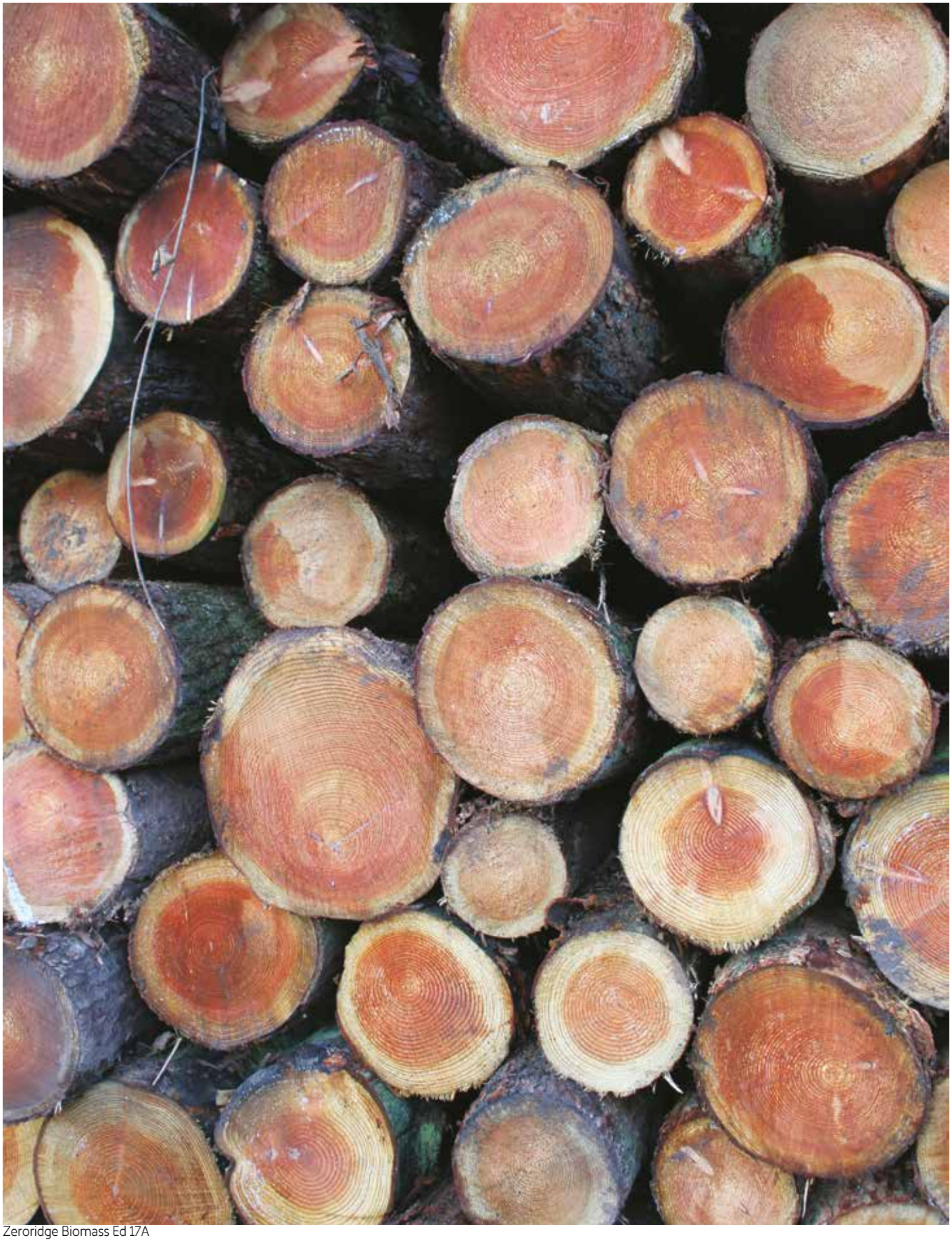


Zeroridge Biomass Ed 17A

Overview

HDG and SHT log boilers

Model information		Heat output	Fuel options and loading options	Page
	**HDG R Series** Easy controller Fuelling chamber size R15 = 65 litres, Fuelling chamber size R20-25-30 = 130 litres Nominal heat output models		**Wood logs** Split logs up to 550 mm in length (21") EN 14961-5:2011 R15 model Log length according to L30 R20 - R30 models Log length according to L50 Log thickness according to D15 Water content according to M20 Fuel loading: Front	A7
	R15	15 kW		
	R20	20 kW		
	R25	25 kW		
	R30	30 kW		
	**HDG F Series** Touch screen controller Fuelling chamber size F 20-30 150 litres Fuelling chamber size F 40-50 190 litres Nominal heat output models		**Wood logs** Split logs up to 550 mm in length (21") Briquettes EN 14961-5:2011 Log length according to L50 Log thickness according to D15 Water content according to M20 Fuel loading: Front	A16
	F20	20 kW		
	F25	25 kW		
	F30	30 kW		
	F40	40 kW		
	F45	45 kW		
	F50	50 kW		
	**SHT Thermodual TDA.HV** Nominal heat output models		**Wood logs** Split logs up to 550 mm in length (21") EN 14961-5:2011 Log length according to L50 Log thickness according to D15 Water content according to M20 Fuel loading: Front	A12
	TDA.HV 25	25 kW		
	TDA.HV 30	30 kW		
	TDA.HV 35	35 kW		
	TDA.HV 40	40 kW		
	**HDG Euro** Touch screen controller Fuelling chamber size 220 litres Nominal heat output models		**Wood logs** Split logs up to 550 mm in length (21") Wood chips G30-G100 (30 mm - 100 mm) Wood shavings Briquettes EN 14961-5:2011 Log length according to L50 Log thickness according to D15 Water content according to M20 Fuel loading: Top	A19
	Euro 30	30 kW		
	Euro 40	40 kW		
	Euro 45	45 kW		
	Euro 50	50 kW		
	**HDG Turbotec** Lambda control 1 Plus controller Fuelling chamber size 340 litres Nominal heat output		**Wood logs** Split logs up to 1000 mm in length (39") Wood chips G100 (100 mm) with optional top loading door EN 14961-5:2011 Log length according to L100 Log thickness according to D15 Water content according to M20 Fuel loading: Front Optional additional top door	A23
	Turbotec 50	50 kW		
	Turbotec 60	60 kW		

Log burning boilers explained

Guide to model sizes and applications

R Series
15/20/25/30
Domestic

F Series
20/25/30/40/45/50
Domestic and/or commercial

Thermodual TDA.HV
25-30-35-40
Domestic and/or commercial

Euro 30-40-45-50
Large domestic and/or commercial

Turbotec 50-60
Large domestic and/or commercial or process

Smaller domestic properties and light commercial installations

R Series

The R range of log boilers are ideally suited to the smaller domestic dwelling. Purpose designed for simple and easy operation. Most commonly used linked with a fossil fuel (oil or gas) boiler.

Ideal entry level boiler for 2-3 bedroom property or highly insulated 3-4 bedroom house. 130 litre fuel chamber capacity (R20-30).
Suitable for wood logs.

F Series

Advanced commercially constructed log boiler.
Designed for long life operation with the minimum of replacement parts over the 20-30 year expected life.
Lambda controlled for excellent efficiency:

F Series 20,25,30

Suitable for a well insulated 3-4 bedroom house with average hot water demand. Ideal as the primary energy source.
Small to medium commercial application such as small shop specialist business unit.
150 litre fuel chamber capacity.

F Series 40-45-50

Suitable for an averagely insulated 3-4 bedroom house or well insulated 4-6 bedroom property with above average hot water demand.
Ideal as the primary energy source.
Medium commercial application such as offices, larger shop or industrial unit.
195 litre fuel chamber capacity.

Larger domestic properties and commercial installations

Thermodual

TDA.HV 25,30

Suitable for a well insulated 3-4 bedroom house with average hot water demand.

Thermodual TDA.HV 35,40

Averagely insulated 4 bedroom house or well insulated 4-6 bedroom property with above average hot water demand.
Ideal as the primary energy source.

Euro

Commercially constructed log boiler designed for both domestic and commercial applications. Scale liner is an option, 220 litre fuel chamber capacity. Lambda controlled for excellent efficiency. As a guide the Euro 30-40-50 range of boilers might suit:

Euro 30- 40

Well insulated 3-4 bedroom house with average hot water demand. Ideal as the primary energy source. Small to medium commercial application such as small shop specialist business unit.

Euro 45-50

Averagely insulated 3-4 bedroom house or well insulated 4-6 bedroom property with above average hot water demand. Ideal as the primary energy source.
Medium commercial application such as offices, larger shop or industrial unit.

Turbotec

Commercially constructed log boiler for heavier load applications. Suitable for 1 meter logs with large fuelling chamber. Lambda controlled for excellent efficiency: Suitable for larger country or urban properties. Large guest house or small hotel.
340 litre fuel chamber capacity.

RHI (Renewable Heat Incentive)

The Domestic RHI is calculated on your properties size and heat requirement, successful applicants will receive "deemed" quarterly payments for seven years, but your boiler has to last for 20 years, replacement is not an option as this would be a new installation and the RHI payments may be withdrawn.

The Non domestic RHI is for a period of twenty years. To make full benefit of the payment structure for both domestic and commercial the boiler you choose must last the 20 year period or more without expensive repairs. Replacement is not an option as this would be a new installation and the RHI payments may be withdrawn.

Log burning boilers explained

Operation

Modern log boilers provide clean and efficient heating: they are fuelled by hand once or less per day under normal seasonal conditions. When sized correctly the fuel chamber is large enough to hold enough energy in the form of wood to supply the average winter daily heating requirements.

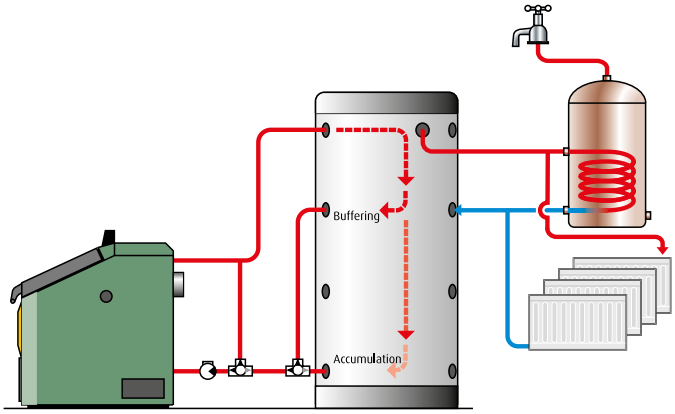
The boilers operate at high levels of efficiency and have large fuelling chambers. Log boiler systems are applicable to all domestic-sized situations and for smaller commercial applications, such as country houses and small industrial buildings.

Log boilers begin to become less practical if the system design requires regular refuelling. A correctly sized log boiler in average winter weather conditions will be ignited and fuelled once per day. In colder periods a second operation maybe required. When choosing a log boiler the main decision is the fuelling chamber size when deciding on a particular unit, not the kW output of the boiler.

During the combustion process more energy (heated water) will be produced than is required at that time. This excess heated water is transferred and stored into an accumulator. This large vessel of stored heated water contains the energy from the wood. This accumulated energy can be stored for long periods until it is used for heating or hot water requirements.

When burning wood there are two stages of the combustion process, burning the volatile gas and then the fixed carbon (charcoal). To burn wood efficiently the boiler needs to be able to operate in whatever stage of combustion is occurring. The release of gas is known as gasification, the wood partially burns in the fuelling chamber which releases the gas. The gas is drawn into a separate combustion chamber where it mixes with secondary air to burn in ideal conditions. The on-board system control monitors the oxygen concentration and/or temperature of the exhaust gasses. The controller automatically adjusts primary and secondary combustion air through independent air controls, optimising combustion as the wood burns.

Wood burning boilers, in common with all wood biomass fuels, burn most efficiently and cleanly when burning hot and fast.



Intelligent control

F Series, Euro and Turbotec

The on board controller not only determines the combustion of the wood through the gasification and charcoal stages but organizes the distribution of the heated water into the accumulator.

At initial lighting the controller understands what process is occurring. As the water temperature in the boiler`s water jacket rises the circulating water pump starts. When the temperature rises to a preset level the first of two motorised valves starts opening to load energy into the top 1/3rd of the accumulator. This ensures that as soon as heated water is produced, it is available for whatever heating requirement is needed, domestic hot water or space heating. The temperature in the upper section of the accumulator is monitored by a sensor. When the temperature reaches a preset level the 2nd mixing valve starts to operate loading excess energy to the lower section of the accumulator, storing the heated water for use later. This is called intelligent accumulator management.

By storing energy, the regularity of continuous boiler fuelling is avoided and greatly reduces manual input and maximises efficiency.

HDG R Series

This range incorporates a combustion temperature sensor which modulates the on board flue fan to alter the required combustion conditions.
The R Series is commonly used with other boiler systems such as fossil fuel.

SHT Thermodual TDA.HV

Derived from the highly successful TDA Thermodual dual fuel wood and pellet boiler, this wood only boiler is a popular addition to the range.

The Benefits

- Simple to operate and ignite
- Burns logs and clean wood waste
- Correctly sized once or twice per day fuelling
- Located in a boiler room simplifies cleaning and maintenance
- Very high efficiency up to 92% depending on model
- Wood logs can be stored locally to the boiler house
- The boiler house can be located remotely to the property to be heated
- Can be easily linked with an alternative heating source

The Checklist

- Requires a dedicated boiler room capable of fitting the boiler and accumulator
- Requires daily fuelling
- Fuelling is undertaken by hand
- Requires occasional ash removal

R Series 15-20-25-30

General information

Comfortable heating. With wood!

10 YEAR WARRANTY

Boiler

The HDG R 15-20-25-30 is a down firing gasification split log boiler featuring the latest generation down firing technology. The fuel chamber is front loading, the large loading door measures 300 mm wide 390 mm high ideal for loading half meter split logs. The lower edge of the fuel chamber is 870 mm from the ground, making the loading procedure a convenient process. The fuel chamber for R15 is 65 litres while the 20-25-30 have 130 litre volume; recommended minimum accumulator size is 1500 litres.
The logs should be seasoned, 20% moisture content. If wood is split immediately after felling it is a simple operation, it also dries very quickly if stored in a well ventilated area free from direct rain.

Ash removal is a simple and clean process due to the integrated ash pan. The vertical tube heat exchanger is cleaned by simple external operating handle; this makes the R15-20-25-30 extremely clean in operation.

HDG R25 Easy Control

The HDG Easy Control optimises combustion efficiencies and minimises emission levels by using information provided by the flue gas & boiler temperature sensors. The R Series can also have accumulator loading via an thermostat and Y2 valve.

HDG construction

- Boiler body – heat exchanger: welded construction, tension rod reinforced 4 **- 5 mm thick boiler plate**
- Certified in accordance with the pressure equipment directive 97/23/EG boiler class 3 (the highest standard)
- RAL colours - Green (RAL 6011) Traffic grey (RAL 7043)
- Integral thermal heat discharge within the heat exchanger
- Separate lighting and warm up door for convenient ignition and cleaning
- Vertical tube heat exchanger, external hand cleaning for ease of use
- Integrated return temperature control
- Potential free contact for refill signal
- Large control display with easy navigation
- Automatic boiler fan control
- Flow and return temperature sensors
- Accumulator sensor included

HDG safety features

- Heat exchanger thermal discharge
- Flue gas bypass: operational when the loading door is opened this allows clean smoke free refuelling

HDG standards and approvals

- Type tested to EN 303-5
- HETAS approved
- The HDG R Series qualifies for the Renewable Heat Incentive emission limits for total particulate matter and oxides of nitrogen 30g/GJ particulate matter and 150g/GJ NOx

R Series 15-20-25-30

Equipment prices and order codes

Boiler pricing		Order code	£ ex VAT	PG	Page
	HDG R15 including HDG Easy Control	HDG1050	4,995.00	41	
	HDG R20 including HDG Easy Control	HDG1042	5,690.00		
	HDG R25 including HDG Easy Control	HDG1039	5,690.00		
	HDG R30 including HDG Easy Control	HDG1043	5,690.00		

Mandatory system and hydraulic components		Order code	£ ex VAT	PG	Page
	**HDG R15** Return temperature kit HE 55-25 energy efficient pump R15 Includes cast iron pre-connected assembly for fast installation. Actuator SM 4.6, 2 x ball valves DN 25. Pump HE 55-25 with insulation, 180 mm, DN 25	PL2024	487.00	41	I18
	HDG R20 - 25 - 30 Return temperature kit HE 55-32 energy efficient pump Includes cast iron pre-connected assembly for fast installation. Actuator SM 4.6, 2 x ball valves DN 32. Pump HE 55-32 with insulation, 180 mm, DN 32	PL2028	545.00		I18
	**Accumulator loading valve** Y2 option, three-way mixing valve DN 32. ID DN 32. Rotation time 150 seconds, SM 4.6 servo motor, 230 V	PL2047	138.00		I18
	**Immersion thermostat** Used for controlling Y2 accumulator loading option	PL2006	35.00		
	**Boiler safety module** Combined pressure gauge, autovent, pressure relief, with two part insulation. DN25, up to 50 kW	PL2001	48.00		I31
	**Thermal safety device** DN 20 file pocket and water connections	PL2000	68.00		
	**Expansion vessel** 200 litre. Sized to suit local installation of boiler and accumulator	EV4706	237.00		I16
	**Accumulator** 1,000 litres. Complete with stratification column and snorkels Minimum recommended for use with soft wood R15	TS4855	1,088.00		I5
	Accumulator 1,500 litres. Complete with stratification column and snorkels Minimum recommended for use with soft wood R20-25-30	TS4801	1,456.00		
	**Accumulator temperature gauges** Minimum 2 recommended	PL2017	19.00		I31

R Series operational principles

Wood gasification boiler with Easy Start

The **speed-controlled flue gas fan** supports the necessary chimney draught and provides the required vacuum in the fuel chamber. This makes heating up as well as cleaning a fast and speedy affair. The speed of the flue gas fan automatically regulated to provide ideal combustion conditions.

The **top cleaning opening** allows easy access to the standing heat exchanger area. The small amount of cleaning and maintenance operations can be performed comfortably from here. An additional cover with integrated insulation prevents excessive radiation losses.

The **flue gas temperature sensor** is the reference variable for the necessary primary air and also defines the output of the boiler. The controller detects when the boiler has reached the required flue gas temperature and switches it to "Heat production on".

The **integrated cleaning turbulators** can be easily operated from the side. On the one hand, the turbulators are used for cleaning of the heat exchangers. On the other hand, they contribute to keeping the boiler efficiency at an optimum level.

The **stainless-steel burner nozzle** is embedded slide-mounted and recessed in the nozzle brick. This special geometric cutout allows the burner nozzle to expand uniformly. The split logs do not negatively affect the gas extraction – a guarantee for long life expectancy and optimum operational reliability. The secondary air channel is integrated in the nozzle brick, allowing the secondary air to be preheated. In return, the nozzle brick is protected from overheating.

Cut through HDG R Series

The **modular combustion chamber** is arranged directly under the fuel chamber according to the functional principle of down firing combustion technology. The burning gases generated are burned out by the addition of the secondary air. The combustion chamber is specially developed for the HDG R20-30 combustion chamber consists of individual fire-resistant concrete elements.

The openings for **primary and secondary air** are locked in place and can be adapted to the particular fuel (hardwood/softwood). The combustion air is supplied through the heating door.

The **HDG Easy Control** is located on the top of the boiler and operates as the "brain" of the modern gasifying wood boiler system. The connections are easily accessible in the housing of the control element. The prefabricated cable can be easily connected with the necessary components.

When the **fuel chamber door i**s opened, the door contact switch is tripped and the flue gas fan starts to run at full speed. The gas flue extraction above the fuel chamber prevents any carbonisation gases in the fuel chamber from escaping into the heating room. The flue gases are thus directly drawn back into the flue gas pipe, ensuring safe and clean reloading or cleaning.

The large fuel chamber door (39cm x 30cm) and the low filling edge (approx. 870mm) allow the boiler to be filled ergonomically and easily. The hinges of the fuel chamber door are on the right as standard but can be refitted on the other side at any time.

The HDG R20-30 has a **fuel chamber capacity** of 130 litres (R15 65 litres). The fuel chamber wall consists of 5mm quality steel sheet and is equipped with a complete fuel chamber liner made of high quality edged profile panel. The fuel chamber capacity is an important reference point for the design of the required accumulator capacity.

The wood goes through four different temperature zones in the fuel chamber. In the upper section, the firewood is "preheated". The water bound in the firewood is evaporated at temperatures around 100°C. For nonpolluting combustion, the firewood must be sufficiency split and contain less than 20% water content. Wood is composed of approximately 85% volatile components by weight, which account for about 70% of the heating energy.

At temperatures up to approximately 600°C, the firewood is degassed with the addition of primary air.

The added primary air also cools the lower part of the rear panel. The primary air is conducted through the heating flap and rear panel into the lower fuel chamber area. The gases released in the first step are ultimately burned out with the addition of secondary air in the underlying secondary combustion chamber (down firing combustion technology).

The separate heating door allows the boiler to be fired conveniently, without smoke or with it being necessary to hold the fuel chamber and combustion chamber door open. The necessary combustion air enters the boiler through openings in the heating door. The hinges of the heating door are on the right as standard but can be re-fitted on the left at any time on site.

Under the combustion chamber is the **large ash compartment** for the fly ash. The ash can be easily drawn forward into the integrated ash pan. The insulated combustion chamber door with stainless-steel liner ensures low radiation losses and, like the fuel chamber and heating door, can be converted from having the hinges on the right to having them on the left.

Zeroridge Biomass Ed 17A

Thermodual TDA. HV

Boiler information

A

LOG BURNING BOILERS

SHT Heiztechnik

5 YEAR WARRANTY

Boiler

The TDA.HV Thermodual is a down firing-split log gasification boiler, utilising a lambda controller to ensure the boiler is always operating at the highest levels of efficiency. The front loading fuel chamber is 175 litres in capacity, with a depth of 550 mm making it ideal for loading half meter split logs.
The logs should be seasoned to 20% moisture content (wet scale). The vertical tube heat exchanger is cleaned by an automatic cleaning system, ensuring the boiler achieves maximum efficiency at all times.
As removal is simple and clean process due to the integrated ash pan.
Recommended minimum accumulator sizes 2,500 litres, see accumulator sizing section I.

TC3 Control

The latest generation TC3 controlled combustion results in 90% plus operational efficiency. Utilising microprocessor controlled combustion, lambda sensor and flame temperature, the controller ensures precise primary and secondary air actuator adjustments to ensure low fuel consumption and maximum efficiencies. Loading the accumulator is also precisely managed. Two three way mixing valves are used in conjunction with one another to achieve this control. When the boiler is first ignited water circulation is limited to the heat exchanger until the temperature has risen to 57°C, this is a precautionary measure to prevent corrosion within the boiler jacket. At 57°C, the first mixing valve gradually starts to open, allowing hot water to leave the closed loop and to start heating the top third of the accumulator, when the water within the top third of the boiler accumulator reaches 57°C the second mixing valve starts to open, this allows loading of the remaining two thirds. This clever accumulator loading management allows rapid access to high grade heat.

The TC3 controller can provide integrated control of up to 6 different heating circuits, 3 hot water circuits, and a solar thermal system for the highest possible efficiencies. The visually clear menu is simple and intuitive to operate, giving current operating status and system information. There is a built in data logging system that provides information for the service engineer and operator alike.

The Thermodual TDA.HV has the advantage of a retrofittable pellet module, giving the boiler the same dual fuel capability as the Thermodual TDA.

SHT construction

- Boiler Body and heat exchanger: welded construction, tension rod reinforced 4-5mm thick boiler plate
- Certified in accordance with the pressure equipment directive 97/23/EG
- Cladding, pre-assembled powder coated steel
- Integral thermal heat discharge within the heat exchanger
- Integrated ash pan for simple cleaning
- Vertical tube heat exchanger, external hand cleaning for ease of use
- Integrated return temperature control
- Integrated control of heating and hot water systems
- Large control display with easy navigation
- Automatic boiler fan control
- Flow and return temperature sensors
- Accumulator sensors included

SHT safety features

- Heat exchanger thermal discharge
- Flue gas bypass: operational when the loading door is opened this allows clean smoke free refuelling

SHT standards and approvals

- Type tested to EN 303-5
- HETAS approved
- The SHT TDA.HV Thermodual qualifies for the Renewable Heat Incentive emission limits for total particulate matter and oxides of nitrogen 30g/GJ particulate matterand 150g/GJ NOx

Touch screen

The SHT touch controller is the very latest in boiler touch screen technology. The purpose design interface can be ordered as an alternative to the standard button controller or as an upgrade to current TC3 models.
The easy to use menu is simple to navigate
The home screen gives a clear overview of the current boilers status including boiler, buffer and heating temperatures, status or when it is next likely to run.
Simply pressing on the heating circuit button changes the screen where any time or temperature settings can be changed.
The operating hours screen advises when next service is due or the diagnosis page for a more in depth over view of the combustions conditions.

TDA Thermodual TDA.HV 25-30-35-40

Equipment prices and order codes

Boiler pricing		Order code	£ ex VAT	PG	Page
	Thermodual TDA.HV 25 with standard controller	SHT2031	8,570.00	40	
	Thermodual TDA.HV 30 with standard controller	SHT2032	8,570.00		
	Thermodual TDA.HV 35 with standard controller	SHT2033	8,570.00		
	Thermodual TDA.HV 40 with standard controller	SHT2034	8,570.00		
	Pellet upgrade kit for dual fuel capability (parts only) Allows choice of pellet fuelling	SHT2035	3,895.00		
	Touch screen option. Surcharge with new boiler purchase instead of standard controller	Suffix T to the above part number ie SHT2031T	379.00		

Note, control and heating extensions see section H or contact the Zeroridge design team

Mandatory system and hydraulic components		Order code	£ ex VAT	PG	Page
	Return temperature kit 80A-32 energy efficient pump Includes cast iron pre-connected assembly for fast installation. Actuator SM 4.6, 2x ball valves DN 32. Pump 80A-32 with insulation, 180 mm, DN 32	PL2035	668.00	41	
	Y2 Distribution Valve Three way mixing valve and actuator (TDA.HV 25-30)	SHT4030	229.00		I18
	Y2 Distribution Valve Three way mixing valve and actuator (TDA.HV 35-40)	SHT4037	249.00		
	**Boiler safety module** Combined pressure gauge, autovent, pressure relief, with two part insulation. DN25, up to 50 kW	PL2001	48.00		I31
	**Thermal safety device** DN 20 file pocket and water connections	PL2000	68.00		
	**Expansion vessel** 250 litre. Sized to suit local installation of boiler and accumulator	EV4707	293.00		I16
	Expansion vessel 300 litre. Sized to suit local installation of boiler and accumulator	EV4708	331.00		
	**Accumulator** 2000 litres. Complete with stratification column and snorkels Minimum recommended for use with soft wood	TS4802	1,682.00		I5
	Accumulator 2500 litres. Complete with stratification column and snorkels Minimum recommended for use with soft wood	TS4803	2,234.00		
	**Accumulator temperature gauges** Minimum 4 recommended	PL2016	24.00		I31

Thermodual TDA. HV

General information

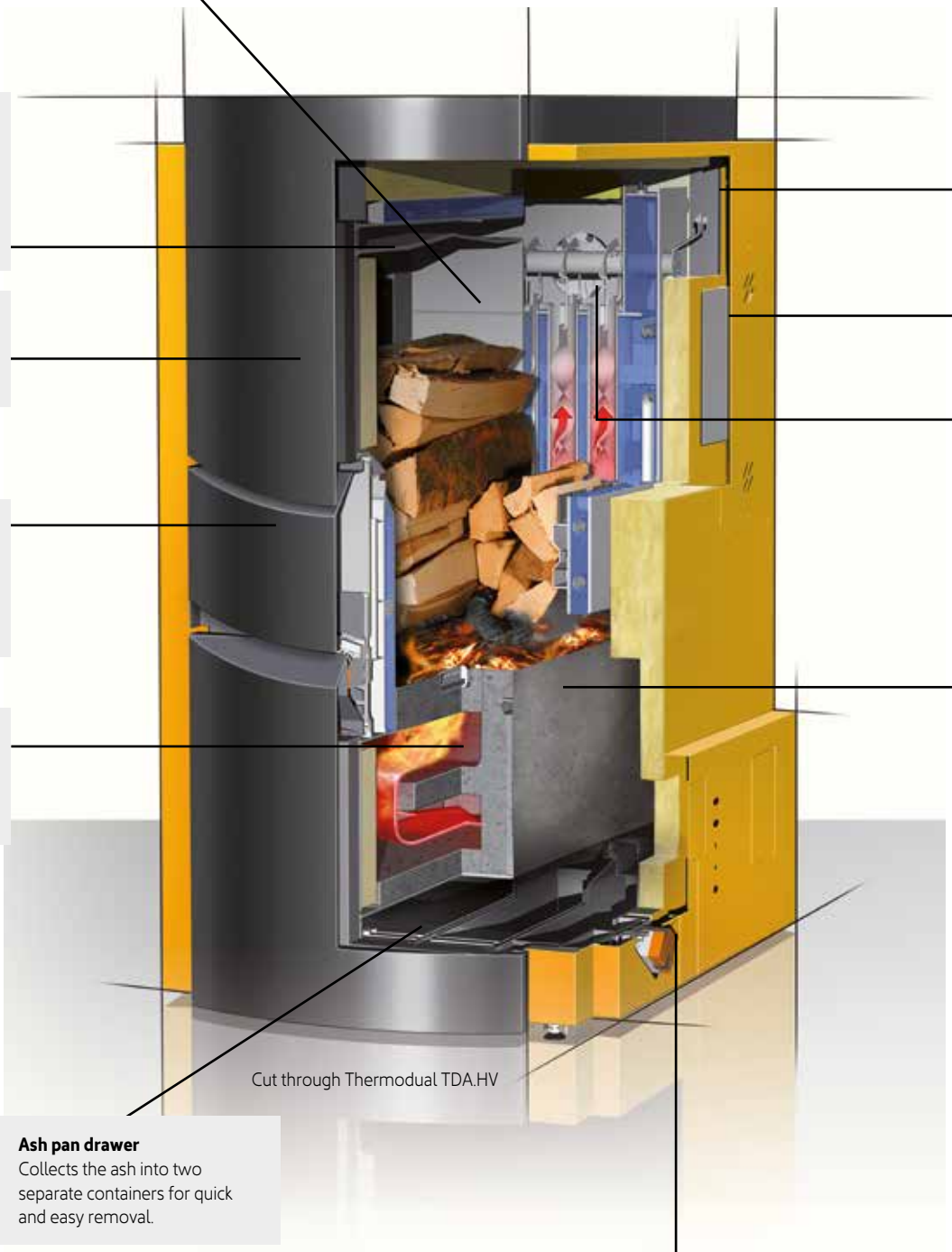
Combustion chamber
Has a hinged stainless steel lining which ensures longevity of the fuel chamber whilst the deep fuel chamber allows for larger log lengths to be loaded (TDA 15/25 -330 mm, TDA 30/40 - 500 mm).

Gas extraction channel
Avoids any spillage into the room when the fuel chamber door is open by extracting combustion air back into the flue ways.

Fuel chamber door
Large door for easy loading of wood logs into the fuel chamber.

Secondary air motor
Automatically adjusts the secondary air for optimum efficiency throughout the burn cycle.

Secondary **combustion chamber**
Ensures complete combustion of the wood gases before they enter the heat exchanger.



Cut through Thermodual TDA.HV

Ash pan drawer
Collects the ash into two separate containers for quick and easy removal.

Primary air motor
Automatically adjusts the primary air for optimum efficiency throughout the burn cycle.

Touch Screen controller
The SHT touch controller is the very latest in boiler touch screen technology. The purpose design interface can be ordered as an alternative to the standard button controller. The easy to use menu is simple to navigate.
The home screen gives a clear overview of the current boilers status including boiler, buffer and heating temperatures, or when it is next likely to run.
Simply pressing on the heating circuit button changes the screen where any time or temperature settings can be changed. The operating hours screen advises when next service is due or the diagnosis page for a more in depth over view of the combustions conditions.

Automatic heat exchanger cleaning
Fully automatic cleaning (TDA HV 30/40) of the heat exchangers without the need for manual operation.

Complete control of the system including all stages of combustion and heating system with weather compensation.

Speed-controlled induced draft fan
Automatically adjusts the fan speed to ensure optimum combustion conditions. Self cleaning turbulators.
Ensure the heat exchangers of the boiler are kept clean for a continuously high degree of efficiency and the lowest fuel consumption.

Refractory combustion chamber
Featuring silicone carbide composite material developed exclusively for the high temperatures needed for complete combustion of the fuel.

Thermal safety discharge (not shown) provides ultimate safety for the boiler system by dissipating excess heat if required.

F Series 20-25-30 & 40-45-50

General information

Comfortable heating. With wood!

10 YEAR WARRANTY

Picture shows F Series 40/50 model

Boiler

The HDG F Series 20-25-30 & 40-45-50 are down firing gasification split log boilers. The F Series 20-25-30 has a 155 litre fuel chamber volume and the F Series 40-45-50, 205 litres.

The logs should be seasoned to 20% moisture content (wet scale). If wood is split immediately after felling it is a simple operation, it also dries very quickly if stored in a well ventilated area free from direct rain.

The vertical tube heat exchanger is cleaned by a simple external operating handle, this makes the F Series extremely clean in operation, there is also the option of automatic cleaning.

Ash removal is a simple and clean process due to the integrated ash pan.

Recommended minimum accumulator sizes 2000 litre for the F Series 20-25-30, and 2500 litres for the F Series 40-45-50, see accumulator sizing section I.

HDG F Series HDG touch screen controller

Latest generation Lambda controlled boiler has a 94% plus operational efficiency. The HDG Touch Controller plus is a well established microprocessor controlled combustion and output regulation solution for the HDG F Series. This 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 in turn means low fuel consumption and ensures that maximised annual efficiencies are achieved. Loading the accumulator is also precisely managed, two three way mixing valves are used in conjunction with one another to achieve this control. When the boiler is first ignited water circulation is limited to the heat exchanger, until the temperature has risen to 60°C, this is a precautionary measure to prevent corrosion within the boiler water jacket. At 60°C the first mixing valve gradually starts to open, allowing hot water to leave the closed loop and to start heating the top third of the accumulator, when the water within the boiler and the top third of the accumulator reaches 72°C the second mixing valve starts to open, this allows loading of the remaining two thirds. Accumulator loading management allows rapid access to high grade energy.

The HDG Touch Controller has a residual heat utilisation programme, when the temperature of the water within the accumulator falls 5°C below that of the water within the boiler, the pump is started, this process unloads the heat that was remaining within the boiler and makes it available for use within the building to be heated.

Integrated component protection

During dormant periods (summer) the component protection program is always operational. All electrical components are energised periodically, the Lambda sensor is heated, and the boiler is ventilated, pumps and mixing valves are energised, this process extends component life time and efficiency.

The visually clear menu system and display, gives current operating status, it also provides reload and reignite instruction ensuring simple operation. There is also a data logging system that provides information for the service engineer and operator alike.

HDG construction

- Boiler body and heat exchanger: welded construction, tension rod reinforced 4-5 mm thick boiler plate
- Fuel chamber: internally clad with individually suspended profiled high temperature resistant panels, ensuring heat exchanger longevity
- Certified in accordance with the pressure equipment directive 97/23/EG boiler class 3 (the highest standard)
- RAL colours - Green (RAL 6011) Traffic grey (RAL 7043)
- Integral thermal heat discharge within the heat exchanger
- Secondary combustion chamber: Modular design, manufactured from cast refractory bricks

HDG safety features

- Heat exchanger thermal discharge
- Excess heat exchanger temperature protection via mechanical wax filled manual reset thermostat
- Two stage fuelling chamber access, for reload whilst in heat production

HDG standards and approvals

- Type tested to EN 303-5
- The F Series qualifies for the Renewable Heat Incentive emission limits for total particulate matter and oxides of nitrogen 30g/GJ particulate matter and 150g/GJ NOx
- Approved for use in smokeless zones
- MCS approved. 20, 25, 30, 40, 45 models
- HETAS. 20, 25, 30, 40, 45 models

Touch Screen Control

The HDG Touch Control is at the forefront of the entire control strategy for the touch controller range. Connected via MODBUS to boiler specific control modules it receives information from all sensors and controls outputs to all electrical components in the boilers. The result is a clear and concise interface which displays and controls all functions including combustion, power regulation of motors, accumulator management, and if installed, heating distribution and solar thermal.

The standard 4.3" industrial quality touch screen is designed to work in boiler room conditions, in low light levels and a dusty environment, and can even be used while wearing gloves, unlike standard touch controls. An upgrade to 7" version with remote access is an option.

F Series 20-25-30 & 40-45-50

Equipment prices and order codes

Boiler pricing	Order code	£ ex VAT	PG	Page
 HDG F Series 20 with 4.3" touch screen	HDG1056	9,045.00	41	
HDG F Series 25 with 4.3" touch screen	HDG1057	9,045.00		
HDG F Series 30 with 4.3" touch screen	HDG1058	9,045.00		
HDG F Series 40 with 4.3" touch screen	HDG1059	9,960.00		
HDG F Series 45 with 4.3" touch screen	HDG1061	9,960.00		
HDG F Series 50 with 4.3" touch screen	HDG1060	9,960.00		

Options	Order code	£ ex VAT	PG	Page
 **HDG Touch Control XL** 7" touchscreen, integrated web server with email and SMS. Surcharge with new boiler purchase instead of standard controller	HDG3506	435.00	40	
 **Automatic ignition system** for fitting on right hand side Ignition fan, expansion module EW-Z, differential pressure switch, CAN-BUS cable, connecting cable for the module and mains power supply, mounting materials	HDG1200	560.00	41	
Automatic cleaning system allows the boiler to clean its own heat exchanger tubes instead of the manual operation	HDG1202	375.00		

Note: control sensors depending on type of installation are required. To determine requirment contact Zeroridge design team

System and hydraulic components	Order code	£ ex VAT	PG	Page
 **Return temperature kit** HE 55-32 energy efficient pump, F Series 20-30 Includes cast iron pre-connected assembly for fast installation. Actuator SM 4.6, 2 x ball valves DN 32. Pump HE 55-32 with insulation, 180 mm, DN 32	PL2028	545.00	41	I18
Return temperature kit U 80A-32 energy efficient pump, F Series 40-50 Includes cast iron pre-connected assembly for fast installation. Actuator SM 4.6, 2x ball valves DN 32. Pump U 80A-32 with insulation, 180 mm, DN 32	PL2035	668.00		
 **Accumulator loading valve** Y2, three-way mixing valve DN 32. ID DN 32. Rotation time 150 seconds, SM 4 servo motor, 230 V	PL2047	138.00		I18
 **Boiler safety module** Combined pressure gauge, autovent, pressure relief, with two part insulation. DN25, up to 50 kW	PL2001	48.00		I31
Thermal safety device DN 20 file pocket and water connections	PL2000	68.00		
 **Expansion vessel** F Series 20/25/30. 250 litre. Sized to suit boiler/accumulator	EV4707	293.00		I16
Expansion vessel F Series 40/45/50. 300 litre. Sized to suit boiler/accumulator	EV4708	331.00		
 **Accumulator** F Series 20/25/30. 2,000 litres. Complete with stratification columns and snorkels. Minimum for use with soft wood	TS4802	1,682.00		I5
Accumulator F Series 40/45/50 2,500 litres. Complete with stratification columns and snorkels. Minimum for use with soft wood	TS4803	2,234.00		
 **Accumulator temperature gauges,** minimum 4 recommended	PL2016	24.00		I31

F Series operational principles

Wood gasification boiler with down-draught combustion technology

Heat exchanger mechanism external access, simple maintenance operations can be conveniently performed through this aperture. An additional insulated outer cover is supplied, to prevent excessive radiant losses.

The external component wiring centre for the Lambda control is made easily accessible.
Simply lift off the top panel, the subsequent wiring of all components is simply accessed using the cable handling ducts provided.

The **flue gas fan** provides the correct pressure conditions within the combustion chamber for perfect combustion; the fan assembly is easily removed for servicing.

The **Lambda sensor** measures the residual oxygen level after the burning process and it provides the reference variable for the right amount of secondary air. It provides the basis for environmentally friendly burning with low wood consumption and high efficiency. The Lambda sensors installed in a protective tube with
heat-resistant gasket and it is calibrated by the control system regularly. The Lambda sensor is therefore a reliable and long-life combustion regulation solution.

The **flue gas temperature** sensor provides the reference variable for the necessary primary air and defines the power of the boiler. The regulator detects when the boiler reaches the necessary flue temperature during heating up and switches it to the "heat generation on" mode.

HDG F Series

The **integrated cleaning turbulators** can be operated comfortably from the front. The turbulators clean the heat exchanger tubes when operated, ensuring that maximum heat transfer efficiency is maintained. For the F Series 20/25/30 its operation is connected with the loading by-pass mechanism. On the F Series 40/50 there is an additional operating handle. A heat exchanger bypass flap allows for reloading whist operational.

Flue gas flap closed

Flue gas flap open and turbulators operating

The **HDG Touch Control** is at the forefront of the entire control strategy for the touch controller range. Connected via MODBUS to boiler specific control modules it receives information from all sensors and controls outputs to all electrical components in the boilers. The result is a clear and concise interface which displays and controls all functions including the, combustion, power regulation of motors, accumulator management and if installed heating distribution and solar thermal. The standard 4.3" industrial quality touch screen is designed to work in boiler room conditions, in low light levels and a dusty environment, and can even be used while wearing gloves, unlike standard touch controls. An upgrade to 7" version with remote access is a option.

The boiler can be refuelled ergonomically and comfortably through the **large fuelling chamber hatch** (350 x 550 mm). The integrated two part cassette type internal doors allow the safe opening of the boiler in any situation, this access is especially useful should reload during operation prove necessary. The doors are hung on the right as standard but may be reversed if the install demands.

An **automatic ignition system** is an option for the HDG F Series. This makes wood heating more convenient, because the fuel chamber contents can be ignited automatically depending on setting and conditions chosen.

The **heat-resistant burner nozzle** made of stainless steel is installed deep in the nozzle brick. The burner nozzle can expand through this special geometry opening. The wood logs cannot limit the passage of the gas - and guarantees a long lifetime and optimum operational safety. The split nozzle brick surrounds the secondary air channel in which the secondary air is pre-heated. The secondary air also prevents the nozzle brick from overheating.

The modular **secondary combustion chamber** is arranged directly under the fuelling chamber according to the operational principle of the down-draught combustion technology. The burning gases generated are burnt here by the addition of the secondary air. The combustion chamber is specially developed for the F Series consisting of refractory brick elements arranged in an integrated part of the water jacket. This protects the combustion chamber from excessive temperatures, and prevents premature deterioration.

The HDG F Series 20/25/30 has a fuel chamber capacity of 155 litres, and the HDG F Series 40/50 has 205 litres. The fuel chamber walls consist of 6 mm quality steel sheets and are equipped with complete internal linings from high quality and chamfered profolder panels. The special design of the side panels allows optimum sliding characteristics for the firewood and protects the panels from damage. The fuel chamber capacity provides an important reference point for model selection and necessary accumulator volume, see also Chapter I.

The firewood undergoes different temperature zones in the fuelling chamber.
In the top section, the firewood is "pre-heated". The water trapped in the firewood is evaporated at a temperature of around 100°C. For an environment-friendly burning, the firewood should be split and have a water content of less than 20% (wet scale). Wood contains volatile substances roughly 85% by weight, providing approximately 70% of heating energy. Firewood is degassed by the primary air at a temperature of about 600°C. Additionally, the added primary air cools the bottom section of the side panels. The primary air is fed by the primary air openings on the side to the bottom fuelling chamber area.
The wood gas liberated in the upper combustion chamber is burnt by the addition of the secondary air in the secondary chamber (down-draught combustion technology).

The **air flow regulator** unit with the servo motors for the primary and secondary air ensures exact air volume regulation during the whole combustion procedure. The air is pre-heated through the air-cooled combustion chamber panels and this optimises the burning process. After the burn-down process, the servo motors automatically close to reduce the cooling of the boiler. If the boiler is not heated up for seven days, the protection program takes care to ventilate the boiler by opening the servo motors periodically.

The **large size ash chamber** for the fly ash is located under the combustion chamber. The integral heat exchanger runs under this chamber ensuring that usable energy is extracted at this point. Fly ash can be pulled out easily at the front into the integrated ash pan. The insulated, air-cooled combustion chamber doors with stainless steel internal lining ensure low radiation losses and may be re-installed on the left side similar to the fuelling chamber doors.

Euro 30-40-45-50

Boiler information

HDG Euro

10 YEAR WARRANTY

Boiler

The HDG Euro 30-40-50 is a lateral firing gasification boiler, the fuel chamber is top loading and large loading door measures 550 mm wide & 430 mm front to back, ideal for loading half metre split logs. The Euro 30-40-50 has a 220 litre fuel chamber volume.
The HDG Euro has become very popular in the field of wood burning due to its ability to burn the widest selection of wood types.
The logs should be seasoned to 20% moisture content (wet scale). If wood is split immediately after felling it is a simple operation, it also dries very quickly if stored
in a well ventilated area free from direct rain.
Ash removal is a simple and clean process due to the large simple fit ash pan.
Recommended minimum accumulator size, is a minimum of 3000 litres, see accumulator sizing section I.

HDG Euro Lambda Control 1 Plus

Latest generation Lambda controlled boiler 93% plus operational efficiency.
This 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, in turn this means low fuel consumption and ensures that maximised annual efficiencies are achieved.
Loading the accumulator is also precisely managed, two three way mixing valves are used in conjunction with one another to achieve this control. When the boiler is first ignited water circulation is limited to the heat exchanger until the temperature has risen to 60°C, this is a precautionary measure to prevent corrosion within the boiler water jacket. At 60°C the first mixing valve gradually starts to open, allowing hot water to leave the closed loop and to start heating the top third of the accumulator, when the water within the boiler and the top third of the accumulator reaches 72°C the second mixing valve starts to open, this facilitates the loading the remaining two thirds. Accumulator loading management allows rapid access to high grade energy.
The Lambda 1 has a residual heat utilisation programme, when the temperature of the water within the accumulator falls 5°C below that of the water within the boiler, the pump is started, this process unloads the heat that was remaining within the boiler and makes it available for use within the building to be heated.

Integrated component protection

During dormant periods (summer) the component protection program is always operational, all electrical components are energised periodically, the Lambda sensor is heated, and the boiler is ventilated, pumps and mixing valves are energised, this process extends component life time and efficiency.
The visually clear menu system and display, gives current operating status, it also provides reload & reignite instruction ensuring simple operation. There is also a data logging system that provides information for the service engineer and operator alike.

HDG construction

- Boiler body and heat exchanger: welded construction, tension rod reinforced 5 mm thick boiler plate for external areas and 10 mm thick within the fuelling chamber
- Fuel chamber: internal surfaces can be specified with a scale lining for long term use whilst burning wood waste, chip, shavings, briquettes & carpentry waste or oak logs
- Certified in accordance to the pressure equipment directive 97/23/EG boiler class 3 (the highest standard)
- RAL colours - Green (RAL 6011) Traffic grey (RAL 7043)
- Integral thermal heat discharge within the heat exchanger
- Secondary combustion chamber: modular design, manufactured from cast refractory bricks

HDG safety features

- Heat exchanger Thermal discharge
- Excess heat exchanger temperature protection via mechanical wax filled manual reset thermostat
- Fuelling chamber access door dual operation lock system

HDG standards and approvals

- Type tested to EN 303-5
- The Euro 30-40-50 qualifies for the Renewable Heat Incentive emission limits for total particulate matter and oxides of nitrogen 30g/GJ particulate matter and 150g/GJ NOx
- Approved for use in smokeless zones
- MCS approved, Euro 30 & 40
- HETAS approved

Touch Screen Control

The HDG Touch Control is at the forefront of the entire control strategy for the touch controller range. Connected via MODBUS to boiler specific control modules it receives information from all sensors and controls outputs to all electrical components in the boilers. The result is a clear and concise interface which displays and controls all functions including the combustion, power regulation of motors, accumulator management and if installed heating distribution and solar thermal.
The standard 4.3" industrial quality touch screen is designed to work in boiler room conditions, in low light levels and a dusty environment, and can even be used while wearing gloves, unlike standard touch controls. An upgrade to 7" version with remote access is a option.

Euro 30-40-45-50

Equipment prices and order codes

Boiler pricing	Order code	£ ex VAT	PG	Page
 Scale liner for wood chips, shavings, pressed wood briquettes, oak logs & wood waste.				
HDG Euro 30 with 4.3" touch screen	HDG1004T	11,495.00	41	
HDG Euro 40 with 4.3" touch screen	HDG1005T			
HDG Euro 45 with 4.3" touch screen	HDG1048T			
HDG Euro 50 with 4.3" touch screen	HDG1006T			
HDG Euro 30 with scale liner with 4.3" touch screen	HDG1035T	12,275.00		
HDG Euro 40 with scale liner with 4.3" touch screen	HDG1036T			
HDG Euro 45 with scale liner with 4.3" touch screen	HDG1049T			
HDG Euro 50 with scale liner with 4.3" touch screen	HDG1037T			

Options	Order code	£ ex VAT	PG	Page
				
HDG Touch Control XL 7" touchscreen, integrated web server with email and SMS. Surcharge with new boiler purchase instead of standard controller	HDG3507	435.00	40	
 **Automatic ignition system** for fitting on right hand side Ignition fan, expansion module EW-Z, differential pressure switch, CAN-BUS cable, connecting cable for the module and mains power supply, mounting materials	HDG1203	560.00	41	

Note: control sensors depending on type of installation are required. To determine requirement contact Zeroridge design teamw

System and hydraulic components	Order code	£ ex VAT	PG	Page
 **Return temperature kit** U 80A-32 energy efficient pump Includes cast iron pre-connected assembly for fast installation. Actuator SM 4.6, 2 x ball valves DN 32. Pump U 80A-32 with insulation, 180 mm, DN 32	PL2035	668.00	41	I18
 **Accumulator loading valve Y2** three-way mixing valve DN 32. ID DN 32. Rotation time 150 seconds, SM 4 servo motor, 230 V	PL2047	138.00		I18
 **Boiler safety module** Combined pressure gauge, autovent, pressure relief, with two part insulation. DN25, up to 50 kW	PL2001	48.00		I31
 **Thermal safety device** DN 20 file pocket and water connections	PL2000	68.00		
 **Expansion vessel** 400 litre. Sized to suit boiler/accumulator	EV4709	475.00		I16
 **Accumulator** 3,000 litres. Complete with stratification column and snorkels Minimum for use with soft wood	TS4805	2,639.00		I5
 **Accumulator temperature gauges** Minimum 4 recommended	PL2016	24.00		I31

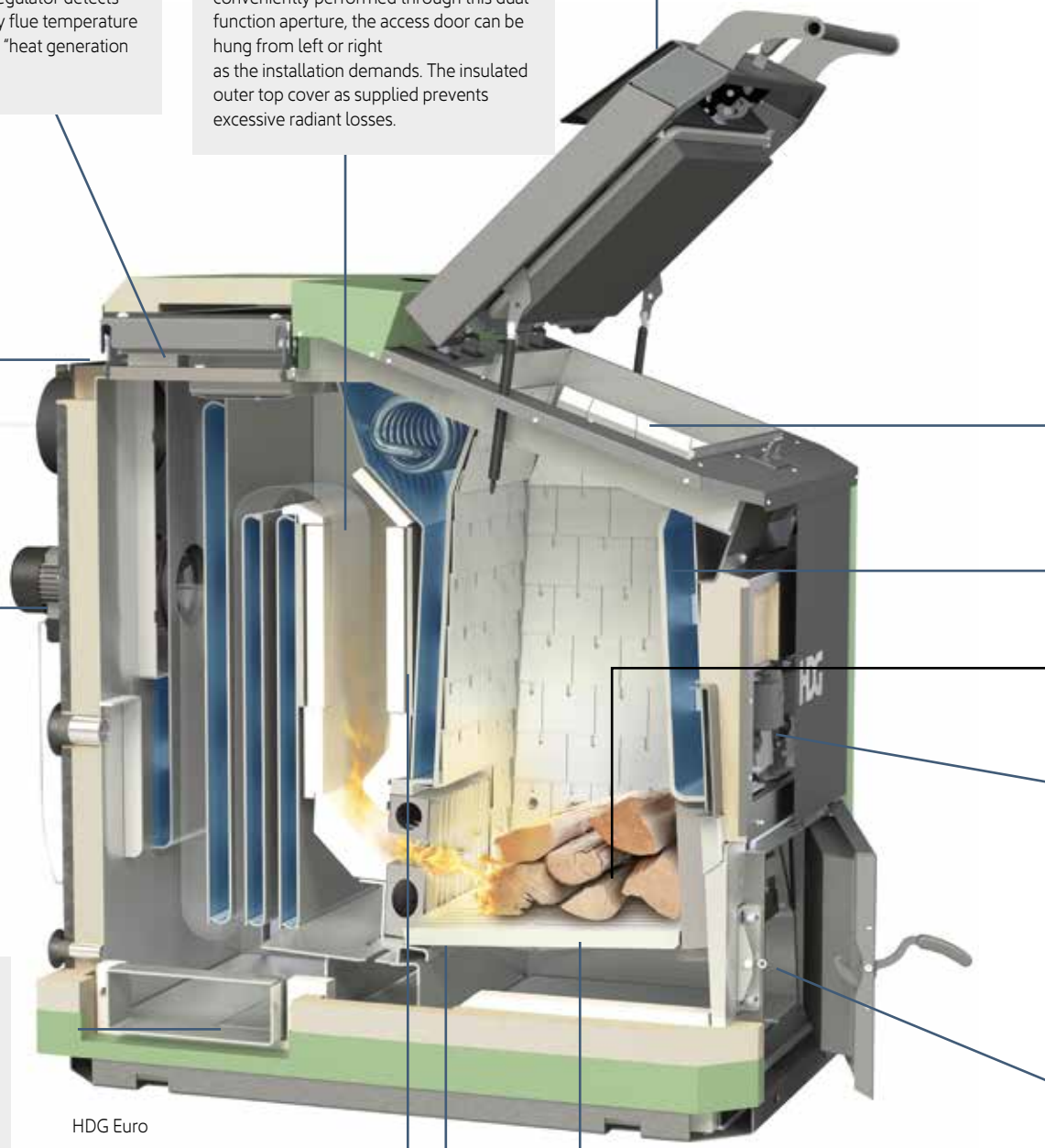
Euro operational principles

Wood gasification boiler with lateral bottom combustion

The **flue gas temperature sensor** provides the reference variable for the necessary primary air and defines the power of the boiler. The regulator detects when the boiler reaches the necessary flue temperature during heating up and switches it in to "heat generation on" mode.

Heat exchanger external access, simple maintenance operations can be conveniently performed through this dual function aperture, the access door can be hung from left or right as the installation demands. The insulated outer top cover as supplied prevents excessive radiant losses.

The **Lambda sensor** measures the residual oxygen level after the burning process and it provides the reference variable for the right amount of secondary air. It provides the basis for environmentally friendly burning with low wood consumption and high efficiency. The Lambda sensor is installed in a protective tube with heat-resistant gasket and it is calibrated regularly by the control system. The Lambda sensor is therefore a reliable and long life combustion regulation solution.



HDG Euro

The **boiler fan** provides the correct pressure conditions within the combustion chamber for perfect combustion; the fan assembly is simply removable for servicing purposes, it is also protected from excessive temperature by the boiler controller.

Any settling fly ash created during combustion or cleaning is easily removed through either the left or right hand service access, the floor within the boiler is cast refractory brick. The access doors are insulated and simply removed.

In the **modular combustion chamber** the combustion gases generated in the fuelling chamber are burnt out by the addition of the secondary air. The modular secondary combustion chamber was developed for the HDG Euro. It compensates for the stresses cause by fluctuation in the temperature, this in turn guarantees long term durability.

The **burner nozzle** made of cast iron, pre-heats the secondary air, which in turn cools the burner nozzle. The burning gases generated in the fuelling chamber can exhaust through the special ribbed construction. Therefore, the HDG Euro is suitable for numerous firewood types. The special construction of the secondary air outputs provides optimum turbulence with the burning gases and ensures a clean burning process.

The **HDG Touch Control** is at the forefront of the entire control strategy for the touch controller range. Connected via MODBUS to boiler specific control modules it receives information from all sensors and controls outputs to all electrical components in the boilers. The result is a clear and concise interface which displays and controls all functions including the combustion, power regulation of motors, accumulator management and if installed heating distribution and solar thermal.
The standard 4.3" industrial quality touch screen is designed to work in boiler room conditions, in low light levels and a dusty environment, and can even be used while wearing gloves, unlike standard touch controls. An upgrade to 7" version with remote access is a option.

Scale lining: The HDG Euro can be equipped with a special lining welded into the fuelling chamber, fire resistant for long term use with chips, shavings, briquettes and carpentry waste or oak logs. The fuelling chamber width is reduced for this version to approximately 54 cm.

It is easy and ergonomically comfortable to fuel the boiler through the pneumatically supported fuelling chamber lid. The lid is equipped with safety interlock and latch for the best possible safety. The fuelling chamber lid forms the sealed closure of the fuelling chamber by means of the pre-tensioned stainless steel cassette with a fibreglass sealing strip.

The conically shaped fuelling chamber for the HDG Euro has a container capacity of 220 litres and is made of 10 mm quality boiler plate as a standard.
The firewood undergoes different temperature zones in the fuelling chamber. In the top area, the firewood is "pre-heated". The water trapped in the firewood is evaporated at a temperature of around 100°C. For an environmentally friendly burning, the firewood should be split and have a water content of less than 20% (wet scale basis). Wood contains volatile substances roughly 85% by weight, providing approximately 70% of heating energy. Firewood is degassed by the primary air at a temperature of about 600°C. The primary air is supplied to the boiler through twelve primary air openings in the bottom of the fuelling chamber area. The wood gas liberated in the loading chamber is burnt by the addition of the secondary air in the lateral secondary combustion chamber.

An **automatic ignition system** is an option for the HDG Euro. This makes wood heating more convenient, because the fuel chamber contents can be ignited automatically depending on setting and conditions chosen.

The **air flow regulator** unit with servo motors for the primary and secondary air ensure precise air volume regulation during the whole burning procedure. After the burn out process, the servo motors automatically close to reduce the cooling of the boiler. If the boiler is not heated up for seven days, the protection program ventilates the boiler by opening the servo motors periodically.

The **large size ash chamber** is located under the cast iron grate. The floor of the ash area is constructed of cast firebrick. The ash can be pulled out easily at the front into the ash pan. The insulated ash door has a fibre glass sealing strip and can be adjusted by the door handle.

The **fuelling chamber** is separated at the bottom by the high quality cast iron grate made from grey cast iron. The 42 kg solid, strutted and conical grate consists of three sections and can be removed one by one. The cleaning flap is also made of solid grey cast iron and is equipped with four adjustable air slides. By means of the adjustable grate lifting rails, the grate's height can be vertically adjusted for different fuel types.

Turbotec 50-60
General information

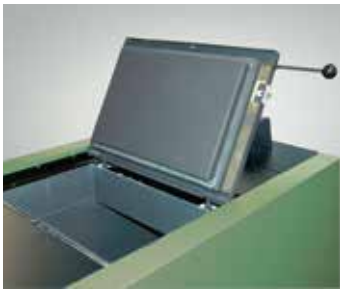
Turbotec with right side hinged fuelling and de-ashing doors, lambda control and optional top loading door.

Boiler
The HDG Turbotec 50-60 is a down firing gasification split log boiler, the standard fuel chamber is front loading, an additional top loading door is available. The large loading door measures 490 mm wide 340 mm high, with a fire chamber depth front to back of 1050 mm ideal for loading one metre split logs. The Turbotec has an enormous 340 litre fuel chamber volume.
The logs should be seasoned to 20% moisture content (wet scale). If wood is split immediately after felling it is a simple operation, it also dries very quickly if stored in a well ventilated area free from direct rain.
Removing the ash is a simple and clean process due to the large simple fit ash pan.
The recommended minimum accumulator size is 4000 litres.

HDG Turbotec Lambda Control 1 Plus
The latest generation Lambda controlled boiler gives 90% plus operational efficiency.
The HDG Lambda control 1 plus is a well established microprocessor controlled combustion and output regulation solution for the HDG Turbotec. This controller optimises combustion and minimises 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, in turn this means low fuel consumption and ensures that maximised annual efficiencies are achieved.
Loading the accumulator is also precisely managed, two three way mixing valves are used in conjunction with one another to achieve this control. When the boiler is first ignited water circulation is limited to the heat exchanger until the temperature has risen to 60°C, this is a precautionary measure to prevent corrosion within the boiler water jacket. At 60°C the first mixing valve gradually starts to open, allowing hot water to leave the closed loop and to start heating the top third of the accumulator. When the water within the boiler and the top third of the accumulator reaches 72°C the second mixing valve starts to open, this facilitates the loading the remaining two thirds. Accumulator loading management allows rapid access to high grade energy.

The Lambda 1 has a residual heat utilisation programme. When the temperature of the water within the accumulator falls 5°C below that of the water within the boiler, the pump is started, this process unloads the heat that was remaining within the boiler and makes it available for use in the building to be heated.

Integrated component protection
During dormant periods (summer) the component protection program is always operational, all electrical components are energised periodically, the Lambda sensor is heated, and the boiler is ventilated, pumps and mixing valves are energised, this process extends component life time and efficiency.
The visually clear menu system and display, gives current operating status, it also provides reload and reignite instruction ensuring simple operation.
There is also a data logging system that provides information for the service engineer and operator alike.



HDG construction
- Boiler body and heat exchanger: welded construction, tension rod reinforced 4-6 mm thick boiler plate
- Certified in accordance to the pressure equipment directive 97/23/EG boiler class 3 (the highest standard)
- RAL colours - Green (RAL 6011) Traffic grey (RAL 7043))
- Integral thermal heat discharge within the heat exchanger
- Secondary combustion chamber: Modular design, manufactured from cast refractory bricks

HDG safety features
- Heat exchanger thermal discharge
- Excess heat exchanger temperature protection.
  Two stage fuelling chamber access, for reload whilst in heat production

HDG standards and approvals
- Type tested to EN 303-5
- The Turbotec 50-60 qualifies for the Renewable Heat Incentive emission limits for total particulate matter and oxides of nitrogen 30g/GJ particulate matter and 150g/GJ NOx
- Approved for use in smokeless zones

Turbotec 50-60

Equipment prices and order codes

Boiler pricing		Order code	£ ex VAT	PG	Page
	HDG Turbotec 50 left side version	HDG1008	12,295.00	41	
	HDG Turbotec 50 right side version	HDG1007			
	HDG Turbotec 60 left side version	HDG1012			
	HDG Turbotec 60 right side version	HDG1011			
	HDG Turbotec 50 left side version with top fuelling door	HDG1010	12,925.00		
	HDG Turbotec 50 right side version with top fuelling door	HDG1009			
	HDG Turbotec 60 left side version with top fuelling door	HDG1014			
	HDG Turbotec 60 right side version with top fuelling door	HDG1013			

Mandatory control technology for HDG Turbotec.		Order code	£ ex VAT	PG	Page
	**HDG Lambda control 1 plus** Includes three sensors, boiler flow and return, plus accumulator	HDG1114	1,855.00	41	H1

Accessories for HDG Lambda Control		Order code	£ ex VAT	PG	Page
	**BSB fuel loading quantity calculator accessory kit** Temperature sensors with measuring element, immersion sleeves DN 15 8 meters silicone cable	HDG1116	215.00	41	
	**Immersion sensor accessory kit** Can be used for systems with oil/gas boilers or with transfer pumps as examples, Immersion sensor, 8 meters silicone cable, measuring element	HDG1117	45.00		A28
	**Outside temperature sensor accessory kit** (Only needed for fuel calculation BSB accessory kit system) Measuring element, housing protection class IP 65, screws and dowels	HDG1118	65.00		

System and hydraulic components		Order code	£ ex VAT	PG	Page
	**Return temperature kit** U 80A-32 energy efficient pump Includes cast iron pre-connected assembly for fast installation. Actuator SM 4.6, 2 x ball valves DN 32. Pump U 80A-32 with insulation, 180 mm, DN 32	PL2035	668.00	41	I18
	**Accumulator loading valve** Y2, three-way mixing valve DN 32. ID DN 32. Rotation time 150 seconds, SM 4 servo motor, 230 V	PL2047	138.00		I18
	Boiler safety module combined pressure gauge, autovent, pressure relief with two part insulation. DN25, up to 50 kW	PL2001	48.00		
	**Boiler safety module** combined pressure gauge, autovent, pressure relief with two part insulation. DN25, up to 100 kW	PL2002	78.00		I31
	**Thermal safety device** DN 20 file pocket and water connections	PL2000	68.00		
	**Expansion vessel** 500 litre. Sized to suit boiler/accumulator	EV4710	591.00		I16
	**Accumulator 4,000 litres** Complete with stratification column and snorkels Minimum for use with soft wood	TS4807	3,162.00		I5
	**Accumulator temperature gauges** Minimum 3 recommended	PL2016	24.00		I31

Turbotec operational principles

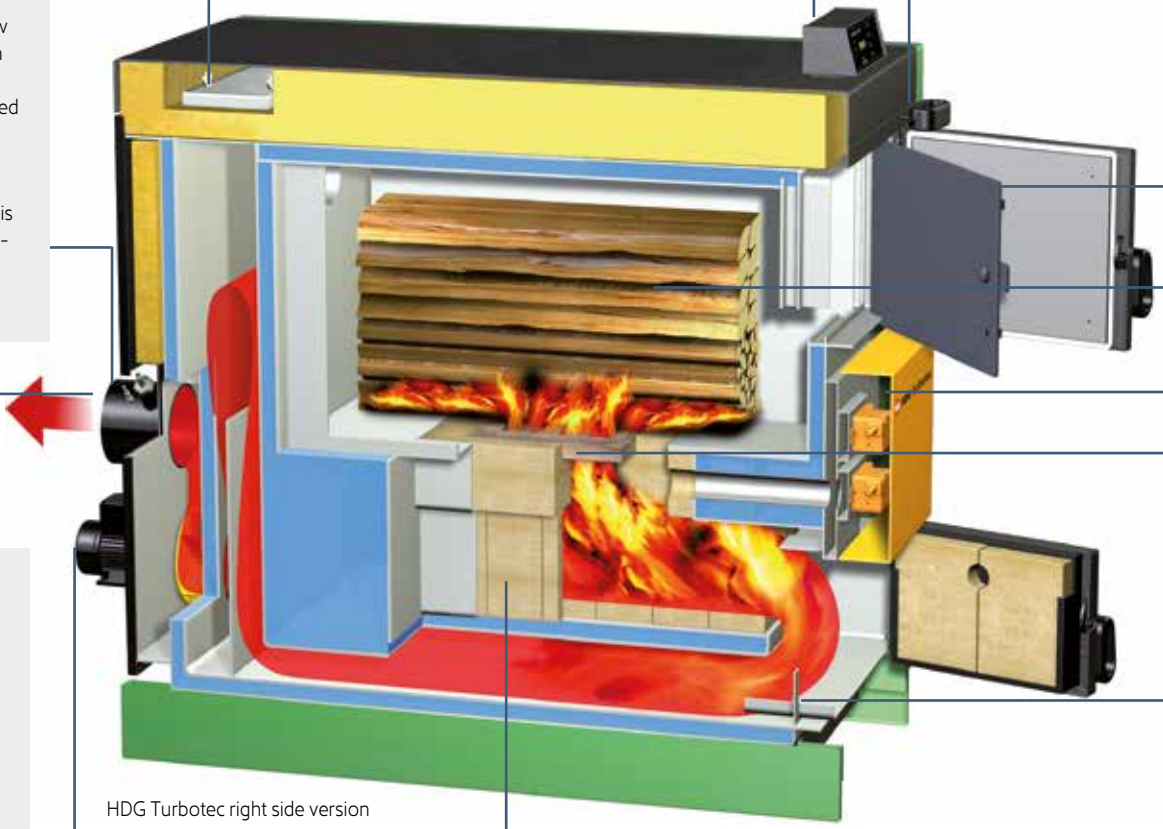
Wood gasification boiler with down-draught combustion technology

The **cleaning hatch** allows easy access to the heat exchanger area. The cleaning and maintenance operations can be performed comfortably from here. An additional outer cover with integrated insulation prevents excessive radiant losses.

The **HDG Lambda Control regulator** is located on the top of the boiler and operates as the "brain" of the modern wood gasification boiler system.

The **flue bypass gas flap** can be operated comfortably from the front. This integrated flap allows the boiler to be cleaned safely and re-loaded if necessary.

The **Lambda sensor** measures the residual oxygen level after the burning process and it provides the reference variable for the right amount of secondary air. It provides the basis for an environmentally friendly, low wood consumption and high efficiency burning process. The Lambda sensor is installed in a protective tube with heat-resistant gasket and it is calibrated via the control system. The Lambda sensor is therefore a reliable and long-life combustion regulation solution.



HDG Turbotec right side version

The **exhaust gas temperature sensor** provides the reference variable for the necessary primary air and defines the power of the boiler. The regulator detects when the boiler reaches the necessary flue temperature during heating up and switches it to "heat generation on" mode.

The **boiler fan** supports the necessary chimney draught and provides the required vacuum in the fuelling chamber. The removal and the cleaning is a clean and fast procedure. The high quality fan has a chamber cooler and it is protected by the controller against overheating.

The **modular secondary combustion chamber** is arranged directly under the fuelling chamber according to the operational principle of the down-draught combustion technology. The volatile gases generated are burnt by the addition of the secondary air. The secondary chamber developed for the HDG Turbotec consists of refractory insulation elements arranged above one the water ways . This protects the combustion chamber from excessive high temperatures.

The HDG Turbotec has a fuel chamber capacity of 340 litres. The fuel chamber wall consists of 6mm quality boiler steel, and the floor area of the fuelling chamber is water transferring.
The firewood undergoes different temperature zones in the fuelling chamber. In the top area, the firewood is "pre-heated". The water trapped in the firewood is evaporated at a temperature of around 100°C. For an environmentally friendly burning, the firewood should be split and have a water content of less than 20% (25% wood moisture). Wood contains volatile substances in roughly 85% by weight, providing approx. 70% of heating energy. Firewood is degassed by the primary air at a temperature of about 600°C.
The primary air is supplied to the boiler through a number of primary air openings in the bottom of the fuelling chamber area. Both primary air channels are accessible from the front through an inspection opening. The wood gas liberated in the fuelling chamber is burnt by the addition of the secondary air in the hot combustion chamber below (down-draught combustion technology).

The large-size **fuelling door** for easy fuelling of the boiler with one meter logs. A special cutout on the door neck allows the one meter logs to be dropped in the fuelling chamber easily. The fuel chamber hatch is coupled with an electronic door latch. The door can be opened only after the re-fuelling button on the controller has been pressed. The fuel chamber door opening direction must be chosen at the time of the order. Figure shows the right-side version.

The **air flow regulator** unit with servo motors for the primary and secondary air ensures exact air volume regulation during the whole burning procedure. The combustion air is pre-heated under the actuator housing and this optimises the burning process, too. After the burn-down process, the servo motors automatically close to reduce the cooling of the boiler. If the boiler is not used for seven days, the protection program ventilates the boiler by opening the servo motors periodically.

The **air-cooled burner nozzle** made of cast iron provides the upper closure of the built-in nozzle brick. The cast iron burner nozzle is ventilated from below by the pre-heated secondary air and ensures a good mixture of the burning gas and the secondary air. The burner nozzle is also protected from overheating by the secondary air.

The large size **ash chamber** for the fly ash is located under the combustion chamber. The heat exchanger extends under the ash chamber to ensure maximum heat absorption. The fly ash can be pulled out easily at the front into the ash pan and the insulated, air-cooled ash door with inspection glass prevents excessive radiation losses. The opening direction of the ash door matches that of the fuelling door.

The optional **upper fuelling hatch** enables the easy fuelling of wood waste. The lid is coupled with an electronic door latch. It can only be opened the re-fuelling button on the regulator has been pressed.

R15 kit

Equipment prices and order codes

HDG R15	Order code	£ ex VAT
HDG R15 kit	TP1001	7,374.00

Includes:
Return temperature control, boiler safety module, thermal safety device, flue starter kit and stand, draught stabiliser, bi metallic temperature gauges, 150 litre expansion vessel, nickel cap valve and 1,000 litre accumulator

Also included free of charge
Purpose designed wall mounted record keeping and service equipment centre

Options
The **Solar Thermal Pack** comes complete and ready to install excluding pipework. The installation is straight forward and offers the benefit of free energy during the summer. Suitable hot water cylinder with thermal solar coil required.

Uniko Solar Thermal Pack	Order code	£ ex VAT	PG
Solar controller Solar controller for Biomass boiler without integrated solar control	ST2039	244.00	24
Uniko Biomass Package - 4.04m² gross area, 2 uniko flat plate collectors, pump station, 24 litre expansion vessel, connection kit, sensor, mixing thermostat, glycol (20 litres)	ST3001	1,938.00	

Mounting options

On-roof, parallel

Flat roof, 45

In-roof mounting

R20-25-30 kit

Equipment prices and order codes

HDG R20/25/30	Order code	£ ex VAT
HDG R20 kit	TP1002	8,681.00
HDG R25 kit	TP1003	
HDG R30 kit	TP1004	

Includes:
Return temperature control, boiler safety module, thermal safety device, flue starter kit and stand, draught stabiliser, bi metallic temperature gauges, 200 litre expansion vessel, nickel cap valve and 1500 litre accumulator

Also included free of charge
Purpose designed wall mounted record keeping and service equipment centre

Options
The **Solar Thermal Pack** comes complete and ready to install excluding pipework. The installation is straight forward and offers the benefit of free energy during the summer. Suitable hot water cylinder with thermal solar coil required.

Uniko Solar Thermal Pack	Order code	£ ex VAT	PG
Solar controller Solar controller for Biomass boiler without integrated solar control	ST2039	244.00	24
Uniko Biomass Package - 4.04m² gross area, 2 uniko flat plate collectors, pump station, 24 litre expansion vessel, connection kit, sensor, mixing thermostat, glycol (20 litres)	ST3001	1,938.00	

Mounting options

On-roof, parallel

Flat roof, 45

In-roof mounting

Please note:
* Prices are an indication of the minimum required equipment.
** Expansion vessels are sized for accumulator and boiler requirements. Increased capacity maybe required depending on system volume.
Prices do not include: Design services, commissioning services or installation. Delivery which will be advised by your installing company.

TDA Thermodual.HV 25-30 kit comparisions

Equipment prices and order codes

TDA.HV Thermodual	Order code	£ ex VAT
TDA Thermodual.HV 25 wood log boiler kit	TP1155	12,148.00
TDA Thermodual.HV 30 wood log boiler kit	TP1156	

Includes:
Control console, return temperature control kit, layering valve, boiler safety module, pressure switch, thermal safety device, draught stabiliser,
flue starter kit and stand, bi-metallic temperature gauges, 2,000 litre accumulator, nickel cap valve and 250 litre expansion vessel

The above boilers come with:
5 year SHT warranty• See page M11 for full details

Also included free of charge
Purpose designed wall mounted record keeping and service equipment centre

Options

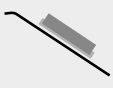
The benefits of installing a **Heating and Hot Water Pack with Weather Compensator** are many, least of all it can significantly improve the efficiency of the heating system.
An additional sensor, mounted outside your property constantly monitors the outside temperature. The boiler is then able to adjust its heating flow temperature in relation to the outside temperature. Altering the temperature in the heating system according to the outside temperature, improves the efficiency of the heating system, reducing energy usage by as much as 20% and giving you a more comfortable environment whatever the weather.

The **Solar Thermal Pack** comes complete and ready to install excluding pipework. The installation is straight forward and offers the benefit of free energy during the summer.Ideal as a top up on shorter days.

Heating and Hot Water Pack - Weather Compensated	Order code	£ ex VAT
PNA Thermocomfort weather compensated pump station set **Includes:** Temperature controlled mixed pump station type T08, unmixed pump station, starter and extension distributors, flow sensor, immersion sensor, intelligent room thermostat	TP2005	653.00

Uniko Solar Thermal Pack	Order code	£ ex VAT	PG
Uniko Biomass Package - 4.04m² gross area, 2 Uniko flat plate collectors, pump station, 24 litre expansion vessel, connection kit, sensor, mixing thermostat, glycol (20 litres)	ST3001	1,938.00	24

Mounting options



On-roof, parallel

Flat roof, 45

In-roof mounting

TDA Thermodual.HV 35-40 kit comparisions

Equipment prices and order codes

TDA.HV Thermodual	Order code	£ ex VAT
TDA Thermodual.HV 35 wood log boiler kit	TP1157	12,881.00
TDA Thermodual.HV 40 wood log boiler kit	TP1158	

Includes:
Control console, return temperature control kit, layering valve, boiler safety module, pressure switch, thermal safety device, draught stabiliser,
flue starter kit and stand, bi-metallic temperature gauges, 2,000 litre accumulator, nickel cap valve and 250 litre expansion vessel

The above boilers come with:
5 year SHT warranty • See page M11 for full details

Also included free of charge
Purpose designed wall mounted record keeping and service equipment centre

Options

The benefits of installing a **Heating and Hot Water Pack with Weather Compensator** are many, least of all it can significantly improve the efficiency of the heating system.
An additional sensor, mounted outside your property constantly monitors the outside temperature. The boiler is then able to adjust its heating flow temperature in relation to the outside temperature. Altering the temperature in the heating system according to the outside temperature, improves the efficiency of the heating system, reducing energy usage by as much as 20% and giving you a more comfortable environment whatever the weather.

The **Solar Thermal Pack** comes complete and ready to install excluding pipework. The installation is straight forward and offers the benefit of free energy during the summer.Ideal as a top up on shorter days.

Heating and Hot Water Pack - Weather Compensated	Order code	£ ex VAT
PNA Thermocomfort weather compensated pump station set **Includes:** Temperature controlled mixed pump station type T08, unmixed pump station, starter and extension distributors, flow sensor, immersion sensor, intelligent room thermostat	TP2005	653.00

Uniko Solar Thermal Pack	Order code	£ ex VAT	PG
Uniko Biomass Package - 4.04m² gross area, 2 Uniko flat plate collectors, pump station, 24 litre expansion vessel, connection kit, sensor, mixing thermostat, glycol (20 litres)	ST3001	1,938.00	24

Mounting options

On-roof, parallel

Flat roof, 45

In-roof mounting

F Series 20-25-30 kit comparisons

Equipment prices and order codes

HDG F Series 20/25/30	Order code	£ ex VAT
HDG F Series 20 Kit with 4.3" touch screen	TP1005	12,512.00
HDG F Series 25 Kit with 4.3" touch screen	TP1006	
HDG F Series 30 Kit with 4.3" touch screen	TP1007	

The above boilers include:
HDG Touch Screen, return temperature control, three way mixing valve for Y2 loading, pressure switch, boiler safety module, thermal safety device, flue starter kit and stand, draught stabiliser, bi metallic temp gauges, 250 litre expansion vessel, 2000 litre accumulator

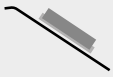
The HDG F Series boilers come with:
A full 10 year HDG warranty • See page M12 for full details

Also included free of charge
Purpose designed wall mounted record keeping and service equipment centre

Options
The **Solar Thermal Pack** comes complete and ready to install excluding pipework. The installation is straight forward and offers the benefit of free energy during the summer. Suitable hot water cylinder with thermal solar coil required.

Uniko Solar Thermal Pack	Order code	£ ex VAT	PG
Uniko Biomass Package - 4.04m² gross area, 2 Uniko flat plate collectors, pump station, 24 litre expansion vessel, connection kit, sensor, mixing thermostat, glycol (20 litres)	ST3001	1,938.00	24

Mounting options



On-roof, parallel

Flat roof, 45

In-roof mounting

F Series 40-45-50 kit comparisons

Equipment prices and order codes

HDG F Series 40/50	Order code	£ ex VAT
HDG F Series 40 Kit with 300 litre expansion vessel and 2,500 litre accumulator with 4.3" touch screen	TP1008	14,140.00
HDG F Series 45 Kit with 300 litre expansion vessel and 2,500 litre accumulator with 4.3" touch screen	TP1009	14,140.00
HDG F Series 50 Kit with 400 litre expansion vessel and 3,000 litre accumulator with 4.3" touch screen	TP1010	14,689.00

The above boilers include:
HDG Touch Screen,, return temperature control, three way mixing valve for Y2 loading, pressure switch, boiler safety module, thermal safety device, flue starter kit and stand, draught stabiliser, bi metallic temp gauges, expansion vessel and accumulator

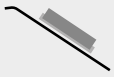
The HDG F Series boilers come with:
A full 10 year HDG warranty • See page M12 for full details

Also included free of charge
Purpose designed wall mounted record keeping and service equipment centre

Options
The **Solar Thermal Pack** comes complete and ready to install excluding pipework. The installation is straight forward and offers the benefit of free energy during the summer. Suitable hot water cylinder with thermal solar coil required.

Uniko Solar Thermal Pack	Order code	£ ex VAT	PG
Uniko Biomass Package - 4.04m² gross area, 2 Uniko flat plate collectors, pump station, 24 litre expansion vessel, connection kit, sensor, mixing thermostat, glycol (20 litres)	ST3001	1,938.00	24

Mounting options



On-roof, parallel

Flat roof, 45

In-roof mounting

Euro 30-40-45-50 kit comparisons

Equipment prices and order codes

HDG Euro 20/25/30	Order code	£ ex VAT
HDG Euro 30 kit with 4.3" touch screen	TP1012	16,272.00
HDG Euro 40 kit with 4.3" touch screen	TP1013	
HDG Euro 45 kit with 4.3" touch screen	TP1014	
HDG Euro 50 kit with 4.3" touch screen	TP1015	

Includes:
HDG Touch Screen, return temperature control, three way mixing valve for Y2 loading, boiler safety module, pressure switch, thermal safety device, flue starter kit and stand, draught stabiliser, bi metallic temperature gauges, 400 litre expansion vessel, nickel cap valve and 3000 litre accumulator

The above boilers come with:
A full 10 year HDG warranty • See page M12 for full details

Also included free of charge
Purpose designed wall mounted record keeping and service equipment centre

Options
The **Solar Thermal Pack** comes complete and ready to install excluding pipework. The installation is straight forward and offers the benefit of free energy during the summer. Suitable hot water cylinder with thermal solar coil required.

Uniko Solar Thermal Pack	Order code	£ ex VAT	PG
Uniko Biomass Package - 4.04m² gross area, 2 Uniko flat plate collectors, pump station, 24 litre expansion vessel, connection kit, sensor, mixing thermostat, glycol (20 litres)	ST3001	1,938.00	24

Mounting options

On-roof, parallel

Flat roof, 45

In-roof mounting

Turbotec 50-60 kit comparisons

Equipment prices and order codes

HDG Turbotec 50/60	Order code	£ ex VAT
HDG Turbotec 50 Left hand kit	TP1016	19,492.00
HDG Turbotec 50 right hand kit	TP1017	
HDG Turbotec 50 left hand with filling hatch kit	TP1018	20,122.00
HDG Turbotec 50 right hand with filling hatch kit	TP1019	
HDG Turbotec 60 left hand kit	TP1020	19,492.00
HDG Turbotec 60 right hand kit	TP1021	
HDG Turbotec 60 left hand kit with filling hatch	TP1022	20,122.00
HDG Turbotec 60 right hand kit with filling hatch	TP1023	

Includes:
HDG Touch Screen, return temperature control, three way mixing valve for Y2 loading, boiler safety module, thermal safety device, pressure switch,
single wall flue starter kit and flue stand, draught stabiliser with saddle, bi metallic temperature gauges, nickel cap valve, 500 litre expansion vessel,
4,000 litre accumulator

Also included free of charge
Purpose designed wall mounted record keeping and service equipment centre

Options
The **Solar Thermal Pack** comes complete and ready to install excluding pipework. The installation is straight forward and offers the benefit of free energy during the summer. Suitable hot water cylinder with thermal solar coil required.

Uniko Solar Thermal Pack	Order code	£ ex VAT	PG
Uniko Biomass Package - 4.04m² gross area, 2 Uniko flat plate collectors, pump station, 24 litre expansion vessel, connection kit, sensor, mixing thermostat, glycol (20 litres)	ST3001	1,938.00	24

Mounting options

On-roof, parallel

Flat roof, 45

In-roof mounting