



... my heating system

ETA HACK VR 333 - 500 kW

*The all-rounder for businesses,
industry and communities*



A passion for perfection.

www.eta.co.at

... the all-rounder ...



Wood chips and pellets

A passion for perfection... was our continued motivation for the ETA HACK VR moving-grate boiler. With state-of-the-art control technology, such as negative pressure and lambda control, combustion chamber temperature monitoring and constantly regulated flue gas

recirculation, coupled with efficient combustion technology, reliable fuel transport and an integrated multi-cyclone dust separator, once again we've succeeded in providing a boiler that combines the highest efficiency and ease of use with the lowest emissions.



Control - visualisation - communication

Active control... with comprehensive measurement and reporting of all statuses, such as draught fan speed, power consumption of all motors, air flap position, residual oxygen, temperatures, etc. to ensure safe operation.

Visualisation... with a touchscreen for graphical display of the entire boiler control system and ETA's messaging system makes it easy to set parameters and generally simplifies operation of the control system. With ETA, you can access this visualisation wherever you are, all over the world, using our internet communications platform,

www.meinETA.at. All you need is a connection between the Internet and the boiler control system to use the free remote control with all internet-capable devices including PCs, laptops, tablets and smartphones.

Communication... lets you make the most of active control: the internet platform is also equipped with a notification system that can send custom-configured messages by e-mail to one or more addresses. ETA's extensive control system provides the best in operational safety and user convenience.

... patented and repeatedly proven ...

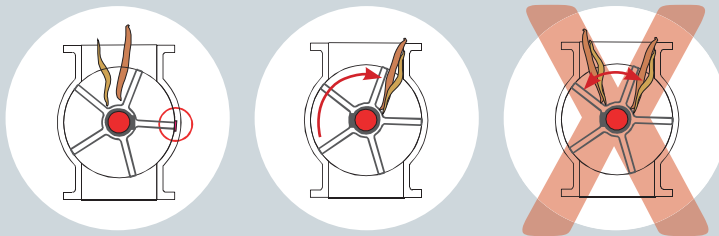
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With the one-chamber rotary valve developed and patented by ETA, our largest boiler can rely on our industrial-strength technology that satisfies high demands on burn-back protection, energy efficiency, durability and, above all, reliability.

No risk... with the airtight one-chamber rotary valve. In contrast to conventional burn-back flaps, it can never be in a position with a direct connection between the combustion chamber and the fuel store. No hot gas can enter the fuel conveying system and ignition of the wood chips is impossible. This is the most reliable possible protection against burn-back.

Reliable... with constant monitoring of the electricity consumed by the motors so any blockages or resistance that build up in the screws are registered straight away. This triggers the screws to run briefly in reverse, up to three times if necessary. The floor agitator is simultaneously decoupled via clutch so the motor's power is exclusively available for unblocking the screw. This process easily loosens any pieces of wood or stones jammed in the screw, so fuel transport can then resume unhindered. Transport of wood chips up to size G50 or P45 is possible.

Conventional rotary valve

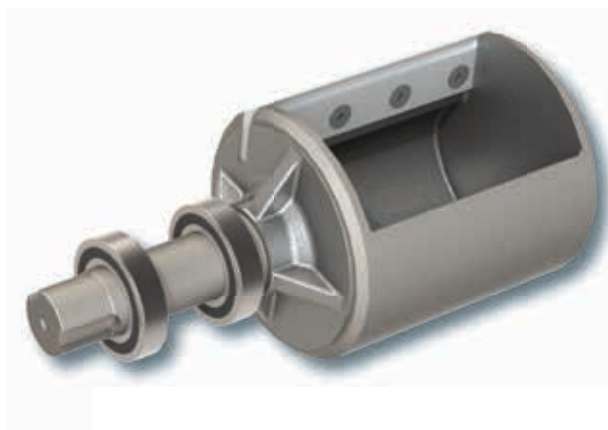


- with coarse chips, more energy required
- more wear and noise
- small seal area
- boiler blocked by long pieces of wood

ETA HACK one-chamber rotary valve



- low energy consumption, even with coarse chips
- less wear, quiet
- large seal area, maximum burn-back protection
- blades cut long pieces of wood



How it works... The one-chamber rotary valve is equipped with a position sensor to ensure that it can only be filled when the rotor is idle. In intermittent operation, the fuel quantity is adapted to the required output; however, the rotor is never filled completely. This functionality makes it possible to feed most of the wood chips through without contacting the cutter blades, ensuring long runtime with low-wear, energy-saving and quiet operation. Only for the longer wood chips do the integrated hard-alloy blades come into service, effortlessly cutting the chips into smaller pieces.

ETA technology

- A Extremely energy-efficient draught fan**
Underpressure-regulated, speed input to highly energy-efficient motor



- B Separately regulated flue gas recirculation**
Combustion chamber temperature regulation for reduced component wear. Stable temperature range with changing fuels

- C Patented one-chamber rotary valve**
Maximum protection against burn-back, contact-free material transport with rotary valve stop, hardened blade and counter-blade for cutting oversized pieces, driven jointly with the stoker screw

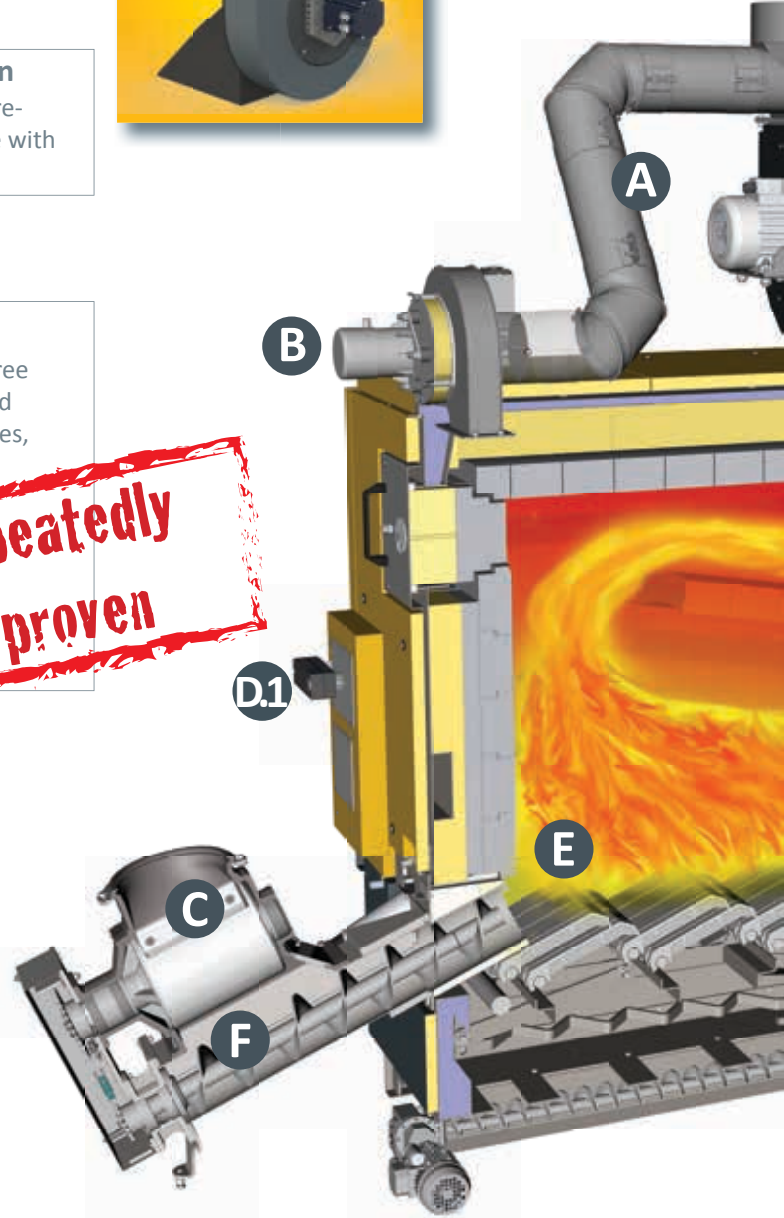


**repeatedly
proven**

- D.1 Primary and secondary air**
Sophisticated combustion air flow, primary and secondary air flow is pre-warmed, cooling the boiler's outer wall, minimising radiation losses and increasing the efficiency of the entire system

- E Combustion chamber with moving grate**
Multi-layered temperature-resistant construction, continual firebed stoking and ash removal, water-cooled grate side rails, jointly driven grate and ash rake

- F Progressive screw**
Progressive stoker screw and special trough geometry for low wear and high reliability



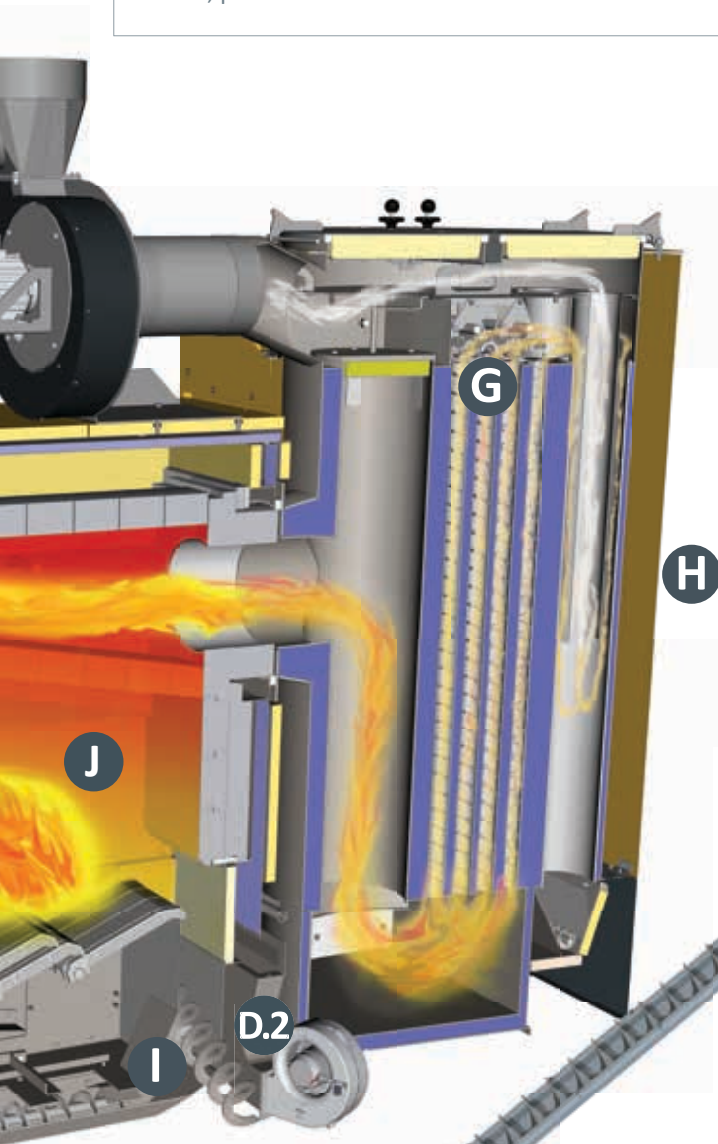
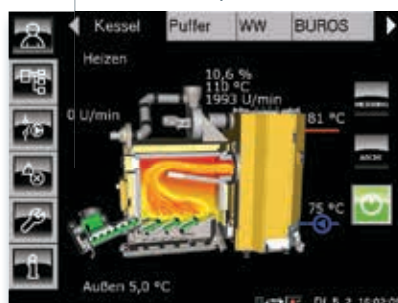
G Vertical pipe heat exchanger

Automatic cleaning for high efficiency, integrated multi-cyclone increases the efficiency compared with external units, pivotable flue tube connection D=300mm



H Touch control unit with microprocessor control

Entire control unit directly on the boiler and prewired, touch control unit with graphical menu navigation via touchscreen, visualisation and remote maintenance using communications platform via Internet including e-mail notification system, partner network and software update via USB port, can be installed in 4 different positions



J Lambda and combustion chamber temperature regulation

Minimal emissions at maximum efficiency, automatic adjustment to fuel quality

I Automatic, complete ash removal*

Ash from grate and cyclone is combined, shaftless inclined screw with temperature monitoring, disposal flap with sealing flange (on external container) or 2 rubbish bins with 110 l ash volume, long handling intervals, flexible disposal options



*Ash disposal from the boiler is configurable on an individual basis and thus not in the boiler's standard scope of delivery.

... A passion for perfection ...



Innovative combustion technology...

in the multi-layered high-temperature combustion chamber, the tilted grate elements constantly stoke the firebed, ensuring complete burnout with minimum emissions and preventing slag formation. A motor drives the grate jointly with the ash rake, with the movement depending on residual oxygen (lambda control), combustion chamber temperature and required output. Ash is removed from the grate continually, so there is no need to switch off the boiler for ash removal. The water jacket extends throughout the boiler and works with the water-cooled grate side rails to minimise radiation

losses (high efficiency) and increase the service life of parts subjected to high temperatures. The uniform distribution of primary air over the entire grate is ensured by an energy-efficient draught fan in combination with negative pressure regulation. Specially positioned secondary air inlets, supplied with pre-warmed air through a separate lambda-controlled fan, provide for clean and low-emission burnout. Flue gas recirculation, continuously regulated according to combustion chamber temperature, ensures optimum adjustment to various fuels, preserving all components and allowing the efficient burning of even the driest fuels within a stable temperature range.



Mechanically separate... The combustion chamber and the heat exchanger are mechanically separate. A connecting flange absorbs thermal stresses so they cannot affect the boiler structure. This construction also simplifies transport, placement and assembly.

Always automatically cleaned... thanks to optimum heat transfer due to the vertical arrangement of the heat exchanger tubes, their entire surface is cleaned easily and automatically, which is very important for years of high-efficiency operation. A special spring mechanism ensures that removed ash is safely deposited at the bottom.

Integrated multicyclone... with two vertical cyclone tubes with welded rotary vanes forming a multicyclone rotary dust separator, which is built into the heat exchanger in the standard configuration. It functions as a coarse-dust separator, suppresses dangerous sparks, ensures low dust emissions and takes the place of an external device that would waste space unnecessarily and cause extra costs.

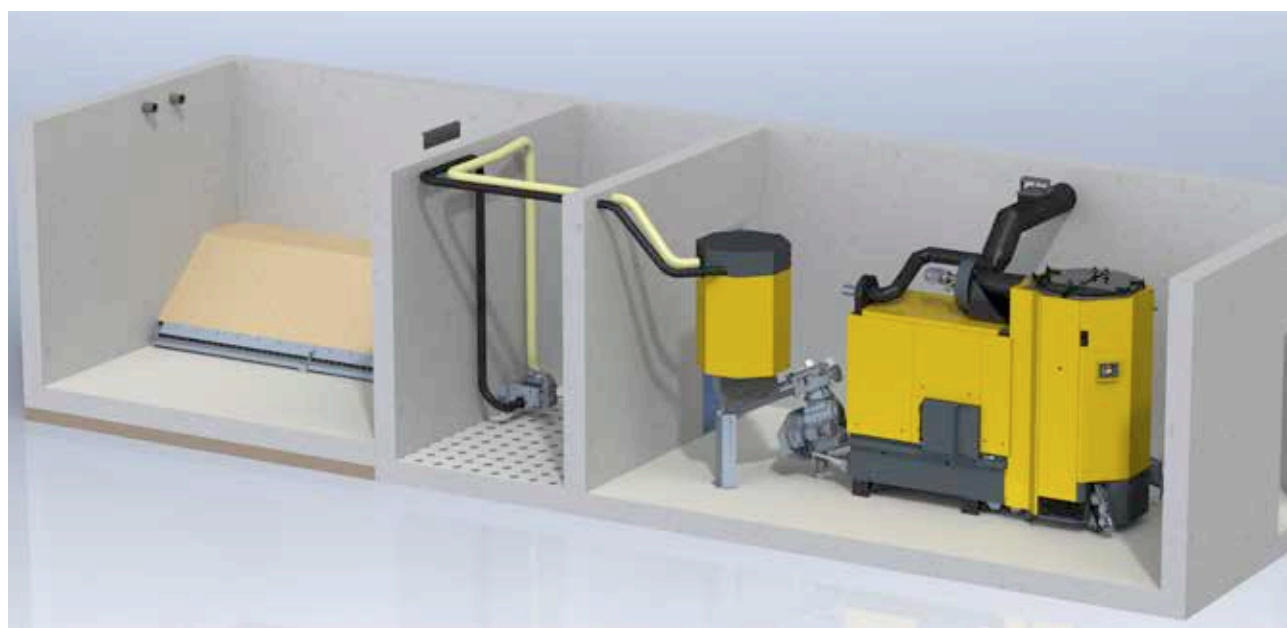
... Pellets, optimised use of limited storage, flexibility for individual applications ...

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Pellet suction unit with horizontal pellet discharge screw*

All ETA wood chip boilers (25-500 kW) can be equipped with a special suction unit with pellet bin, allowing flexibility in the location of pellet store and boiler room.

Distances of up to 20 m and heights up to 3 m can be overcome with a pair of suction and back air hoses.



Direct screw for pellets, low-wearing and efficient*

If the pellet store is adjacent to the boiler room and at the same level or above it, then the ETA pellet

discharge screw offers unbeatable efficiency and low-wear operation.



*With pure pellet discharge conveyor, no wood chip operation is possible.

... Wood chips, harmonizing optimum store volume with easy filling ...

Floor agitator with articulated arms and flat springs, for one or two boilers*

Standard configuration, ideal for underground bunkers, ramps and filling by loader; largest possible effective diameter 6 m, maximum fill height 5 m



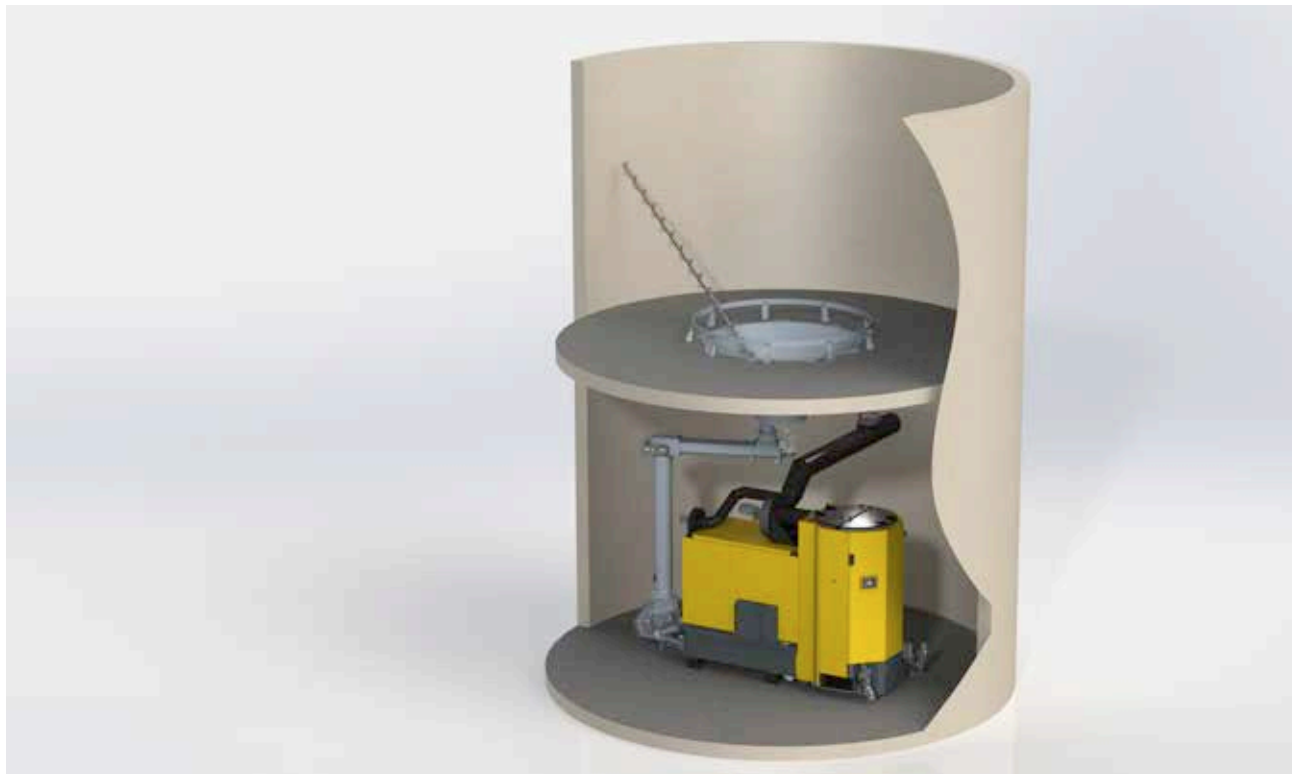
Floor agitator with centred outlet*

Economical configuration, ideal for pneumatically or mechanically filled silos, maximum possible effective diameter 6 m, maximum fill height 5 m



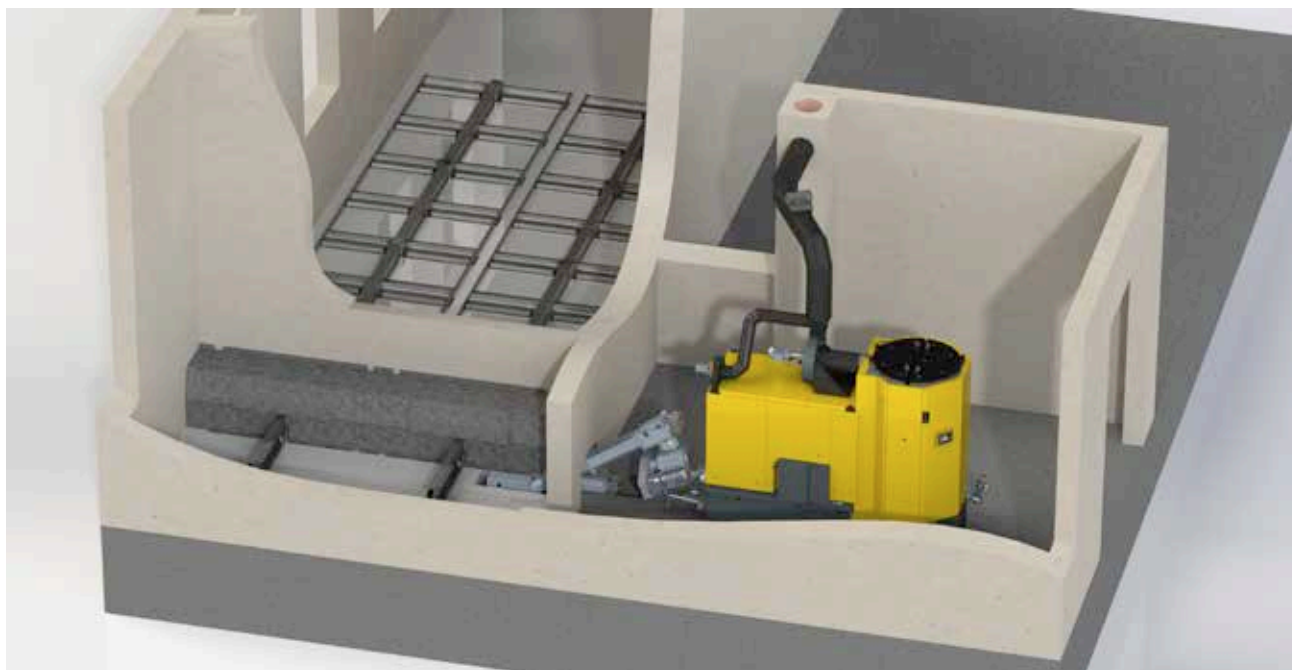
Pivot auger discharge system*

Space-saving configuration, ideal for high, pneumatically filled silos or material with poor flow characteristics; maximum possible working diameter 6 m, maximum fill height 8 m



Moving-floor conveyor**

XXL configuration, ideal for storing large quantities, fast filling with push-off trailers, tippers and overhead cranes, maximum possible push rod width 2 m, up to 3 push rods side by side, maximum fill height 5 m



*With floor agitator systems, pellet operation is also possible with the following limitations:

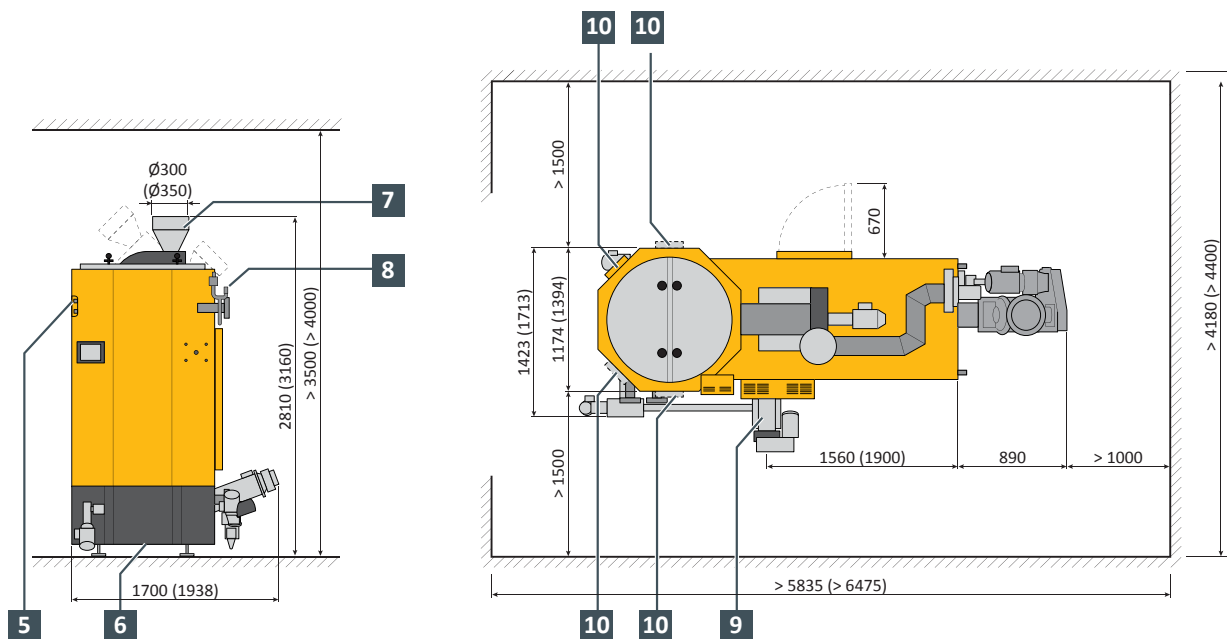
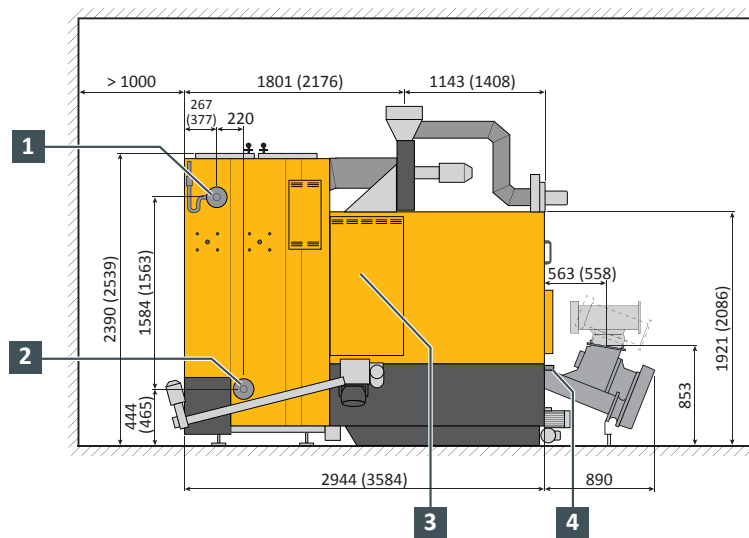
- maximum fill height 2 m, maximum agitator diameter 4 m
- intermediate screw with minimum length of 500 mm needed for fuel dosing with overhead fuel conveyors

**With moving-floor conveyors, pellet operation is conditionally possible in consultation with ETA Heiztechnik GmbH.

Technical data

- | | |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1 Flow with DN65 connecting flange | 6 Drainage outlet R1" (under casing) |
| 2 Return with DN65 connecting flange | 7 Flue tube connector can be pivoted in 45° steps |
| 3 Boiler control system | 8 Connection for safety valve 6/4" outside thread |
| 4 Safety heat exchanger for combustion chamber, connection R1/2" inside thread | 9 Ash removal attachment (left or right) |
| 5 Safety heat exchanger for heat exchanger, connection R1/2" inside thread | 10 ETAtouch screen can be installed at 4 different positions |

Dimensions in parentheses apply for the boilers with 500 kW



WOOD CHIP BOILER VR 333 - 500 kW			333	350	500
Rated capacity	Wood chips M25 BD 150 (W25-S160) Pellets	kW	92 - 333 86 - 333	92 - 350 86 - 360	135 - 499 135 - 499
Efficiency at partial/full load – spruce chips*		%	94,6 / 92	94,6 / 92	94,0 / 93,0
Efficiency at partial/full load – wood pellets*		%	95,1 / 94,2	95,1 / 94,2	93,8 / 93,2
Transport dimensions, combustion chamber 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
Transport dimensions, heat exchanger 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	3.200
Weight of heat exchanger		kg	1.454	1.454	2.000
Weight of one-chamber rotary valve with stoker		kg	211	211	211
Total weight		kg	4.170	4.170	~5.300
Water content		Litres	747	747	1.095
Water-side pressure drop ($\Delta T = 20\text{ }^{\circ}\text{C}$)		Pa / mWs	9.000 / 0,9	9.000 / 0,9	12.000 / 1,2
Flue gas mass flow rate (spruce chips) at partial / full load		g / s	52 / 190 48 / 173	52 / 201 48 / 184	84 / 302 75 / 274
CO ₂ content in dry flue gas, partial/full load*		%	14,9 / 15,4	14,9 / 15,4	14,4 / 14,5
Flue gas temperature, partial/full load*		°C	90 / 145	90 / 150	90 / 140
Flue draught, partial/full load		Pa	>2 / >5	>2 / >5	>2 / >5
Carbon monoxide (CO) emissions* Wood chips, partial/full load		mg/MJ mg/m ³ 13%O ₂	1 / 7 2 / 11	1 / 7 2 / 11	9 / 1 13 / 2
Dust emissions* Wood chips, partial/full load		mg/MJ mg/m ³ 13%O ₂	1 / 5 2 / 8	1 / 5 2 / 8	1 / 7 2 / 10
Unburned hydrocarbons (CxHy)* Wood chips, partial/full load		mg/MJ mg/m ³ 13%O ₂	<1 / <1 <1 / <1	<1 / <1 <1 / <1	<1 / <1 <1 / <1
Carbon monoxide (CO) emissions* Pellets, partial/full load		mg/MJ mg/m ³ 13%O ₂	2 / 2 3 / 3	2 / 2 3 / 3	12 / 7 18 / 10
Dust emissions* Pellets, partial/full load		mg/MJ mg/m ³ 13%O ₂	3 / 13 5 / 20	3 / 13 5 / 20	4 / 10 7 / 16
Unburned hydrocarbons (CxHy)* Pellets, partial/full load		mg/MJ mg/m ³ 13%O ₂	<1 / <1 <1 / <1	<1 / <1 <1 / <1	<1 / <1 <1 / <1
Maximum permissible operating pressure		bar	6		
Temperature adjustment range		°C	70 – 85		
Maximum permissible operating temperature		°C	95		
Minimum return temperature		°C	60		
Boiler class			5 acc. to EN 303-5:2012		
Suitable fuels			Wood chips EN 14961-4, P16-P45 (G30-G50), maximum water content 35%; Pellets EN 14961-2, ENplus A1		
Electrical connection			400 V AC / 50 Hz / 16 A / 3P + N + PE		

* Data from test report by TÜV Industrie Service GmbH



ETA PU PelletsUnit 7 to 15 kW
(7, 11 and 15 kW)



ETA PC PelletsCompact 20 to 32 kW
(20, 25 and 32 kW)



ETA PE-K pellet boiler 35 to 90 kW
(35, 50, 70 and 90 kW)



ETA SH wood gasification boiler 20 to 60 kW
(20, 30, 40, 50 and 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
(20, 25, 35, 50, 70, 90, 130 and 200 kW)



ETA HACK VR wood chip boiler
with moving grate 333 - 500 kW



ETA stratified buffer 500 - 5.000 litres



ETA Hydraulic Interface Units



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Your heating specialist will be happy to advise you:

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