quantity
Main flow and return pipe TL3 NW65	1
Main gas pipe TL3 – 2"	1
Boiler piping set TL configuration	3
2½" Low loss header	1
TL configuration supports	4
Connecting frame	3

Required accessories

Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	3

Controls and fluing as required.

TL4 configuration with pump groups



Specification	Value
Cascadable outputs (max.)	180 to 400kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	2,765mm
Depth	496mm

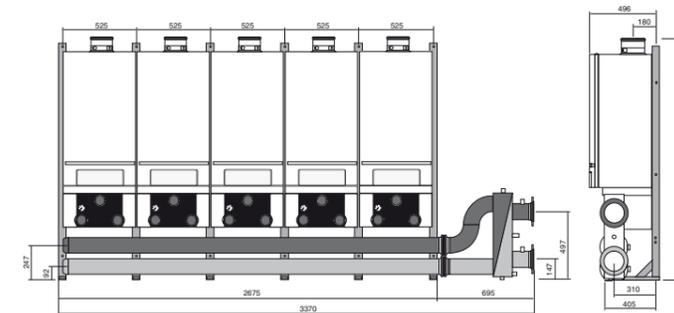
Parts List	Quantity
Main flow and return pipe TL4 NW80	1
Main gas pipe TL4 – 2"	1
Boiler piping set TL configuration	4
3" Low loss header	1
TL configuration supports	5
Connecting frame	4

Required accessories

Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	4

Controls and fluing as required.

TL5 configuration with pump groups



Specification	Value
Cascadable outputs (max.)	225 to 500kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	3,370mm
Depth	496mm

Parts List	Quantity
Main flow and return pipe TL5 NW100	1
Main gas pipe TL5 – 2"	1
Boiler piping set TL configuration	5
4" Low loss header	1
TL configuration supports	6
Connecting frame	5

Required accessories

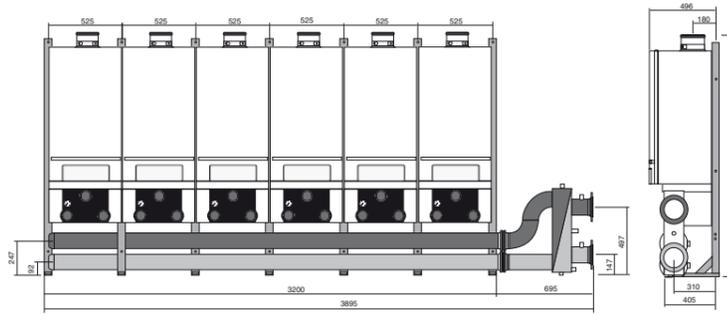
Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	5

Controls and fluing as required.

GB162 Cascade in-line (TL) systems – continued

GB162 Cascade back-to-back (TR) systems

TL6 configuration with pump groups



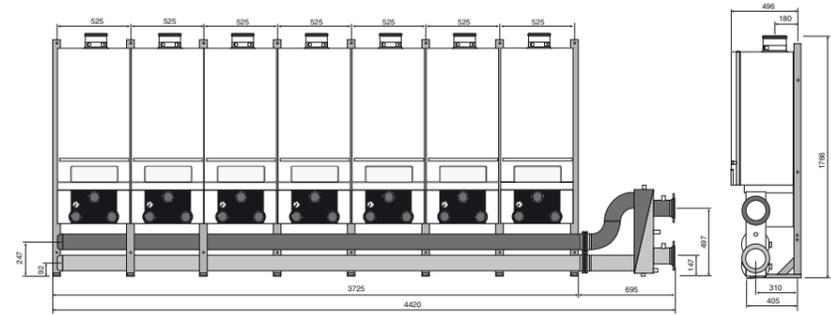
Specification	Value
Cascadable outputs (max.)	270 to 600kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	3,895mm
Depth	496mm

Parts List	Quantity
Main flow and return pipe TL6 NW100	1
Main gas pipe TL6 – 3"	1
Boiler piping set TL configuration	6
4" Low loss header	1
TL configuration supports	7
Connecting frame	6

Required accessories	Quantity
Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	6

Controls and fluing as required.

TL7 configuration with pump groups



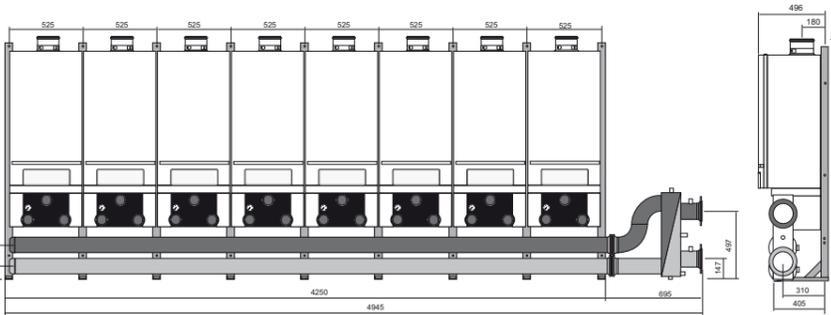
Specification	Value
Cascadable outputs (max.)	315 to 700kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	4,420mm
Depth	496mm

Parts List	Quantity
Main flow and return pipe TL7 NW100	1
Main gas pipe TL7 – 3"	1
Boiler piping set TL configuration	7
4" Low loss header	1
TL configuration supports	8
Connecting frame	7

Required accessories	Quantity
Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	7

Controls and fluing as required.

TL8 configuration with pump groups



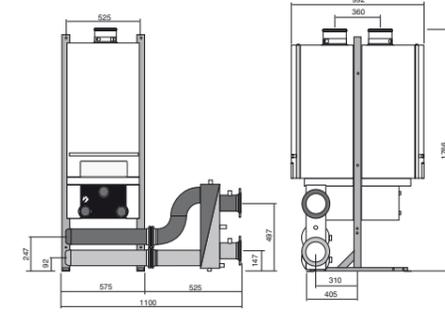
Specification	Value
Cascadable outputs (max.)	360 to 800kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	4,945mm
Depth	496mm

Parts List	Quantity
Main flow and return pipe TL8 NW100	1
Main gas pipe TL8 – 3"	1
Boiler piping set TL configuration	8
4" Low loss header	1
TL configuration supports	9
Connecting frame	8

Required accessories	Quantity
Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	8

Controls and fluing as required.

TR2 configuration



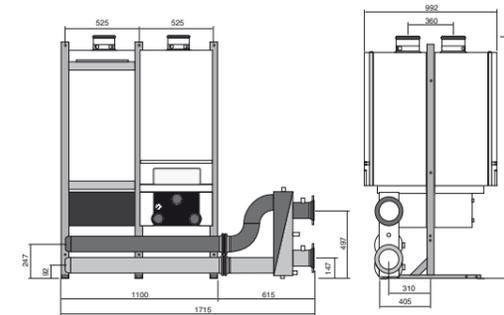
Specification	Value
Cascadable outputs (max.)	90 to 200kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	1,100mm
Depth	992mm

Parts List	Quantity
Main flow and return pipe TR2 NW65	1
Main gas pipe TR2 – 2"	1
Boiler piping set TL configuration	1
Boiler piping set TR configuration	1
2½" Low loss header	1
TR configuration supports	2
Connecting frame	1

Required accessories	Quantity
Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	2

Controls and fluing as required.

TR3 configuration with pump groups



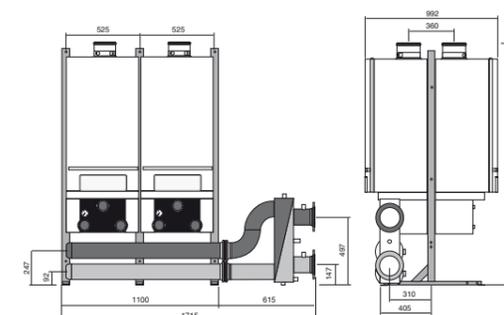
Specification	Value
Cascadable outputs (max.)	135 to 300kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	1,715mm
Depth	992mm

Parts List	Quantity
Main flow and return pipe TL4 NW80	1
Main gas pipe TR4 – 2"	1
Boiler piping set TL configuration	1
Boiler piping set TR configuration	2
3" Low loss header	1
TR configuration supports	3
Connecting frame	2

Required accessories	Quantity
Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	3

Controls and fluing as required.

TR4 configuration with pump groups



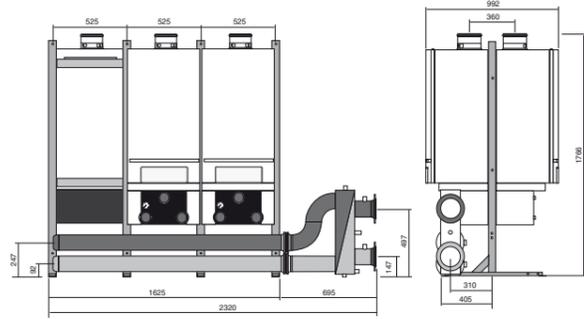
Specification	Value
Cascadable outputs (max.)	180 to 400kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	1,715mm
Depth	992mm

Parts List	Quantity
Main flow and return pipe TL4 NW80	1
Main gas pipe TR4 – 2"	1
Boiler piping set TL configuration	2
Boiler piping set TR configuration	2
3" Low loss header	1
TR configuration supports	3
Connecting frame	2

Required accessories	Quantity
Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	4

Controls and fluing as required.

TR5 configuration with pump groups



Specification	Value
Cascadable outputs (max.)	225 to 500kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	2,320mm
Depth	992mm

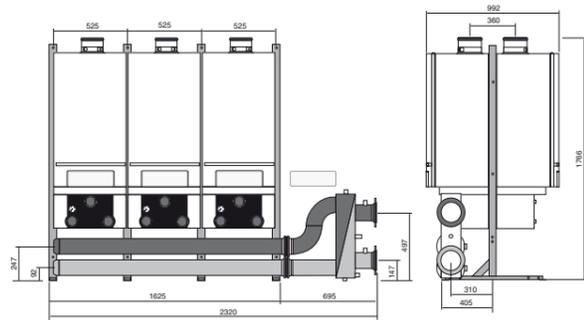
Parts List	Quantity
Main flow and return pipe TL5 NW100	1
Main gas pipe TR6 – 3"	1
Boiler piping set TL configuration	2
Boiler piping set TR configuration	3
4" Low loss header	1
TR configuration supports	4
Connecting frame	3

Required accessories

Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	5

Controls and fluing as required.

TR6 configuration with pump groups



Specification	Value
Cascadable outputs (max.)	270 to 600kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	2,320mm
Depth	992mm

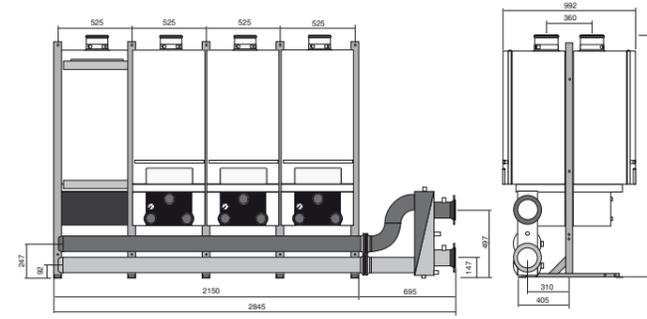
Parts List	Quantity
Main flow and return pipe TL6 NW100	1
Main gas pipe TR6 – 3"	1
Boiler piping set TL configuration	3
Boiler piping set TR configuration	3
4" Low loss header	1
TR configuration supports	4
Connecting frame	3

Required accessories

Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	6

Controls and fluing as required.

TR7 configuration with pump groups



Specification	Value
Cascadable outputs (max.)	315 to 700kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	2,845mm
Depth	992mm

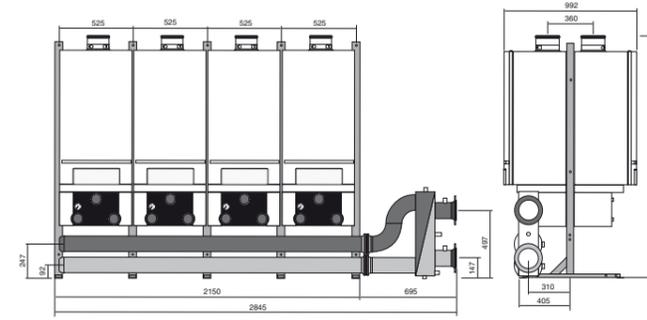
Parts List	Quantity
Main flow and return pipe TR8 NW100	1
Main gas pipe TR8 – 3"	1
Boiler piping set TL configuration	3
Boiler piping set TR configuration	4
4" Low loss header	1
TR configuration supports	5
Connecting frame	4

Required accessories

Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	7

Controls and fluing as required.

TR8 configuration with pump groups



Specification	Value
Cascadable outputs (max.)	360 to 800kW
Height (excluding flue adaptor)	1,710mm
Length (inc. straight low loss header)	2,845mm
Depth	992mm

Parts List	Quantity
Main flow and return pipe TR8 NW100	1
Main gas pipe TR8 – 3"	1
Boiler piping set TL configuration	4
Boiler piping set TR configuration	4
4" Low loss header	1
TR configuration supports	5
Connecting frame	4

Required accessories

Sensor pocket	1
Pump group (65/80/100kW) or cascade pipe kit (45kW)	8

Controls and fluing as required.

Worcester GB162 boiler series and accessories

GB162 boilers

<p>GB162 45kW</p>  <p>Worcester Part No. 7 746 901 511</p>	<p>GB162 65kW</p>  <p>Worcester Part No. 7 746 900 822</p>	<p>GB162 80kW</p>  <p>Worcester Part No. 8 747 024 8</p>	<p>GB162 100kW</p>  <p>Worcester Part No. 8 747 025 0</p>
--	--	--	---

<p>FM442 heating circuit control module</p>  <p>Worcester Part No. 30 004 867</p>	<p>FM443 solar module</p>  <p>Worcester Part No. 7 747 300 910</p>	<p>FM456 two boiler cascade sequence module</p>  <p>Worcester Part No. 30 009 043</p>	<p>FM457 four boiler cascade sequence module</p>  <p>Worcester Part No. 30 009 057</p>
---	--	---	--

RC series boiler & system controls

<p>RC35 digital boiler control</p>  <p>Worcester Part No. 7 747 312 318</p>	<p>RC25 room thermostat (max 2 per system)</p>  <p>Worcester Part No. 7 747 312 367</p>	<p>WM10 low loss header module</p>  <p>Worcester Part No. 30 008 458</p>	<p>MM10 mixed heating circuit module</p>  <p>Worcester Part No. 30 008 453</p>
--	--	--	---

BFU remote control & room thermostat



Worcester Part No.
5 720 720

<p>SM10 solar module</p>  <p>Worcester Part No. 30 008 448</p>	<p>EM10 BMS interface for single boilers</p>  <p>Worcester Part No. 5 016 995</p>	<p>MCM10 cascade sequencing control for up to 4 boilers</p>  <p>Worcester Part No. 7 746 900 847</p>
--	---	---

Hydraulic accessories

<p>Variable speed pump group & connection set for 65, 80 & 100kW models</p>  <p>Worcester Part No. 7 114 070</p>	<p>3 speed pump group & connection set for 65, 80 & 100kW models</p>  <p>Worcester Part No. 7 114 080</p>	<p>Connection set when using pump group without cascade frame</p>  <p>Worcester Part No. 5 584 552</p>	<p>Low loss header for single boiler installations (c/w insulation)</p>  <p>Worcester Part No. 89 200 972</p>
--	---	--	---

4000 series boiler & system controls

<p>4121 control unit</p>  <p>Worcester Part No. 30 008 919</p>	<p>4122 control unit without MEC2</p>  <p>Worcester Part No. 30 009 078</p>	<p>4122 control unit with MEC2</p>  <p>Worcester Part No. 30 008 934</p>	<p>FM441 heating & DHW control module</p>  <p>Worcester Part No. 30 004 850</p>
--	---	---	---

Only for use with 4122

Worcester GB162 boiler series and accessories

80/125mm room sealed concentric flue – 45 & 65kW models

<p>Vertical flue kit (80/125mm dia.)</p> <p>Worcester Part No. 7 716 191 115</p>	<p>Horizontal flue kit (80/125mm dia.)</p> <p>Worcester Part No. 7 716 191 116</p>	<p>0.5m flue extension – cutable (80/125mm dia.)</p> <p>Worcester Part No. 7 716 191 117</p>	<p>1m flue extension – cutable (80/125mm dia.)</p> <p>Worcester Part No. 7 716 191 118</p>	<p>1m flue extension – cutable (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 096</p>	<p>1m flue extension – non-cuttable (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 097</p>	<p>90° bend (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 098</p>	<p>45° bends – pair (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 099</p>
<p>90° bend (80/125mm dia.)</p> <p>Worcester Part No. 7 716 191 119</p>	<p>45° bends – pair (80/125mm dia.)</p> <p>Worcester Part No. 7 716 191 120</p>	<p>Flue support bracket – single (80/125mm dia.)</p> <p>Worcester Part No. T 0000 82 131</p>	<p>Flat roof flashing for vertical flue kit (80/125mm dia.)</p> <p>Worcester Part No. 7 716 191 090</p>	<p>Flue support bracket – 3 pack (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 102</p>	<p>Clamp with EPDM seal (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 103</p>	<p>Flat roof flashing (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 100</p>	<p>Pitched roof flashing (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 101</p>
<p>Pitched roof flashing for vertical flue kit (80/125mm dia.)</p> <p>Worcester Part No. 7 716 191 091</p>							

100/150mm room sealed concentric flue – 65, 80 & 100kW models

<p>Vertical flue kit (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 093</p>	<p>Horizontal flue kit (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 094</p>	<p>Adaptor for GB162 65kW only (100/150mm dia.)</p> <p>Worcester Part No. 8 720 011 6</p>	<p>0.5m flue extension – cutable (100/150mm dia.)</p> <p>Worcester Part No. 7 716 191 095</p>
--	--	--	--

The very best training programmes from Worcester



Worcester has always placed great emphasis on technical support and training for installers and service engineers. Advances in heating technology, including the increasing use of renewables, make the need for training greater than ever.

To ensure the highest levels of competence and expertise in the installation of all Worcester products, the company runs intensive training courses for installers, commissioning engineers and operatives involved with servicing and fault finding.

Courses available

Our training facilities offer a number of courses suitable for the installer and commissioning engineers, and more in-depth courses for the servicing and fault finding engineers.

Training centres throughout the UK

To enable us to meet the growing demand for training we have invested in additional facilities at the award-winning training academy at our Worcester headquarters. In addition to the original academy there is now a new 400m² unit, 25% of which is devoted to an open-plan domestic training area with life-size single-storey brick buildings. These feature working Greenskies solar thermal systems which enable installers to get up onto the roof of the building to get more realistic training. There are bays full of all Greenstar gas-fired appliances, so installers can really get to grips with the importance of system design. The additional space will also contain dedicated training areas for our renewable and future products. The training centre will also run certified CODNC01 and COCN1 courses. CODNC01 equips installers with the relevant qualifications for the changeover from domestic to commercial gas work. COCN1 allows existing commercial installers to renew their qualification.

Further academies are located at West Thurrock in Essex, Bradford and Clay Cross in Derbyshire, all offering our full suite of courses. Please phone 01905 752526 for more information about a course near you. Each course is run by specialist trainers and is superbly equipped to deliver a combination of classroom theory and practical hands-on experience that's second to none.

College-linked Learning

As well as offering training at our own centres, Worcester has established close partnerships with many colleges around the UK, equipping them with our latest products. Call us on 01905 752526 to find out when we will be running the course of your choice at a college in your area.

Mobile training

To complement our training venues across the country, we can also bring training to you.

We have mobile vehicles fully equipped with operational Greenstar gas-fired boilers, dry strip-down models and even a Greensource air to air heat pump, ensuring that quality training in a comfortable environment can be achieved on your doorstep!

If it's oil training you require, our 7.5 tonne mobile oil vehicle is available throughout the country for hands-on product training and OFTEC assessments.

Distance learning/web based learning

Worcester has produced a selection of Distance Learning CD ROMs/DVDs which are packed with information. Call 0844 892 9800 for your copies, or visit www.worcester-bosch.co.uk for information on Web Based Learning.

Get on course for a more profitable future now.

Call now for more information 01905 752526



Worcester training courses

One stop shop training

We are here to provide you with training and assistance for all areas of your business, not just product training. Call us on 01905 752526 to order a full training course brochure.

Boiler training courses	
Greenstar CDi gas-fired condensing combi boilers	
Models covered Greenstar 27/30/37/42CDi	Duration: 1 day
Greenstar i Junior & Si gas-fired condensing combi boilers	
Models covered Greenstar 24/28i Junior and Greenstar 25/30Si	Duration: 1 day
Greenstar Highflow CDi & FS CDi regular floor standing gas-fired condensing combi and regular boilers	
Models covered Greenstar Highflow 440/550CDi and Greenstar FS 30/42CDi Regular	Duration: 1 day
Greenstar system & regular gas-fired condensing boilers	
Models covered Greenstar 12/15/18/24Ri, Greenstar 30/40CDi Regular, Greenstar FS 30/42CDi Regular, Greenstar 30CDi System and Greenstar 12/15/18/24i System	Duration: 1 day
Greenstar Danesmoor, Heatslave & Camray high efficiency condensing oil-fired boilers – pre-OFTEC training	
Models covered Greenstar Danesmoor series, Greenstar Heatslave series and Greenstar Camray series	Duration: 1 day
Greenstar controls	
Models covered MT10, MT10RF, DT20RF, DT20, DT10RF, TD200, RT10, FR10, FR110, FW100 and ISM1	Duration: 1 day
GB162 gas-fired condensing boilers	
Models covered GB162 45/65kW	Duration: 1 day
GB162 gas-fired condensing boilers – cascade	
Models covered GB162 45/65/80/100kW – cascading up to 800kW	Duration: 1 day

Renewable training courses	
Greenskies solar hot water system	
Covering Installation, commissioning and servicing	Duration: 2 days
Greenskies advanced solar	
Covering Worcester solar control range and pump stations	Duration: 1 days
Greenstore ground source heat pumps	
Covering Installation, commissioning and system design	Duration: 2 days
Greensource heat pumps – air to water	
Covering Installation, commissioning and system design	Duration: 2 days
Greensource heat pumps – air to air	
Covering Installation, commissioning and system design	Duration: 1 day
Greenfloor heating	
Covering Installation, commissioning and servicing	Duration: 1 day
Greenstream MVHR	
Covering Installation, commissioning and system design	Duration: 1 day



Industry focused training courses		
BPEC warm water underfloor heating installation		
Covering	Basic principles & advantages of underfloor heating, floor systems and finishes, operation, installation, testing and post installation activities	Duration: 2 days
BPEC ventilation		
Covering	Installation, commissioning, inspection and testing	Duration: 2 days
Hot water systems & safety		
Covering	All G3 Regulations for the installation, servicing and commissioning of unvented cylinders. This course is certified by Logic Certification.	Duration: 1 day
Chemical water treatment		
Covering	Water treatment of domestic heating systems in accordance with BS 7593: 2006	Duration: 1 day
Construction skills F-Gas training/assessment certification		
Covering	Qualifies for Construction Skills Certification & Registration (valid for 5 years) and Voluntary ACRIB Registration	Duration: 4 days
Domestic ACS training and assessment		
Initial CCN1 + 4 appliances + CPA1		
Covering	Designed for candidates whose qualifications expired more than 12 months ago	Duration: 5 days
Reassessment CCN1 + 4 appliances + CPA1		
Covering	Re-assessment for candidates whose CCN1 qualification expires in less than 12 months	Duration: 4 days
Commercial ACS training and assessment		
CODNCO1		
Covering	Changeover qualification from domestic to commercial, including CIGA1, ICPN1, TPCP1A	Duration: 4 days
OFTEC training and assessment		
OFTEC 101		
Covering	Domestic/light commercial pressure jet commissioning and servicing	Duration: 3 days
OFTEC 105e		
Covering	Domestic/light commercial pressure jet boiler installation	Duration: 1 day assessment
OFTEC 101 & 105e		
Covering	Domestic/light commercial pressure jet installation, commissioning and servicing	Duration: 3 days
OFTEC 600a		
Covering	Oil tank installation and associated controls	Duration: 1 day assessment
OFTEC 101/105e/600e		
Covering	Domestic/light commercial pressure jet boiler installation, commissioning, servicing and oil tank installation and associated controls	Duration: 4 days
Mobile OFTEC		
All above covered throughout the country on the mobile training vehicle as well as in all our centres		

Please note to attend OFTEC courses you must have a minimum of 12 months' experience installing/servicing oil boilers. For inexperienced candidates, our Greenstar Danesmoor, Heatslave and Camray course offers pre-OFTEC training. For experienced oil technicians training is not a pre-requisite for OFTEC assessment.

A complete after-sales service



As part of the worldwide Bosch Group, Worcester strives to maintain the highest possible standards of after-sales care.

In addition to the no-nonsense parts and labour guarantee applicable to all Worcester products, you and your customers have the assurance that every Worcester product is manufactured to both the appropriate British and European standards.

Worcester Contact Centre

Should you require support, our fully trained Contact Centre staff, based at our head office in Worcester, are ready to take your calls. Whatever your query our contact centre operators along with our nationwide team of engineers are ready to help you.

Opening Times

Monday – Friday: 7.00am – 8.00pm
 Saturday: 8.00am – 5.00pm
 Sunday: 9.00am – 12 noon

All the technical advice you need

Spares

Genuine replacement parts for all supported Worcester products are readily available from stock, on a next day delivery basis. For more information please call your local stockist. You can find a spares stockist on our website.

Customer Technical Support

The Worcester Technical Helpline is a dedicated phone line – committed to providing a comprehensive service to complement the brand name and quality of our products. Our experienced team of technical experts provides answers to queries of a technical nature across the entire Worcester range.

Worcester also has a pre-sales department, which provides assistance in selecting a heating system to suit a particular application, along with full guidance on installation. For more information please contact the Technical Helpline or alternatively visit our website where literature can be downloaded at www.worcester-bosch.co.uk.

Technical

Tel: 0844 693 3028
 Fax: 01905 752 741

Opening Times

Monday – Friday: 7.00am – 8.00pm
 Saturday: 8.30am – 4.00pm



Useful numbers

Sales

Tel: 01905 752640
Fax: 01905 456445

Spare Parts

Tel: 01905 752576
Fax: 01905 754620

Technical Helpline (Pre & Post Sales)

Tel: 0844 693 3028
Fax: 01905 752741

Renewables Technical Helpline

Email: renewable.energy@uk.bosch.com
or telephone 0844 892 4010

Training

Tel: 01905 752526
Fax: 01905 752535

Literature

Email: literature@uk.bosch.com
or download instantly from our website
or telephone 0844 892 9800

Customer Service

Engineer Appointments

Email: appointment.worcester@uk.bosch.com
or telephone 0844 892 3000

Enquiries

Email: service.mailbox@uk.bosch.com
or telephone 0844 892 3000

Guarantee Registration

To register your Worcester guarantee,
please visit our website or
telephone 0844 892 2552

Calls to the listed 0844 numbers are charged at up to 3 pence per minute from BT land lines.
Calls from mobiles and some other networks may vary. Calls to and from Bosch Thermotechnology Ltd
may be recorded for training and quality assurance purposes.

www.worcester-bosch.co.uk



In partnership with



Worcester, Bosch Group is a brand name of Bosch Thermotechnology Ltd.

This leaflet is accurate at the date of printing, but may be superseded and should be disregarded if specification and/or appearances are changed in the interest of continued improvement. The statutory rights of the consumer are not affected.

Part No. 8 716 111 872 B 10/11



BBT2465



Worcester, Bosch Group,
Cotswold Way, Warndon,
Worcester, WR4 9SW