system design

In order to get the best out of your Inter boiler, it is essential that the central heating system is properly designed, installed, maintained and commissioned. The following important information should be taken into account by the designer or installer.

Design of central heating system
The central heating temperature can be set from 35 to 90˚c. We recommend that radiator systems are designed for 75˚c flow and 55˚c return. This means that the return temperature will be below 56˚c at all times, so that the boiler always operates in the condensing mode for maximum efficiency. In addition it results in a lower pump flow rate, reduced noise and electrical power consumption. A system by-pass is not required for the boiler, but is recommended on systems with all thermostatic radiator valves to reduce noise.

For under-floor heating systems the boiler can be set at the required low flow temperature. For the InterSystem boiler, a special hot water thermostat connection enables the boiler to fire up to 85˚c to rapidly heat up an indirect hot water tank.

Installation
The Inter boiler can only be installed by an installer who is on the Gas Safe Register.

Commissioning
The boiler and the heating system must be properly commissioned and balanced in order to obtain the best performance. This should be done in accordance with the Benchmark system, including flushing out and the addition of an appropriate corrosion inhibitor.

Maintenance
The Inter boiler should be serviced once per year by an engineer who is on the Gas Safe Register. Due to quality of LPG, boiler must be serviced twice annually for first two years.

Fault diagnosis
The Inter boiler has a control panel with a fault diagnostic system, which enables the customer to identify common faults and take appropriate action. There is also an engineer's programme which permits a more in depth diagnosis, for rapid fault identification and repair.

Warranty
The Inter boiler comes with a two year parts and labour warranty. In addition the heat exchanger is guaranteed for ten years. Warranties are subject to our terms and conditions and Warranty Policy, available on our web site".

Atmos Partners
If you are an installer or service engineer then you can join the Atmos Partners scheme to get the most out of the Atmos opportunity. We offer extra exclusive discounts, website listing, sales lead preference, training and on going support. In return you will promote the Atmos range and build business for yourself.

For more details contact **atmospartners@atmos.uk.com** or telephone our sales department on our special freephone 0800 698 5588.

Atmos fully supports the Gas Safe Register, for all gas appliance operatives

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02/09

interboiler

atmos heating systems

welcome to atmos

Atmos Heating Systems started business in 1976 as Skaino Services, a heating and plumbing company operating in the Midlands. The company installed all types of heating systems, but always tried to design systems that were energy efficient. In the 1980's Skaino Services became Northamptonshire's only 'Registered Energy Efficient Heating Company' with the fledgling Energy Saving Trust, promoting energy efficient heating systems.

In 1995 John Thomason invented and patented a revolutionary concept in high efficiency heating for commercial properties. The Atmos Heat Recovery System was launched and a new division named Atmos Heating Systems, specializing in high energy efficient products was born.

In 1999 the Atmos team visited European companies looking for energy efficient heating products for the UK domestic market. High efficiency condensing boilers were still in their infancy in the UK, but in The Netherlands they had been mainstream products for 9 years, and were already in their second generation.

The Multi is made by the Dutch water heater manufacturer, Daalderop, a market leader in The Netherlands since 1896. So in 2000, Atmos launched into the domestic heating market with the innovative Atmos Multi. It was the first condensing 'Storage Combi' in the UK, and immediately won the prestigious H&V News Award 'Best domestic Product of 2001'.

Then in 2002 Atmos launched another of Daalderop's energy saving products, the unique MonoSolar Solar thermal hot water system. The MonoSolar system is approved for use as a pre-heat system with any Solar compatible boiler. Once again the Dutch had already set in place a standard for solar compatibility, the NZ standard; for which the InterCombi has been certified.

In 2004 Atmos decided to look for a condensing instantaneous combi boiler, and once again, the ideal product was found in The Netherlands. Intergas, another leading Dutch boiler manufacturer established in 1938, made Atmos their UK partner, and so the highly successful Inter range of boilers was launched.

Atmos are committed to the promotion of high quality, energy efficient and environmentally friendly solutions. Our products are designed for the future and built to last. With the advent of new regulations on energy efficiency, and in particular the government's "Code for Sustainable Homes", Atmos continues to innovate. The Combinair is a ground breaking unit that combines an Air Source Heat Pump with a gas condensing combi boiler. This unique combination maximises CO_2 savings. Atmos now has a range of cost effective product solutions to enable house builders to meet CFSH level 3 and 4.

We are committed to continuous improvement and provide whole package innovative solutions. We work in partnership with our customers - installers, service engineers and contract customers from design to installation and service back up.

Leaders in low carbon heating.

Yours sincerely
John Thomason, Manager

introduction and benefits

Holland may be best known for tulips, but one of the lesser known facts is that the Dutch have been using condensing gas boilers for the last 20 years. The Inter boilers are made by a Dutch company that have produced 500,000 condensing boilers since 1996, and have developed their products to a high degree of efficiency and reliability. Atmos Heating Systems are proud to offer this unique boiler with its proven pedigree to the market in the UK, where condensing boilers have now become compulsory.

For many years cast iron has been used for the best boilers as it is an excellent material, but condensing boilers cannot be made from this because the condensate would corrode it away. The Inter heat exchanger however, is made of solid cast aluminium, which has the same thermal qualities as cast iron, but does not corrode. This robust construction results in a boiler that is tough and long lasting, just like the old cast iron boilers; but with the added benefit of high efficiency resulting in substantially lower fuel consumption and Carbon Dioxide emissions.

"We have been using Inter boilers for many years, and we expect the new range to last 20 years"
Chairman of the Dawn Housing Association

Benefits

- Separate heating and hot water circuits - eliminates diverter valve
- Robust cast aluminium heat exchanger gives better thermal performance than cast iron
- Copper water channels eliminate corrosion
- Single continuous waterways minimise risk of blockage or scaling
- Totally safe - not damaged by lack of water - no pressure switch
- Totally reliable - not one heat exchanger failure on over 500,000 units

Inter savings compared with other modern condensing boilers:

- **Hot water:** The heat exchanger has an integral single tube DHW (Domestic Hot Water) circuit; so that condensing operation works on this circuit as well as central heating (CH). The UK SEDBUK rating is only for CH, but in the Netherlands DHW efficiency is also measured. The HE32 rates DHW at 89% efficiency compared to an average of 75% for other condensing combi's.
  Result = 14% gas saving
- **Electrical 1:** Other combi's use a circulation pump for DHW; often single speed 105 watt. However the HE32 heats the DHW directly in the heat exchanger and so the pump is switched off in DHW operation.
  Electrical 2: The controller has a 'switched mode power supply'. This is a much more energy efficient power supply technology than the 'linear power supply' used in most boilers. In standby mode the HE32 uses only 2.4 watts of power. The combined saving on electrical energy used is a massive 89% compared with other condensing combi's.
  Result = 89% electrical saving. **Total energy saving = over 19%**
- **Water 1:** Other condensing combi's use a plate heat exchanger for DHW which means it takes an average of 45 seconds to heat the DHW from cold. That wastes a considerable amount of water. In contrast the HE32 provides instant hot water, thanks to the unique heat exchanger. This produces at least 25% less water used for DHW.
  Water 2: The Eco mode is a self learning timer which means that the boiler only heats up for DHW during periods of actual use.
  Result = 25% water saving

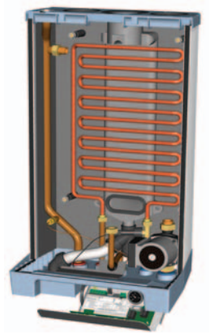
(see Technical page for full details)

features

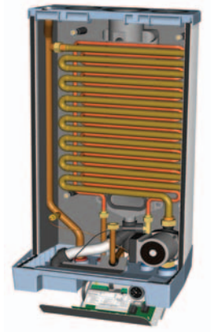
Heart of the Inter boiler

The unique patented heat exchanger is at the heart of what makes the Inter boiler outstanding in terms of energy efficiency, robustness and reliability. The pictures show the hot water tube behind the separate central heating tube. Both are encased in a cast aluminium block. The main benefits of this design are:

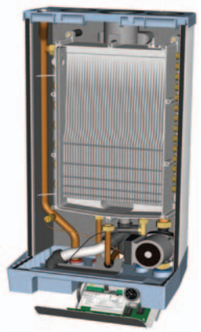
- Separate heating and hot water circuits - eliminates both diverter valve and separate plate heat exchanger
- Cast aluminium gives thermal performance like cast iron and acts as a heat store
- Solid aluminium block is virtually unbreakable
- Copper water channels minimises corrosion
- Single continuous waterways minimise risk of blockage or scaling
- Totally safe - not damaged by lack of water and no pressure switch
- Totally reliable - not one heat exchanger failure on over 500,000 units



a. Cutaway shows hot water loop



b. Cutaway shows central heating loop



c. Cutaway shows both loops encased in cast aluminium block

Boiler

- Burner modulates from 30% to 100% to match the heat demand, resulting in maximum efficiency
- Quiet operation due to soft start burner programme
- Suitable for natural gas or LPG (propane)
- Flue lengths up to 60m (equivalent) for ease of siting

Control System

- Electronic controller with adjustable settings
- 24V or 240V room thermostat connection
- Opentherm control option
- Fault diagnostics for easy maintenance
- Computer port for operating history downloading
- CH heat output can be set from 9kW to 26kW
- Weather compensation by adding an outside sensor
- CH flow temperature can be set from 35˚c to 90˚c, ideal for underfloor heating systems
- Frost protection built in
- Pump runs briefly every 24 hrs to prevent sticking

range

InterCombi HE32

- **The InterCombi 32 is a combination boiler designed for sealed systems**
- Condensing gas boiler with output up to 31.5 kW (107,500 Btu/hr)
- Can be used for hot water only even when central heating is not connected
- Keep Hot facility provides instantaneous hot water. The Eco Mode is a self learning timer for the Keep Hot facility which reduces energy consumption so that you get instant hot water only when you want it
- Central Heating output up to 26.8 kW (91,500 Btu/hr)
- Solar compatible, can be linked to a solar hot water system
- No diverter valve needed due to design of heat exchanger
- High efficiency condensing operation in hot water mode
- Hot water flow rate 12.5 litres/min at 35˚c rise
- 240V or 24V options for thermostat connection

InterSystem HE26

- **The InterSystem boiler is a sealed system boiler for central heating and/or for hot water via an indirect hot water tank**
- Condensing gas boiler with output up to 26kW (90,000 Btu/hr)
- Built in expansion vessel
- Built in circulation pump
- Suitable for connection to Y plan systems with separate indirect hot water tank, utilising existing pump and controls
- 240v thermostat connection for direct replacement
- 240V or 24V options for thermostat connection

InterOpen HE22

- The InterOpen boiler is designed for open vent systems with a header tank
- Condensing gas boiler with output up to 22kW (75,000 Btu/hr)
- Ideal replacement wall hung boiler
- Top connections for flow and return
- Suitable for connection to Y plan systems with separate indirect hot water tank, utilising existing pump and controls (no pump in boiler)
- 240V or 24V options for thermostat connection
- No by-pass required with Y plan system

range

Inter SuperSystem

When you want lashings of hot water, this new combination provides a highly efficient and compact solution by combining the Inter System HE26 boiler with the innovative OSO Super S cylinder

- 150 litre indirect stainless steel hot water tank fits below boiler
- All tank pipe connections under insulated top lid
- Neat appearance due to minimal external pipe work and wiring
- Built in 3 kW electric immersion heater for back up
- Ultra low heat losses, with cylinder encased in 100% recyclable insulation
- Up to 3 bar pressure with external expansion vessel
- 25 year manufacturer's warranty on tank (conditions apply)
- Package comes complete with control pack (2 channel programmer, room thermostat, wiring centre and two 22 mm motorised valves)
- Competitive price

Intergas Combi Compact HRE24/18

When you need a truly compact boiler for smaller heat loads then this new boiler is just the job

- Very compact dimensions
- Built in digital timer (can be by passed for remote clock)
- Easy fit concentric or twin pipe air flue connection
- Exceptionally quiet operation
- Includes rear mounted expansion vessel or external Robokit (installer option)

CH Output @ 80/60°C	5.4 – 17.8 kW
CH Output @ 50/30°C	5.9 – 18.1 kW
DHW output max	23.0 kW
Flow rate @ 35° rise	9.4 L/min
SEDBUK Efficiency	91.0%
DHW Efficiency	85%

Height	Width	Depth	Weight
590mm	450mm	240mm (+95)	30kg

All technical data is subject to change without prior notice. Available from April 2009

options

Wall Mounting Frame *Fig.1*

Supplied by itself, or with optional valve bracket, valve set and bottom cover.

Wall Fixing *Fig.2*

Supplied with special valve set, including filler loop. For first fix pipework, enabling later installation of Inter boiler. Can only be used with Wall Mounting Frame.

Bottom Pipe Cover *Fig.3*

Covers valves and pipework. Must be used with Wall Mounting Frame.

Fig.1

Fig.2

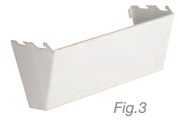


Fig.3

Controls

The UK Building Regulations require that all boilers are fitted with a time clock programmer and a thermostat or room temperature control. Atmos recommends the following options;

- Programmable Room Thermostat; The Salus RT500 or Danfoss TP5000Si provides seven day control with three time and temperature options per day. *Fig.4*
- Wireless Programmable room thermostat Salus RT500RF or the Danfoss TP5000RF provides the same control but without the need for hard wiring between the boiler and the controller. *Fig.5*
- Opentherm. This programmable room thermostat is a modulating control that lowers the boiler flow temperature with indoor heat demand. This forces the boiler to operate in the condensing mode and thus improved overall efficiency. *Fig.6*
- Weather Compensating System. The Intergas controller has built in software so that by fitting an outside sensor it enables the Intergas to modulate the central heating water temperature according to the outside temperature, and thus improve overall efficiency. *Fig.7*

Fig.4

Fig.5

Fig.6

Fig.7

Reducing Lime Scale *Fig.8*

Building Regulations state that a suitable anti-scale device must be fitted in areas with over 200 ppm (parts per million of calcium carbonate). For areas with hard water, Atmos recommend the in line Limefighter for the boiler only protection, or the electronic Hydroflow for whole house protection.

Fig.8

Plume Management Kit *Fig.9*

The new Plume Management Kit, for use with one of two special telescopic flue kits, diverts the flue plume away from interfering with neighbouring properties.

LPG

The Inter boiler can be easily converted for use with Liquid Petroleum Gas. Kit ref ICPROKIT. Due to quality of LPG, boiler must be serviced twice annually for first two years.

Fig.9

technical

Specification	InterCombi HE32 Boiler	InterSystem HE26 Boiler	InterOpen HE22 Boiler
Central Heating			
Heat output range condensing mode kW	7.7 - 26.8	7.7 - 26.8	7.5 - 23.1
Heat output range non-condensing mode kW	7.0 - 26.2	7.0 - 26.2	6.9 - 22.4
Sedbuk Efficiency % (rating)	90.1 (A)	90.1 (A)	89.0 (B)
Expansion Vessel Capacity (litres)	6	6	
Domestic Hot Water			
Heat output maximum	31.5 kW		
Flow rate at 35°c rise (45°c outlet) litres/min	12.5 l/min		
Flow rate at 60°c outlet	9 l/min		
Minimum flow rate	2 l/min		
Electrical Data (240V)			
Power consumption CH only watts (pump on)	105 watts	105 watts	40 watts
Power consumption domestic hw (pump off)	40 watts	40 watts	40 watts
Standby power consumption	2 watts	2 watts	2 watts
Weight (Dry) kg	39	39	34
Gas Consumption max m3/hour	3.40	3.25	2.29
Dimensions: 450mm Wide x 270mm Deep x H	H = 810mm	H = 810mm	H = 750mm

Energy Use	STD Condensing Gas Combination Boiler - kWh	InterCombi HE32 Boiler – kWh	Annual Saving
Space heating energy kWh	3,333	3,333	0%
Hot water heating energy kWh	4,915	3,805	23%
Electrical energy kWh	425	105	75%
Total energy kWh	**8,673**	**7,243**	**16%**
Cost of Gas @ 3.5p/kWh	£288.68	£249.83	£38.85
Cost of Electricity @ 12p/kWh	£51.00	£12.60	£38.40
Total energy cost	**£339.68**	**£262.43**	**£77.25**
Hot water used m3/annum (average)	43	32	11
Cost of hot water @ £2.20/m3	£94.60	£70.40	£24.20
Total cost of energy & water @ £2/m3	**£434.28**	**£332.83**	**£101.45**

Notes:

1. Energy consumption based on identical modern insulated terraced houses; 111m2 floor area, 5 rooms over 3 floors. One house has an InterCombi HE32, whilst the other had another quality brand high efficiency condensing gas boiler
2. Total costs do not include standing charges
3. Other energy costs include Lighting (1,745 kWh) and mechanical ventilation (1,200 kWh) which are the same for both houses

Solar - introduction and benefits

Solar Power

The ancient Egyptians worshipped the sun, because they understood that it was a source of life, light, energy and warmth. With today's technology that warmth can be used to heat water. In the UK we may feel that our share of sunshine is rather meagre, but in fact there is a substantial amount of solar heat that can be gathered both in the summer and the winter.

Solar Collectors

Solar heat is gathered by solar collectors, which come in a variety of types and size, each with its own merits. The popular flat plate collector comprises a black heat absorbing plate made of copper or aluminium, with copper tubes welded to it. Water passes through the copper tubes, so that the heat gathered by the plate is transferred to the water, which is then stored in a collector tank.

At the back, the plate is heavily insulated and the front is enclosed by a sheet of toughened glass. The collector should face between south east and south west, but ideally south. In the UK it should be angled between 30 and 40 degrees to the horizontal in order to gain the most heat. Most houses have a roof either sloping or flat, which provides a suitable location for a panel.

How much energy will I collect?

A good flat plate collector will gather 400 kWh of heat energy per annum for each square meter (evacuated tube collectors are more compact, and gather more heat per square metre, but cost more).

Using a 2.75 m^2 panel, 1,150 kWh of energy can be collected, or with 4 m^2, 1600 kWh. Since the average home (2.5 persons) uses some 2,500 kWh for hot water, it can be seen that the solar collector can provide between 45% and 60% of the annual hot water energy requirement.

How much money and CO_2 will I save?

A solar hot water system will last over 20 years, so the annual cost saving of between £60 (2.75 m^2 system with gas boiler) and £192 (4 m^2 system with standard rate electricity) will increase each year as fuel prices increase over the life of the system.

Legionella Safety

Legionella bacteria are present in all tap water, but the MonoSolar storage system reduces the risk of Legionella formation to well below the minimum safety level. This is achieved because of the very low volume of stored tap water in the heat exchanger, and the use of copper which is an anti-bacterial material.

solarCombi

The Atmos Inter SolarCombi combines all the benefits of the Inter Combi HE32 boiler with the MonoSolar drain back system which utilises solar power. The MonoSolar system is designed for the UK climate, and the system will give up to 50% savings in fuel costs and CO2 savings, compared with a non condensing gas boiler and hot water tank."

Water is circulated from the MonoSolar tank to the solar collector, picking up heat from the sun, and returning to the tank as hot water. This continues until either the tank reaches maximum temperature of 85°C or there is no more solar heat to be gained. Any water remaining in the collector then drains back to the tank. The mains cold water passes through a copper coil which winds through the tank and picks up heat from the thermal store. The hot mains water then either diverts directly to the hot tap (via a Thermostatic Mixing Valve (for customer adjustable delivery temperature) or goes to the boiler to top up the heat. Most combi boilers cannot take preheated water in this way, but the InterCombi has the Dutch NZ certification to do just that! The MonoSolar uses a multi speed circulation pump which minimises the use of electricity, thus adding significant energy savings.

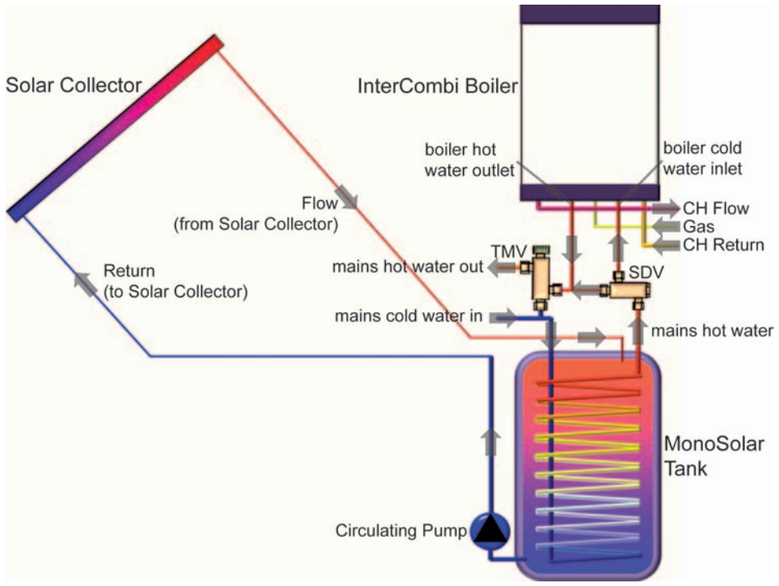
Benefits

- MonoSolar saves 50% of annual hot water fuel bill
- Increases hot water flow rate as table opposite
- Drain back system designed specifically for UK type climate
- Saves up to 2,000 kWh of gas energy per year
- Reduces CO_2 emmisions by up to 400 kg per year
- Easy to install and virtually maintenance free
- No stored water in collector means no danger of freezing or boiling and no need for anti-freeze
- Increased system life expectancy - 25 to 30 years
- Mains pressure
- No risk of Legionella as stored water transfers heat through copper pipe heat exchanger
- Increases energy rating of your home

Features

- Single drain back collector 2.75 sq m (1.76m x 1.78m)
- Roof mounted or roof integrated
- 100 litre heated water storage capacity
- High grade tank insulation to minimise heat loss
- Encased in rigid, cleanable pale grey plastic case
- Integrated controller and multi speed pump
- Integrated drain back system
- Freezing and overheating safeguard

solarCombi options



Season	MonoSolar Temperature	Flow rate at 45°c
Winter no sunshine	10°c	12.5 litres/min
Mild weather	35°c	15 litres/min
Average Summer day	60°c	18 litres/min
Hot summer day	80°c	20 litres/min

Technical Data	Atmos Monosolar	Atmos Solar Panel
Width mm	640mm	1800mm
Depth mm	500mm	1800mm
Height mm	900mm	100mm
Water volume litres	100 litres	2 litres
Weight kg	35kg	74kg
Guarantee period	5 years	10 years

- The Solar Diverter Valve (SDV) maximises the efficiency of the system by diverting the hot water straight to the hot taps when it is above 45°C, so that the boiler is by-passed and does not fire up unnecessarily. Below 45°C the SDV sends the water to the boiler, which tops up the hot water to the temperature set on the boiler. The Thermostatic Mixing Valve is a user adjustable safety feature to prevent scalding.

Atmos Solar diverter valve and Thermostatic Mixing Valve - both used as in connecting MonoSolar to the HE32 boiler

- The standard MonoSolar system works up to a pump head height of 6m. For installations from 6m to 10m Atmos can supply a 2nd booster pump. For installations over 10m a header tank is available. Head height is calculated from the bottom of the tank to the top of the panel