



# PLANNING PORTFOLIO

PZ65RL / PZ100RL / PZ101RL

**DCC**  
dual combustion control®

*Biotech*  
THE FUTURE OF HEATING

Only start-up the heating system after having read this assembly instruction manuals thoroughly!

## Note

If you require customer service, please have the serial number as well as the exact system type ready. You can find this information on the identification plate, which is located on the pellet daily tank.

Type / Modell	System type	Serial number
Seriennummer / Numéro de série / Serie nr Seriennummer / Serial number / Seriennummer	<b>TopLight M</b>	
Baujahr / Année de fabrication / Tillverkningsår Bouwjaar / Year of construction / Produktionsår	2010	20002001004430
Kesselklasse / Classification chaudière / Pannklass Ketelclassificatie / Boiler category / Kjeleklasse	3	
Brennstoff / Combustible / Bränsle Brandstof / Combustible / Brensel	Pellets EN14961-2/A1,A2-Ø6mm	
Nennwärmeleistung / Puissance nominale / Nominell effekt Nominaal Vermogen / Nominal work load / Nominell effekt	14,9 kW	
Maximaler Betriebsdruck / Pression de service max. / Max. driftstrykk Max. bedrijfsdruk / Max. operating pressure / Max. driftstrykk	3,0 bar	
Maximale Betriebstemperatur / Temp. de service max. / Max. drifttemperatur Max. bedrijfstemperatuur / Max. operating temperature / Max. drifttemperatur	90° C	
Wasserinhalt / Volume d'eau échangeur / Vattenvolym Waterinhoud / Water content / Vannvolum	60 ltr.	
Elektrische Aufnahme / Alimentation électrique / Elektrisk anslutning Elektrische Opname / Electrical consumption / Elektrisk tilkobling	230VAC, 50Hz, 16A, max. 1600W	
Typenprüfung / Homologation / Typgodkjend Typekeuring / Sample Testing / Typegodkjent	TÜV BAYERN SZA, Technische Prüf GmbH A-1030 Wien, Österreich (laut DIN EN 303-5) Nr. K44042	
Biotech Energietechnik GmbH Furtmühlstraße 32 * AT-5101 Bergheim Tel. +43 / 662 / 454072-0 * Fax +43 / 662 / 454072-50 www.pelletsworld.com * office@pelletsworld.com	<b>DCC</b> dual combustion control™	<b>CE</b>

This figure is a symbol image and does not necessarily correspond to the system type described in the present instruction manual.

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## 01 General Information

- Our customer service or an authorized specialist contractor must carry out assembly, installation, and initial start-up (setting) of our pellet heating system.
- Recommendation: For long burner run times, for reducing start-stop-emissions and for reducing maintenance costs: fit boiler with buffer store, thermosyphon buffer store or combination store. If the heating load is less than 50% of the rated boiler output, then the boiler must be fitted with a buffer store, thermosyphon buffer store or a combination store. In practice, buffer sizes between 40 and 75 litres/kW have been proved effective. Note specific regional rules for buffer stores. (N.B.: for pellet heating with an output of 65 kW, a buffer store of at least 1,500 litres is essential and with an output of 100 kW, the buffer store must hold at least 2,000 litres.)
- Use only those fuels recommended by us - wood pellets pursuant to EN 14961-2, Class A1+ A2 (Ø 6 mm). Only in this way can low-emission, economic, and trouble-free operation of your pellet heating system be ensured. Non-compliance will result in voiding of the guarantee.
- At regular intervals, perform the maintenance and cleaning procedures recommended by us in the manual for your pellet heating system. When this is done you not only ensure the functional reliability of the system and its safety systems, but also efficient, low-emission operation of the system. You achieve the best care of your pellet heating system by concluding a maintenance contract. The indicated cleaning and maintenance intervals must be unconditionally respected. Please note that, no warranty claim arises for damage that is the result of non-compliance with the maintenance instructions.
- Your heating boiler is adjustable within an output range of 30% to 100% of the rated output. The units should **be operated if at all possible in the middle and upper output range (adjusted to the respective heat requirement)**, in order to avoid unnecessary emissions in low load operation. The ideal is the combination with a modulating room and heating regulator in order to avoid unnecessary cycles and to enable the longest possible running times.
- If technical changes are undertaken independently, we assume no liability for damages that that may result thereof.
- Any procedure undertaken by persons other than those authorized by us, and non-compliance with these general considerations and the safety notices described below, shall result in immediate voiding of any warranty claim as well as the guarantee.
- Damaged parts and unit components must be replaced only with original replacement parts.
- It is urgently recommended that this manual be kept within reach in the heating room.
- The pellet heating system described in this manual has been tested in accordance with EN303-5.
- The generally applicable rules of heating technology must be observed for protection against Legionella.
- NOTE: When using pellet heating systems with 2 suction turbines (e.g. 100kW boiler) the daily tank is unequally emptied (complete emptying cannot be ensured). We have already recommended in the planning a division of the storage area of between 60 and 40%.



**The mandatory maintenance of the system must be done by authorized technicians at least two a year but no later than when reaching 1500 hours of operation (with an output range of 80-100%).  
If NO service is performed, the warranty claim or the warranty is void!**

- In the course of maintenance work on the pellet heating system all wear parts are replaced and billed, if necessary. For service work to be performed, the system must be „cold“. If the system is not shut down in sufficient time and is still “warm” when the service technician arrives, the resulting idle and waiting time will also be billed.
- Foreign bodies in the fuel can result in damage to the system.
- The regulations pursuant to A-Norm M 7136 (Transport and Storage Logistics) and M 7137 (Pellet Storage Requirement) must be observed.
- Please note that you must observe the prescribed servicing intervals during the warranty period!
- Properties that require a high degree of security for heat supply (the hotel business, process heating, etc.) are to be equipped with dual boiler systems. If this requirement is not met, we will deny any claims for consequential damage based on a faulty heating source. In a biomass heating system, it is essential to take appropriate care ( caretaker, porter, etc.) so that the stipulated maintenance tasks are carried out regularly!

• Datasheet on Wood Pellets pursuant to EN 14961-2, Classes A1 + A2 (Ø 6 mm)

Parameters (Unit)	ENplus-A1	ENplus-A2
Length (mm)	up to 40 <sup>1</sup>	up to 40 <sup>1</sup>
Fines (% , mass)	≤ 1 <sup>2</sup>	≤ 1 <sup>2</sup>
Ash content (% , mass)	≤ 0,7 <sup>3</sup>	≤ 1,0 <sup>3</sup>
Ash melting temp. (°C)	≥ 1.200	≥ 1.100

1) Maximum 5% of the pellets may be longer than 40 mm, max. length 45 mm.

2) Particles < 3.15 mm, fines at the last loading site.

3) In a water-free state (wf)



**YMM 3x2.5 mm cable <sup>2</sup>; electrical connection: 230 V, 50 Hz; fusing 16 A, slow triggering. Protection with protective multiple earthing with fault-current circuit breaker (voltage limits pursuant to EN 50160) ATTENTION: ISO Norm 60364 must be observed! Operational limits: Max. ambient temperature 0-45 °C; max humidity 0-95%**



**We assume warranty obligations in accordance with the provisions of our warrantee conditions only when original Biotech replacement parts are used. Biotech grants repair service and supply of replacement parts for at least 10 years from the date of purchase of the system!**

## 02 Safety Notes

**A heating emergency switch (all-phase multidirectional switch off) must be arranged upstream of the combustion chamber! Switch it off before carrying out the maintenance and/or service work!**



**The safety notes must absolutely be read before operating the system! Non-compliance with the safety notes can result in physical injury, life-threatening situations, or damage to the system!**

- The pellet heating system may be operated only in technically perfect condition. Malfunctions and damage that adversely affect or are capable of adversely affecting safety, must be resolved promptly by our technical personnel.
- Assembly must be done only by our customer service or by an authorized technical contractor . The system includes rotating parts that are driven at relatively high torque (crushing hazard).
- Live voltage parts are located under the enclosure and in the junction boxes. Therefore never remove enclosure parts or never open the junction boxes!
- During running operation never open the maintenance ports of the boiler; hot flue gas and dust can escape.
- **The system must be switched off prior to carrying out any maintenance. Use the ON/OFF switch** to switch off the system. Wait until the system is cooled down (please refer to the boiler temperature on the display). Then switch the system off using the **Heating Emergency OFF Switch**. Secure the switch against accidental switch-on of the system.
- **Before sweeping the heating tube or the chimney by the chimney cleaner, switch off the system using the ON/OFFswitch and wait for the burn-out process (about 20 minutes). Explosion hazard due to flue gas congestion.**
- Never empty flammable liquid into the combustion chamber.
- Never perform repair work yourself on our systems but rely on our technical personnel. A warning sign „Smoking and tampering with open flame and fire is prohibited“ must be posted (hazard when refilling the pellet hopper).
- A certified fire extinguisher must be provided in the heating room.
- **Ensure an adequate supply of fresh air.**
- Secure the heating room against unauthorized access, especially by children.
- The boiler doors and the water-side connections must be inspected once a month for tightness and damage.
- The safety temperature limiter (STL) must be inspected once a year (this should be done during maintenance or service).
- Safety and monitoring devices must not be removed, bypassed or in any other way made inoperative.
- When cleaning and when removing ashes use a dust mask in order to prevent hazards to health and damages.
- When filling the fuel bunker using pump vehicles, the system must be switched off (waiting time: 20 minutes).
- When setting the non-potable water temperature above 60 °C ensure an appropriate mixture of cold water (scalding hazard).

- The pellet heating unit must be set up and operated only in heating or installation spaces that have been constructed in accordance with regulations.
- A suitable vent valve must be installed on the top of the boiler.
- The heating system must be filled with heating water in accordance with VDI 2035 or A-Norm H 5195-1.
- Annual inspection of the heating water pursuant to A-Norm H 5195-1.
- Annual inspection of the safety valves by a specialist.
- Regular inspection of the expansion daily tank by a specialist.
- Regular inspection in accordance with prTRVB H 118 of the discharge device, automatic wood firing systems, loader.
- Fire prevention specifications that are compliant with the applicable regulatory provisions must be implemented!
- **Please note that even when the system is switched off, different functions are still operating!** (The frost protection device, pumps, and mixers are moved periodically during night times in order to prevent sticking of the bearings). **In order to be certain that absolutely no current is still flowing through the system, you must disconnect your heating unit from the mains!**
- The manufacturer assumes no liability for damage arising from an incorrect hook-up of the flow and return – do not confuse these connections. Establish removable and non-distorted connections. When routing pipelines ensure venting of the boiler block. For the event of repair, equip the system at the appropriate point with shut-off devices (e.g. ball valve etc.).
- Before hooking up the boiler to the heat distribution system: Flush the lines and remove residues.
- Caution: Danger of injury by safety valve blow-off! Direct blow-out water to the drainage point.
- Check the boiler for leaks prior to initial start-up. Pressure test the boiler using the pressure equivalent to the safety valve response pressure. Large pressure will damage the pressure, control, and safety devices. Carryout closure integrity tests in accordance with local regulations.
- Fill the boiler only when it is in a cold condition The flow temperature must not exceed 40°C

## 03 Return flow increase

It must be ensured that the return temperature never drops below 55°C. Fitting an automatic return warm water riser valve is mandatory.



**Disregard voids the warranty.**

## 04 Minimum distance from walls

Model	PZ65RL	PZ100RL PZ101RL
To the back [mm]	700	700
Left side to wall [mm]	500	500
Right side to wall [mm]	750	750

The following specific equipment properties must be considered when planning/selling and when operating systems:

- PZ100RL / PZ101RL:

The PZ100RL / PZ101RL system types have two feeding systems from the store to the interim daily tanks. The design dictates that the emptying of the store will be asymmetrical through both feeding systems. After one storage area is emptied, the relevant feeding system is disabled automatically. The second feeding system continues to work. After filling the store, this is to be confirmed via the control panel, so that both feeding systems are once again supplied with fuel.

- When planning biomass systems, it should be borne in mind that there will be noise from the relevant mechanical systems and drives such as ignition blowers and vacuum turbines. The relevant soundproofing measures must be taken for the building. Locating heating areas and installation rooms directly under living and sleeping areas must be avoided.

- It is essential to ensure that the fuel is of the quality we stipulate. Operating faults due to poor fuel, even within the warranty period, must be billed to the operator if customer service intervention is needed. If, in individual cases, costly analyses of the ash (slag) or fuel are necessary, the costs will fall on the operator if it is found that these diverge from the requirements.

Using fuel which does not comply with our requirements will render any claim under warranty void.

- Emptying the ashes: the PZ65RL, PZ100RL and PZ101RL system types each have two external ash trays. Direct (by detaching the ash daily tanks) or indirect (by removing ash from ash boxes that remain attached to the equipment) emptying may only be carried out once the system has been shut down. (The systems are operated at reduced pressure. Opening or emptying the ash daily tanks causes a loss of the reduced pressure and this can exceptionally lead to the escape of smoke.)

- Pellet transport from the store to the intermediate daily tank:

The period during which the intermediate daily tank is filled automatically can (must) be set by the operator to suit their needs. Within the set „flex-time“, the daily tank will be filled automatically after the level in the intermediate tank falls below a set level. Outside this flex-time, the intermediate tank will be filled only as an emergency filling when the level falls below an absolute minimum. One should bear in mind that this minimum level cannot be defined 100% in advance because of fuel quality (fine parts affect the pouring angle). If the flex-time in which the pellets are refilled is exceeded, this can lead to the intermediate tank emptying and hence to subsequent system faults (no ignition, flame goes out, etc.). We must advise you that these settings are to be chosen according to operator requirements and that faults attributable to an incorrectly selected flex-time cannot be considered as a claim under warranty.

- Pellet storage:

Please note that in systems rated at 100 kW, up to 400 kg of pellets are consumed per day in full load operation. Sack silos with correspondingly small volumes of 5 or 6 tonnes, which have to be filled several times a season (or year), are therefore unsuitable. Unsuitable because the manufacturers stipulate cleaning, say, after every third emptying. This would therefore be necessary several times a year and is therefore absolutely not recommended. Please note that we also have not approved the „Mole“ extraction system for these PZ65RL / PZ100RL / PZ101RL systems.

- System dimensioning:

Experience has shown that system configurations are common which need the output to be 90 or 100 kW for a short time only, say 2 hours a day, at minimum outside temperature (-15 °C). For the remainder of the time, for example, only one dwelling or office building is heated with a required output of, say, 15 kW at -15°C. Unfortunately, no additional buffer volumes are realized, so that this leads to the most unfavourable operating conditions (start-stop) for a biomass system. This method of operation leads to increased wear of the ignition equipment and unfavourable emission patterns, etc. We recommend in such applications that the system be designed as dual (cascade) systems or with commensurably large buffer store volumes. We must inform you that claims under this heading cannot be recognized and are not a claim under warranty.

- At servicing intervals, the side daily tank cover with inspection hole in the PZ65RL and 2 inspection holes in the PZ100RL / PZ101RL must be removed and the pellets are to be moved to the daily tank auger screw extraction point (to be carried out by the KD engineer)

- System care:

Owing to the necessary tasks such as ash removal, reordering of fuel, including resetting the meter as described, it is essential that a trained operator is available for the system and that he is also on site for instruction at the time of commissioning.

- Store room safety:

Chemical processes in wood can lead to the generation of carbon monoxide in the pellet store.

The room therefore needs to be adequately ventilated before entry. The warning notice delivered with the system must be fitted to the entrance to the store and must be observed.

- Heating room ventilation:

Experience has shown (and this is very common) that the vents for providing oxygen to the boiler are obstructed, covered or are not designed adequately. Note that operating faults can occur through an inadequate oxygen supply (air feed), and that these will not be covered under warranty.

- If the system fails to ignite for the above reasons and therefore will not start, the combustion chamber is to be cleared of any residual fuel before a restart (lower service door) so that there cannot be any uncontrolled combustion under the actual burner system.

- Please advise the future operator that a biomass system requires more looking after.

- Systems in sensitive areas (schools, residential homes for the elderly, hospitals, hotels, process heating supplies, etc.) are to be designed with redundancy, because even a short failure of the heating can lead to damage. If this instruction is ignored, Biotech does not accept any liability for damage which has occurred due to lack of heating. It is essential to enter into a maintenance agreement with the operator. This service level agreement must be accepted by an approved technical contractor.

## 06 Technical data

System type	PZ65RL	PZ100RL	PZ101RL
Nominal heat performance (kW)	64,90	99,90	101,00
Degree of efficiency at full load (%)	93,60	95,10	95,10
Degree of efficiency at part load (%)	94,60	95,60	95,60
Max. adjustable boiler temperature (C°)	85	85	85
Tolerable operating pressure (bar)	3	3	3
CE designation according to low tension guideli	CE	CE	CE
<b>Dimensions</b>			
Width of boiler (mm)	1891,50 <sup>4</sup>	1891,50 <sup>4</sup>	1891,50 <sup>4</sup>
Depth of boiler (mm)	1232,50	1232,50	1232,50
Total depth (mm)	1375,00	1375,00	1375
Height of boiler (mm)	1833,50 <sup>1</sup>	2020,00 <sup>1</sup>	2020,00 <sup>1</sup>
Height of smoke tube connection (mm)	1733,00 <sup>1</sup>	1988,00 <sup>1</sup>	1988,00 <sup>1</sup>
Height of flow (mm)	139,50 <sup>1</sup>	139,50 <sup>1</sup>	139,50 <sup>1</sup>
Height of return flow (mm)	1209,50 <sup>1</sup>	1458,00 <sup>1</sup>	1458,00 <sup>1</sup>
Height of ventilation (mm)	1296,50 <sup>1</sup>	1545,00 <sup>1</sup>	1545,00 <sup>1</sup>
Diameter of smoke tube connection (mm)	180	200	200
Total weight (kg)	920	1153	1153
Water content (ltr.)	248	273	273
Daily tank – automatically useable (kg)	152	323	323
Ash box - useable (ltr.)	2x42	2x42	2x42
<b>Connections</b>			
Flow (inch)	2	2	2
Return flow (inch)	2	2	2
Ventilation for boiler (inch)	1	1	1
Boiler emptying (inch)	1/2	1/2	1/2
<b>Heating water fow resistance</b>			
ΔT= 20 K (mbar)	5	5	5
ΔT= 10 K (mbar)	20	20	20
<b>Exhaust gas values</b>			
Exhaust gas temperature at full load (C°)	117	110	110
Exhaust gas temperature at part load (C°)	85	73	73
Exhaust gas mass fow at full load (g/s)	41	52	52
Exhaust gas mass fow at part load (g/s)	10,5	13	13
Co <sub>2</sub> at full load (Vol%)	14,1	15,1	15,1
Co <sub>2</sub> at part load (Vol%)	12,3	13,7	13,7
Necessary delivery pressure (mbar/Pa)	0,05-0,15/5-15	0,05-0,20/5-20	0,05-0,20/5-20
<b>Electric power inpute</b>			
Standby (W)	15	15	15
Filling - Turbine (W)	1600	3200	3200
Grate cleaning (W)	65	65	65
Pre-filling (W)	75	75	75
Ignition (W)	1020	1020	1020
At 100% performance (W)	200	200	200
<b>Minimum distance masonry</b>			
Backward (mm)	700	700	700
Left to masonry (mm)	500	500	500
Right to masonry (mm)	750	750	750
<b>Placement dimension</b>			
At least (mm)	900	900	900
<b>Minimum ceiling height</b>			
At least (mm)	2200	2300 <sup>9</sup>	2300 <sup>9</sup>
<b>Volume</b>			
In operation (DB)	35	35	35
During suction (DB)	70	70	70

1) excluding base, adjustment range at 65-101 kW 50-80 mm

2) incl. ash box

3) Recommendation 2500 mm

**Individual values base on the standard sample testing. These can deviate in practice.**

# 07 Dimensions

## 7.1 Pellet boilers PZ65RL

**Pellet boilers PZ65RL**

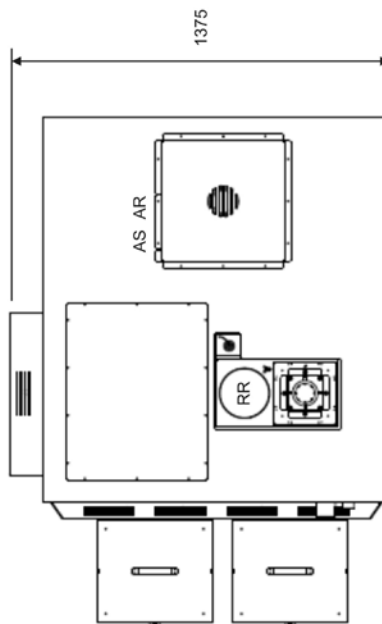
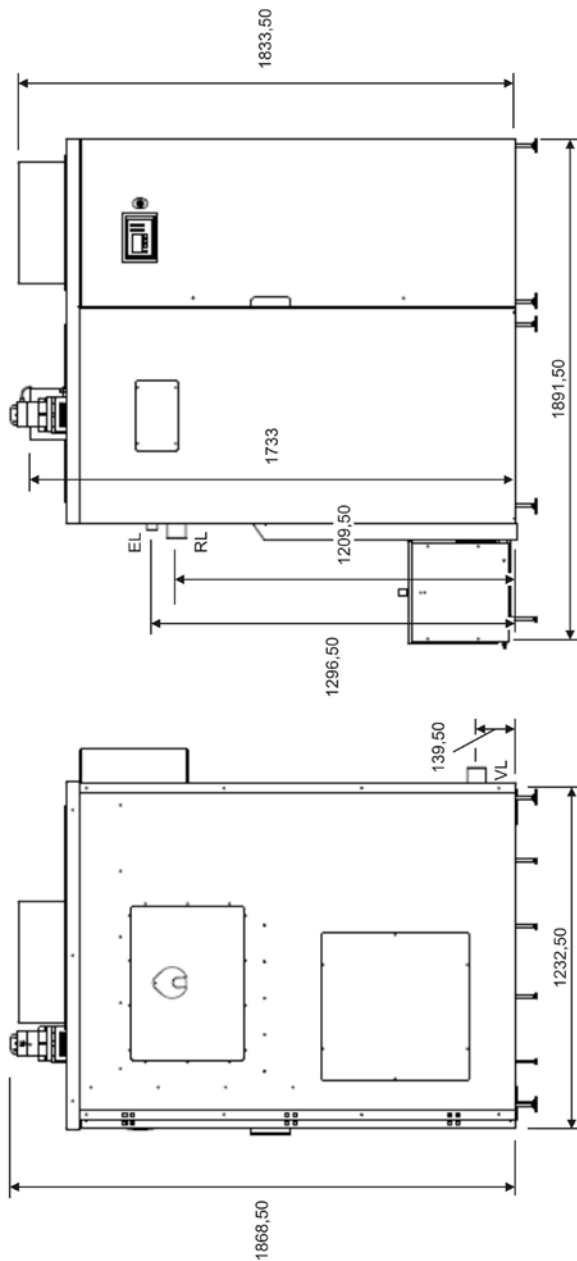


Installation dimensions [mm]	A [mm]	B [mm]	C [mm]
boiler (1)	850	1805	1280
vessel (2)	740	1800	1260

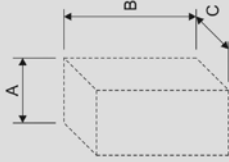
(1) ... When dismantling console/motor ash extraction  
 (2) ... Excluding base (50 - 80 mm)

**KG**

All-up weight	[kg]	920
VL ... Advance 2" IG		
RL ... Return 2" IG		
EL ... Venting 1" IG		
ER ... Emptying 1/2" IG		
AS ... Aperture/connection pellet suction line DN45		
AR ... Aperture/connection pellet return air line DN60		
STB ... Safety temperature limiter		
RR ... Flue pipe connection Ø180 mm		



Pellet boilers  
**PZ100RL / PZ101RL**



Installation dimensions (mm)	(1)	(2)
boiler	A [mm] 850	1992
	B [mm] 1992	1280
	C [mm] 1280	
Installation dimensions (mm) <th>(1)</th> <th>(2)</th>	(1)	(2)
vessel	A [mm] 740	1987
	B [mm] 1987	1260
	C [mm] 1260	

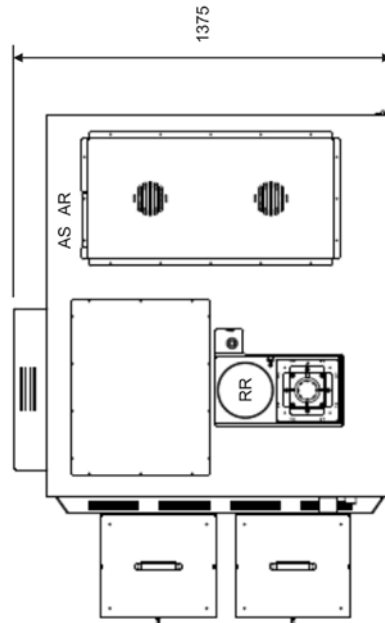
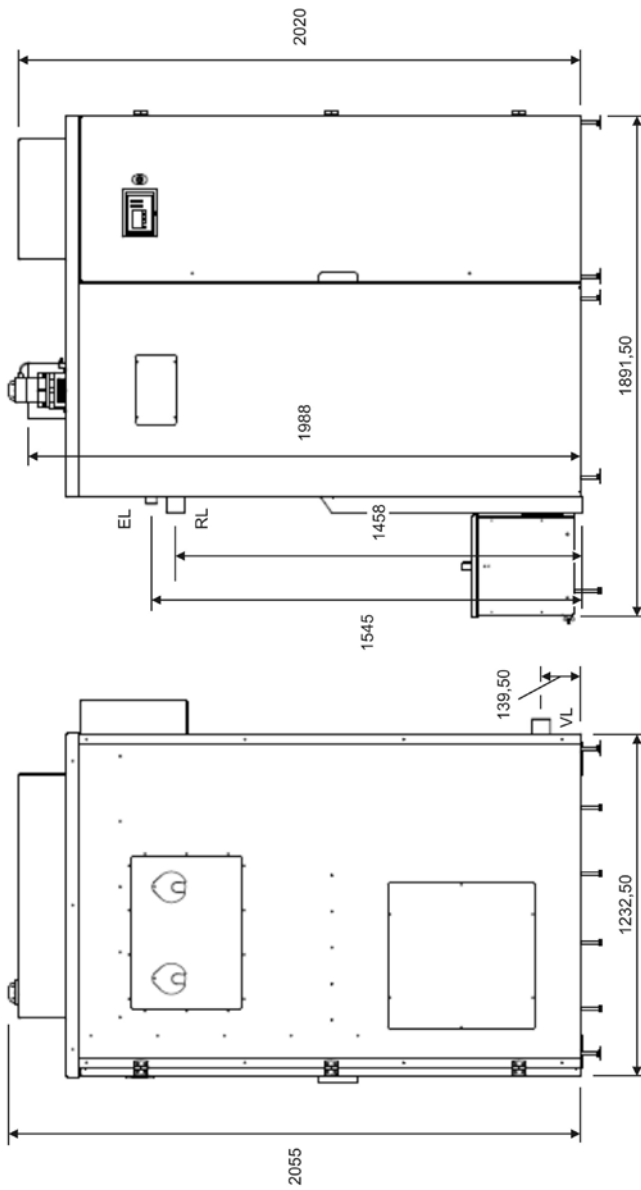
(1) ... When dismantling console/motor ash extraction

(2) ... Excluding base (50 - 80 mm)



All-up weight [kg] 1153

VL ...	Advance 2" IG
RL ...	Return 2" IG
EL ...	Venting 1" IG
ER ...	Emptying 1/2" IG
AS ...	Aperture/connection pellet suction line DN45
AR ...	Aperture/connection pellet return air line DN50
STB ...	Safety temperature limiter
RR ...	Flue pipe connection Ø200 mm

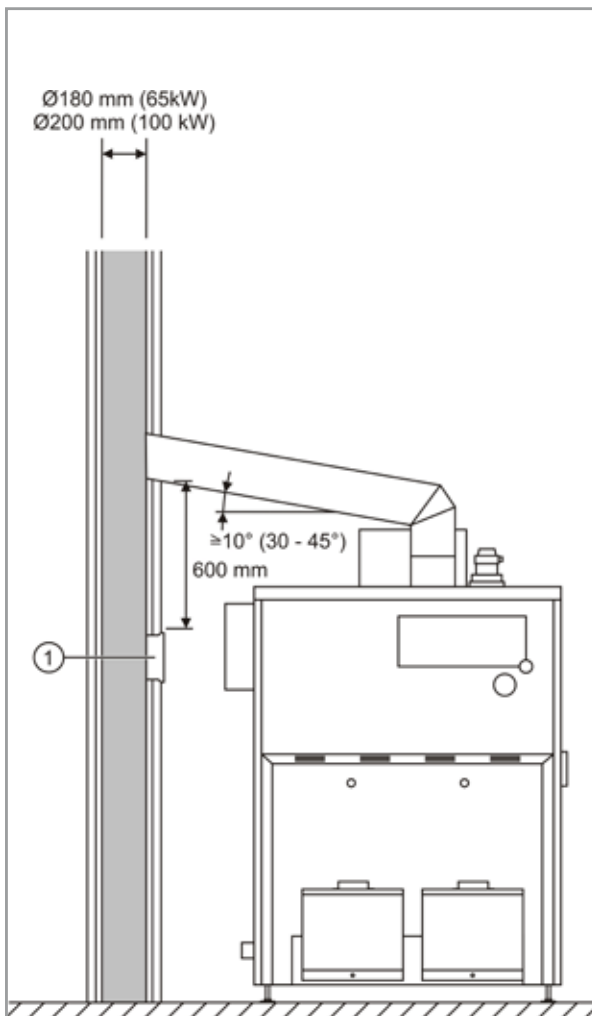


## 08 Chimney Presetting

A moisture resistant (MS) chimney with a (Recommendation material 1.4401, 1.4404) maximum chimney draught of 15 or 20 Pa (0.15 or 0.20 mbar) is required, depending on the system pump. The connection line (flue connector) must be installed with at least 10° of inclination (30-45° is optimum) with a maximum length of 3.0 metres. The flue connector must be insulated with at least 25 mm. Execute the chimney connection using at least 45° elbows. Flue gas problems can occur if 90° elbows are used in a connection. Incorporation of the flue gas connector in the chimney must be done so that no condensation water can flow into the boiler. The heating boiler and the chimney must be coordinated with each other (see the chimney recommendation). Please use EN 13384-1 as an aid in calculations.



**The chimney must be moisture resistant (MS)!  
Installation of a draught stabilizer is required.**



System Type	PZ65RL	PZ100RL PZ101RL
Required delivery head - MIN (mbar / Pa)	0,05 / 5	0,05 / 5
Required delivery head - MAX (mbar / Pa)	0,15 / 15	0,15 / 15
Chimney diameter (mm)	180	200
Chimney computation according to standard	EN 13384-1	EN 13384-1

Requirements for the flue connector

Connect the flue connector rising on the chimney at least 10°, ideally 30 to 45°

The flue connector must not be reduced; the diameter of the flue connector must correspond to that of the flue sockets.

The flue connector must be a pressure-tight design and provided over its entire length with at least 25 mm thick thermal insulation.

The draught regulator must be installed at least 600 mm below the flue connector inlet in the flue system.

**ATTENTION:** If, due to local conditions, the chimney draught regulator is deployed directly in the flue duct as opposed to the position recommended below, an increased dust load must be expected in the heating room - PLEASE note this at the time of planning!

### 8.1 Effective height

The effective height is the chimney length between the flue inlet in the chimney and the chimney mouth. The chimney must be adapted to the local, regulatory specifications! Low-emissions operation in accordance with the Quality seal is possible only if the system can be operated using the low flue gas temperatures of the lowest heat output (30% of rated load). As a rule, this requires an acid-resistant chimney.

## 09 Pellets storage tank

The pellets are delivered in a silo truck and are blown into the storage room. Usually the silo truck has a pumping hose with a maximum length of 30 metres. The pellet storage room / the filling couplings must be within 30 metres from the place of unloading. Please contact your pellet supplier if you require a longer hose.

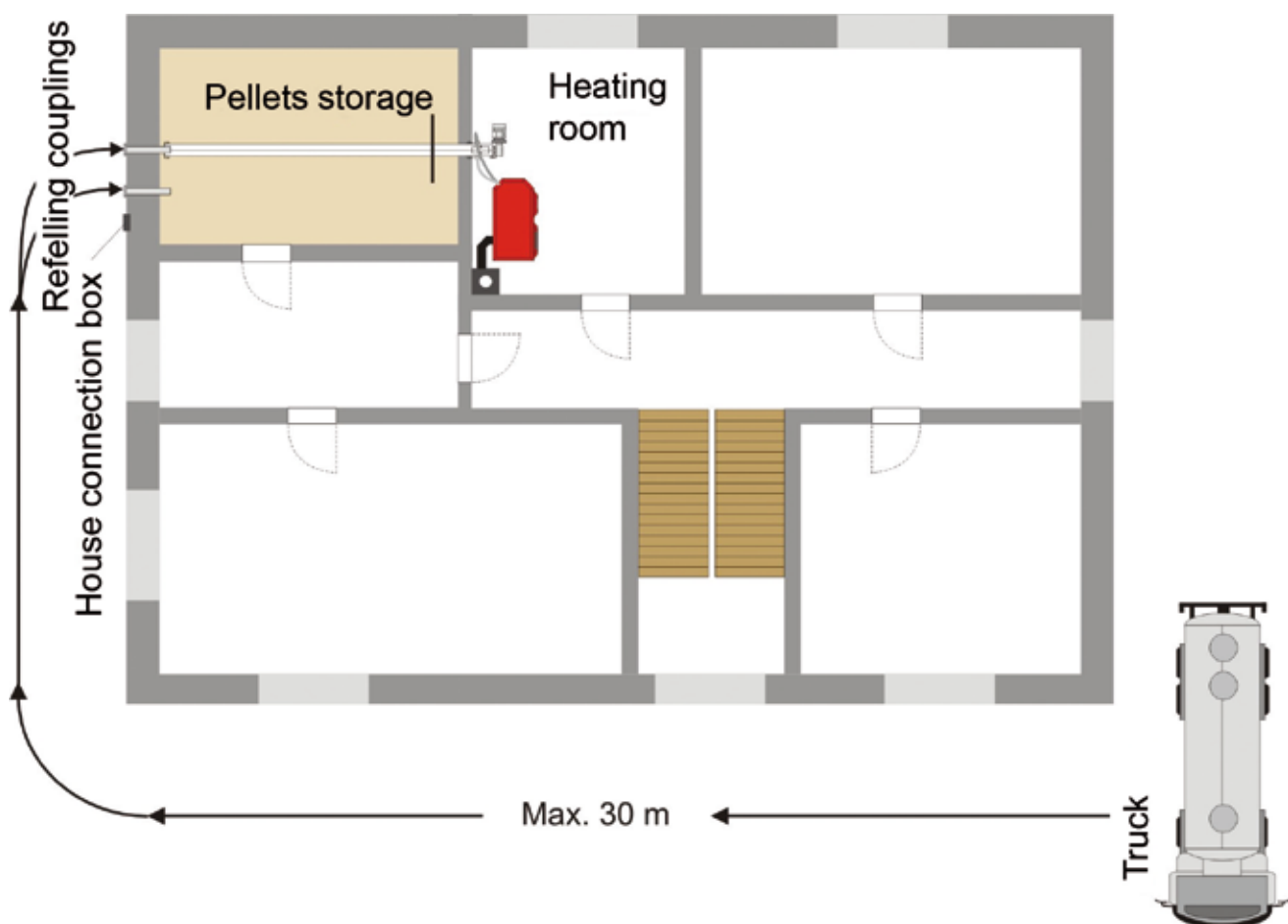


**ATTENTION: Switch off the heating system before the filling process!**

If possible, the pellet storage tank should have an outer wall, as the filling connections should be accessible from outside. The walls must not be humid! If the storage room is anywhere in the interior of the building, the filling and exhaust air connections can be prolonged so that they reach the outer wall, or the pumping hose of the pellet supplier may run through the inside of the building during the filling process.

### 9.1 Location of the heating room

Also the heating room should have an outer wall to ensure the supply with air required for the combustion. If the heating room is in the interior of the building, a supply air tube must be provided (in compliance with local fire regulations).



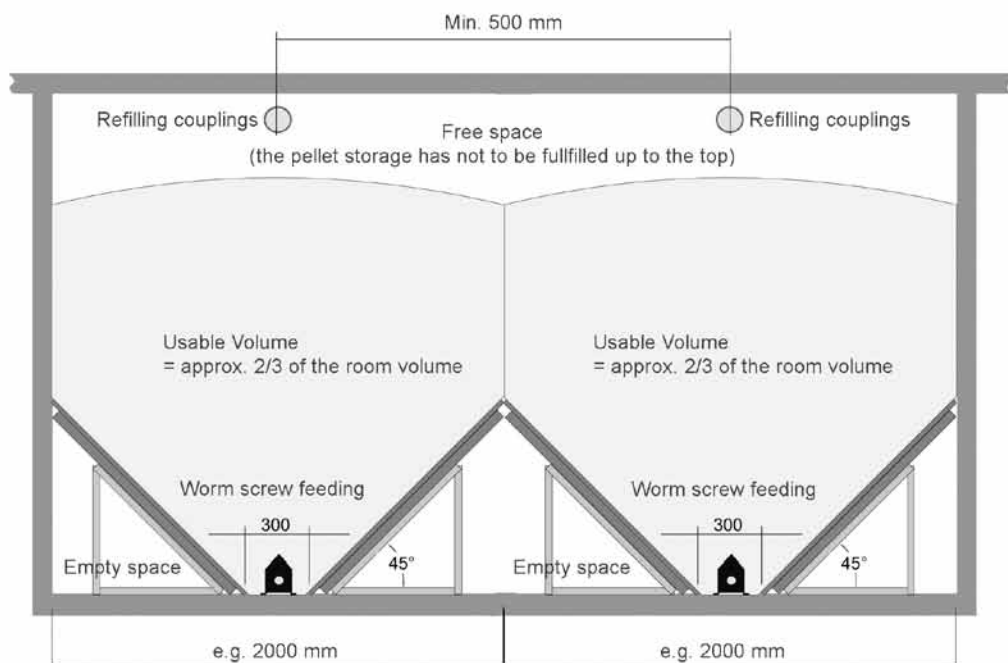
## 9.2 Size of the pellet storage room

The size of the storage room depends on the heating load required for the building. However, it should be of a size that the annual demand of fuel can be stored up to 1.5 times.

Considering the not utilisable volume of the room, the following rules of thumb can be applied for calculating the size:

### **General rule::**

- **Per 1 kW heating load = 0.4 - 0.9 m<sup>3</sup> storage room – depending on the insulation of the building (including expansion space)**
- **Utilisable storage space = 2/3 of storage room (including expansion space)**
- **1 m<sup>3</sup> pellets = 650 kg**
- **Energy content = approx. 5 kWh / kg**



### 9.3 Static requirements for the pellets storage room

The walls of the storage tanks have to support the weight of the pellets (density 650 kg/m<sup>3</sup>).

In practice the following wall thicknesses have stood the test\*:

- Medium weight vertically perforated brick 11,5 cm with plastering on both sides
- Concrete 10 cm
- Clay brick 12 cm, with plastering on both sides
- Timber pillar wall with 8 cm with frame poles, 50 cm apart, both sides with 20 mm OSB boarding

#### **Important:**

Please ensure dust-proofness in the pellet storage room. Aerated concrete (Ytong) is not recommendable. If the outer walls are made of aerated concrete, cover it with OSB platters. Furthermore ensure a constructive connector to the ceiling, floor and walls.

*\*... maximum length of wall is 5.0 metres, height 2.5 meters*

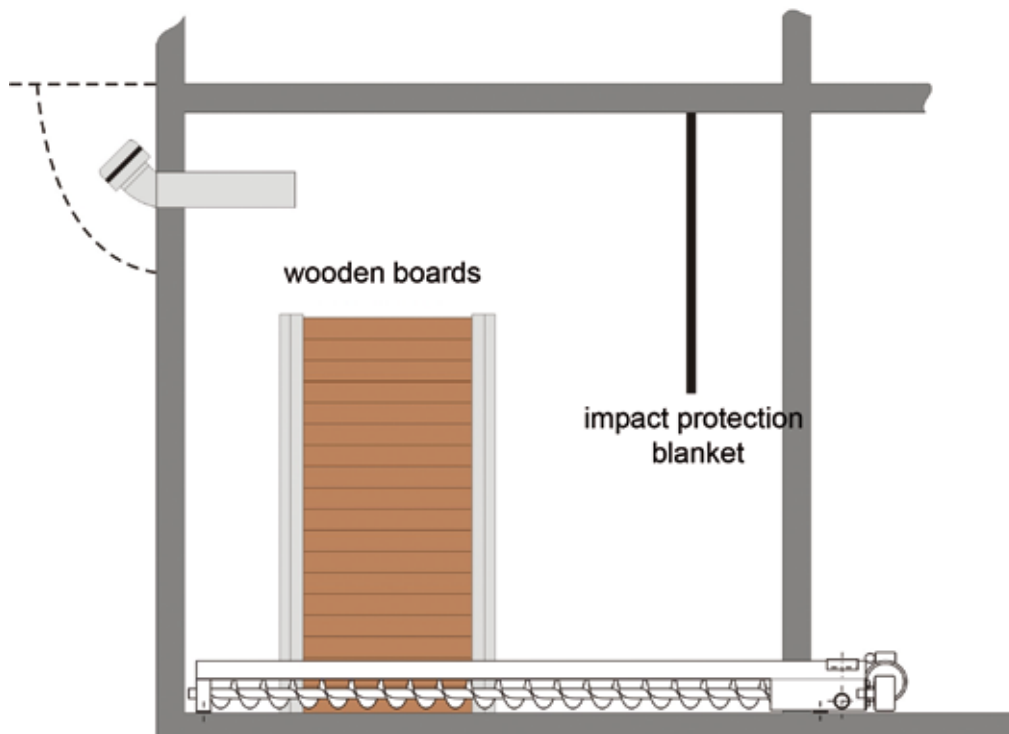
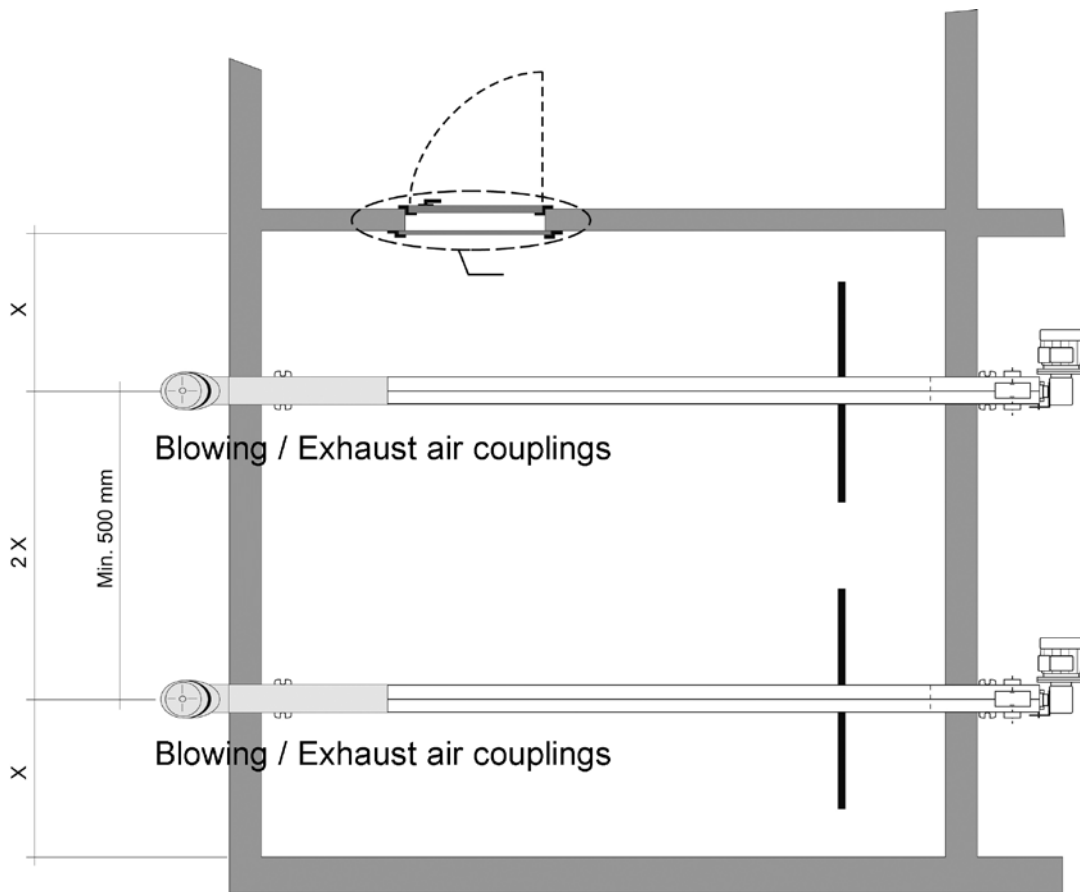
#### **Protection from humidity**

Pellets are very hygroscopic. If there is contact with water or a humid underground e.g. walls, the pellets swell up to its fourfold volume, then decay and so become useless or can even lead to damages of the outer and inner wall, if the storage room is full!

#### **Please note:**

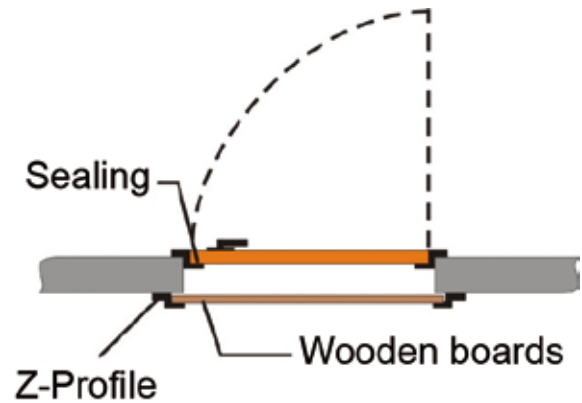
- The pellets storage room must stay dry throughout the year.
- If there is a danger of wet walls (e.g. in old buildings) it is recommended to fit a rear ventilated facing formwork. Alternatively there is the possibility of a storage in boxes like bag silos.
- Bag silos and feed units which are outside must be protected from rain, splash water and direct exposure of the sun. (e.g. car port, wooden sheds,...).

## 9.4 Sketch / Section pellets storage tank



## Door

For stored quantities  $\leq 15,000$  kg there are no fire protection requirements regarding doors or hatches in the pellet storage room. Doors and hatches must open outwards and have to be completely lined with a gasket strip (for dust tightness). Wooden boards must be fitted on the inside of the doors and hatches of the pellet storage for pressure relief, in order to prevent the pellets from making pressure against the door or hatch. The inside door handle has to be removed, the lock must be sealed from the inside to ensure dust-tightness..



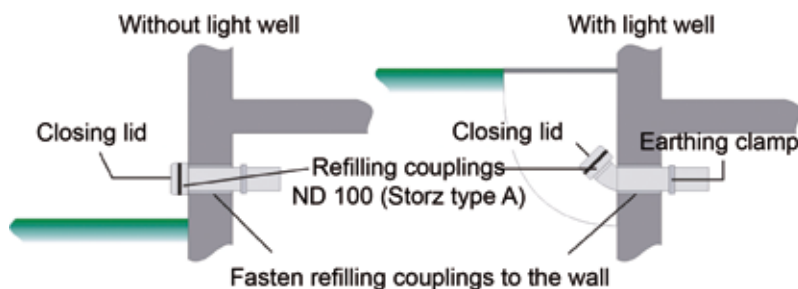
**IMPORTANT: Note country specific regulations!**

## Impact protection blanket

The impact protection blanket protects the pellets from breaking when impinging against the wall of the storage tank. Furthermore, it protects the wall from damage. The impact protection blanket consists of an abrasion resistant and ageing resistant plastic and can be attached to the ceiling and anchored on to the floor (trampoline effect). It is fixed opposite to the filling connection with a distance to the wall of at least 300 mm.

## Filling system

Two filling connections are required for filling the pellets storage. When the pellets are delivered, an extract fan is connected to one connection, and the pellets are blown into the storage room via the other connection. An opening in the wall with a diameter of 125 – 150 mm is required and the filling connections are inserted and well fixed by means of adequate material (they must not become loose when the storage room is filled). Whether fitting foam glue may be used or not must be clarified with the pellet supplier beforehand.



### Please Note!

The filling connections must be firmly connected to the wall.  
An earthing via the potential equalisation  
is necessary to prevent electrostatic charging during the filling process!



## 9.5 General indications concerning the filling system

### The following materials must not be used:

- Plastic pipes (danger of electrostatic charging)
- Pipes which may damage the condition of the pellets (folded spiral-seam pipes used in ventilation engineering)

### General instructions:

- Only metal pipes or earthed synthetic pipes may be used for the filling system.
- The filling system must be earthed in order to avoid electrostatic charging..
- The inside of the filling pipes or pipelines have to be smooth throughout. If it is necessary to extended the pipes, use sleeve sockets.
- If pipelines are welded make sure there are no fin lines or welding seams on the inside of the pipes.
- The filling system must not end with a bend - after a bend, a straight pipe of at least 500 mm must follow for quieting.

## 9.6 Slanted floor

The storage room has to be designed in a way that it can be almost completely emptied by the pellet extraction system (e.g. auger feed, suction tube) used.

### General advice:

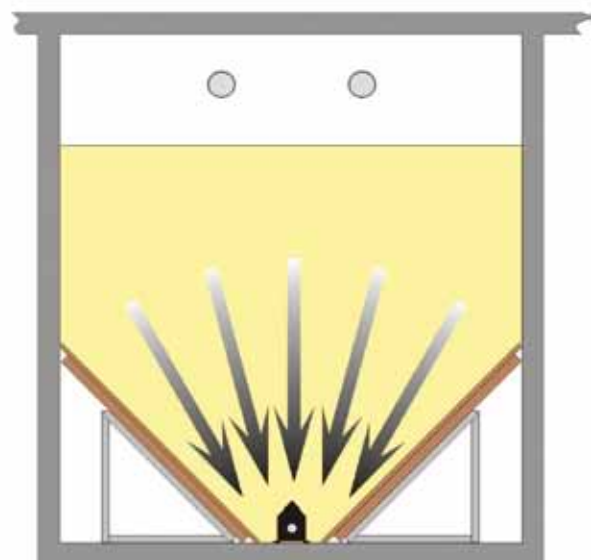
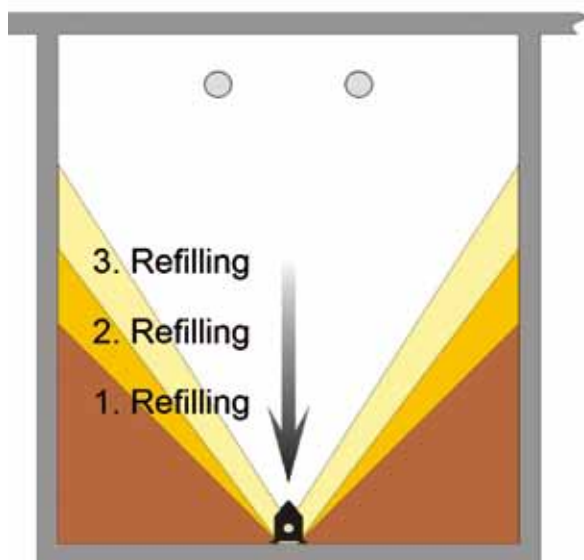
- The inclination of the slanted floor has to be  $45^\circ$ , so that the pellets can slide down automatically.
- The slanted floor should preferably be made of timber with a smooth surface (e.g. chipboard or coated chipboard; OSB boards have a rather rough surface).
- The slanted floor has to resist the weight of the pellets (density  $650 \text{ kg/m}^3$ ).
- L-Beams are an ideal substructure and make the construction of the slanted floor significantly easier.
- The slanted floor should connect to the walls of the storage room so that no pellets can fall into the empty space below (they cannot be removed from there).
- When the auger feed is in operation, the openings on the side between the feed channel and the cover must not be narrowed.

### Without slanted floor:

- Increasing gradient angle

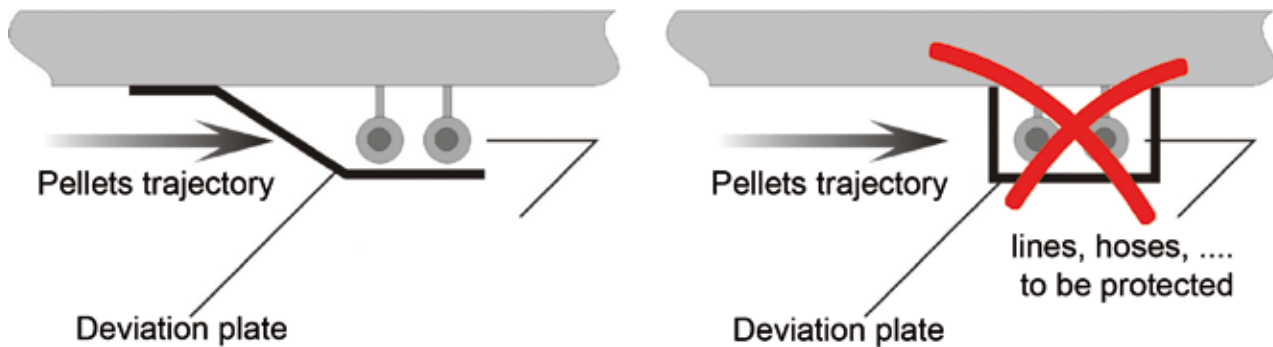
### With slanted floor $45^\circ$ :

- Almost complete emptying
- Same gradient angle



## 9.7 Existing fixtures in the pellet storage

Existing piping and plumbing which cannot be removed with reasonable effort or involving unreasonable expenses, have to be covered with a flow- and shockproof casing (e.g. diversion plate) in order to prevent the pellets from bouncing against, when the storage room is filled. Furthermore it has to be ensured that the pellets cannot be damaged by the deviation plate (no rectangular cover).



### Electric installation in the pellets storage room

There must not be any electric installations (switches, lights or junction boxes) anywhere in the pellets storage!



**PLEASE NOTE: With exception of explosion-proof materials!**

### Power supply

The boiler requires a separate power supply of 230 V 50 Hz. The feeder must be secured with a 16 A expulsion fuse. We recommend to install a heating emergency switch.

### Fire protection



**ACCORDING TO COUNTRY SPECIFIC REGULATIONS!**

## 10 Extraction systems

**Attention: Construction according to country-specific regulation for automatic wood combustion systems.**

### 10.1 General assembly information

- Plug the other end of the pellet suction tube (transparent with copper cord) via the corresponding sleeve on the feeding system (cannot be confused with the return air connection due to the different inner diameter) and fix it with the delivered clamp. Also fasten the grey return air tube to the feeding system or the return air probe.
- When connecting the pellet suction tube to the target feeding system, **bend the copper cord inwards**, to reach an earthing of the transporting tube with the feeding system.
- A possible shaft for the lead-through of the transporting tubes (suction and return air tube) must have a minimum size of 120 x 70 mm!



**ATTENTION: The pellet suction tube must be earthed and must be installed in one piece throughout. Pushes can lead to a blockage!**

- Fasten the pellet transporting tube to the wall and ceiling approx. every 50 cm with tube clamps (can be ordered as accessory).

**ATTENTION:**

**The flaps of the carrier of the auger must not block the auger!**



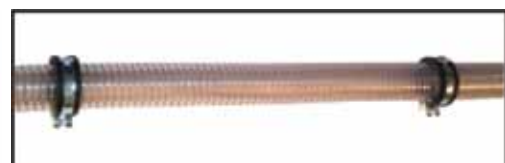
**If the suction tube is shorter than 5.0 metres, the return air tube must be at least 2.0 metres longer!**

**ATTENTION:**

**Adjust the auger with a leveling rule or cord. Alignment and height must be straight!**



Pic.: Flaps must not block the auger!



Pic.: Pellet tube Do not squeeze. Do not forget the earthing.

### 10.1.1 Earthing of the auger

Detach the copper cord from the transporting tube and bend it inwards.

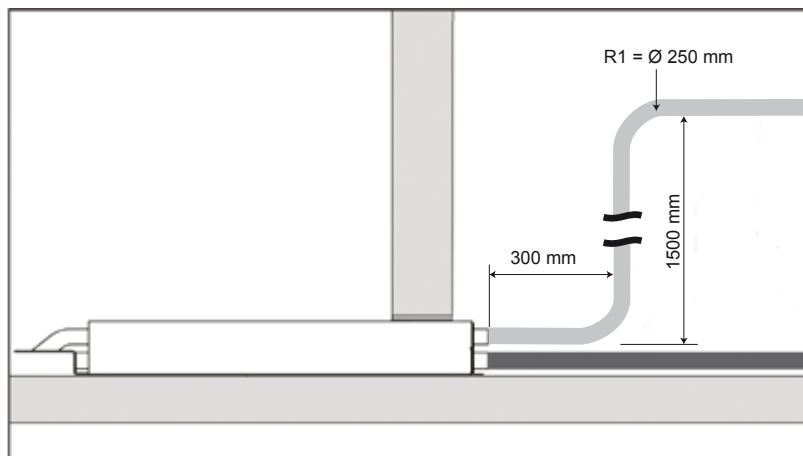
**PLEASE NOTE:** The copper cord must be connected to the connecting socket with **blank metal** (use a file or sand paper).



### 10.1.2 Installation of tubes

When using a feeding system with a return air probe, you must install the suction tube in a way that it runs at a maximum of 1.5 m vertically and 0.3 m horizontally (= level) (otherwise there is the danger of blockage at the sectional laying when ending the suction cycle). The return air tube can be connected directly – without level – to the return air probe.

**The tube diameter must be at least 25 cm,  
otherwise there is the danger of blockage!**



### 10.1.3 Earthing of suction tube with copper cord

Detach the copper cord from the transporting tube and bend it inwards. Connect the tube with the suction socket and lay the copper cord onto the metal.

**PLEASE NOTE:** The copper cord must be connected to the connecting socket with **blank metal** (use a file or sand paper).



### 10.1.4 Impact protection mat

The impact protection mat (1000 x 1250 mm) protects the pellets from bursting when impinging onto the storage room wall. Furthermore, the wall is also protected from damages. The impact protection mat consists of an abrasion-proof and age-proof synthetic material with a mounting possibility to the ceiling and a stretching possibility downwards (trampoline effect). It is mounted on the opposite of the filling socket with a wall distance of at least 500 mm.



**The distance between wall and impact protection mat must be at least 500 mm!**

### 10.1.5 Filling system

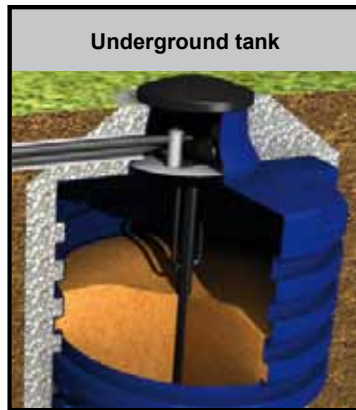
For the filling process you need two filling sockets. Onto one filling socket there is a suction fan applied (at filling process) and at the other socket, the pellets are blown into. Construct a whole opening with a diameter of 125 – 150 mm. The filling sockets are to be mounted with suitable material into these wall openings (they must not loosen during the filling process). The usage of fitting foam glue must be arranged beforehand with your pellet supplier.



**The impact protection mat must be mounted in a way that the supply socket is located at the opposite!**  
**Minimum distance between filling sockets: min. 0.5 m!**

### 10.1.7 There are three (3) different delivery variants for outputting pellets

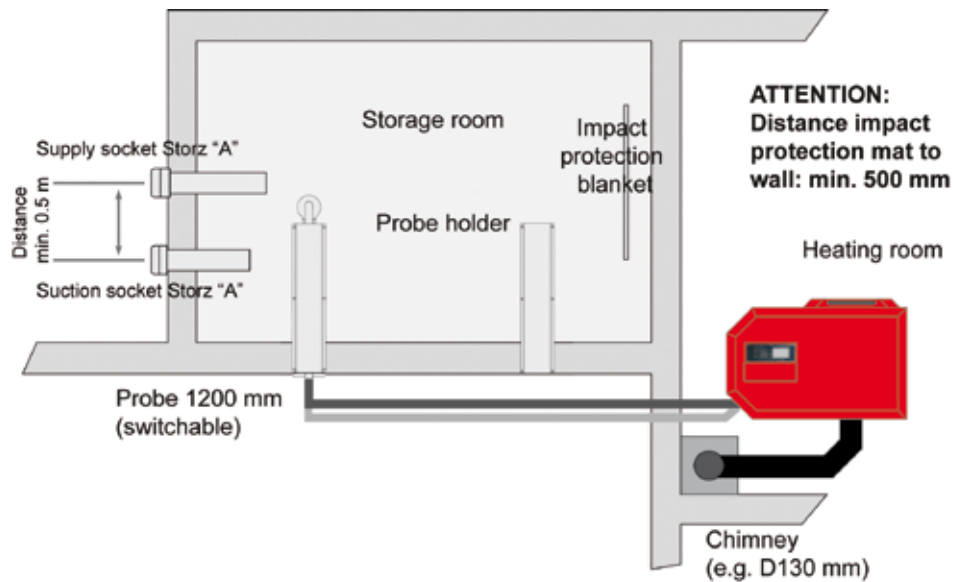
Other output systems on request or on consultation and release by Biotech Energietechnik GmbH can also be used. The warranty / warranty performance is voided if unauthorized output systems are used.



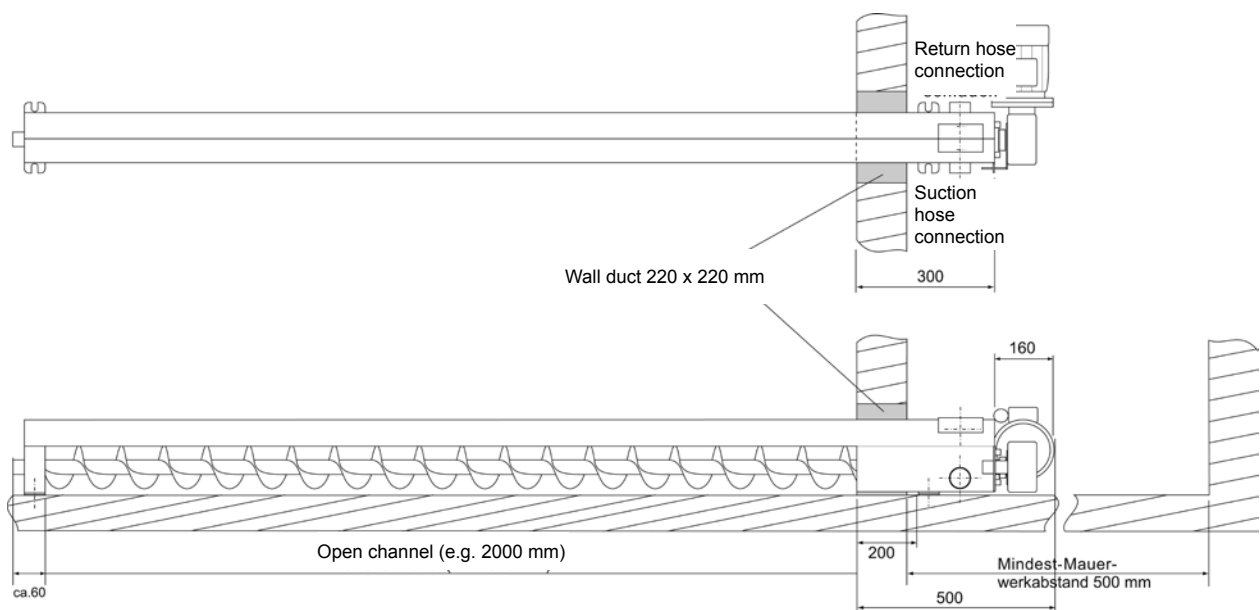
## 10.2 Auger conveyor output

### 10.2.1 Operating principle

The pellets are conveyed by the auger from the storage area to the suction point and sucked up from there. The suction tube and the return air tube are secured on the auger head left and right with the clamps supplied..



There are six (6) different auger lengths (1500 / 2000 / 2500 / 3000 / 3500 / 4000 mm) available as standard equipment; other auger lengths are available on request (up to a maximum of 4000 mm). Split designs are also available on request.



## 10.2.2 Assembly

A 220 x 220 wall duct must be created at the site below centrally in the storeroom wall. The auger output system is passed through the wall duct into the storage room.

The open channel must always be completely in the storeroom.

The connections for the tubes and the motor must be freely accessible on the outside of the storeroom and must be splash-proof.

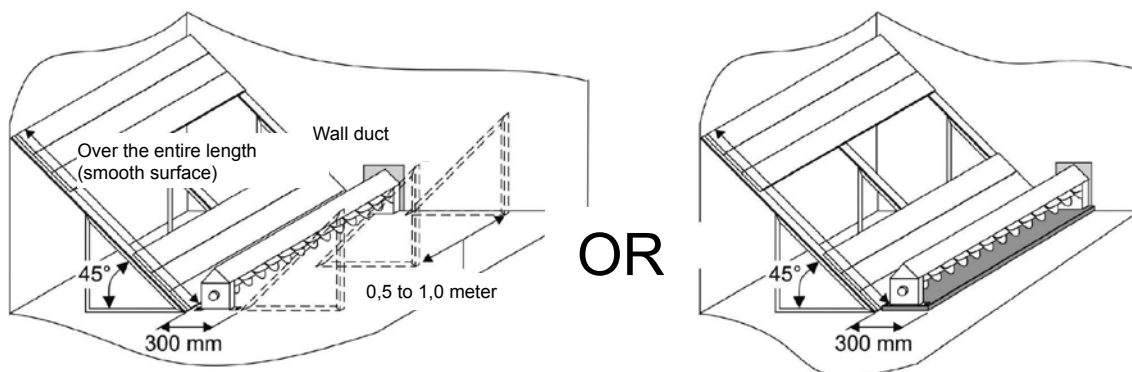


**ATTENTION: The hose radius must be at least 25 cm!**

Fasten the auger to the floor using the dowels and screws supplied.

Inclined floors in the storeroom must be provided to the left and right of the auger. The chute angles should have at least a 45° incline in order to ensure reliable continuous sliding of the pellets.

Fasten the angle profile (accessory) at a distance of 0.5 to 1.0 m (depending on the load capacity of the upper structure) on the floor and assemble the plates for the inclines on them.



Assemble the auger fixed on the floor. Assemble the right and left slide angle with a spacing of 300 mm from each other.

Assemble the auger on a wooden board (300 mm wide, 20 mm high) fixed on the floor. A wooden slat serves as a stop for the slide angles, which must also be fixed in position.

**ATTENTION:**



**The carrier straps of the auger must not block the auger!  
If the suction hose is less than 5.0 meters in length,  
the return air hose must be at least 2.0 metres longer.**

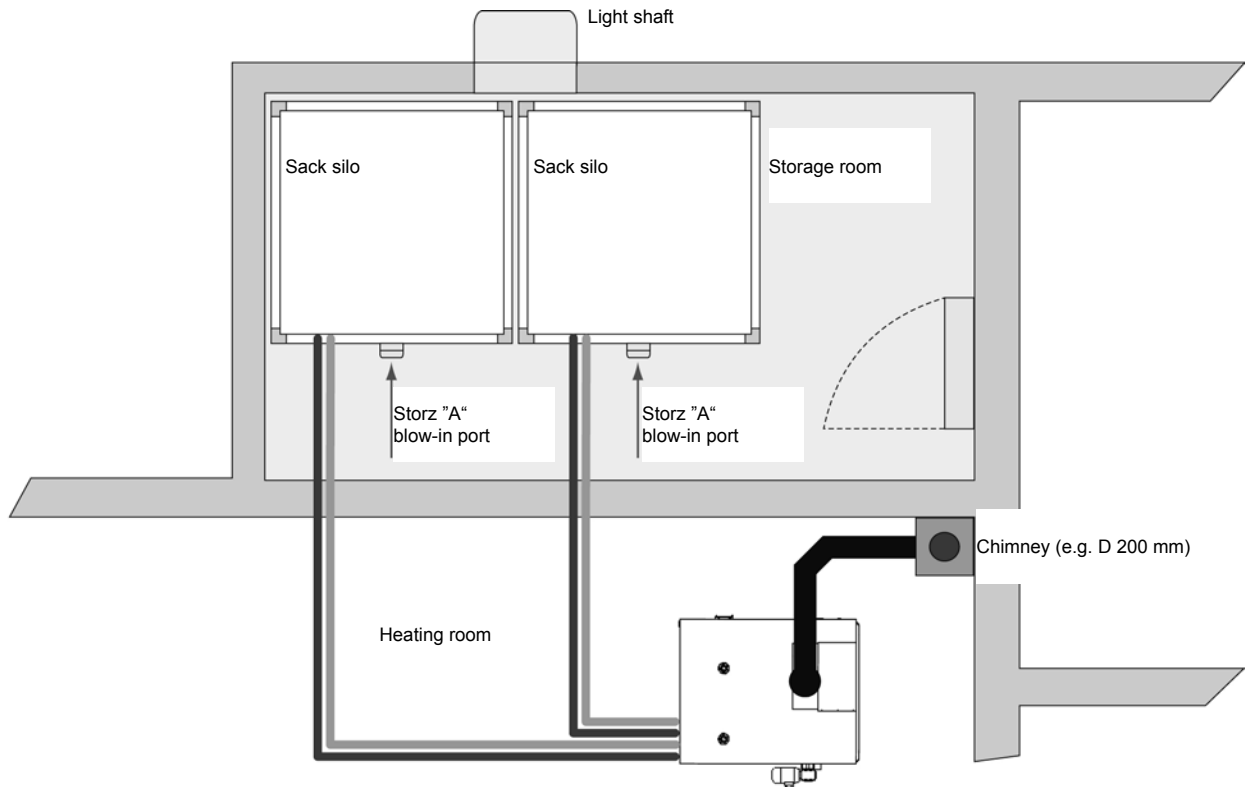


## 10.3 Output form the sack silo

### 10.3.1 Operating principle

The pellets are sucked via the point-suction system, which is situated in the flanged removal box under the sack silo, into the supply hopper. When using a sack silo with an assembled auger in the removal box, the pellets are dosed via the auger into the suction hose. Pellet filling of the sack silo takes place via the filling nozzles installed on the steel frame.

**Different silo sizes are available depending on the room size.**



### 10.3.2 Assembly

The silo must be set up in accordance with the set-up instructions either in the storage room or in the heating room in accordance with the country-specific fire protection regulations.

### 10.3.3 Earthing of the sack silo

Strip the copper braid from the conveyor hose and bend them inward. Connect the hose to the suction nozzles and place the copper braiding on the metal.

**The maximum conveyor hose length with the Biotech PLS pellet storage system is 10 m.**



**A complete evacuation of the PLS can not be guaranteed,  
as this greatly depends on the quality of pellets  
(Particulate matter content)**

## 10.4 Output form the underground tank

### 10.4.1 Operating principle

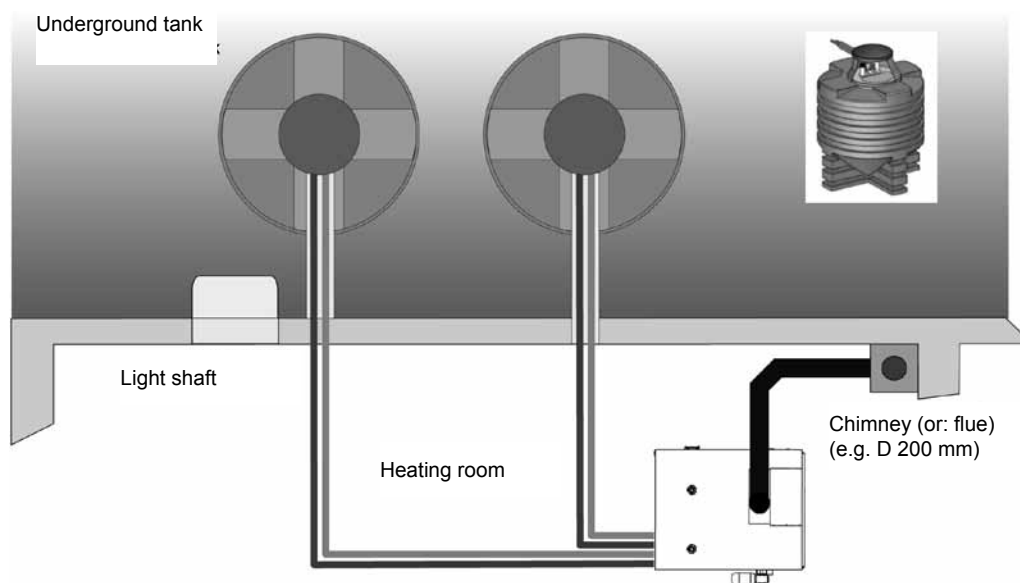
The pellets are conveyed through a suction probe / auger / mole via a suction tube to the supply hopper.

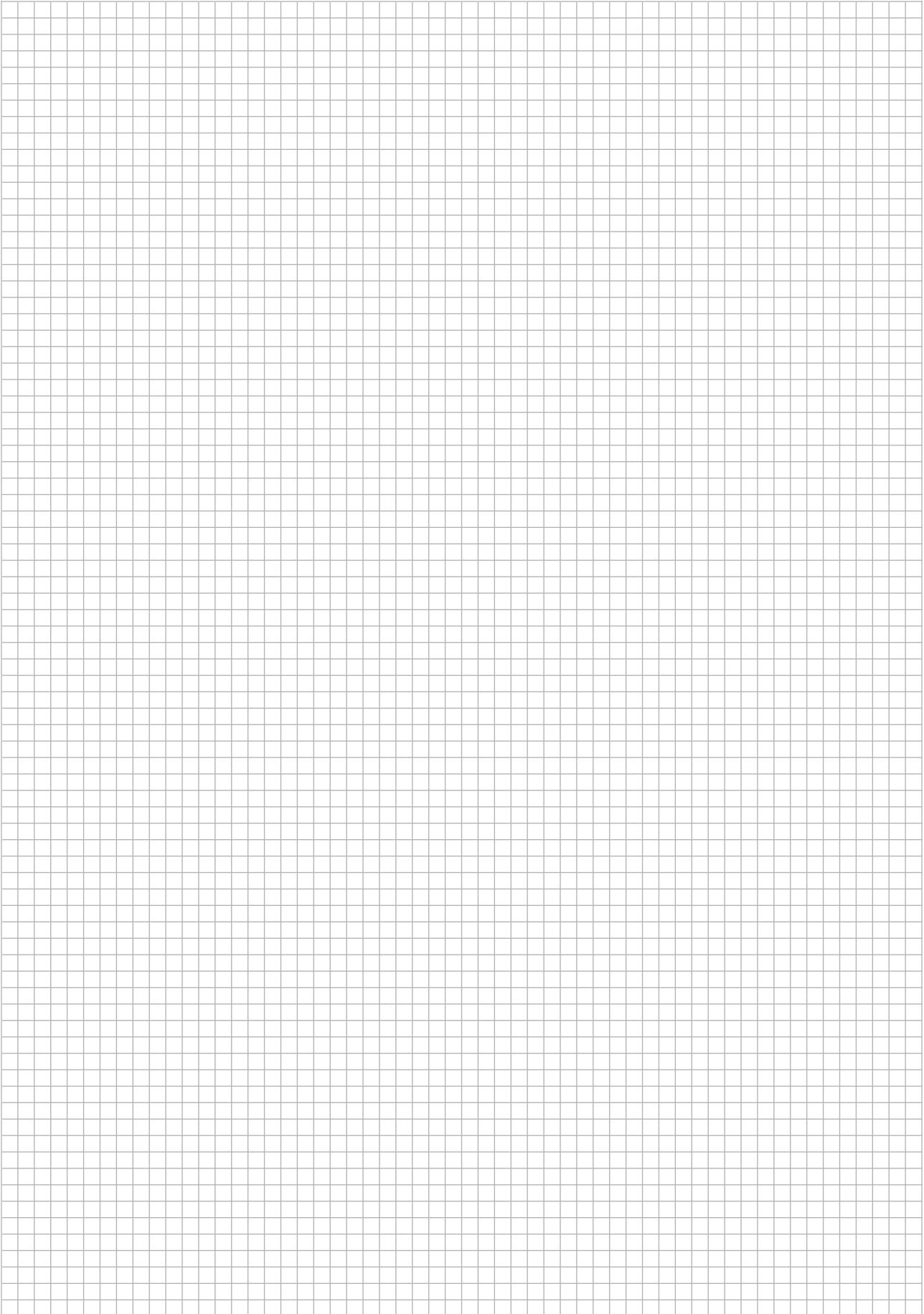
Pellet filling is done via a filling coupling on the underground tank.

Depending on the manufacturer, different sizes of underground tank are available (e.g. 11,000 litres...).

### 10.4.2 Earthing of the underground tank

Strip the copper braid from the conveyor hose and bend them inward. Connect the hose to the suction nozzles and place the copper braiding on the metal.





DECLARATION OF CONFORMITY  
EU Declaration of Conformity for Discharge Systems

WITHIN THE MEANING OF THE EC MACHINERY DIRECTIVE 2006/42/EC, Annex II 1 A

The manufacturer

**Biotech Energietechnik GmbH**  
**Furtmühlstraße 32**  
**5101 Bergheim bei Salzburg**

herewith declares that the machines/products produced and sold by us

<b>Worm discharge</b>	<b>Return air probe</b>	<b>Suction points</b>	<b>Rotation discharge</b>
<b>Hose switch</b>	<b>PLS Pellet Storage System</b>		

Are in compliance with the provisions of the following directives:  
**2006/42/EC | Machinery Directive**

The following harmonized standard(s) has (have) been applied:  
**EN ISO 12100-1/A1:2009-10 | Safety of Machinery**

DECLARATION OF CONFORMITY  
EU Declaration of Conformity for Pellet Heating Boilers

IN THE MEANING OF THE EC LOW-VOLTAGE DIRECTIVE 2006/95/EC, Annex II 1 A

The manufacturer

**Biotech Energietechnik GmbH**  
**Furtmühlstraße 32**  
**5101 Bergheim bei Salzburg**

herewith declares that the machines/products produced and sold by us

<b>Top Light Pellet Heating Boiler</b>	<b>Top Light M Pellet Heating Boiler</b>	<b>Top Light M (MBW) Pellet Heating Boiler</b>
<b>PZ8RL Pellet Heating Boiler</b>	<b>PZ25RL Pellet Heating Boiler</b>	<b>PZ32RL Pellet Heating Boiler</b>
<b>PZ35RL Pellet Heating Boiler</b>	<b>PZ65RL Pellet Heating Boiler</b>	<b>PZ100RL Pellet Heating Boiler</b>

Are in compliance with the provisions of the following directives:

**2006/95/EC | Low-voltage Directive**

**2004/108/EG | EMC-Directive**

The following harmonized standard(s) has (have) been applied:

**EN 303-5 | Solid Fuel Heating Boilers**  
*Manually and automatically charged firing/furnaces, rated thermal output up to 300 kW*  
**EN 60335-1 | Electrical Equipment Safety**

Bergheim, dated 07/04/2010





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