



HEATING WITH
WOOD CHIPS, SHAVINGS AND PELLETS

HDG Compact

100 - 200 kW



40
year HDG

“With wood chips, I’ve got the heating costs for my inn under control!”



The First Competence Center of the company Unterreiner in the Lower Bavarian book is heated by a HDG Compact 150.

From boilers tailored to your needs to completely professional service – you will find everything you need for a modern wood heating system at HDG

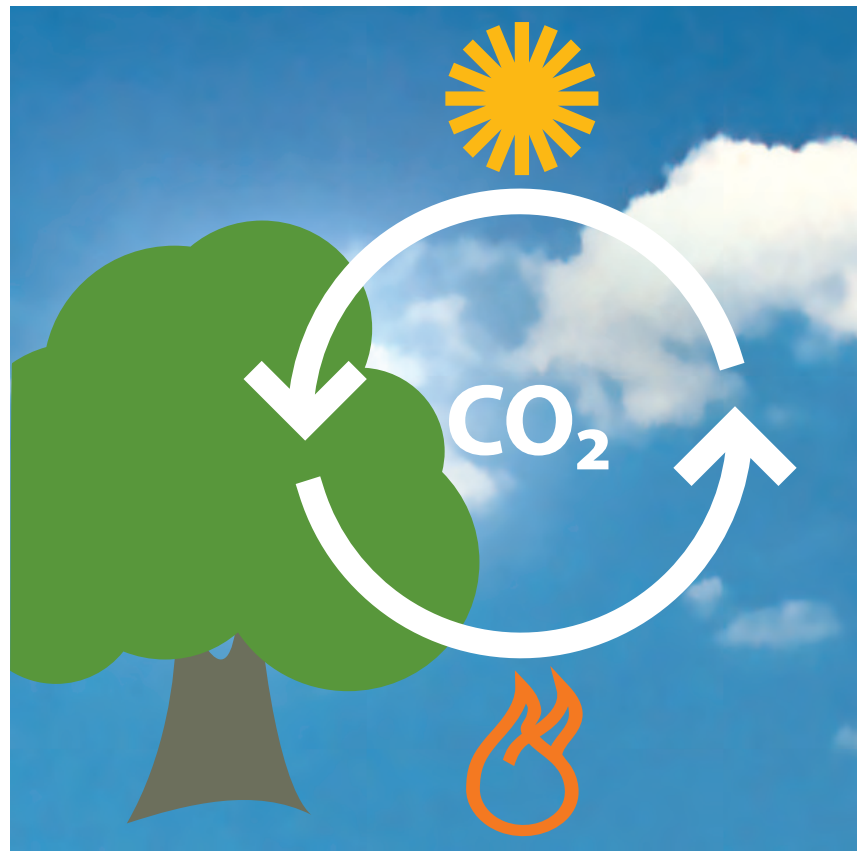
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Ecologically sound ...

Heating with wood: it makes sense for nature and mankind.

Those who consider the impact of their actions on nature are acting to help future generations. Functional natural lifecycle systems are a prerequisite for life on earth. The increasing number of catastrophes due to storms and floods gives an ideal of how expensive a disregard of nature can be to us.

Wood is stored solar energy and when heating with wood the same amount of CO₂ is released that the tree removed from the atmosphere while growing. Heating with wood is therefore at one with nature. Burning oil or gas on the other hand releases CO₂ reserves into the atmosphere which were formed millions of years ago.



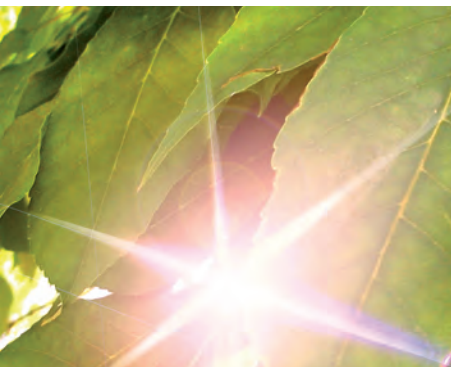
An even balance When burning plant matter, just as when it rots, it releases exactly the same amount of CO₂ as it takes in while growing.

This CO₂ is one of the causes of the greenhouse effect – a problem for which mankind must take responsibility.

Heating with wood has many other advantages:

- Short transport routes
- Independence and reliable supplies
- Safe storage and unhazardous transport
- Employment and commerce in countryside areas
- Harvesting and preparation requires little energy

Therefore it makes sense (both for nature and mankind) to opt for the renewable energy source wood.



... and economical.

Keep your energy costs under control with wood.

Fossil fuel energy will inevitably become more expensive in future. The prices of fossil fuels have already increased in unpredictable leaps.

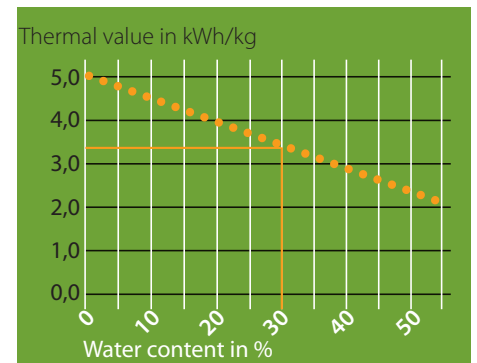
This situation is not set to improve in the medium-term, the increasing consumption in countries such as China or India will increase the demand for oil and gas.

Compared with other fossil fuels, the price of wood is very stable. With wood, you're heating on the safe side.

Make the most of wood's potential.

The operators of a wood heating system can influence the efficiency and pollution output of the system considerably.

Waste wood or dirty, decaying and very wet wood requires a lot of energy to dry and can therefore only give off less heat. It also shortens the service life of the boiler. Your boiler only attains its maximum heating power – the nominal power – and minimum emissions with dry material.



Heating values of wood in kWh/kg depending on water content

Useful information on heating with shavings and chippings

Comparison of water content and wood moisture

Water content (w)	50%	40%	30%	20%
Wood moisture (u)	100%	65%	45%	25%

Conversion factors

- 1 Srm wood chips = approx. 65-75 litres heating oil
- 1 Srm wood chips = bulk density 210-250 kg/m³
- 1 kg wood chips = approx. 3.4 kWh (at 30% water content)
- 1 Rm wood (stere) = approx. 2.0 Srm wood chips
- 1 Fm wood = approx. 2.8 Srm wood chips

Explanations and abbreviations of cubic measures:

- 1 Srm = fill volume unit, corresponds to 1 m³ wood (poured)
- 1 Rm = stacked cubic meter (stere), corresponds to 1 m³ wood (stacked)
- 1 Fm = 1 solid cubic metre (without intermediate spaces)

Sources:
Energy information centre, Stuttgart;
Wood sales promotion fund, Bonn
Bavarian regional office for agriculture and forestry



An automatic heating system. Economical and versatile for high output requirements

It is not only the degree of boiler efficiency and level of emissions 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 HDG.

The HDG Compact heating system impresses with its:

- Excellent efficiency levels
- Exemplary low emissions
- Unique combustion technology with patented stepping grate
- Comprehensive safety technology
- Solid manufacturing and durability
- Low wood consumption
- Ease of operation

Fuel storage



Planning the storage design

Delivery and feeding



There are many possibilities for fuel storage and delivery: HDG offers numerous variants which you can use to plan and implement the best solution.

> More on pages 10-15



Our service:

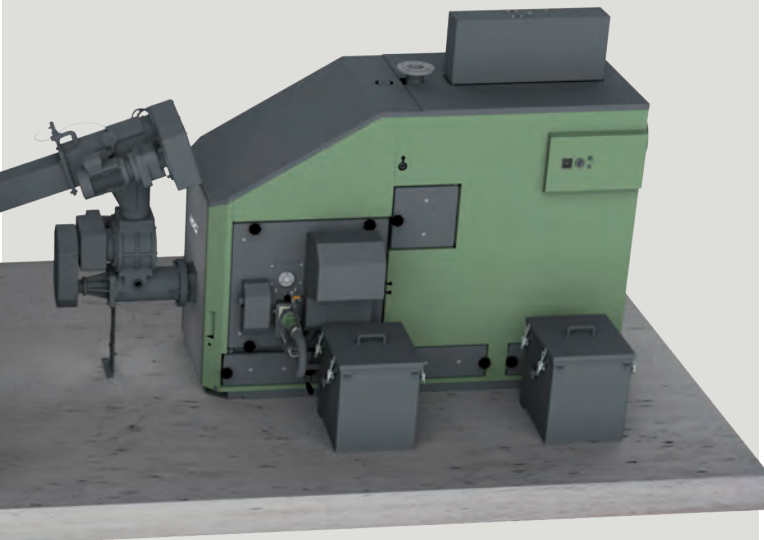
With a CAD plan we can show you the optimum set-up for your HDG heating system – adapted to your personal wishes. > More on page 10

The HDG Compact heating system



Boiler

Control system



The degree to which your heating system functions safely and without problems is decided here: The HDG Compact is first-rate in terms of safety and technology.

Optimum combustion and boiler output depend on many factors: The PLC control of the HDG Compact optimally regulates all components.

> More on pages 6-9

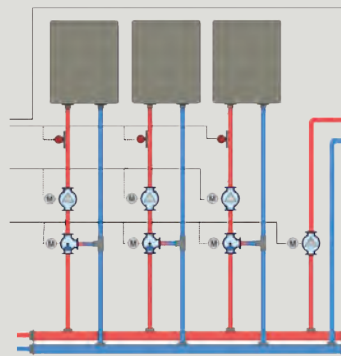
> More on pages 16-19

The complete system



HDG system components

HDG remote control



A heating system is well designed if the valuable energy is available at the right place at the right time: HDG system components leave nothing to be desired in terms of energy and heat management.

Oversee your heating system without having to be on-site. HDG remote maintenance systems enable system access even over great distances.

> More on page 19



HDG Compact

Powerful and reliable

The HDG Compact is our automatic wood heating system for burning wood chips, shavings and pellets for outputs of 100 to 190 kW. This makes it particularly suitable for use in agriculture and forestry, commercial businesses, shared heating systems, hotels and larger buildings.

Fuel*:

- Wood chips
- Shavings
- Pellets

Output:

100, 105, 115, 150, 200 kW

- ✓ **Suitable for wood chips (up to 65% wood moisture, medium chips of 3 to 5 cm = max. G50 / P45S), shavings and pellets**
- ✓ **Patented back-burning protection with rotary feeder**
- ✓ **Highly convenient with automatic cleaning and ash removal**
- ✓ **High quality combustion technology with air-cooled, moving stepping grate**

*) No painted, varnished and coated wood, plywood, chipboard, fibre-board or otherwise bonded wood including remains thereof (without organic halogen compounds, without wood protection agents)

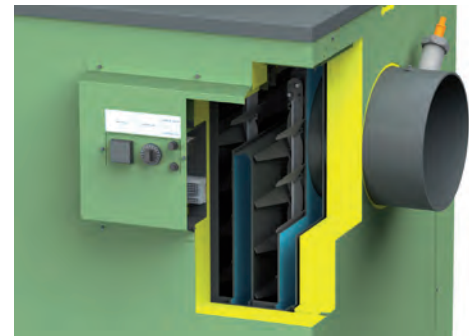


Awarded with

Federal Innovations Prize



The "Wilderness House" in the Bavarian Forest National Park heats with the HDG Compact 200



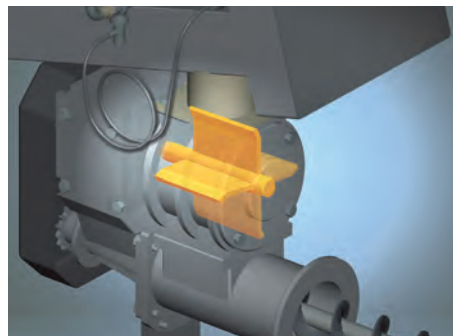
The cleaning of the heat exchanger surfaces is done simply and automatically with the aid of the cleaning turbulators.

Innovative combustion and control technology

The HDG Compact has innovative combustion and control technology which makes heating not only convenient but also highly economical with low emissions. The high quality combustion technology with air-cooled, moving stepping grate enables constant output even with different fuels.

Automatic cleaning

Vertical heat exchanger surfaces and an effective self-cleaning design, combined with cleaning turbulators which are fitted as standard, ensure maximum heat transfer. The turbulators are moved during cleaning, thus freeing the surfaces of the heat exchanger from fly ash.



The feed system – safe and energy-saving

In conjunction with a water extinguisher, feeding via our patented rotary feeder with stoker auger guarantees you the utmost in operating safety (tested by the Institute for Fire Protection Technology and Safety Research, Linz, Austria).

An automatic reversing mechanism ensures, as far as possible, continuous operation in the unlikely event of jamming. The combustion chamber is hermetically separated from the silo and transport unit by means of the rotary feeder (patented back-burning protection).



The HDG ash removal system

The HDG Compact is equipped with external ash containers in which the ash is compressed. This extends the intervals at which the system requires emptying. Ash removal augers transport the ash into the containers, which are fastened to the boiler with simple latch locks.

Maximum convenience

The compact heating system from HDG – specialists in heating with wood for over 35 years – is delivered ready for connection. For even more convenience, at your request we can enhance your HDG Compact with a reliable remote control function. That's what we call convenient heating with wood.



HDG Compact

Cross section

Safety heat exchanger

Hot gas temperature sensor

Water extinguisher

Automatic cleaning of the heat exchanger surfaces

Lambda-probe

Back-burning protection with rotary feeder

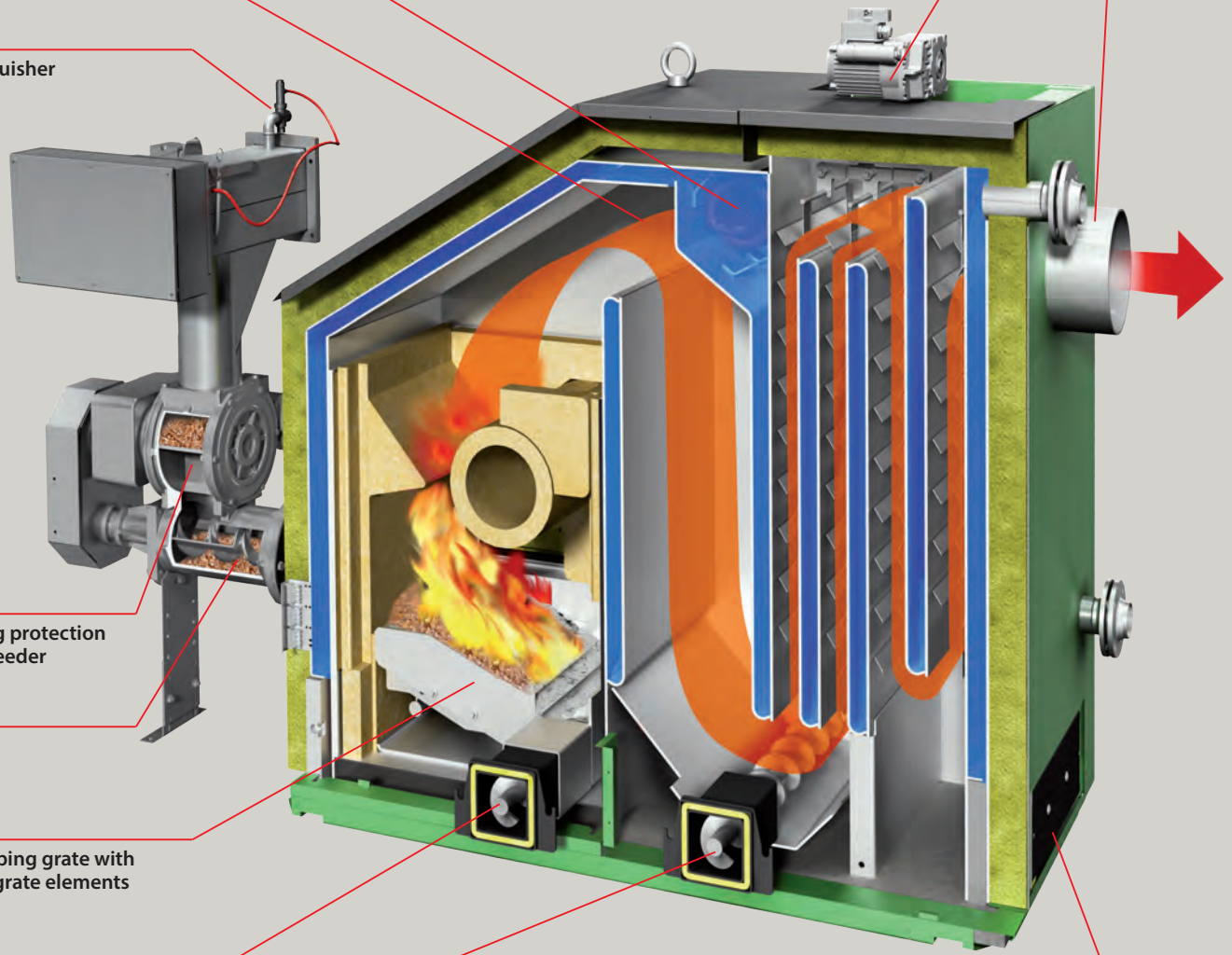
Stoker auger

Moving stepping grate with replaceable grate elements

Ash removal auger for grate ash

Ash removal auger for fly ash

Cleaning hatch



Control system

The HDG Compact is equipped with a comprehensive control system to enable constant operation, even in changing circumstances.

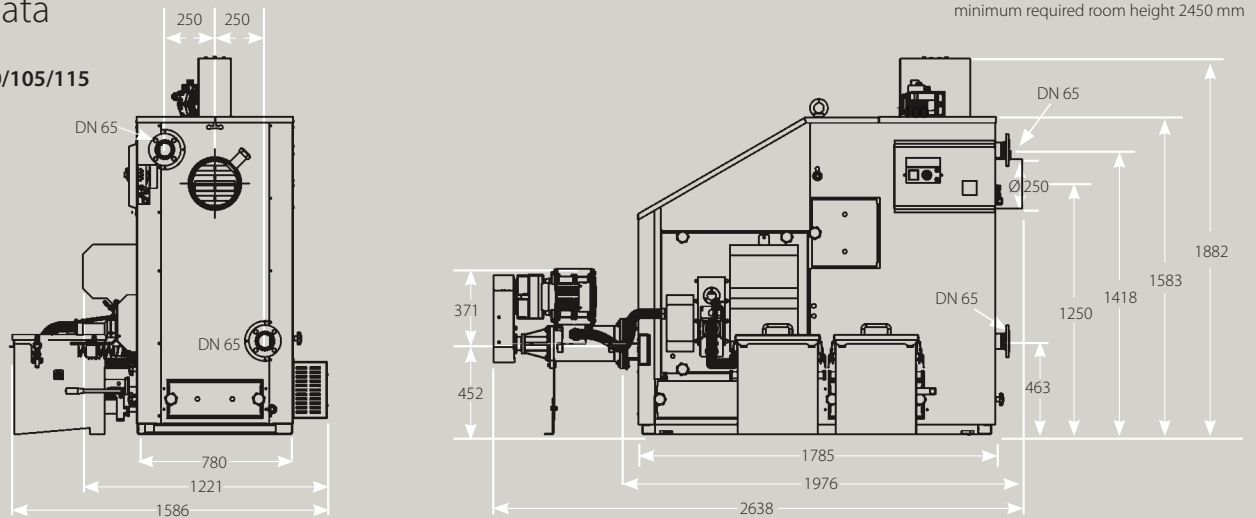
You can find more detailed information on this on pages 18-19.

Delivered ready for connection

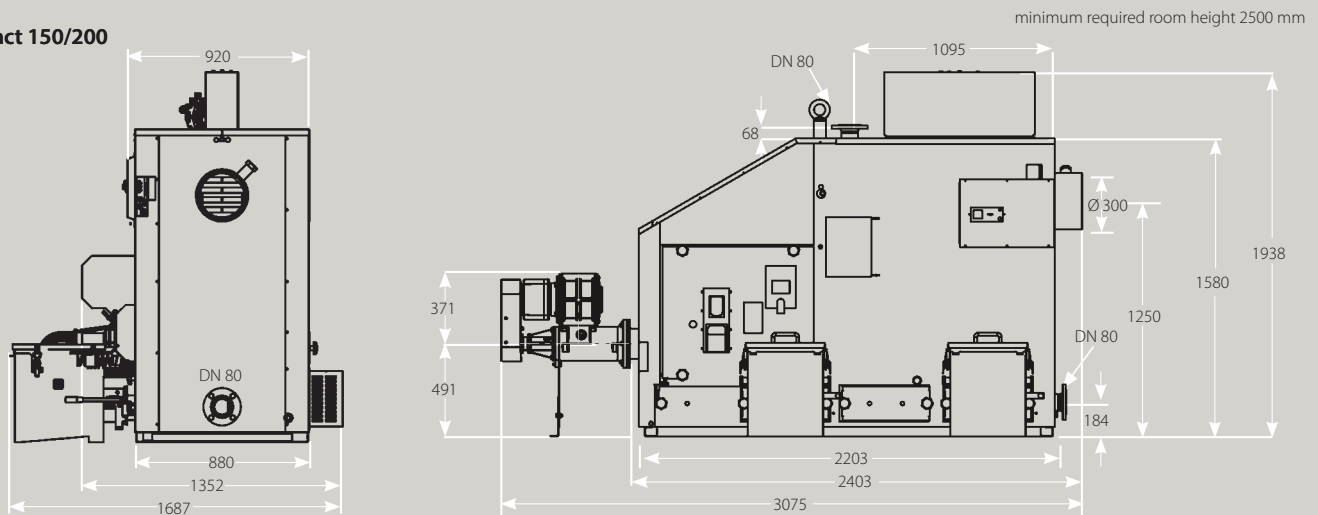
The HDG Compact is delivered pre-assembled. This means it can be set-up, installed and commissioned quickly and easily.

Technical data

HDG Compact 100/105/115



HDG Compact 150/200



HDG Compact

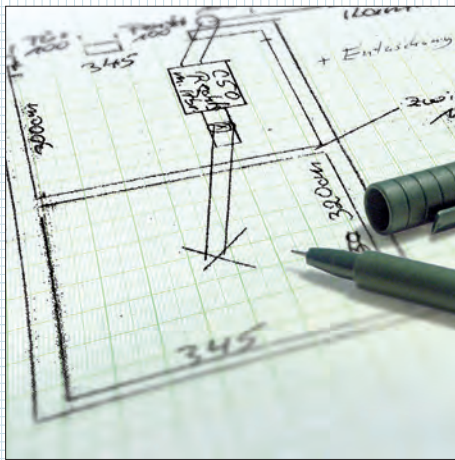
	100	105	115	150	200
	wood chips/pellet	wood chips/pellet	wood chips/pellet	wood chips/pellet	wood chips/pellet
Nominal thermal power	100 kW	105 kW	115 kW	150 kW	199/200 kW
Minimum thermal power	30 kW	31,5 kW	34,5 kW	45 kW	60 kW
Water capacity	210 l	210 l	225 l	450 l	450 l
Operating pressure	3 bar	3 bar	3 bar	3 bar	3 bar
Flue draught requirement	20/10* Pa	20/10* Pa	20/10* Pa	20/13* Pa	20/15* Pa
Flow temperature	95°C	95°C	95°C	95°C	95°C
Weight	1540 kg	1540 kg	1585 kg	2140 kg	2220 kg

* Combined with flue gas cyclone and flue gas fan

We will plan the best solution for you

You can save unnecessary costs and work with intelligent planning of fuel storage and delivery. We have gleaned the requisite experience from making hundreds of different systems and we can also offer the best solution for tricky situations.

We will use this information to draw up a CAD plan for the installation of a complete heating system – tailored to your personal wishes.



Optimum adjustment to different circumstances

Which storage type is suitable for which fuel, which spacial prerequisites must be present (or created), what is the simplest method of fuel delivery, how is the fuel to be transported to the boiler, what is the best location to install the boiler – we have expert answers for all these questions.

However, as no two situations are ever exactly the same, our employees will be happy to give you the benefit of their many years of experience.



Example: Bunker in a separate building, connected using conveyor worm and downpipe



Example: pellet bunker in cellar with blower system

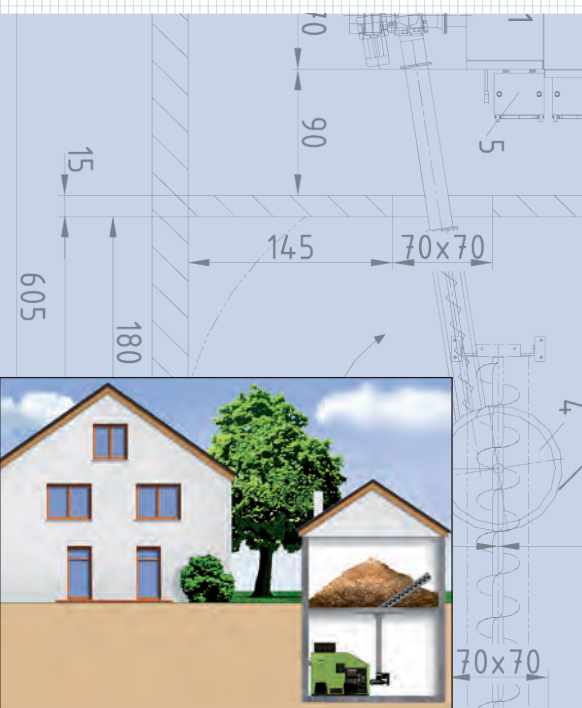


"St. Michael's Church" in Leipzig heats using two HDG Compact 100 units





"Charity shops" in Obermühl (Raubling) heat with the HDG Compact 200



Example: fuel transport from a remote bunker using two conveyor augers

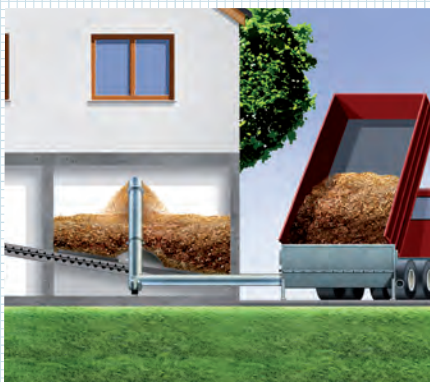


Example: walking floor feeding system with filling via a load-bearing ceiling

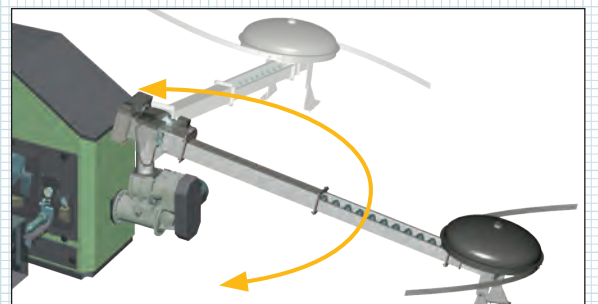
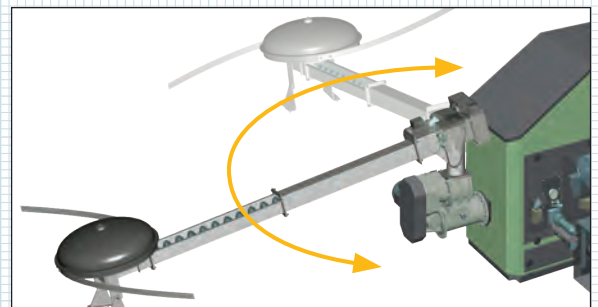


Example: silo delivery from a chip silo using a silo feeding system

The HDG chip shifter (HES) is used to load chip stores where access or loading to the optimum height is difficult. The large trough is loaded by a tipping trailer or front loader, augers then convey the chip to the store at a rate of up to 60m³/hr.



The HDG Compact is available with the feed module fitted on the left or right. The connection point between the delivery system and boiler is only fixed in place during on-site installation. This means that the HDG Compact can be integrated in nearly every building.



HDG fuel feeding

Where the wood chips and pellets go

The most common delivery system version in combination with a HDG Compact 25-80 is a HDG flexi blade delivery system.

With a robust and flexible design, a reliable fuel supply is ensured at all times.

- Suitable for **wood chips** and **pellets**
- Ideal for use in **fuel stores with a diameter of 2.5 to 4.5 meters**
- Allows **filling heights of up to 3 meters** or 250 kg per cubic metre.

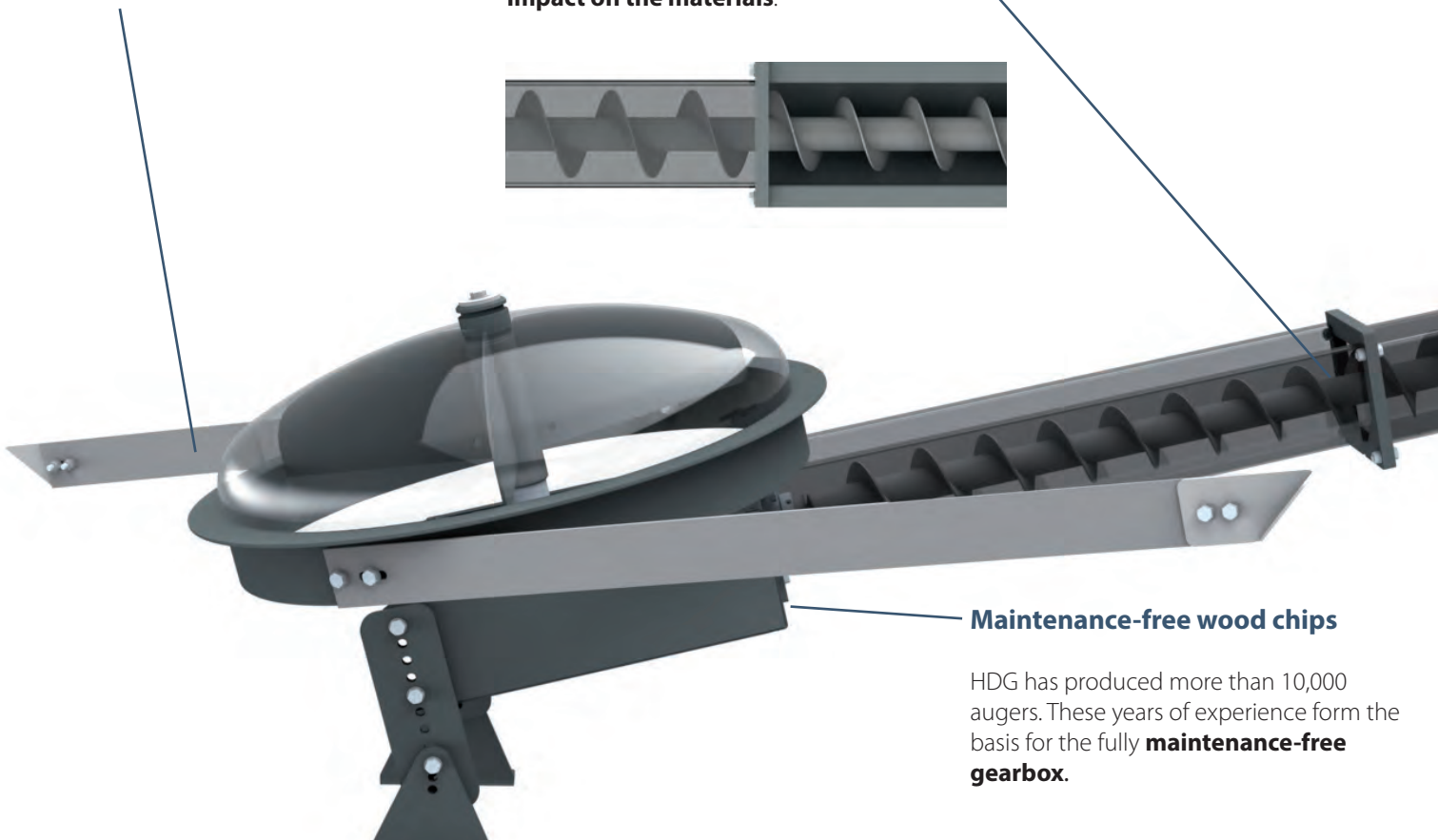
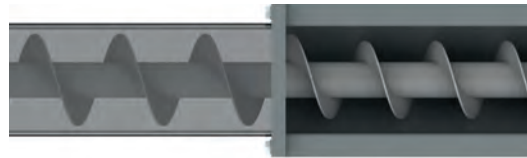


Extra high leaf-spring pack

The leaf-spring pack with a height of 80 millimetres (standard: 50 mm) optimises the material flow and transports **the same quantity of fuel with fewer rotations.**

Ergonomically optimised conveyor auger

The design of the auger is conical and gradually rising, and it is this which guarantees both **energy saving fuel transport and minimal impact on the materials.**



Maintenance-free wood chips

HDG has produced more than 10,000 augers. These years of experience form the basis for the fully **maintenance-free gearbox.**



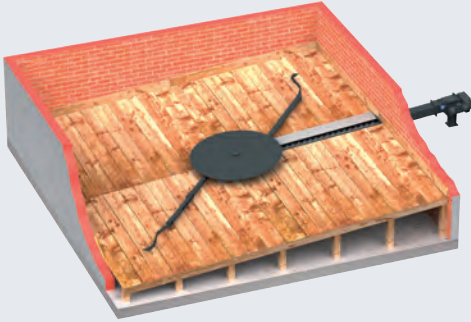
HDG tip from the experts

In the long term, a wooden intermediate floor guarantees energy-saving and reliable operation. The wood chips are gathered much more easily without losses due to friction, particularly with a partially emptied chamber.

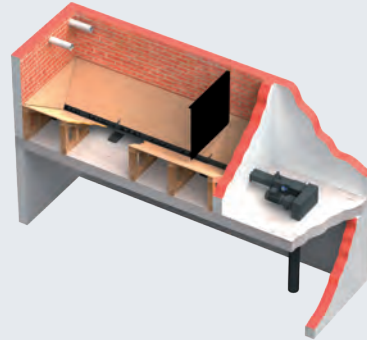
Consistent and efficient operation is the result.

The right delivery system for you

Besides the flexi blade delivery system, HDG also offers alternative systems which can be adapted perfectly to individual requirements.



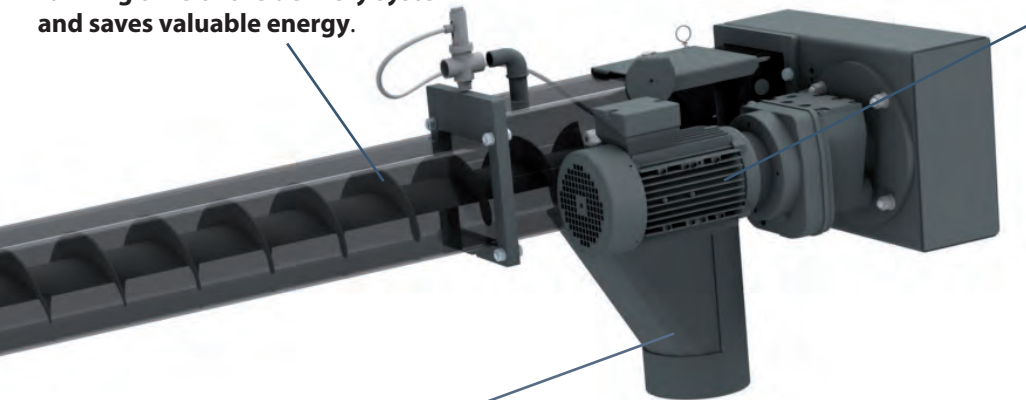
For larger diameters of up to 5.7 metres, the **HDG hinged arm delivery system** can be used. Large store rooms with tall filling heights (5 meters with a bulk weight of 250 kg/m^3) are reliably emptied with the use of two pretensioned arm elements.



The **HDG pellet delivery system PSZ** is the cost-effective alternative to the pure pellet operation. A pressure relief plate protects the auger from the high bulk weight of the pellets. This allows a maximum filling height of 650 kg/m^3 or 3 metres to be achieved.

Optimized auger channel

The auger channel has been geometrically optimized at a width of 160 mm and the filling capacity has been increased in line with this by 15 percent. This reduces the **running time of the delivery system and saves valuable energy.**

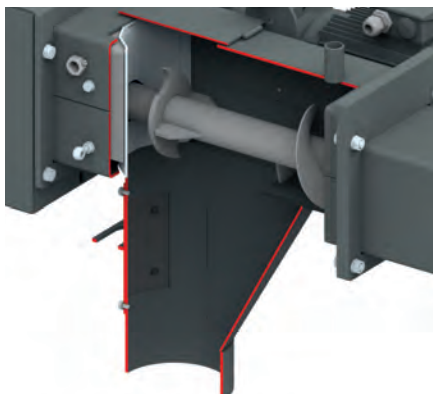


Powerful drive

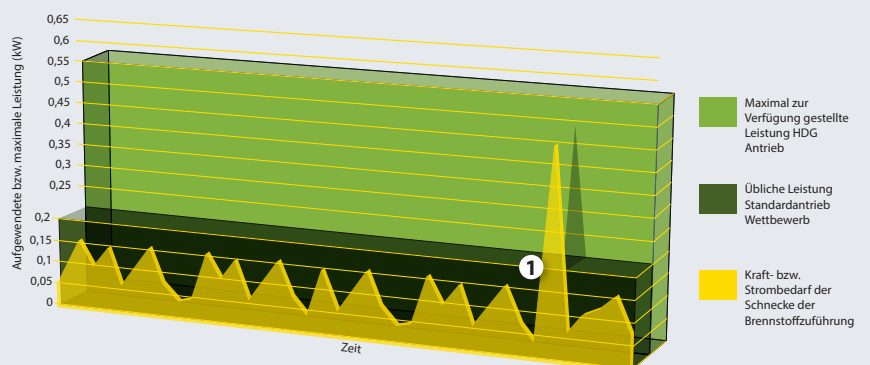
In keeping with the motto "as little energy as possible - as much energy as needed", the powerful, yet economical drive combines **low-power consumption with high performance reserves.**

Innovative sloping down-pipe

The completely redesigned sloping down-pipe with **double sorting-finger technology guarantees trouble free operation** – even with over-long wood chips.



Performance reserve for safe operation



The drive of the HDG fuel feed provides sufficient reserves. Even if, for example, more power is required for a short period **1** of time due to larger pieces of wood. However, a powerful motor requires no more energy than a less powerful drive at "normal loads" – but requires **significantly more operational reliability.**

The right delivery system for special requirements: HDG pellet suction system

With the HDG pellet suction system, we have developed a system that enables the heating system and the bunker to be in separate rooms. This makes installation of the ecologically sound pellet heating system simpler in older constructions and renovated buildings.



The intermediate container of the HDG pellet suction system can hold up to 100 kg of pellets.

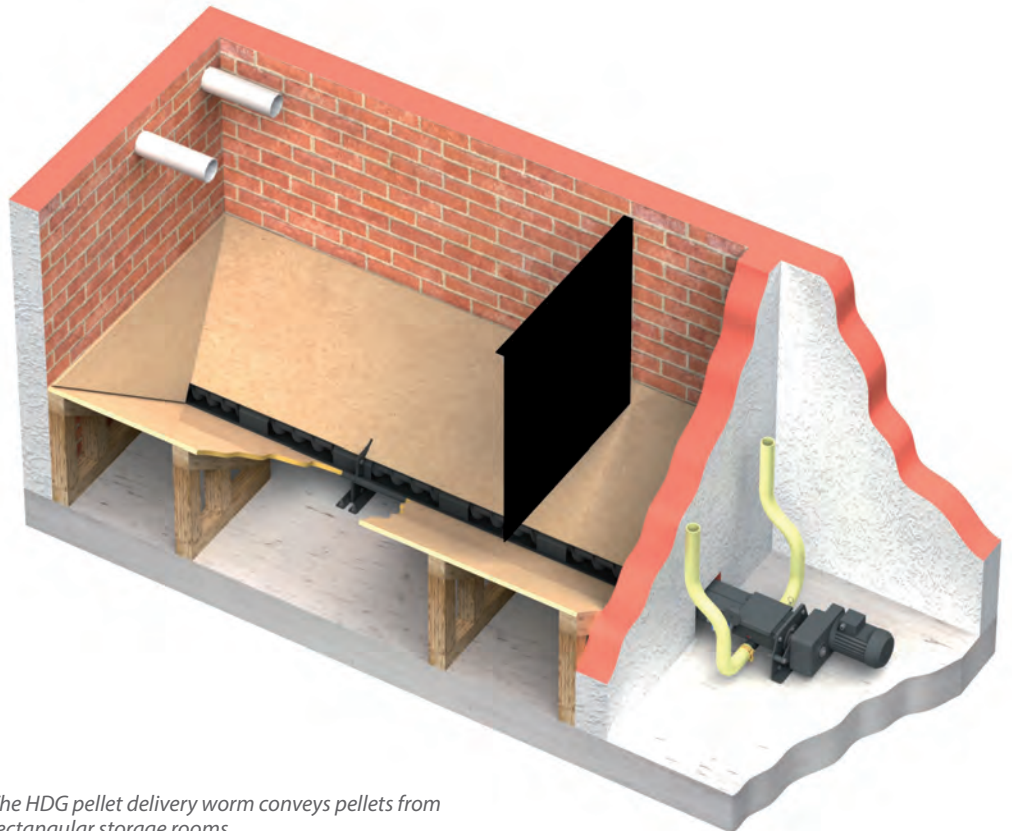


Reliable operation

The HDG pellet suction system is a delivery system which was specially developed for pellets. The suction system allows pellets to be transported over distances of up to 25 metres and then stored temporarily. The use of a rotary feeder and water extinguisher means that all HDG delivery systems are protected by reliable safety technology.

Flexible storage

The many challenges presented by storage rooms make a flexible storage system essential. The HDG pellet suction system has unbeatable advantages here with its many combination options with tailored HDG delivery systems. We will be happy to help you find the right storage system.



The HDG pellet delivery worm conveys pellets from rectangular storage rooms.

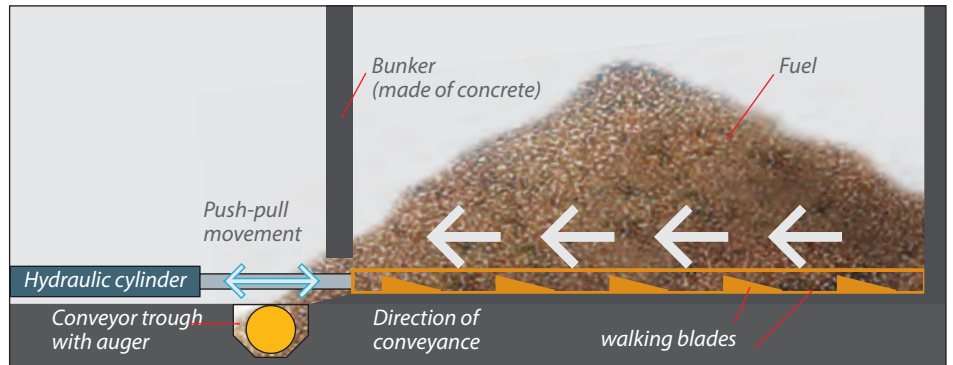
HDG walking floor feeding system

Storage and delivery for high demand

The HDG walking floor delivery system is often used for larger heating systems. It enables very large quantities of up to 200 m³ to be stored and simultaneously conveyed to the heating system. This delivery system is suitable for wood chips and shavings.

With the HDG walking floor delivery system, rectangular chambers can be emptied completely.

To provide the optimal solution for each customer, all components can be individually tailored.



Through the action of blades running over the floor of the bunker, the fuel is transported by means of push-pull movements to a conveyor trough. This then conveys it directly to the feeding unit of your HDG Compact heating system.

The walking blades are driven backwards and forwards by hydraulic pistons.



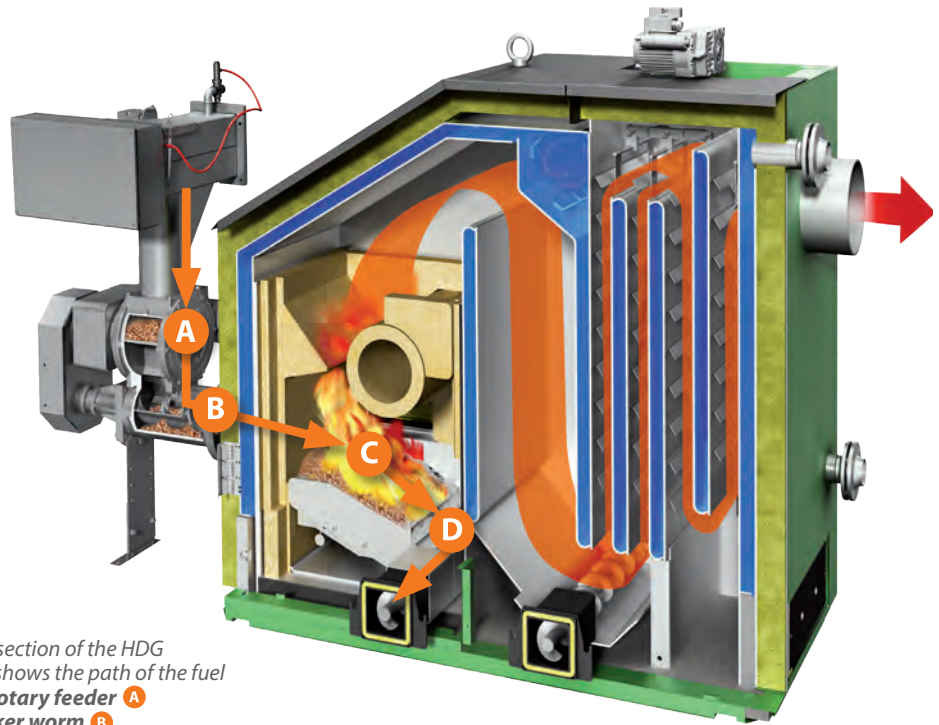
The HDG walking floor delivery system is particularly suitable for very high output requirements. In this example, it is used in connection with two HDG Compact 200 units.

For energy-saving and constant output: The HDG feeding system

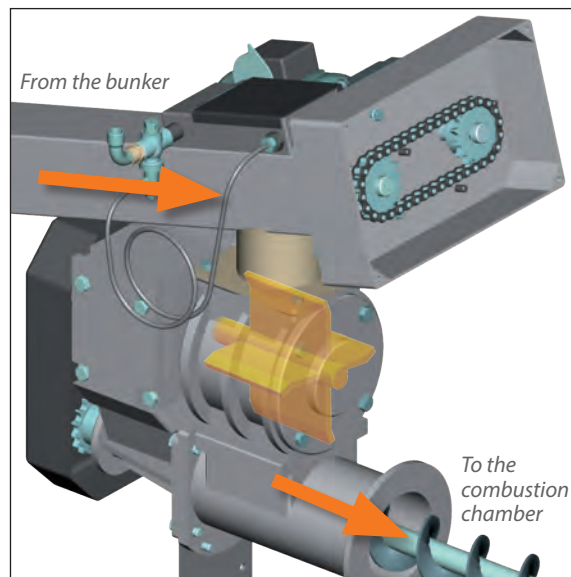
The feed system – safe and energy-saving

The feed system of the HDG Compact consists of a rotary feeder and a stoker worm and ensures that fuel is loaded simply and safely onto the grate.

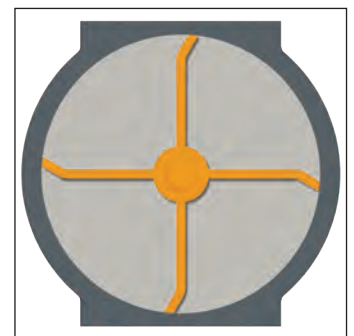
The patented rotary feeder separates the combustion from the fuel storage area and, in conjunction with the water extinguisher, ensures absolute operational safety (IBS tested). The automatic reversing mechanism prevents damage from foreign bodies by moving the rotary feeder back up to three times when it encounters certain levels of resistance. The stoker worm constantly provides the HDG Compact system with the quantity of fuel it needs for optimum combustion. The direct fuel insertion on the grate and the high quality gearing attain quiet operation with low energy costs.



The cross-section of the HDG Compact shows the path of the fuel from the **rotary feeder A** to the **stoker worm B** to the **combustion chamber C** to **ash removal D**.



The HDG rotary feeder safely separates the combustion chamber from the storage room and the transport unit. This is the proven and patented back-burn safety technology from HDG.



The robust construction and four chambers of the patented rotary feeder ensure particularly reliable fuel transportation. Friction surfaces are kept to a minimum to enable smooth and energy-saving operation.

The movable HDG stepping grate

To achieve the best emission levels, the combustion grate is the key component. HDG is the first manufacturer to successfully employ the already well proven feed grate technology used in commercial firing systems to small scale firing systems.

The stepping grate design ensures absolute low-emission combustion with a high degree of efficiency – even with variable fuel characteristics.

Unique combustion technology

In HDG Compact heating systems, a moving and air-cooled stepping grate is employed in the firing chamber for 100 kW or greater heating power. Air for combustion (primary air) is fed in underneath the fuel grate. Routing air in this way effectively cools the grate elements and preheats combustion air at the same time, which has a positive effect on combustion. Due to the continual movement of the grate elements, the combustion remnants are systematically conveyed to the ash augers and thus cannot remain in the combustion chamber.

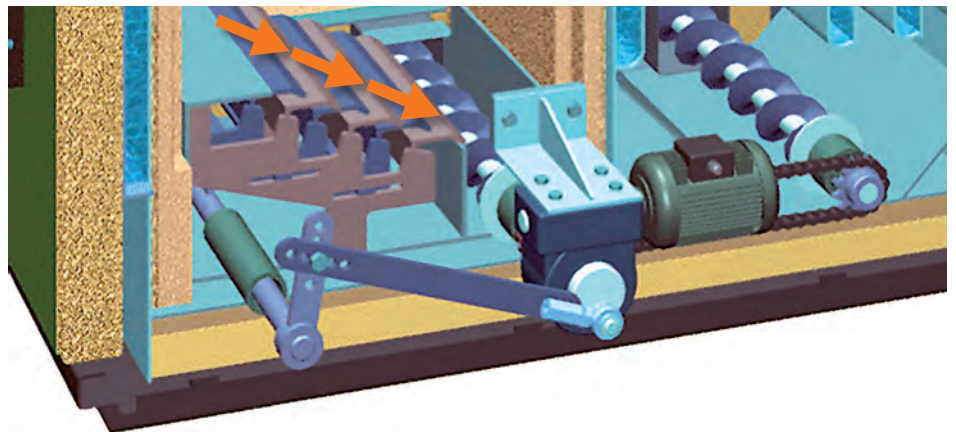
The geometric design of the hot combustion chamber facilitates an above average retention time and turbulence of the combustion gases.

Great variety of fuels

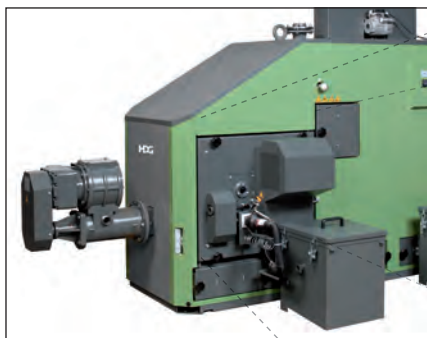
In the output range of 30 to 190 kW, moist and high-ash wood chips, shavings, pellets. The stepping grate technology ensures that optimum performance is maintained even when the proportion of non-combustible or very moist material (up to 65% moisture content) is increased.

The material moves through different temperature zones on the grate. The fuel is thereby dried, degassed and finally burned in its entirety.

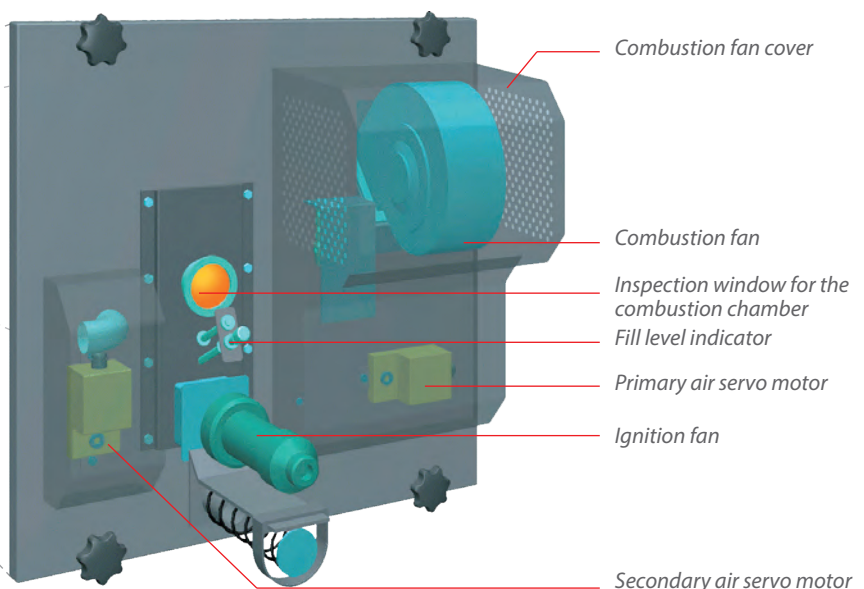
The continual movement of the grate elements removes the combustion remnants from the combustion chamber.



Compact functional components of the combustion technology

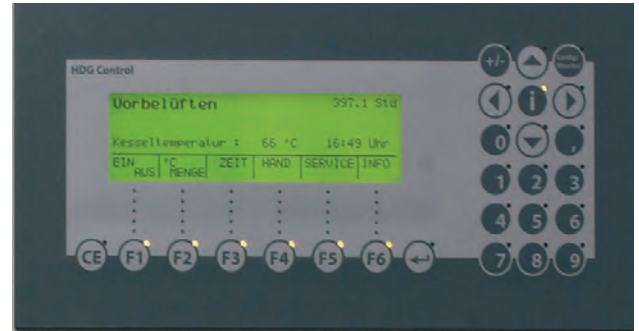


The functional components of the combustion technology are arranged on the side cover. They are thus also easily accessible for maintenance work.



PLC control technology. For convenient and reliable operation

The control technology is the “brain” of a wood chip firing system. HDG employs the most modern electronics so that you enjoy the full benefits of your heating system’s high performance combustion technology: consistently reliable and convenient operation.



The clear control panel layout on the PLC controller displays the current operating status and enables you to call up all necessary operating parameters at any time.

Innovative output and combustion control

The combustion control uses the lambda sensor to determine the volume of secondary air required for the respective operating status and thus optimises combustion. Data from the hot gas temperature sensor is used to meter out the optimal amount of fuel.

The integrated output controller uses sensors in the supply and return flows to enable continuous adjustment of output ranging from 30% to 100%. The fuel type can be set to provide even more intensive and direct control over combustion.

Our unique combustion and output control system guarantees the lowest possible emission levels and the highest degree of efficiency, which has been certified by the TÜV testing agency of southern Germany.



All components of the system are electronically controlled by a PLC controller inside the control cabinet. Current operating data from the combustion system is indicated on an illuminated display.

The design is compliant with the requirements of DIN EN 60335 and DIN EN 50156. The control cabinet can be expanded to accommodate different system requirements.



▼ The lambda sensor relays the residual oxygen value in the flue gas to the PLC controller of the HDG Compact.
 ▼ This ensures that the combustion parameters are always optimised for the type of fuel being used, e.g. spruce and beech.

Combustion chamber under pressure

To ensure a steady combustion quality, it is required to keep a constant underinflation in the combustion chamber. On request, this can be controlled by a pressure gauge, which allows adjustments by changing of the flue gas fan's rotational speed. Especially when using shifting fuel qualities or having an awkward chimney situation, this kind of underinflation control is worth a mint.



Telecontrol systems – control from a distance

It is not always possible to control the operating condition of the wood heating system on site. To ease this situation, the HDG compact can be equipped with a telecontrol system. Many control options of the SPS-system can so be displayed and changed on a computer. This remote control respectively remote maintenance system offers an affordable way to optimize the wood heating system from a distance.



Change the settings of the wood heating system on your computer is no problem when using the HDG web visualization.



HDG accumulator system – expand your heating system in a way that makes sense

Your heating system works best at high output levels – in the nominal load range. This attains the best emission levels, as combustion takes place in optimum conditions. The resulting heat can however only be stored briefly in consumers such as radiators. Then the boiler output drops and it no longer operates in optimum conditions. To counteract this, we recommend using an HDG accumulator system. It enables optimum system running times by storing energy and supplying it at delayed intervals to connected consumers. This means that the 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 its service life. The required energy quantity is attained with less fuel. The HDG accumulator system is a sensible enhancement which benefits nature and you as a customer.



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- pellet
- Combi boiler for firewood / oil or for logs / pellets
- Heat + electricity from wood - energy concepts with wood gasification
- HDG buffer tank and system components

