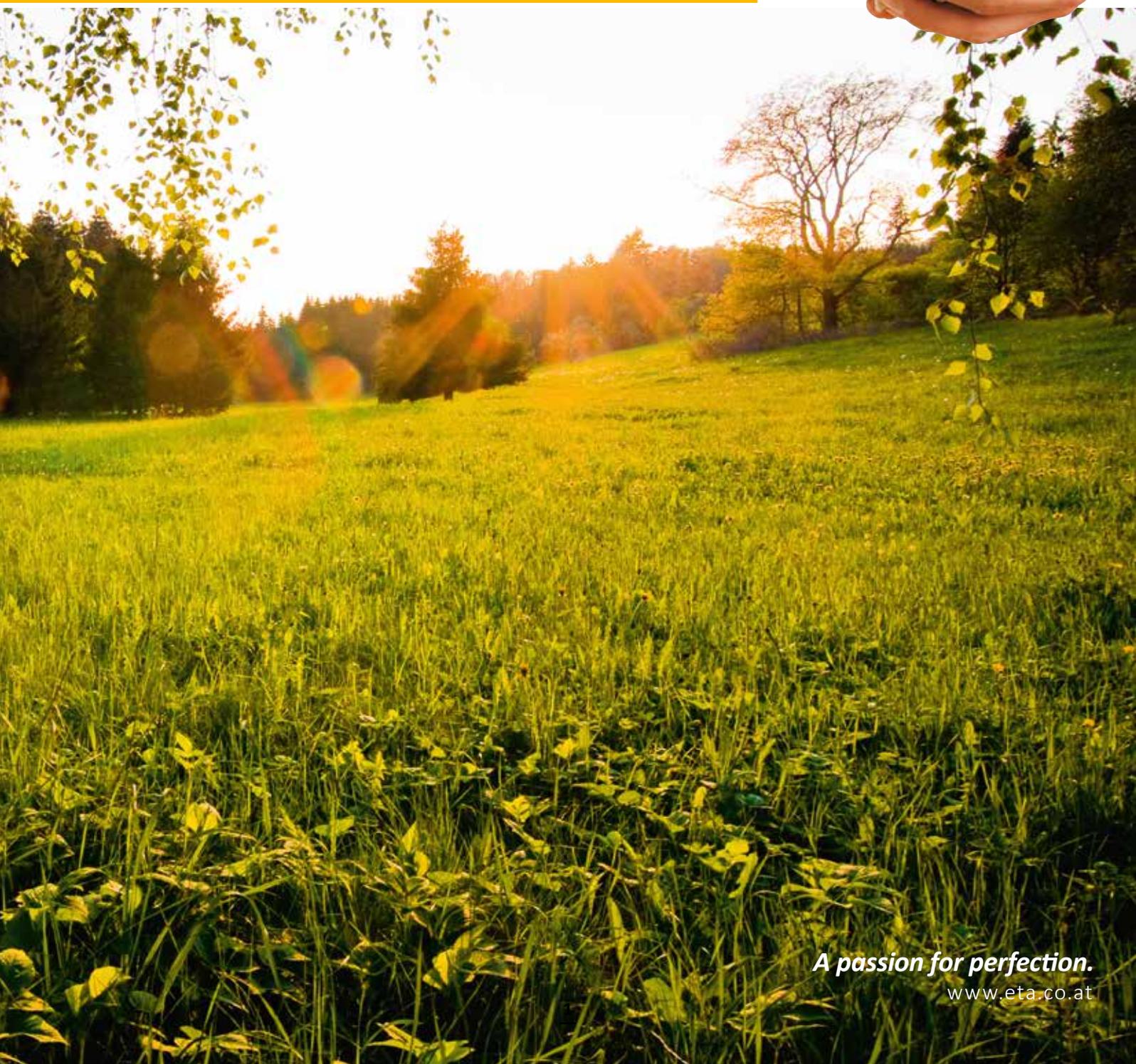




Heat You can Feel and Understand,
Life Energy from Natural Processes



Pellets - the uncomplicated fuel

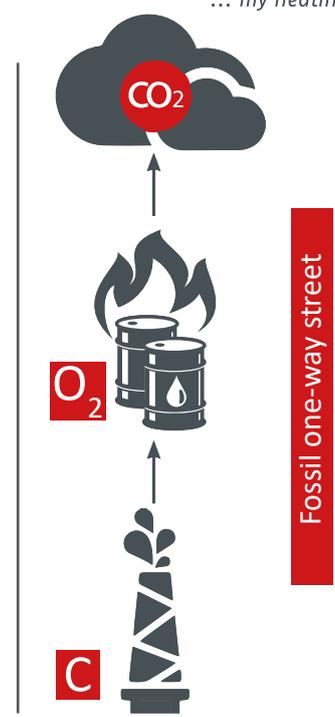
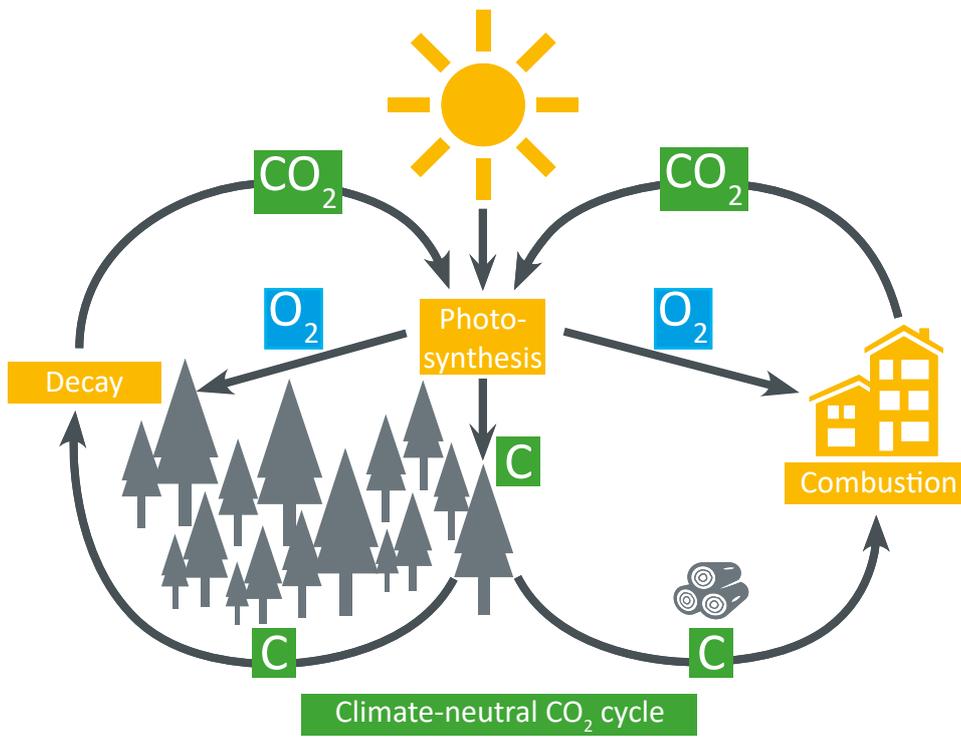
Oil and natural gas are becoming increasingly precious and expensive as a commodity for technical materials. Pellets are an uncomplicated, clean and also cost-effective alternative for heating buildings.

Pellets are transported and stored without major safety expenditures.

Not all wood is suitable for making furniture. Pellets are produced from wood left over from the forest, the sawmill and the natural wood furniture factory. When the trees re-grow, the same amount of carbon dioxide is absorbed from the air that is released into the air through combustion.

By the way: When unused wood decomposes in the forest, it releases the same amount of carbon dioxide that it does when we burn this wood for heat. With a wood heating system, we easily plug into the natural carbon cycle without environmental impact. Wood is stored solar energy and our forests are magnificent sun collectors.





Source: Austrian Biomass Association

Heat from the forest

Why heating with wood is so advantageous

What is biomass?

Everyone has heard the term biomass by now. But what does it really mean? Biomass refers to all organic substances which are biogenic and non-fossil. Examples of biomass include waste wood, shrub cuttings, biowaste, animal manure and many more organic substances. Energy can be derived from all of these raw materials. For heating, wood in its various forms is the standard and most frequently used energy source.

Heating with wood

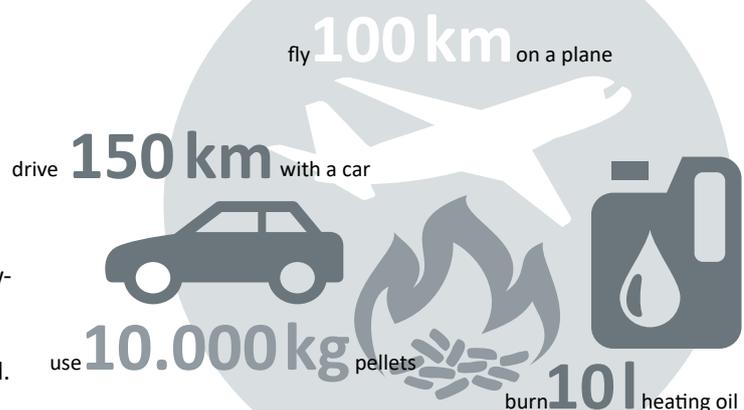
Wood as fuel has proved its worth in the heating sector against other biomass raw materials for various reasons. On the one hand, the energy requirement and the effort for the further processing and transport of the wood are very low, even with pellets. Another reason why wood is an established fuel is its chemical composition with low-emission combustion. Compared to other biomass raw materials, availability and climate neutrality are important factors in the popularity of wood as a fuel.

Environmentally friendly and CO₂-neutral

Everyone knows by now why burning fossil fuels, such as oil and gas, is not preferable. The procurement of crude oil and gas is very energy- and cost-intensive, as is the further processing of the final heating medium. Moreover, fossil fuels are not climate-neutral. This means they intensify the greenhouse effect and contribute to climate warming.

The natural raw material wood is CO₂-neutral, which means that during its combustion no more CO₂ will be released than the tree took in 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.

about 30 kg CO₂ are emitted when you



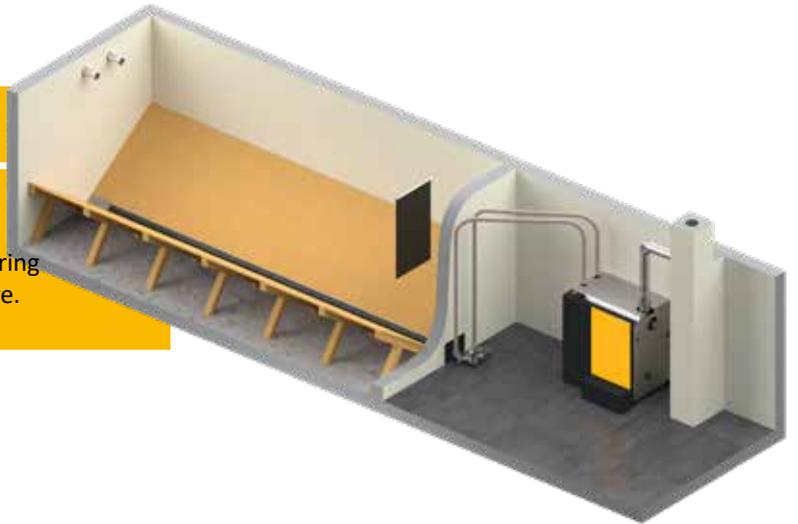
Any building can accommodate pellets

Select the best places in the building for the boiler and the storage area. Every ETA pellet boiler can suck in the pellets from a distance of 20 m with its vacuum turbine.

Differences in height can also be easily overcome with screw discharges. Only two flexible 50 mm hoses are required to connect the boiler to the storeroom.

ETA discharge screw

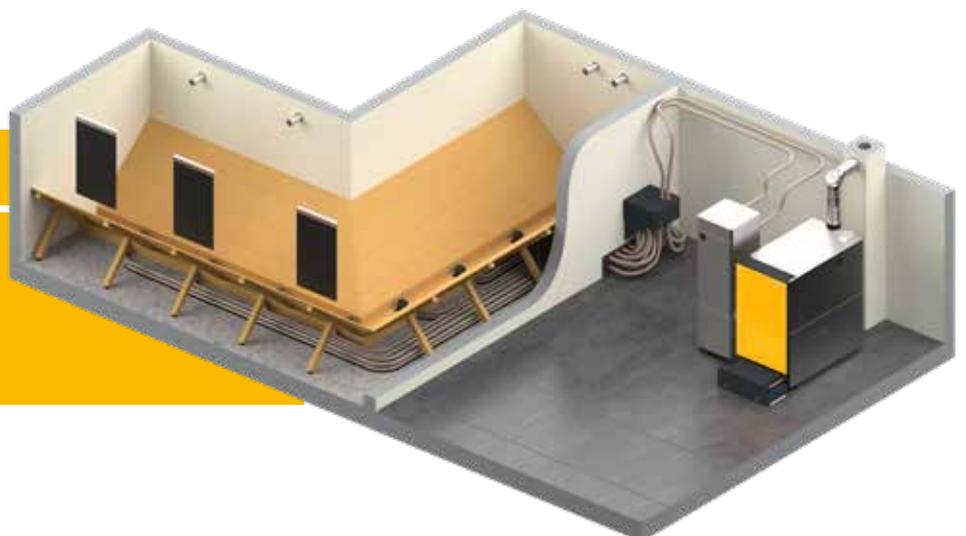
...our standard system for safe fuel supply during operation and complete discharge of the store.



ETA suction probes with automatic switching

...even unfavourable room shapes can be used for pellet storage. With the suction probes, nearly all rooms can be used as a pellet store, even if the storeroom is angular. Up to eight probes can be used for larger storerooms.

Up to eight probes can be used for larger storerooms.

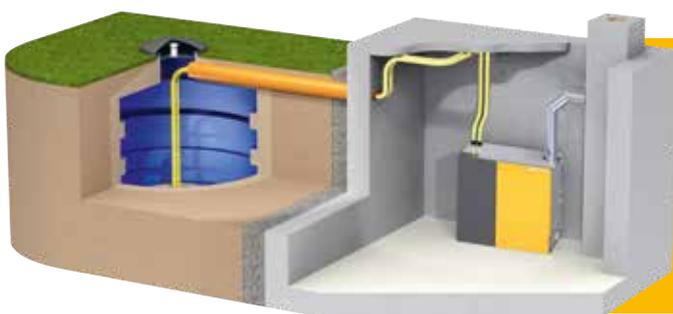




With the E3 mole conveying system, the storage space can be almost completely emptied and the sloping wooden structure is eliminated.

ETAbox

...is a practical solution for pellet storage. It enables setting up in the boiler room, in the attic or in larger storage areas.



Underground tank

...specialised companies offer underground pellet tanks when there isn't any space available in the house. For example by www.geoplast.com



ETA info: for larger boilers

... we can connect up to four conveying systems, either discharge screws or ETAboxes to one large boiler via the fully automatic switching unit.

Storeroom with discharge screw flex - the proven standard

Advantages:

- **Individually adaptable**
By simply shortening the channel and auger, the ETA Flex discharge can be easily adapted to a wide variety of room lengths.
- Optimal adaptation to the storage room length through on-site shortenable channel and auger screw
- With the screw reaching over the entire length of the storeroom, the storeroom is emptied completely.
- Safe conveying during operation is guaranteed. The screw also continuously removes dust from the storeroom.
- The storeroom itself is dust-proof, a clean solution.
- Larger height differences, up to two storeys, are possible between boiler and storeroom . By separating the conveying system and pneumatic transport, it is possible to clear out the hose line by letting the vacuum turbine run at the end of the conveying operation. This safely prevents the bends below the ascending sections of the hose from clogging.
- An existing oil tank room can be optimally converted into a pellet store.
- The pellet transport accelerates through the self-contained system (return air transfers directly into the suction hose)
- The screw doses the pellets evenly and loosely to the suction nozzle; this guarantees short suction times.

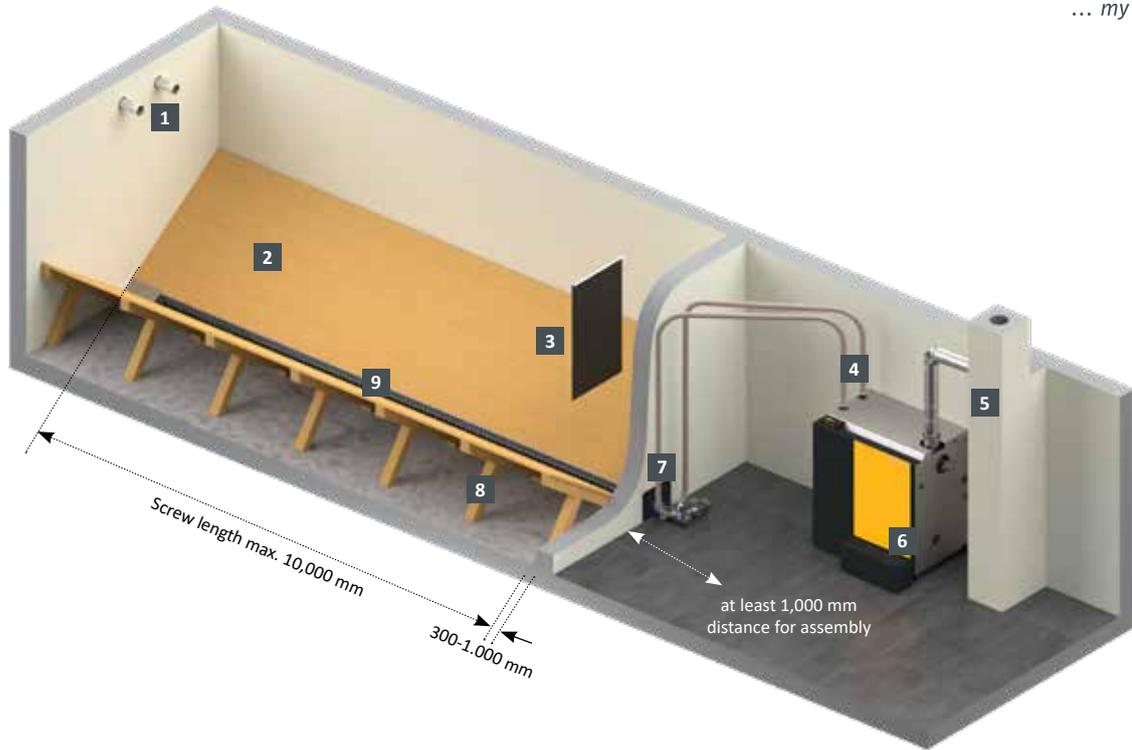
Requirements:

- The storeroom can be up to 10 m long.
- The boiler room should be on the small side of the storeroom in order to achieve better utilisation of the room with a screw in the longitudinal direction. The basic pellet discharge channel set to which the hoses are connected can also be installed in a side room next to the narrow side of the storeroom.
- The storeroom should be dry. If walls tend to accumulate temporary moisture, a rear-ventilated wooden front cover can help significantly.
- If the forces from the tilted floor construction are directed into the floor, then 10 cm of reinforced concrete, 17 cm of tiles or a post-and-beam wall with 12 cm bars (distance 60 cm, both sides planed with 2 cm of wood) is sufficient for the walls.



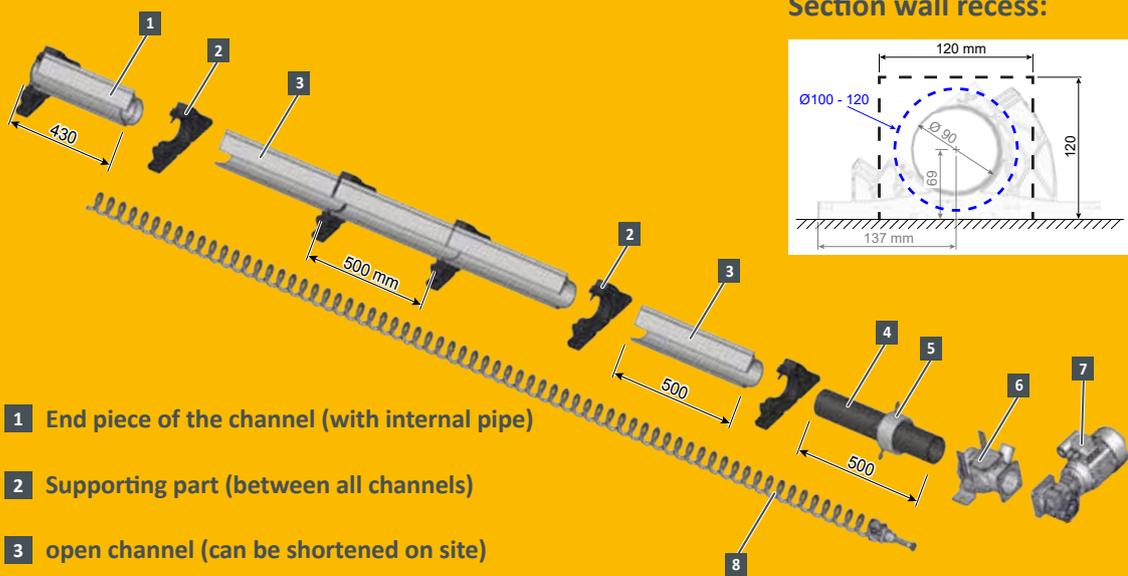
If the storeroom length is greater than 3 m and the discharge head cannot be mounted on either of the two small sides outside of the storeroom, a different storage system should be selected (e.g. ETA suction probes or ETAbbox).





- | | | |
|--|----------------------------------|---|
| 1 Back air and filling nozzles | 4 Suction and return line | 7 Auger screw drive and pellet transfer unit |
| 2 Inclined construction with smooth surface (40°) | 5 Chimney | 8 Wooden substructure |
| 3 Impact protection mat | 6 ETA pellet boiler | 9 Open channel with coreless auger screw |

Modular discharge screw system from ETA



- | | |
|--|--|
| 1 End piece of the channel (with internal pipe) | 6 Transfer coupling |
| 2 Supporting part (between all channels) | 7 Conveying system drive |
| 3 open channel (can be shortened on site) | 8 Shaftless screw conveyor (can be shortened on site) |
| 4 Wall duct for maximum 300 mm thick walls (can be shortened on site) | |
| 5 Fire protection sleeve (for the wall duct from the pellet store to the installation room) | |

With four suction probes, almost every room can be used for pellet storage

Advantages:

- With the suction probes, nearly all rooms can be used as a pellet store, even if the room is difficult to access.
- Suction probes with automatic switching guarantee high operational reliability. If one probe fails, heating can continue with the remaining probes without restriction.
- The storeroom itself is dust-proof, a clean solution.
- An existing oil tank room can be converted into a pellet store.
- Lower structure-borne noise in the neighbouring rooms than with discharge screws. Recommended for larger systems in residential buildings

Requirements:

- The storeroom may not be longer than 4 m.
- The storeroom must be on the same level as the boiler or on the storey above it to keep the vertical transport path to a minimum.
- The storeroom should be dry. If walls tend to accumulate temporary moisture, a rearventilated wooden front cover can help. This keeps the ingress of moisture into the pellets to an acceptable minimum.
- If the forces from the tilted floor construction are directed into the floor, then 10 cm of reinforced concrete, 17 cm of tiles or a post-and-beam wall with 12 cm bars (distance 60 cm, both sides planked with 2 cm of wood) is sufficient for the walls.



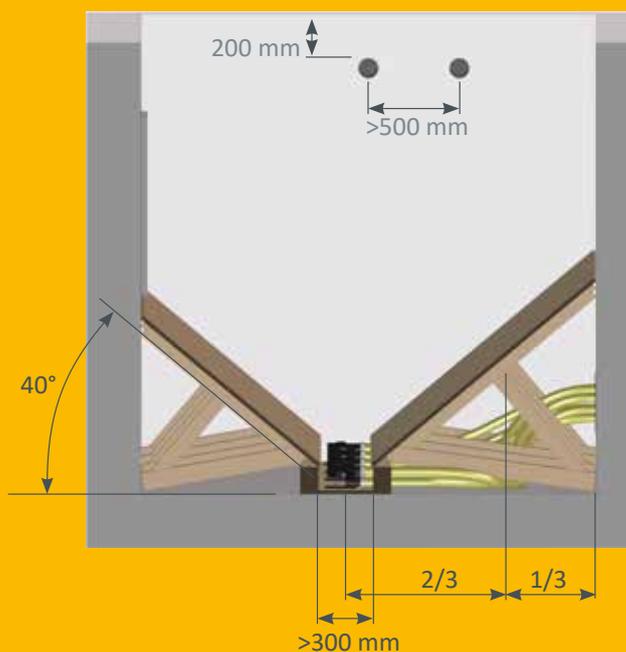
- A suction probe system is not ideal for installation situations where the storeroom is on the storey below the boiler.
- The suction probes will not completely empty the storeroom and pellets will become stuck between the individual probes. When the storeroom capacity is tight, this can be a disadvantage.



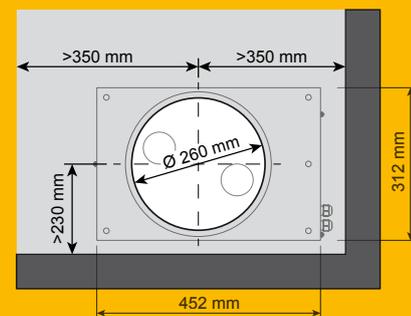


- | | | |
|--|----------------------------------|-----------------------------------|
| 1 Impact protection mat | 4 Suction and return line | 7 Automatic switching unit |
| 2 Inclined construction with smooth surface (40°) | 5 Chimney | 8 Suction probes |
| 3 Pellet nozzles for filing and back air | 6 ETA pellet boiler | |

Pneumatic conveying system with suction probes



Section wall recess:



A suitable solution even for larger storerooms

Advantages:

- With the suction probes, nearly all rooms can be used as a pellet store, even if the room is difficult to access.
- Suction probes with automatic switching guarantee high operational reliability. If one probe fails, heating can continue with the remaining probes without restriction.
- The storeroom itself is dust-proof, a clean solution.
- An existing oil tank room can be converted into a pellet store.
- Lower structure-borne noise in the neighbouring rooms than with discharge screws. Recommended for larger systems in residential buildings

Requirements:

- The storeroom must be on the same level as the boiler or on the storey above it to keep the vertical transport path to a minimum.
- The storeroom should be dry. If walls tend to accumulate temporary moisture, a rear-ventilated wooden front cover can help. This keeps the ingress of moisture into the pellets to an acceptable minimum.
- If the forces from the tilted floor construction are directed into the floor, then 10 cm of reinforced concrete, 17 cm of tiles or a post-and-beam wall with 12 cm bars (distance 60 cm, both sides planked with 2 cm of wood) is sufficient for the walls:



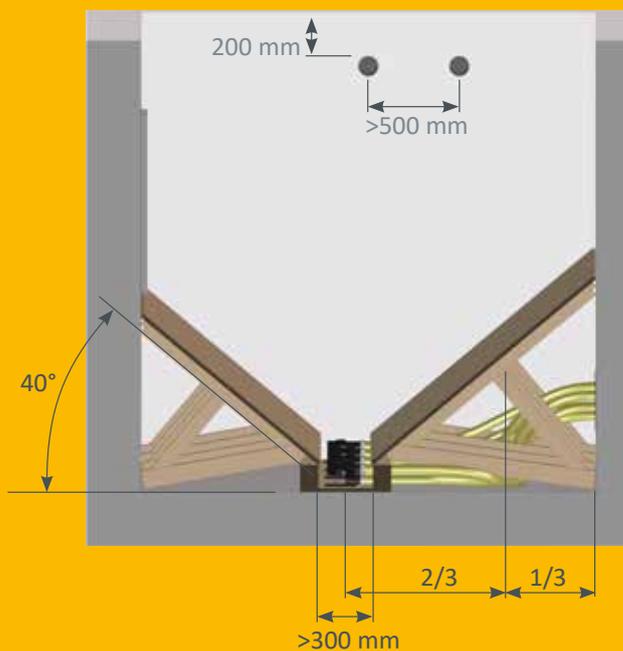
- To find an optimal solution for larger storage volumes, contact ETA Heiztechnik GmbH.
- A suction probe system is not ideal for installation situations where the storeroom is on the storey below the boiler.
- The suction probes will not completely empty the storeroom and pellets will become stuck between the individual probes. When the storeroom capacity is tight, this can be a disadvantage.



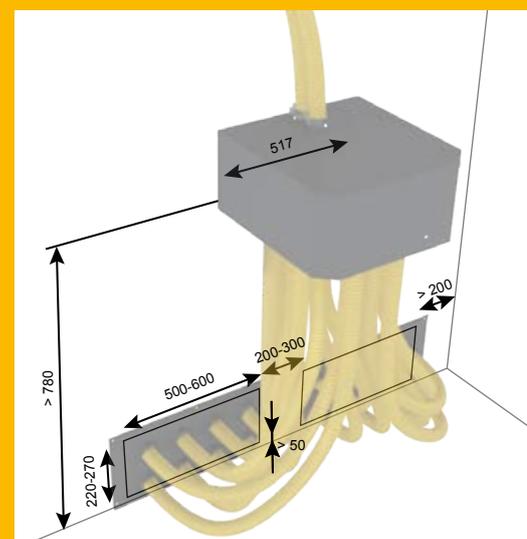


- | | | |
|--|----------------------------------|-----------------------------------|
| 1 Impact protection mat | 4 Suction and return line | 7 Automatic switching unit |
| 2 Inclined construction with smooth surface (40°) | 5 Chimney | 8 Suction probes |
| 3 Pellet nozzles for filing and back air | 6 ETA pellet boiler | |

Pneumatic conveying system with suction probes



wall recess



Removal from the top - without sloping floor

Advantages:

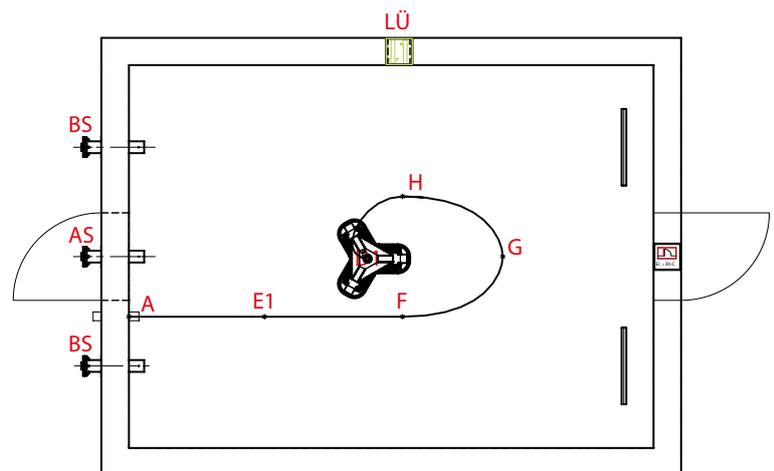
- Removal from above, so no slopes required
- Near-complete utilization of the room volume
- The storeroom itself is dust-proof; a clean solution
- A pre-existing oil tank room can be converted into a pellet store



- To find an optimal solution for larger storage volumes, contact ETA Heiztechnik GmbH.
- The arrangement of the inlet nozzle must be strictly adhered to, as incorrect installation can lead to damage to the mole.

Requirements:

- The storeroom must be on the same level as the boiler or on the storey above, in order to keep the vertical transport path to a minimum
- The storeroom should be dry. If walls have a tendency to accumulate temporary moisture, a rear-ventilated wooden front cover can help. This keeps the ingress of moisture into the pellets to an acceptable minimum
- Maximum working area of the E3 pellet mole is 36 m² with a ceiling height of 2.5 m, or 16 m² with a room height of 3.5 m
- Minimum width of the storage room must be 2.5 m, the maximum length is 8 m for room heights between 1.7 m and 3.5 m



Customized planning according to structural conditions.





- | | | |
|--|----------------------------------|-----------------------------------|
| 1 Impact protection mat | 3 Suction and return line | 6 Mole E3 |
| 2 Pellet nozzles for filling and back air | 4 Chimney | 7 Automatic lifting device |
| | 5 ETA pellet boiler | |

E3 mole conveying system



- | | | |
|---|--|---------------|
| 1 Spring balancers for guiding the pellet hose | 3 Connection box for mole and lifting module | 5 Mole |
| 2 Lifting module for the mole | 4 Flexible pellet hose with attached electrical wire for the mole | |

ETAbOX - for a small pellet store in a large space

Advantages:

- The ETAbOX can either be set up in a boiler room or a storage room, in a barn or even in a loft. Outdoor installation is also possible if the ETAbOX is protected from the sun and rain.
- The ETAbOX protects the pellets thanks to its design, even in high water. As a result, water ingress in the storeroom and moisture in the walls does not necessarily mean damage to the pellet stock.
- An ETAbOX enables dry storage of the pellets even if the walls in the installation space are moist.
- The ETAbOX is a complete modular system that can be set up by two people in a short amount of time and without having to build a wall or hire a carpenter.
- The smooth container base made of galvanised steel sheet and a discharge screw ensures safe conveying during operation. The screw also continuously removes dust from the storeroom.
- Larger height differences, up to two storeys, are possible between boiler and storeroom. By separating the conveying system and pneumatic transport, it is possible to clear out the hose line by letting the vacuum turbine run at the end of the conveying operation. This safely prevents the bends below the ascending sections of the hose from clogging.

Requirements:

- Storage of the pellets in the boiler installation room must be permitted in accordance with building regulations.
Germany: In most German states, up to 6.5 tonnes of pellets can be stored in the boiler installation room (maximum 50 kW).
Austria: The latest amendments to building laws allow the storage of up to 15 m³ of pellets in the boiler room in individual Austrian States (e.g. Upper Austria).
Switzerland: Up to 10 m³ of pellets can be stored in separate boiler rooms (EI60); the clearance from the boiler must be 1 m. Country-specific regulations must be observed.
- During filling, the dusty conveyor air is sucked from the ETAbOX using a ventilator on the tank truck. Therefore, air must be able to flow through a window or a door into the room.
- If the container is installed on a floor above the first storey, the situation should be evaluated by a construction expert. If necessary, the load can be integrated directly into the load-bearing walls with three steel beams beneath the ETAbOX.

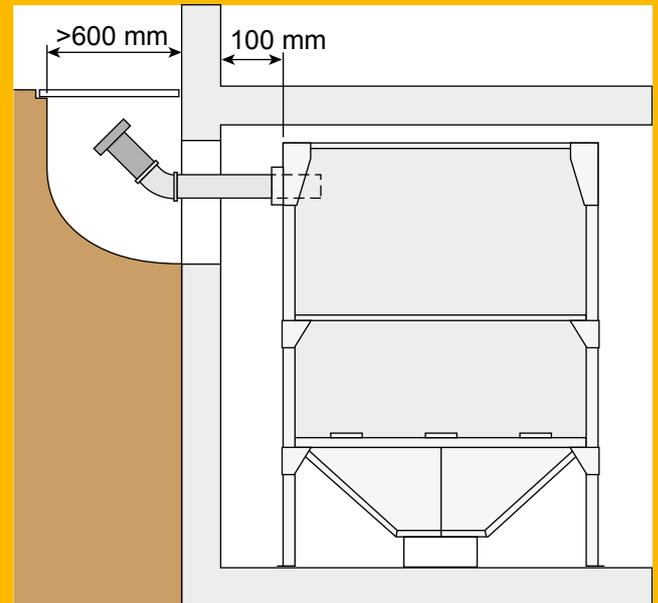
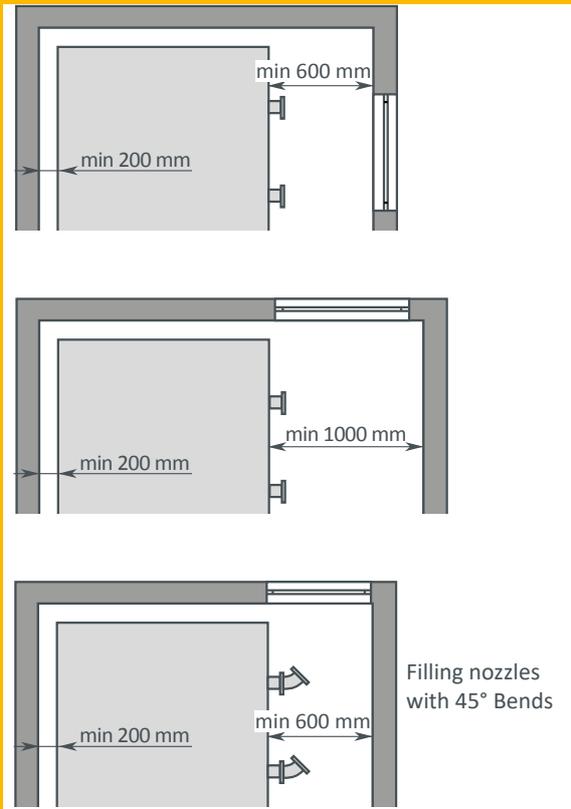


Due to the required clearance to the wall around the ETAbOX, the space requirement is a bit larger than it is for a store made from masonry.





- 1** Suction and return line
- 2** Chimney
- 3** ETA pellet boiler
- 4** ETAbox

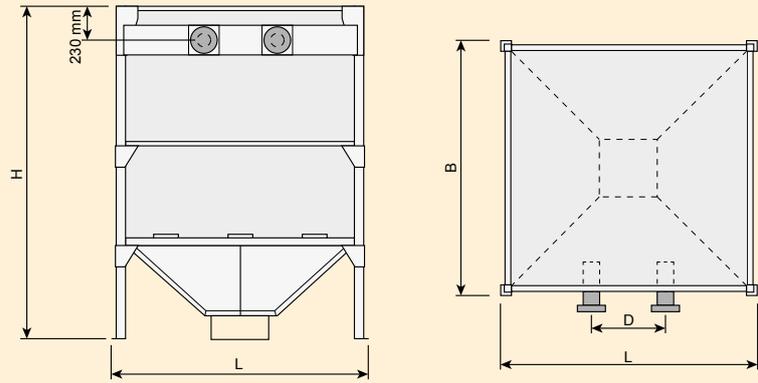


As standard, all ETAboxes ship with two filling nozzles. ETAboxes 17/29 and 21/29 can either be filled from the longitudinal side or the broadside. A third filling nozzle for the longitudinal side is optionally available. An optional third nozzle is also possible for ETAbox 29. The additional filling nozzle is recommended for achieving better filling.

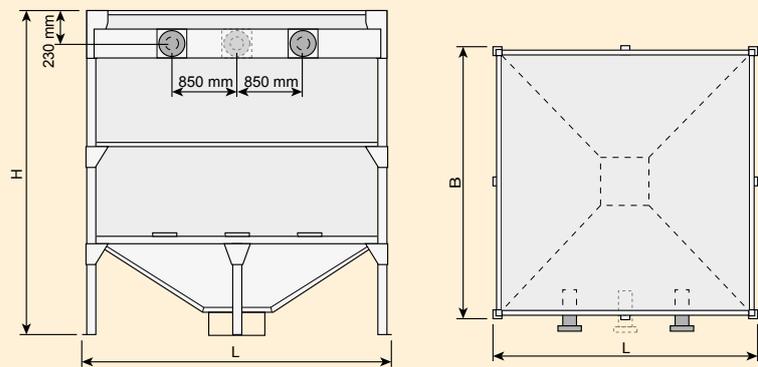
TECHNICAL DATA FOR ETABOX SPEED

Measurements

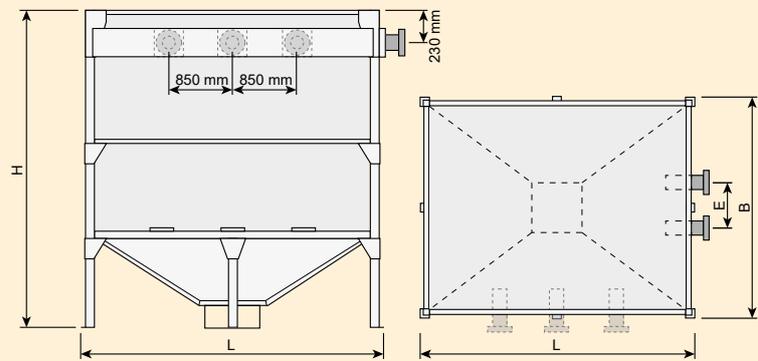
ETAbox Speed 12 - 25



ETAbox Speed 29



ETAbox Speed 17/29, 21/29, 25/29



Dimensions and data	ETAbox 12		ETAbox 17		ETAbox 21		ETAbox 25		ETAbox 29		ETAbox 17/29		ETAbox 21/29		ETAbox 25/29	
	m ³	to														
Length (L) in mm	1.200		1.700		2.100		2.500		2.900		2.900		2.900		2.900	
Width (W) in mm	1.200		1.700		2.100		2.500		2.900		1.700		2.100		2.500	
Height (H) adjustable in increments of 100 mm	1.800 - 2.500										1.900 - 2.500					
Clearance between the filling nozzles (D) in mm	500		500		500		900		-							
Distance between the filling nozzles (E) in mm	-		-		-		-		-		500		500		900	
Storage volume at	m ³	to														
H = 1.800 mm	1,7	1,1	3,2	2,1	4,4	2,8	6,4	4,2	-	-	-	-	-	-	-	-
H = 1.900 mm	1,8	1,2	3,5	2,3	4,9	3,1	7,0	4,6	9,4	6,1	5,6	3,6	6,6	4,3	7,7	5,9
H = 2.100 mm	2,1	1,4	4,1	2,7	5,8	3,7	8,3	5,4	11,0	7,1	6,5	4,2	7,8	5,1	8,9	6,6
H = 2.500 mm	2,6	1,7	5,4	3,5	7,7	5,0	10,9	7,0	14,1	9,2	8,3	5,4	10,2	6,6	11,4	7,9

The most important pellet data

Since the heating value of different types of woods differ fractionally on a weight basis, the following formula applies as a rule of thumb: 1 litre of heating oil = 2 kg pellets

Typical data for pellets	
Calorific value	4.9 kWh/kg
Bulk weight	650 kg/m ³
Diameter	6 - 8 mm
Length	5 - 48 mm
Water content	< 10 %
Ash content	< 0.7 %
Raw material	Natural wood shavings and sawdust
Energy required for manufacture	approx. 2 - 3% of the energy content
Additives	no chemical additives but just natural pressing aids (thickness < 2%)

Visit the "Products" page at www.eta.co.at for a heating cost comparison.

How big does my storeroom have to be?

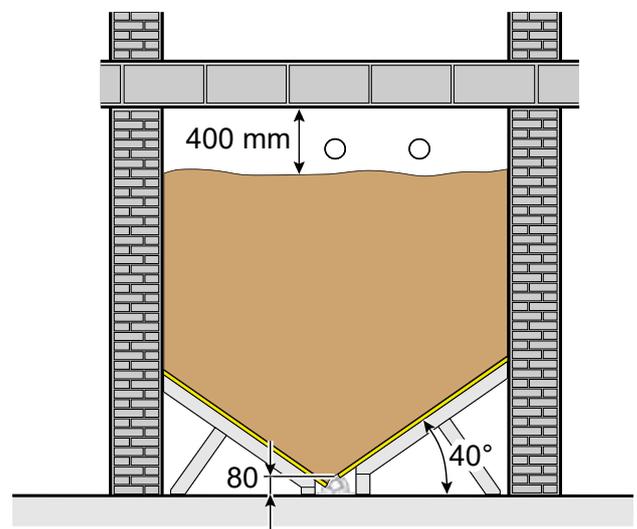
The approximate pellet requirement per year in tonnes is calculated by dividing the heating load in kilowatts by 3. To calculate the pellet requirement in cubic meters, divide the heating load by 2. So, for example, for 30 kW heating load you need approx. 10 tonnes or 15 m³ pellets per year, respectively.

When moving from another energy source to pellets, the pellet requirement can also be determined from the previous consumption. 1 tonne of pellets roughly corresponds to:

- 500 l heating oil
- 520 m³ natural gas
- 750 l liquid gas
- 600 kg coke
- 1,400 kWh current for geothermal heat pumps (in normal operation 3.4)
- 2,700 kWh current for air heat pumps (in normal operation 1.8)

Determining the usable storage volume

Due to the 40° tilted floor required in the store, room widths greater than 3 m offer little or no additional useful volume for rooms of normal height (this also applies for conveyors with suction probes).



Usable cross-section of pellet storeroom in square metres

40° floor tilt, upper clearance of 0.40 m, 0.08 m below for screw

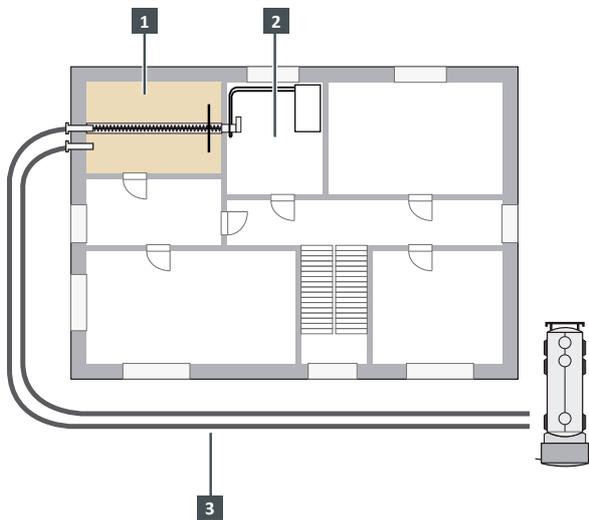
	Height of the storeroom in metres							
	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4
2.0	2,20	2,60	3,00	3,40	3,80	4,20	4,60	5,00
2.2	2,33	2,77	3,21	3,65	4,09	4,53	4,97	5,41
2.4	2,44	2,92	3,40	3,88	4,36	4,84	5,32	5,80
2.6	2,53	3,05	3,57	4,09	4,61	5,13	5,65	6,17
2.8	2,61	3,17	3,73	4,29	4,85	5,41	5,97	6,53
3.0	2,67	3,27	3,87	4,47	5,07	5,67	6,27	6,87
3.2	2,72	3,36	4,00	4,64	5,28	5,92	6,56	7,20
3.4	2,75	3,43	4,11	4,79	5,47	6,15	6,83	7,51
3.6	2,76	3,48	4,20	4,92	5,64	6,36	7,08	7,80
3.8	2,76	3,51	4,27	5,03	5,79	6,55	7,31	8,07
4.0	2,76	3,53	4,33	5,13	5,93	6,73	7,53	8,33

Cross section x room length (screw axis) = pellet storage volume
 Pellet storage volume x 0.650 t/m³ = pellet store in tonnes

Delivery of pellets

The pellets are delivered by a tank truck and blown into the storeroom. The tank trucks usually have a pump hose with a length of up to 20 m. If you need a longer pump hose, ask about your pellet supplier's technical capabilities.

Vehicle access area should be at least 3 m wide and 4 m high. The tank truck can only back up if the street and gate are wide enough.



- 1 Pellet store
- 2 Boiler room/installation room of the boiler
- 3 Filling hoses of the tank truck

Position of pellet store and boiler room

If possible, the pellet storeroom should adjoin an outer wall since the filling nozzle should be accessible from outside. For an interior storeroom, the blower and back air pipes should be extended to the outer wall.

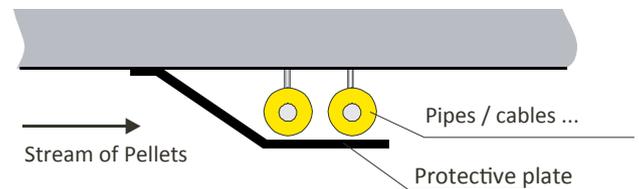
Correct placement of the pellet store

Placement of the storeroom is crucial for satisfactory operation. For this reason, do not place the pellet store underneath or in the immediate vicinity of bedrooms, otherwise, the noises that occur during operation could be transferred into these rooms.

No cables/pipes in the pellet store

In the pellet store, there should be no water pipelines or electrical cables. Water from a broken pipe would cause the pellets to swell up. Uninsulated parts and electrical installations in the pellet store are prohibited.

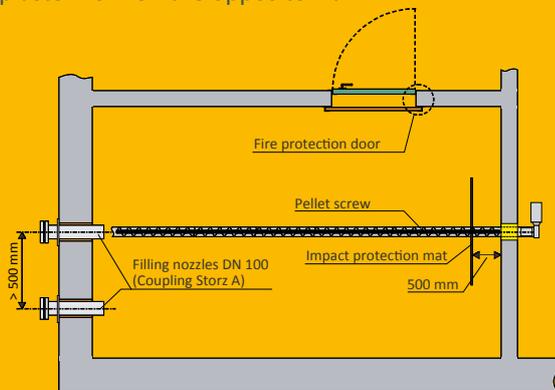
Existing cold water pipes that can only be removed with unreasonable effort must be insulated against condensation to ensure that the pellets cannot be damaged by dripping condensation. Pipelines must be shielded. A protective plate is required if the pipeline is in the path of the pellets.





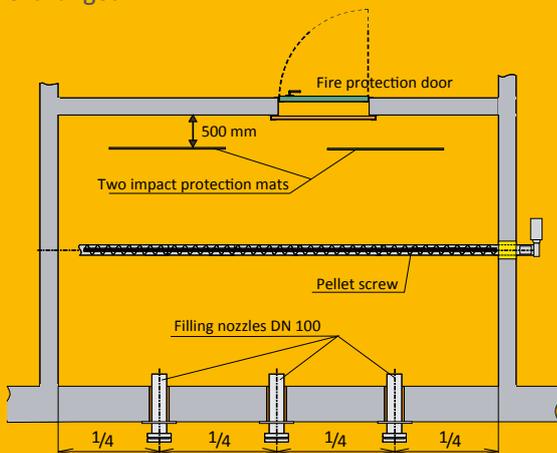
Installing the filling nozzles on the narrow side of the pellet store

Two nozzles are installed in the narrower outside wall (preferably) of the storeroom. one (centred) for blowing in the pellets and the other (to the side) for back air. Opposite the central nozzle, an impact protection mat is installed to prevent damage to both pellets and the plasterwork on the opposite wall.



On the longitudinal side of the pellet store in exceptional cases only

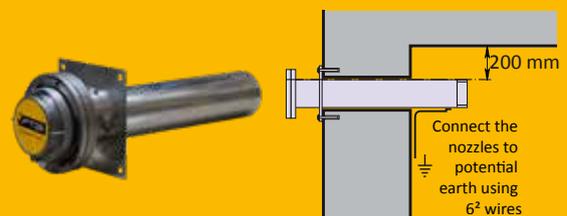
In exceptional cases, when the narrow side of the storeroom is not accessible from the outside, the filling nozzles may be positioned on the longitudinal side. Each half of the room needs its own nozzle with opposite impact protection mat. The disadvantage is that halfway through the injection process, the hoses must be exchanged.



Installing the filling nozzles

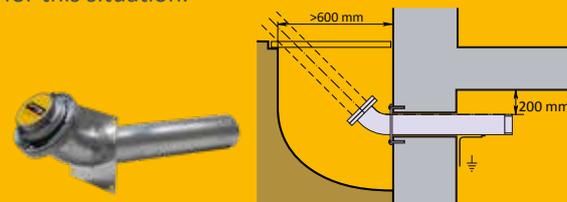
The filling nozzles must be firmly anchored in the wall so they can withstand the movements of the hoses from the delivery vehicle and cannot rotate when the hoses are attached. They should be mounted horizontally **200 cm under the ceiling of the pellet store**, so that the pellets are not blown against the ceiling. To install the filling nozzles in smooth holes or sewer pipe cut-outs so they cannot twist, the ETA filling nozzles are equipped with a flange that transfers the forces directly into the wall via four plug screws.

ETA filling nozzles with 100 mm diameter fit exactly in the cut-outs made for fitting a sewer pipe with 110 mm outside diameter. The small gap between nozzle and wall can be sealed with silicone; for larger gaps, foam is used.



Filling nozzles below ground level

If the filling nozzles are installed below ground in an area, ensure that the hose can be led out of the shaft in a straight line. Angled filling nozzles are available for this situation.





ETA Pelletboiler

ETA PU PelletsUnit	7 - 15 kW
ETA ePE pellet boiler	7 - 32 kW
ETA PC PelletsCompact	20 - 105 kW
ETA ePE-K pellet boiler	100 - 240 kW



ETA condensing heat technology

ETA ePE BW pellet boiler	8 - 36 kW
ETA BW condensing heat exchanger PU	7 - 15 kW
ETA BW condensing heat exchanger PC	20 - 105 kW



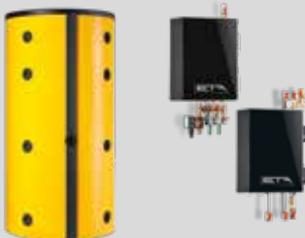
ETA SH log wood boiler and TWIN pellet boiler

ETA eSH log wood boiler	16 - 20 kW
ETA eSH-TWIN combination boiler with ETA eTWIN pellet boiler	16 - 20 kW 16 kW
ETA SH log wood boiler	20 - 60 kW
ETA SH-P log wood boiler with ETA TWIN pellet boiler	20 - 60 kW 20 - 50 kW



ETA wood chip boiler

ETA eHACK wood chip boiler	20 - 240 kW
ETA HACK VR wood chip boiler	250 - 500 kW



ETA buffer tank

ETA buffer	500 l
ETA buffer tank SP	600 - 5.000 l
ETA buffer tank SPS	600 - 1.100 l

ETA hydraulic modules

- ETA fresh water module
- ETA stratified charging module
- ETA system separation module
- ETA mixing circuit module
- ETA heat transfer module and station

Your heating specialist will be happy to advise you:



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