ETA HACK VR
333 to 500 kW

... my heating system

The powerful wood chip boiler for industry, businesses and heating networks

A passion for perfection.

www.eta.co.at

The ETA Hack VR is therefore ideal where heating needs to be economical, environmentally-friendly and fully automatic, above all in agricultural businesses, industry, commerce and in the form of local or district heating networks.

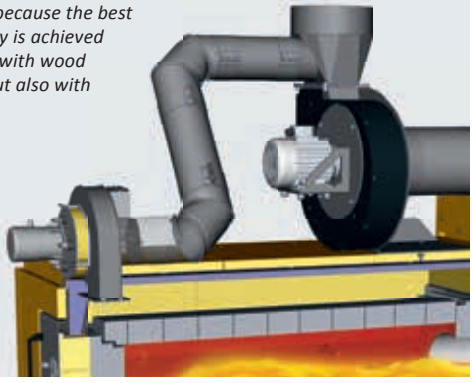
High quality and flexible

In times of rising raw material costs, it is really a challenge to heat larger properties – not, however, if you rely on a crisis-proof and domestic fuel such as wood chips. Wood chips are produced from wood that is difficult to reuse, such as thinning materials, splinters of wood after storm damage and sawing residue from domestic wood processing plants. It is chopped in powerful chippers and according to predefined standards. The size of wood chips is standardised. Sizes from P16S - P31S are suitable for our systems.

A system that can handle coarse chips too
Every ETA wood chip conveyor system is well thought out, tried, tested and designed for the toughest use: the transport of coarse, uneven wood chips. So that pieces of wood of up to 12 cm can be transported, all parts must work together perfectly. That starts already in the bunker. The wood chips reach the screw via generously designed open troughs. In the process, a relief plate prevents the material from exerting too much pressure on the discharge screw and thus enables fill heights of up to five metres. Bottlenecks are avoided in the enclosed trough channel thanks to the spacious discharge connections. A smooth material transport is supported by the progressive screw, which additionally loosens the wood chips. Even the installation is easy thanks to the modular design. The screw modules with sizes of 25 to 200 cm are produced and aligned in automated machines, the specially shaped trough channels only have to be screwed together.

The right temperature in the combustion chamber
thanks to permanently regulated flue gas recirculation: to achieve optimum result as regards emissions and efficiency during combustion, you need an even ideal temperature in the combustion chamber and therefore the permanent control system of the flue gas recirculation. As in the draught fan, a highly efficient fan is used here too to keep the combustion temperature in the de-gassing zones above 800 °C but under 1,000 °C at all times. In this temperature window, all components of the fuel are completely split for one. And on the other hand the thermal load on the components is kept as low as possible, which enormously increases the lifetime of the boiler. Too high combustion temperatures can also lead to undesirable slag formation.

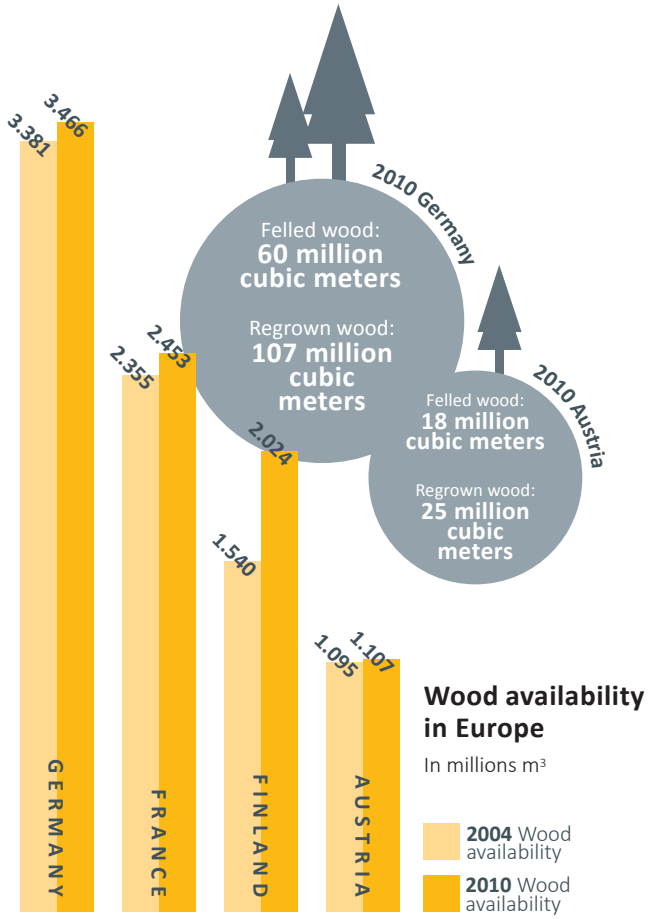
With the standard ETA Hack VR flue gas recirculation, you are flexible in your choice of fuel, because the best efficiency is achieved not just with wood chips, but also with pellets.

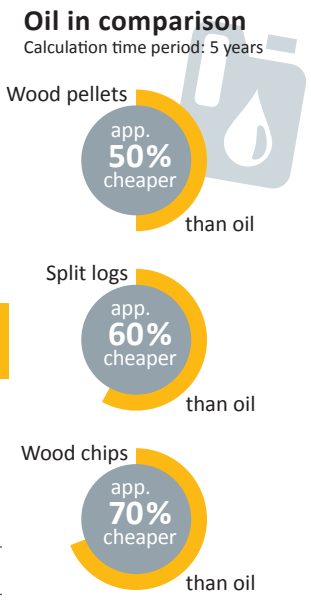


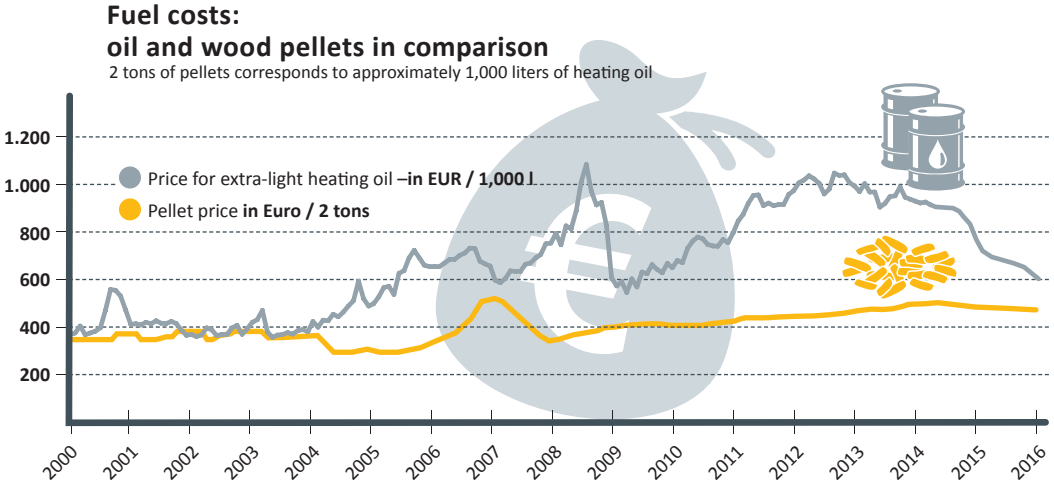
A win-win situation

Save on heating costs, strengthen your domestic economy and look after the environment in the process: heating with wood is worth it. Wood continuously regrows in our domestic forests, thus it is crisis-proof and economical. Forested areas are growing across Europe.

The natural raw material is CO_2-neutral, this means that during its combustion no more CO_2 will be released than the tree absorbs during its growth. The same amount will also be released if the wood rots in the forest. So heating with wood doesn't burden our climate.







While the price of fossil fuels such as oil and gas is subject to heavy fluctuations in the international markets and will certainly rise long-term, the price of wood and pellets is reliable.

Pellets: A lot of energy that needs little space

Anyone who only has limited storage volume available to them and wants to make optimum use of it uses pellets. The storage systems from ETA can be optimally adapted to the structural conditions. But beware: With this pure pellet discharge conveyor, wood chip operation is not possible.

Planning advice for pellet stores with discharge screw:

- The open trough screw in the store room may be a maximum of six metres long, the total length of the open and closed trough screws may be a maximum of eight metres.
- Taking into consideration the structural integrity of the building, the screws can be filled up to six metres high.
- With the ETA industrial suction unit, distances of up to 35 metres and height differences of up to 5 metres can be overcome.

Pellet suction unit with horizontal pellet discharge screw

All ETA wood chip boilers with outputs of 25 to 500 kW can be equipped with a special suction unit consisting of a suction and back air hose, as well as with a pellet bin. Distances of up to 35 m and heights up to 5 m can be overcome. The boiler room and the store room can also be positioned where there is space and do not have to be close to one another.

Pellet direct screw

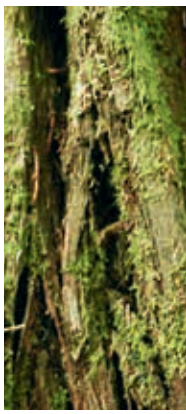
This system which is also cheap to set up is ideal if the boiler room and pellet store room are right next to each other and the pellet store room is on the same level or above the boiler room. It works unbeatably efficiently, is low-wear and reliable.

Wood chips: It‘s all about simple feeding

With the ETA system, you can find the right solution for the most varied of structural situations in order to harmonise optimal storage volumes with simple feeding. Pellet operation is also possible with agitator discharges, but then the maximum feed height is 2 metres, the largest possible agitator diameter 4 metres. For an overhead conveyor, an intermediate screw with a minimum length of 500 mm is needed for material dosing. Also with moving-floor conveyors, pellet operation is possible under certain conditions. Talk to an ETA technician about the details of individual cases.

Floor agitator with articulated arms and flat springs.
This standard variant is made for the feeding of one or two boilers (with a maximum output totalling 700 kW). It is ideal for underground store rooms, ramps and filling by loader. The maximum possible effective diameter is 6 metres, the maximum fill height is 5 metres.

ETA info
Planning advice for a wood chip store room.
- The floor agitators are designed for a maximum fill height of 5 metres.
- The trough screw between the store outlet and boiler may be a maximum of 6 metres long.



Pivot auger discharge system
This space-saving variant is ideal for high, pneumatically filled silos or for material with poor flow characteristics. The maximum possible effective diameter is 6 metres, the maximum fill height is 8 metres.

Push-floor discharge
This XXL variant is ideal for large storage quantities as well as rapid filling via push-off trailer, dumper or hall crane. The maximum possible push rod width is 2 metres, whereby a maximum of 3 push rods can be used alongside one another. The maximum fill height is 5 metres.
Operation with pellets is optionally possible in consultation with ETA.

Special solutions as required

With our modular system, we are able to build a technically perfect discharge system with a very good price-performance ratio for almost all situations. With ETA, two agitators can be implemented for one boiler or one agitator for two boilers, among other things. For fuel silos in carpentry workshops, ETA offer pivot augers.

You can use intermediate conveyor screws to overcome height differences, direction changes and distances up to 6 m. These should not be installed with inclinations greater than 30°. Intermediate conveyor screws are used to form connections to existing store room conveying systems.

Floor agitator with centred outlet

This very economical variant is ideal for pneumatically or mechanically filled silos. The maximum possible effective diameter is 6 metres, the maximum fill height is 5 metres.

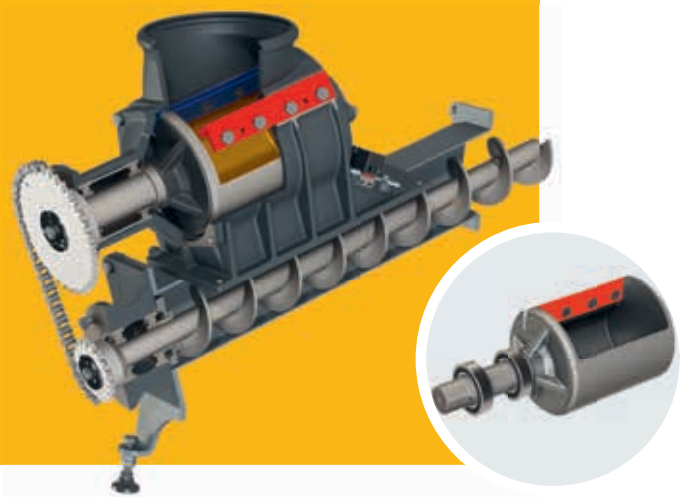
Patented one-chamber rotary valve

Uniquely safe: ETA sets new safety standards with the sealed one-chamber rotary valve. In contrast to conventional burn-back flaps, there is never a position that results in a direct connection between the combustion chamber and the fuel store. Dangerous burn-back is excluded, as no hot gas from the combustion chamber can penetrate the fuel feeding system.

Low power requirement: The one-chamber rotary valve has been newly developed by ETA to handle wood chips of up to size P31S. Pieces of wood that are too long are cut by a hardened blade on the edge of the chamber. The power requirement is minimal, the one-chamber rotary valve is driven by the same motor as the stoker screw.

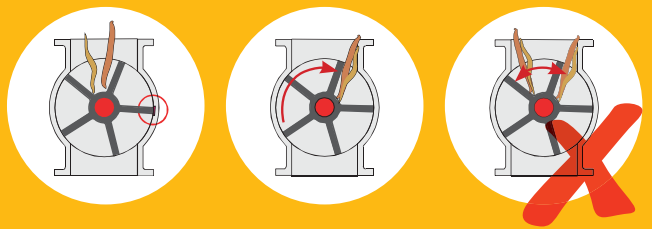
Rotary valve stop for long lifetime: The blade on the rotary valve serves to cut off very long individual pieces of wood chips. A rotary valve stop is used to ensure that it doesn't cut wood chips of the proper size. It protects the knife blade and reduces wear on the sealing edges.

ETA info:The rotary valve stop functions like this The discharge screw conveys the material from the store room into the drop chute upper section. From there the material falls into the one-chamber rotary valve. Meanwhile the screw remains open pointing upwards. Because during the filling process it does not continue to turn and is only half filled, fuel material that is compliant with the standard is not constantly cut of. No material remains lying on the sealing surfaces. Thus ensuring a long lifetime for the blade and sealing surfaces.



Conventional double or multi-chamber rotary valve:

- larger power and energy requirement specially for coarse wood chips
- long pieces of wood bring the boiler to a standstill
- high wear
- noisy
- small sealing surfaces



ETA HACK one-chamber rotary valve

- low power and energy requirement also for coarse wood chips
- long parts are cut off with blades
- quiet
- low wear
- large sealing area and thus the highest burn-back safety

Innovative combustion technology The combustion chamber is built up in multiple layers, the expansion joints between the layers also ensure a long lifetime of the boiler as does the cooling air jacket. This extends throughout the boiler construction and, along with the water-cooled grate side rails, ensures low radiation losses and therefore high efficiency. The individual, angled grate elements that work upwards ensure a complete burnout for the lowest emissions. Slack formation is consistently prevented. The uniform distribution of primary air over the entire grate is ensured by an energy-efficient draught fan in combination with an underpressure control system. Furthermore, specially positioned secondary air inlets, supplied with pre-warmed air through a separate lambda-controlled fan provide for clean and low-emission burnout. The combustion is optimally adapted to the different fuels via the constantly regulated flue gas recirculation. This protects all components and also allows the efficient burning of even the driest fuels within a stable temperature window.

Permanent de-ashing The moving grate and ash rake are driven by just one motor. The stoking interval of the rake is fully automatically adapted to the requirements - and from the residual fuel that the lambda probe measures, the combustion chamber temperature and the relevant required output. So grate de-ashing takes place permanently. The system therefore does not need to be switched during ash removal.

The combustion chamber and the heat exchanger are mechanically separate So thermal stresses are no problem as a connecting flange absorbs them. This makes the boiler safe even at the highest loads. Furthermore, this construction makes the transport, placement and the installation easier.

Heat exchanger: automatically always clean Since the heat exchanger stands vertically in the boiler, an ideal heat transfer is enabled. Additionally, the ash can simply just fall off the entire heat exchanger surface. Only a heat exchanger that is always clean can ensure high efficiency for years to come. The ash is safely removed and taken away below with a special compression spring mechanism.

Multi-cyclone against dust and sparks It consists of two standing cyclone tubes with welded rotary vanes and is already integrated into the heat exchanger. So it needs less space than an external device and generates no extra costs. The multi-cyclone separates coarse dust through rotation, thus reducing dangerous sparks and at the same time lowering the dust emission values.

The way to heat

The ETA HACK VR – reliable technology with moving grate

1 **Highly efficient draught fan:** It ensure underpressure and thus safety in the boiler – and is especially energy-saving: The ideal speed required for the underpressure is passed on to the motor via a frequency converter.

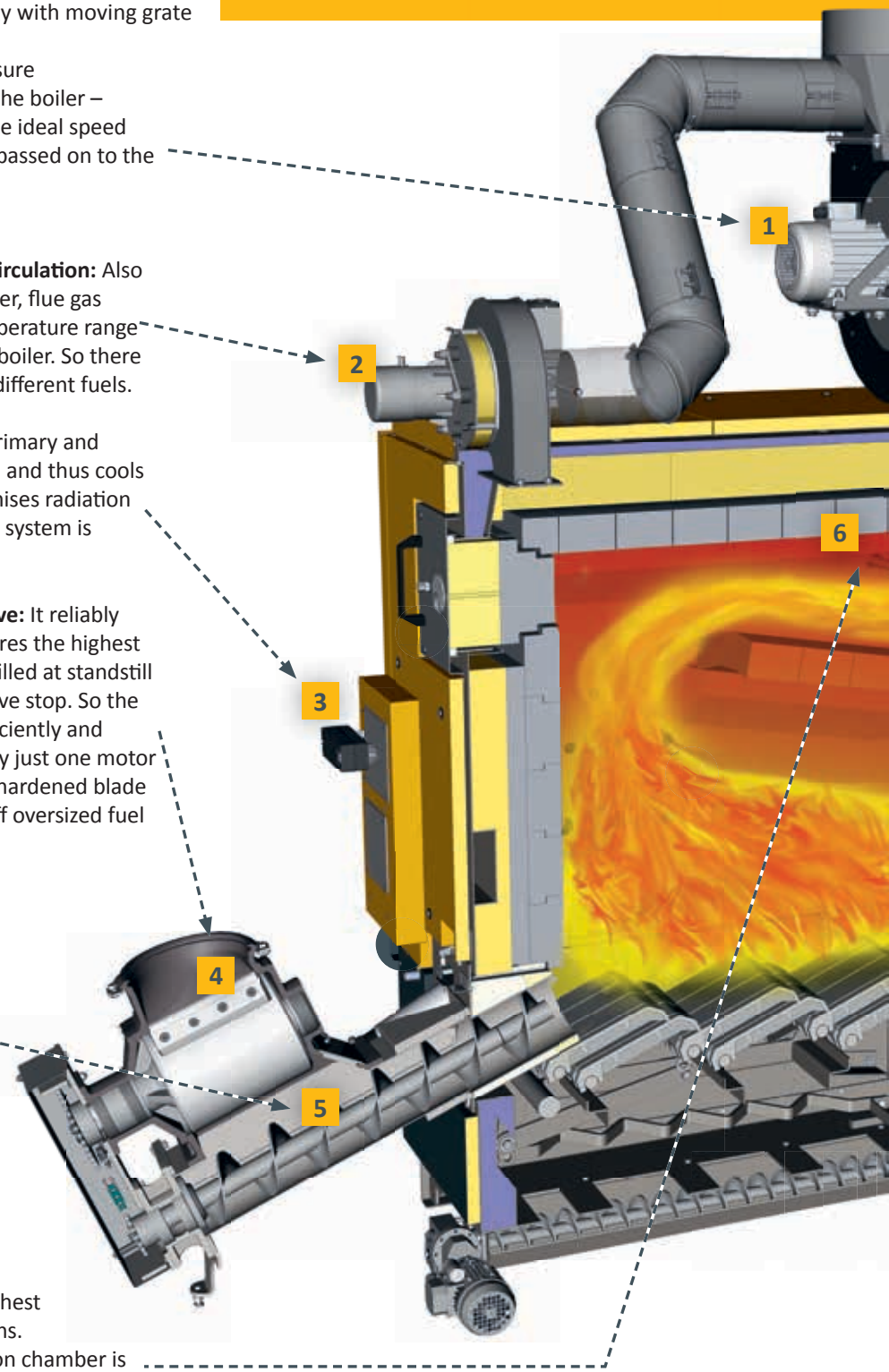
2 **Separately controlled flue gas recirculation:** Also controlled via a frequency converter, flue gas recirculation ensures a stable temperature range in the burner, thus protecting the boiler. So there is no slag on the grate, even with different fuels.

3 **Primary and secondary air:** The primary and secondary air supply is pre-heated and thus cools the boiler's outer layer. This minimises radiation losses. The efficiency of the whole system is increased.

4 **Patented one-chamber rotary valve:** It reliably prevents burn-back and thus ensures the highest safety. The large chamber is only filled at standstill thanks to the automatic rotary valve stop. So the rotary valve works particularly efficiently and energy-saving and can be driven by just one motor together with the stoker screw. A hardened blade with counter-blade reliably cuts off oversized fuel parts. So nothing gets jammed.

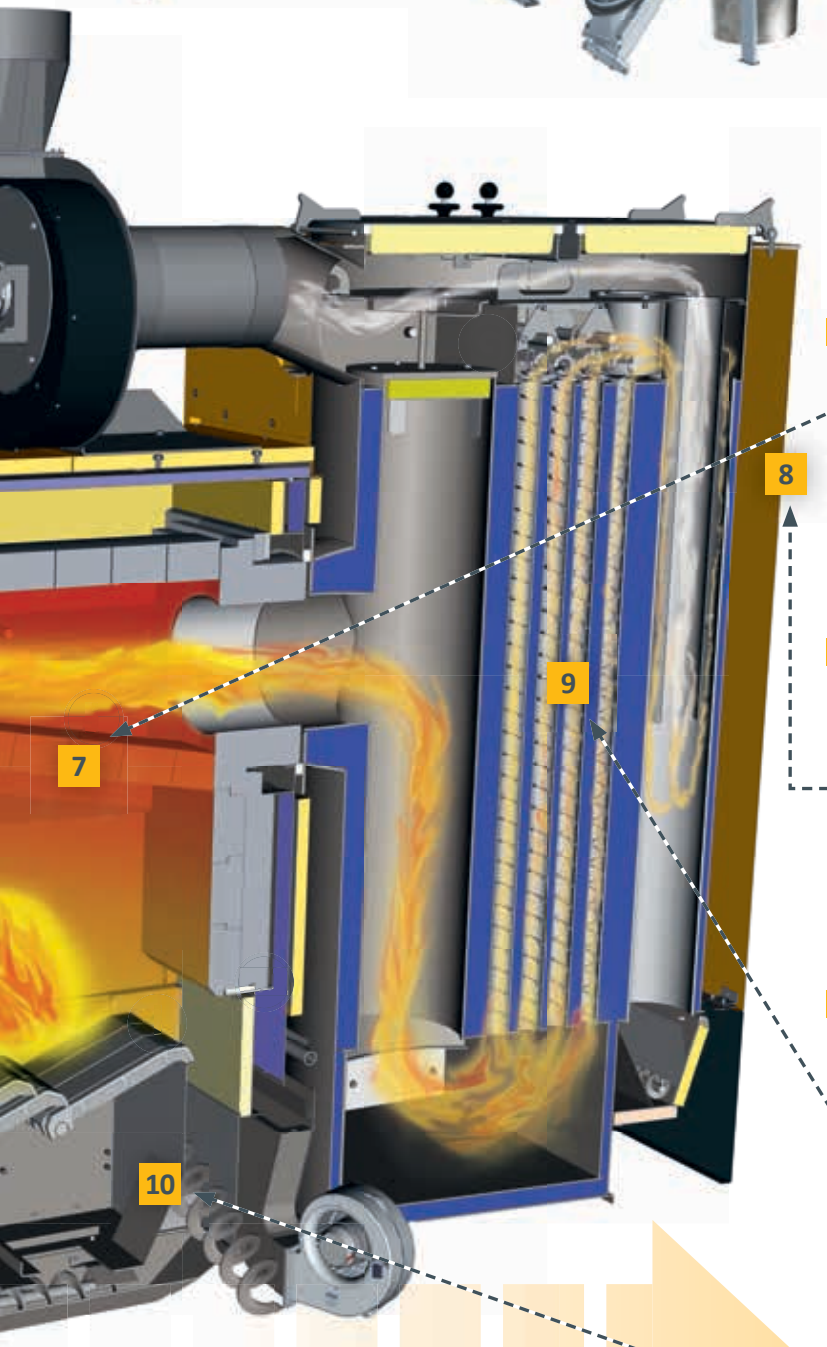
5 **Stoker screw:** Thanks to a special trough geometry and the progressive stoker screw, it operates with low-wear and largely without disruptions.

6 **Lambda and combustion chamber temperature regulation:** Through the adaptation of the oxygen supply to the relevant fuel quality, the boiler achieves the highest efficiency with the lowest emissions. The temperature of the combustion chamber is controlled by the flue gas recirculation flap as needed.



De-ashing variants:
There are 2 solution available to transport the ash away.
- Transfer flap with sealing flange on an external container
- De-ashing in two 110-litre ash bins.

As the systems can be designed individually, they are not included in the delivery scope of the boiler.



7 Cmbustion chamber with moving grate: The combustion chamber with its multi-layered, high temperature resistant construction is made for the highest loads. The firebed is constantly stoked. The combustion chamber area on the sides is provided with extra protection by water-cooled side rails. This ensures the long lifetime for the boiler. De-ashing takes place automatically, whereby a common drive is sufficient for grate and ash rake.

8 Touch control system with microprocessor control: The whole touchcontrol system of the heating system is located directly on the boiler and is already wired. Four different mounting positions are possible. The menu guidance works via touchscreen with clear images. Visualisations of the working processes of the heating system as well as remote control are possible via the internet with meinETA, including email messaging system, partner network and software updates via USB connection.

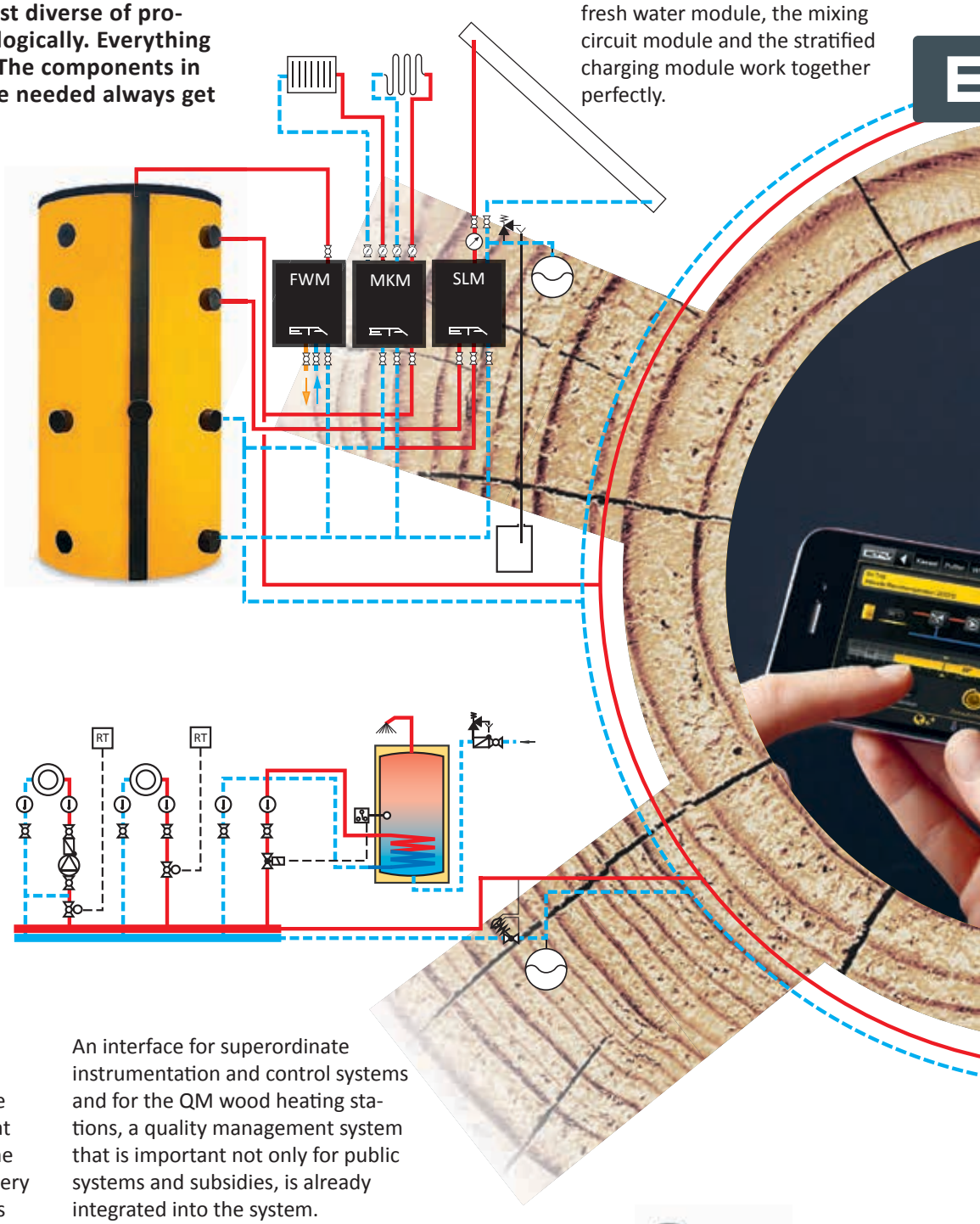
9 Standing plain tube heat exchanger: Automatic cleaning ensures constantly high efficiency. An integrated multi-cyclone cuts coarse dust through rotation, thus preventing dangerous sparks and at the same time lowering the dust emissions. It is already integrated into the system and thus needs less space than an external device and also generates no extra costs. The smoke tube connection is designed to pivot.

10 Automatic full de-ashing: The grate and cyclone ash are collected and transported away via a high quality shaftless inclined screw with temperature monitoring, for which also coarse foreign bodies in the ash are no problem. Further disposal takes place via a spherical transition on which the de-ashing variants can be connected.

Interaction of the products

ETA not only offers the most diverse of products, but also links them logically. Everything runs smoothly and safely. The components in the heating system that are needed always get automatic priority.
The whole system is controlled by ETA so that the interplay works perfectly. It is conveniently controlled via a touchscreen on the boiler or via the internet, mobile or PC.

Here, the ETA stratified buffer, the fresh water module, the mixing circuit module and the stratified charging module work together perfectly.



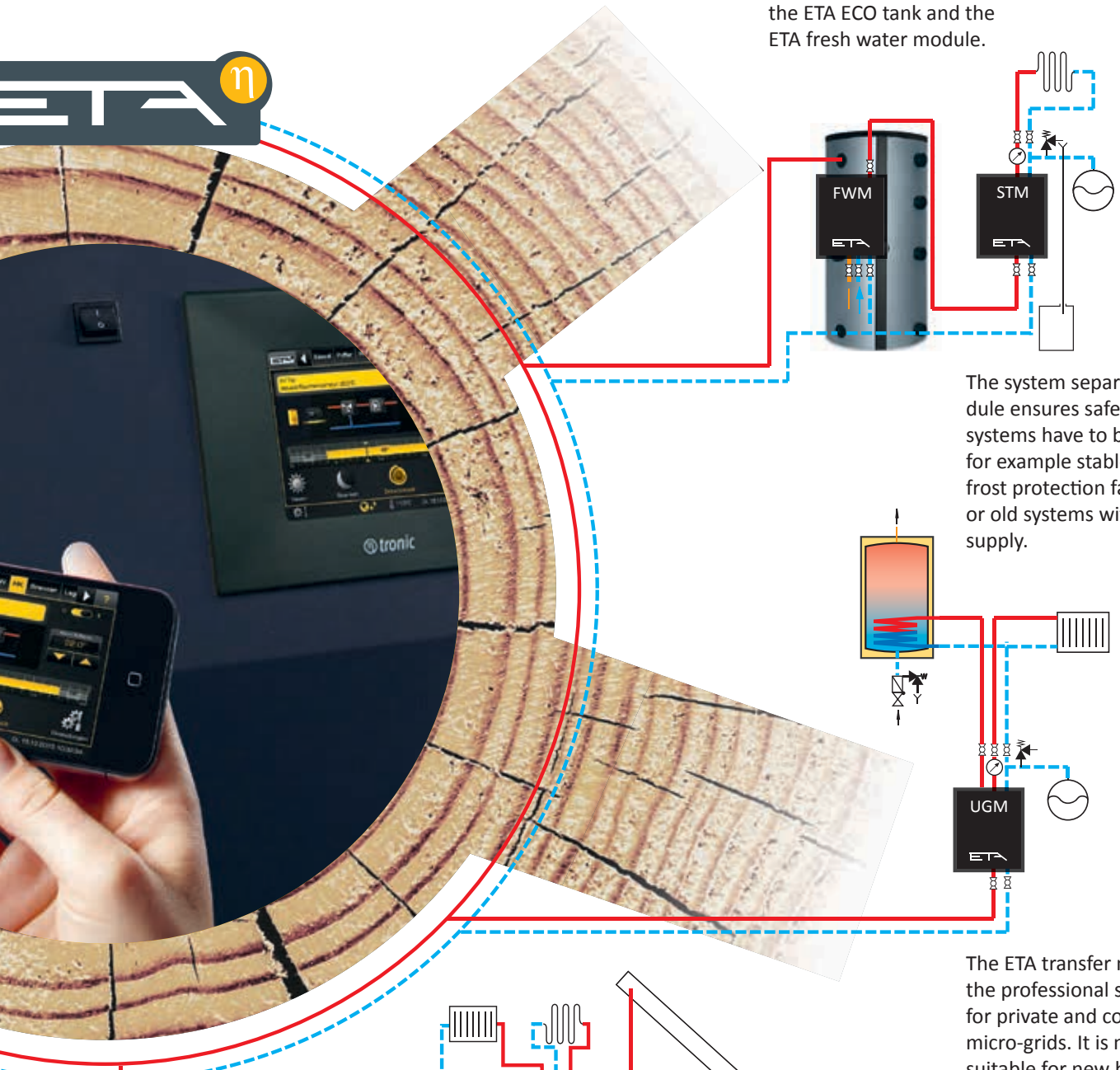
ETA planning service or support
You don't have to reinvent the wheel, just know how it turns. The ETA control system offers a lot of possibilities to integrate existing systems. We support our customers with design advice and a multitude of suggested hydraulic systems.

The integration of existing components or systems in the ETA system is no problem. There are hardly any requirements that the system cannot handle. As the standardised control system is very extensive, very complex systems can also be implemented without a lot of effort. The ETA module family takes over the most diverse of tasks – and is delivered ready to plug in. Each module is connected to the central hub with only two fine wires – perfect plug & play for central heating!

An interface for superordinate instrumentation and control systems and for the QM wood heating stations, a quality management system that is important not only for public systems and subsidies, is already integrated into the system.

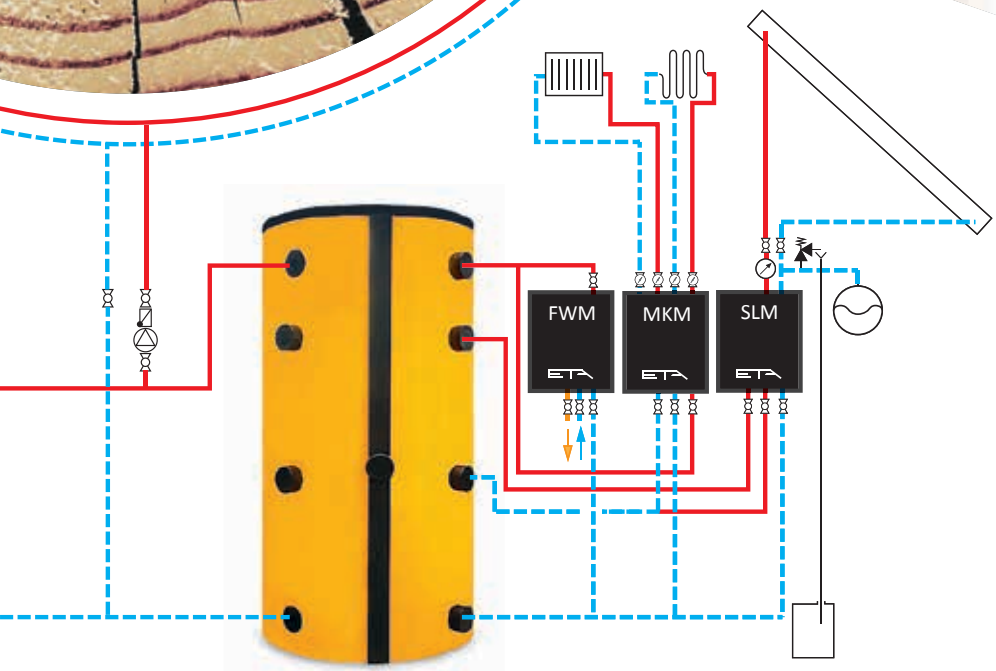
All data from the boiler and buffer storage tank can be regularly downloaded using a USB stick. It is very easy to evaluate the data, for example also via common systems like Excel spreadsheets. Superordinate control systems can be fed information via ModBus TCP too.

So hot water is economically, hygienically and quickly prepared: with the ETA ECO tank and the ETA fresh water module.

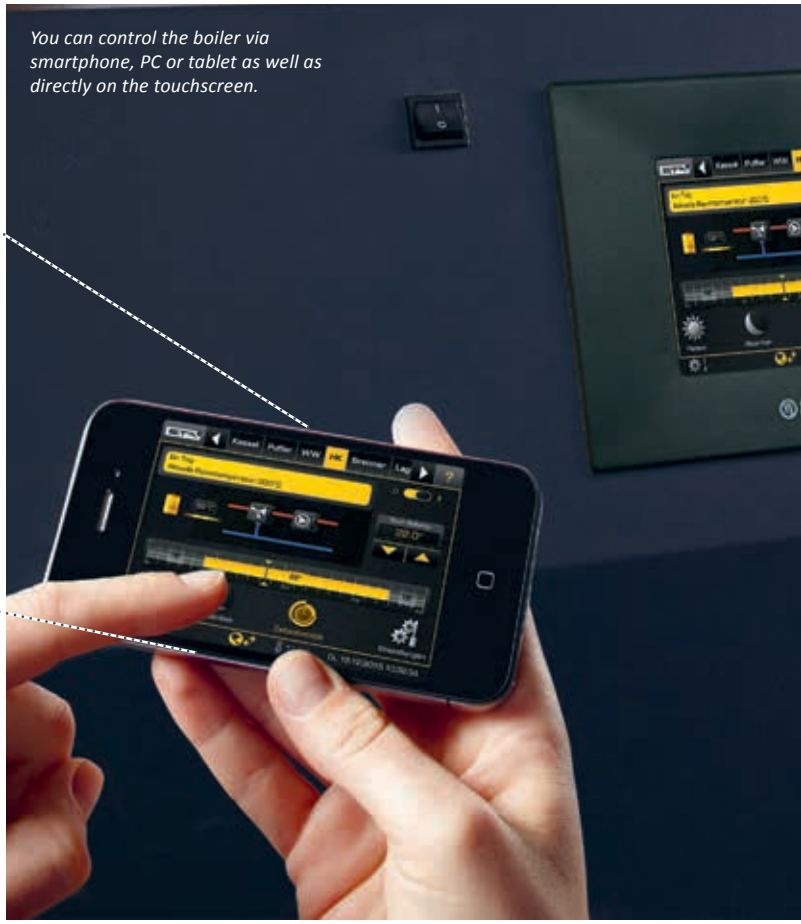


The system separation module ensures safety if heating systems have to be separated: for example stable heating, frost protection facilities or old systems with oxygen supply.

The ETA transfer module is the professional solution for private and commercial micro-grids. It is not only suitable for new builds but also especially good for the quick and economical renovation of buildings that don't have their own heating boiler.



Away mode, night time reduction, vacation setting: intuitively, you know immediately which button does what.



You can control the boiler via smartphone, PC or tablet as well as directly on the touchscreen.

Easy to control from anywhere

Good technology is characterised by its user friendliness. You don‘t have to be a technician to use the many functions of the ETAtouch.

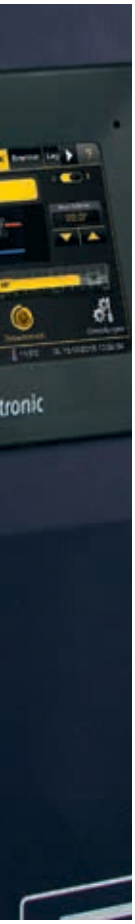
ETAtouch: the touchscreen on the boiler
Confusingly arranged buttons and control systems are a thing of the past, because with the touchscreen of the ETA HACK VR you can quickly and easily control all settings. The icons are self-explanatory. Whether you generally want to make it warmer or cooler, change the time for night-time reduction or want to switch to eco mode during your vacation - you will tap on the right symbol intuitively and completely without operating manuals!

You not only control your boiler via the touchscreen, but also have an overview of all connected components, such as buffer storage tank, pellet store, solar heating system or hot water preparation. You know straightaway, for example, how many pellets you still have in store or how effective your solar heating system was.

meinETA: the free internet platform
If your heating boiler is connected to the internet, you can see and change all heating settings on your mobile, tablet or PC. So you always have a handle on your heating, wherever you are! When you login to www.meinETA.at, you see the touchscreen as if you were standing right in front of the boiler!

The ash bin must be emptied, it‘s time for the next heating service...You don‘t have to worry about all of these things yourself. meinETA reminds you for free by email.

Quick help
Give your installer or the ETA customer service representative temporary access rights to your meinETA account. So they can prepare for their visit to you. And maybe the technician doesn‘t even have to come visit, because thanks to meinETA they can tell you over the phone what you need to do to make your heater work again. You can see who can access your boiler via the status display. Only you decide who‘s in your network!



Whether at work or in your leisure time: Your ETA heating system can also be controlled when you're on to go.

Technical requirements for meinETA
To be able to use meinETA, you need a broadband connection in your home. The ETA boiler's touch screen is connected to the Internet via a network cable. And anyone who doesn't have a network connection in the basement simply connects via the ETA PowerLine. It comfortably transfers the data from any socket to the modem.

For tablet, smartphone and PC
meinETA runs on all current operating systems, such as iOS or Android. Via PC, meinETA can be loaded by any modern internet browser, such as Mozilla Firefox, Safari, Google Chrome or Internet Explorer 9, for example.

There for you
ETA devices are characterised by the highest quality. They feature patented systems developed in Austria. The entire assembly takes place in-house in Hausruckviertal, Austria. In the unlikely event of a breakdown, ETA customer service is on the spot quickly. An experienced, competent on-call team is available to you.

Everything on one display: the ETA standard

A modern heating system is only effective if it is well-controlled. ETAtouch takes care of that.

At no added cost, the ETAtouch control system already includes all functions for two heating circuits, hot water supply via tank or fresh water module as well as for the integration of a solar heating system. The ETA HACK VR also comes with a LAN connection as standard. If you connect it to the net, you can easily control all components from a PC, tablet or smartphone.

Of course also without the need for an operating manual: The symbols on the touchscreen are self-explanatory. Making control of the heating system child's play.

Boiler and combustion regulation*
Speed-controlling the units saves power. The lambda and ignition time regulation increases efficiency. All components relevant to operation are monitored.

Buffer storage tank management**
Three to five sensors in the tank control the heat generator in the system and distribute the energy to the different consumers. Using five sensors, cascading regulation, QM wood heating stations and peak load management are part of ETA Standard.

Hot water preparation*
Is made possible both via the ETA fresh water module but also via the hot water tank or combi storage. For all variants, circulation pumps can be controlled with time and/or requirement programs.

Solar heating systems**
Single or double circuit solar heating systems with one or two tanks, zone loading via the ETA stratified charging module and also two collector fields as well as three consumers are controlled.

Two weather-controlled mixing heating circuits**
They run with a weekly program with many time windows and automatic and/or manual additional functions. The system can optionally be expanded with room sensors and remote control.

Additional system functions**
External heat detection and/or switching, thermostat or differential temperature thermostat, display of up to five freely selectable temperatures, heat request from external devices as well as heating pipeline(s) with or without mixer.

Wall switch box for complex systems
All control systems can be extended with wall switch boxes, with or without touchscreen.

*Control system and sensor included in standard delivery scope
**Control system depends on configuration, sensors are available as accessories

From Hausruckviertel to the whole world

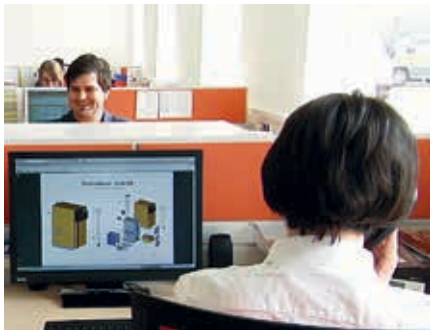
ETA specializes in the manufacture of biomass heating, i.e. log, pellet and wood chip boilers. The most modern technologies combined with naturally growing resources.

ETA is efficient
Technicians designate the efficiency of a heating system with the Greek letter η, pronounced „eta“. ETA boilers stand for more heat with less fuel consumption, environmental soundness and sustainability.

Wood: old, but good
Wood is our oldest fuel - and our most modern: There is a lot of history in-between open fires in front of caves and modern biomass boilers. In the middle of the 20th century, the number of wood heating systems fell briefly. Oil was the new heating hype. A brief interlude in comparison to the consistency of wood. Today, we know that heating with fossil fuel has no future. It contributes to global warming and harms the environment. Supply security is not guaranteed long term also, as fossil fuels are diminishing, don‘t regrow, and sometimes come from politically unstable regions. While wood in contrast is a cheaper, domestic, renewable raw material that does not pollute the climate when burnt. No wonder wood heating is booming!

Comfort with many components
Since December 1998, the Upper Austrian company ETA has been designing and building a new generation of wood-fired boilers. They are full of patented technologies and the most modern control technology – and are still easy to use. Comfort and efficiency make ETA products so popular around the world. With a production of over 10,000 boilers per year and a global export quota of around 80%, ETA is one of the leading biomass boiler producers.

You get more than just a boiler
Anyone who decides on a wood or pellet boiler from ETA is choosing sustainability. And not just in terms of fuel. ETA shows responsibility across the board. So sustainable workplaces are created in the region. More than 230 employees in Hofkirchen an der Trattnach have the best working conditions – including an in-house canteen, bright assembly and storage halls, fitness rooms, and a sauna. And a free electric filling station, which is supplied by the in-house photovoltaic system. This also covers all power needs of a production hall and thus saves around 230 tonnes of CO2 per year.



The ETA wood chip boiler

Data sheet 333 to 500 kW

1 Flow with DN65 connecting flange

2 Return with DN65 connecting flange

3 Boiler control system

4 Safety heat exchanger of combustion chamber, connection R1/2“ internal thread

5 Safety heat exchanger for heat exchanger, connection R1/2“ internal thread

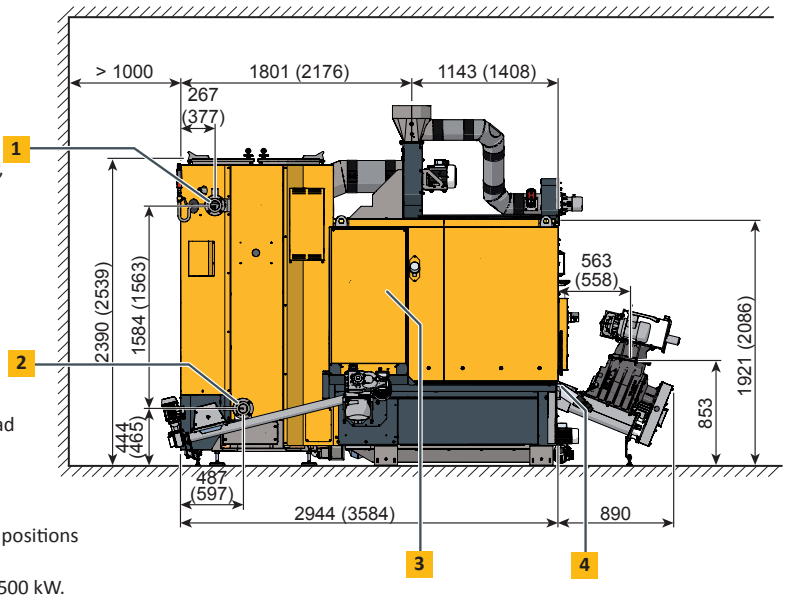
6 Discharge with coupling R1“ (below panel)

7 Flue tube connector pivotable win 45° steps

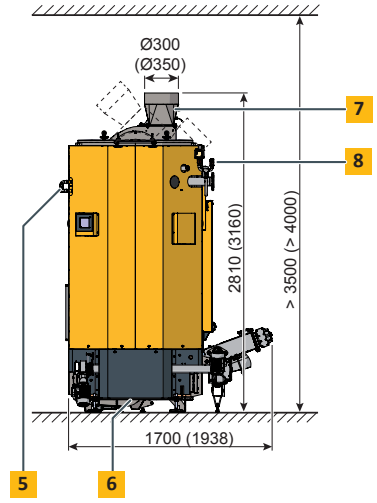
8 Connection for safety valve 6/4“ external thread

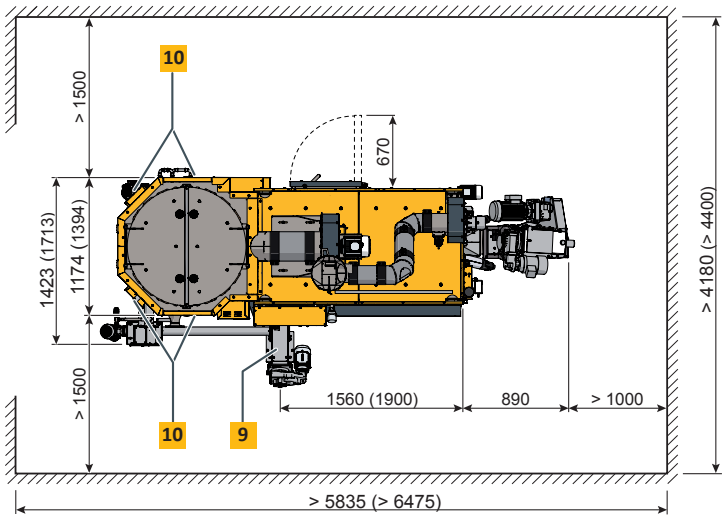
9 De-ashing connection (left or right)

10 ETAtouch screen can be installed in 4 different positions



Dimensions in parentheses apply for the boiler with 500 kW.





WOOD CHIP BOILER VR 333 - 500 kW		333	350	500
Rated capacity Wood chips M25 BD 150 (W25-S160)	kW	92 – 333	92 – 350	135 – 499
Rated capacity, pellets	kW	86 – 333	86 – 360	135 – 499
Spruce wood chip efficiency at partial / full load*	%	94.6 / 92	94.6 / 92	94 / 93
Efficiency with pellets at partial / full load*	%	95.1 / 94.2	95.1 / 94.2	93.8 / 93.2
Transport dimensions, retort W x D x H	mm	1,300 x 2,000 x 2,000	1,300 x 2,000 x 2,000	1,600 x 2,300 x 2,200
Heat exchanger transport dimensions W x D x H	mm	1,300 x 2,000 x 2,500	1,300 x 2,000 x 2,500	1,600 x 2,300 x 2,700
Weight of combustion chamber	kg	2,505	2,505	3,170
Weight of heat exchanger	kg	1,454	1,454	1,980
Weight of one-chamber rotary valve/ stoker	kg	211	211	221
Total weight	kg	4,170	4,170	5,371
Water content	Litres	747	747	1,095
Water-side resistance (ΔT = 20 °C)	Pa / mWs	9,000 / 0.9	9,000 / 0.9	12,000 / 1.2
Required flue draught at partial/full load	Pa	> 2 / > 5	> 2 / > 5	> 2 / > 5
Maximum permissible operating pressure	bar	6		
Temperature adjustment range	°C	70 – 90		
Maximum permissible operating temperature	°C	95		
Minimum return temperature	°C	60		
Boiler class		5 acc. to EN 303-5:2012		
Suitable fuels		Wood chips ISO 17225-4, P16S-P31S (G30-G50), maximum 40 % water content; pellets ISO 17225-2-A1, ENplusA1		
Electrical connection		400 V AC / 50 Hz / 16 A / 3P + N + PE		

* Values from test report of TÜV Industrie Service GmbH

CE entspricht EU-Normen

TÜV Süddeutschland

Institut für Brandschutz

ETA PU PelletsUnit 7 to 15 kW

ETA PC PelletsCompact 20 to 50 kW

ETA PE-K Pellet Boiler 35 to 220 kW

ETA SH Wood Gasification Boiler 20 to 60 kW

ETA SH-P Wood Gasification Boiler 20 and 30 kW
with ETA TWIN Pellet Burner 20 and 26 kW

ETA HACK Wood Chip Boiler 20 to 200 kW

ETA HACK VR Wood Chip Boiler
with moving grate 333-500 kW

ETA stratified buffer SP 500 to 5,000 lt
and SPS 600 to 2,200 lt

ETA Hydraulic modules

Your heating specialist will be happy to advise you

...mein Heizsystem

ETA Heiztechnik GmbH
Gewerbepark 1
4716 Hofkirchen an der Trattnach, Austria
Tel.: +43 (0)7734 2288-0
Fax: +43 (0)7734 2288-22
info@eta.co.at
www.eta.co.at

ETA HACK VR 333-500 kW EN, 2016-06