

Ensbury LT

- Floor standing
- Steel power flame boiler
- Low temperature high efficiency
- High differential temperature

**NO
MINIMUM
WATER
FLOW RATE**



3 MODELS, OUTPUTS 440 -580KW

up to
85%
Gross Seasonal
Efficiency

Nat Gas
LPG
Oil
Biofuel
Dual fuel

up to
3:1
Turndown

2 Yr
Warranty

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Innovative design offers system versatility

The Ensbury LT floor standing boiler from Hamworthy uses an innovative design for delivering excellent hydraulic and combustion performance, offering versatility in system applications.



Fuel options for low temperature systems

Meeting the needs of modern low temperature or mixed temperature heating systems, the Ensbury range of steel boilers can accept a minimum return temperature of 15°C without condensing, whilst delivering flow temperatures up to 90°C. The boiler is also designed for operating at low flow conditions, making it a very versatile and robust boiler solution.

Comprising 3 models with outputs from 440kW to 580kW, for use with fully modulating or high/low matched burners, delivering operating efficiencies up to 95% nett (86% gross) part load.

The burner options give a choice of fuel; Natural gas, LPG (propane), biofuel or oil. Selected models are also suitable for dual fuel arrangements.

Oil burners are suitable for 28 second and 35 second oil and where matched burners are available, FAME and RME blends of liquid biofuel may be specified, offering sustainable energy solutions.

A three-pass heat exchanger reduces the level of NOx and additionally, there is a range of low NOx matched burners to further improve the environmental credentials of the boiler.

The thermal mass within the Ensbury boiler can accommodate fluctuating operating conditions, and with no minimum water flow requirement, eliminates the need for a shunt pump, simplifying the hydraulic system design.

Key benefits



No minimum water flow required



Low standing losses



High differential temperature range



Close load matching for improved efficiencies



Lower NO_x emissions

Key features:

- ⊗ Floor standing power flame boiler
- ⊗ 3 models: 440, 510 & 580kW output
- ⊗ Natural gas, LPG, oils, biofuel and dual fuel
- ⊗ Open vented or sealed systems
- ⊗ Up to 3:1 turndown ratio
- ⊗ Up to 85% Gross Seasonal Efficiency
- ⊗ Steel heat exchanger

Controls (Page 10)

- ⊗ Pre-wired control panel as standard
- ⊗ Volt free contacts for remote signalling
- ⊗ Limit, control and high fire thermostats
- ⊗ Burner on/off switch
- ⊗ Overheat indicator
- ⊗ Safety interlock indicator

Flues

- ⊗ B23 open flue system

Service & Warranty

(Page 16)

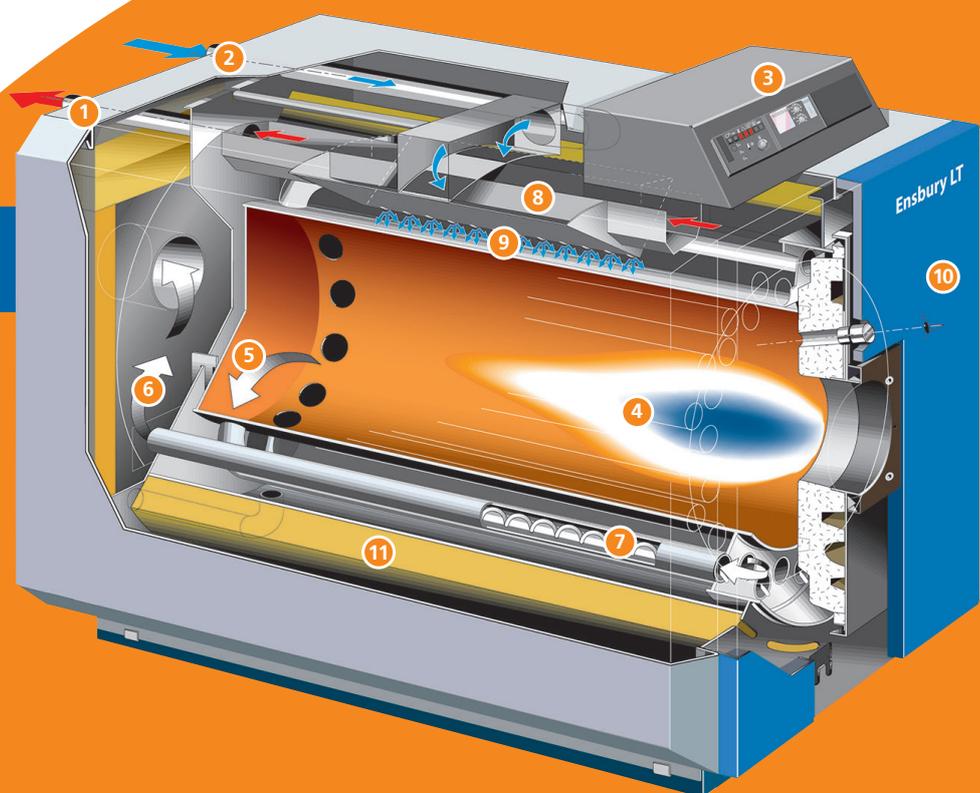
- ⊗ 2-year warranty
- ⊗ Range of service options
- ⊗ Commissioning

Flue gas economiser

(Page 12)

- ⊗ Extracts energy that would otherwise be lost
- ⊗ Increase operating efficiency by up to 18%
- ⊗ Range of models to suit different applications and power requirements

Anatomy of the Ensbury



- | | | |
|------------------------|--|---------------------------------|
| ① Flow connection | ⑤ 2 nd pass swept entry tubes | ⑨ Calibrated injection holes |
| ② Return connection | ⑥ 3 rd pass flue exit | ⑩ Hinged door |
| ③ Boiler control panel | ⑦ Flue gas turbulators | ⑪ High density 100mm insulation |
| ④ Combustion chamber | ⑧ Injection chamber | |

Ensbury technical data

Models ELT 440, ELT 510 & ELT 580

	Ensbury LT boiler model	Units	ELT440	ELT510	ELT580
Energy	Building regulations Part L seasonal efficiency	% gross	85.05	85.11	84.97
	Boiler output 80/60°C	kW	440	510	580
	Boiler input (gross) - maximum	kW	537	622	707
	Boiler input (nett) - maximum	kW	483	560	637
	Boiler output - minimum 80/60°C, NG	kW	100	100	165
	Boiler output - minimum 80/60°C, oil	kW	127	127	219
Water	Water content	litres	540	540	540
	System design flow rate @ 20°C ΔT rise	l/s	5.26	6.1	6.94
	Water side pressure loss @ 20°C ΔT rise	mbar	20	27	35
	System design flow rate @ 10°C ΔT rise	l/s	10.53	12.2	13.88
	Water side pressure loss @ 10°C ΔT rise	mbar	81	108	140
	Water flow rate - minimum	l/s	No minimum flow rate		
	Minimum water pressure	barg	0.5	0.5	0.5
	Maximum water pressure	barg	4	4	4
	Maximum water flow temperature	°C	90	90	90
	Minimum water flow temperature - NG	°C	60	60	60
	Minimum water flow temperature - oil	°C	50	50	50
	Minimum water return temperature	°C	15	15	15
Gas	Gas flow rate, NG - maximum	m ³ /hr	51.2	59.3	67.4
	Inlet pressure for NG - nominal	mbar	20	20	20
	Inlet pressure for NG - maximum	mbar	50	50	50
	Input rate for oil (35sec)	l/h	50.8	58.8	66.9
Flue	Approx. flue gas volume @ 15°C, 9% CO ₂ , N.T.P	m ³ /hr	614.9	707.1	830.1
	Flue gas temperature @ 80/60°C	°C	182	192	197
	Combustion chamber resistance	mbar	2.53	3.83	5.86
Connection	Water flow/return connections		PN6 - DN80	PN6 - DN80	PN6 - DN80
	Gas inlet connection pipe thread size		Rc1 ½"	Rc2"	Rc2"
	Safety valve connection		Rc1 ½"	Rc1 ½"	Rc1 ½"
	Drain connection		R1"	R1"	R1"
	Flue diameter (O/D) - nominal	mm	250	250	250
Electrics	Electrical supply for boiler		230V 1Ph 50Hz	230V 1Ph 50Hz	230V 1Ph 50Hz
	Electrical supply for burner		230V 1Ph 50Hz / 400V 3Ph 50Hz Dependant on burner selection		
	Approx shipping weight (excluding burner)	kg	973	976	980

Note:

1. Data applies to gas and oil fired boiler, unless otherwise stated.
2. The nominal gas inlet pressure shown is for Riello burners. Alternative burners and dual fuel burner requirements may change. Nominal gas inlet pressure must be maintained under full gas flow operating conditions.

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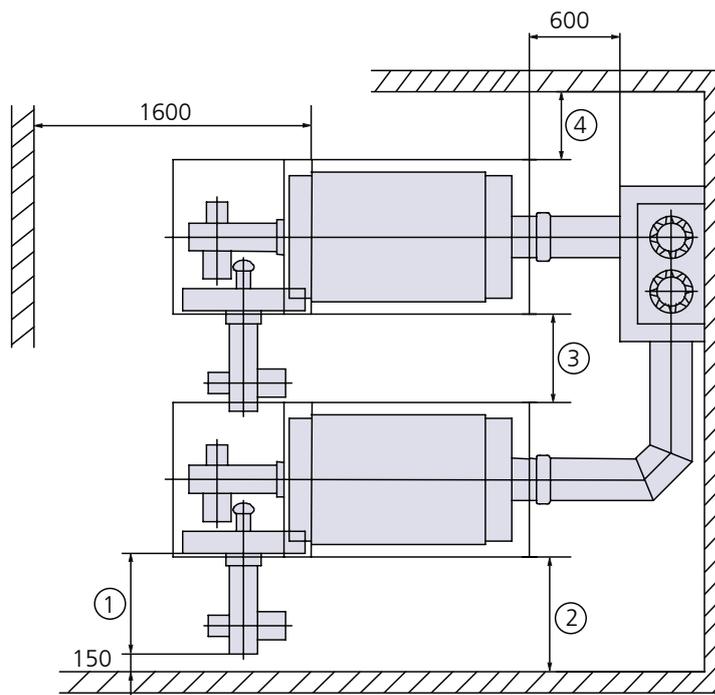
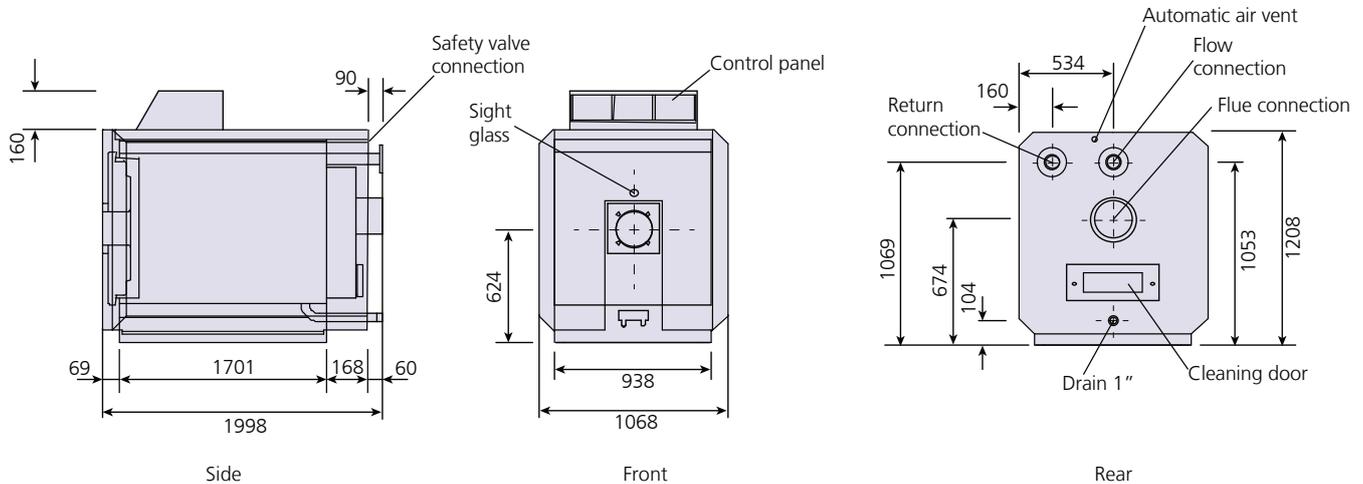
MODELS

440-580

kW
OUTPUT

Ensbury dimensions

Models ELT 440, ELT 510 & ELT 580



Notes:

- ① Burner lengths vary by model.
- ② The boiler door including burner should be able to swing open through 90° providing access to the burner head and combustion chamber for cleaning and maintenance.
- ③ A minimum distance of 200mm must be maintained between boiler castings. If the door handing is as shown, then it should be noted that burner lengths vary by model and may need increasing.
- ④ At least 200mm should be allowed to the side of the boiler for fitting the casing. After fitting the casing the boiler may be moved closer to the wall, but no closer than 60mm. Burner clearance will be required if handing is opposite to that shown.

*Please contact hamworthy technical department for further assistance.
Tel: 01202 662500
Email: technical@hamworthy-heating.com*

Note: All dimensions in mm unless otherwise stated.

Burners

Burners

The Ensbury range of boilers is available with a choice of high/low or fully modulating matched Riello burners. Other burner manufacturers are available on request.

There is a choice of fuel; natural gas, LPG (propane) or oil. Selected models are also suitable for dual fuel arrangements. Oil burners are suitable for 28 second and 35 second oil and where matched burners are available, FAME and RME blends of liquid biofuel may be specified. For further information, please refer to liquid biofuel in the table below.

For gas fired burners, the burner and gas train selections are based on standard design requirements as stated in IGE/UP/2, 20mbar gas pressure available at the burner under maximum flow conditions. Where this pressure is not available, it may be possible to select an alternative matching. For further details please contact our technical department. Tel: 01202 662500.

A drilled mounting plate is supplied to suit the specified burner. Burners are supplied with a flying lead and plug for connection to the boiler control panel.

For new buildings with a total heat load greater than 500kW, it is a requirement of Building Regulations Part L: 2010 that each boiler will be fitted with a fully modulating gas burner, or a multi stage burner for oil fired installations.

Low NO_x Burners

For further reduction in emissions, low NO_x burners are available for natural gas.

Burner connection

Each control panel is supplied with a set of cables for making electrical connections to the burner. Final connection between control panel and burner is made using polarised plugs and sockets.

Burner matching

The following table illustrates the availability of Riello matched burners with Ensbury LT boiler models.

Fuel	Natural gas or LPG				Oil or liquid biofuel		Dual fuel	
	High/low		Modulating		High/low	Modulating	Mod (gas) high/low (oil)	
Boiler / Burner	Standard	NG Low NO _x	Standard	NG Low NO _x	Standard	Standard	Standard high/low	NG Low NO _x (Mod)
ELT 440	Nat Gas = 3 LPG = 1/3	3	Nat Gas = 3 LPG = 1/3	3	3	3	3	3
ELT 510	3	3	3	3	3	3	3	3
ELT 580	3	3	3	3	3	3	3	3

1 = Single phase 3 = three phase

Liquid biofuel

Liquid biofuel must conform with the requirements of EN 14213. Suitable classifications of liquid biofuel for use with Riello burners are FAME (Fatty Acid Methyl Ester) and RME (Rape Methyl Ester) blends up to B30. Higher concentrations of liquid biofuel up to B100 can be accommodated, however, burners must be matched specifically to the fuel specification. All liquid biofuel specifications must be referred to our technical department. Tel: 01202 662500. Email technical@hamworthy-heating.com

Where external storage is used for liquid biofuel, it is recommended that Kerosene (Class C2) blend is used. Kerosene blends have better cold filter plugging points (CFPP) than gas oil (Class D) blends, providing improved reliability during cold weather. Other blends may cause problems with gelling and blockages in the fuel system when ambient temperatures are very low.

Blended liquid biofuel must be sourced from a reputable supplier, capable of demonstrating compliance with a certified quality assurance system such as ISO 9000, and able to provide the correct specification of fuel.

Liquid biofuel burners are supplied with specific flexible oil feed hoses. It is important to stipulate the use of liquid biofuel at the time of ordering.

Liquid biofuel storage

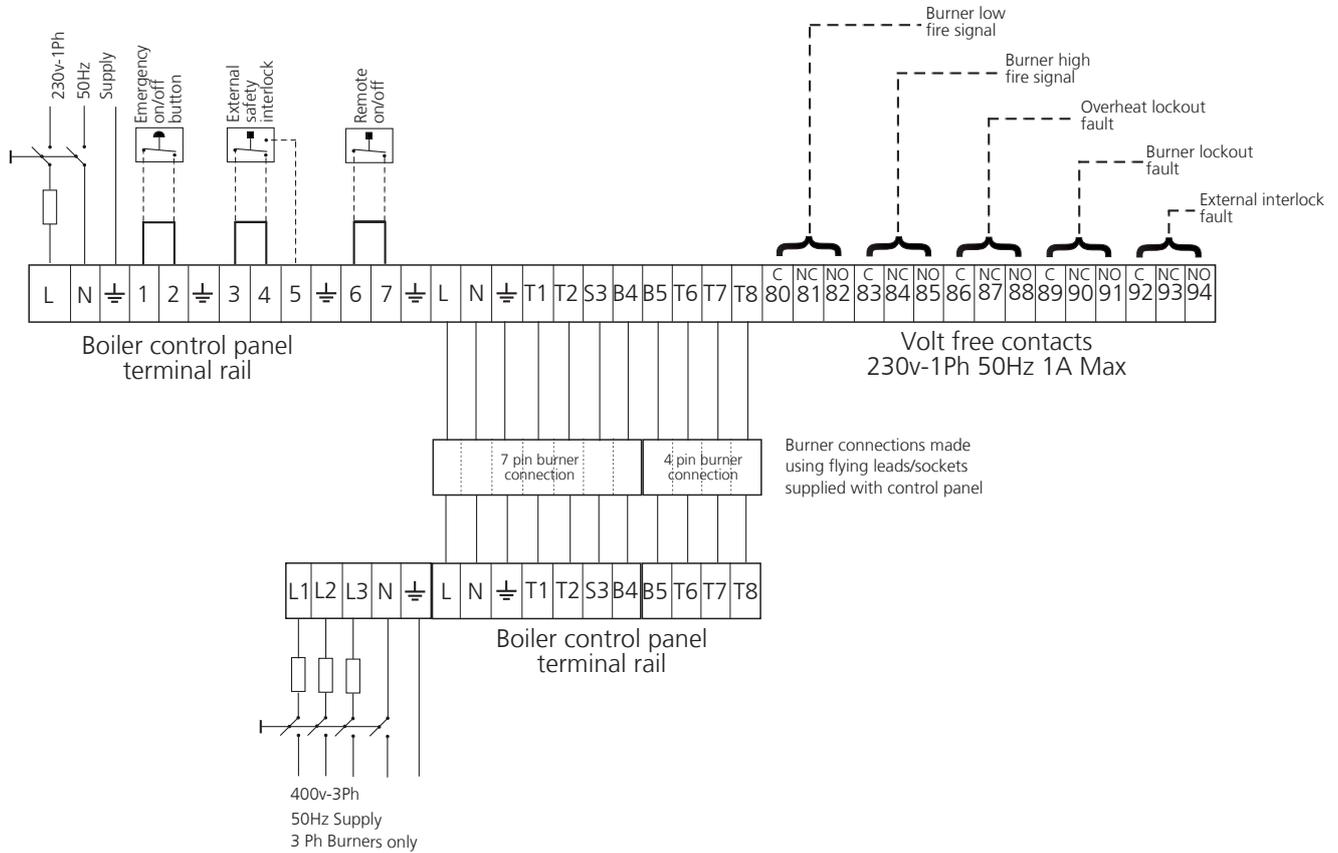
Oil storage tank manufacturers' must verify that their tank construction and ancillary equipment is suitable for use with liquid biofuel. Any suitable existing oil storage tank must be thoroughly cleaned prior to use.

Liquid biofuels are hydroscopic and any traces of water absorbed into the oil could result in blocked filters, oil pumps or nozzles.

Liquid biofuels can be susceptible to bacteria growth so it is advisable to implement management best practice for storage of the fuel. Prudent precautions such as using additives and limiting the storage volume may help limit bacterial growth.

Electrical connections

Wiring diagram



Electrical supply

The boiler control panel requires a 230 volts, 50 Hz, single phase electrical supply, via a fused isolator close to the boiler. Single phase burners derive their power supply from the boiler control panel via the 7 pin burner connection. Three phase burners require an additional 400 volts, 50 Hz, three phase electrical supply directly to the burner, wired in accordance with the manufacturer's instructions, and via a fused isolator close to the burner.

Burner wiring

Connections between the boiler control panel and the burner are made using flying leads with plugs and sockets with the boiler and burner. High Low burners use both the 7 pins and 4 pins burner connections. Fully Modulating burners only use the 7 pin burner connection. 0-10 volt control of fully modulating burners requires additional wiring dependent on burner selection.

External wiring

Wiring external to the boiler must be installed in accordance with I.E.E regulations. Wiring to the boiler control panel must be completed in heat resistant 3 core cable, (size 1.0mm² c.s.a.). An isolator correctly fused at 5 amps should be sited close to each boiler for the control panel.

Controls

Ensburly LT boilers can be connected to external controls using terminals 1-7, and remote signalling can be achieved via the volt free contacts using terminals 80-94. For more information see page 10.

Specification

Design ⁽¹⁾

The Ensbury boilers incorporate an innovative design feature which enables the system return temperature to be as low as 15°C, whilst preventing formation of condensate within the boiler, protecting the boiler from corrosion. Coupled with the low flow capability, this allows the Ensbury boilers to operate with a wide differential temperature, and tolerate fluctuating operating conditions. Minimum flow temperatures must be maintained at all times.

Low temperature management system ⁽¹⁾

On entering the boiler, the system return water is routed through the injection chamber. The hot water outlet is drawn through the injection chamber in a heat exchanger, to pre-heat the return water, which is then injected through calibrated holes into the hottest part of the boiler above the combustion chamber.

This design by-passes the colder tubes of the second and third passes, to ensure a stabilised load in which corrosive condensates cannot occur.

The low temperature management does not require electronic controls and is achieved via mechanical design, which simplifies the solution and ensures a long and reliable performance.

Construction

The boilers are manufactured from high quality steel, with the multiple second and third pass tubes arranged radially around the combustion chamber.

Back-end protection is provided by the low temperature management system which pre-heats return water using the hot water from the flow side of the boiler.

A large hinged door provides ease of access to the combustion chamber and flue ways for cleaning and servicing. This door can be arranged to swing open to either the left or right hand side.

The entire boiler shell is provided with a generous 100mm depth of glass fibre insulation ensuring standby losses are minimised

Boiler casings

Ensbury boiler casings are robust steel panels finished externally using powder coating. The casings are supplied flat-packed for site assembly.

Pressure

Ensbury boilers are suitable for operation on open vented or pressurised systems with a minimum head pressure of 0.5 bar and a maximum operating pressure of 4.0 bar.

Alternative higher operating pressures are available by special order up to a maximum of 10 barg.

Low NO_x ⁽²⁾

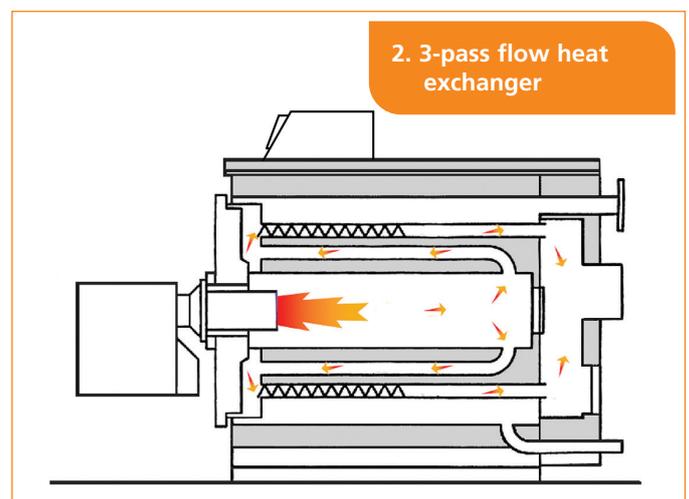
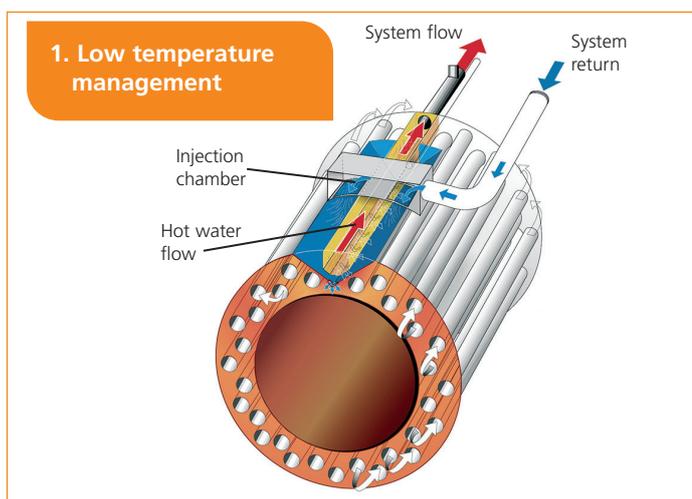
Ensbury boilers are designed with a three-pass heat exchanger to maximise heat transfer and performance of the boiler.

An innovative and patented element of the design is the second-pass heat transfer tubes with swept entry, to reduce turbulence within the combustion chamber, improve the flow of hot gases into the tubes and effectively evacuate heat away from the combustion chamber, which in turn reduces the production of thermal nitrogen oxide (NO_x).

Low flow

The design of the Ensbury boiler means it is not necessary to maintain flow through the boiler as there is sufficient thermal mass to absorb residual combustion heat, without tripping the high limit thermostat.

This allows more flexible heating system design with no differential temperature restraint at the boiler, and eliminates the requirement for primary circuit pumps or boiler shunt pumps, so reducing energy consumption.



Case study

Mixed use development, London

Products

- ⊗ Ensbury LT boiler
- ⊗ B100 biodiesel
- ⊗ Wessex ModuMax boiler

Sector

- ⊗ Residential
- ⊗ Commercial property

Building

- ⊗ Dwellings
- ⊗ Retail
- ⊗ New build

Application

- ⊗ Space heating
- ⊗ Renewable energy
- ⊗ Modular boilers

A 100% liquid biofuel boiler from Hamworthy proved to be the greenest heating option for a mixed use development in Hoxton, East London.

Hamworthy's Ensbury LT steel boiler using B100 biodiesel and a high/low three-phase Dunphy burner specifically matched to the fuel was specified for the project to provide the space heating for this city centre development of 16 flats and a commercial unit.

Due to the city centre location of the development, the Planners insisted on the provision of a site specific dispersion modelling impact assessment which would identify any problems the proposed system may cause to surrounding properties.

The report was used to predict the ground level concentration of combustion products emitted to atmosphere from the boiler.



City centre location.

The conclusions drawn from the assessment were that the emissions from burning biodiesel were unlikely to have a significant impact on local air quality.

Hackney Pollution Control accepted this report and gave permission to use biodiesel as the boiler's fuel. The report showed this fuel to be superior to biomass, as biodiesel is a cleaner fuel because there is no grit or other particular matter in the flue gases. Also, less storage space is required for biodiesel, which is ideal for a city centre locations.

John Moore, Operations Director from Mulalley – the main contractors on the project commented, *“Working with Hamworthy Heating on this project ensured the installation went smoothly and kept to projected timescales.”*

Geoff Fox, from Fox Curtis Murray said, *“Liquid biofuel presents a sustainable alternative to fossil fuels and also qualifies for the Renewable Heat Incentive scheme which reduces the actual fuel costs accordingly.”*

The Ensbury low temperature high efficiency 260kW boiler installed at Pitfield Street permits close load matching, low NO_x emissions and is designed for operating at low flow conditions with the ability to accommodate fluctuating temperature and load conditions.

A Hamworthy Wessex ModuMax condensing boiler was supplied as a standby boiler for service or maintenance periods plus a Chesil wall mounted pressurisation unit with matched expansion vessel ensures the correct pressure is maintained.

Controls

Controls

Each boiler is supplied with a pre-wired control panel that mounts on top of the boiler casing. The control panel includes the following features:

- ⊗ Control fuse 6.3 AT
- ⊗ Limit thermostat 110°C manual reset
- ⊗ Control thermostat 35°C to 90°C
- ⊗ High fire control thermostat 35°C to 90°C
- ⊗ Burner on/off switch
- ⊗ Limit thermostat test button
- ⊗ Overheat indicator lamp
- ⊗ Safety interlock indicator lamp
- ⊗ Burner lock out lamp
- ⊗ Water temperature thermometer
- ⊗ High and low fire hours run meters
- ⊗ 5 Volt free contacts for remote signalling

Multiple boiler sequencing

Each boiler is provided with remote enable circuitry allowing the use of external boiler sequence controls with high/low and fully modulating burners.

Fully modulating burners are supplied with a temperature sensor that must be fitted in the flow pipe work immediately leaving the boiler, and wired directly to the burner. This sensor provides temperature feedback data from which the burner derives the correct load setting to maintain the temperature set-point.

Alternatively fully modulating burners can be specified with optional controls, to provide full BMS compatibility using a 0-10 volt analog signal to set the load performance of the burner within its operating band. This option must be stated at the time of ordering.

External controls interface

Terminals 1 - 7 (see page 7)

Each boiler control panel is supplied with controls interfaces that can be connected to external controls solutions for:

- ⊗ Emergency on/off circuit
- ⊗ Safety interlock circuit
- ⊗ Remote on/off circuit (remote enable)

Emergency on off circuit immediately cuts the electrical supply to the boiler control panel stopping burner operation and heat generation.

Where external controls are used, the hard wired links must be removed. All external wiring carries 230 volts and requires volt free external switches. External switches are not provided with the boiler.

Remote signalling

Remote signalling is achieved via a set of volt free contacts which indicate the following:

- ⊗ Burner low fire operation
- ⊗ Burner high fire operation
- ⊗ Overheat lockout
- ⊗ Burner lockout
- ⊗ External interlock fault

Volt free contacts

Terminals 80 - 94 (see page 7)

External wiring for volt free contacts is typically connected to the common and normally open contacts. Alternatively wiring may be connected to the common and normally closed contacts.

For the external interlock fault volt free contact to operate, an external interlock fault condition power supply is required to terminal 5, 230 volts.



**Need help with your flue design?
Talk to Jeremias, our flue partner.**

The Jeremias Group is one of the leading manufacturers of flue systems and chimney systems in domestic and industrial applications worldwide.

Their history dates back to the early 70's with the discovery of a niche sector in relining chimney systems due to the use of new technologies in the heating sector.

The UK division was created in 2010 with a focus on providing the most reliable turn key service in the UK, combining the complete Know-How of the Jeremias group.

Jeremias UK can offer special component design, manufacture, install, technical support, commissioning, or supply only.

For any enquiries, technical support or project requirements please talk to Jeremias UK:
www.jeremias.uk 01623 889219 info@jeremias.uk

Application and water system

Location

Ensbury boilers must be installed on a non combustible flat and level surface capable of supporting the weight of the boiler when filled with water, plus any ancillary equipment. It is recommended that a plinth at least 50mm high is used for the boiler.

Where L.P.G. fuels are used the boiler house must not be in a basement location.

Water systems

Ensbury boilers are suitable for operation on open vented or pressurised systems with a minimum head pressure of 0.5 bar. Sealed systems must comply with Health and Safety Document PM5 requirements for fuel supply cut off in the event of low and high pressure conditions. To ensure compliance, consider using a proprietary pressurisation unit with correctly sized expansion vessels.

Safety valves

Each boiler must be provided with a suitably sized and rated safety valve located in the boiler flow between the boiler flow connection and any isolating valve. The safety valve will ideally be located as close to the boiler as possible.

Safety valves should be sized in accordance with the requirements of BS6644.

Adequate water flow

Ensbury boilers do not have minimum flow rate requirements, however, care must be taken to ensure system hydraulics are designed to maintain the minimum required flow temperature of 60°C when gas firing and 50°C when oil firing, irrespective of the system return temperature.

System feed water quality

If the boiler feed water has a high degree of hardness, >100mg CaCo₃/litre, it is recommended that the water be treated to prevent the precipitation of scale and sludge in the boiler waterways. Details of additives can be obtained from any reliable manufacturer of water treatment products or the local water authority.

It should be noted however, that even if the boiler water is of average hardness, not requiring treatment, subsequent draining of the system for repair or constant make-up water due to an undetected leak will cause additional deposits and gradual build up of scale. It is essential therefore, that leaks are attended to promptly and draining is kept to absolute minimum.

It is recommended that the system be flushed out at least twice before any water treatment is added.

Air and Dirt Removal

To provide effective degassing of circulating system water and for sludge removal, an air and dirt separator equipped with a fast action flushing valve must be installed in the return pipe work to the boiler.

Additionally for the removal of larger particulate matter from circulating system water, a coarse strainer must be fitted in the return pipe work to the boiler, upstream of the air and dirt separator.

Oil supply storage

The oil supply and storage system should be designed and installed in accordance with BS 5410 Part 1 or 2.

Gas supply

Some of the larger burners may require a boosted gas supply. Hamworthy offer optional gas boosters as part of the burner boiler package.

On some models, as an alternative to using gas boosters, a larger gas train may be available. Consult with our technical sales team for further advice.

LPG supply

It is strongly recommended that gas detection equipment is fitted on LPG installations. Sensors should be positioned near the burner at low level.

The installation of LPG storage vessels, pipe work and pressure regulators must be in accordance with current standards and codes of practice.

Ventilation grille openings

High and low level ventilation grilles shall be positioned as high and as low as practicably possible. Low level grills will be located within 1metre of floor level for Natural Gas. High level grilles are recommended to be positioned within 15% of the boiler room height from the ceiling. High and low ventilation grilles shall communicate with the same room or internal space where compartment ventilation is used. Where ventilation grilles communicate directly with outside air they shall be positioned on the same wall.

Air supply

The air supply should be free from contamination such as building dust and insulation fibres from lagging. To avoid unnecessary cleaning and servicing of the boiler modules, the boilers should not be fired whilst building work is being undertaken. Where a boiler installation is to operate throughout the summer months, e.g. for domestic hot water production for more than 50% of the time, then additional ventilation allowances are required. Refer to BS 6644 for more information.

Flue system

Flue system

Hamworthy Ensbury boilers are designed to be used with natural draught flue systems, which 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 multiple boiler installation.
- ⤵ Under part load conditions, flue gases leaving the boiler will be at lower temperatures, circa 95°C for gas fired and 120°C for oil fired.
- ⤵ The flue system should be designed to maintain atmospheric pressure at the boiler flue connection at all times. If at any time a suction condition is likely to arise, then it is recommended that a draught stabiliser be fitted to the flue system.
- ⤵ The flue system must be self supporting and facilitate access for cleaning and maintenance 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 drained safely to a suitable waste point, and that the flue and drain materials are resistant to the corrosive effects of the condensate.
- ⤵ Ensbury boilers are suitable for installation in a balanced compartment in accordance with the requirements of BS 6644.

Flue gas economiser - Arne

Flue gas economisers are designed for use with boilers, to extract energy that otherwise would be expelled through the flue system. Hamworthy offer the Arne range of flue gas economisers and the free-standing design allows use in new or existing boiler installations, and with virtually any type of non-condensing boiler. Fitted to the flue system, heat is transferred to the heating system return water, further increasing the energy efficiency performance. Dependent on application and return water temperature, it is possible to achieve operating efficiency performance gains up to 18%.

There are two ranges of Hamworthy Arne flue gas economiser, each having several models to suit different applications and power requirements.

Flue gases enter the economiser at the top and exit from the bottom ensuring condensate flows to the bottom of the sump for draining.

Waterways within the Arne flue gas economisers are constructed from grade 316L stainless steel smooth tubes, combining low resistance to the passage of flue gases with tolerance to the acidic nature of flue gas condensate.

Heat is recovered from the flue gases by two processes.

Firstly, sensible heat is extracted by significantly reducing the flue gas temperature from typically 190°C for Ensbury boilers, or higher from other steel boilers, circa 220°C.

Secondly, latent heat is extracted by condensation of the water vapour present in the combustion gases, when the return water temperature is below 55°C.

For further details of Hamworthy Arne flue gas economisers, refer to publication 500001194.

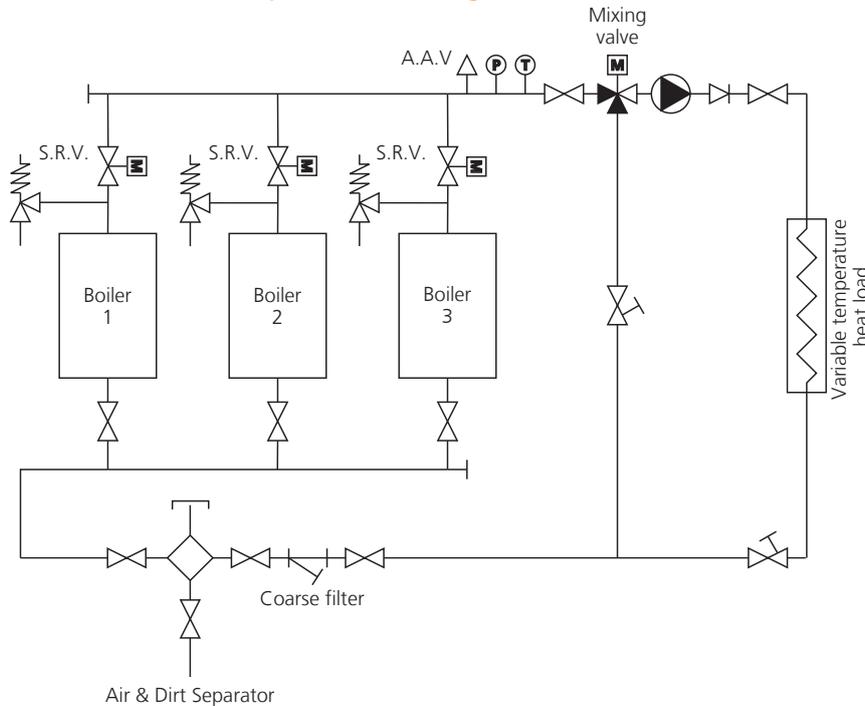


Hamworthy Arne flue gas economiser

Range	Application	No. of models	Boiler outputs
Arne Eco	Individual boilers	12	95kW to 6470kW
Arne Eco Turbo	Multiple boilers	4	400kW to 1430kW

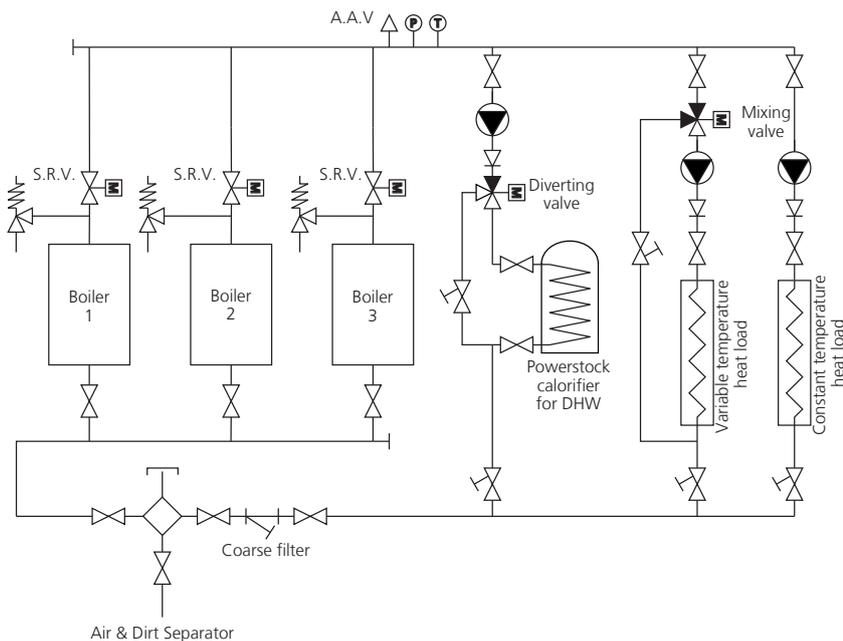
Ensbury hydraulic schemes

Scheme 1: Variable temperature heating circuit



Typical boiler installation with a variable temperature heating circuit. Compensation of the heating circuit must use external mixing control and the minimum boiler flow temperature must be maintained.

Scheme 2: Constant and variable temperature heating circuits with domestic hot water



Typical boiler installation with two heating circuits and domestic hot water. Compensation of the variable temperature heating circuit must use external mixing control.

Boiler operating temperature should be set to meet the demands of the highest temperature circuit but not be set below the minimum boiler flow temperature.

Where all circuits are required to operate below the minimum boiler flow temperature then all circuits should incorporate mixing to lower the temperature from the boiler before being admitted to the circuit.

Due to the thermal mass of the boiler, the flow rate returning from the heating circuits can be low.

Note: These schematics have been provided for reference only.

Case study

Christchurch Police Station, Dorset

Products

- ⊗ Ensbury LT boilers
- ⊗ Chesil pressurisation unit
- ⊗ Expansion vessel

Sector

- ⊗ County Council
- ⊗ Public sector

Building

- ⊗ Dual purpose building
- ⊗ Police Station and Adult education service

Application

- ⊗ Space heating 360kW

Dorset County Council's dual purpose building, located in the heart of Christchurch, has benefited from the installation of four Ensbury LT steel boilers from Hamworthy Heating supported by a pressurisation unit and expansion vessel.

The building is occupied by the council's adult education service and the Dorset Police Authority, acting as Christchurch Police Station and until recently the two separate facilities relied on one boiler house with two common boilers to serve both the education centre and police station. Yet with each occupant placing different demands on the shared heating arrangement, Dorset County Council took the decision to provide two separate boiler systems, while replacing the existing and increasingly inefficient boilers. Emissions from burning biodiesel were unlikely to have a significant impact on local air quality.

Working to detailed plans by local building services consultants, Mabey Francis, Watertite Heating Limited of Yeovil installed four of Hamworthy's highly efficient, oil-fired, steel boilers, resulting in two separate heating systems in one common boiler room. Malcolm Hunt, Senior Engineer at Mabey Francis, commented on the installation and specification of Hamworthy's Ensbury LT 90 steel boilers: "In today's climate, the need to have greater control over heating systems is essential to ensure maximum efficiencies. It was therefore only beneficial for Dorset County Council to split the heating system, to allow both the adult education service and police authority responsibility for its own heating requirements.



"Hamworthy's Ensbury LT boilers were selected for their size, capacity and the innovative low temperature management system, which is ideally suited for this unique project."

Hamworthy's Ensbury LT boiler range comprises 14 models with outputs from 70kW to 580kW, for use with fully modulating or high/low matched burners, delivering operating efficiencies up to 95 per cent nett (86 per cent gross) at part load.

Enabling return water temperature to reach as low as 15°C without condensing, and with no minimum flow rate, the steel boilers provide versatility in systems applications.

Ensbury LT boilers from Hamworthy feature a three-pass heat exchanger, which has been designed to reduce the level of NOx. With a range of low NOx matched burners the boilers achieve up to European Class 5 performance. The burner options give a choice of fuel; natural gas, LPG or oil, as selected for Dorset County Council.

The thermal mass within the Ensbury boiler can accommodate fluctuating operating conditions, and with no minimum water flow requirement, eliminates the need for a shunt pump, simplifying the hydraulic system design. A high level of insulation also ensures very low standing losses at just 0.15 – 0.5 per cent.



Want to improve your industry knowledge?

We're accredited with CIBSE to deliver approved Continuing Professional Development (CPD) courses.

It's our opportunity to share our knowledge with you. More than 3,000 people have attended our CPD seminars and 95% rated them as good or excellent.

Hamworthy CPD seminars are free to attend and our flexible approach means that we are able to tailor our training to suit your business. Lots of our customers choose to run these online at lunchtime or at their own premises so that there is minimal disruption to the working day.

“Very good session with lots of very detailed and relevant information. Would highly recommend!”



Book a free CIBSE-accredited CPD seminar for you and your colleagues today:
hamworthy-heating.com/cpd

CPD courses available:

- ① **New Boilers on Old Heating Systems: Hydraulic Design - A Story of Separation**
- ① **Best Practice Heating & Hot Water Plant Refurbishment**
- ① **Energy Saving in Commercial Heating and Hot Water - Could you save a £million?**
- ① **Best Practice in Domestic Hot Water (DHW) - 3 modules**



Product Training

Get hands-on training with Hamworthy's commercial boilers.

We can provide training onsite, online, or you can attend a course at one of our training centres. Delivered by Groupe Atlantic engineers with years of product knowledge and industry experience. By attending our training you'll be more confident in running our equipment.

The course will guide you through the servicing and fault finding of Hamworthy products to ensure they are operating at their maximum efficiencies.

Hamworthy's training centres are conveniently located across the UK.

Each training centre has live firing boilers as well as a display of boilers, water heaters and additional system equipment.

See the latest training dates and book your place online:
hamworthy-heating.com/training

Training courses available:

- ① **Purewell Variheat mk2 boiler**
- ① **Stratton mk2 wall hung boiler**
- ① **Wessex ModuMax mk3 boiler**
- ① **Upton boiler**



Services and warranty



Commissioning

We strongly recommend that all boilers are commissioned by our service department, and some specifications state that it must be carried out by the manufacturer. As well as ensuring your product is set up correctly for maximum efficiencies you will receive extra benefits on warranty (see below). On completion, you will get a report with details of the initial operating settings.

Service

Regular servicing and maintenance will help prolong the life of the equipment and maximise the overall performance through its lifecycle.

To maintain your boilers, we have a range of servicing options that can be tailored to your requirements. Hamworthy engineers are fully trained, equipped and familiar to working on our products. They have a high level of practical and diagnostic experience so that you can be assured your products are running at optimum performance.

For more information on commissioning and service please contact Hamworthy Heating service department.



Warranty

The Ensbury boiler comes with Hamworthy's standard two years' warranty (except for consumables in line with our Terms and Conditions). Where the product is commissioned by Hamworthy service engineers within 6 months of delivery date, then the two-year warranty covers parts and labour from date of commissioning. We offer tailored packages to suit individual customer requirements, many of which include extended warranty benefits. Full details of warranty terms and conditions are available on request.



Spares

Essential to any maintenance and service regime is the availability of quality spare parts.

By coming to us, the Original Equipment Manufacturer (OEM), you can be assured of genuine spare parts and may also benefit from technological improvements. We have a long-term commitment to spare parts for our products.

Delivery

Each boiler is delivered to site on a wooden pallet in one package containing the boiler, casing and control panel.

Each boiler is fitted with lifting eyes allowing lifting by crane where necessary.

The boiler casing is supplied flat packed for on-site assembly along with the boiler control panel.

Boilers are delivered to ground level and are closely coordinated with the customer, to suit the site construction programme.

To enquire about special delivery services including FORS and time critical deliveries (additional charges apply) please contact our customer services team.

Service

Tel: 01202 662555

Email: service@hamworthy-heating.com

Spares

Tel: 01202 662525 Fax: 01202 662551

Email: spares@hamworthy-heating.com

Complete your system

As well as energy efficient commercial boilers, we supply direct and indirect fired water heaters plus equipment to enhance the efficiency and longevity of your heating system.

From dosing pots and air & dirt separators for system cleanliness to pressurisation units and expansions vessels for sealed systems, Hamworthy can offer the support equipment needed for your system installation.



Burstock expansion vessel

Chesil pressurisation units

System equipment

Chesil pressurisation unit

Wall hung and floor standing pressurisation units for sealed systems. Available in 5 models with single and twin pump options.

Burstock expansion vessel

Floor standing expansions vessels for use with sealed heating and hot water systems. Available in 10 models from 25 to 1000 litres.

Clenston air and dirt separator

For the removal of dissolved gas and air particles from heating systems. Available in 7 models to suit pipe sizes from DN50 to DN200.

Horton dosing pots

Chemical dosing pots for introducing chemicals into a sealed heating system. Available in 4 models from 3.5 to 15 litres capacity.

Hot water

Powerstock calorifiers and storage tanks

Glass lined calorifier for indirect domestic hot water production with single and twin coil options. Available in 7 models with continuous outputs from 569 to 1,858 litres per hour.

Glass lined storage tanks for domestic hot water available in 4 models with storage capacities of 300 to 990 litres.

Halstock calorifier

Stainless steel calorifiers for domestic hot water production with a single coil and vented and unvented options. Available in 5 models with continuous outputs from 344 to 1,055 litres per hour.



Dorchester direct fired water heaters

5 ranges of condensing and non-condensing direct fired water heaters with glass lined and stainless steel options to choose from. Available in over 22 models with continuous outputs from 228 to 2,400 litres per hour.

Trigon solar thermal system

A complete solar hot water system including solar collectors, transfer stations, and controller.

About Hamworthy

Hamworthy Heating is a leading British commercial boiler manufacturer. Our energy efficient heating, hot water and renewable solutions are used in buildings across the UK.

The Hamworthy difference

British engineering excellence

Here in the UK, we design, test, manufacture and source market-leading products. We know our products inside out, back to front and from start to finish. You can trust that we know what we're talking about.

Lifetime support

From design and specification, through to commissioning, training and maintenance, as well as commitment to spares availability. We provide long term support for businesses with their commercial heating and hot water needs.

People first

It's not just our products that set us apart, it's our people. Truly excellent customer service, great technical knowledge and being easy to deal with.

That's the Hamworthy difference.



Everyone's got history, we've got heritage

Our roots date back to 1914 when two brothers in Poole set up Hamworthy Engineering. Decades of experience go in to every nut, screw and bolt. Every phone call, text and email. Since 2008, we've been part of Groupe Atlantic, a company with a similar ethos to us. Groupe Atlantic was founded in 1968 by two engineers and is now one of the market leaders in the European heating and hot water industry. We're now part of their growing UK, ROI and North America Divisions



Our associations

We are an active member of trade associations and professional bodies supporting the industries we work in.

Our accreditations

International Organisation for Standardisation (ISO) is the world's largest developer of voluntary International Standards. We are proud to have been awarded the following ISO accreditations:

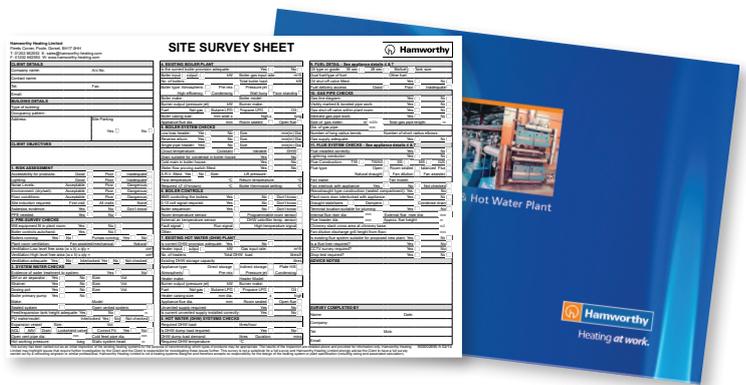
- ISO 9001 Quality Management System
- ISO 14001 Environmental Management System
- ISO 45001 Health and Safety Management System

When you deal with Hamworthy, have confidence that we're working within a defined set of standards that is internationally recognised.



Book a free site survey

www.hamworthy-heating.com/site-survey

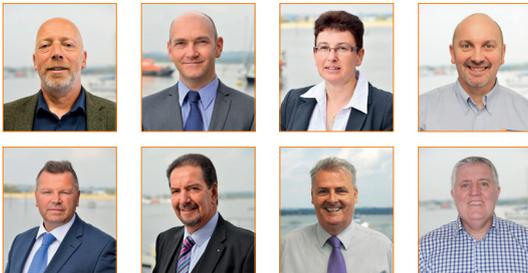


View our full CPD and product training offer

www.hamworthy-heating.com/cpd
www.hamworthy-heating.com/training

Download product literature and drawings

www.hamworthy-heating.com/technical-library



Find out who your local contact is

www.hamworthy-heating.com/find-your-local-sales-manager

Get information for discontinued products

www.hamworthy-heating.com/discontinued-products



Contact our in-house technical support team

on **01202 662505**

Your local contact is:



British engineering excellence from Hamworthy Heating;
the commercial heating and hot water specialists.



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Poole, Dorset BH17 0NF

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Hamworthy Heating Accreditations

ISO 9001 Quality Management System
ISO 14001 Environmental Management System
ISO 45001 Health & Safety Management System



The printed version of this brochure is produced using environmentally friendly print solutions in partnership with our suppliers.

Every effort has been taken to ensure the details in this guide are accurate. Hamworthy Heating does not, however, guarantee the accuracy or completeness of any information nor does it accept liability for any errors or omissions in the information.

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