

Herald

Floor standing gas condensing boilers

Installation, Commissioning and Maintenance Instructions



Models:

HCB117
HCB190
HCB235
HCB295



Warning:

Read and fully understand this manual before attempting to install this Boiler. It can cause personal injury and damage to the Boiler when you do not read the manual and/or do not obey the instructions.



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Article	Language	Version	Amended by
Herald boiler ICM	English	Launch	SJA

DOCUMENT IDENTIFICATION

PREFACE

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Lochinvar Ltd. reserves the right to modify specifications in this manual.

TRADEMARKS

Brand names in this manual are registered trademarks of their respective owners.

WARRANTY

Refer to the appendix Warranty ([see Warranty](#)) for the warranty provisions.

LIABILITY

User

Lochinvar accepts no liability when the boiler is not used correctly and requires the user to:

- Read this manual carefully and obey the instructions.
- Ask your installation engineer for advice about the use of the Boiler.
- Make sure that the service and maintenance activities are done by a qualified engineer.
- Store the manual, in good condition, near the Boiler.

Installation engineer

Lochinvar accepts no liability when the Boiler is not used correctly and requires the installation engineer to:

- Read this manual carefully and obey the instructions.
- Make sure that the entire Boiler installation complies with all applicable regulations.
- Make sure that the Boiler is tested before the installation is taken into use.
- Explain the correct use to the user.
- Notify the user when service and maintenance is required.
- Make sure that you hand over all applicable manuals.

Supplier

The Herald Boiler is designed in accordance with the applicable regulations. The Boiler is delivered with UKCA and CE-marking and all necessary documentation in accordance with these regulations.

Lochinvar accepts no liability for claims from third parties when:

- The instructions for the correct installation of the Boiler are not followed.
- The instructions for the correct use of the Boiler are not followed.
- The Boiler has not been serviced as per the maintenance schedule.

For more information, refer to the General Terms of Sales. These are available on request, free of charge.

We believe that this manual provides you with an accurate and complete description of all relevant components. If you, nonetheless, find errors or inaccuracies in this manual, please inform Lochinvar. This helps us to further improve our documentation.

COMPLIANCE

To safely produce low temperature hot water, the design and construction of the Herald Boilers is in accordance with:

- UK and European Regulations 2016/426 on appliances burning gaseous fuels (GAR).
- UK and European Standard for Gas-fired central heating boilers (BS EN15502).
- UK and European Eco-Design Directive.

Refer to the appendix Declaration of conformity ([See Appendix](#)).

REGULATIONS

It is law that all gas appliances are installed by a competent person, registered with a H.S.E. approved body, in accordance with The Gas Safety (Installation and Use) Regulations 1998. Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure that this law is complied with. The installation of the equipment MUST be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations, I.E.E. Regulations, and the bylaws of the local water undertaking.

In addition, the installation should follow the relevant guidance offered in the following documents. It is not practical to list all relevant information due to continuous changes, but emphasis is placed on the following documents, as failure to comply with the guidance given will almost certainly result in an unsatisfactory installation:

Institute of Gas Engineers and Managers (IGEM) Publications

CIBSE Guides

Clean Air Act

H.S.E Guidance



Note

Manufacturer's notes must not be taken in any way as overriding statutory obligations.

Contact information!

In the event of problems with your gas, electricity, or water supply connections or when you have any comments or questions, please contact your (energy/water) supplier

ABOUT THIS MANUAL

SCOPE

This manual gives information about safe and correct use of the Boiler and how installation, maintenance and service activities must be done correctly. You must obey the instructions in this manual.



Warning:

Read this manual carefully before you start the Boiler. It can cause personal injury and damage to the Boiler when you do not read the manual and/or do not obey the instructions.

The purpose of this manual is to:

- Describe the working principles and layout of the Boiler.
- Explain the safety devices.
- Highlight possible hazards.
- Describe the use of the Boiler.
- Describe the installation, service, and maintenance of the Boiler.

This manual has two parts:

A User part that describes the correct usage of the Boiler.

An Installation, Maintenance and Service part, that describes the correct installation and maintenance procedures.

TARGET GROUP

The information in this manual applies to three target groups:

- Users
- Installation engineers
- Service and maintenance engineers

The User part is intended for the (end) users. The Installation, Maintenance and Service part is intended for the installation engineers and the service and maintenance engineers.

There is a separate service manual which covers maintenance and fault finding in greater detail.

This manual contains the following text styles/symbols for situations that may endanger users/engineers, cause damage to equipment or need special attention:



Note

A note gives more information on a topic.



Caution

Obey the caution instructions to prevent damage to the Boiler.



Warning

Obey the warning instructions to prevent danger of personal injury, and serious damage to the Boiler.

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USER PART

SAFETY

Lochinvar cannot be held responsible for damages or injuries which can lead back to:

Failure to follow the instructions provided in this manual.

Carelessness during use or maintenance of the Boiler.

Every user must study the user part of this manual and must follow the instructions in this part of the manual strictly. Do not change the sequence of the described actions. This manual must be always available for the user and service engineer.

Warning



- **If you smell gas:**
 - **Shut off the mains gas supply valve!**
 - **Avoid causing sparks! Do not use any electrical equipment or switch, i.e., no telephones, plugs or bells!**
 - **No naked flames! No smoking!**
 - **Open windows and doors!**
 - **Warn occupants and leave the building!**
 - **After leaving the building, alert the gas distribution company.**
-

Caution



Do not store or use chemical substances in the room where the Boiler is installed because of the risk of explosion and corrosion of the Boiler. Some propellants, bleaching agents and degreasing agents etc. give off explosive vapours and/or cause accelerated corrosion. If the Boiler is used in a room where such substances are stored or used, the warranty will be void.



Caution

Installation, maintenance, and service may only be carried out by a qualified engineer.



Caution

The Boiler is not intended for use by persons (incl. children under the age of 16) with reduced physical, sensory, or mental capacities, or who lack the necessary experience or knowledge. When the person responsible for their safety is supervising or has explained how the Boiler should be used, these persons can use the Boiler.

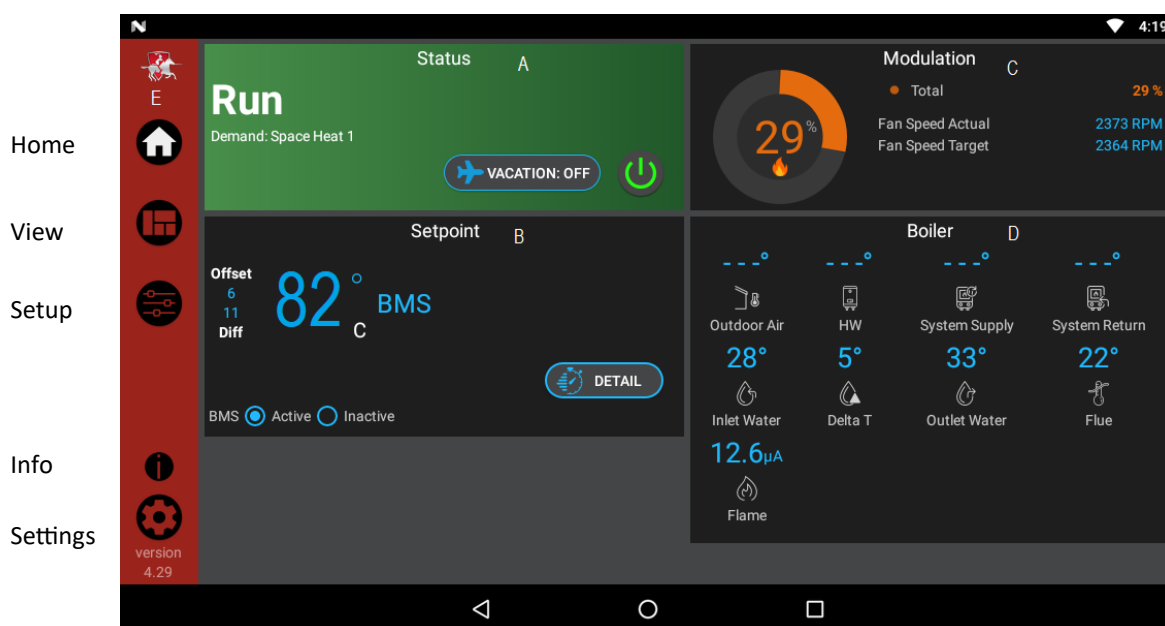


Note

Regular maintenance extends the service life of the Boiler. To determine the correct service interval, the service and maintenance engineer must do a check on both the water and gas side of the Boiler three months after installation. Based on this check, the best service interval can be determined.

CONTROL INTERFACE

FIGURE 1 SMARTOUCH CONTROL INTERFACE



The home screen displays basic information on how the unit is running, it is divided into the following sections:

- Status
- Demand
- Modulation
- Sensors
- Navigation
- **A-The Status Section** is located on the top left of the screen and displays how the unit is currently running (i.e. Off, Stand-by, locking, and Lockout) including current driving demand, the next Heating Setback scheduled, the reason for any blocking or lockout, and a power button.
- **B-The Demand Section** is located on the bottom left of the screen and displays information about the targets and limits of the current demand being serviced.
- **C-The Modulation Section** is located on the top right of the screen and displays the target modulation of the unit. This section also includes target and actual fan speeds.
- **D-The Sensor Section** is located on the bottom right of the screen and displays both factory installed, and field installed sensor including Inlet Water Temperature, Delta T Water Temperature, Outlet Water Temperature, Flue Temperature, and HW Tank Temperature.
- **E-The Navigation Section** is located down the left side of the screen. There are five (5) sections located below the Lochinvar icon: Home, View, Setup, Information (About), and Settings. The Home Section is the screen shown in [Figure 1](#). The View Section provides more detailed information including subsections for: History, Cascade, Graphing, and a complete list of current Sensor Values. The Setup Section has several screens to aid in setting up the appliance.

The Setup Section includes screens for adjusting: Set Points, Pump Settings, Cascade, BMS, Ramp Delay, and Night Setback.

The Information Section provides information about the hardware and software including the current software version of the interface, the version of the boiler control.

The Setting Section enables several interface setup features including Time Setup, Temperature Unit Select and System Update.



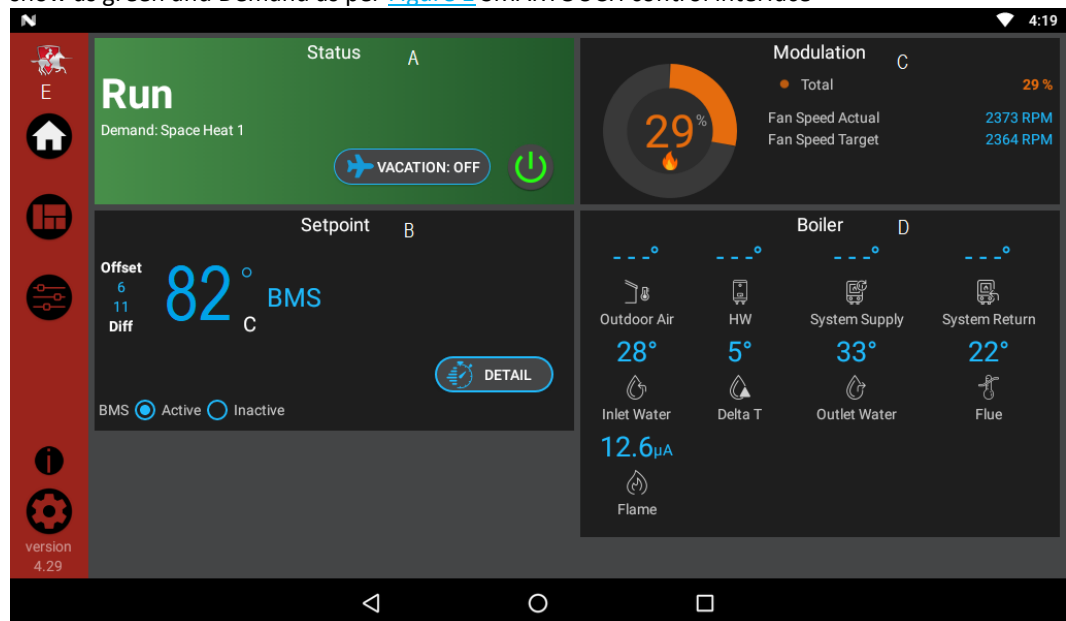
Warning

There are no user serviceable parts inside the Herald boiler, only suitably qualified engineers can remove any of the panels. If the boiler is not operating correctly contact your service agent.

USE

To turn on the boiler

Ensure power supply is turned on and that there is a heat demand, the status screen should show as green and Demand as per [Figure 1](#) SMARTOUCH control interface

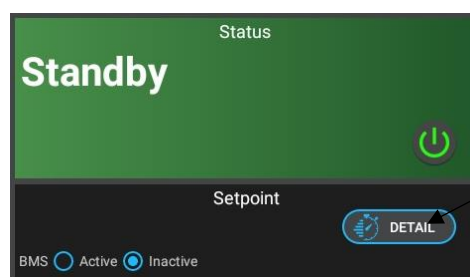


Warning

If the boiler fails to operate contact your service agent, do not attempt to investigate the fault yourself.

To set a parameter

During normal operation, set point temperatures can be adjusted from the Home Screen by pressing the [DETAILS](#) button in the demand section (B) of the screen as shown below.



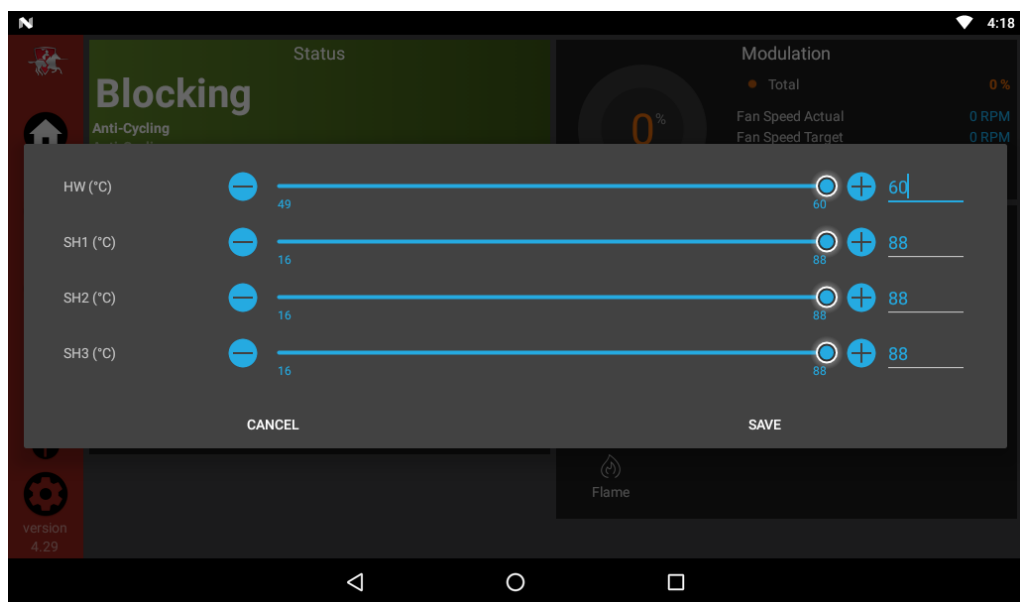
1. To change a set point, use the set point slider feature or the PLUS (+) and MINUS (-) buttons as shown in [Figure 2](#).
1. To change a set point, use the set point slider feature or the PLUS (+) and MINUS (-) buttons as shown below in [Figure 3](#).
2. Once the set point has been adjusted to the desired setting, press the save button.



NOTE:

The APPLY CHANGES button must be pressed to complete programming of the controls. Failure to press the APPLY CHANGES button will result in an unprogrammed control.

FIGURE 2 SET POINT ADJUSTMENT



INSTALLATION PART

INTRODUCTION

Herald is a fully modulating condensing gas boiler; it can be used to supply low temperature hot water for heating purposes and/or domestic hot water via an indirect vessel or plate heat exchanger. Herald features the SMARTOUCH interface which allows for simple parameter changes and shows the status of the appliance without having to scroll through multiple screens.

Safety

For safety instructions on the use of the Boiler, refer to ([Safety](#)) in the User part of this manual.



Warning:

It is law that all gas appliances are installed by a competent person, registered with a H.S.E. approved body, in accordance with The Gas Safety (Installation and Use) Regulations 1998. Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure that this law is complied with. The installation of the equipment MUST be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations, I.E.E. Regulations, and the bylaws of the local water undertaking.

Leave the Boiler electrically isolated until you are ready to commission it.

READ AND UNDERSTAND THE INSTRUCTIONS

Read and fully understand all instructions before attempting to operate maintain or install the unit.



Caution:

The Boiler may only be manoeuvred in an upright position. After unpacking, make sure that the Boiler is not damaged.

Make sure that the diameter of the gas supply pipe is large enough to supply sufficient capacity to the Boiler.

Make sure that the condensate drain is connected to the wastewater discharge using an open connection.

Fill the Boiler completely before use. Dry firing will damage the Boiler.

After installation, maintenance, or service, you must always check that the appliance is gas tight and make sure that the gas supply pressure, the CO2 value, and the air pressure differential are correct.



Warning :

If the gas supply pressure is not correct, contact your mains gas supply company. Do not use the Boiler.



Note:

Any leakage from the boiler and/or connections can cause damage to the immediate environment or floors below the level of the boiler room. Install the boiler above a wastewater drain or in a suitable metal leak tray. The leak tray must have an appropriate wastewater drain and must be at least 5 cm deep with a length and width of at least 5 cm larger than the boiler.

SAFETY DEVICES

Herald boilers have the following safety devices fitted:

1. Temperature sensors, inlet, outlet, flue gas and a high limit sensor are fitted to ensure accurate temperature control and to ensure a hazardous situation does not occur.
2. Air/gas pre-mix control, this achieves optimum efficiency and prevents gas flowing should there be a fault with the inlet fan.
3. Flame sensor to ensure the burner lights quickly, if no flame is detected the boiler will shut down.

In addition, the installer should fit a suitable sized boiler safety valve and expansion vessel as per BS6644.

Note

The packaging material is environmentally friendly, recyclable, and relatively easy to discard.

Old end-of-life appliances contain materials that need to be recycled. When you discard devices at the end of their service life, you must obey local legislation related to waste disposal.

Never discard your old device together with regular waste. Put the device into a municipal waste collection depot for electrical and electronic equipment. If necessary, ask your supplier or your service and maintenance engineer for advice.



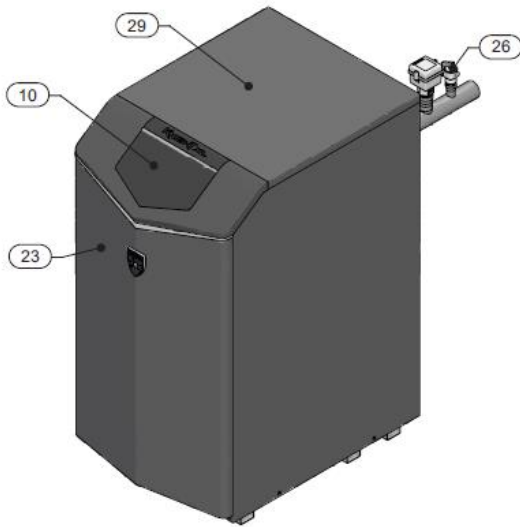
PRINCIPLE PARTS

The Herald boiler is a condensing, fully modulating gas boiler designed to supply low temperature hot water for heating and domestic hot water via an indirect vessel or plate heat exchanger. Herald boilers feature: [See exploded view](#)

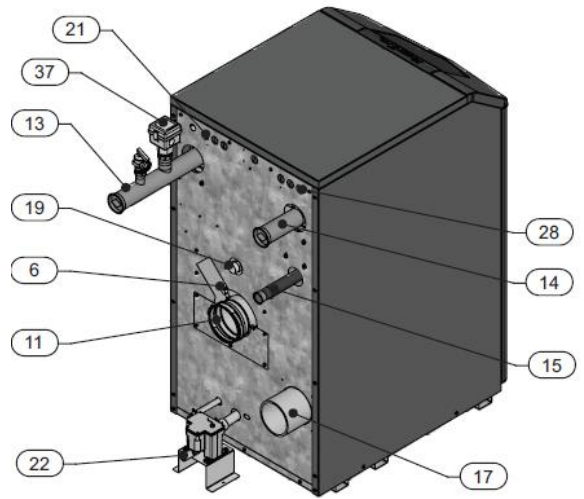
1. **Stainless steel heat exchanger**- Allows system water to flow through specially designed coils for maximum heat transfer, while providing protection against flue gas corrosion. The coils are encased in a jacket that contains the combustion process.
2. **Combustion chamber access cover**-Allows access to the combustion side of the heat exchanger coils.
3. **Fan**-The fan pulls in air and gas through the venturi. Air and gas mix inside the fan and are pushed into the burner, where they burn inside the combustion chamber.
4. **Gas valve**-The gas valve senses the negative pressure created by the fan, allowing gas to flow only if the gas valve is powered and combustion air is flowing.
5. **Venturi**-The venturi controls air and gas flow into the burner.
6. **Flue gas sensor (not shown)**-This sensor monitors the flue gas exit temperature. The control module will modulate and shut down the boiler if the flue gas temperature gets too hot. This protects the flue pipe from overheating.
7. **Boiler outlet temperature sensor (housed with the high limit sensor)**-This sensor monitors boiler outlet water temperature (system supply). If selected as the controlling sensor, the control module adjusts boiler firing rate, so the outlet temperature is correct.
8. **Boiler inlet temperature sensor**-This sensor monitors return water temperature (system return). If selected as the controlling sensor, the control module adjusts the boiler firing rate, so the inlet temperature is correct.
9. **Temperature and pressure gauge**- (Field supplied and not shown) Monitors the outlet temperature of the boiler as well as the system water pressure.

10. **Electronic Display**-Digital controls with SMART TOUCH screen technology, full colour display, and an 7" user interface screen.
11. **Flue pipe adapter**-Allows for the connection of the PVC vent pipe system to the boiler.
12. **Burner (not shown)**-Made with metal fibre and stainless-steel construction, the burner uses pre-mixed air and gas and provides a wide range of firing rates.
13. **Water outlet (system supply)**-A 2" (Models 117-235) or 2.5" (Model 295) water connection that supplies hot water to the system.
14. **Water inlet (system return)**-A 2" (Models 117-235) or 2.5" (Model 295) copper water connection that returns water from the system to the heat exchanger.
15. **Gas connection pipe**-Threaded pipe connection of 1" or 1 1/4" (depending on the model). This pipe should be connected to the incoming gas supply for the purpose of delivering gas to the boiler.
16. **SMART TOUCH Control Module**-The SMART TOUCH Control responds to internal and external signals and controls the fan, gas valve, and pumps to meet the heating demand.
17. **Air intake adapter**-Allows for the connection of the PVC air intake pipe to the boiler.
18. **High voltage junction box**-The junction box contains the connection points for the line voltage power and all pumps.
19. **Boiler drain port**-Location from which the heat exchanger can be drained.
20. **Low voltage connection board**-The connection board is used to connect external low voltage devices.
21. **Low voltage wiring connections (knockouts)**-Conduit connection points for the low voltage connection board.
22. **Condensate drain connection**-Connects the condensate drain line to a 1/2" PVC connection.
23. **Front access cover (not shown)**-Provides access to the gas train and the heat exchanger.
24. **Ignition Electrode**-Provides direct spark for igniting the burner.
25. **Flame inspection window (not shown)**-The quartz glass window provides a view of the burner surface-and flame.
26. **Relief Valve (Field supplied)**- Protects the heat exchanger from an over pressure condition the relief valve should be set no higher than 10bar.
27. **Flame Sensor (not shown)**-Used by the control module to detect the presence of burner-flame
28. **Line voltage wiring connections (knockouts)**-Conduit connection points for the high voltage junction box.
29. **Top Panel**-Removable panel to gain access to the internal components.
30. **Power Switch**-Turns 230 VAC ON/OFF to the boiler.
31. **Air box**-The air box houses the combustion air filter.
32. **Air pressure switch (117 and 235 models only)**-The air pressure switch detects blocked flue/inlet conditions. breaking the control circuit, shutting the boiler down.
33. **Pump relays**-The pump relay is used to connect the boiler, system and DHW pumps.
34. **Transformer**-The transformer provides 24V power to the integrated control.
35. **High limit sensor (housed with the outlet temperature sensor)**-Device that monitors the outlet water temperature. If the temperature exceeds its setting, the integrated control will break-the control circuit, shutting the boiler down.
36. **Air Filter (not shown)**-The air filter prevents dirt and debris from entering the burner and is installed inside the air box (33).

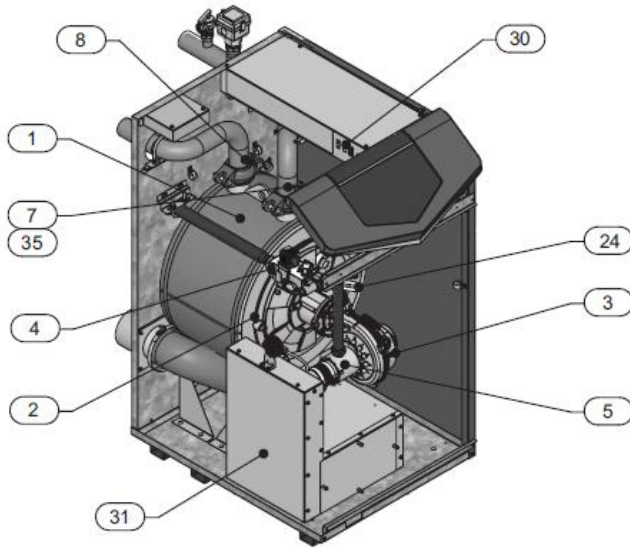
FIGURE 3 HERALD MODEL HCB117 EXPLODED VIEW.



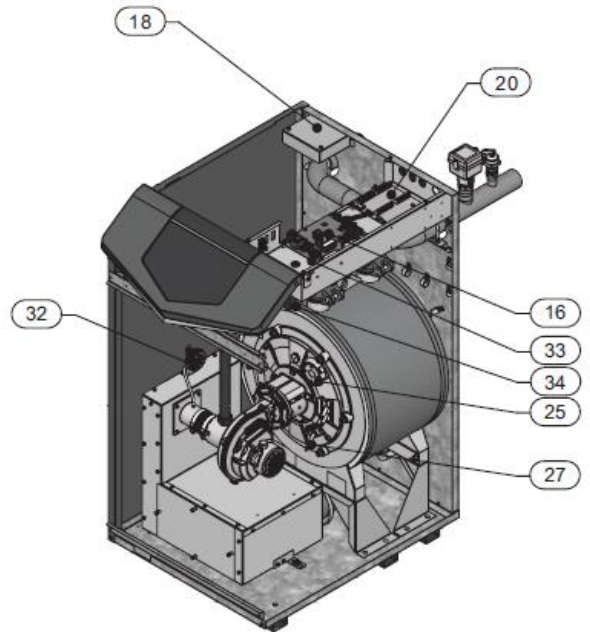
Front view



Rear view

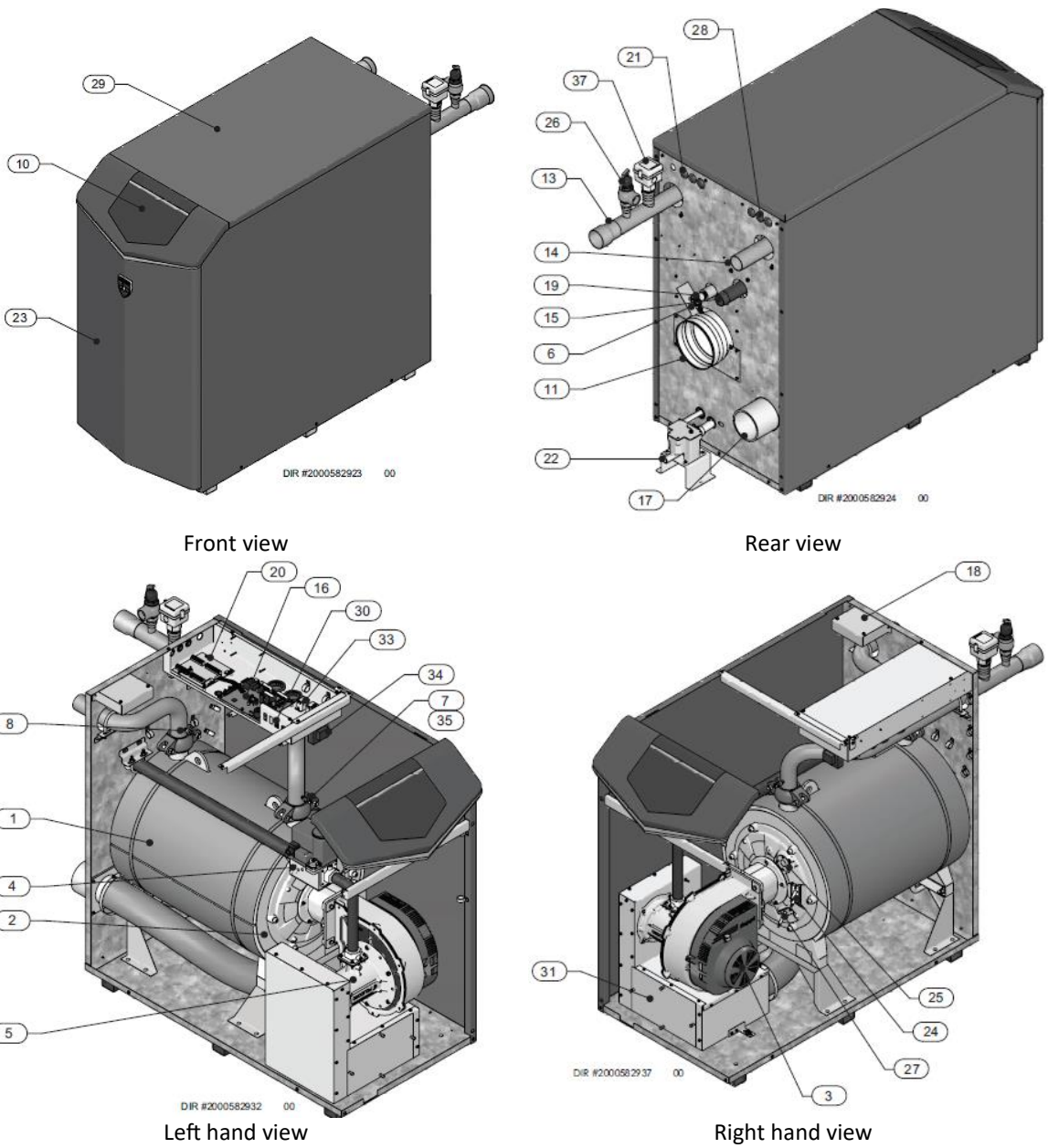


Left hand side view



Right hand side view

FIGURE 4 HERALD MODEL HCB190-HCB295 EXPLODED VIEW

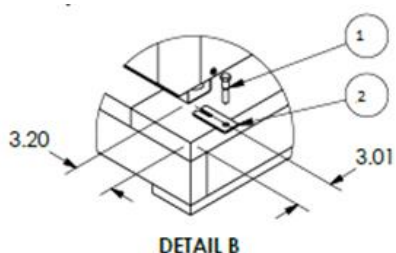


PACKAGING

Unpack the boiler as close as possible to the site of final installation to prevent damage to the appliance during manoeuvring. Carefully inspect the boiler for any damage and report immediately to Lochinvar customer service if any is found.

The boiler is supplied on a pallet, to remove first remove the four bolts securing the boiler to the pallet as in detail B. See [Figure 5](#)

FIGURE 5 DETAIL B



Carefully remove the boiler from the pallet without dropping as this may cause damage to the boiler.

CONDITIONS

The boiler is suitable for room-sealed and for open flue combustion: For room-sealed combustion, the air inlet does not depend on the installation site. For open combustion, you must comply with the local applicable directives and ventilation regulations for open boilers. ([See section on ventilation](#))

Ambient conditions

The installation site must be frost-free. If necessary, adjust the installation site to keep it frost-free. Make sure that the ambient conditions are correct to prevent malfunction of the electronics in the water heater.

Air humidity and ambient temperature	
Humidity	Max 93% RH at +25°C
Temperature	≤40°C as per BS6644

The equipment must be installed on a level surface that is capable of adequately supporting its weight (when filled with water) and any ancillary equipment. The operation of the equipment must not cause the temperature of any combustible material in the vicinity of the equipment and its flue to exceed 65°C. If such a situation is unavoidable, appropriate insulation should be provided.

Caution



Locate the equipment so that if the appliance or any connecting pipework should leak, water damage will not occur. When such locations cannot be avoided it is recommended that a suitable drain pan be installed under the equipment. The pan should be adequately drained but must not restrict the combustion or ventilation airflow.

Corrosion of the heat exchanger coils, and flue system may occur if air for combustion contains certain chemical vapours. Such corrosion may result in poor combustion and create a risk of asphyxiation. Aerosol propellants, cleaning solvents, refrigerator and air conditioning refrigerants, swimming pool chemicals, calcium and sodium chloride, waxes and process chemicals are corrosive. Products of this sort should not be stored near the boiler or outside by the air intake (if applicable). The fitting of this equipment in a situation where aerosols or other chemicals may be entrained into the combustion air will invalidate the warranty.

WATER COMPOSITION

The Lochinvar Herald contains a stainless-steel heat exchanger; therefore, care must be exercised to ensure that the system water and any water treatment are compatible. Whenever a new boiler is connected to an existing system, the pipework must be thoroughly cleaned and flushed to remove debris, rust particles, carbonate deposits and any existing water treatment that might be incompatible with the heat exchanger. If the existing system is in poor condition and/or cannot be pressurised, then consideration should be given to using a Plate system separator. [See Figure 9](#), new systems must also be thoroughly flushed to remove debris and flux deposits.



Note

Failure of the heat exchanger due to deposits in the water are not covered under the boiler warranty. For advice on system treatment or separation contact Lochinvar

Whilst chemical inhibitors remove oxygen from the water, due to uncertainty in dosing levels, there is the possibility that the inhibitor will eventually be diluted to the point where it is no longer effective. To ensure there is effective air separation and removal, an air separator should be fitted to the hottest part of the system, in accordance with the item manufacturer's instructions. In addition to this a means of dirt removal (e.g., dirt separator or strainer) should be fitted to the boiler return pipework to prevent the accumulation of debris within the heat exchanger coils.



Note

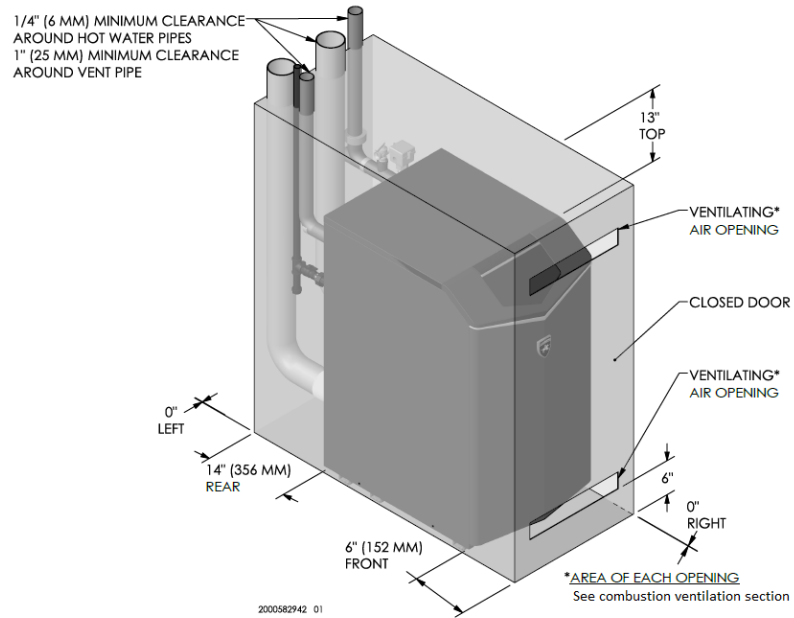
The use of chemical inhibitors alone will not satisfy the terms of the heat exchanger warranty

WORKING CLEARANCES

To maintain sufficient clearances for cooling and access for maintenance the Herald should have the following clearances:

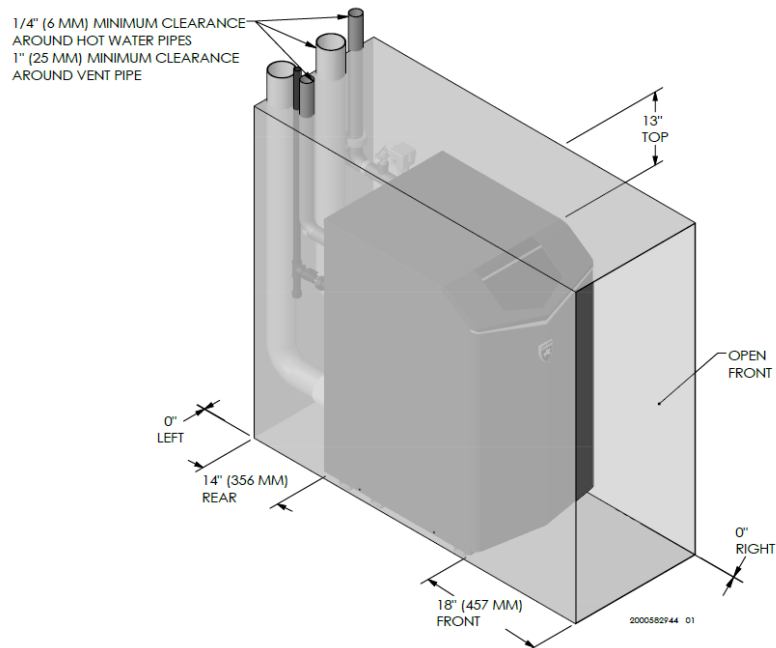
INSTALLATION IN A COMPARTMENT

FIGURE 6 COMPARTMENT CLEARANCES



INSTALLATION WITHIN A PLANTROOM

FIGURE 7 PLANTROOM CLEARANCES



[See ventilation requirements](#)

INSTALLATION SCHEMATIC S

FIGURE 8 SINGLE BOILER WITH LOW LOSS HEADER

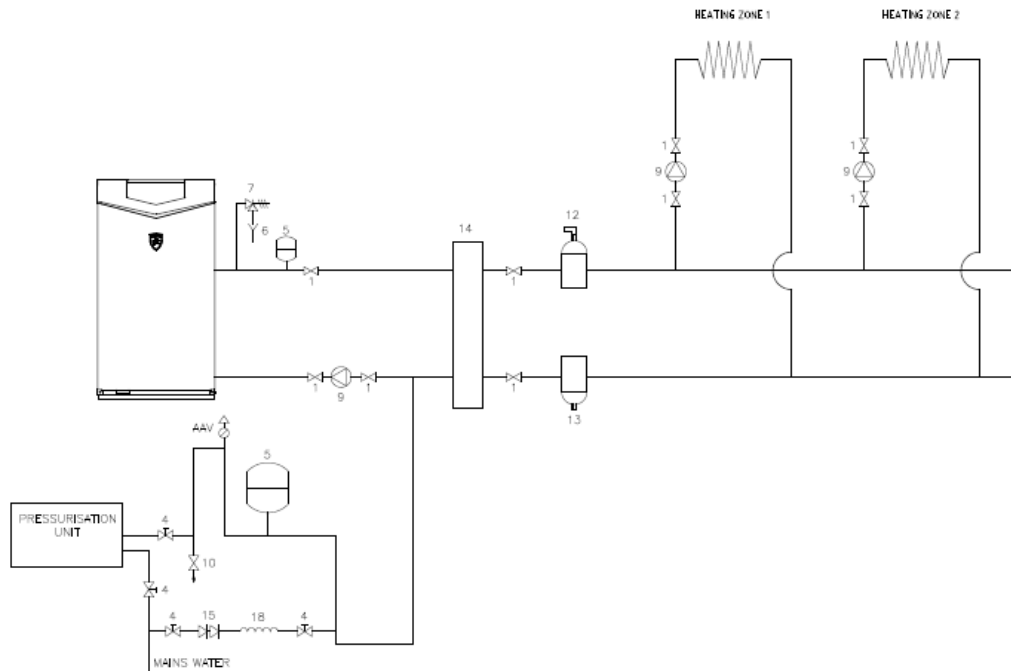


FIGURE 9 TWO BOILERS WITH LOW LOSS HEADER

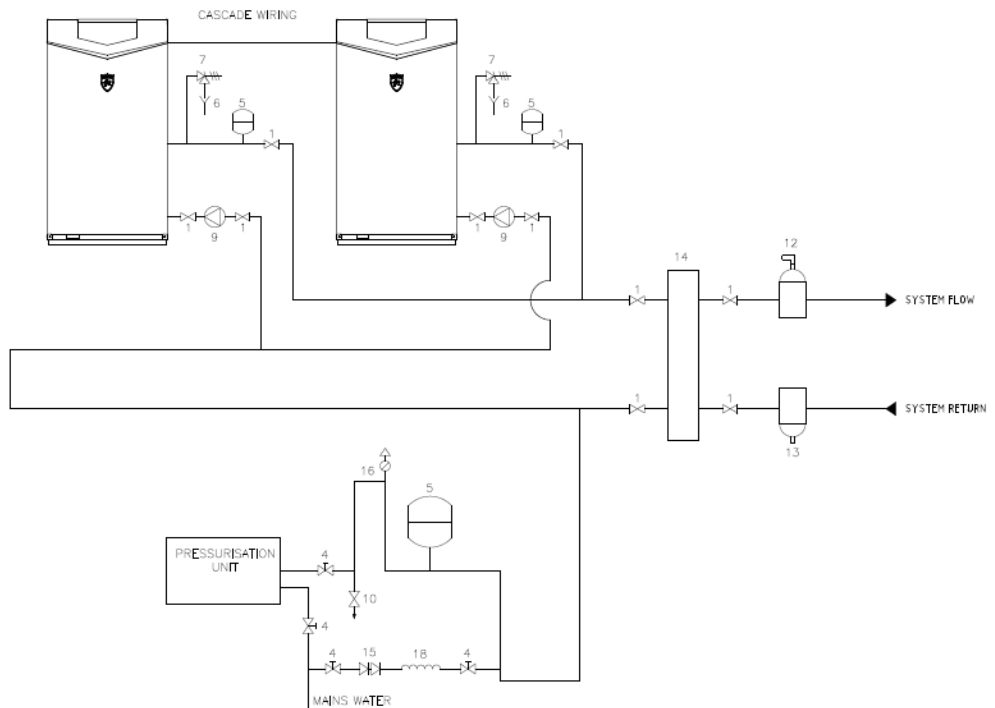


TABLE 1 KEY TO DRAWINGS

Key to drawings	
Item	Description
1	Isolation valve
3	Non return valve
4	Lockshield valve
5	Expansion vessel
6	Tundish
7	Expansion valve (pressure relief)
8	T&P valve
9	Circulating Pump
10	Drain valve
12	Air separator
13	Dirt separator
14	Low loss header
15	Double check valve
18	Temporary fill loop

WATER CONNECTIONS

The requirements of minimum water flow are given in [Table 3](#) boiler flow rates. Recommendations for the water circulation system are given in BS6644 and BS CP342-2. The following notes are of particular importance.

1. It is strongly recommended that a low velocity header be used to separate the primary circuit from the secondary circuit.
2. Circulating pipework not forming part of the useful heating surface should be insulated. Cisterns, expansion vessels and pipework situated in areas exposed to freezing conditions should also be insulated.
3. Drain valves must be in accessible positions that will permit draining of the entire system including the boiler.
4. Tapping sizes for connection to the system are detailed in [Table 2](#) connections.
5. Ideally, individual valves should be fitted to each unit to enable isolation from the system. The arrangement must comply with the requirements of BS6644 and must incorporate a small expansion vessel and correctly sized safety valve.

A suitably sized low velocity header or plate separator is available from Lochinvar Limited as ancillary item.

OPEN VENTED ARRANGEMENT

The Lochinvar Herald can be used in an open vented arrangement provided that a vent pipe in accordance with BS CP342-2 or BS6644 as appropriate is fitted. The minimum static head requirement for an open vented system is 1bar.

SEALED SYSTEM ARRANGEMENT

If a sealed system arrangement is required, a suitable pressurisation unit is available from Lochinvar Limited on request. Sealed systems should incorporate a safety valve with a lift pressure no greater than the maximum pressure rating of any component in the heating system. The maximum working pressure of the boiler is 11.0 bar. A suitably sized expansion vessel should also be fitted to the system in accordance with BS EN 13831.

Caution



If the heating system features plastic piping such as that used for underfloor heating it must contain an oxygen barrier to prevent air from entering the system. Failure of the boiler due to excess air is not considered a fault and would not be covered under warranty. Most UK supplied plastic pipe will be suitable, but this should be checked with the manufacturer.

PRIMARY PIPING ARRANGEMENTS

1. BOILER SYSTEM PIPEWORK MUST BE SIZED AT LEAST AS PER THE REQUIREMENTS SHOWN IN TABLE 5 PIPEWORK HEADER SIZING

Header sizing at a 20K dt

- . Reducing the pipe size will restrict the flow rate through the boiler causing high limit shutdown and poor system performance.
- 2. A boiler shunt pump will be required to pump water between the boiler and low loss header or plate separator, this should be a fully modulating type and will be controlled via the Herald boiler control. This pump should be sized on the pressure drop of the boiler and associated primary pipework run. A suitable shunt pump can be supplied as an ancillary by Lochinvar, or we can assist in ensuring your own pump is suitable.
- 3. Suitable boiler isolation valves should be fitted to allow the boiler to be drained without shutting the whole system, these must be full port type valves.
- 4. A pressure relief valve should be fitted as per the requirements of BS6644.
- 5. A suitable boiler expansion vessel should be fitted as per the requirements of BS6644.
- 6. A filter should be fitted on the return to each boiler after the shunt pump to protect the heat exchanger against debris in the system.

FIGURE 10 BOILER CONNECTIONS

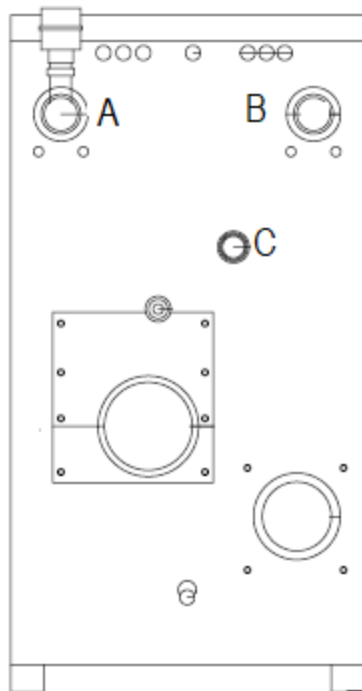


TABLE 2 BOILER PIPEWORK CONNECTION SIZES

Boiler	Water connections A and B	Gas connection C
HCB117	2"	1"
HCB190	2"	1¼"
HCB235	2"	1¼"
HCB295	2½"	1¼"

TABLE 3 BOILER FLOW RATES AND PRESSURE DROP.

Model	Minimum pipe size	11K DT		19.44K DT	
		l/sec	kPa	l/sec	kPa
HCB117	2"	2.4	29.9	1.4	12.0
HCB190	2"	3.9	47.8	2.3	20.9
HCB235	2"	4.8	50.8	2.8	26.9
HCB295	2½"	6.1	53.8	3.4	17.9

BOILER SHUNT PUMP

Lochinvar supplied boiler shunt pumps have been sized assuming the following criteria.

1. Primary pipework has been sized according to [Table 5](#).
2. 6 Metres of pipework, 4no 90 elbows and 2no fully ported valves.

TABLE 4 HERALD SHUNT PUMPS

Primary shunt pump				
Model	11k		20k	
HCB117	Magna 3 40/60	LM900338A	Magna 3 40/60	LM900338A
HCB190	Magna 3 40/120	LM900339A	Magna 3 40/60	LM900338A
HCB235	Magna 3 40/150	LM900340A	Magna 3 40/60	LM900338A
HCB295	Magna1 50/180	LM900392A	Magna 3 40/150	LM900340A

Warning



The modulating pump 0-10v must be controlled via the Herald boiler to ensure the correct flow rate is always maintained. If the modulating pump is controlled externally this can cause low flow rates across the boiler which may cause permanent damage to the heat exchanger. Any such damage caused will not be covered by the boiler warranty.

[Table 5](#) shows the pipework header sizing required to ensure the correct flow rate is maintained between the Herald boiler primary circuit and the heating secondary circuit at a 20K dt.

Using the example schematics shown and assuming the Herald Boiler is an HCB190 in both cases the header would be sized as:

Single unit = as there is only a single heater there is no common header so all the pipework should be 54mm.

Two units = the common header shown in red (B) should be sized according to the table at 76mm with the pipework between the header and each individual units shown in blue (A) at 54mm.

TABLE 5 PIPEWORK HEADER SIZING

Header sizing at a 20K dt

MODEL	PIPEWORK (A) BLUE SIZE (mm)		PIPEWORK (B) RED SIZE (mm)	
	NUMBER OF HERALD BOILERS			
	1	2	3	4
HCB117	54	54	67	76
HCB190	54	76	76	108
HCB235	54	76	108	108
HCB295	67	108	108	108

FIGURE 11 SINGLE BOILER PRIMARY PIPEWORK SIZING

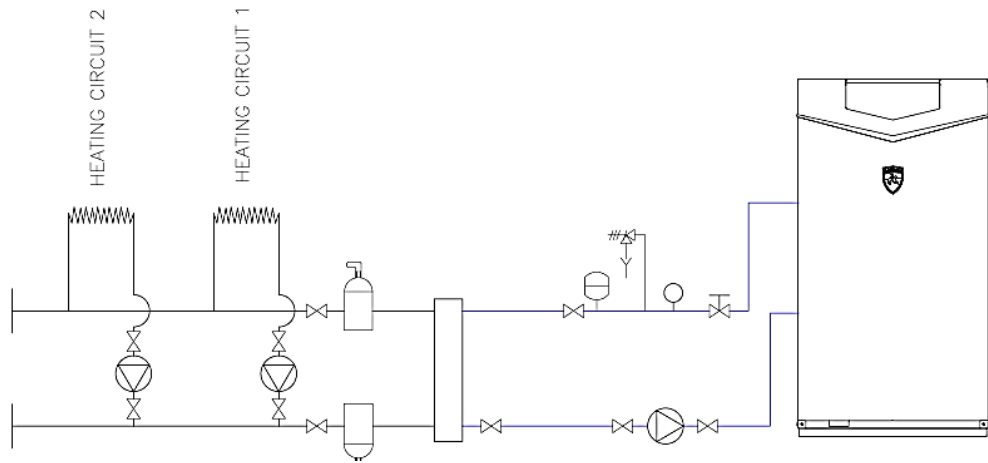
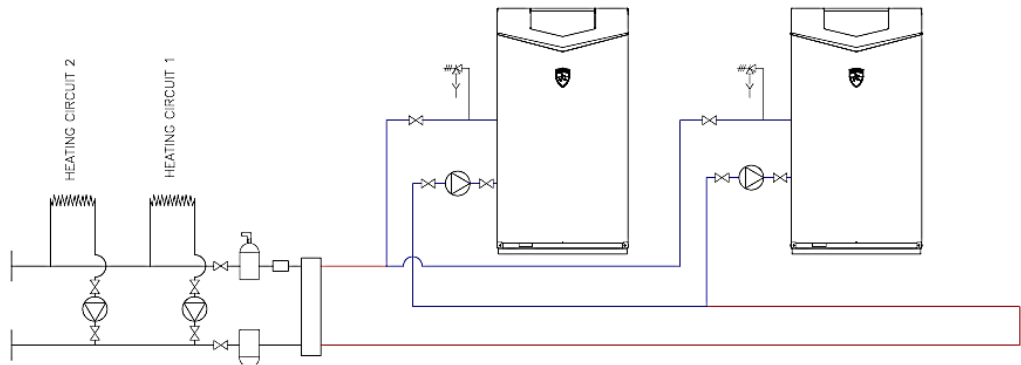


FIGURE 12 MULTIPLE BOILER PRIMARY PIPEWORK SIZING



Caution



The pipework header between the primary Herald Boiler circuit and the secondary heating circuit must be sized as per the guidance given in this section. Failure to use the correct size of pipe header will cause operational problems and potential early failure of the boiler; this will not be covered under the boiler warranty.

If your installation is outside the scope of this guidance, please contact Lochinvar Technical support before proceeding with the installation.

CONDENSATE DRAINPIPE

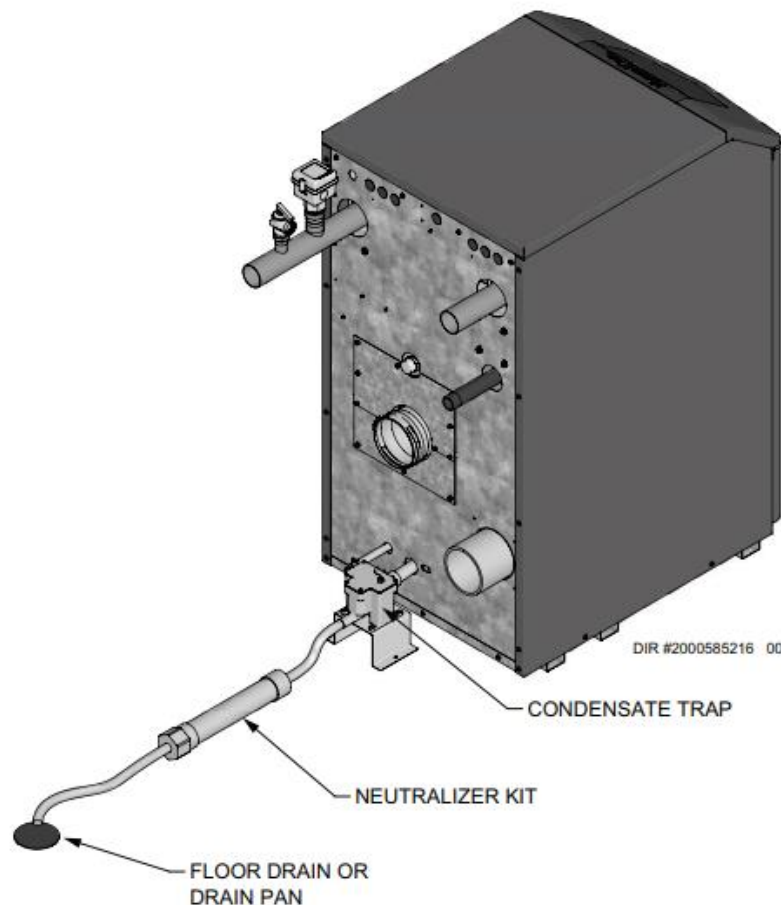
The condensate drain is placed at the centre and at the bottom of the boiler and has a ½" 12.7mm hose discharge. Connect this hose to the sewer system. Condensate will be slightly acidic with a Ph between 3 and 5.

Use only plastic pipe for the condensate drain. The condensate line must have a continuous fall away from the boiler of 5mm per metre of pipe.

Blockage of this drain might damage the boiler. The drain connection is correct when the condensate can be seen flowing away, e.g., using a funnel. Any damage that might occur, when the drain is not installed correctly, is not covered by the warranty of the boiler.

There must be an open connection of the condensate hose into the sewage system. A possible vacuum in the sewage system must never be able to suck on the boiler's condensate drain hose.

FIGURE 13 CONDENSATE DRAIN LOCATION.



Caution

Before commissioning the boiler and/or after maintenance, the condensate trap must **ALWAYS** be filled with water. This is a safety measure: the water in the condensate trap keeps the flue gases from leaking out of the heat exchanger via the condensate drain.

GAS CONNECTION



Warning

Strain on the gas valve and fittings may result in vibration, premature component failure and leakage and may result in a fire, explosion, property damage or serious injury. Do not use an open flame to test for gas leaks. Failure to follow these instructions may result in fire.

The Lochinvar Herald range is suitable for use on second family gasses 2H - G20 - 20mbar.
Service pipes

The local gas distributor must be consulted at the installation planning stage to establish the availability of an adequate supply of gas. An existing service pipe must not be used without prior consultation with the local gas distributor.

Gas meter

A new gas meter will be connected to the service pipe by the local gas distributor contractor. An existing gas meter should be checked, preferably by the gas distributor, to ensure that it is adequate to deal with the rate of gas supply required.

Supply pipes

Supply pipes must be fitted in accordance with IGE/UP/2. Pipework from the meter to the equipment must be of adequate size. The complete installation must be purged and tested as described in IGE/UP/1.

Boosted gas supplies

Where it is necessary to employ a gas pressure booster, the controls must include a low-pressure cut-off switch at the booster inlet. The local gas distributor must be consulted before a gas pressure booster is fitted. For details of how to connect a low-pressure cut-off switch, please refer to [Page 45 Low Voltage Connections](#).

Plant room control valve

A manual valve for plant-room isolation must be fitted in the gas supply line. It must be clearly identified and readily accessible for operation, preferably by an exit.

Equipment isolation valve

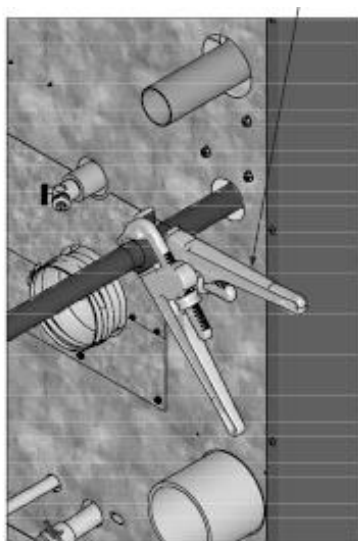
An approved gas-inlet appliance isolating valve and union should be installed for each unit in a convenient and safe position and be clearly marked. Ensure that the gas-inlet appliance isolating valve is in the OFF position. Although the equipment receives a gas leak check and gas train component integrity check prior to leaving the factory, transit and installation may cause disturbance to unions, fittings, and components. During commissioning a further test for tightness should be carried out on the equipment gas pipework and components. All gas pipes must be supported and must not be allowed to hang on the boiler or accessories.



Warning

The gas valve and fan will not support the weight of the gas pipe, do not attempt to support the weight of the pipe on the boiler or accessories. This could result in an unsafe situation.

When connecting /fitting any pipework to the boiler supplied gas pipe a second wrench must be used to prevent the gas pipe within the boiler turning as per drawing below.



Caution

Before carrying out any gas pressure testing on the system pipework close the manual isolation valve on the boiler if the test pressure is to be above 30mbar. The appliance must be checked for leaks using a suitable leak detection fluid.



Warning

Take care not to allow leak detection fluid to get onto any electrical components. Or connections



Warning

Herald boilers are not suitable for use on LPG gas

FLUE SYSTEM

All versions of the Herald Condensing boiler (except the HCB295) can be installed as either type B23 (fan assisted open flue) or C13, C33, C53 (room sealed) appliances. See the relevant section for details of each flue type and requirements. Standard flue kits are available as an ancillary item, these include the standard pieces to start the flue system, additional elbows, extensions will probably be required depending upon site installation requirements. Model HCB235 is suitable for B23 or C63 flue systems only and model HCB295 is suitable for C63 installation only, i.e., flue supplied by others.



Caution

Install the horizontal flue components with an angle of 3° back in the direction of the boiler (roughly equal to five centimetres for every linear meter). Failure to install the flue correctly will result in a build-up of condensate within the flue pipework that will cause early component failure.



Note

When using a wall terminal, there is the possible risk of ice building-up on surrounding parts/structures, because the condensate will freeze. This risk should be considered during the design phase of the heating installation.



Note

Herald boilers will produce large condensate clouds especially during cold weather, consideration must be taken as to whether this will cause a nuisance to neighbouring properties and if so alternative flue arrangements used.



Note

Herald boilers can operate with very low flue temperatures; as such the flue system used must be suitable for use with condensing appliances made from either Polypropylene or stainless steel and have a temperature class of T120.



Note

Before installation of any flue system read the installation manual carefully for both the appliance and flue system to be used. Information on the flue system Supplied by Lochinvar can be found within this manual.



Caution:

Aluminium flue pipe must not be used on this appliance as it may lead to premature failure of the heat exchanger and will invalidate the warranty.

Detailed recommendations for the flue system are given in BS6644 for equipment above 70kW net and IGE/UP/10 for equipment of rated input above 54kW net. The following notes are intended to give general guidance only.

FLUE DISCHARGE

The flue system must ensure safe and efficient operation of the equipment to which it is attached, protect the combustion process from wind effects and disperse the products of combustion to open external air.

The flue must terminate in a freely exposed position and be so situated as to prevent the products of combustion entering any opening in a building.

Under certain operating and weather conditions, the Herald boiler may generate a plume at the terminal. Consideration should be given to the nuisance this may cause and the terminal should be sited according to IGEMUP10. [See Flue terminal positions](#)

Condensate drain

If the flue system rises at an angle of at least 3° (50mm per metre), no additional condensate drain will be required. Failure to provide an adequate rise in the flue system may lead to pooling of condensate which may lead to premature failure of the flue system.

CLEAN AIR ACT

For any termination or group of terminations with a total net heat input exceeding 333 kW, the general requirements of the clean air act shall apply, and approval must be sought from the Local Authority prior to commencement of the installation.

Horizontal flue terminations (other than for fan diluted flues) are not permitted for any termination or group of terminations with a total net heat input exceeding 333 kW net heat input.

Notice:



If the total combined net input of the installation is > 333kW then approval of the height and position of any termination must be obtained from the local authority BEFORE installation to satisfy the requirements of the clean air act.



For flue gas type B23, C13, C33, C43 systems, use only flue gas and air supply parts of the approved supplier M&G group (Muelink & Grol) and only the parts mentioned in the DoP (declaration of performance): “No 001-MG-PP DoP” and No 001-MG-RVS DoP”. (With exception of O4 and O5) The concerning DoP’s can be found at the website of Muelink & Grol <https://www.mg-flues.com/certifications>

The following Manuals for parts supplied by Muelink & Grol are applicable:

- Regulations regarding flue gas systems PP(s)
 - Installation instructions clamps: Checklist
 - Installation instructions Skyline 3000
 - - Installation instruction Multiline PP (Cascade)
-



Aluminium flue pipe must not be used on this appliance as it may lead to premature failure of the heat exchanger and will invalidate the warranty.

Under no circumstances may this appliance exhaust gases into a masonry chimney.

For Horizontal flue terminations not exceeding 333 kW net heat input (other than for fan diluted flues) the general requirements of this Section shall apply. However, for any termination or group of terminations the risk assessment ([see risk assessment](#)) shall be completed to ensure compliance and maybe subject to approval by the local Environmental Health Officer (EHO).

FLUE TERMINAL POSITIONS

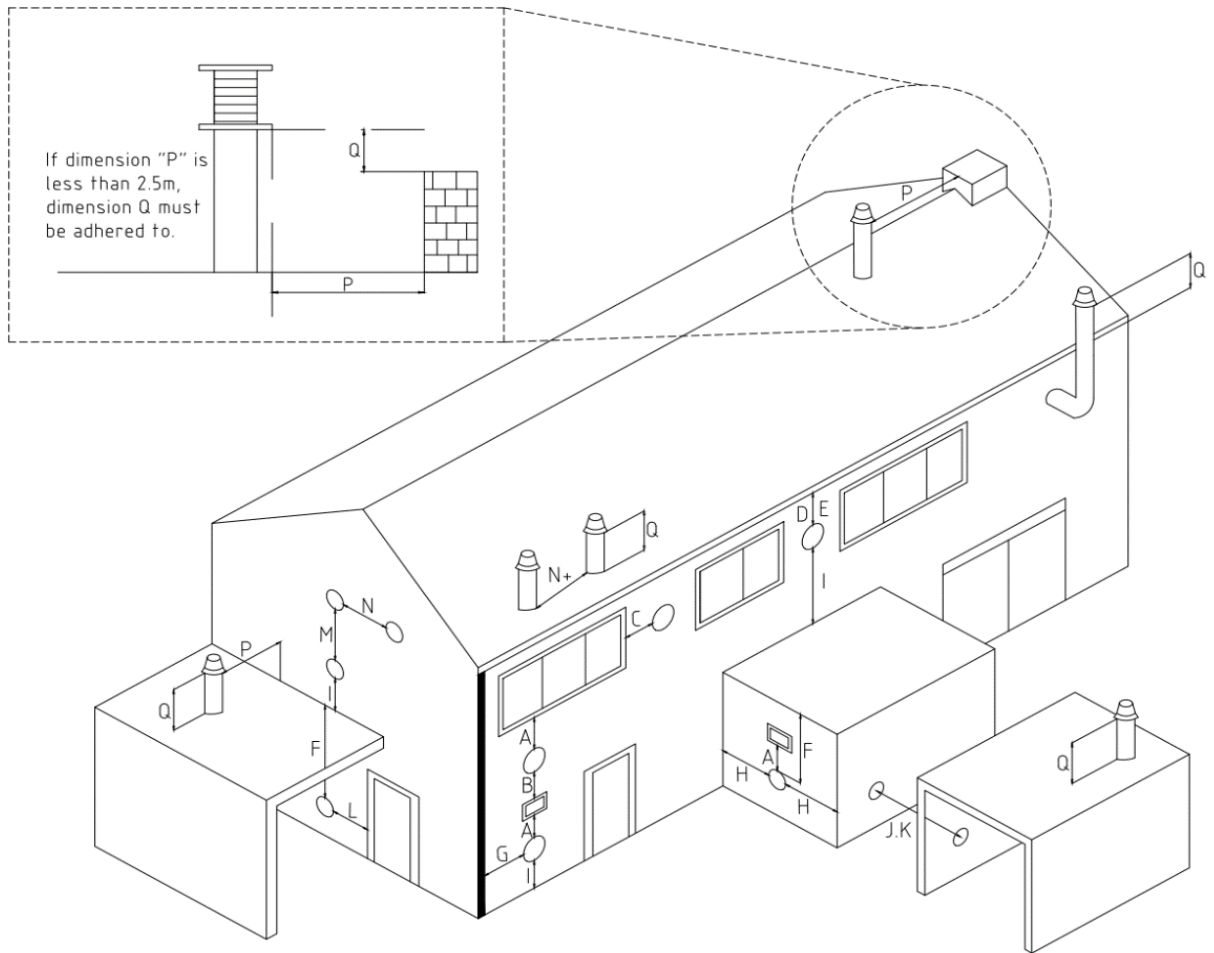


TABLE 7 FLUE TERMINAL POSITIONS (USE IN CONJUNCTION WITH ABOVE)

Location	Description	HC B117	HC B190	HC B235	HC B295
A	Directly below an opening, air brick, opening windows etc.	2500	2500	2500	n/a
B	Above an opening, air brick, opening windows etc.	94	94	94	n/a
C	Horizontally to an opening, air brick, opening windows etc.	940	1468	1793	n/a
D	Below a gutter or sanitary pipework	200	200	200	n/a
E	Below the eaves	200	200	200	n/a
F	Below a balcony or car port roof	Not recommended see UP10 risk assessment			
G	From a vertical drain or soil pipe	150	150	150	n/a
H	From an internal or external corner	2087	3775	4816	n/a
I	Above ground, roof or balcony level	300	300	300	n/a
J	From a surface facing the terminal	-619	-619	-619	n/a
K	From a terminal facing the terminal	648	648	648	n/a
L	From an opening in the car port (e.g. door, window) into the dwelling	Not recommended see UP10 risk assessment			
M	Vertically from a terminal on the same wall	940	1468	1793	n/a
N	Horizontally from a terminal on the same wall	940	1468	1793	n/a
P	From a vertical structure on the roof	113	113	113	n/a
Q	Above intersection with the roof	425	620	740	n/a

Further to the requirements in IGEM/UP/10 Edition 4 +A: 2016 Section 8 under clause 8.7.3.3 and Figure 7 the following risk assessment gives guidance for the positioning of horizontal flues. This form should be completed before work commences and undertaken by a person who is competent to undertake the risk assessment.

Type C appliances with net heat input exceeding 70 kW and not exceeding 333 kW low level flue discharge risk assessment (including net heat input for groups of appliances)			
No.	Regarding the flue position	No	Yes
1	Is the proposed flue termination within the distance in Figure K of a road, path, track, thoroughfare, walkway, property boundary or area, which is used for general public access other than for maintenance purposes?	No	Yes
2	Is the proposed flue termination within the distance in Figure K to a playground, school, yard, seating area, or area where there may be a public gathering	No	Yes
3	If the proposed flue termination enclosed on more than two sides, then does it comply with the requirements of Figure 11B?	No	Yes
4	Is the proposed flue termination within the distance in Figure K of a surface or building element that may be affected by corrosion or deterioration from plume condensate?	No	Yes
5	Is the proposed flue position in an area where vehicles could be parked within distances from Figure 12 Line G to the flue?	No	Yes
6	Are there shrubs or trees within minimum distances shown on Figure K of the proposed terminal position?	No	Yes
7	Is the proposed flue termination within a light well?	No	Yes
8	Are the products of combustion from the proposed flue position likely to build up under unfavourable atmospheric conditions, due to poor cross flow of air caused by enclosures or adjacent structures and/or likely to cause nuisance?	No	Yes
9	Is the flue termination position likely to cause a nuisance to adjoining properties?	No	Yes
Building Regulations part J			
10	Is the proposed flue termination less than 300 mm from the boundary of the property, as measured from the side of the terminal to the boundary?	No	Yes
Regarding the Clean Air Act			
11	Is the total output of the individual, or group of flue terminals (if within 5U (see A3.7)), greater than 333 kW net heat input?	No	Yes
General			
12	Are there any other considerations that are required for this risk assessment, see separate sheet.	No	Yes
13	Comments:		
If all answers are Blue, then the flue position should be suitable			
If any answer is Orange, then the flue position is unsuitable, consider revising the position or type of flue outlet or contact the local Environmental Health officer for assistance and/or approval			

APPROVED FLUE SYSTEMS

The Herald boiler is approved for use on the following types of flue system, which are described in more detail on the following pages:

Installation type	Version	Description
B23	Open	Air for combustion is drawn from the installation room and flue gas outlet via a horizontal wall or vertical roof terminal

Installation type	Version	Description
C13	Closed	Concentric or parallel flue system with horizontal air inlet and flue gas outlet within the same pressure zone
C33	Closed	Concentric and/or parallel flue system vertical air inlet system and flue gas outlet, within the same pressure zone

Installation type	Version	Description
C43	Closed	Boilers on a common air inlet and flue gas outlet, (concentric and/or parallel) in a multiple floor building
C53	Closed	Separate air inlet and flue gas outlet, terminal types may be mixed. Air inlet and flue gas outlet may be in different pressure zones

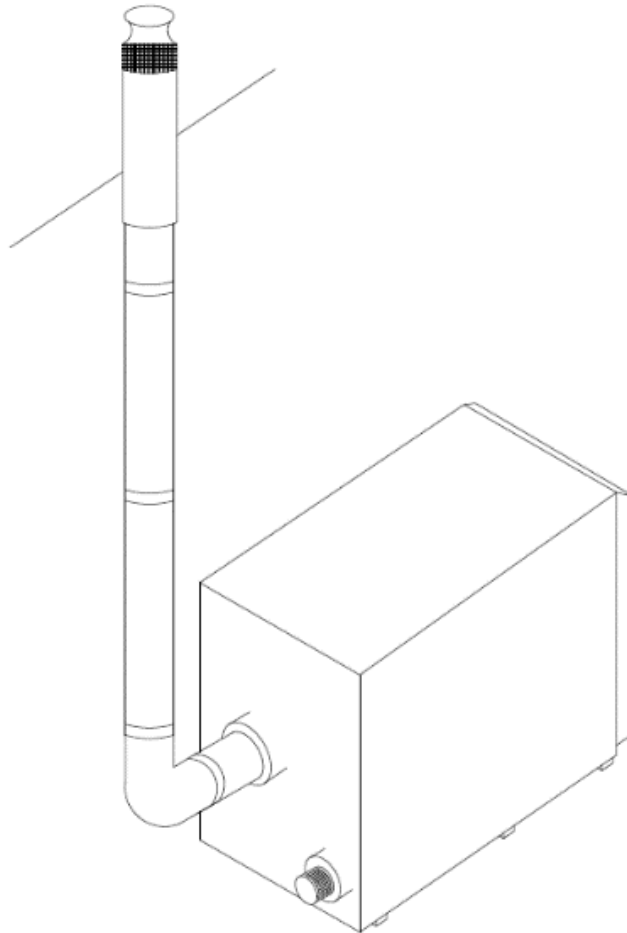
Installation type	Version	Description
C63	Closed	Boiler supplied without venting materials. These boilers must be installed in compliance with local regulations and is intended to be connected to a separately approved flue system.

B23 FLUE SYSTEMS

Flue system specifications

- MANUFACTURER MUELINK AND GROL (M&G)
- TEMPERATURE CLASS T120
- FLUE GAS MATERIAL PP

Model Number		HC B117	HC B190	HC B235	HC B295
FLUE DATA TYPE B₂₃					
Nominal flue diameter	mm	150	150	150	150
Minimum flue gas temp	°C	35			
Average flue gas temp	°C	70			
Maximum flue gas temp.	°C	120			
Maximum equivalent length	m	27	27	16	N/A
Roof terminal	m	1	1	0.55	N/A
Equivalent length 90° bend – mm	mm	7.1	7.1	7.1	N/A
Equivalent length 45° bend – mm	mm	1.8	1.8	1.8	N/A
Flue draught requirements	mbar	-0.03 to -0.1			



B23 Flue starter kit HCB117

Item no EKWCF010			
Starter kit HCB117			
Item	Item No	No	Equivalent length meter
EXPANDER Ø100mm - Ø130mm PP	M85126	1	0.3
EXPANDER Ø130mm - Ø150mm	M70262	1	0.3
SAMPLING POINT Ø150mm PP	M70326	1	0.3
BEND 90° Ø150mm PP	LV310665	1	7.1
APPLIANCE AIR INLET GUARD Ø100mm	M86787	1	0
Total equivalent length meter			8

B23 Flue starter kit HCB190-235

Item no EKWCF011			
Starter kit HCB190-235			
Item	Item No	No	Equivalent length meter
SAMPLING POINT Ø150mm PP	M70326	1	0.3
BEND 90° Ø150mm PP	LV310665	1	7.1
APPLIANCE AIR INLET GUARD Ø100mm	M86787	1	0
Total equivalent length meter			7.4

B23 Additional flue items available

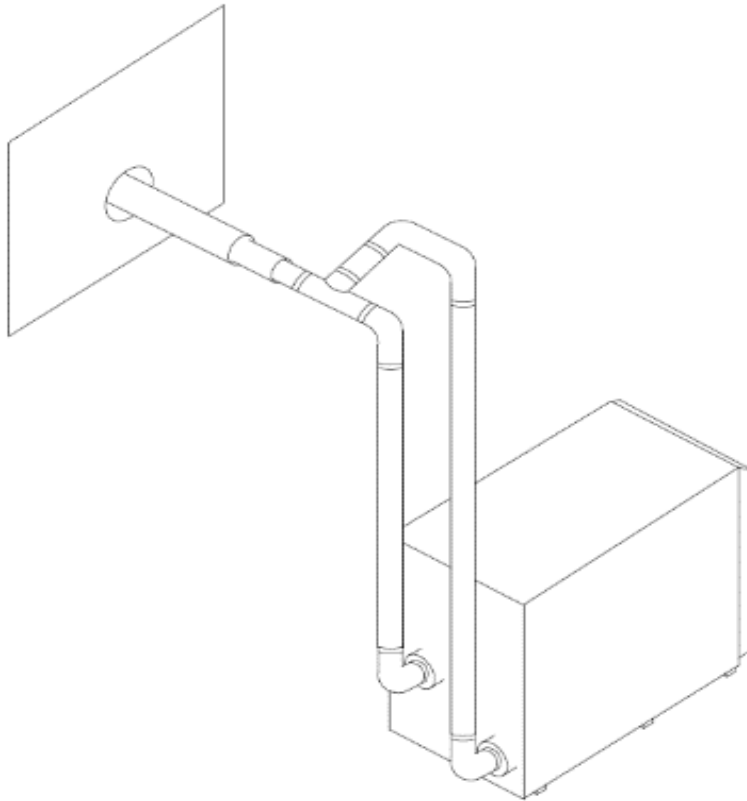
Model HCB117-190-235		
Item	Item No	Equivalent length meter
EXTENSION Ø150mmPP CUT TO LENGTH (2000mm)	LV310695	2
EXTENSION Ø150mmPP CUT TO LENGTH (1000mm)	LV310694	1
BEND 45° Ø150mm PP	LV310664	1.8
BEND 90° Ø150mm PP	LV310665	7.1
ROOF TERMINAL 150MM	M70359	1
WALL CLAMP Ø150mm	M87196	n/a
FLAT ROOF FLASHING (170mm) ALU	LV302509	n/a
SLOPING ROOF FLASHING Ø100/150mm (25°-45°) LEAD	LV306017	n/a

C13 FLUE SYSTEMS

Flue system specifications

- MANUFACTURER MUELINK AND GROL (M&G)
- TEMPERATURE CLASS T120
- FLUE GAS MATERIAL PP

Model Number		EKW117	EKW190	EKW235	EKW295
FLUE DATA TYPE C₁₃ & C₃₃					
Nominal flue diameter	mm	150	150	150	150
Nominal air inlet diameter	mm	150	150	150	150
Minimum flue gas temp	°C	35			
Average flue gas temp	°C	70			
Maximum flue gas temp.	°C	120			
Maximum equivalent length	m	27	27	N/A	N/A
Roof terminal	m	1	1	N/A	N/A
Wall terminal	m	0.86	0.86	N/A	N/A
Equivalent length 90° bend	mm	7.1	7.1	N/A	N/A
Equivalent length 45° bend	mm	1.8	1.8	N/A	N/A



C13 Flue starter kit HCB117

Item no EKWHF010			
Starter kit HCB117			
Item	Item No	No	Equivalent length meter
EXPANDER Ø100mm - Ø130mm PP	M85126	2	0.6
EXPANDER Ø130mm - Ø150mm	M70262	2	0.6
SAMPLING POINT Ø150mm PP	M70326	1	0.3
BEND 90° Ø150mm PP	LV310665	2	14.2
HORIZONTAL TERMINAL Ø150/220mm ALU	M76561	1	5
Total equivalent length meter			20.7

C13 Flue starter kit HCB190-235

Item no EKWHF011			
Starter kit HCB190			
Item	Item No	No	Equivalent length meter
EXPANDER Ø100mm - Ø130mm PP	M85126	1	0.6
EXPANDER Ø130mm - Ø150mm	M70262	1	0.6
SAMPLING POINT Ø150mm PP	M70326	1	0.3
BEND 90° Ø150mm PP	LV310665	2	14.2
HORIZONTAL TERMINAL Ø150/220mm ALU	M76561	1	5
Total equivalent length meter			20.7

C13 Additional flue items available

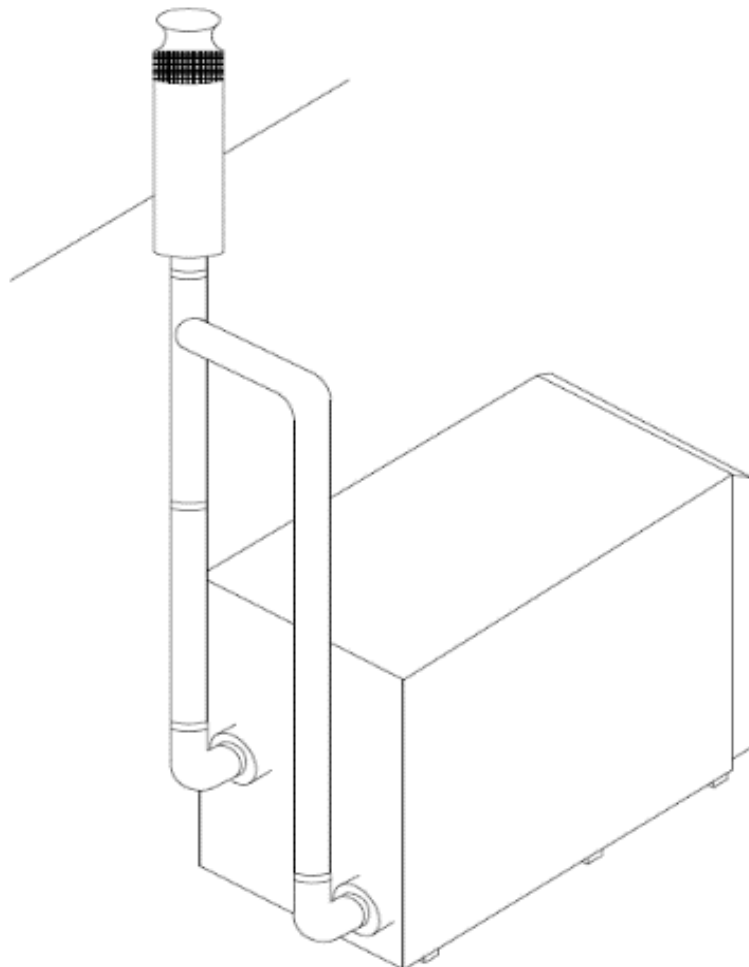
Model HCB117-190-235		
Item	Item No	Equivalent length meter
EXTENSION Ø150mmPP CUT TO LENGTH (2000mm)	LV310695	2
EXTENSION Ø150mmPP CUT TO LENGTH (1000mm)	LV310694	1
BEND 45° Ø150mm PP	LV310664	1.8
BEND 90° Ø150mm PP	LV310665	7.1
WALL CLAMP Ø150mm	M87196	

C33 FLUE SYSTEMS

Flue system specifications

- MANUFACTURER MUELINK AND GROL (M&G)
- TEMPERATURE CLASS T120
- FLUE GAS MATERIAL PP

Model Number		EKW117	EKW190	EKW235	EKW295
FLUE DATA TYPE C₁₃ & C₃₃					
Nominal flue diameter	mm	150	150	150	150
Nominal air inlet diameter	mm	150	150	150	150
Minimum flue gas temp	°C	35			
Average flue gas temp	°C	70			
Maximum flue gas temp.	°C	120			
Maximum equivalent length	m	27	27	N/A	N/A
Roof terminal	m	1	1	N/A	N/A
Wall terminal	m	0.86	0.86	N/A	N/A
Equivalent length 90° bend	mm	7.1	7.1	N/A	N/A
Equivalent length 45° bend	mm	1.8	1.8	N/A	N/A



C33 Flue starter kit HCB117

Item no EKWVF010			
Starter kit HCB117			
Item	Item No	No	Equivalent length meter
EXPANDER Ø100mm - Ø130mm PP	M85126	2	0.6
EXPANDER Ø130mm - Ø150mm	M70262	2	0.6
SAMPLING POINT Ø150mm PP	M70326	1	0.3
BEND 90° Ø150mm PP	LV310665	2	14.2
CONCENTRIC VERTICAL TERMINAL Ø150/220mm ALU	M86929	1	5
Total equivalent length meter			20.7

C33 Flue starter kit HCB190-235

Item no EKWVF011			
Starter kit HCB190			
Item	Item No	No	Equivalent length meter
EXPANDER Ø100mm - Ø130mm PP	M85126	1	0.6
EXPANDER Ø130mm - Ø150mm	M70262	1	0.6
SAMPLING POINT Ø150mm PP	M70326	1	0.3
BEND 90° Ø150mm PP	LV310665	2	14.2
CONCENTRIC VERTICAL TERMINAL Ø150/220mm ALU	M86929	1	5
Total equivalent length meter			20.7

C33 Additional flue items available

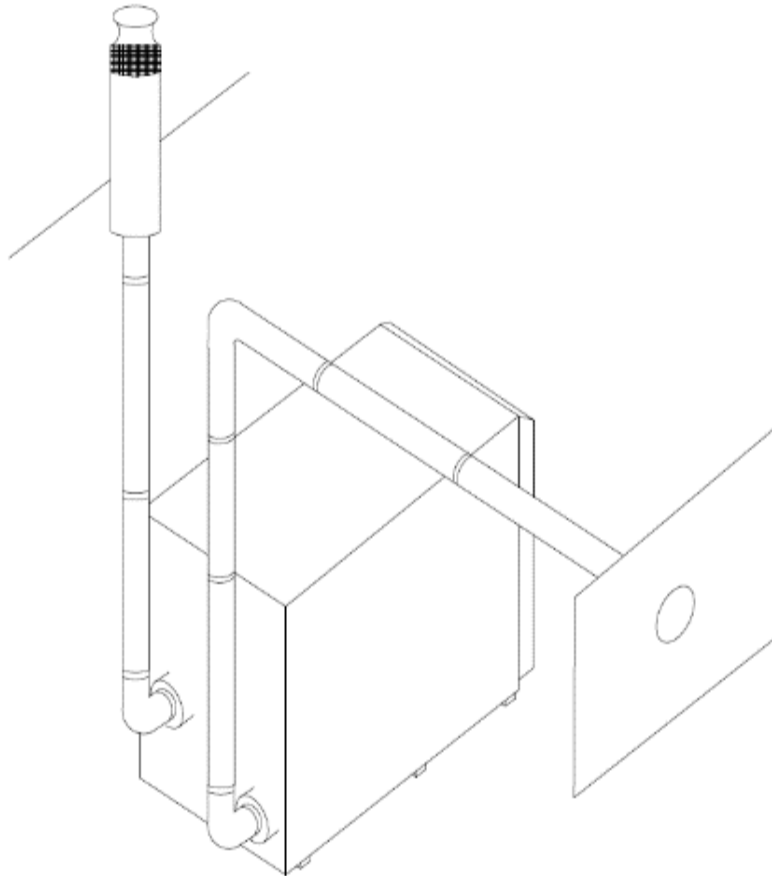
Model HCB117-190-235		
Item	Item No	Equivalent length meter
EXTENSION Ø150mmPP CUT TO LENGTH (2000mm)	LV310695	2
EXTENSION Ø150mmPP CUT TO LENGTH (1000mm)	LV310694	1
BEND 45° Ø150mm PP	LV310664	1.8
BEND 90° Ø150mm PP	LV310665	7.1
WALL CLAMP Ø150mm	M87196	

C53 FLUE SYSTEMS

Flue system specifications

- MANUFACTURER MUELINK AND GROL (M&G)
- TEMPERATURE CLASS T120
- FLUE GAS MATERIAL PP

Model Number		EKW117	EKW190	EKW235	EKW295
FLUE DATA TYPE C₄₃ & C₅₃					
Nominal flue diameter	mm	100	150	150	150
Nominal air inlet diameter	mm	100	100	100	150
Minimum flue gas temp	°C	35			
Average flue gas temp	°C	70			
Maximum flue gas temp	°C	120			
Maximum equivalent length	m	27	27	N/A	N/A
Equivalent length 90° bend	mm	7.1	7.1	N/A	N/A
Equivalent length 45° bend	mm	1.8	1.8	N/A	N/A



C53 Flue starter kit HCB117

Item no EKWTF010			
Starter kit HCB117			
Item	Item No	No	Equivalent length meter
EXPANDER Ø100mm - Ø130mm PP	M85126	2	0.6
EXPANDER Ø130mm - Ø150mm	M70262	2	0.6
SAMPLING POINT Ø150mm PP	M70326	1	0.3
BEND 90° Ø150mm PP	LV310665	2	14.2
AIR INLET TERMINAL Ø150mm	LG800015A	1	1
ROOF TERMINAL 150MM	M70359	1	2
Total equivalent length meter			18.7

C53 Flue starter kit HCB190-235

Item no EKWTF011			
Starter kit HCB190			
Item	Item No	No	Equivalent length meter
EXPANDER Ø100mm - Ø130mm PP	M85126	2	0.6
EXPANDER Ø130mm - Ø150mm	M70262	2	0.6
SAMPLING POINT Ø150mm PP	M70326	1	0.3
BEND 90° Ø150mm PP	LV310665	2	14.2
AIR INLET TERMINAL Ø150mm	LG800015A	1	1
ROOF TERMINAL 150MM	M70359	1	2
Total equivalent length meter			18.7

C53 Additional flue items available

Model HCB117-190-235		
Item	Item No	Equivalent length meter
EXTENSION Ø150mmPP CUT TO LENGTH (2000mm)	LV310695	2
EXTENSION Ø150mmPP CUT TO LENGTH (1000mm)	LV310694	1
BEND 45° Ø150mm PP	LV310664	1.8
BEND 90° Ø150mm PP	LV310665	7.1

WALL CLAMP Ø150mm	M87196	
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C63 FLUE SYSTEMS

In general, Boilers are certified with their own purpose supplied Concentric or Twin Pipe flue systems, C63 certified appliances allow the installer to use other flue systems when installing the Boilers however, they must be of a suitable minimum standard as per Table below.

Model Number	Item	HCB117	HCB190	HCB235	HCB295
Minimum flue gas temp	°C	35	35	35	35
Average flue gas temp	°C	70	70	70	70
Maximum flue gas temp	°C	120	120	120	120
Flue gas mass rate (@9.0% CO ₂)	g/sec	57.72	80.73	102.18	129.94
Pressure available at the flue outlet	Pa	169	183	190	196

TABLE 8 FLUE GAS MATERIAL SPECIFICATION C63

CE string flue gas material	EU standard	Temperature class	Pressure class	Resistance to condensate	Corrosion resistance class	Metal: liner specifications
Min required PP	EN 14471	T120	P1	W	1	n/a
Min required INOX	EN 1856-1	T120	P1	W	1	L20040
CE string flue gas material	Soot fire resistance class	Distance to combustible material	Plastics location	Plastics fire behaviour	Plastics enclosure	
Min required PP	O	30mm	I of E	C/E	L	
Min required INOX	O	40mm	n/a	n/a	n/a	

Material	Boiler	dnom	Doutside	Linsert
PP	HCB117	100	100 +/-0.6	50 +20/ -2
PP	HCB190	150	150 +/-0.6	50 +20/ -2
PP	HCB235	150	150 +/-0.6	50 +20/ -2
PP	HCB295	150	150 +/-0.6	50 +20/ -2

Caution:



When installing the boiler as a Type C63 appliance, it should be noted that the terminals must not be installed on opposite sides of the building.

The maximum allowable recirculation rate is 10% under wind conditions.

Aluminium flue pipe must not be used on this appliance as it may lead to premature failure of the heat exchanger and will invalidate the warranty.

COMBUSTION VENTILATION

The following information is based on single boiler installations only. If more than one boiler is being used, BS6644 or IGEM UP10 (as appropriate) should be consulted to calculate the necessary requirements.

TYPE B INSTALLATIONS

When used as a Type B (open flue) appliance, the combustion air requirements are as follows:

TABLE 9 VENTILATION REQUIREMENTS TYPE B FLUE SYSTEMS

Model	Input nett kW	Input gross kW	Plant Room	
			High cm ²	Low cm ²
HCB117	105	117	211	422
HCB190	171	190	342	685
HCB235	212	235	423	847
HCB295	266	295	532	1063

When used as a type B (open flue) appliance, provision for cooling ventilation is included in the combustion ventilation allowance.

TYPE C FLUE INSTALLATIONS

When used as a Type C (room sealed) appliance, provided sufficient clearance is provided, [see Working clearances](#)

ventilation for combustion is not necessary as the combustion air is ducted directly from outside.

When used as a type C (room sealed) appliance, installed in a compartment or an enclosure, cooling ventilation should be provided as follows:

TABLE 10 VENTILATION REQUIREMENTS TYPE C FLUE SYSTEMS

Model	Input nett kW	Input gross kW	Direct to outside		To an internal space	
			High cm ²	Low cm ²	High cm ²	Low cm ²
HCB117	105	117	527	527	1054	1054
HCB190	171	190	856	856	1712	1712
HCB235	212	235	1059	1059	2117	2117
HCB295	266	295	1329	1329	2658	2658

Note:



Where a boiler installation is occupied for example by boiler operators and is to operate in summer months, for example domestic hot water heating, the above allowance ought to be sufficient, if it does not operate for more than 50% of the time. If the boiler installation is to operate at a higher percentage of the time, increased ventilation will be required. For example, at 75%, an additional 720 m³ per hour per 1000 kW and, at 100%, an additional 1350 m³ per hour per 1000 kW total heat input will be required for inlet and extract air.

ELECTRICAL CONNECTIONS

WIRING EXTERNAL TO THE EQUIPMENT MUST BE INSTALLED IN ACCORDANCE WITH THE I.E.E. REGULATIONS AND ANY LOCAL REGULATIONS THAT APPLY.

Warning

Leave the boiler electrically isolated until you are ready to commission it.

This appliance must be earthed.

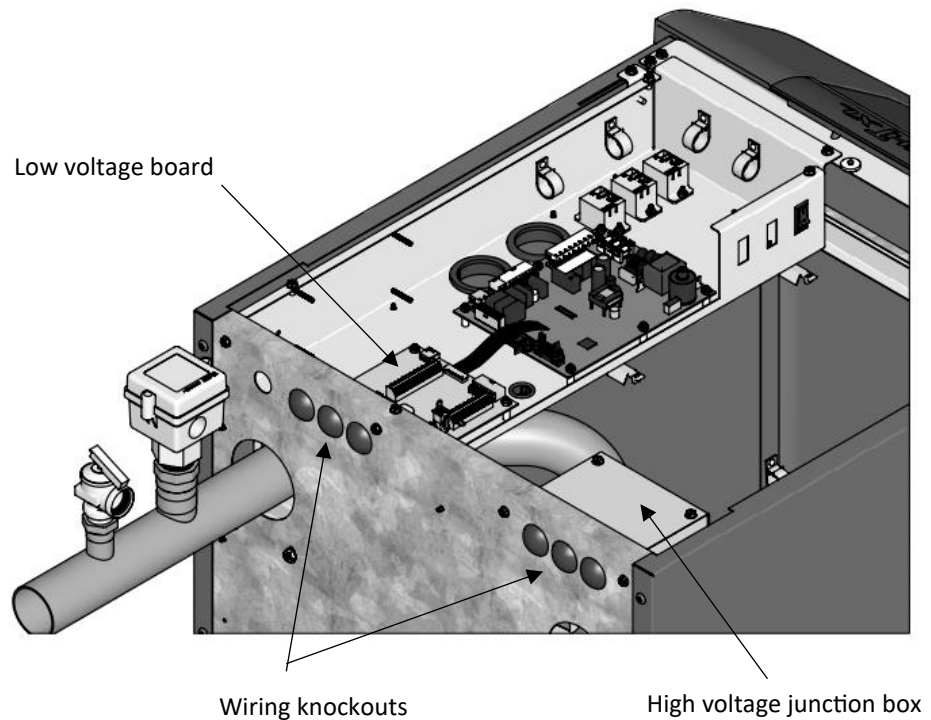
A suitably competent person must check wiring. Normal supply required is 230 volts ac, single phase, 50 hz. An isolator with a contact separation of at least 3mm in all poles should be sited close to the equipment and must only serve that equipment. The double pole switch must be readily accessible under all conditions.



PREPARATION

Remove the top cover to gain access to the electrical connection terminals.

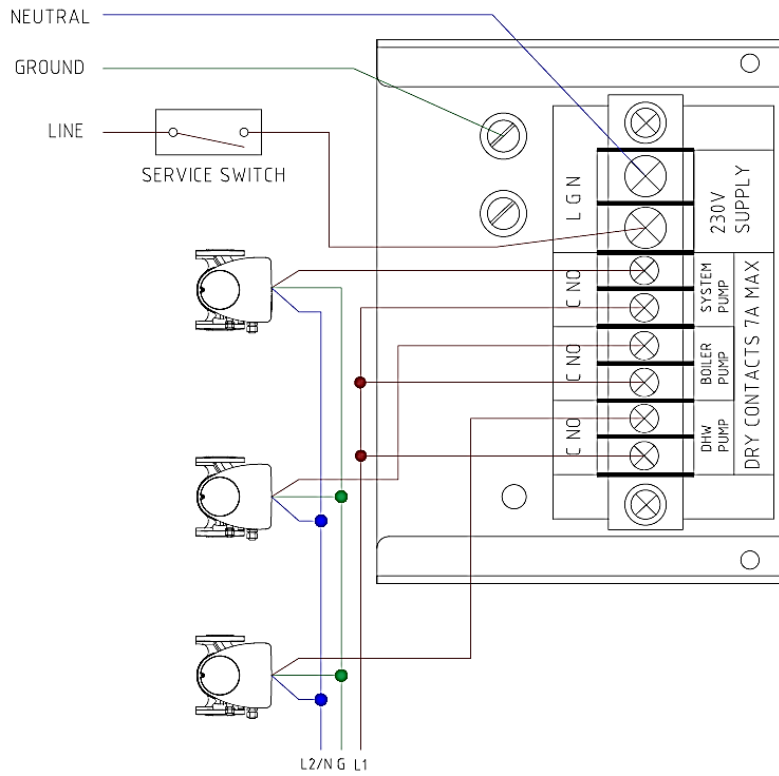
FIGURE 15 ELECTRICAL TERMINAL LOCATIONS



HIGH VOLTAGE CONNECTIONS

Route all high voltage connections through the knockouts at the rear of the boiler as shown in [Figure 15](#)

FIGURE 16 HIGH VOLTAGE CONNECTIONS



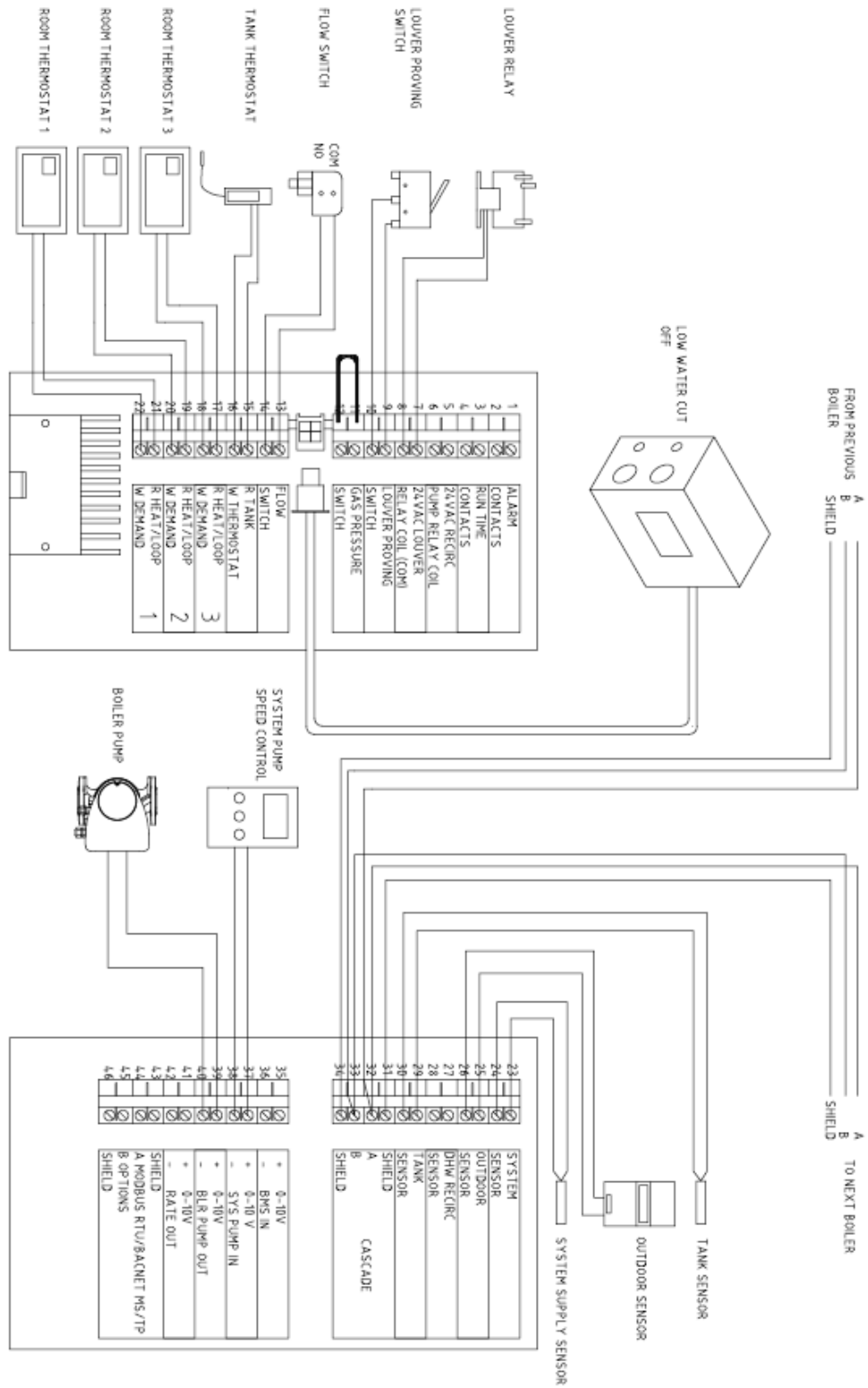
Caution

The three pump outputs are relays, each can accept up to 7amp maximum. If the pumps are larger than this, please contact Lochinvar Technical support for further assistance.

LOW VOLTAGE CONNECTIONS

Route all low voltage connections through the knockouts in the rear of the boiler as shown in [Figure 15](#). All connections should be secured using an appropriate cord anchorage.

FIGURE 17 LOW VOLTAGE CONNECTIONS, SEE DESCRIPTIONS FOR DETAILS



CONNECTION DESCRIPTIONS

1-2 ALARM CONTACTS Volt free – Close on alarm. An internal volt free contact across pins 1 and 2 will close in the event of the heater locking out. This connection can be used by a BMS to monitor the operation of the heater.

3-4 RUNTIME CONTACTS Volt free – Close when unit running. An internal volt free contact across pins 3 and 4 will close in the event of the burner operating. This connection can be used by a BMS to monitor the operation of the heater.

5-6 24VAC RECIRC PUMP RELAY COIL 24VAC Output – when recirc sensor calls – switches on Neutral When the heater gets a call for heat from the DHW RECIRC SENSOR a 24VAC supply will be sent to a DHW recirculation pump relay (field supplied).

7-8 24VAC LOUVER RELAY COIL (COM) 24VAC Output – When the heater gets a call for heat, a 24VAC supply becomes present on pin 7. Used in conjunction with the ground pin (pin 8), these terminals can be used to send a signal to energise an auxiliary device such as a fan dilution system or mechanical ventilation system.

9-10 LOUVER PROVING SWITCH 24VAC Output – When unit calls for heat. If an auxiliary device such as a fan dilution system or mechanical ventilation system is to be used, the link should be taken out of pins 9 and 10 and the auxiliary device safety circuit wiring installed. If there is no continuity across the terminals the heater will not fire.

11-12 GAS PRESSURE SWITCH 24VAC Output – constant when unit is powered. If a gas pressure switch is to be used to ensure the incoming gas pressure is correct, the link should be taken out of pins 11 and 12 and the gas pressure switch wiring installed. If there is no continuity across the terminals the heater will not fire.

13-14 FLOW SWITCH 24VAC Output—constant when unit is powered. If a flow switch is to be used to ensure the primary pump is operating, the link should be taken out of pins 13 and 14 and the flow switch wiring installed. If there is no continuity across the terminals the heater will not fire.

15-16 TANK THERMOSTAT 24VAC Output – constant when unit is powered. An on-off type thermostat located in an indirect Calorifier can be connected to terminals 15 and 16 to control the output from the boiler. This connection is not polarity sensitive. **Not to be used in conjunction with the tank sensor.**

17-18 HEAT/LOOP DEMAND 3 24VAC Output – constant when unit is powered. An on-off type thermostat or modulating room sensor can be connected to terminals 17 and 18 to control the output from the boiler. This connection is not polarity sensitive. Can also be used for a BMS 0V enable signal.

19-20 HEAT/LOOP DEMAND 2 24VAC Output – constant when unit is powered. An on-off type thermostat or modulating room sensor can be connected to terminals 19 and 20 to control the output from the boiler. This connection is not polarity sensitive. Can also be used for a BMS 0V enable signal.

21-22 HEAT/LOOP DEMAND 1 24VAC Output – constant when unit is powered. An on-off type thermostat or modulating room sensor can be connected to terminals 21 and 22 to control the output from the boiler. This connection is not polarity sensitive. Can also be used for a BMS 0V enable signal.

23-24 SYSTEM SENSOR Contacts read a resistance. When configured in a cascade, the Master boiler will use the system sensor to monitor and control the output from the cascade. This sensor should be mounted in the boiler flow.

25-26 OUTDOOR SENSOR Contacts read a resistance. If the boiler is to be compensated to the outside temperature, an outdoor sensor should be connected to pins 25 and 26. This connection is not polarity sensitive.

27-28 DHW RECIRC SENSOR Contacts read a resistance. The heater can control a DHW recirculation pump. A sensor must be installed in the circulation loop return and connected to terminals 27 and 28.

29-30 TANK SENSOR 24VAC Output – When unit calls for heat. A sensor located in an indirect Calorifier can be connected to terminals 29 and 30 to control the output from the boiler. This connection is not polarity sensitive. **Not to be used in conjunction with the tank thermostat.**

31-34 CASCADE Communication. If the heaters are to be operated in a cascade, shielded 2-wire twisted pair communication cable should be used. The shielding should be connected to pin 31 or 34 and then all “A” terminals (pin 32) should be linked together, and all “B” terminals (pin 33) should be linked together.

35-36 BMS IN 0 – 10 V DC input. When the heater is to be controlled by a 0-10V DC analogue output from a Building Management System (BMS), the 0-10V 0V line should be connected to pin 33 and the 0V line should be connected to pin 34.

37-38 SYS PUMP IN 0 – 10 V DC input. If a variable speed pump is used in the primary loop, and a 0-10V signal is available from the speed control, this signal can be used to control the modulation of the boiler as primary flow increases or decreases. The 0-10V line should be connected to pin 35 and the 0V line to pin 36.

39-40 BLR PUMP OUT 0 – 10 V DC output. This 0-10V output is available to control the speed of a variable speed boiler pump to maintain a minimum temperature difference across the heat exchanger. This feature is only to be used with primary/secondary piping systems and a supply sensor **MUST** be installed.

41-42 RATE OUT 0 – 10 V DC output. Provides a 0-10V signal that is proportional to the firing rate of the heater. This may be used by a BMS system to monitor the actual rate of the heater.

43-46 NOT USED

Warning

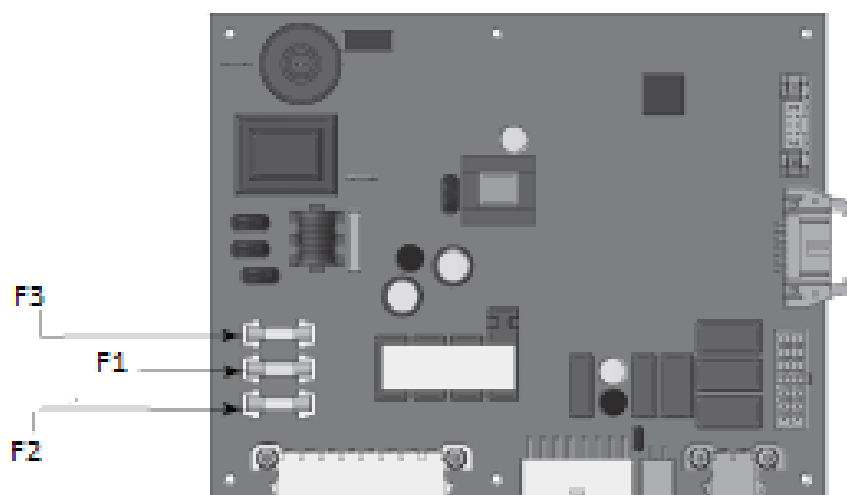


If a knockout is removed by mistake, the resulting hole must be blocked with an appropriate anchor, plug or grommet to prevent accidental access to the live parts within the boiler.

FIGURE 18 FUSE LOCATION

The Herald has three internal fuses. All are slow blow fuses, located and rated as follows:

- F1-5A
- F2-3.15A
- F3-80A



The boiler has three spare fuses in a plastic bag attached to the control module cover. Only replace with an equivalent rated fuse. Use of non-equivalent fuses or link wires will invalidate the warranty.



Caution

The appliance must be isolated from the mains electricity supply in the event of electric arc welding being carried out on any connecting pipework.

COMMISSIONING

PRIOR TO START-UP



Caution:

A person deemed competent must be responsible for the commissioning of this equipment. Before attempting to commission any equipment, ensure that personnel involved are aware of what action is about to be taken and begin by making the following checks:

WATER SIDE

The system should be thoroughly flushed in accordance with CIBSE Commissioning Codes B & W and BSRIA AG1/2001.1: Pre-commission cleaning of pipework systems.

Check the system for leaks and repair as necessary. If the system is configured in a sealed arrangement, check the expansion vessel cushion pressure and pressurisation unit settings.

Leaks in the boiler or piping must be repaired at once to prevent excessive makeup water. For this purpose, it is recommended to install a water meter to easily check the amount of makeup water entering the system. Makeup water volume should not exceed 5% of the total system volume per year.

After flushing the boiler and the installation the system can be filled with fresh water. Fill the boiler and the heating system by using the appropriate filling valve. The water pressure of the system normally lies between 1.5 and 2.0 bar.

In hard water areas, scale formation can occur in hot water systems. The situation can intensify where higher temperatures or demands exist.

The pH value of the water must be between 6.5 and 8.5.

Water hardness must be between 85 ppm CaCO₃ and 150 ppm CaCO₃ The Aluminium content of the TDS (Total Dissolved Solids) should not exceed 8.5 ppm.

Note

If the above requirements cannot be satisfied, a water treatment specialist must be consulted. Failure of the heat exchanger due to deposit build up is not considered a manufacturing defect and will not be covered under warranty.

An approved multi metal corrosion inhibitor such as Sentinel X100 or Fernox F1 is recommended at the correct concentration and installed as recommended by the manufacturer.

Note

When makeup water is added, make sure the chemical additives are added to maintain the correct level.

GENERAL CHECKS PRIOR TO LIGHTING

1. Flueway passages are clear.
2. Adequate ventilation exists in the plant room (if necessary).
3. The system is fully charged with water, ready to receive heat. All necessary valves are open, and all allied pumps are circulating water.
4. The gas supply pipework is clear of any loose matter, tested for soundness and purged.
5. The condensate drain is installed correctly, and the condensate trap is filled with water.

EQUIPMENT CHECKS PRIOR TO LIGHTING

This unit has been designed for a nominal gas inlet pressure of 20.0 mbar when used on natural gas.

1. Gas supply is connected but turned to the "off" position. Any unions or fittings are correctly tightened, test points are closed, and the flame sense electrode lead is connected correctly. Ensure the ceramic sheath around the flame sense electrode is not cracked or broken.
2. Ensure electricity supply is connected and there is a call for heat from the BMS or room thermostat.
3. Ensure the flue system is connected correctly
4. Read [User Section](#) on the SMART TOUCH control to familiarise yourself with its operation.

PROCEDURE FOR INITIAL SETUP

Clock and Date

The control uses an internal clock for the night setback feature and for logging of events. For these features to work correctly, the clock must be set when the appliance is first installed or anytime the appliance has been powered off for more than four (4) hours. This parameter must be accessed to set the clock. If the unit is connected to the internet, the time will adjust based on the time zone selected.

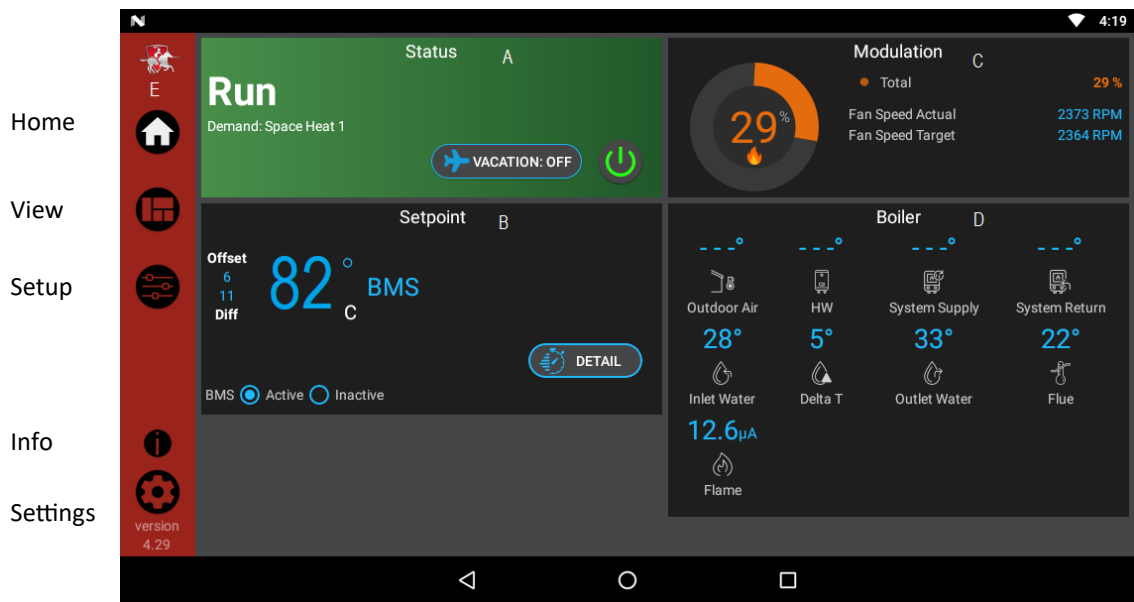
Temperature units (°C / °F)

The control can be configured to display temperature in either °C or °F.

Set clock!

The SMART TOUCH control has a built-in clock that it uses for its night setback feature and for logging events. This clock must be set when the appliance is installed and anytime the appliance has been powered off for more than four (4) hours.

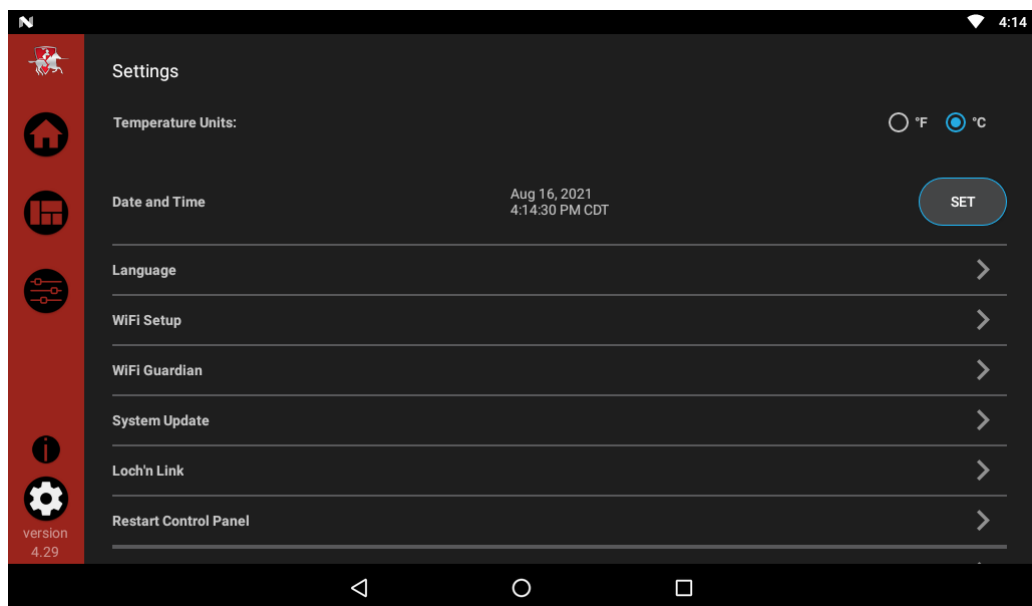
FIGURE 19 SMART TOUCH HOME SCREEN



Use the following procedure to set the clock:

1. Press the SETTINGS button on the left hand side [See Figure 19](#).
2. Press the SET button across from the date and time
3. Proceed to set the date, time, and time zone. NOTE: Automatic Time Zone will not work unless the appliance is connected to a WIFI network..
4. Temperature units and Wi-Fi may also be set here. These items may be used to automatically sync the time.
5. Press the Home, View, or Back button to exit.

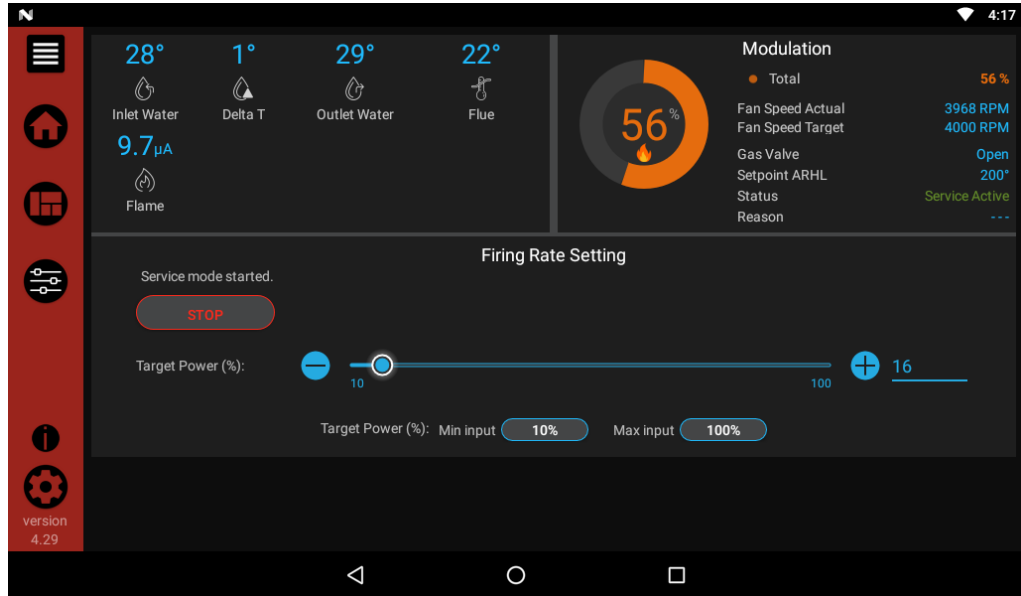
FIGURE 20 SMART TOUCH CONTROL SETTINGS



CHECK FLAME AND COMBUSTION

1. Navigate to the Setup Screen from the Home Screen by pressing the SETUP button along the left side of the screen. Enter the installer password [See Figure 19](#)
2. Select the Service Maintenance Screen. The tabs will scroll (up and down) to reveal more options.

FIGURE 21 SERVICE MAINTENANCE SCREEN



3. Insert the probe from a combustion analyser into the flue gas analyser point in the flue at the rear of the boiler.
4. Once the boiler has modulated up to full fire, measure the combustion. The values should be in the range listed in the table below. The CO levels shall be less than 150 ppm for a properly installed unit.

Note

If the combustion is not within the specified range, reference the Troubleshooting Section of this Manual for possible causes and corrective actions or contact Lochinvar Technical Support.



TABLE 11 CO₂ LEVELS

Natural Gas	
CO ₂	O ₂
8.4% - 9.4%	4.8% - 6.5%

5. Once the combustion analysis is complete, test the safety shutoff device by turning the manual shutoff valve to the OFF position and ensuring that the boiler shuts down and registers an alarm. Turn the manual shutoff switch to the ON position and reset the control.
6. Turn the main power off to the boiler and replace the flue temperature sensor into the flue pipe connection.
7. Place the boiler back into normal operation.

SET SPACE HEATING OPERATION

Determine controlling sensor

For space heating systems, the temperature control can be based on one of three sensors: the inlet, outlet, or system supply sensor. The SMART TOUCH control is programmed at the factory to control the temperature of the outlet sensor. The control will automatically switch to the system supply sensor once it is connected. If it is desired to base the temperature control on the inlet sensor, the appropriate parameter must be changed in the control.

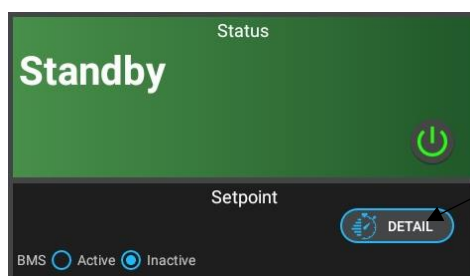
[Contact Lochinvar technical support for further assistance.](#)

Verify space heat circulator mode

The Space Heating Mode controls both the system pump (if connected), and the boiler pump. When the SMART TOUCH control receives a space heating call for heat, it turns on the system pump. If the boiler is not heating an indirect DHW (Domestic Hot Water) tank, and the set point is not met, it also turns on the boiler pump. After the space heating call for heat ends, the system pump continues to run for a short period of time. The system pump can be programmed to run continuously, except during outdoor shutdown. If the boiler pump was running, it continues to run for a short period of time as well. These pump delays are factory set to 30 seconds. If different delays are desired, the appropriate parameters in the control must be changed. See the Service section of this manual for a detailed explanation of this procedure.

Adjust set point temperature(s)

During normal operation, set point temperatures can be adjusted from the Home Screen by pressing the **DETAILS** button in the demand section (B) of the screen as shown below.



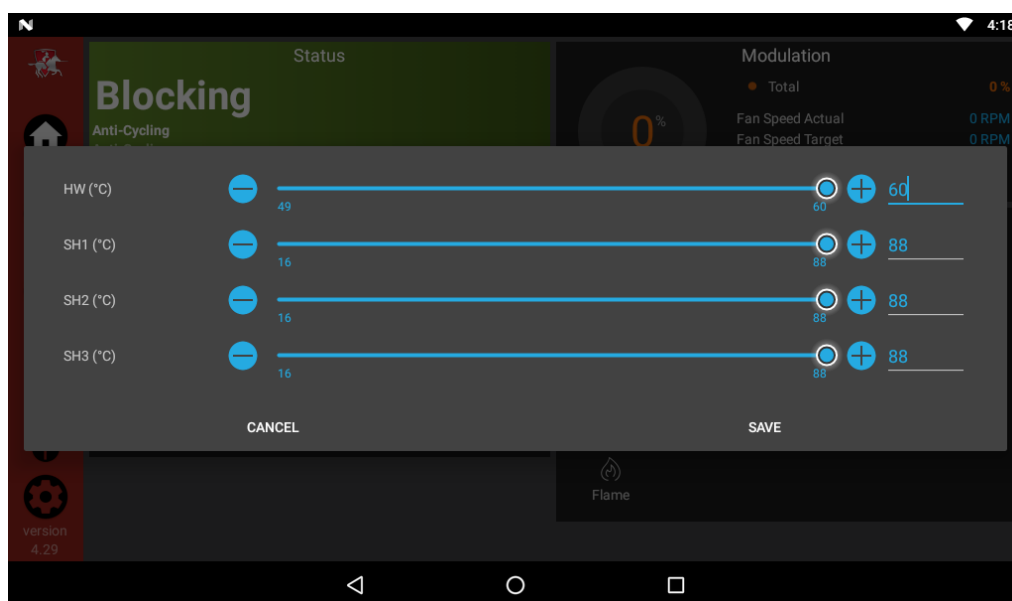
1. To change a set point, use the set point slider feature or the PLUS (+) and MINUS (-) buttons as shown in [Figure 22](#).
2. Once the set point has been adjusted to the desired setting, press the save button.



NOTE:

The APPLY CHANGES button must be pressed to complete programming of the controls. Failure to press the APPLY CHANGES button will result in an unprogrammed control.

FIGURE 22 SET POINT SCREEN



SET DOMESTIC HOT WATER (DHW) OPERATION

Verify DHW mode

There are two (2) modes of operation for DHW. In Normal Mode, when a DHW demand begins, the control will start the DHW pump, turn off the boiler pump (if running), and modulate to bring the outlet temperature to the DHW boiler set point. The maximum firing rate may be limited in this mode if desired. In Zone Mode it is assumed that the indirect DHW tank is piped as a zone on the primary loop. When a DHW demand begins, the control will turn on the DHW pump output, and raise the system temperature set point to the DHW boiler set point (if higher). The boiler pump will be turned on. The system pump may be forced on, forced off, or not changed, depending on the System Pump Mode selected See Herald Boiler Service Manual for details. In this mode, any low temperature zones (such as radiant heating) may need additional controls to limit the water temperature sent to those zones.

Set DHW boiler target temperature

When in the DHW Mode, the control will modulate to maintain the boiler outlet temperature or system supply temperature to a set point. This set point is set at the factory to 82°C. If a different set point is desired, the appropriate parameter in the control must be changed. See Herald Boiler Service Manual for details.

Set maximum DHW fan speed

If the rated input of the indirect tank is less than the maximum output of the boiler, change the maximum DHW fan speed setting to limit the boiler output, See Herald Boiler Service Manual for details.

Cascade control

When installing a Cascade system, all units must be programmed for Cascade to operate. Access the Cascade Setup options as follows:

1. Press the SETUP button on the left side of the display screen. See [Figure 19](#).
2. Enter the installer password. 5309
3. Select the Cascade option as shown in [Figure 23](#).
4. Each unit must have a unique address set between 1 and 7. The leader must be zero and has more options which are described further.
5. Once all the updates are complete, press the Door Menu slider (top left) or the Setup button.
6. Press the APPLY CHANGES button on the top of the screen.

Cascade types

There are two (2) options for the way a Cascade divides the load between its heaters. The first is Lead/Lag, designated as L/L in the menu. This method is used when it is desired to have the least amount of total flow through the boilers. This method will modulate the last two (2) boilers. This provides for smooth transitions when a boiler turns on or off. When the last boiler reaches 100% and the calculated load is still increasing, it will start the next boiler at 20% and reduce the previous boiler to 80%, thus eliminating the sudden jump in total output of the Cascade. When the calculated load is decreasing and the last boiler gets down to 20% fire, it will hold it there and start lowering the firing rate on the next-to-last boiler. When the next-to-last boiler reaches 20%, it will turn the last boiler off and raise the rate of the next-to-last boiler to 40%, thus eliminating the sudden drop in total output of the Cascade.

The other Cascade divider method is Efficiency Optimization, designated as EFF in the menu. This method is used, as the name implies, when it is desired to have the most efficient system. When the first boiler reaches a certain rate (default =90%), it lowers its rate to 45% and turns on the next boiler at 45%. The two (2) boilers then modulate at the same rate. As the calculated load increases further and both boilers ramp up to 90%, it lowers the rate of the first two (2) boilers to 60% and brings the next boiler on at 60%. The three (3) boilers then modulate together. As the calculated load decreases, the boilers will reach a lower threshold (default = 30%), at which time the last boiler (the third in our example) will turn off and the Cascade will increase the rates of the remaining boilers to provide the equivalent total output as before ($(3 \times 30\%) / 2 = 45\%$ in our example). Efficiency optimization is automatically selected when boilers of different sizes are programmed into the Leader control (see Boiler Size on this page).

Maximum Cascade Set Point

This parameter determines the set point used by the individual boilers in a Cascade when a system sensor is connected to the Leader boiler. When a boiler is commanded to fire by the Leader boiler, it will attempt to achieve this temperature at its outlet. The Leader boiler will limit the modulation of the last boiler to fire to hold the temperature at the system supply sensor to the user set point. If any of the boiler outlet temperatures reach the maximum cascade set point, the boiler will then modulate down on its own to keep its outlet temperature within the maximum cascade set point. Therefore, this parameter can be used to limit the outlet temperatures of all the boilers in a Cascade. Note that this parameter does not apply when the boiler is heating an indirect DHW tank. This parameter is adjustable by the installer by accessing the Maximum Cascade Set Point parameter. The temperature range of this parameter is 0°C to 88°C. The default maximum cascade set point is 85°C.

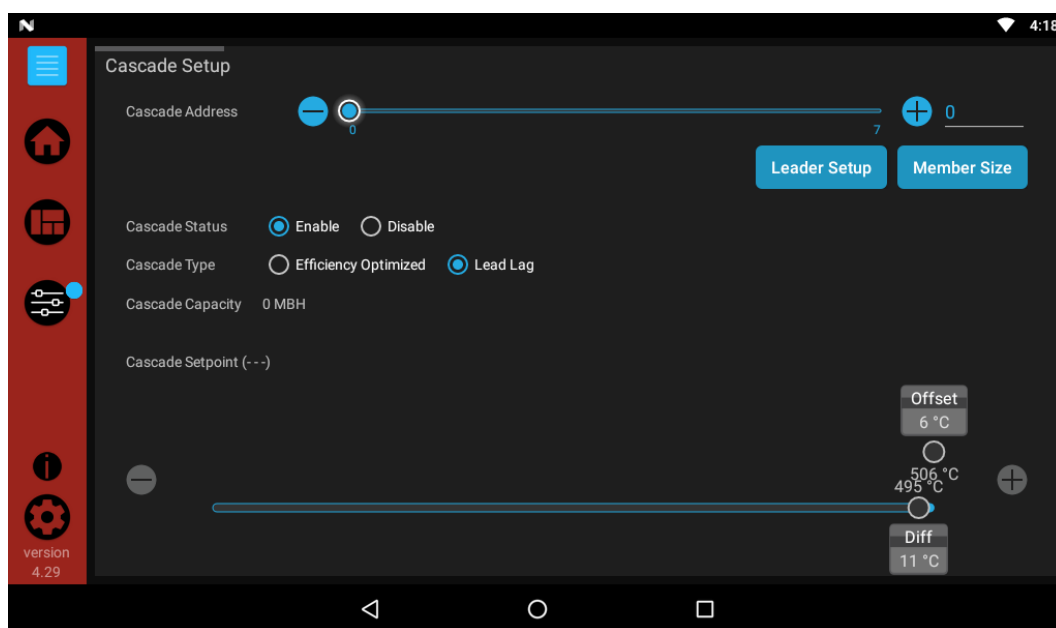
Cascade Offset

This parameter determines how much the temperature must go above set point before the lead boiler will turn off. This parameter can be adjusted by the installer by accessing the Cascade Offset parameter. The temperature range of this parameter is 0° to 11°C The default value is 6°C.

Cascade Differential

This parameter determines how much the temperature must go below the turn off temperature (Set point + Offset) before the lead boiler turns on. This parameter can be adjusted by the installer by accessing the Cascade Differential parameter. The temperature range of this parameter is 0° to 33°C The default value is 11°C.

FIGURE 23 CASCADE CONTROL SETUP



HOW THE BOILER OPERATES

The Herald boiler uses an advanced stainless steel heat exchanger and electronic control module that allows fully condensing operation. The fan pulls in air and pushes flue products out of the boiler through the heat exchanger and flue piping. The control module regulates fan speed to control the boiler firing rate. The gas valve senses the amount of air flowing into the boiler and allows only the right amount of gas to flow.

HOW THE CONTROL MODULE OPERATES

The SMART TOUCH control module receives inputs from boiler sensors and external devices. The control module activates and controls the fan and gas valve to regulate heat input and switches the boiler, Domestic Hot Water (DHW), and system pumps on and off as needed. The user programs the module to meet system needs by adjusting control parameters. These parameters set operating temperatures and boiler operating modes. Boiler operation can be based on boiler outlet water temperature, boiler inlet water temperature, system temperature, a 0 - 10V signal, or Modbus, depending on the parameter settings.

CONTROL INPUTS AND OUTPUTS

Room thermostat

There are three (3) heat/loop demand connections available on this control. These inputs tell the boiler to provide water for space heating. Each demand connection has its own set point and outdoor air reset curve. When multiple demands have a call for heat the control will give priority to the demand with the highest set point.

Example: Assume that both heat/loop demand 1 and heat/loop demand 2 have a call for heat. Demand 1 has a set point of 45°C. Demand 2 has a set point of 80°C. The boiler will regulate the system temperature to 80°C until Demand 2 has been satisfied. Once Demand 2 has been satisfied the boiler will provide 45°C water to the system.

0 - 10V input (set point or power)

The Herald boiler can be controlled by a Building Management System (BMS) using a 0 - 10 VDC signal. The control can be configured by the installer to use this signal to either control set point or firing rate. The Herald boiler can also be programmed to accept a call for heat from a 0 - 10V signal, See Herald Boiler Service Manual for details.

DHW priority

The SMART TOUCH control allows the connection of a DHW thermostat or tank sensor to the low voltage connection board. When a tank sensor is connected, the DHW thermostat input is ignored. When a boiler is programmed for DHW Normal Mode, the maximum firing rate can be limited to match the input rating of the indirect tank coil.

DHW / space heating (SH) cycling

If a DHW call for heat is received while a space heating call is in progress, and the DHW is in Normal Mode, the control will start the DHW pump and shut the boiler pump off. The system pump will remain on. For stand-alone boilers, if the space heating call is still active while the DHW call is in operation, the control will wait for 30 minutes (time adjustable by installer) then it will switch back to the space heating demand. There is a timer to switch from space heating to DHW and a timer to switch from DHW to space heating. The control will switch back and forth until one of the heat demands end. This function does not apply to cascade systems.

Programmable controlling sensor

The control module is programmed to use the outlet sensor as the control sensor by default. If a system supply sensor is connected, the control automatically uses it as the control sensor. For stand-alone boilers, the control sensor can be changed by the installer to the inlet sensor. If the inlet sensor is chosen as the controlling sensor, it is recommended that the system supply sensor be installed in the system supply to provide the best control of the inlet temperature.

Anti-cycling

After the burner turns off, the control will delay the next burner cycle for a set period (time is adjustable by the installer).

The time delay will be bypassed if the inlet water temperature drops too far during the delay.

Boiler and system pump control

The boiler pump will run whenever the burner is firing, unless the DHW is programmed for Normal Mode and the boiler is heating the DHW tank. The boiler pump will run during Freeze Protection Mode as well. It will continue to run for a short time after the burner turns off or the Freeze Protection Mode ends. The system pump will run whenever there is a space heating call for heat, or the boiler goes into Freeze Protection Mode. It may be programmed to run during a DHW call for heat when the DHW is programmed for Zone Mode. It will continue to run for a short time after the end of the heat demand or the Freeze Protection Mode. The system pump can be programmed to run continuously if desired, except during outdoor shutdown and/or a DHW call for heat.

TEMPERATURE CONTROL

Modulation

The Herald can modulate its firing rate from a minimum of 10% to a maximum of 100%. The firing rate is dictated by the call for heat (i.e., space heating or domestic hot water), the heating load, ramp delay (if enabled), and various other temperature limitations.

Ramp delay

For systems with lower flow, the SMART TOUCH can limit the firing rate (when enabled) when a space heating call for heat starts, or when switching from a DHW call for heat to a space heating call for heat. There are six (6) limits that can be programmed, as well as six (6) time intervals corresponding to each limit. The sixth limit will also limit the firing rate for the rest of the call for heat.

Gradient limiting

If during operation of the boiler the outlet water temperature is rising too quickly, the control will reduce the firing rate to its lowest setting.

Outdoor air reset

If an outdoor air sensor is connected, the control module will calculate the set points of the three (3) space heating demands based on the programmed reset curves. The installer can change the slope of the reset curves by several adjustable parameters. The user can limit the maximum set point for the system using the space heating set points.

Boost function

If outdoor air reset is active, and any space heating demand has been active continuously for a set period (time adjustable by installer) and there has been no DHW demands, the control will increase the set point of that demand by a fixed number of degrees (adjustable by installer). This process will continue until the space heating demand ends, the set point reaches the programmed set point or a maximum of 20 increases has occurred. Once the system heat demand is satisfied, the set point will revert to the value determined by the reset curve.

Night setback

The controller may be programmed to reduce the space heating and DHW set points during certain times each week. Seven different start and stop times may be programmed for the space heating setback and seven start and stop times for the DHW setback.

Flame current support

To prevent nuisance shutdowns when the boiler is firing at minimum rates, the control will increase the firing rate when the flame signal drops too low.

Protection features

Outlet temperature, flue temperature, and temperature rise limiting. The outlet temperature is monitored by the boiler outlet temperature sensor. When the outlet temperature exceeds 85°C, the unit will reduce the fan speed. If the outlet water temperature exceeds 90°C the control will shut the unit down until it cools off. The control module monitors the flue temperature by a sensor located in the flue exhaust. If the flue temperature exceeds 102°C the control will reduce the maximum fan speed. If the flue temperature exceeds 107°C the control will shut the unit down. The unit will restart automatically once the flue temperature drops 6°C and the minimum off time has expired. The control monitors the temperature difference between the inlet and the outlet sensor. If this difference exceeds 13°C the control will reduce the maximum fan speed. If the temperature difference exceeds 15°C the control will shut the unit down. The unit will restart automatically once the temperature difference has dropped below 13°C and the minimum off time has expired.

Freeze protection



Warning

DO NOT install the boiler in a room likely to freeze.

If this boiler may have been exposed to freezing conditions, prevent from firing. Shut off power and gas to the appliance immediately and contact Lochinvar for further instructions.

Allowing the boiler to fire when the heat exchanger or near boiler piping is frozen will result in death or serious injury and significant property damage.

The following integral feature of the boiler control module provides some protection for the boiler only -- not for the system.

The boiler control module provides a freeze protection feature with the following attributes:

- Below an inlet temperature of 7°C, the boiler pump operates constantly.
- Below an inlet temperature of 3°C, the burner fires.
- Boiler and pumps turn off if boiler water inlet temperature rises above 7°C.

Neither this feature, the boiler control module, nor the use of glycol eliminates the possibility of freezing. The installation must still use recognized design, installation, and maintenance practice to prevent freeze potential for the boiler and system.



Note:

When system return temperatures are maintained below the dew point, condensation will form on the inside of the boiler jacket causing some internal sheet metal components to rust.



Warning:

The Freeze Protection feature will not work if the appliance does not have power, is locked out, is in shutdown mode, had a component failure, or is otherwise prevented from firing.

MONITOR EXTERNAL LIMITS

Connections are provided on the connection board for external limits such as flow switch, low water cut-off, gas pressure switches, and a louver proving switch. The SMART TOUCH will shut off the burner and inhibit relighting whenever any of these external limits open.

Run-time and alarm outputs

The boiler provides dry contacts for indicating when the boiler is running, and when it is unable to operate.

Run-time and cycle counting

The control uses two timers to monitor the total hours of burner operation. One timer monitors the time the boiler is in the Space Heating Mode. The other timer monitors the time the boiler is firing in the DHW Mode. The control uses two (2) ignition counters to monitor the amount of boiler cycles. The first counter counts all ignitions of the control. The second counter counts only ignition attempts that have failed.

Service reminder

The control can be programmed for service reminder notification. This notification will become active when either a set time frame has expired, or a set amount of running hours or cycles have expired (all adjustable by the installer). The display will show a Maintenance Required screen. The installer's name and phone number can be programmed into the control. This information will appear on the Maintenance Required screen. The service reminder notification can be reset or disabled by the installer. The time dependent feature has been disabled by the manufacturer. To enable this feature, change the parameter to the desired time interval, See Herald Boiler Service Manual for details.

Error logging

The control will hold in memory the last 10 lockouts as well as the last 10 blockings. The date and time of the occurrence will be recorded as well. Only the 10 most current occurrences of each will be held in memory.

Boiler temperature regulation

Operating temperature (target)The SMART TOUCH control module senses water temperature and regulates boiler firing and firing rate to achieve a target temperature. The target temperature can be set between 21°C and 88°C.

- Target temperature is fixed when the outdoor sensor is not installed.
- Target temperature is calculated as described in section [Outdoor Reset Operation](#) and Target Temperature Boost when the outdoor sensor is connected.

High limit operations

The Herald is equipped with adjustable automatic reset and manual reset high limits. The automatic reset high limit has a maximum set point of 93°C and the manual reset high limit has a maximum set point of 98°C. When the outlet temperature exceeds 93°C, the automatic high limit action occurs. The boiler shuts down until the outlet water temperature cools below 88°C, and a 60 second timer has expired. If the outlet temperature continues to increase, the manual reset high limit action will occur at 98°C.

High limit test procedure

1. Turn ON the main power to the boiler by placing the ON/OFF switch in the ON position.
2. Navigate to the Setpoints Screen.
3. Use the slide bar to decrease the MRHL temperature below the current outlet temperature or to its minimum setting, whichever is higher.
4. Press the APPLY CHANGES button to save the setting.
5. If the current outlet temperature is above the MRHL setting then the MRHL will function, causing a boiler lockout. If the outlet temperature is below the MRHL setting, navigate to the Service Screen and place the boiler in service mode at full fire.
6. Once the outlet temperature rises above the MRHL setting, the MRHL will function causing a boiler lockout.
7. Repeat steps 2-4 to set the MRHL to the desired setting for normal operation.

Low water cut-off protection

1. The SMART TOUCH control module uses temperature sensing of both supply and return areas of the heat exchanger. If the flow rate is too low or the outlet temperature too high, the control module modulates and shuts the boiler down. This ensures boiler shutdown in the event of low water or low flow conditions.

OUTDOOR RESET OPERATION, IF USED

Target temperature with outdoor reset

This feature improves the system's efficiency as the outdoor temperature warms up. See Herald Boiler Service Manual for details.

Reset curve

The reset curves look at outdoor air temperature and adjusts the set points.

Cascade

When multiple boilers are installed, they can be wired together in a cascade sequence. A maximum of eight boilers can be controlled from a single control. In this application one boiler would be designated as the Leader control and all others would be designated as Member controls. The Leader control can be programmed to use Lead/Lag or Efficiency Optimization control methods. Once the Leader boiler receives a call for heat from a room thermostat, BMS, or Modbus, the control will determine what the set point will be. If outdoor air reset is desired, connect the outdoor air sensor to the terminals on the Low Voltage Connection Board on the Leader boiler. The set point will be calculated based on the programmed reset curve parameters See Herald Boiler Service Manual for details. If outdoor air reset is not desired, do not connect the outdoor air sensor. A fixed temperature set point can be programmed into the control. See the Start-Up section of this manual to program the set point. If the water temperature at the system supply sensor is less than the set point + the turn-off off set - the off -on differential, then the control will initiate a call for heat on the Cascade See Herald Boiler Service Manual for an explanation of the offset and differential. The Leader will energize the lead boiler on the Cascade. For a new start-up this will be the Leader boiler. DHW, Night Setback, and Ramp Delay operation with cascade For normal mode DHW operation any boiler(s) in the Cascade can be selected to provide heat for a DHW call. Select a boiler to be designated as the DHW boiler. Connect the DHW thermostat or sensor to the terminals on the Low Voltage Connection Board marked for the corresponding device. When the boiler receives a DHW call, the Leader control will take that boiler out of the Cascade sequence. If another boiler is available, the Leader will start it up to take its place. The DHW boiler will adjust its set point to the programmed DHW boiler set point and will adjust its firing rate to maintain this. Once the DHW call has been satisfied, the Leader control will place that boiler back into the Cascade sequence. Switching of the boiler between DHW operation and SH operation when there is a call for both does not occur in Cascade Mode. When DHW is programmed for Zone Mode, connect the DHW thermostat or tank sensor to the Leader boiler. When a DHW call is received, the Leader will modulate the entire Cascade to bring the system supply temperature up to the DHW boiler set point (if higher). Night Setback operation of the boilers within the Cascade is available. Programming of the Night Setback will be done through the Leader boiler See Herald Boiler Service Manual for details on Night Setback. Ramp Delay operation of the boilers as described in the Herald Service Manual is available when the boilers are part of a Cascade system.

User

The user can set the tank set point, turn the unit on/off and set up Wi-Fi.

Installer

Most parameters are only available to the installer/service engineer accessible by entering the installer password See Herald Service Manual for details.



Note:

The password will timeout after 60minutes from entry

TABLE 12 SEQUENCE OF OPERATION

OPERATION	
1	Upon a call for heat, the gas pressure switch(es) must be closed.
2	Once the gas pressure switch(es) are closed, the control turns on the appropriate pumps (system and boiler pumps for space heating, DHW pump for DHW). The flow switch and/or LWCO must close.
3	The control turns on power to the louver relay. The louver proving switch, air pressure switch, and blocked drain switch must close.
4	The control starts the prepurge cycle by initiating the fan.
5	The control starts the trial for ignition by firing the spark electrode and opening the gas valve.
6	If a flame is not detected after the sparking ends, the control will perform a post purge, then start another prepurge cycle and try to light the burner again. On the 500 and larger models, the control will lock out if this second attempt also fails. On the HCB117, the control will perform a total of 4 attempts before locking out. Once the control has locked the unit out, the RESET button will need to be pressed on the touch screen LCD.
7	If a flame is detected, it holds the firing rate steady for a few seconds to let the flame stabilize, then it begins to modulate the firing rate based on a set point or some other command (such as a 0-10V BMS signal).
8	If the space heating call for heat is active, and the tank thermostat or sensor starts a DHW call for heat, the boiler will switch to the DHW mode. If programmed for normal DHW operation (not as a zone), the DHW pump will turn on first, then the boiler pump will turn off (boiler and DHW pump operation briefly overlap to ensure flow is maintained through the unit). This will divert the boiler's outlet water from the heating system and send it to the tank coil instead. The control will then modulate to maintain the outlet temperature to the DHW boiler set point.
9	If the boiler is not part of a Cascade, and both the space heating and DHW calls for heat remain active long enough, the boiler will switch back and forth between the two heating modes until one of them is satisfied.
10	Once both calls for heat are satisfied, the control will turn off the burner. The fan will continue to run during the post purge period.
11	Any pumps that are running will continue to run for their respective pump delay times before turning off, unless programmed to remain on continuously. A 60 second anti-cycle period will start, which will delay any new call for heat until it times out.
12	In Standby, ready to start a new cycle.

SERVICE AND MAINTENANCE PART

MAINTENANCE SCHEDULES

Refer to separate Herald service manual for full details.



Scan QR code to view the Herald service manual

TABLE 13 MAINTENANCE SCHEDULES

Service technician

Service technician (See the following pages for instructions)	
Annual Service	<p>General:</p> <ul style="list-style-type: none"> • Address reported problems • Inspect interior; clean and vacuum if necessary; • Clean condensate trap and fill with fresh water • Check for leaks (water, gas, flue, condensate) • Verify flue and air lines in good condition and sealed tight • Check system water pressure/system piping/expansion tank • Check fill water meter • Test boiler water. When test indicates, clean system water with approved system restorer following manufacturer's information. • Check control settings • Check ignition and flame sense electrodes (sand off any deposits; clean and reposition) • Check wiring and connections • Perform start-up checks and performance verification as per General checks prior to lighting. • Flame inspection (stable, uniform) • Flame signal (at least 10 microamps at high fire) • Clean the heat exchanger if flue temperature is more than 30°C above return water temperature. • Test low water flow conditions. <p>If combustion or performance indicate a need:</p> <ul style="list-style-type: none"> • Clean heat exchanger • Remove and clean burner using compressed air only • Clean the blower wheel

Building owner

Owner maintenance	
Daily	Check boiler area Check pressure/temperature gauge
Monthly	Check vent piping Check air piping Check air and vent termination screens Check relief valve Check condensate drain system Check air vents Check strainer
Periodically	Test low water cut-off (if used) Reset button (low water cut-off)
Every six months	Check boiler piping (gas and water) for leaks Operate relief valve
End of heating season	Shut boiler down (unless boiler used for domestic hot water)

Warning:

Follow the Service and maintenance procedures given throughout this manual and in component literature shipped with the boiler. Failure to perform the service and maintenance could result in damage to the boiler or system. Failure to follow the directions in this manual and component literature could result in severe personal injury, death, or substantial property damage.



The boiler should be inspected annually only by a qualified service technician. In addition, the maintenance and care of the boiler designated in Table 13 and explained on the following pages must be performed to assure maximum boiler efficiency and reliability. Failure to service and maintain the boiler and system could result in equipment failure.

MAINTENANCE PROCEDURES

Refer to separate Herald service manual.



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Troubleshooting

Refer to separate Herald service manual.



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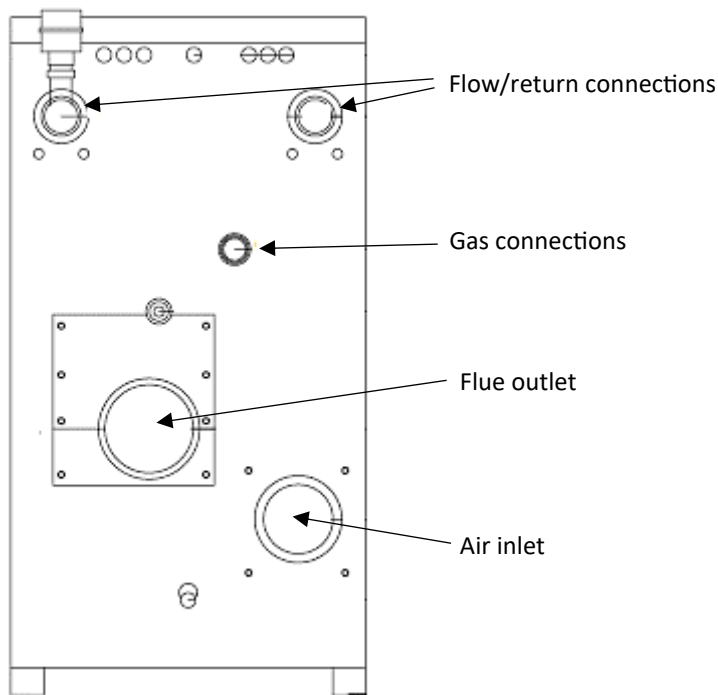
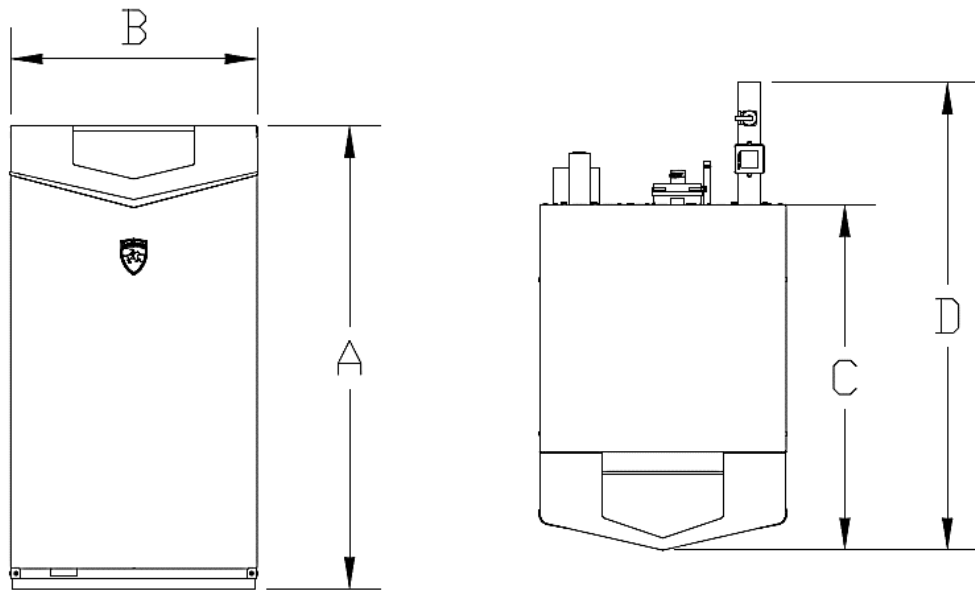
APPENDIX

APPENDIX 1 TECHNICAL DATA TABLE

Model Number		HCB 117	HCB 190	HCB 235	HCB 295
GENERAL DATA					
Product I.D. Number		0063DO3450			
Classification		I _{2H}			
Input (gross)	kW	128.1	187.3	226.6	285.9
Input (net)	kW	115.3	168.7	204.1	257.5
Output (80/60)	kW	111.7	163.1	197.4	86.9
Output (50/30)	kW	126.1	184.3	222.1	279.6
Downturn		10:1	10:1	10:1	10:1
Heat generator seasonal efficiency	%	96.3	96.3	95.9	95.7
Shipping Weight	kg	165.3	206.6	219.3	256.9
NOX @ 0% o ₂ According to EU regulation 812/2013	mg/kw	22	30	33	37
NOX Class According to EU regulation EN15502		6			
Maximum allowable temperature of the combustion	°C	40			
GAS DATA - G20					
Nominal gas inlet pressure	mbar	21			
Maximum gas inlet pressure	mbar	25			
Minimum gas inlet pressure	mbar	17.5			
Gas flow rate	m ³ /hr	12.29	17.5	22.13	28.44
Flue gas mass rate (@9.0% CO ₂)	g/sec	57.72	80.73	102.18	129.94
Gas inlet connection size	"BSP	1	1¼	1¼	1¼
ELECTRICAL DATA					
Power consumption	W	238	767	979	1003
Power supply		Single phase 230v/50Hz			
Protection class		IP00			
WATER DATA					
Water content	litres	17	24	28	34
Water connections (F & R)	"BSP	2	2	2	2½
Max. water pressure (PMS)	bar	11			
Min. water pressure	bar	0.5			
Maximum water temperature	°C	85			

APPENDIX 2 DIMENSIONS

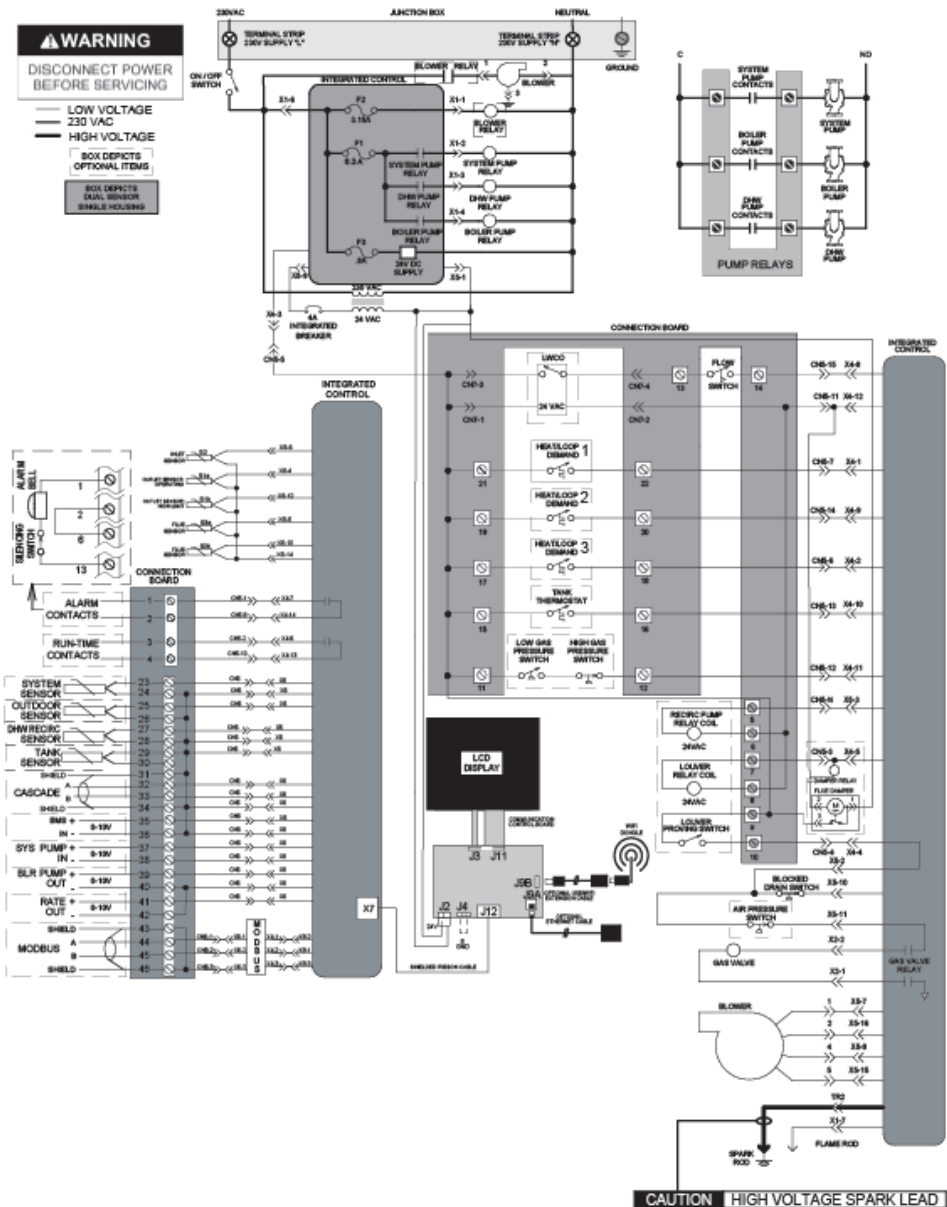
		HCB117	HCB190	HCB235	HCB295
A Height	mm	1143	1143	1143	1143
B Width	mm	610	610	610	610
C Case length	mm	851	1080	1080	1270
D length including pipework	mm	1080	1346	1346	1575
Gas Connection	Inch	1"	1¼"	1¼"	1¼"
Flow connection	Inch	2"	2"	2"	2½"
Return connection	Inch	2"	2"	2"	2½"



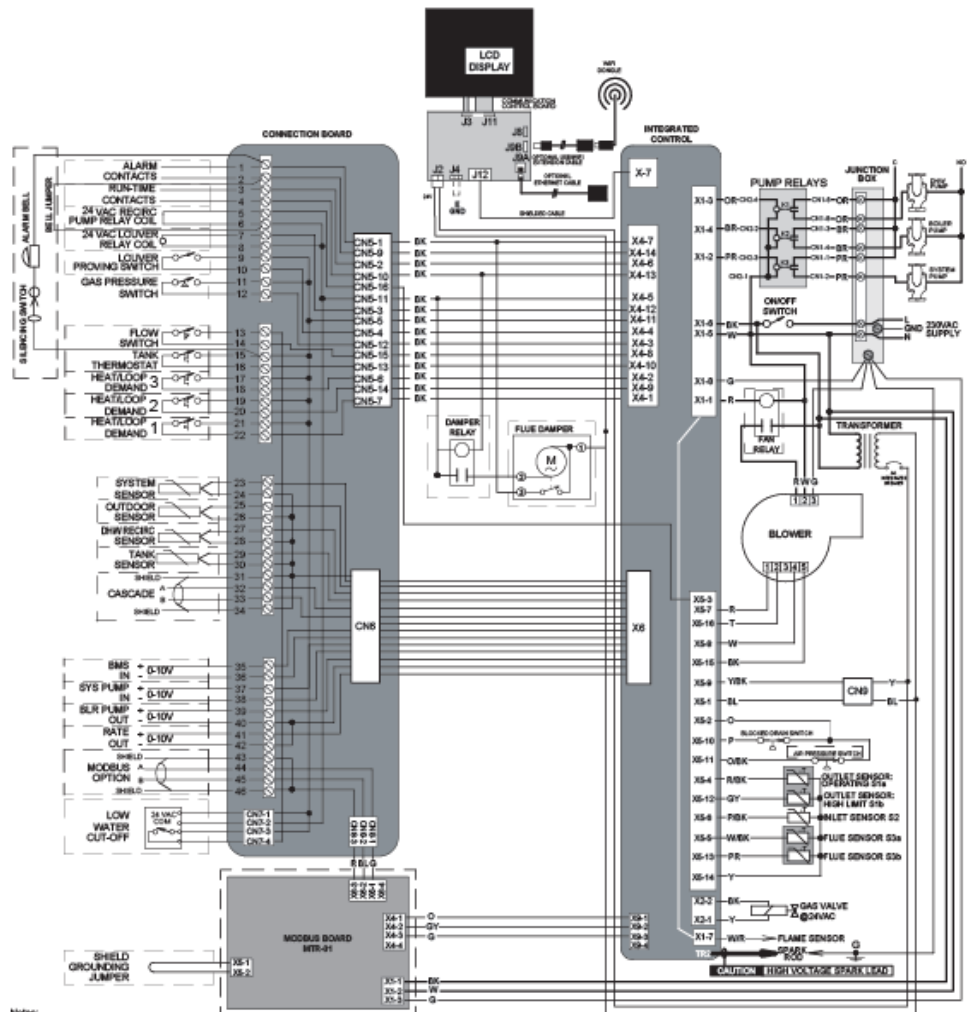
APPENDIX 3 ERP DATA TABLE

Type		HC B117	HC B190	HC B235	HC B295
Condensing boiler:				Yes	
Low temperature boiler:				No	
B11 boiler:				No	
Cogeneration space heater:				No	
Combination heater:				No	
	Unit:				
Rated heat output					
P-rated (P4) at 60-80°C	kW	111.7	163.1	197.3	248.4
Heat output (p1) 30% at 30-37°C	kW	37.8	55.3	66.6	83.9
Seasonal space heating energy efficiency (η_s)					
Energy efficiency Class space heating		A	A	A	A
Seasonal space heating efficiency (η_s)	%	92.5	92.4	90.8	92
Energy efficiency (η_4) at 60-80°C	%	87.2	87.1	87.1	86.9
Energy efficiency (η_1) at 30-37°C	%	98.4	98.4	98	97.8
Auxiliary electricity consumption					
At full load (elmax)	kW	0.238	0.767	0.979	1.003
At part load (elmin)	kW	0.193	0.283	0.821	0.353
In standby mode (Psb)	kW	0.017	0.017	0.018	0.045
Other					
Standby heat loss (Pstby)	kW	0.14348	0.14583	0.14348	0.15623
Emissions (NOx) of nitrogen oxides (EN15502)	mg/kWh	22	30	33	37
Sound power level, indoors (EN 14436 - 1:2006)	db	79.2	80.7	81.8	83.3

APPENDIX 4 WIRING DIAGRAM



APPENDIX 5 LADDER DIAGRAM



- Notes:
1. All wiring must be installed with local, state, provincial, and national code requirements per either N.E.C. in USA or C.S.A. in Canada.
 2. If any original equipment wire as supplied with appliance must be replaced, then it must be replaced with wire having same wire gauge (AWG) and rated for a minimum of 105°C. Exceptions: Replacement high voltage spark lead and ribbon cables must be purchased from the factory. Use of a non-approved spark lead or ribbon cables can lead to operational problems which could result in non-repairable damage to the integrated controller or other components.
 3. Actual connector block locations may vary from those shown on diagrams. Refer to actual components for proper connector block locations when using diagrams to trouble shoot.
 4. Where possible, switches are shown without utilities (gas, water, electricity) connected to the unit. As such, actual switch states may vary from those shown on diagrams depending upon whether utilities are connected or fault condition is present.

APPENDIX 6 DECLARATION OF CONFORMITY



CERTIFICATE

Number	23GR0622/00	Replaces	--
Issue date	28-03-2024	Contract number	E4722
Due date	28-03-2034	Module	B (Type testing)
Report number	P000118450	Scope	(EU) 2016/426 (9 March 2016)
PIN	0063DO3450		

EU TYPE EXAMINATION CERTIFICATE (GAR)

Kiwa hereby declares that the **condensing central heating boilers**, model(s):

**HCB 117,
HCB 190,
HCB 235,
HCB 295**

Manufacturer **Lochinvar Ltd
8 Lombard Way, The MXL Centre
Oxon, OX16 4TJ Banbury
United Kingdom**

meet(s) the essential requirements as described in the
Regulation (EU) 2016/426 relating to appliances burning gaseous fuels.

Reference standard: EN 15502-1:2021/AC:2022 and EN 15502-2:1-2022

This certificate is only valid in combination with the appendix to this certificate, where specific information and/or conditions are given.

Ron Scheepers
Managing director

Kiwa Nederland B.V.
Vijlindardijk 50
P.O. Box 137
7320 AC APELDOORN
The Netherlands

<https://www.kiwaenergy.com>



APPENDIX 7 WARRANTY

Model	Warranty Period	
All Herald HCB Range	Heat Exchanger	5 Years
	All other components#	2 Years
Conditions	Working temperature must be no greater than 85°C . Water quality must comply with the guidance within the ICM instructions	

(1) General Warranty

If within 2(Two) years of the invoice date or commissioning date of a Boiler supplied by Lochinvar Ltd., following verification, and at the sole discretion of Lochinvar Ltd., an assembly or part (with exclusion of the heat exchanger) proves to be defective or fails to function correctly due to manufacturing and/or material defects, then Lochinvar Ltd. shall repair or replace this assembly or part. The warranty starts from the date of delivery, unless commissioned by Lochinvar in which case warranty starts from the date of commissioning which can be up to a maximum of 6 months after the date of delivery.

(2) Heat Exchanger Warranty

The Herald low water content stainless steel heat exchanger has a manufacturing defect warranty of up to 5(5) years. This provides coverage to the end user via Lochinvar that if the heat exchanger becomes unserviceable due to a material or workmanship defect it will be replaced.

(3) Conditions for installation and use

The warranty set out in articles 1 and 2 will apply solely under the following conditions:

- The Boiler is installed under strict adherence to Lochinvar Ltd. installation instructions for the specific model and must be in accordance with the relevant requirements of the Gas Safety Regulations, Building Regulations, I.E.E. Regulations and the byelaws of the local water undertaking. The installation should also be in accordance with any relevant requirements of the local gas distributor and local authority.
- The Boiler remains installed at the original site of installation.
- The water temperatures in the heater do not exceed the maximum setting of the thermostats, which form a part of the Boiler.
- The water pressure and/or heat load do not exceed the maximum values stated on the Boiler rating plate.
- The boiler is installed in a non-corrosive atmosphere

(4) Exclusions

#Service parts and consumables are not included within the above warranty period, this includes (but is not limited to) any part identified within the Installation manual which should be changed as part of the service regime for the appliance. These parts have a 12-month warranty from the date of commissioning or from the date of delivery to site (see warranty clause above).

The warranty set out in articles 1 and 2 will not apply in the event of:

- Damage to the boiler caused by an external factor;
- Misuse, neglect (including frost damage), modification and incorrect and/or unauthorized use of the boiler;
- Contaminants or other substances having been allowed to enter the boiler heat exchanger;
- Any attempts at repair to a defective Boiler other than by an approved service engineer.
- Blockages of the heat exchanger due to the ingress of debris from the heating system or lime scale from the system water are not defects in the material or workmanship of the heat exchanger and are therefore not covered by the warranty. It is of utmost importance when installing the boiler that adequate measures are taken to prevent blockages of the heat exchanger.
- Any fault arising due to inadequate water quality or insufficient cleansing of the heating system.

(5) Scope of the warranty

The obligations of Lochinvar Ltd. pursuant to the specified warranty are limited to free delivery from the warehouse of the replacement assemblies, parts or boiler, respectively. Labour, installation and any other costs associated with the replacement will not be accepted by Lochinvar Ltd.

(6) Claims

A claim on grounds of the specified warranty must be submitted to the dealer from whom the water heater was purchased, or to another authorized dealer of Lochinvar Ltd. Inspection of the boiler as referred to in articles 1 and 2 shall take place in one of the laboratories of Lochinvar Ltd.

(7) Warranty Procedures

If a claim is to be made under the terms of our warranty, the original purchaser of the appliance should place a purchase order for the required component/appliance and obtain a Warranty Case number for the return of the defective component/appliance.

To process any warranty claim, we require the following information:

- Appliance model number
- Appliance serial number
- Date and proof of purchase
- Brief description of fault

Upon receipt of the defective component/appliance, it will be tested and if found to be faulty, a credit will be raised against the relevant invoice.

Obligations of Lochinvar Ltd.

Lochinvar Ltd. grants no other warranty or guarantee over its boilers nor the (assemblies or parts of) boilers supplied for replacement, other than the warranty expressly set out in these conditions. Under the terms of the supplied warranty, Lochinvar Ltd. is not liable for damage to persons or property caused by (assemblies or parts, of) a (replacement) boiler that it has supplied.



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