



# Hamworthy Warmwell

Gas Fired Modular  
Condensing Boilers

Single Boiler Outputs 59 kW to 135 kW

Multiple Boiler Outputs 118 kW to 810 kW



Heating *at work.*

# Warmwell

Cast Iron Gas Fired

Condensing Boilers

Hamworthy have introduced two additional models to the Warmwell range, further increasing the flexibility of this leading range of cast iron atmospheric condensing boilers.

The 120kW and 80kW models have been added to complement the other models which provide condensing outputs of 59kW, 93kW and 135kW.

The Warmwell has been designed to integrate with the Purewell range of atmospheric boilers and is ideally suited to installation in modular configurations. The casings have been designed with flexibility in mind to allow compatible Warmwell and Purewell boilers to be installed in a multi-casing arrangement.

The Warmwell achieves higher efficiencies than conventional boilers by extracting extra heat, which is held in the form of a water vapour, from the products of combustion.

The condenser is made from aluminium with copper construction on the water-side. This removes the need for the specialised water treatment that is required for all aluminium heat exchangers.

Increased reliability is achieved by the use of hot surface ignition system, which improves cold start situations and eliminates electrical spikes associated with conventional spark ignition systems.

High/low burner operation comes as standard, further enhancing the energy efficiency of the Warmwell boiler.

Individual shunt pumps are not required on Hamworthy Warmwell boilers and therefore costs can be reduced on multiple installations.

## Options

- Hours run meters
- Sequence Controller
- Pump over-run timer
- LPG-Propane  
(W60, W95 & W140 models only)

- Simple, reliable design
- Reduced fuel bills
- Greater efficiency
- No special water treatment
- Lower servicing & maintenance costs
- System design flexibility

BENEFITS

**Warmwell condensing boilers can be integrated with the Purewell Classic range to provide cost effective heating solutions that respond to increasing government and social pressures to reduce combustion emissions.**

### Modular Condensing Boilers

Warmwell and Purewell Classic modular boilers combined in multi-casing arrangement



# Typical Layout



# Specification

The Warmwell comes as standard with a fully automatic ignition system, utilising a hot surface ignition element, that dispenses with a permanent pilot.



This highly effective and reliable form of ignition requires less maintenance than conventional spark ignition, and eliminates the electrical interference sometimes associated with that type of system. Flame proving is achieved by using a flame rectification probe.

All boilers are fitted with a fabricated steel control panel, which houses the main electronic control system. The control panel has a drop down fascia to facilitate access for servicing and a simple mimic display allows the user to monitor the current operating status of the boiler at any given point in time.

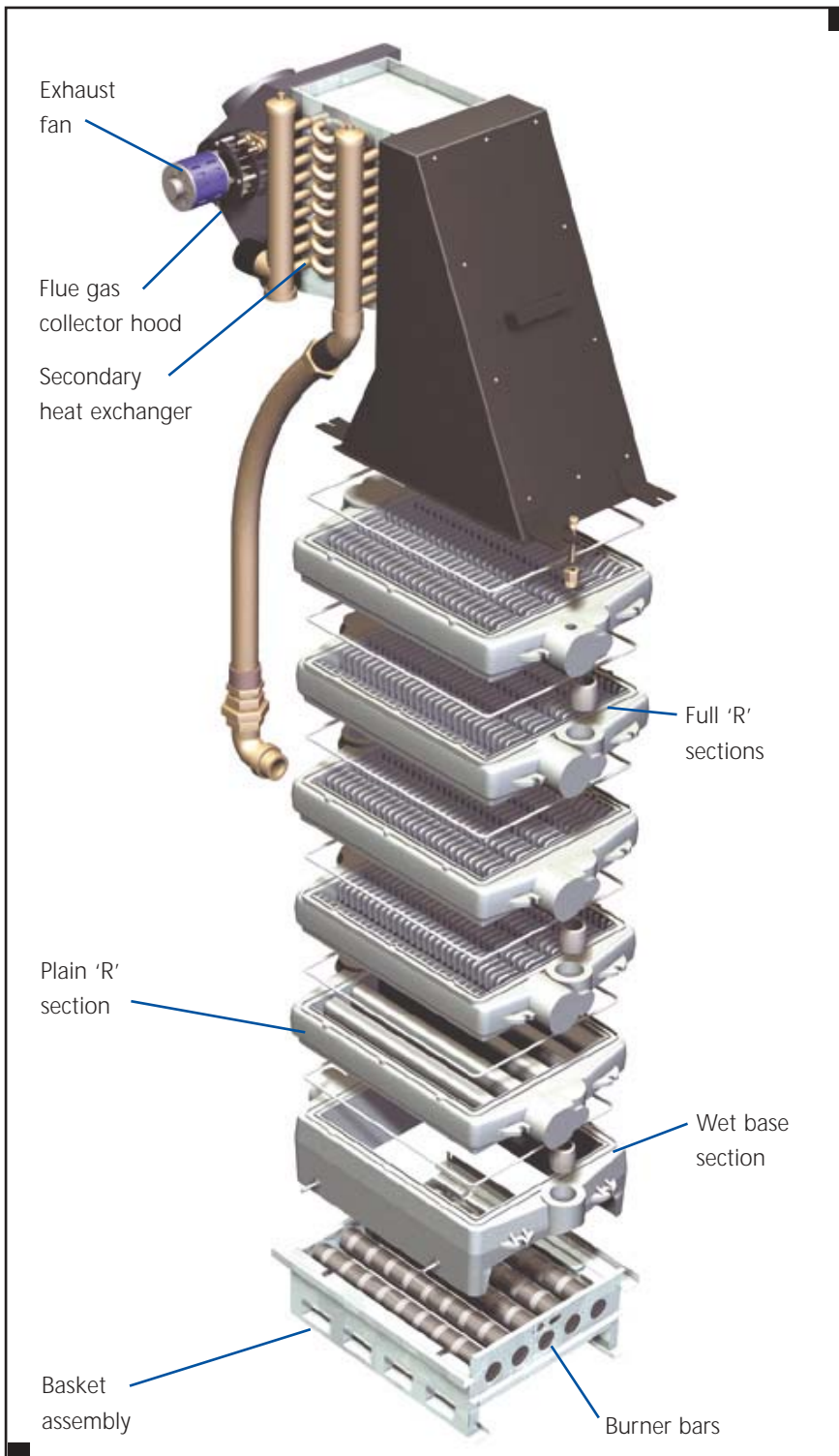
Volt free contacts are fitted as standard to enable remote monitoring of the boiler status, indicating boiler run, lockout and high temperature conditions.

In-built high/low operation, via a dual stage electronic thermostat, provides an effective form of control for single boiler installations. However for modular applications full sequence control is more appropriate, refer to the controls section on page 8 for more details.

The boiler can be controlled remotely from a Building Management System or Timeclock Controller using the remote start/stop circuit. The high/low operation can also be controlled remotely in a similar manner.

# Improved Efficiency

High efficiency is one of the key principles for the Warmwell. The heat exchanger has been developed to maximise heat transfer, satisfying the efficiency requirements laid down within the European Boiler Efficiency Directive, whilst retaining a very robust construction for long life.



## Primary Heat exchanger

Using up to date casting technology, Hamworthy has a reliable proven design for the "series flow" primary heat exchanger, that has been developed specifically for the Warmwell range of boilers.

- Each section has been designed exclusively to suit boiler output.
- Section design contains an increased finned surface area generating a highly efficient gas to water heat transfer rate.
- Each section is nipped at alternate ends eliminating the problem of thermal stress.
- The Warmwell wet section base is positioned close to the burner bars. This enables the boiler base to remain cool while absorbing heat normally lost, thereby improving efficiency.
- On assembly, the Warmwell heat exchanger is fully insulated with a jacket, which retains heat within the boiler minimising standing losses.

## Condensing Section

Attached to the top of the primary heat exchanger assembly, the Warmwell condensing section has been designed for maximum efficiency and performance.

- Design ensures the heat exchanger is continually flushed of any salts that may form.
- Design ensures there will be no re-entrainment of flue gas, which could increase acidic levels, leading to aggressive condensate.
- Produced with copper tubes on the water side and aluminium on the gas side which ensures that no special water treatment is required.

### Radiant baffle



The patented baffle is constructed such that it reflects radiant heat back into the combustion chamber, consequently minimizing heat losses from the boiler.

- The combustion air is pre-heated by extracting heat, as it passes through the baffle.
- By pre-heating the air, efficiency is improved which assists the process of combustion.
- The air travels in a convoluted pattern cooling the baffle in the process by impacting air onto the steel surface.
- The baffle ensures that there are very low temperatures beneath the boiler which protects the floor and provides a safer environment for servicing purposes.
- The baffle removes the need for ceramic insulation and its associated problems.

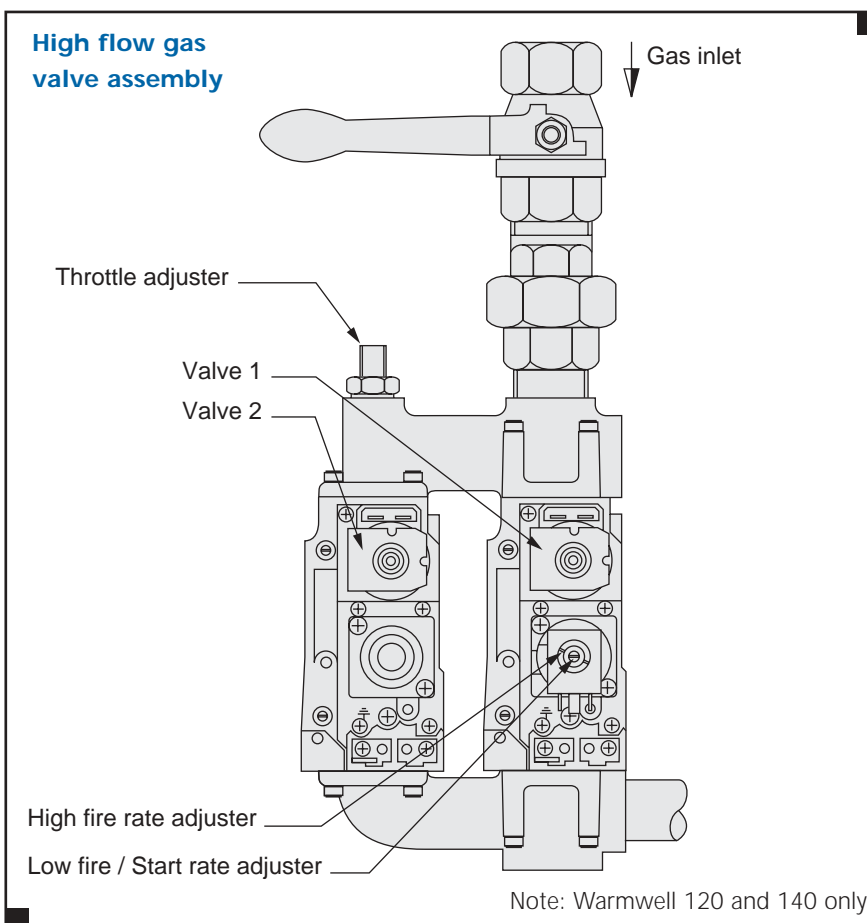
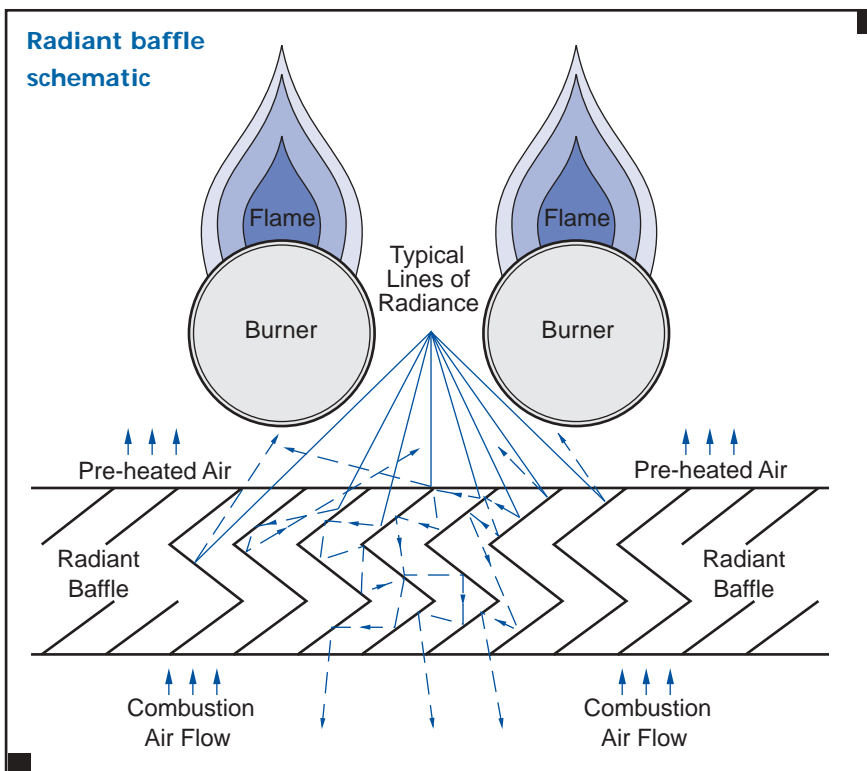
### High flow gas valves



The W120 and the W140 models have a unique patented flow sharing gas valve system demonstrating Hamworthy's skilled proficiency in design engineering.

- The flow share system enables a specified quantity of gas to be passed economically through small valves, whilst retaining the required degree of downstream pressure control.

All Warmwell boilers have a low fire start rate which ignites across all burners at a given percentage of total output. This ensures a safer light up which is fully compliant with the Gas Appliance (Safety) Regulations.



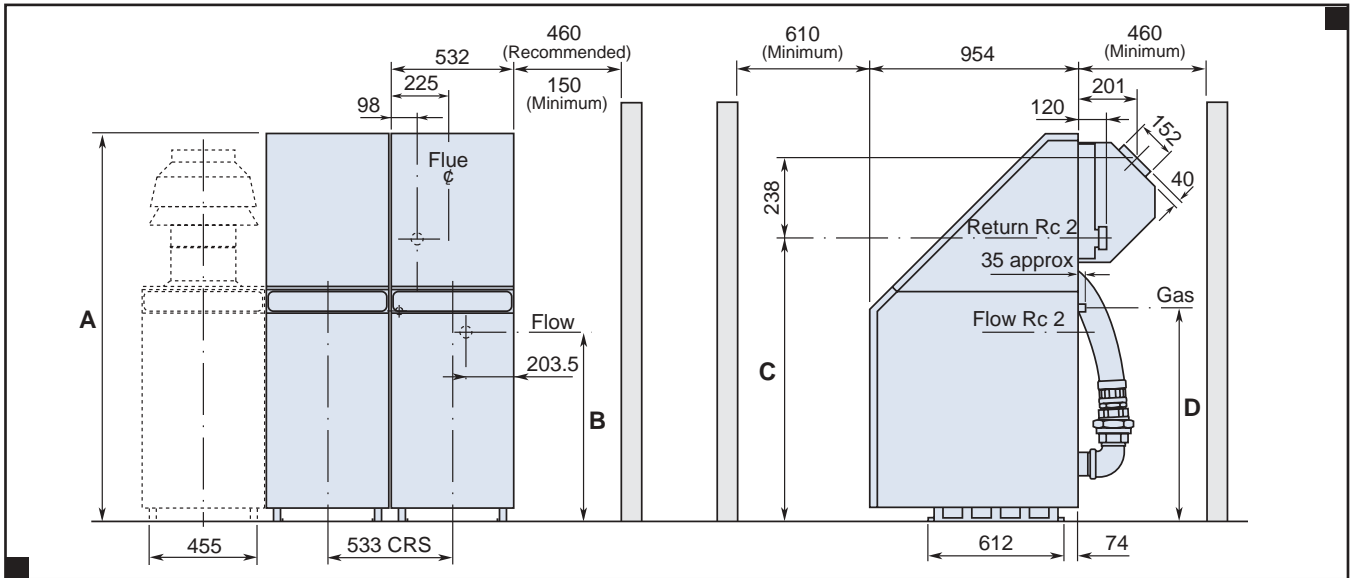
# Technical Data

## Warmwell - Performance and General Data Information

BOILER MODEL		W 60	W 80	W 95	W 120	W 140	
Energy	Boiler output (Condensing)	kW Btu/h x 1000	59 201.3	78 266.0	93 317.3	120 409.4	135 460.6
	Boiler output (Non-condensing)	kW Btu/h x 1000	54 184.2	72.5 247.0	86 293.4	117 399.2	128 436.7
	Boiler input (Gross)	kW Btu/h x 1000	63.4 216.3	86.5 295	101 344.6	132 450.4	150 511.8
	Boiler input (Nett)	kW Btu/h x 1000	57.1 194.8	78 266	90.9 310.2	119 406.0	135 460.6
Water	Water content	litres UK gal	36 7.9	43 9.5	43 9.5	50 10.9	57 12.5
	Water flow rate @ 15°C Δt rise	litres UK gal/min	0.94 12.4	1.21 16.0	1.46 19.3	1.91 25.2	2.15 28.4
	Water flow rate @ 20°C Δt rise	litres UK gal/min	0.70 9.2	0.91 12.0	1.10 14.5	1.43 18.8	1.61 21.2
	Water side pressure drop @ 20°C Δt rise	mbar in wg	17.6 7.1	32.0 12.8	50.0 20.0	91.0 36.5	117.7 47.1
	Maximum water pressure	barg psig	6 87				
Gas	Input rate natural gas	m <sup>3</sup> /h ft <sup>3</sup> /h	5.92 209	7.90 279	9.44 333	12.6 445	14.1 498
	Nominal gas inlet pressure	mbar in wg	20 8				
	Maximum gas inlet pressure	mbar in wg	25 10				
	Gas setting pressure, natural gas	mbar in wg	12.5 5.0	10.7 4.3	9.5 3.8	11.6 4.6	11.0 4.4
	No. of burner bars/injectors		4	4	4	5	5
Flue	Approx. flue gas volume Condensing @ 9% CO <sub>2</sub> & NTP. (Dry)	m <sup>3</sup> /h ft <sup>3</sup> /h	82.81 2924	111.0 3920	132.05 4663	173.5 6127	197.2 6964
	Approx. flue gas temperature (Condensing)	°C °F	45 113				
	Approx. flue gas temp. (Non-Condensing)	°C °F	65 149				
Connections	Water flow/return connections		Rc 2" ISO 7/1				
	Gas inlet connection pipe thread size		R <sup>3</sup> / <sub>4</sub> " ISO 7/1			R1" ISO 7/1	
	Nominal flue diameter	mm	150				
Electrics	Normal supply voltage		230V, 50Hz, Single Phase, 10 Amp Fuse				
	Power consumption (Maximum)	W	190				

# Technical Data

## Warmwell - Dimensions / Clearances



NOTE: The condensate drain is located at the rear of the boiler adjacent to the bottom pipe connection. A suitable tundish must be positioned below this connection to dispose of any condensate produced.

### Single units

Model		W60	W80	W95	W120	W140
Approx. dry weight	kg	285	335	335	395	450
A - Boiler height (casing)	mm	1440	1440	1440	1630	1630
B - Flow connection height	mm	573	667	667	761	855
C - Return connection height	mm	953	1047	1047	1141	1235
D - Gas connection height	mm	769	769	769	957	957

### Multiple units (The following multiples are suggestions)

Model	Number of modules	Output to water condensing		Input rate natural gas		Approx. dry weight kg
		kW	Btu/h x 1000	m <sup>3</sup> /h	ft <sup>3</sup> /h	
MW 120/2/60	(2 x W 60)	118	403	11.84	418	570
MW 160/2/80	(2 x W 80)	156	532	15.80	558	670
MW 190/2/95	(2 x W 95)	186	635	18.88	666	670
MW 240/2/120	(2 x W 120)	240	819	25.20	890	790
MW 280/2/140	(2 x W 140)	270	921	28.20	996	900
MW 180/3/60	(3 x W 60)	177	604	17.76	627	855
MW 240/3/80	(3 x W 80)	234	798	23.70	837	1005
MW 285/3/95	(3 x W 95)	279	952	28.32	999	1005
MW 360/3/120	(3 x W 120)	360	1228	37.80	1335	1185
MW 420/3/140	(3 x W 140)	405	1382	42.30	1494	1350

Other modular configurations can be used to achieve the desired output. Warmwell condensing boilers can be incorporated into heating systems with the Purewell Classic atmospheric boilers (see brochures 500002201).

# Specification

## Heat exchanger

Each individual boiler has a heat exchanger manufactured from horizontal cast iron sections which when pressed together with nipples at alternate ends, produce a proven horizontal series water flow pattern. During assembly each heat exchanger is pressure tested to 14bar (203 psi). The Warmwell is tested to the latest boiler standards covering working pressure up to 6 bar (87 psi).

The boiler sections are positioned onto a fabricated galvanized mild steel basket assembly which houses the burner bar and igniter assembly. The burner bar and gas train assemblies are attached by two nuts to the basket emphasising serviceability and ease of inspection.

## Condensing Section

The condensing section is connected to the top of the primary exchanger assembly. It is arranged such that flue gasses and condensate run in a co-current flow path. The design ensures the heat exchanger is continually flushed of any salts which may form and that there will be no re-entrainment of the flue gas condensate, which could increase acidic levels leading to an aggressive environment.

## Exhaust fan and flue connector

An exhaust unit pulls the flue gas through both exchangers and supplies adequate pressure for connection to the flue. The spigot for the flue take-off is angled at 45° to facilitate either a horizontal or vertical flue via a 45° connector (supplied by others).

## Flue System

The flue system must be capable of handling the wet flue gases and horizontal sections should incorporate a fall for drainage of the condensate that forms in the flue system.

The Hamworthy Masterflue MF system is designed specifically for high performance condensing boilers and features fully welded construction and a unique factory fitted tri-lip silicone

sealing ring with every component. The Masterflue MF range of components also includes a standard range of tees and elbows at 87 and 43 degrees to facilitate easy drainage without alignment problems.

## Hot Surface Ignition

Fully Automatic boilers have a direct burner ignition system that ignites the burners each time the boiler is called to fire. This is achieved using a hot surface ignition element that reaches a temperature of approximately 1300°C.

Hot surface ignition replaces the traditional spark electrode that can sometimes produce electrical spikes, which are a possible cause of interference with control systems.

## Burner

The burner arrangement of the boiler comprises a tried and tested reliable burner bar system with 4/5 burner bars depending on thermal input. This system has been specifically designed to provide clean and efficient combustion.

## Radiant Baffle

A patented radiant baffle assembly is positioned beneath the burner bars, this both protects the floor underneath the boiler and improves overall efficiency. The baffle assembly is extremely durable, constructed from coated steel, and obviates the need to use ceramic insulation. (For more detailed information refer to page 5).

## Layout

The Warmwell boiler can be installed as a single unit or in modular form where a 'multi' casing maximizes available floor space.

It is recommended that a maximum of 6 boilers can be positioned on 533mm (21") centres if required. Larger numbers should be split into two or more banks with 150mm (6") between each bank.

The positioning of the boilers on 533mm (21") centres can be done with a high level of accuracy. To

complete a modular formation, the baskets are butted against each other which ensures that distances cannot be sized incorrectly.

The Warmwell is supplied on a dismantlable wooden pallet giving improved ease of installation.

The basket assembly incorporates runner type feet which increases the overall manoeuvrability of the boiler for final site positioning.

NOTE: W 60, W 80 or W 95 can only be used in a modular configuration with Purewell PC 40, PC 50, PC 60, PC 70 & PC 80 models.

A W 140 or W 120 can only be used in a modular configuration with Purewell PC 95, PC 105 and PC 120 models.

Boiler casings are supplied to suit compatible models. The modular configuration must be specified at the time of ordering.

## Sequence Control

Using a number of smaller boilers (modules) in order to accurately match the required load is an excellent approach to heating system design.

In order to get the full benefit from a multiple boiler installation it is essential to fit some form of sequence control system.

The Marshall sequence controller is capable of providing effective sequence control for Warmwell boilers.

In addition to providing sequence control of the boiler installation the Marshall is also capable of direct weather compensation and optimised boiler start. These features require optional external and room temperature sensors to be fitted, and enable further energy savings to be achieved.

### Boiler casing

Careful consideration has been given to casing design. The panels are of robust construction and mounted to the boiler giving greater rigidity to the unit. Due regard has been given to serviceability and easy access to the boiler. A removeable front door panel provides the end user with ease of inspection and maintenance. For modular applications two casing panels are provided and positioned on either side of the configuration. In between each module is a steel intermediate frame.

Optional rear cover plates are available to enhance the appearance of the boiler backs.

### The gas train

The gas train is completely detachable. Major items can be removed during servicing within 2-3 minutes if required. The gas train comprises a service cock, union connection, gas valve(s) and injector manifold.

### Electrical details

Supply 230V 50Hz, single phase.  
Wiring external to the boiler must be installed in accordance with I.E.E. regulations and any local regulations which apply. Wiring must be completed in heat resistant 3 core cable, (size 1.0 mm<sup>2</sup> c.s.a.). Fascia fuse rating is 2 amp. External fuses should be 10 amp for all single boiler sizes.

### Condensate Pipework

When the boiler is in the condensing mode, condensate is produced typically in the order of approx. 7.2 litres (1.6 gals) per hour of operation. When designing the condensate pipework it is recommended that a tundish or similar device be fitted. In the event of the pipework becoming blocked or freezing externally, this would ensure the boiler flue ways are not contaminated with condensate. Copper pipework is not recommended for this application owing to the acidity of the condensate

### Thermostats

All Warmwell boilers are fitted as standard with a dual stage electronic temperature control that has a range of 30-90°C. A manual reset temperature limit thermostat is supplied which has a range of 90-110°C, this will be normally factory set to 100°C.

For the boiler to run effectively in condensing mode the return temperature should be between 30-45°C. The control thermostat should therefore be set at 45-55°C depending on water flow rate and hence the temperature rise achieved. If a higher flow temperature is required the boiler is capable of operating in non-condensing mode up to 90°C, providing sufficient water head is available.

The difference between the high limit stat setting and the control stat setting must not be less than 10°C.

### Time clock control

Where boilers are operated from time clocks, to avoid overheating and progressive calcium deposition at zero flow conditions, provision should be made for a 5 minute circulating pump over run after the last boiler has ceased firing.

### Connections

#### Water

Designed to meet latest market requirements, the water connections are also at the rear of the boiler.

Each boiler has one 2" BSP female flow and one 2" BSP female return tapping.

#### Gas

The Warmwell boiler is fitted with a gas inlet pipe which terminates at the rear of the casing.

Connection sizes are as follows:

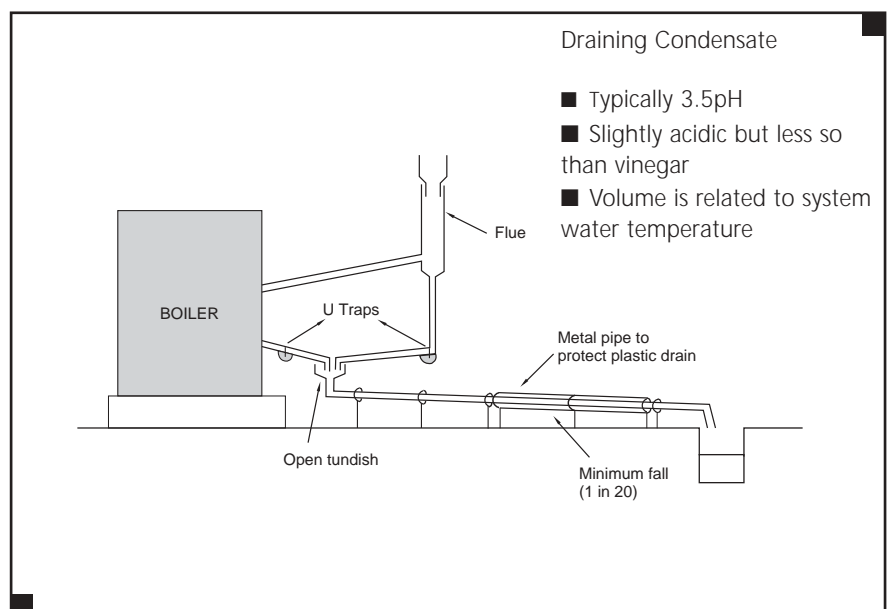
*Warmwell 60, 80 and 95 - R<sup>3</sup>/<sub>4</sub>" (BS.21)*

*Warmwell 120 and 140 - R1" (BS.21)*

### Commissioning

Hamworthy Heating Ltd strongly recommend that all boilers are commissioned by their service department who will issue a boiler log-book that details the initial operating settings and can be used to record future maintenance work.

*For more information on commissioning contact Hamworthy Heating Service Department: 0845 450 2866.*



# Application & System Data

The installation of the boiler 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.

The installation should also be in accordance with any relevant requirements of the local gas region and local authority and the relevant recommendations of the following documents:

## British Standards

**BS 5854** Code of practice for flues and flue structures in buildings.

**BS 6644** Specification for installation of gas fired hot water boilers of rated inputs between 60kW and 2MW.

**BS 6700** Design, installation, testing and maintenance of services supplying water for domestic use.

**BS 6880** Code of practice for low temperature hot water heating systems of output greater than 45kW.

**Part 1:** Fundamentals and design considerations.

**Part 2:** Selection of equipment.

**Part 3:** Installation, commissioning and maintenance.

**BS 7074** Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems. **Part 2:** Code of practice for low and medium temperature hot water systems.

**BS CP342** Code of practice for centralised hot water supply. **Part 2:** Buildings other than dwellings.

## I. Gas E. Publications

**IGE/UP/1** Soundness testing and purging of industrial and commercial gas installations.

**IGE/UP/1A** Soundness testing and direct purging of small low pressure industrial and commercial natural gas installations.

**IGE/UP/2** Gas installation pipework, boosters and compressors in industrial and commercial premises.

**IGE/UP/10** Installation of gas appliances in industrial and commercial premises.

## Health and safety executive:

Guidance note PM5 - Automatically controlled steam and hot water boilers.

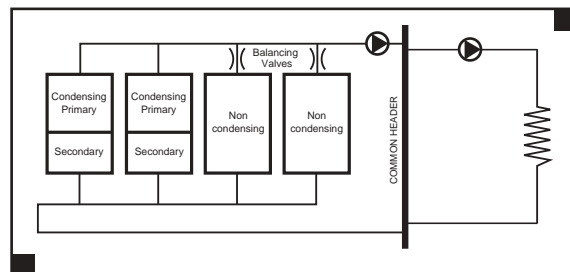
## Boiler base

Warmwell boilers should be positioned on a level non combustible surface that is capable of adequately supporting its weight (when filled with water) and any ancillary equipment. Adequate space for installation and servicing should be considered. This should not normally be less than 460mm at the rear, for flow and return connections. Also allow at least 460mm on one side, the other side must be no less than 150mm. Allow 610mm (minimum) in front of the boiler for servicing.

## Water systems - Modular installations

Flow and return headers should be connected in a "reverse return" arrangement (i.e. the water flow in each header follows the same direction) thus providing equal flow through each boiler. This also ensures that pressure loss across any number of boilers will never be greater than the head loss across one boiler plus local pipework losses.

When installing Warmwell boilers as part of a mixed modular system with Purewell boilers, balancing valves should be fitted to the Purewell boilers. Balancing valves are required in order to compensate for extra pressure drop through the Warmwell's condensing section.



Warmwell and Purewell modular boilers in "reverse return arrangement"

For further details relating to the design of multiple boiler systems refer to publication 500002194.

## Adequate water flow

The Warmwell boiler is designed as a quick response, low water content unit to run continuously with minimal operating problems. Care should be taken in the initial design and layout, having due regard for adequate water flow through the boilers and the influence of the system control. Refer to technical data table for minimum water flows required. The control system and valves, where fitted, should be regulated to avoid lower flows occurring. The flow corresponding to 22°C temperature rise across the boiler is the minimum recommended flow at any time. A minimum return temperature of 30°C should be maintained.

## System feed water quality

If the boiler feed water has a high degree of hardness, it is recommended that the water be treated to prevent precipitation of scale or sludge in the boiler water passages. Since the secondary heat exchanger is constructed from copper on the water-side, specialist additives for water treatment are not required. Details of additives can be obtained from any specialist water treatment manufacturer or local water authority.

## Open vent pipe and cold feed pipe

Boiler	Open vent size	Cold feed size
<60kW	25mm (1in)	19mm (3/4 in)
60kW-150kW	32mm (1 1/4 in)	25mm (1in)
150kW-300kW	38mm (1 1/2 in)	32mm (1 1/4 in)
300kW-600kW	50mm (2in)	38 (1 1/2 in)

### Pressure relief valve

Each boiler, or in the case of a modular installation, each bank of boilers must be fitted with a pressure relief valve to BS759 or BS6759 Pt.1 and sized as shown in BS6644.

BS6644 provides comprehensive information for the selection and location of safety valves and attention is drawn to the higher capacity requirements of safety valves for pressurised hot water systems.

### System head

#### Guidance Note PM5 Health and Safety Executive

This note states that "hot water boilers should have an automatic control apparatus to cut off fuel to the burners of gas fired plant when the water at or near the boiler flow outlet rises to a pre-determined temperature. This should provide a margin of at least 17°C below the temperature of saturated steam corresponding to the pressure at the highest point of the circulation system above the boiler." To comply with this recommendation, the minimum system pressure is dependant on system design flow temperatures and in the case of modular installations, the temperature rise across each module.

#### Single installations

The minimum pressure must be equal to the gauge pressure equivalent to the saturated steam temperature obtained by adding 17°C to the required boiler flow temperature. The highest point of the circulation system above the boiler should never be less than 2m (6.5ft).

Required flow temperature	95°C
Safety margin	17°C
Equivalent saturated steam temperature	112°C

From steam tables corresponding gauge pressure - 0.50 bar (7.3 psi) - 5.1m (16.7ft) head of water.

#### Modular installations

The minimum pressure should be equal to the gauge pressure equivalent to the saturated steam temperature. This is obtained by adding 17°C to the sum of the required mixed flow temperature plus the temperature rise across the modules.

Required mixed flow temperature	82°C
Temperature rise across modules at minimum flow rate	11°C
Safety margin	17°C
Equivalent saturated steam temperature	110°C

From steam tables corresponding gauge pressure 0.42 bar (6.1 psi) - 4.3m (14ft) head of water.

#### Air supply and ventilation

An adequate supply of fresh air for combustion and ventilation must be provided in accordance with BS 6644. The air supply should be achieved using:

- Natural ventilation supplying air with a low level opening and discharge through a smaller sized high level opening.
- A fan to supply air to a low level opening with natural discharge through a high level opening.
- A fan to supply air to a low level opening and discharged by means of a fan at a high level.

Note: Fans must be selected such that a negative pressure is not created in the boilerhouse relative to outside air pressure.

The air supplied for boiler house ventilation should be such that the maximum temperatures within the boiler house are as follows:

At floor level (or 100mm above the floor level)	25°C
At mid level (1.5m above floor level)	32°C
At ceiling level (or 100mm below ceiling level)	40°C

Where natural ventilation is used suitable permanent openings at low level and high level connected directly to the outside air should be provided. These openings must be fitted with grilles that cannot be blocked or flooded.

The free area of the grilles should be as follows:

#### Low Level (Inlet)

540cm<sup>2</sup> plus 4.5 cm<sup>2</sup> per kW in excess of 60kW total rated input.

#### High Level (Outlet)

270cm<sup>2</sup> plus 2.25 cm<sup>2</sup> per kW in excess of 60kW total rated input.

### Pumps

Hamworthy Heating is now the exclusive distributor of Biral pumps in the UK. With a wide range of models available, you can closely match pump performance to suit your requirements.

The high quality design with innovative features include:

- Unique Can system – no seals to leak
- Low, medium and high speed ranges
- High torque starting
- Ultra low power consumption
- Flat performance curves – less system noise
- Operating pressures up to 16 bar
- Temperatures from -20°C to 140°C
- Whisper quiet pump operation



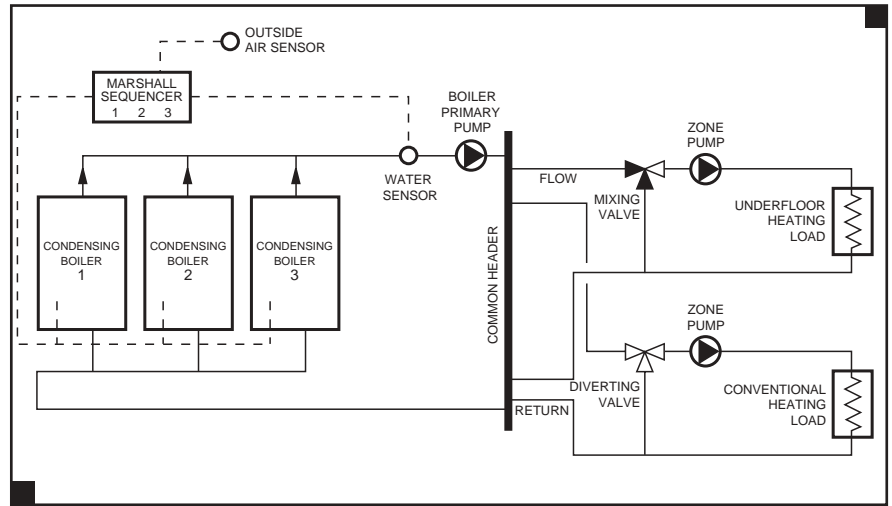
**Talk to HAMWORTHY BIRAL your new partners in pumps**

# System Design

The installation of modular boilers in commercial and industrial heating and hot water systems offer a wide choice of design options and applications. The following systems shown are typical and should be considered for general guidance.

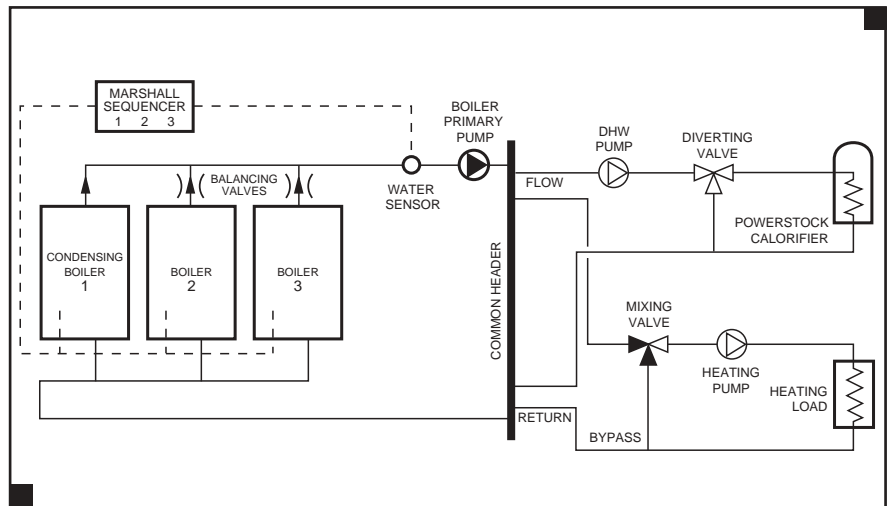
## Example 1

Heating only; with direct temperature compensation and zoned heating loads.



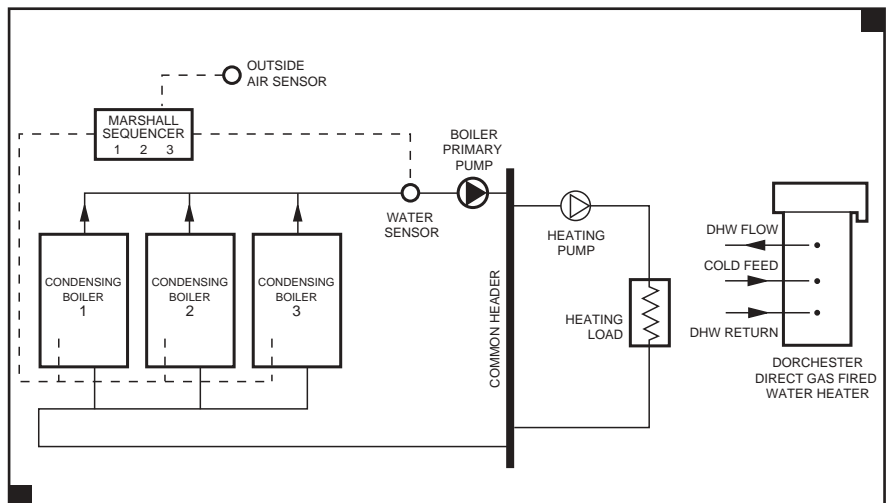
## Example 2

Combined heating and domestic hot water with diverting valve on DHW and mixing valve on heating.



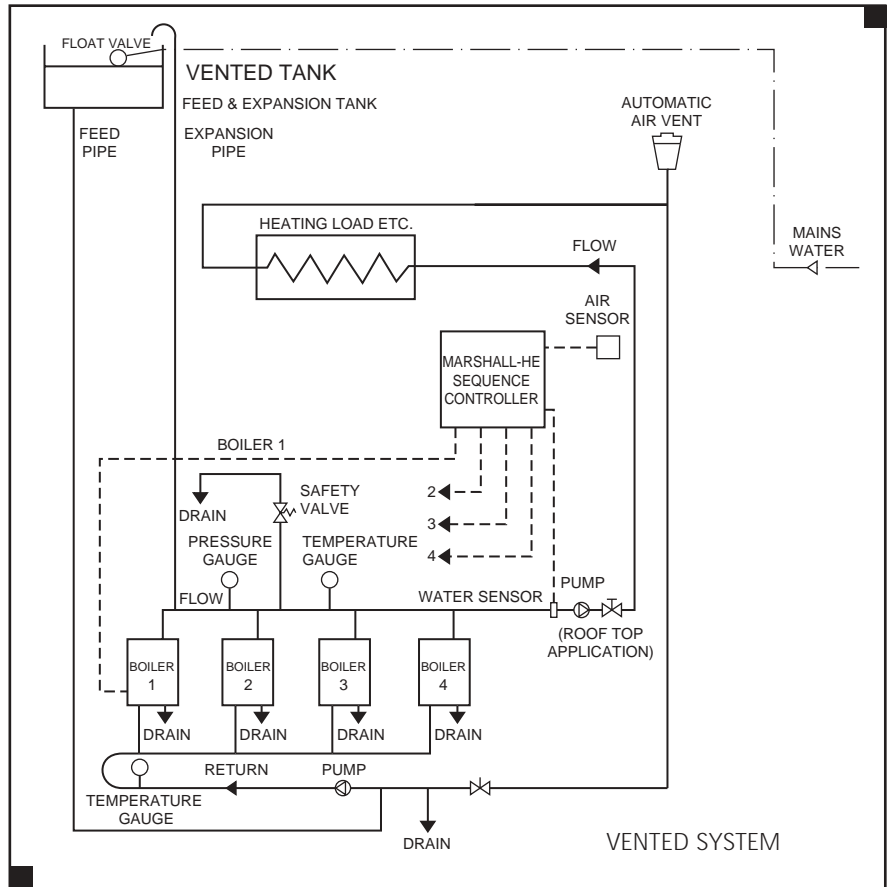
## Example 3

Split system. Completely separate heating and DHW systems. Multiple boilers under direct temperature compensation and a decoupled heating circuit, which may have a variable flow. DHW generated by direct gas fired water heaters.



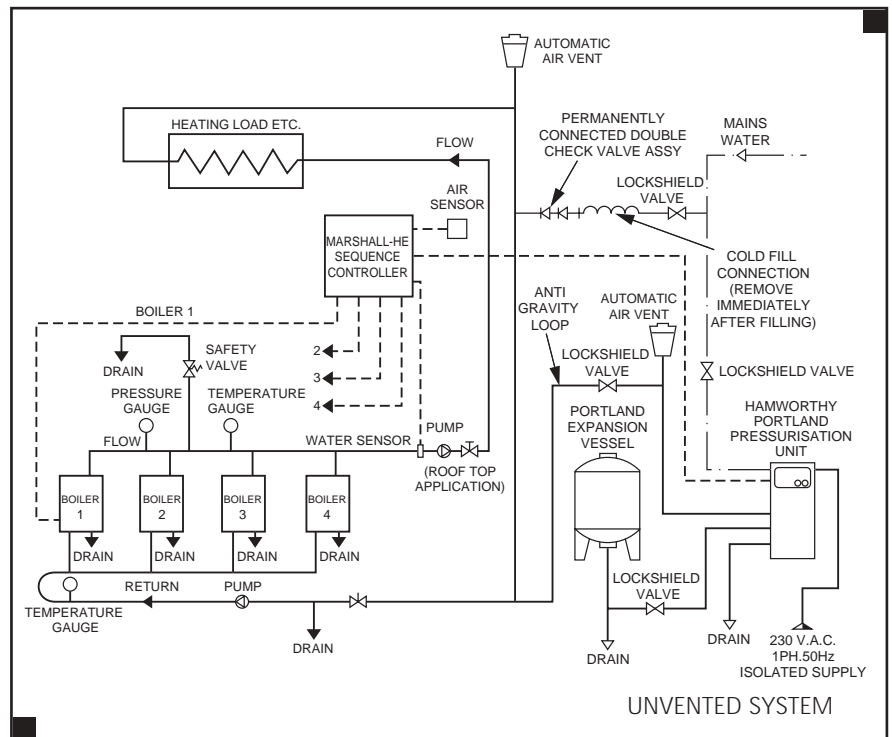
**Example 4**

Boiler installation (typical) vented system.



**Example 5**

Boiler installation (typical) unvented system.



**General notes**

In any single or modular system, it is important that the water flow rate through each firing boiler does not fall below the minimum required flow rate for that size of boiler (see table page 6). In applications where the minimum flow rate will not be met a shunt pump should be installed, sized to provide the minimum stated flow rate per boiler at the equivalent boiler pressure drop plus pipework resistance.

Both heating and shunt pumps should be controlled to provide an overrun period to dissipate residual heat.



# Flue System

Hamworthy Warmwell boilers are designed to be used with natural draught flues. Flue systems should be designed in accordance with current regulations.

The following points should be noted:

- The boiler is designed for connection to a single flue system or a common flue header, where part of a multi-boiler installation.
- The flueways will be under slight positive pressure, up to possibly 25 pascals (0.1in wg) and escaping vapours will condense in the flue, therefore all joints should be sealed to be pressure resistant and watertight.
- The flue systems must be self supporting and facilitate access for cleaning and maintenance joint near the boiler connection.
- When designing the flue system, care must be taken to ensure that any condensate that may form within the system can be safely drained to a suitable waste point, and that the flue material used is resistant to the corrosive effects of that condensate.
- Warmwell boilers are suitable for installation in a balanced compartment in accordance with the requirements of BS 6644



## Flues from Hamworthy

The Masterflue MF system from Hamworthy is a modular, twin wall, insulated, fully welded flue solution, optimised for high efficiency and condensing boiler applications.

### Leak-Free

- Unique factory fitted tri-lip silicone gasket as standard - leak proof, high temperature seal, impervious to water and vapour.
- All components fully welded and pressure tight, including traditionally troublesome elbows.

### Corrosion-Free

- Premium grade stainless steel construction for inner and outer walls.
- 87 degree elbows and tees to ensure condensate drains effectively.

### Worry-Free

- Fast, push-fit assembly with no need for additional sealants.
- Precision finished, reliable components for high quality installation.
- Range of 'Tru-Align' adjustable wall brackets for simplifying alignment, achieving a faster installation and neater finish.
- Continuous insulation from base to stub.
- Fire resistant - 4 hour fire rated.
- Stress-free thermal expansion.
- CE mark accredited to meet 2005 legislation.

The Masterflue range from Hamworthy also comprises 3 further specialist flue lines:

Masterflue ME - single wall, fully welded flue system.

Masterflue AG - gas vent system for atmospheric appliances

Masterflue BF - balanced flue system.

## Design & Install, or Supply Only

Hamworthy's extensive knowledge of combustion systems, and the flue requirements for each boiler, makes a boiler and flue package the perfect solution for every project.

Offering a comprehensive range of flue and chimney equipment for natural draught, fan assisted and fan dilution applications, Hamworthy will provide a full design and installation service incorporating sizing, site survey and drawings for approval (where necessary) prior to installation. All this with the added benefit of a single commissioning visit for boiler and flue system together.

Alternatively, Hamworthy can provide components on a supply only basis for the contractor to install.

Speak with Hamworthy about your flue requirements and get peace of mind on your next project - guaranteed.

Phone 0845 450 2865

Email [flues@hamworthy-heating.com](mailto:flues@hamworthy-heating.com)



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Hamworthy reserves the right to make changes and improvements which may necessitate alteration to the specification without prior notice.

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