

The background of the advertisement is a photograph of a stack of wood logs. The logs are stacked in a way that forms a small, triangular roof-like structure on top. The logs are light brown and appear to be made of a softwood. The stack is placed on a green lawn, and the background is a blurred green field with trees, suggesting a rural or natural setting. The overall tone is bright and natural.

**Wood Biomass heating
for the Home**
**WOOD LOG, CHIP AND PELLET
BOILERS**
10 TO 95 kW

www.zerobiomass.co.uk



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Why choose Zeroridge?

With over 30 years experience, and over a thousand successful biomass installations, we understand that installing a biomass solution can seem a big step. That's why we offer all of the technical advice and support you will need - from choosing a suitable boiler and fuel to suit your needs, to integrating the system with your existing heating and hot water systems.

This guide is here to help give you an introduction to the different biomass fuels and boilers available, and explain the benefits of our range of wood log, wood chip, and wood pellet boilers. If you would like to view our biomass boilers first hand, our approved installation partners will happily take you to one of their previous installations, or you are always welcome to visit our Biomass Training Centre where we have the widest range of working wood log, chip and pellet boilers in the country.

Once you have seen the many benefits and decided if a biomass solution is right for you, we will work closely with our installation partner to ensure a smooth installation and handover.



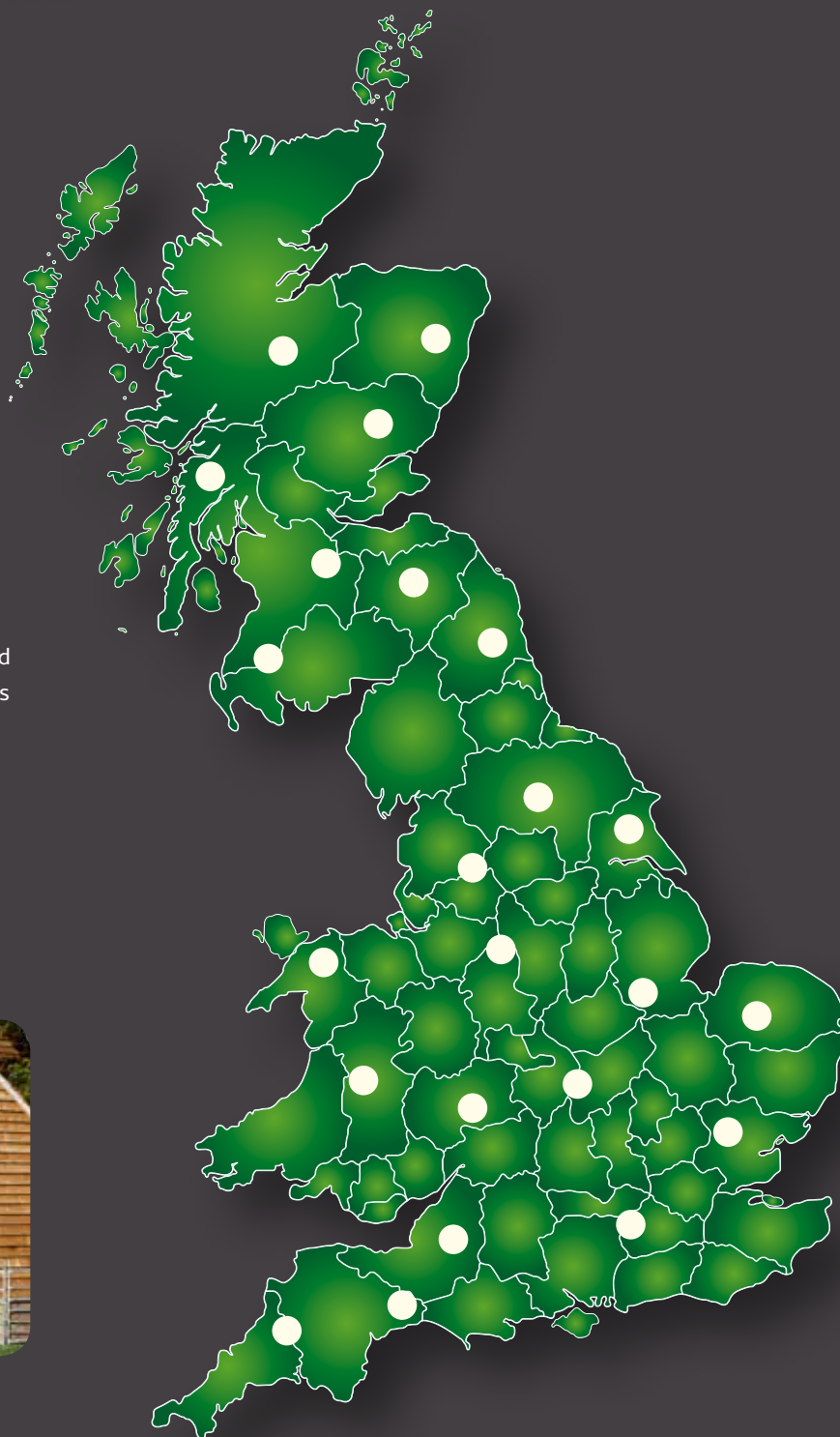
Zeroridge Partners

We have built up a UK wide network of specialist partner companies who we work closely with throughout your project. Only those companies with extensive technical and financial resources, and a passion for biomass are selected to join our partner program.

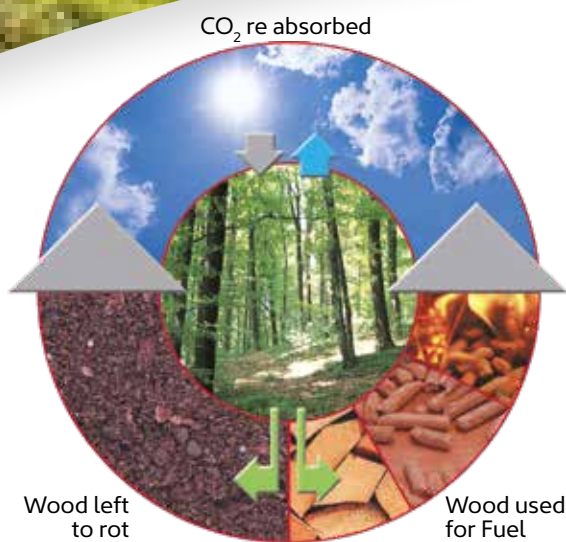


Case Studies

We understand that there is no better way to understand how biomass can benefit you than to see real life examples of the boilers in action. That's why we have put together an extensive range of case studies, covering all of our boilers and available online at Zerobiomass.co.uk



Wood biomass



What is biomass?

Biomass is any carbon based biological material derived from living or recently living organisms. In the context of biomass for fuel this is often used to mean plant based material such as trees or crops.

We all know that trees help the planet, especially young trees. During their life, they absorb CO₂ and give out oxygen. When they are cropped and used for fuel, they release the same amount of CO₂ as they absorbed during their life, and are therefore classed as being CO₂ neutral. In contrast, burning fossil fuels such as coal, oil or gas, releases CO₂ into the atmosphere that has been stored for many millions of years.



Wood log is the simplest form of biomass, produced from felled trees and branches. As with all forms of biomass, moisture control is of critical importance. Wood log in particular must be stored until the moisture content is suitable for burning, normally around 20%. This essential, but natural process takes approximately one year and requires the wood logs to be split, shielded from rain, and air circulated around them. Using wet wood will cause poor performance of the boiler and reduce maintenance intervals.

Whilst offering the most cost effective and simplest solution, there are several important factors to consider when purchasing a log boiler; time to split and process the wood, suitable space to dry and store the logs, and the daily input required to load and light the boiler during the heating season.

Wood pellets are small, typically 6mm in diameter and no more than 15mm long. They are made from processed sawdust and wood chips that have been dried, heated and compressed. When heated and exposed to high pressure, lignin, the binding component in wood, softens and allows the wood product to be

shaped and pressed into a pellet.

Their consistent form means wood pellets can be delivered by bag for manual feeding or bulk delivered into a hopper for automatic feeding. Whilst the more expensive of the biomass fuels, wood pellets still offer significant savings against oil, LPG and electricity, whilst still providing an automated heating solution.



Wood chips are again completely natural and are made from both waste wood and sustainable virgin timber. Wood chip biomass systems are more suitable for larger applications and for those who can utilize a local source or their own wood supply to make the chip. For high efficiency, wood chip needs to be consistent in size and stored in a covered area that allows air to circulate and naturally dry the chip. Wood chips offer the cheapest form of automated biomass heating.



Why do we need to reduce carbon dioxide emissions?

Carbon dioxide or CO₂ for short is one of several greenhouse gases in our atmosphere. The natural regulation of these gases helps ensure the Earth remains at its normal temperature. However, since the Industrial Revolution in the 1700's, humans have been adding to these greenhouse gases, primarily in the form of CO₂ from heating, transportation, and electricity production. This increase has led to the planet steadily rising in temperature, a concept known as global warming. Unlike fossil fuels, wood biomass can be harvested on a sustainable basis as part of a constantly replenished crop; CO₂ is taken out of the atmosphere at the same time as it is released by combustion of the previous harvest. This process is often referred to as being CO₂ Neutral.



Log boilers



Wood log boilers

Modern log boilers provide clean and efficient heating, whilst utilising one of the most cost effective means of heating. Log boilers are suitable for all domestic-sized situations and for smaller commercial applications, such as country houses and small industrial buildings. They need careful consideration on larger applications where the physical requirement of splitting and loading the fuel can become time consuming.

Nominal output and fuel chamber size

When choosing a log boiler, it is important to consider both its nominal output and fuel chamber size to ensure it is suitability.

The nominal output of a boiler is the rate at which the energy stored in the wood is converted to heated water. It is important the nominal output of the boiler is at least matched to the property it is heating so as to ensure it can keep up with the rate at which heat is lost from the property. To ensure the boiler only requires loading and igniting once per day in average winter temperatures, it is important the fuel chamber is sized sufficiently.

Electronic combustion control

To burn wood efficiently, there are two stages of combustion to be controlled - the burning of the volatile gases, and the burning of the fixed carbons (charcoal). The release of the wood gases is known as gasification, where the wood is partially burnt in the fuelling chamber and the gas released. The gas is then drawn into a separate combustion chamber where it mixes automatically with secondary air to burn completely in optimum conditions. The control of this two stage burning process requires boilers to incorporate intelligent combustion controllers, known as a Lambda sensor, to achieve the highest possible efficiencies. This sensor is situated in the flue way of the boiler and constantly monitors the flue gases and adjusts the primary and secondary air to ensure the boiler is always working to its maximum possible efficiency.

Accumulators

During the combustion process, more energy will be produced in the form of heated water than is required at the time by the heating system. This excess heated water is therefore transferred and stored into a highly insulated water tank, known as an accumulator. The high levels of insulation of these accumulators mean this energy can be stored for long periods until it is required for heating or hot water.

Benefits of a log burning boiler

- Simple to operate
- Burns logs and clean waste wood, resulting in very low heating costs
- Eligible for both the Domestic and Non-Domestic Renewable Heat Incentive Schemes
- Requires only once or twice a day fuelling (if sized correctly)
- Lambda controllers ensure high real-life efficiencies up to 93%
- Wood logs can be stored locally to the boiler house to reduce time and labour
- The boiler house can be located remotely to the property to be heated
- Can be easily linked with an alternative heating source
- Can have automatic ignition
- Can have on board fuel calculator which advises how much fuel to load into boiler

Options to make life easy

A number of options are available to make life with a log boiler that little bit easier. **Automatic ignition** systems enable the boiler to be loaded with fuel at a time of day that suits, with the boiler igniting automatically via an electrical ignition fan only when the heating system requires more energy. **Fuel loading sensors** inform the user of how much fuel to load into the boiler, based upon outside weather temperature and forecasted energy use.



Pellet boilers



Wood pellet boilers function much like fossil fuel boilers. When heat is required, they automatically ignite, feed fuel to the fire, and switch off as required. Their automated nature make them an excellent alternative for those looking for a more cost effective and environmentally friendly alternative to traditional oil, LPG, or electrical heating, whilst maintaining the highest comfort levels. They are suitable for all sized applications, from small domestic properties, right through to large commercial applications.

When choosing a wood pellet boiler, there are several important points to consider such as fuel storage, energy storage and control.

Pellet Storage

Pellet storage can either be incorporated locally within the boiler, or via a bulk pellet store that is either augered or vacuum transferred to the boiler. Pellets are available in pre-packed bags (normally 15 kg) for ease of handling and convenience, or bulk delivered for those looking for extended periods between refuelling and optimum buying price.

Buffer Tanks/Thermal Stores

Buffer tanks, or thermal stores, are crucial for the efficient operation of all biomass boilers. The benefits gained from using an accumulator are substantial. Not only do they reduce fuel consumption they allow accumulated energy to be available immediately, there is no need to light the boiler. This reduces emissions and increases the life span of the boiler. In addition the buffer tank or thermal store allow multiple heat sources to be linked as well as offering your central heating system access to heated hot water.

Weather Compensation

Rather than simply controlling the heating of the buffer tank, the onboard controller can be used to control the entire heating and hot water system with weather compensation. Weather compensation control adjusts the temperature in the heating system according to the temperature outside and has been shown to give savings in fuel costs.

Benefits of a pellet burning boiler

- Simple to operate
- Fully automatic control and feed systems
- Automatic ignition and cleaning
- Eligible for both the Domestic and Non-Domestic Renewable Heat Incentive Schemes
- High density wood pellet requires less storage space than other forms of biomass
- Significant fuel savings over oil, LPG and electricity
- Lambda controllers ensure high real-life efficiencies up to 93%
- Designed for long operational life
- Integrated weather compensation
- Advanced combustion control



Combustion Control

As with all high efficiency biomass boilers, pellet boilers require clever electronic controllers to ensure the highest efficiencies possible. Typically, pellets are ignited in a combustion chamber where the volatile gases are driven off and gassified by adding secondary air. The controller ensures the precise mix of fuel, primary air, and secondary air at all stages of combustion.

Chip boilers



Wood chip boilers function much like fossil fuel boilers. When heat is required, they will automatically ignite, feed fuel to the fire, and switch off. Their automated nature make them an excellent alternative for those looking for a more cost effective and environmental friendly alternative to traditional oil, LPG, or electrical heating, whilst maintaining the highest comfort levels.

Wood chip boilers are generally more suitable for larger domestic and commercial applications where the additional fuel savings compensate for the slightly higher capital cost and greater space and input required for fuel storage. Some models designed for wood chip can also burn wood pellets.

Combustion Control

Wood chip boilers require automatic combustion control to adjust to the varying nature of wood chip as a fuel. The most advanced and efficient boilers encompass a lambda sensor to adjust the primary and secondary air for the highest possible efficiencies. The controller ensures the precise mix of fuel, primary air, and secondary air at all stages of combustion to ensure efficiencies of up to 93%.

Fuel Storage

Wood chip boilers require larger fuel stores than the equivalent sized wood pellet system. Fuel stores should be sized so as to allow the boiler to run for a minimum of approximately 4 weeks in the coldest weather without the need to replenish the store. A number of methods can be used to fill the fuel store and are dependent upon individual sites and equipment available.

Buffer Tanks/Thermal Stores

Buffer tanks, or thermal stores, are crucial for the efficient operation of all biomass boilers where the heat demand of property can drop below the minimum output of the boiler (typically 30%). Very few properties can guarantee a base load in excess of 30% and therefore buffer tanks should be used to avoid boiler cycling, decreased efficiency, increased electrical consumption, and increased maintenance intervals this causes.

Benefits of a chip burning boiler

- Fully automatic control and feed systems
- Automatic ignition and cleaning
- Option of automatic weather compensation
- Eligible for both the Domestic and
- Wood chips offer an automated heating solution at a lower cost than wood pellets
- Can utilise own/local woodland to provide fuel
- Significant fuel savings over oil, LPG and electricity
- Lambda controllers ensure high real-life efficiencies up to 93%
- Designed for long operational life



Which boiler?

What is the right boiler for your home?

Log boilers

F Series 20-50



The F Series is an advanced, highly engineered log boiler suitable for domestic and commercial applications. It is designed for long life operation with the minimum of replacement parts over the boilers 20-30 year expected life. Suggested Suitability:

F Series 20-30 Two or three bedroom older property or highly insulated three or four bedroom property. Small to medium commercial application such as small shop or business unit.

F Series 40-50: Three or four bedroom older property or highly insulated five or six bedroom property. Medium commercial application such as offices, larger shop or industrial unit.



Euro

The Euro is an advanced, highly engineered log boiler suitable for domestic and commercial applications. It is designed for long life operation with the minimum of replacement parts over the boilers 20-30 year expected life.

Suggested Suitability: Three or four bedroom older property or highly insulated five or six bedroom property. Medium commercial application such as offices, larger shop or industrial unit.



Small pellet boilers



K Series

The K Series is ideally suited to domestic properties. Designed for the home, it has a simple and easy operation to ensure minimum maintenance.

K10

Very well insulated modern house, two or three bedrooms or more if of passive type construction. Older one or two bedroom property.

K15

Very insulated modern house 3-4 bedrooms or more if passive type construction. Older two or three bedroom property.

K21

Well insulated three to five bedroom property. Poor insulated two or three bedroom. Small low energy commercial application such as high street shop.

K26-K33

Well insulated four to six bedroom house. Poor insulated three or four bedroom. Small low energy commercial applications, larger shop or small warehouse.

Continue over

Larger pellet boilers



HDG K 38-63 and HDG Compact 30-95 range

Commercially constructed pellet boiler for domestic applications. As a guide the Compact 25-50 range of pellet boilers might suit:

HDG K38-63

Well insulated 4-6 bedroom house with larger than average hot water demand and/or swimming pool.

Compact 30 - 50

Medium to large country property or large urban house. Small school or rest home, manufacturing process with heat requirement or space heating.

Compact 65-95

Commercially constructed pellet boiler designed for domestic and commercial applications. Medium to large country property or large urban house. Small school, rest home, manufacturing process with heat requirement or space heating.



Log & pellet boilers combined



HDG FK

Excellent dual fuel wood and pellet boiler. Combination of HDG Log boiler and HDG pellet boiler.

FK 20 to 50kW wood combined with 15-33kW pellet

Well insulated 4-6 bedroom house with larger than average hot water demand. Small commercial application.

Chip boilers



Compact range

Compact 35-45

Well insulated 4-6 bedroom house with larger than average hot water demand and/or swimming pool. Small to medium commercial application.

Compact 50-65

Medium to large country property or large urban house. Small school or rest home, manufacturing process with heat requirement or space heating.

Compact 80-95

Large country property or large urban house. Medium rural primary school, rest home, manufacturing process with heat requirement or space heating.

Log range

of HDG log burning boilers from Zeroridge

The HDG range of wood log burning boilers from Zeroridge are eco living at its finest. Renowned for the highest quality construction, each of the boilers are gasification units, driving off the volatile gases in the wood and burning it in a secondary combustion chamber to ensure complete combustion of the fuel with minimal waste. All of the boilers burn exceedingly cleanly, meaning you can burn with the peace of mind you are helping the environment in every aspect.

The controls of the boilers are simple and intuitive, providing information on the boiler and heating system at a glance. To make life with your boiler even easier, further options available include weather compensated heating control, automatic ignition, and fuel loading predictions.

- Highest quality German construction
- Suitable for domestic and commercial requirements
- Outputs from 20 kW to 50 KW
- Low emissions
- Low running costs
- Automatic ignition option on F Series and Euro





HDG F Series

Wood Burning 20/25/30/40/45/50 kW



A range of six wood log boilers, the F Series range is ideally suited to domestic properties, where people who want to save on their heating bills and prefer to use a completely sustainable fuel to heat their home quickly and efficiently. One burn will offer many days of stored energy through an accumulator.



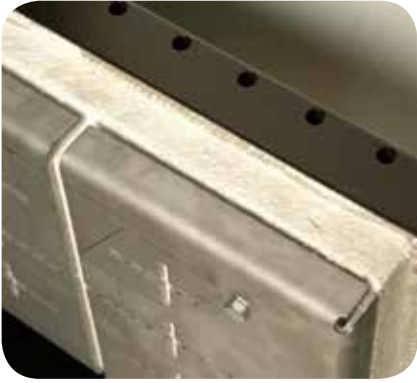
The HDG F Series is a sophisticated and intelligently designed log burning boiler. The large front loading door is ideal for easy loading of the half metre logs, whilst the Lambda control system ensures the boiler can operate effortlessly at over 90% efficiency. The two stage fuel chamber door means you can reload quickly and easily whilst the boiler is still in operation, ensuring that even in the coldest of winters your F Series will easily cope with the demand. The vertical tube heat exchangers are cleaned by a simple external operating handle, making the F Series easy to maintain whilst ensuring maximum efficiency throughout the combustion cycle. Ash removal is also a simple and clean process due to the large integrated ash pan. With a wide range of outputs, the F Series is perfect for homes of most size.

- Waist height fuelling door for easy filling
- All controls and operations from front
- Simple, effective cleaning system
- Space saving dimensions fits in almost any home
- Lambda controlled for highest possible efficiencies
- High quality construction for extended life
- Technically advanced features
- Option of automatic ignition



HDG F Series

Wood Burning 20/25/30/40/45/50 kW



HDG Construction

HDG F Series boilers distinguish themselves through their quality build and durability. The boiler itself is constructed of 6mm steel, whilst the fuel chamber features the addition of removable chamfered panels, protecting the boiler plating from the high temperatures required for the complete combustion.



Constant heat output with low emissions

The dedicated motors for the primary and secondary air distribute the air precisely in the combustion zone. The primary air dictates the rate of combustion, modulating the air supply to ensure a constant output. The secondary air ensures the complete combustion of the fuel to maximise the efficiency whilst minimising the emissions of the boiler through the entire burning process.



Simple operation

The operation of the HDG F Series has been designed to make life easy. The large doors, the central control panel, and the cleaning system are all operated from the front, whilst the large 150 or 195 litre fuel chamber allow long intervals between refuelling. For easy re-loading during cold snaps, the heat exchanger features a bypass flap to redirect the combustion gases and ensure none escape into the boiler room.

Easy to clean and maintain

The integrated cleaning turbulators can be operated comfortably from the front or with the optional electric motor automatic version. The turbulators clean the heat exchanger tubes when operated, ensuring that maximum heat transfer efficiency is maintained. A heat exchanger bypass flap allows for reloading whilst operational.

Lambda control

The Lambda control 1 plus is a microprocessor that controls the combustion and output of the F Series. It ensures high efficiency along with low fuel consumption and emissions. The Lambda control can be fitted with optional Automatic ignition, fuel loading, immersion sensor and outdoor temperature sensor making this an extremely powerful addition to the F Series.



Did you know?
 An HDG log boiler keeps Valli the elephant warm and with plenty of hot water via her heated waterfall, at her home in Carmarthen, Wales.

Large ash chamber

The integrated ash pan is located under the combustion chamber at the base of the F Series. When emptying the ash it can be simply pulled out, allowing the ash to be cleaned out without spillage.

HDG Euro

Wood Burning 30/40/45/50 kW



The HDG Euro is a powerful mid sized boiler, burning a whole range of wood types. More importantly it is highly efficient and very cheap to run. Once burning is completed, the air flaps close and the flue fan blower switches off. This prevents the flue from cooling down the boiler. The remaining charcoal is intentionally preserved for subsequent lighting.





The HDG Euro has a reputation for quality unlike any other. Its specially designed grate, combined with a 10mm thick steel fuel chamber make it ideal for a wide range of fuels including wood logs, chips, carpentry off cuts, and briquettes. This flexibility has made it an extremely popular choice in agriculture and forestry, commercial businesses and larger private households, especially for those who have access to woodland or carpentry waste.

The top loading door featuring integrated pneumatic arm makes the boiler quick and simple to load, whilst the fixed charcoals left at the end of each combustion cycle make lighting the boiler effortless.

The large, 220 litre fuel chamber is ideal for easy loading of half metre logs, whilst the Lambda control system ensures the boiler operates effortlessly at over 90% efficiency, making the boiler a powerful workhorse for mid-sized heating requirements.

- Easy top loading pneumatic fuelling hatch
- Suitable for a wide variety of fuels
- Low emissions
- All controls and operations from front
- Lambda controlled for highest possible efficiencies
- High quality construction for extended life
- Technically advance features
- Option of automatic ignition
- MCS and RHI approved
- Option of BSB controller, automatic calculation of fuel load (Recommended)



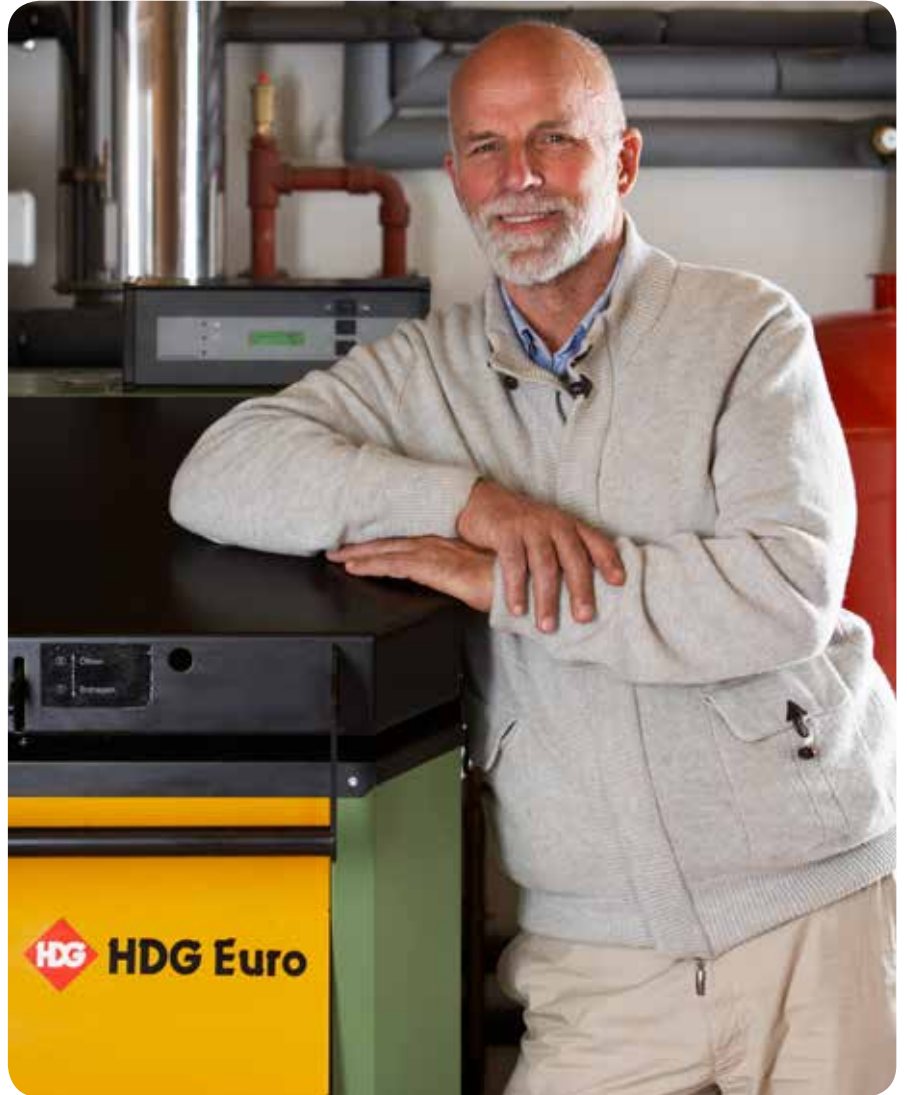
HDG Euro

Wood Burning 30/40/45/50 kW



HDG Construction

No log boiler has the reputation for sheer build quality quite like the HDG Euro. The boiler is constructed of 10mm in the fuel chamber for the highest durability. For added longevity when burning wood waste, chips, shavings or briquettes, the internal surfaces of the fuel chamber can include a fuel scale liner. From the outset, the HDG Euro has been designed to be a heating workhorse and with over 13,000 boilers installed in Europe, its credentials are proven.



The power to heat your home or your business

The HDG Euro from Zeroridge is an ideal wood burning boiler for the home or business. With a range of heat outputs and large wood log capacity it provides hot water and heat with the minimum of fuss.



Did you know?

An HDG Euro is used to make Wallace and Gromitt favourite cheese - Stinking Bishop, made by Charles Martell & Son in rural Gloucestershire.



Easy to light

Once burning is completed, the air flaps close and the flue fan blower switches off. This prevents the flue from cooling the boiler down, whilst the remaining charcoal is intentionally preserved to make the next lighting of the boiler quick and easy. To relight the next day, it needs a few pieces of wood, a few crumpled pieces of newspaper, and a match. Within minutes the boiler is running and producing heat to the accumulator.



Reliable and robust

The design of the HDG Euro grate allows the use of a wide range of different fuels. The innovative construction and robustly manufactured burner nozzle allows - together with the secondary combustion chamber - the optimum after-burning of flue gases.

At the end of the burning cycle, the air flaps close and the fan switches off; therefore the chimney draft cannot cool the boiler down. Unburned charcoal is intentionally preserved after each burn, this makes re-lighting a simple operation as the charcoal is used instead of kindling to easily light.



Choice of fuels

The innovative constructed grate allows for the use of a wide variety of fuels including wood logs, chips, shavings, carpentry off cuts, and briquettes, whilst maintaining the high degree of efficiency that gasifying combustion brings. Its versatility has made it a popular choice for agriculture and forestry uses, commercial businesses and larger private households.



Convenient refilling with pneumatic door

The large fuel chamber of 220 litres is tapered to make it easy to fill with log wood and dry bulk fuel. It will offer hours of burning allowing storage by way of an accumulator. In addition, the fuelling chamber hatch is easy to open due to the integrated pneumatic arm.

Did you know?
Over 13,000 HDG Euro's have been installed since its launch over a decade ago. With its highly engineered construction, and advanced control, it's easy to see why this boiler is so popular.

Zero Ridge pellet range

Zeroridge's range of pellet boilers are from HDG in Germany. Superbly designed and constructed, the quality is as you would expect from manufacturers based in the very heartlands of wood burning technology. These boilers feature the latest technology to give a heating solution that is as automated as fossil fuels, kinder on the environment, whilst offering significant fuel savings.

Versatile, flexible and easy to live with, the HDG pellet boilers are an efficient and cost effective means of heating your property. Each of the boilers feature advanced combustion controls the maximum efficiency and minimum fuel use, and meet the strict UK emissions regulations.

Every boiler in the range utilises simple, intuitive controls, providing information on the boiler and heating system at a glance. In addition, many of the boilers can control the entire heating and hot water systems of the property, creating synergies that improve the efficiencies of the system further still.

All of the boilers feature a wide range of pellet feed systems, from simple manual feed hoppers through to large bulk stores that require filling only annually. The boilers switch on and off completely automatically, and nearly all in the range include self cleaning and automatic de-ashing systems.

- Highly engineered for extended life
- Suitable for domestic to commercial applications
- Low maintenance designs
- Advanced combustion controls
- Outputs from 9kW to 95 KW





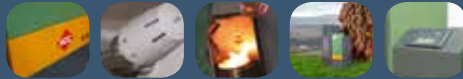
HDG K Series

Pellet burning boiler 10-63 kW



The HDG K Series provides the latest generation pellet heating technology, in a small footprint. Featuring complete automation from lighting to cleaning, the K Series has been built for the home owner. It offers heating and hot water with the minimum of maintenance and by burning wood pellet you will future proof yourself against fossil fuel price increases. Protect yourself and your family from these price hikes, choose to burn a natural, eco friendly and affordable fuel.





The HDG K Series is the latest generation of pellet boilers. These innovative, fully automatic pellet boilers are designed with compactness in-mind and feature a small footprint. The K Series not only incorporates exciting new combustion technology but also the highest level of reliability and comfort. Key features include automatic ignition, computer controlled combustion technology and automatic cleaning and de-ashing all as standard. All this automation means the boiler operates in the background with little intervention except filling, the occasional emptying of the ash and an annual service. Filling the boiler with pellets can be fully automated as well, if you choose to manually fill, then even this is a job that can be completed in minutes.

- High quality German construction
- Integrated pellet hopper
- Optional bulk storage systems
- Low maintenance
- Weather compensation



HDG K Series

Pellet burning boiler 10-63 kW



HDG Construction

The K Series as standard comes with automatic ignition, the integrated IC engine and power control, automatic cleaning of the heat exchanger, as well as the patented burner cleaning system. The K Series also offers two types of wood pellet fuelling. Manual feed or automatic refuelling via fuel hopper by vacuum transfer system. The advanced designed cleaning system is also a standard feature, motorised turbulators automatically clean the heat exchangers, allowing efficiencies of 93%. Fully automated ash removal by two augers allows easy cleaning and ash emptying. The K Series uses a microprocessor controller to control the combustion. Complete with the user-friendly, touch screen display the K Series offers a fully automatic operation. From ignition, warm up, combustion control via temperature sensors, automatic cleaning and de ashing.



Flexible, efficient and perfect for your home

The K Series incorporates innovative combustion technology to provide the highest levels of comfort and reliability. When the K series boiler is installed with the HDG hydronic plus controller, a world of advanced heating control is available. These include options for weather compensated heating as standard for 3 heating circuits which negate the requirement of additional controllers. These can be used for hot water production with integrated buffers (thermal stores), hot water cylinders or hot water production stations even integration with thermal solar.



Automatic weather compensation control

The HDG K Series boilers have an additional sensor, mounted outside your property, which constantly monitors the outside temperature. The boiler is then able to adjust its heating flow temperature in relation to the outside temperature. By altering the temperature in the heating system according to the outside temperature, your K Series boiler can significantly improve the efficiency of the heating system - reducing energy usage by as much as 20% and giving you a more comfortable environment whatever the weather.

Choice of pellet storage

The K Series has a pellet storage solution for every property and lifestyle. For those looking for the most concise solution, a manually filled hopper can be located next to the boiler that requires filling every few days. For those wanting longer refuelling periods, a number of vacuum and auger systems can be utilised in conjunction with a bulk pellet store to supply many months of automation whilst also ensuring the very best fuel prices are obtained.

Simple operation

The HDG K Series from Zeroridge is a dream to operate. Once set up the K Series runs automatically in the back ground, all you have to do is fill it up and occasionally empty the ash. You have full control over when the boiler comes on and off, the temperature, it even tells you when it needs servicing. It comes with standard automatic ignition, computer controlled combustion technology, automatic cleaning of the heat exchanger, as well as the patented burner cleaning system.



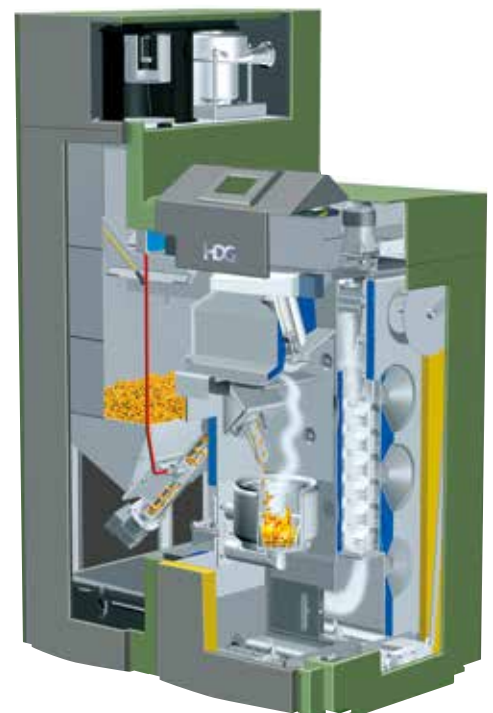
HDG Touch Control

The all new HDG Touch Control provides intuitive, user-friendly control of your entire boiler and heating system. A simple scroll through the screens provides key operation and performance information including fuel consumption, boiler status, accumulator temperatures and combustion output. The HDG Control is available as either a standard 4inch display or optional 7inch display with built in remote access to allow all settings to be controlled via smart phone, laptop or tablet.



Small footprint

The small footprint and clever design means the K Series will fit quite easily into a 1.5 x 1.2 meter space. It therefore could fit into a utility room, garage or outdoor building. Zeroridge also supply space saving Energy cabins, these are supplied ready to use and simply require plumbing into your existing system.



HDG Compact

Pellet burning boiler 35/45/50/65/80/95 kW



The HDG Compact range of wood pellet boilers are the choice for those looking for a boiler that is second to none. The sheer level of design and engineering quality built throughout this boiler mean it is built to last, with a design life in excess of 25 years. Throughout this period, the HDG Compact provides effortless heating and hot water, at the highest possible efficiencies, with minimum input. The Compact range encompasses touch screen displays, automatic ignition, automatic cleaning, and automatic de-ashing.





The HDG Compact range of pellet burning biomass boilers are without doubt one of the finest you can buy. A combination of the latest technology, first class engineering and only the highest quality components give them their deserved reputation as the leading boiler in their class.

The range feature everything you could wish for in a pellet boiler including touch screen displays, automatic feed systems, automatic ignition, automatic cleaning, and automatic de-ashing, making them the perfect alternative for fossil fuel boilers in a larger property.

- Highest quality German construction
- Unique combustion control by means of lambda oxygen sensor and hot gas sensor for maximum efficiency
- Touch screen display
- Automatic ignition with hot air blower
- User-friendly ash removal system.
- Patented rotary feeder for burn-back protection.



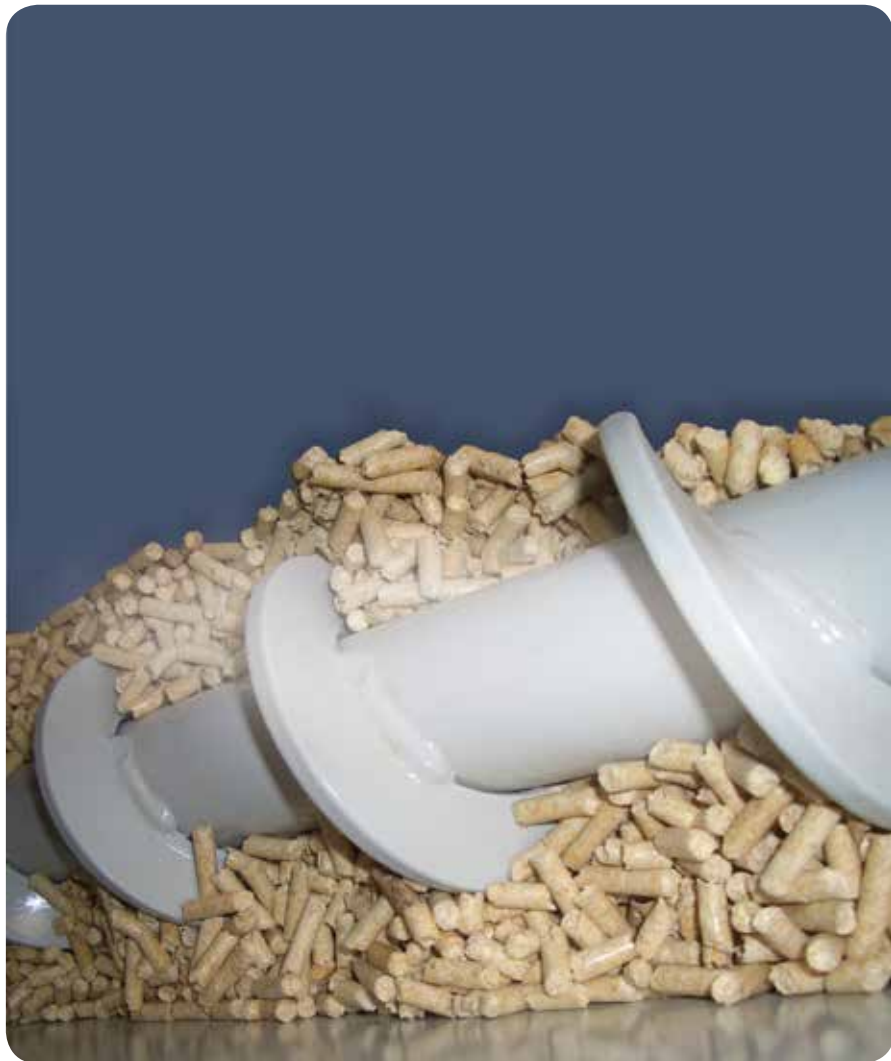
Compact

Pellet burning boiler 35/45/50/65/80/95 kW



HDG construction

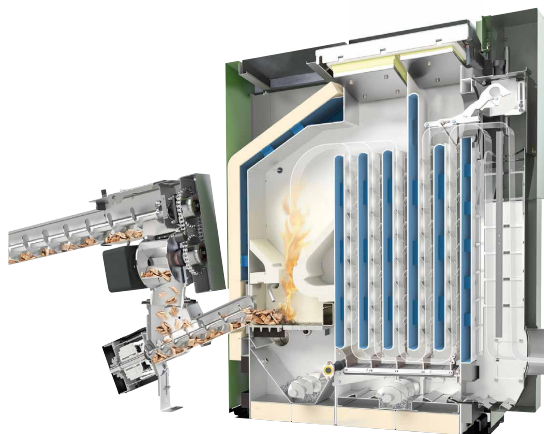
The HDG Compact range leads the way in providing the highest quality, most robust pellet boilers available. The boiler body is of welded construction, manufactured from 4-5mm thick boiler plate and reinforced with tension rods. Pellet delivery into the boiler is via a heavy duty, steel insertion auger, manufactured to last the extended life of the boiler.



Maximum efficiency and convenience

The HDG Compact boilers are astonishingly efficient, with their advanced electronic combustion control and effective cleaning turbulators, the boilers achieve a continuously high efficiency all year round.

It offers advanced features such as the innovative HDG Control, a rotary feeder for uncompromising efficiency, automatic cleaning and ash removal for maximum convenience as well as economical operation.



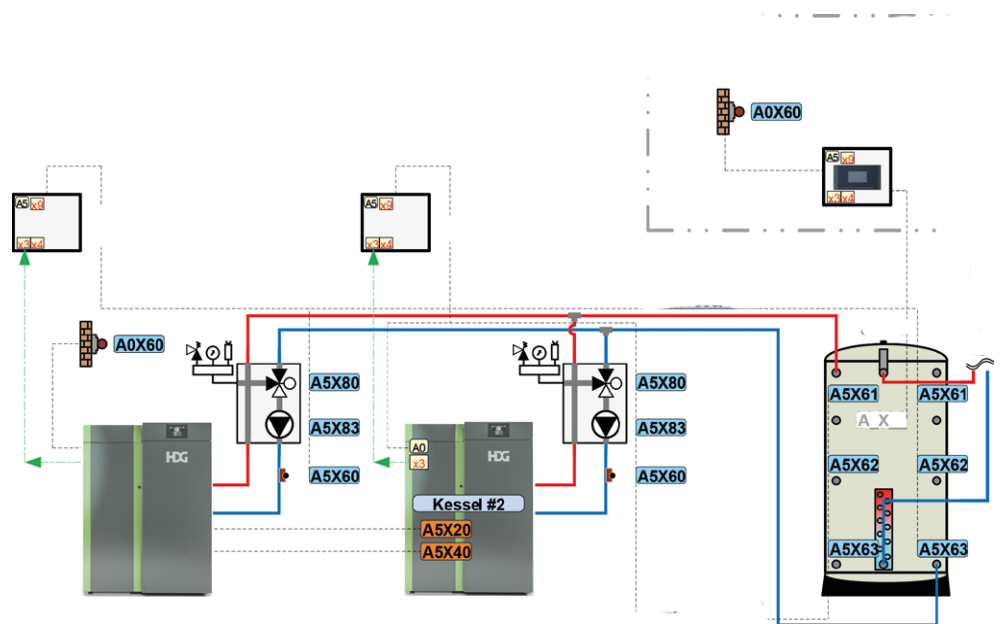


Advanced features

The HDG Compact range feature the HDG Touch control, an advanced microprocessor touch screen controller at the centrepiece of the entire combustion control. The HDG Control regulates every stage of combustion including fuel feed rates, heat output, automatic cleaning, ash removal, and accumulator charging. At start up the fuel is incrementally fed onto the tipping grate, and automatically ignited, primary and secondary air is precisely added, ensuring that the fire is quickly established. Once the fire has become established, the controller changes from ignition mode to Lambda control, the controller optimises combustion and emission levels by using information provided by the Lambda sensor. The Lambda sensor continuously samples the flue gas. Information gathered from this analysis allows precise primary and secondary air actuator adjustments, this guarantees low fuel consumption and ensures that maximised annual efficiencies are achieved.

HDG Touch Control

The all new HDG Touch Control provides intuitive, user-friendly control of your entire boiler and heating system. A simple scroll through the screens provides key operation and performance information including fuel consumption, boiler status, accumulator temperatures and combustion output. The HDG Control is available as either a standard four inch display or optional seven inch display with built in remote access to allow all settings to be controlled via smart phone, laptop or tablet.



Based on the layout of the building, size of the fuel store, boiler capacity and fuel type, we offer custom delivery systems tailored to your needs, from spring steel blade and jointed arm delivery to silo and walking floor delivery. HDG delivery systems are designed to be robust and solid. Moreover, they offer a hassle free means of quietly and reliably supplying your system with fuel.

HDG Compact

Chip burning boiler 35/45/50/65/80/95 kW



HDG Chip boilers offer you the lowest fuel cost to heat your home. Large storage area is the key allowing you to buy in bulk based on the layout of the building, size of the fuel store, boiler capacity and fuel type, we offer tailored custom delivery systems, from spring steel blade and jointed arm delivery to silo and walking floor delivery. HDG delivery systems are designed to be robust and solid. Moreover, they offer a hassle free means of quietly and reliably supplying your system with fuel.





The HDG Compact range of chip burning biomass boilers are without doubt one of the finest you can buy. A combination of the latest technology, first class engineering and only the highest quality components give them their deserved reputation as the leading boiler in their class.

The range feature everything you could wish for in a chip boiler, including touch screen displays, automatic feed systems, automatic ignition, automatic cleaning, and automatic de-ashing, making them the perfect alternative for fossil fuel boilers in a larger property.

The HDG range of chip boilers are ideal for larger domestic homes right through to large country manors and commercial applications.

- For wood pellets and shavings
- Highest quality German construction
- Unique combustion control by means of lambda oxygen sensor and hot gas sensor for maximum efficiency
- Touch screen display
- Automatic ignition with hot air blower
- User-friendly ash removal system.
- Patented rotary feeder for burn-back protection.

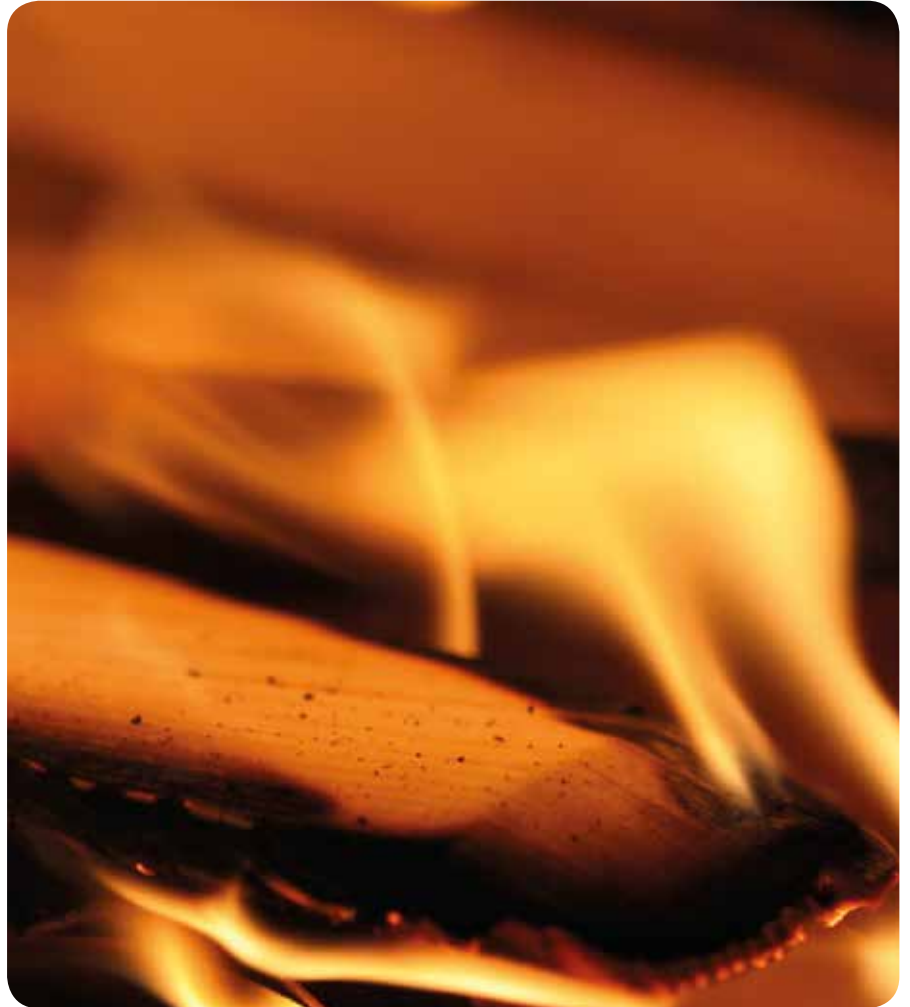


HDG Compact

Chip burning boiler 40/45/50/65/80/95 kW

HDG performance

The HDG Compact range leads the way in providing the highest quality, most robust chip boilers available. The boiler body is of welded construction, manufactured from 4-5 mm thick boiler plate and reinforced with tension rods. Pellet delivery into the boiler is via a heavy duty, steel insertion auger, manufactured to last the extended life of the boiler.



Innovative and intelligent output and combustion control

The HDG Compact boilers are astonishingly efficient, with their advanced electronic combustion control and effective cleaning turbulators, the boilers achieve a continuously high efficiency all year round.

It offers advanced features such as the innovative HDG Control, a rotary feeder for uncompromising efficiency, automatic cleaning and ash removal for maximum convenience as well as economical operation.

Did you know?
The HDG Compact has won numerous awards for its innovative design and technology, including the prestigious KWF Prize for Innovation

Significantly reduce your fuel bills

By switching to chip as a source of fuel you will be utilising one of the cheapest and most sustainable of fuels. Wood chip is a very competitive source of heat compared to most fossil fuels such as oil, and even natural gas especially when looking in the long to medium term. Wood chip has the potential to offer you sustainable, ecologically friendly and affordable energy that to some extent can be insulated from the predicted increases in fossil fuel prices. It also is one of the lowest costs of all renewable energy fuels.



HDG Touch Control

The all new HDG Touch Control provides intuitive, user-friendly control of your entire boiler and heating system. A simple scroll through the screens provides key operation and performance information including fuel consumption, boiler status, accumulator temperatures and combustion output. The HDG Control is available as either a standard four inch display or optional seven inch display with built in remote access to allow all settings to be controlled via smart phone, laptop or tablet.

Compact, versatile and very economical

It is not only the boiler efficiency level and emissions values that are decisive factors in an economical, easy to operate and ecological heating system. It is just as important that a trained heating professional determines your individual needs, and takes your specific requests into account. This is why all of the components you intend to integrate with your heating system will be harmonised with one another at Zeroridge.



Storing your energy

The energy created by your HDG Compact needs to be stored to maximise the efficiency of the boiler and to avoid losing energy. Zeroridge recommend using an accumulator system. This highly insulated device enables optimum boiler system running times by storing energy and supplying it on demand. This means that your boiler can operate for longer in its nominal load range and avoids uneconomical heating and cooling phases. Fewer operating hours reduces the electricity consumption of the system and considerably prolongs the boilers service life. The required energy quantity is also attained with significantly less fuel. The Zeroridge accumulator system is a sensible enhancement which benefits nature and you as a customer.



Fuel storage

Understanding the basics for wood log, chip and pellet

Wood Logs

Wood logs require drying prior to being burnt in your wood log boiler. Whilst this process might seem tedious, burning logs that have not been dried sufficiently will lead to poor efficiency, in addition to significantly increased service and maintenance on the boiler and flue system. It is recommended the logs are stored near to the boiler, to allow quick and easy loading of the boiler as required.

To dry effectively, wood logs should be split and stacked either outside, with a water proof cover over, or in an open sided barn. In addition, the logs should be stacked off the ground to prevent moisture rising into the logs at the base of the stack.

Annual log usage varies on a number of factors, including moisture content, boiler efficiency, and size of the property. However, the following gives an approximate guide:



Wood Pellets

The handling and storage of wood pellets requires careful consideration and planning to ensure the maximum benefit. As part of our design service we will ensure the key issues are considered as follows~:

Maximum distance from the delivery vehicle to storage hopper of 30m

Sight glass to visually see pellet level

The store is the biggest possible to enable bulk purchase pricing of pellets

Storz A couplings for simple fuelling

Due to the low moisture content of wood pellets (circa 8%), they should be stored where they will not absorb high levels of ambient moisture

Due to the natural degradation that can take place, pellets should not be stored for longer than 12 months.



Wood Chips





The handling and storage of wood chips requires careful consideration and planning to ensure the maximum benefit. As part of our design service we will ensure the key issues are considered as follows~:

An easy means of filling the chip store is available (telehandler, Zeroridge chip shifter etc)

The chip store allows sufficient storage of fuel (recommended minimum of 1 month)

The chip store allows suitable ventilation in order to reduce the moisture content of the fuel whilst in the store.



Estimated Fuel Usage								
	Boiler Size kW	Estimated Annual kWh	Log		Pellet		Chip	
			70	105,000	29 tonnes	69m ³	24 tonnes	41 m ³
	60	90,000	25 tonnes	59m ³	21 tonnes	35 m ³	27 tonnes	118m ³
	50	75,000	21 tonnes	49m ³	17 tonnes	29 m ³	22 tonnes	98m ³
								
	45	67,500	19 tonnes	44m ³	16 tonnes	26 m ³	20 tonnes	88m ³
	40	60,000	17 tonnes	39m ³	14 tonnes	23 m ³	18 tonnes	78m ³
	35	52,500	15 tonnes	34m ³	12 tonnes	20 m ³	16 tonnes	69m ³
								
	30	45,000	13 tonnes	29m ³	10 tonnes	17 m ³	Not suitable	
	25	37,500	10 tonnes	25m ³	9 tonnes	14 m ³	Not suitable	
	20	30,000	8 tonnes	20m ³	7 tonnes	12 m ³	Not suitable	
								
	15	22,500	6 tonnes	15m ³	5 tonnes	9 m ³	Not suitable	
	10	15,000	4 tonnes	10m ³	3 tonnes	6 m ³	Not suitable	

The above table is for indication purposes only.

For calculation, the following assumptions have been made:

Boiler efficiency of 90%

Boiler operates for 1,500 hours per year

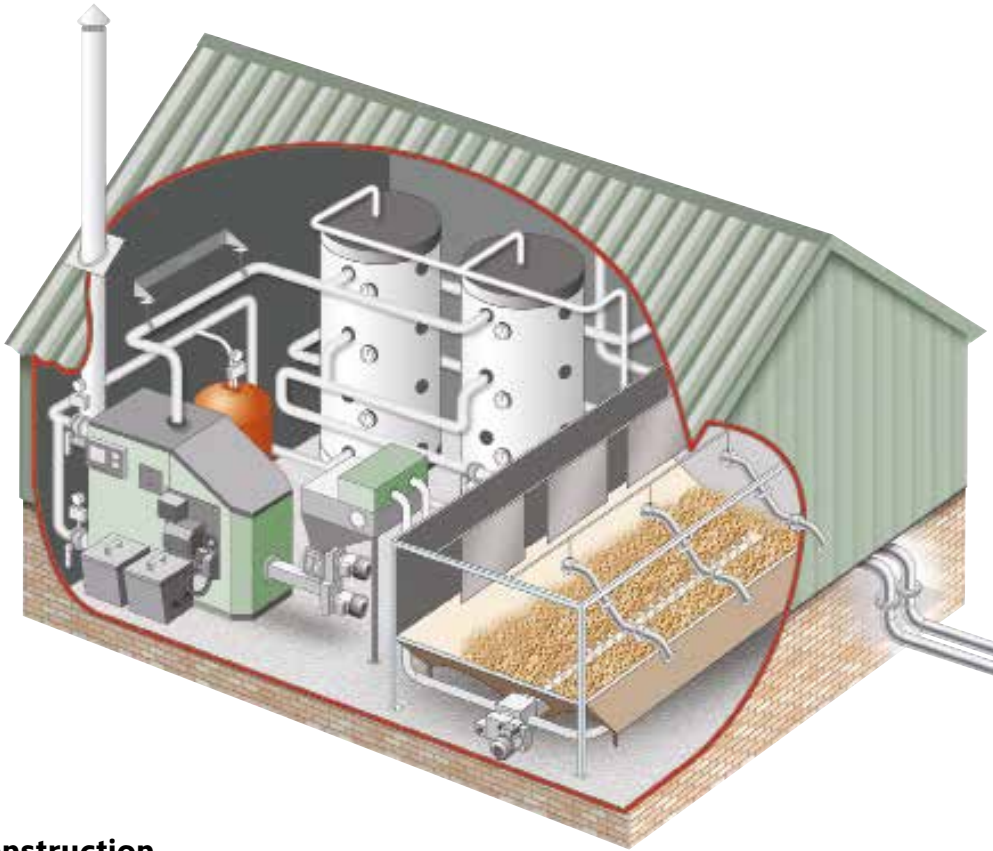
Wood log moisture content of w 20%

Wood pellets in accordance with EN Plus Grade A1

Wood chips moisture content w 30%

Did you know?
 Did you know EN A1 Plus wood pellets are 100% natural and are held together by the lignin contained within the wood.

Fuel delivery systems & storage



Quality Construction

At Zeroridge we have compiled a wide range of feed systems for both wood chip and pellet boilers. Each system is manufactured of the highest quality component to ensure they are built to the same high standards as the HDG and SHT Austria boilers to which they are utilised.

Vacuum Transfer Systems

The range of vacuum transfer systems available allow reliable transfer of pellets from remote storage rooms up to 20 metres away from the boiler. Each boiler carefully controls the refuelling periods to ensure a quiet and undisturbed nights sleep.

Direct Augers

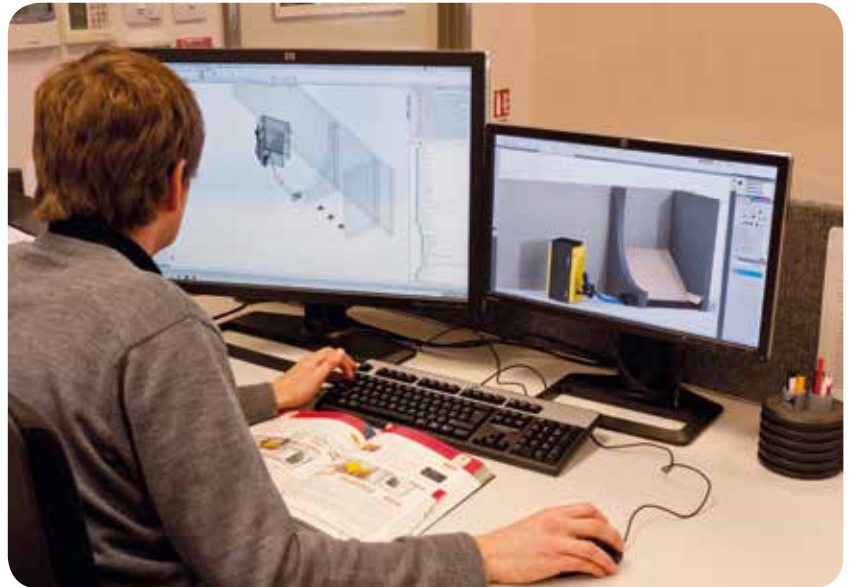
The range of vacuum transfer systems available allow reliable transfer of pellets from remote storage rooms up to 20 metres away from the boiler. Each boiler carefully controls the refuelling periods to ensure a quiet and undisturbed nights sleep.

Flexible Auger

The TDA Thermodual and PNA Thermocomfort boilers feature a clever, flexible auger. Allowing a fuel store to be located up to four metres from the boiler whilst allowing the extraction system to be located at an angle.

Design Expertise

Our design team will ensure the most suitable fuel storage for your specific requirements. This can include a detailed 3D drawing showing filling tubes, anti-shatter mat placement, and exact storage capacity using our specialist design software.



Indoor and Outdoor Silos

We offer a range of pre-built pellet and chip silos, available for locating both internally and externally. As well as reducing installation time, these clever solutions ensure perfect storage conditions and include extras such as filling tubes, storz connectors, and glass inspection windows as standard.

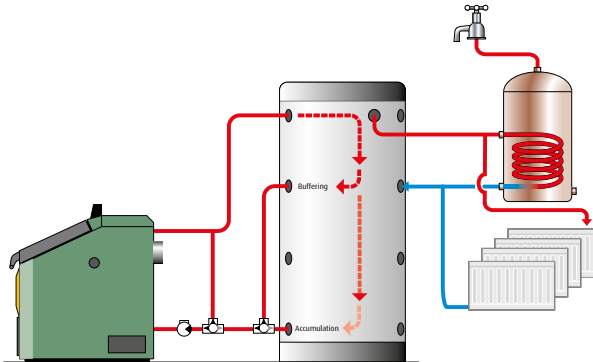


Did you know?

Over 15,000 HDG FRA feed systems have been produced to date. Featuring flexi blade arms, and a highly constructed auger, this makes the perfect solution for feeding wood chip reliably and effortlessly into a HDG Compact boiler.

Heat Storage

Understanding its importance



Wood Log Boilers

Modern, highly advanced log boilers operate at high combustion chambers in order to fully combust the wood and achieve the highest efficiencies possible. In most circumstances this will result in the boiler producing energy at a faster rate than it is consumed by the property, with the energy being stored in an accumulator. It is therefore important that the boiler can store this heat in an accumulator, rather than try to slow/shut down the combustion process as this latter option leads to incomplete combustion, poor efficiency, and increased maintenance on the boiler and flue system. Calculated correctly,

a suitably sized log boiler and accumulator will require loading and lighting once per day. Key to this is the size of the accumulator in relation to the combustion chamber size. Without sufficient accumulation, the boiler will require loading several times per day, as it is unable to store enough energy to allow for extended refuelling periods.

Automatic Wood Chip and Pellet Boilers

Unlike their fossil fuel equivalents which can quickly achieve full output and then switch off, wood burning boilers take time to feed the fuel, ignite, warm up and achieve their working temperature.

It is therefore imperative that energy can be stored to allow for this period between heat being demanded, and heat being supplied.

In addition to providing energy during the warm up cycle of the boiler, more importantly a buffer allows the boiler to run for extended periods and achieve a high level of efficiency. Without this ability, biomass boilers will cycle on and off as the heating demands of the property change, leading to incomplete combustion, poor efficiency, and



Why do some manufacturers and installers say accumulators are not required?

Some biomass boilers, are able to modulate their output to 30% output. As a consequence, provided the heat load of the property can be maintained above this level, the boiler will function satisfactorily without an accumulator. This approach works acceptably in Continental Europe where the winters are cold and for extended periods, allowing the heating system to at least

match the partial load of the boiler. However our climate in the British Isles is far more variable due to the different air masses that meet over the Isles, and we experience much milder winters than those living on the continent. As a result, installing a biomass boiler in the UK without an accumulator is likely to result in

the boiler cycling on and off throughout the day, resulting in lowered efficiency, increased maintenance and far more frequent cleaning of the flue system.

Did you know?
In recognition of the importance accumulators make in an efficient biomass system, the German government pay higher grants to people who have them installed as part of their system.

Accumulators, Buffers and Thermal Stores Explained

The biomass industry has several name conventions for the ability to store heated water. At Zeroridge, we narrow these down into three distinct areas - accumulators, buffers, and thermal stores.

Accumulator

As the name suggests its main use is to accumulate energy. The accumulator absorbs energy in the case of wood boilers, heated water. In correctly specified log boiler installation the aim is to fuel and light the boiler once a day in cold conditions or once every two - three days in warmer weather. This is possible not because it takes a long time for the wood to burn, but because the energy is collected and stored in the accumulator until it is needed. The accumulator is highly insulated so the heated water can be used days later.



Buffer

As the name suggests its main use is buffering between a heat source and energy usage area, such as

heating circuits for heating process requirements. As described above, automatic wood boilers respond slower than fossil fuel boilers when requested to produce heat due to the nature of the fuel. By including a buffer between the heat source and the heating circuit, energy (heated water) is first drawn from the buffer. By using the buffer temperature sensors, as the water temperature drops to a preset level, this activates the automatic boiler to reheat the buffer and supply demand.



If no demand exists, the buffer remains heated due to the high level of insulation and the wood boiler remains turned off. This prevents the automatic wood boiler cycling (switching on and off regularly) which in turn prevents undue wear and tear, reducing emissions to the environment and fuel consumption.

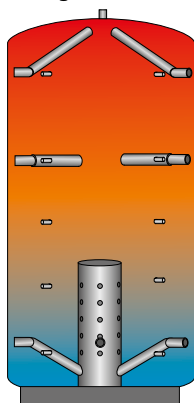
Thermal stores

Probably the most poorly explained and confused accumulator/buffer. Generally best described as a small buffer undertaking many duties. These include buffering, some accumulation (though limited due to the size) hot water production through internal transfer coils or via external heat exchangers. As with accumulators and buffers, these can include additional coils for solar thermal input and electrical heating elements.

Optimum Stratification

Good stratification is of crucial importance to the efficiency of a biomass heating system, ensuring the hottest and most usable water is stored at the top of the tank, rather than a tank of cooler water that is the same temperature throughout.

Thermal stratification is based on a natural process: Warm water is lighter than cold water, and will therefore rise either until it reaches a layer of warmer water or until it reaches the top of the tank. Our range of accumulator tanks feature a number of unique devices to improve the natural stratification, including stratification columns, plates, and flow and return snorkels.



Accumulator insulation

Our range of Zeroridge accumulators feature the highest levels of insulation, ensuring the heated water stays at a high temperature with minimal heat loss.

The insulation made of polyurethane with a density of 18kg/m^3 , with a thermal coefficient of 0.039 W/mk .



Design services

Zeroridge's design team offer a complete service



With over 30 years experience, and over a thousand successful biomass installations, we understand that installing a biomass boiler can seem a big step. That's why we offer all of the technical advice and support you need - from choosing a suitable boiler and fuel, right through to operating and maintaining your boiler.

The following step by step gives a guide to a typical biomass installation.

An initial discussion will discuss the outline of the biomass options available, and whether it is right for you and your home. We will give you all of the information needed to make an informed decision, including estimated fuel savings and RHI income.

One of our authorised installation partners will visit your property and discuss the potential installation in greater detail, determining exact boiler sizes, location for the boiler, and fuel storage.

From the site visit the installer will provide a detailed quotation, outlining a full turnkey cost for a fully commissioned biomass system.

If required, a full 3D design layout will be produced by a member of our specialist design team, showing exactly how the boiler and feed system will be incorporated within the existing building.

Once the quotation has been accepted, the boiler will be ordered. Depending upon the exact boiler and feed system ordered, delivery typically takes between 2-6 weeks.

The installation takes place, typically taking a week for a standard system, but can take several weeks if it involves more complicated changes or district heating pipe to be installed.

After the installation has been completed, a specialist Zeroridge commissioning engineer will check over your system, ensuring it is working to its optimum, and providing a complete handover to ensure you are happy with everything.





- HDG split log boilers
- HDG wood chip, pellet and split wood systems
- HDG pellet heating systems
- Buffer tank, accumulators and thermal stores
- System components

Speak to one of our team

01531 584000

Inspiration and information

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Zero ridge operate a continuous development policy and specifications may have changed since the production of this brochure. October 2022 E6OA Product number LI090