

## Pellet Extraction System *Pellet Mole*®

Installation instructions  
for installation in the pellet store

Incl. installation instructions for manual lifting gear

## Overview of Contents

<b>1. Introduction .....</b>	<b>3</b>
1.1 General Instructions .....	3
1.2 Note on Target Group .....	3
1.3 EC Conformity .....	3
1.4 Explanation of Symbols and Signs / Warning Instructions .....	3
<b>2. For your safety .....</b>	<b>4</b>
2.1 Risks and Safety Measures .....	4
2.2 Regulations .....	5
2.3 Obligations of the Installer .....	5
<b>3. Product Description Pellet Mole® .....</b>	<b>6</b>
3.1 Scope of Supply .....	6
3.2 Information on the Product .....	6
3.3 Description of Equipment .....	7
3.4 Function of the Equipment .....	7
3.5 Technical Data on the Mole .....	8
<b>4. Installing Pellet Mole® in Pellet Store .....</b>	<b>9</b>
4.1 BRIEF INSTRUCTIONS .....	9
4.2 Planning Sketch for Standard Store Shapes .....	9
4.3 Requirements on the Pellet Storage Room .....	10
4.4 Planning Sketches for Standard Store Shapes .....	11
4.5 Preparation for Installation .....	12
4.6 Installation of Adapter Plate .....	13
4.7 Installation of Mole Tube .....	14
4.8 Parking Position of Basic Mole .....	18
<b>5. Installation of Manual Lifting Gear .....</b>	<b>19</b>
5.1 System Overview .....	19
5.2 Installing Components .....	20
<b>6. Installation of Accessories .....</b>	<b>24</b>
6.1 Filling Set .....	24
6.2 Impact protection mat .....	25
6.3 Tube cables to the boiler .....	25
<b>7. Electrical Activation of Pellet Mole® .....</b>	<b>27</b>
7.1 General Description .....	27
7.2 Suction system with pressure-tight supply containers .....	27
7.3 Suction system with atmospheric supply containers .....	28
<b>8. Electrical installation .....</b>	<b>29</b>
<b>9. Commissioning the pellet mole® .....</b>	<b>30</b>
9.1 System review .....	30
9.2 Schematic sequence of commissioning .....	30
<b>10. Commissioning Log .....</b>	<b>31</b>
<b>11. Troubleshooting .....</b>	<b>32</b>
<b>12. Maintenance .....</b>	<b>34</b>
12.1 Regular maintenance work .....	34
12.2 Customer Services .....	34
<b>13. Putting out of operation .....</b>	<b>35</b>
<b>14. Disposal .....</b>	<b>35</b>
<b>15. Appendix .....</b>	<b>36</b>
15.1 Filling instructions for the pellet store of the basic mole .....	36
15.2 Filling instructions for the pellet store of the mole with manual lifting gear .....	37
15.3 EC Declaration of Conformity .....	38

## 1. Introduction

### 1.1 General Instructions

The present installation instructions are valid for pellet mole® from Version III\_11. Before starting the installation, the instructions are to be read by the persons entrusted with the relevant work.

The specifications given in these instructions must be followed. These instructions are to be retained by the operator as an integral part of the equipment supplied.

There is no guarantee claim if the present installation and operating instructions are not followed.

Special steps are to be maintained for filling the store. The filling instructions that come with the system are to be attached in the store in a visible place.





### 1.2 Note on Target Group

These installation instructions are intended for qualified engineers.

### 1.3 EC Conformity

The product has been EC tested and meets the requirements of the applicable European directives. You will find the conformity declaration under 15 - Appendix.

### 1.4 Explanation of Symbols and Signs / Warning Instructions

	<b>DANGER</b> Marks an immediate danger which can lead to serious injury or death if it is not avoided.
	<b>CAUTION</b> Marks a possible danger which can lead to minor injuries or material damage if it is not avoided.
	<b>Note</b> Points to important information on the procedure and contents of the instructions.
	<b>Working Step</b> Points to a working step.

**Technical Changes Reserved / Technical Status: November 2012**

**Components may sometimes differ from the illustrations**  
**No liability is accepted for any printing errors**

## 2. For your safety

### 2.1 Risks and Safety Measures

The electrical installation and commissioning must only be done by a qualified engineer.



#### **DANGER**

On the electrical connections there is a mains voltage of 230 VAC/50 Hz. Danger of death from electric shock. Disconnect the plug before working on the equipment. For working on the electrical cable, disconnect the connection on the boiler.



#### **DANGER**

A dust-air mixture may ignite or explode. When the hot boiler is operating, do not under any circumstances open components carrying pellets.



#### **DANGER**

Moving parts of the extraction system may cause crush injuries. When the hot boiler is operating, do not carry out any work on the moving parts. Disconnect the plug before working on the equipment.



#### **DANGER**

The wood pellet store is a fuel store. The safety regulations of VDI, DEPV and the insurance association and local regulations are to be followed. In particular, VDI directive 3464 on "Storage of Wood Pellets as a Consumer" and DEPV brochure "Recommendations on Storage of Wood Pellets" are to be followed.

For DEPV safety instructions, see under:

<http://www.depv.de/downloads/publikationen/>

- In the pellet store there is a risk of the lack of oxygen, or the accumulation of gases (e.g. carbon monoxide – CO is poisonous and odourless) and the development of dust.
- Generally, a CO measurement before climbing in is recommended for your safety. In stores with a pellet quantity greater than 10 t, in earth stores or similarly tight pellet stores, this measurement must absolutely be carried out.
- Ensure that the storage room is well ventilated before entering. To ventilate, open any filling couplings and use a fan. When working in the store, wear a breathing protection mask (dust protection).
- Only enter the storage room if a second person is present, who can help in case of danger. It must be possible to rescue a helpless person.
- When climbing into the store from above, wear appropriate climbing safety gear (follow local safety regulations or those of insurance associations).



#### **CAUTION**

Keep children away from the pellet store.



#### **DANGER**

Smoking and naked flames are prohibited in the pellet store.

## 2.2 Regulations

When fitting and installing, follow the regulations and directives, including those below:

### Legal Specifications

- Legal regulations on accident prevention
- Legal regulations on environmental protection
- Provisions of insurance associations
- Template fire regulations MFeuVO or regional fire regulation FeuVO
- Fire protection regulation Brandsch.VO

### Standards and Directives

- The relevant safety provisions of DIN, ÖNORM, EN, DVGW, TRGI, TRF and VDE
- Federal Pollution Protection Regulation BImSchV
- Fire Behaviour of Building Materials and Components DIN 4102

## 2.3 Obligations of the Installer

When fitting and installing, follow the regulations, including those below:

- Only undertake activities which are described in these instructions.
- Carry out all activities in accordance with the applicable standards and regulations.
- Instruct the operator on the use and operation of the equipment.
- Instruct the operator on the operation of store filling.
- Instruct the operator on the maintenance of the equipment.
- Instruct the operator on possible risks that may arise from the operation of the equipment.
- Instruct the operator on handling fuel stores.
- Instruct on the regular store cleaning to be carried out.



### Note

Attach the filling instructions supplied visibly on the store for the pellet suppliers (either on the filling pipe or on the storage room door).

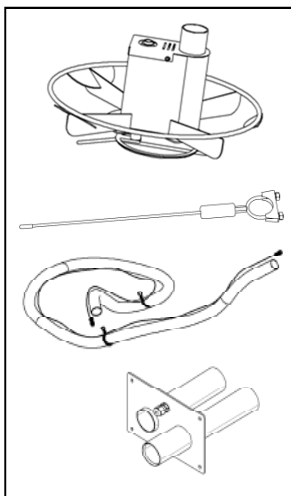


### Note

The operator of the system undertakes to retain the documents so that they are available when needed.

### 3. Product Description Pellet Mole®

#### 3.1 Scope of Supply



The scope of supply includes all the accessories and small parts for installation of the removal system in the store. The adapter plate (wall opening) allows the connecting pipes to be connected to the heating boiler.

- Mole equipment with 230V, AC/50 Hz drive and prefitted base ring
- Mole tuning set with installation handle
- Tube system (5 m) consisting of flexible wire-spiral tube (wire= earthing lead) and cable with special plug connections and prefitted tube brackets with carabiner hooks.
- Adapter plate (wall opening) for a wall thickness up to 24 cm
- Various small parts needed for the installation (including hooks, clamping plate, double-wire plate, screws and dowels)
- Filling Instructions

**Scope of supply of the basic version of the Pellet Mole®**



**Scope of Supply of the Basic Mole**

#### 3.2 Information on the Product

##### Proper Use

The wooden pellet removal system pellet mole® is for conveying pellets from the store into the furnace room in combination with a wooden pellet boiler designed with suction system. Regarding compatibility, ensure the relevant applicable boiler approval list, which can be found as a download under [www.schellinger-kg.de](http://www.schellinger-kg.de), is available.

##### Improper Use

For each improper use and for changes to the product, including in conjunction with fitting and installation, any guarantee and liability claim is null and void.

## Permitted fuel



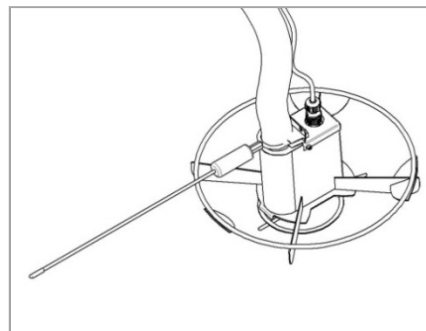
The pellet mole® is solely suitable for the removal of wood pellets corresponding to EN 14961-2 (e.g. ENplus, DINplus) and have a diameter of 6 mm.



## 3.3 Description of Equipment

The pellet mole® consists of a sheet steel housing with a synchronous geared motor to be connected to 230 V / 50 Hz AC voltage and a suction pipe for connecting to a suction tube with nominal width 50 mm.

The equipment number on the rating plate provides information about the exact version and design of the product and is to be quoted in case of any queries.



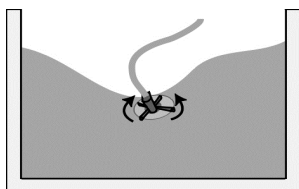
## 3.4 Function of the Equipment

The mole assumes the function of pellet removal from the pellet store. If the filling process has been started by the boiler control system, the suction turbine starts first. After a short delay (suction turbine pre-running 5 s) the mole motor is started.

Pellets are dosed in front of the suction opening by the rotational movement. The pulse time (switch-on time) of the mole is 120 s, then a pause of 5 s, then another pulse time of 120 s (opposite to the direction of rotation). The reversal of direction is done by the mole itself.

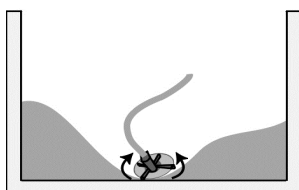
As soon as the boiler control system detects a full pellet container, the mole is shut down; the suction turbine shut down is delayed (suction turbine overrun 10 s), to completely empty the tube.

### a. Normal Mode



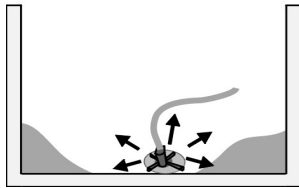
The mole forms a funnel or a recess in the pellet store. From this funnel it removes pellets until it reaches the floor of the pellet store. In this process, sliding pellets may sometimes cover the mole. As long as the housing lid remains visible, it is normal operating condition. The uniform, efficient removal is based on the rotary movement of the base ring supported by the underpressure of the suction system.

### b. Store Emptying



After the floor of the store has been reached, the rotations of the base generates a sideways movement. Starting with the tube suspension in the centre of the room, the mole has a radius of activity of up to 2.5 m in diameter. As a result, the conveying power may be reduced for a time, as the mole moves over the "empty" areas of the floor. This results in an increase in the time needed to fill the supply container.

The pellet store should be cleaned after approximately 3 fillings, and the pellets should be raised as much as possible.



### c. Residual Emptying

If the prescribed filling time is no longer sufficient, this is an indication that the pellet store must be refilled. The longer the maximum suction time, the lower the remaining residual quantity on the floor. A certain residue remains as a reserve until the pellets are topped up.

You can use these spare pellets by putting the residual pellets onto the mole and restarting the boiler. Ideally, you push the residual quantity from the corners of the store into one place. If you want to completely empty the store, you can fill the residual pellets into a large buckets and put the mole on top of it.

The pellet store should be cleaned after approximately 3 fillings, and the pellets should be raised as much as possible.

## 3.5 Technical Data on the Mole

Conveying quantity: 5 to 10 kg/min in filled store, 2 to 4 kg/min in partially empty store, depending on the suction system and tube length

Suction length (simply, from the storage room outside to the boiler): 10 to 15 m depending on suction power and suction height.

Suction tube: 50 mm nominal width, internal (special wire spiral tube)

Connection voltage:	230 VAX/50Hz	Weight	approx. 4.0 kg
Power consumption:	23 VA	Diameter:	approx. 410 mm
Current:	100 mA	Height	approx. 270 mm
Fuse type for motor:	IP 55	ATEX equipment module:	II
Cable plug connection:	IP 67	ATEX equipment category:	3D T100



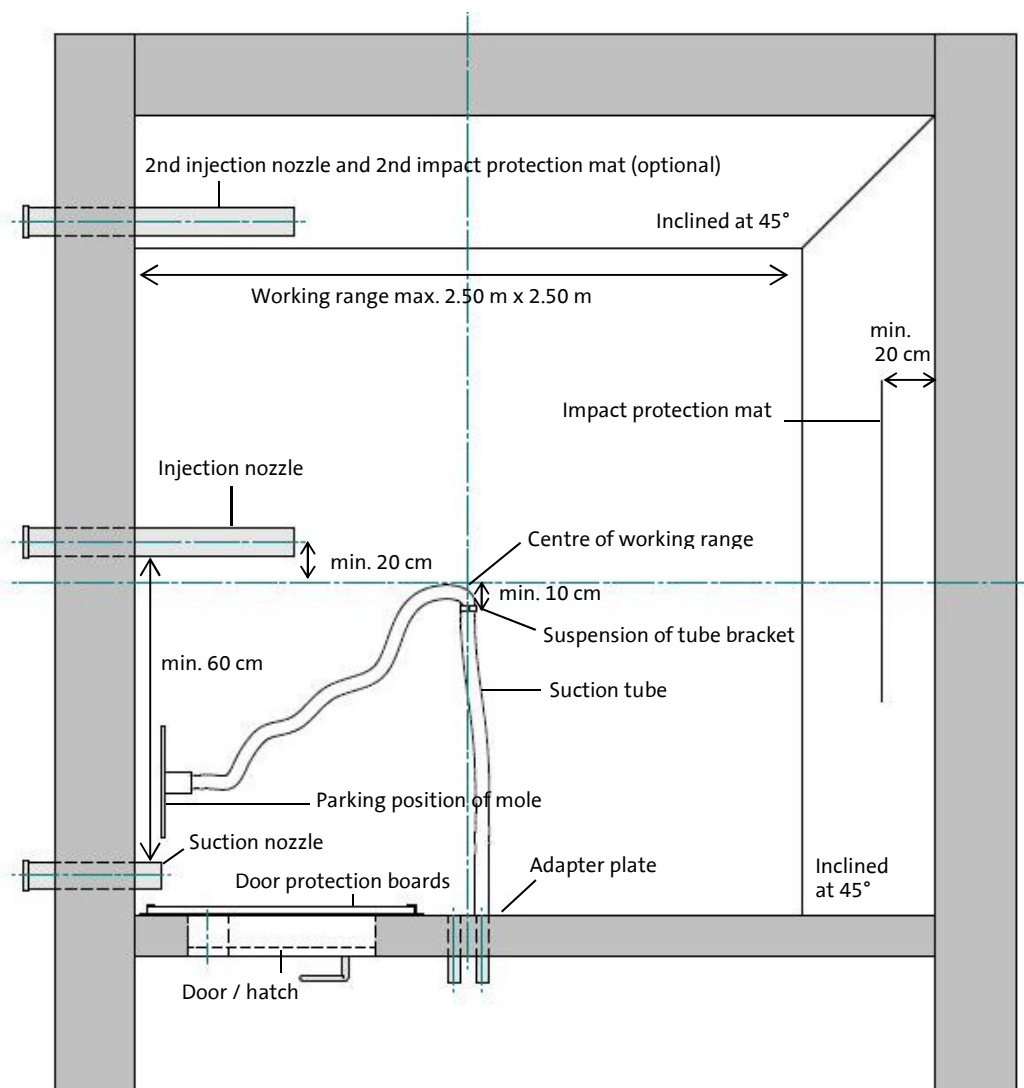
## 4. Installing Pellet Mole® in Pellet Store

### 4.1 BRIEF INSTRUCTIONS

1. Check the supply for completeness.
2. Measure out the storage room (length, width, height) and prepare planning sketch as per 4.2.
3. Define the suspension point of the mole suction tube. Follow arrangement of filling nozzle, impact protection mat and door.
4. Determine the tube length from the suspension point to the mole equipment according to the room dimensions and install the tube bracket accordingly.
5. Establish the position of the wall opening. Ensure that the tube route from the wall opening to the central suspension point on the ceiling does not cross the filling stream if at all possible.
6. Provide mole parking position in the area of the doors (needed for filling the store).
7. When installing with manual lifting gear, establish the position of the guide rollers.

### 4.2 Planning Sketch for Standard Store Shapes

**Plan View of Pellet Store with Mole**  
(minimum gaps are to be observed)



### 4.3 Requirements on the Pellet Storage Room

**Important for optimum  
function and  
operational safety**

The pellet storage room must remain dry throughout the year.  
Normal humidity as may occur in a residential building due to the weather,  
does not damage the pellets.

For general requirements and recommendations on building the store, see:  
<http://www.depv.de/downloads/publikationen>

Pipework or other unremovable components are to be protected accordingly. The  
conveying air used to blow the wooden pellets into the store must be sucked out  
during the filling process.



**Note**

**Follow the plan  
in Chapter 4.2**

- Ideally, the floor surface of the store will be designed to be square or round.
- The working range of the mole is 2 to 2.5 m in diameter.
- For larger rooms or stores with a square floor surface, put in a slope of 45°, so that the pellets slide down into the working range of the mole.
- The working range of the mole depends on the room height (min. 1.70 m) and is restricted by the narrow side wall of the store (min. 1.70 m).
- Maximum permitted room height is 3 m.
- Offset the injection nozzle and suspension point of the mole suction tube by at least 25 cm from each other, so that the tube is not damaged during the filling process.
- Install the injection and suction nozzle at least 60 cm apart, so that the suction nozzle remains free of pellets during the filling process.
- Install the door or hatch at least 70 cm on to the side of the injection nozzle to guarantee accessibility.
- Provide the parking position for the mole between the tube suspension and the door / hatch, so that the mole can be positioned in the filled store.
- When filling, a natural hollow space is created due to the flow of pellets. Use this for parking position of the mole.
- Attach the adapter plate to the same side as the door/hatch.  
If at all possible, the tube should not cross the filling stream from the central suspension to the wall opening. If this cannot be avoided, the tube must be permanently protected from damage by the pellet filling stream.

#### 4.4 Planning Sketches for Standard Store Shapes

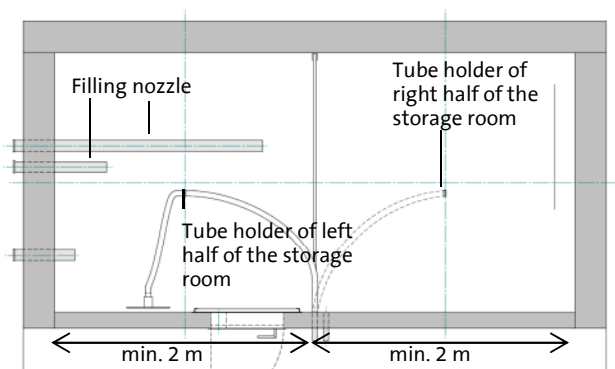
Further examples of the design of a pellet store with mole system can be found in the corresponding planning documents under [www.schellinger-kg.de](http://www.schellinger-kg.de).

##### 4.4.1 Square Storage Room

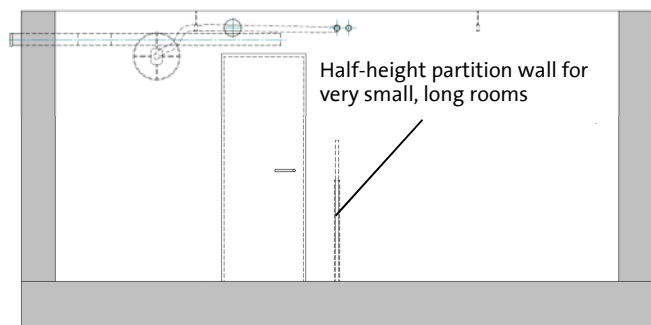
In square rooms, as shown on page 9, the floor surface may be delimited by installing slopes on a square dimension.

For very narrow, long rooms, the working area of the mole can also be expanded by manually hanging it around. From a store of 4 m, the working ranges should be subdivided by a half-height partition wall.

Ground Plan

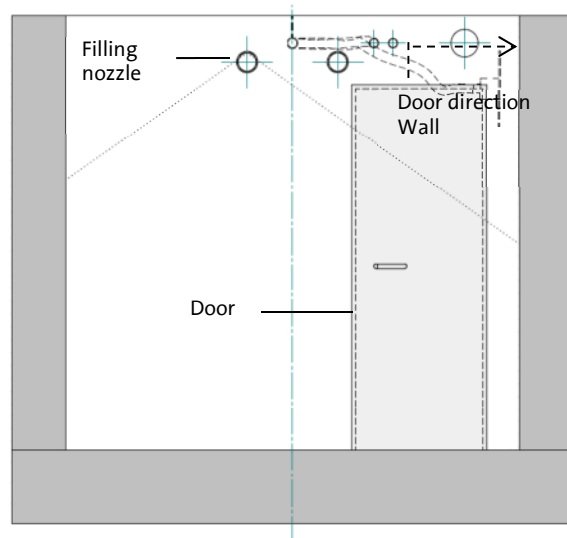
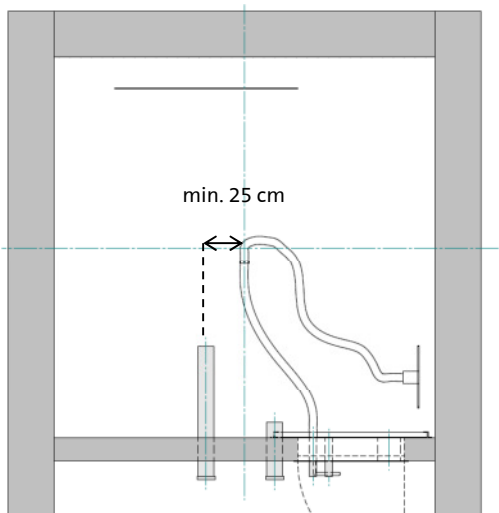


Cross- Section



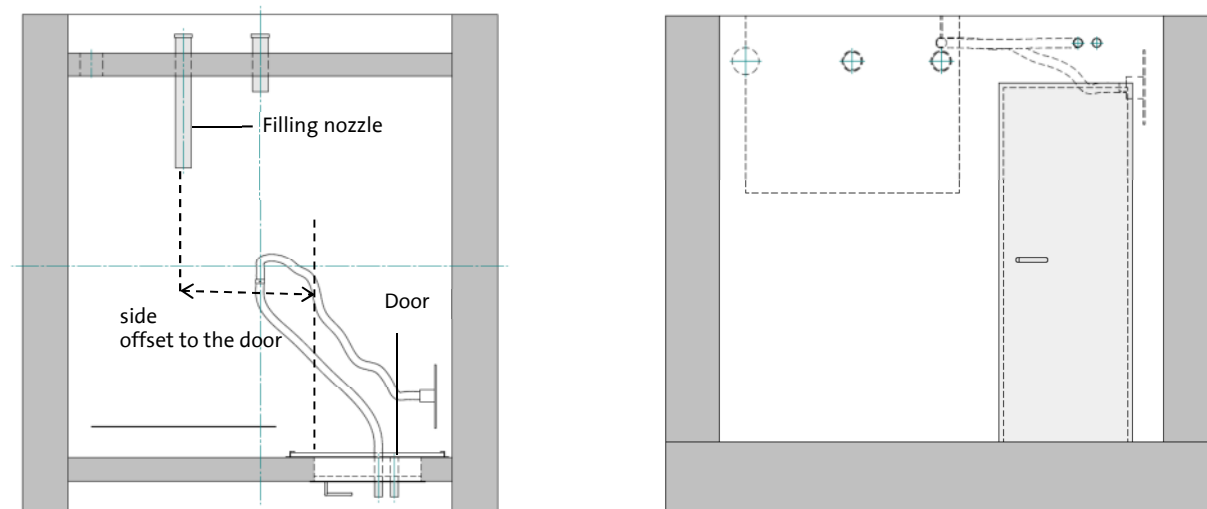
##### 4.4.2 Store with Filling Nozzle and Door on a Side Wall

If the filling nozzle is attached to the interior wall of a building, then the door / hatch should be arranged as far as possible from the edge. Due to the natural pellet flow, there is a natural empty space in this area for the parking position of the mole.



#### 4.4.3 Store with Filling Nozzle Opposite the Door

If possible, the door should always be arranged on the same side as the filling nozzle. If this is not possible due to the structural situation, it is important to retain a side offset.



#### 4.5 Preparation for Installation

##### Floor surface

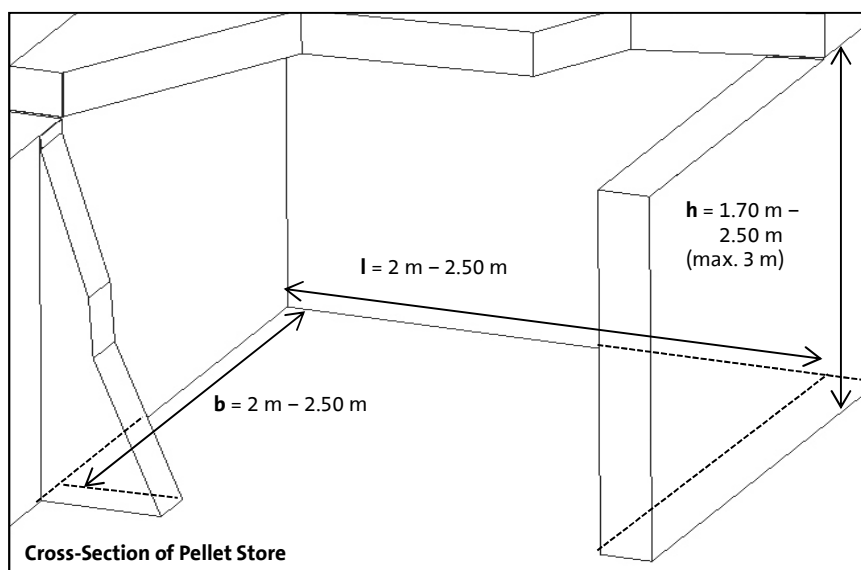
The optimum function of the mole is with a square floor surface with an edge length of 2 m to 2.50 m.

For larger or square rooms, the installation of a sloping floor is recommended to give the floor surface, ideally a square, with an edge length of 2.50 m.

##### Room Height

The room height  $h$  is to be within the range of 1.70 m to 2.50 m. The working range is reduced for room heights below 2 m. For room heights above 2.50 m, particular attention must be paid to the tube guidance in the filled store. Stores higher than 3 m are not suitable.

##### Determining the room dimension



## Note



The tube length must be adapted to the room height. See Installation of Mole Tube, Chapter 4.7

The cable connection in the area of the wall opening is to be designed inside the store (as described in the following steps), to enable a rapid and uncomplicated replacement of the tube system if required.

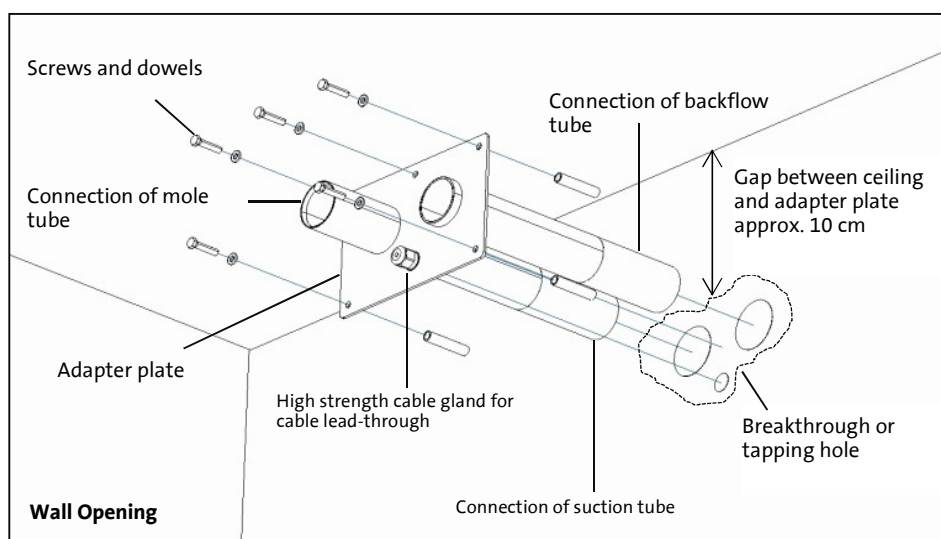
## 4.6 Installation of Adapter Plate

The adapter plate represents the interface of the store and serves as a wall opening. For installation, proceed as follows:

### Installing adapter plate

- Install the adapter plate on the same side as the door or hatch where possible.
- Mark the wall opening for adapter plate approx. 10 cm below the ceiling.
- Proceed as follows for the wall opening:
  - Wall opening: Mark the circumference of the wall opening according to the adapter plate with a width of approx. 15 cm and a height of approx. 10 cm and break through wall.
  - Tapping drill hole: For the pipe of the suction tube or backflow tube, drill a hole of min. 55 mm, using a drilling template.
- Install the adapter plate from the inside of the store outwards with the supplied screws and dowels.

### Overall Structure of Wall Opening (Inside Store)



## Note

If particular fire protection or soundproofing requirements are laid down, the design of the wall opening is to be adapted accordingly. Check the relevant applicable national regulations on this matter and follow them.

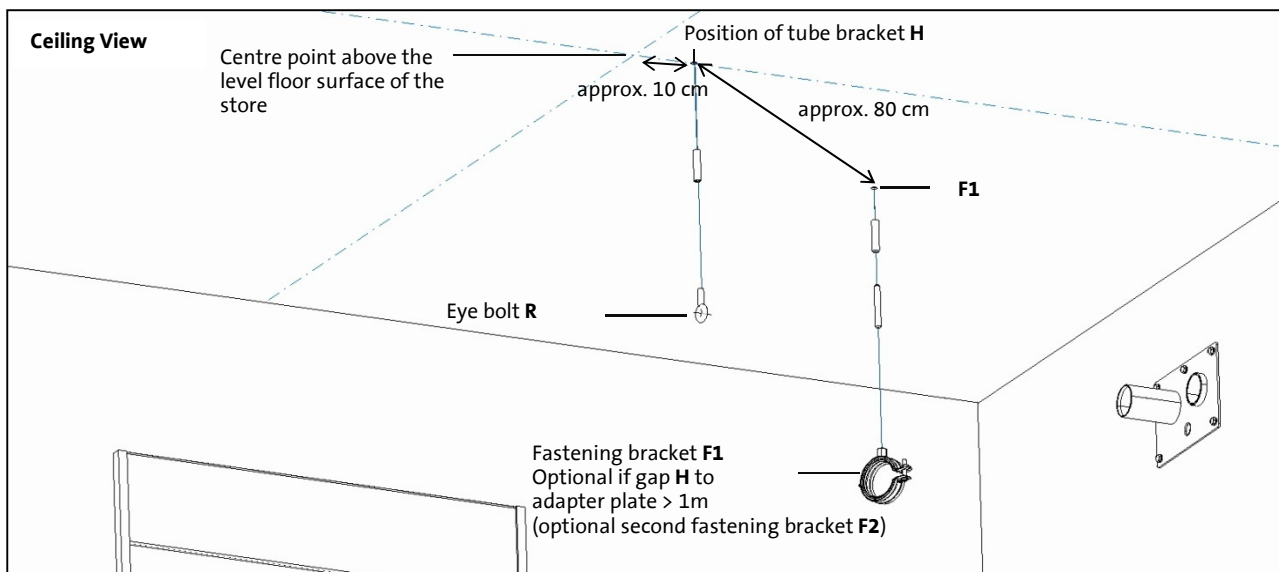
For larger pellet stores with stricter requirements regarding fire protection, a special wall opening can be obtained as an accessory.

#### 4.7 Installation of Mole Tube

##### Set tube hanging points on the ceiling

The tube bracket **H** is used as a bracket and pivot point for the mole and tube. The ability to move is through the carabiner hooks and the eye bolt.

- Determine the centre point of the store ceiling above the level working floor surface.
- Arrange the hole for the tube holder **H** at a distance of approx. 10 cm from the centre point in the direction of the tube connection, so that the tube is not damaged during the filling process. Then tighten eye bolt **R**.



##### Note

In larger storage rooms fasten the tube with the fastening brackets **F1** and **F2** onto the ceiling.

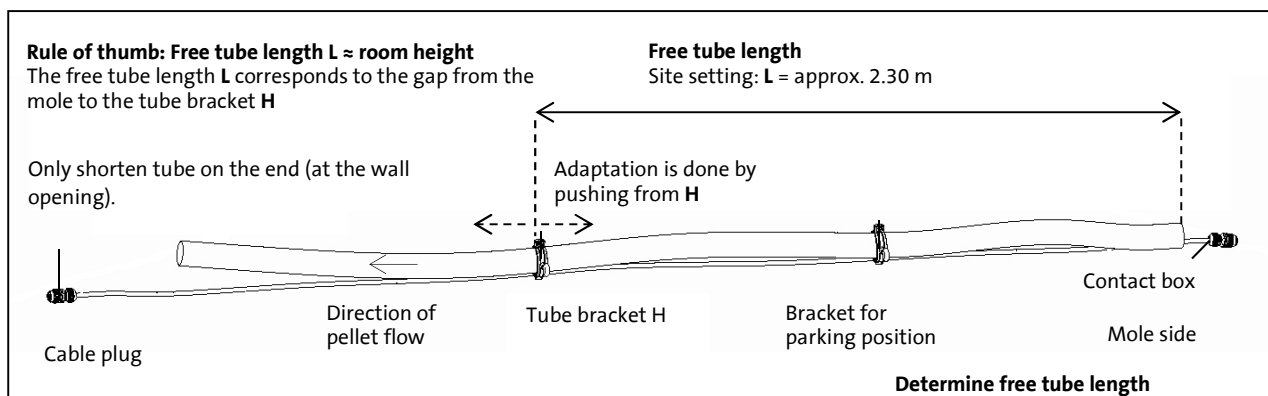
- If the gap between the tube bracket **H** and the adapter plate is greater than 1 m, fit fastening bracket **F1** at a gap of 80 cm from tube bracket **H** (direction of adapter plate) with stair bolt and lock nut onto the ceiling.
- If needed, install fastening bracket **F2** at a similar distance as **F1** on the ceiling. The tube is to be guided in a slight arc from the adapter plate to the central suspension point.

##### Adapt the position of the tube holder on the tube

The entire length of the tube is 5 m. The free tube length **L** corresponds to gap of the mole to the tube bracket **H**. On the factory side, the tube bracket **H** is adjusted on a room height of 2.3 m.

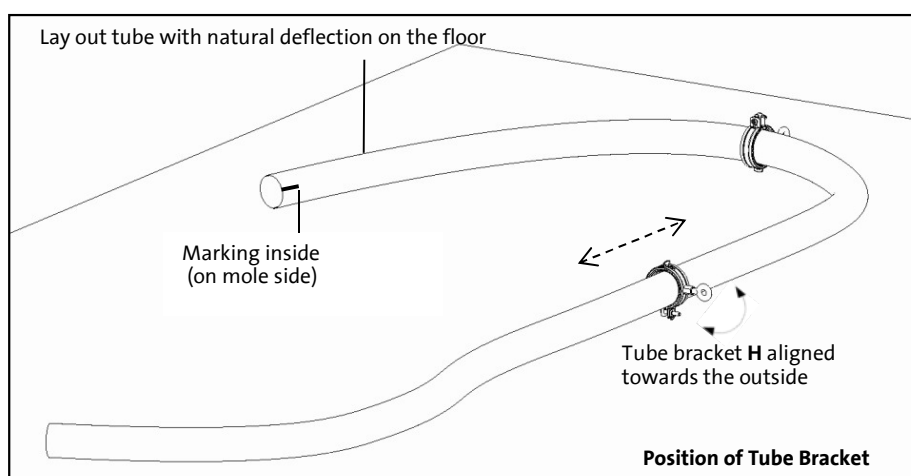
For different room heights adjust the tube bracket **H** accordingly:

- Measure the room height.
- Mark the measured room height on the tube, starting from the mole side.
- Undo pre-fitted tube bracket **H** from the tube, push onto marking and fasten.



### Check alignment of bracket on tube.

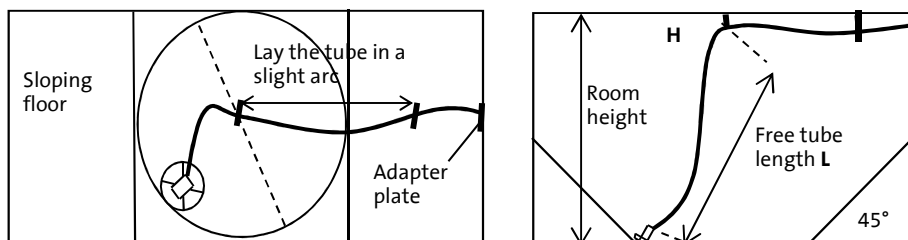
- In so doing, follow the alignment / twisting of the bracket. Fit bracket offset by  $180^\circ$  to the marking (see Fig. position of tube bracket).



### Adjust length of tube

- hook tube bracket  $H$  with carabiner hooks into the already installed tube suspension.
- If present, hang the tube onto fixing brackets **F1** and **F2**.
- Lay the tube between the tube bracket  $H$  and the wall opening in a slight arc (10 cm – 20 cm clearance), so that it is possible to turn the tube slightly on the tube bracket.
- Mark excess tube on the connection to the adapter plate and shorten.

### Plan view and cross-section of the pellet store with mole tube

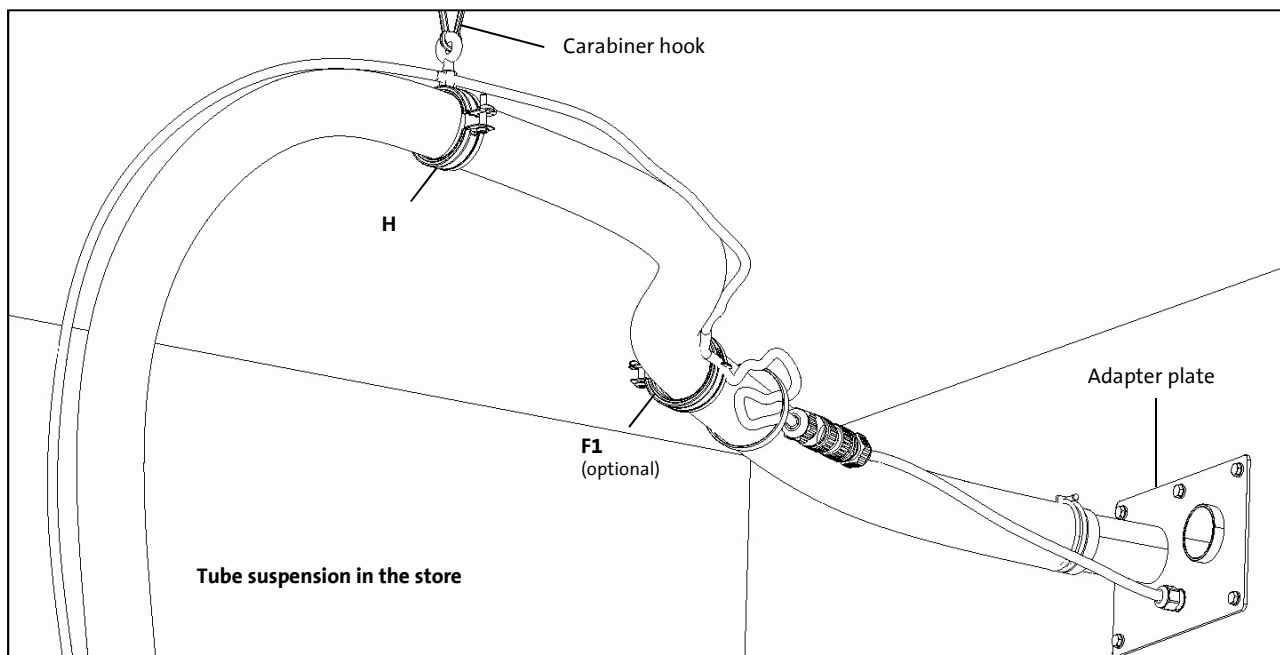


### Note

With long and very narrow rooms, less than 2 m wide, the tube length must be shortened.

### Installing the tube on adapter plate

- Before the final installation of the tube, check the course on the ceiling and the correct position of the tube suspension.
- Strip the earthing wire of the tube with a carpet knife about 4 cm and fold inwards.
- Turn the double wire bracket loosely on the tube (turn the bracket clockwise).
- Push the tube over the pipe of the adapter plate, so that the earthing wire is clamped between the hose and pipe nozzle (electrostatic discharge).



### Note:

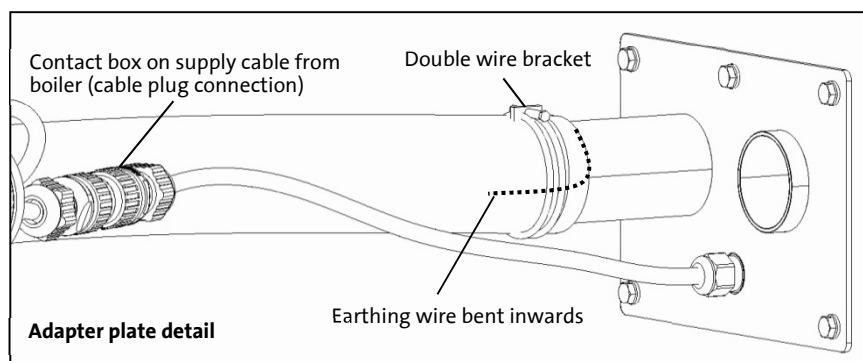
If the tube can only be pushed onto the pipe with difficulty, turn the tube left beforehand and push the tube onto the pipe with a turn to the right.

### Tube fastening

- Fasten the mole tube with the double wire bracket on the adapter plate.
- Install the supplied contact box onto the electrical cable already put into the store (for circuit diagram see Chapter 8) and connect with the mole cable plug.



### Tube earthing and installation on the adapter plate



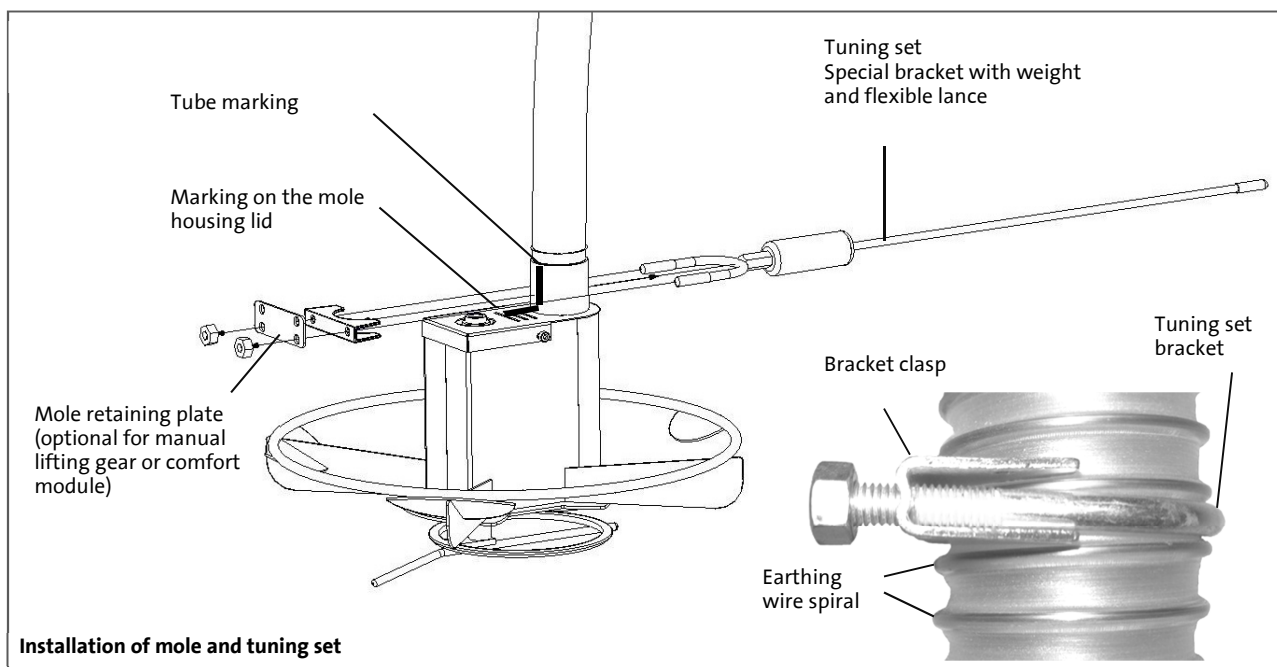
### Tuning set installation on the mole

- Push the lower end of the tube onto the mole pipe nozzle (rotation movement clockwise).
- Align mark on the tube and on the mole housing lid congruently (see figure).
- Push tuning set over the tube and fasten bracket with securing nuts (see figure).
- Fasten mole manual lifting gear or comfort module bracket and retaining plate. The retaining plate is included in the package.



#### Note

Ensure that the bracket is pushed in between two loops of the earthing wire spiral and fastened. The wire spiral runs diagonally in the hollow space of the bracket clasp (see figure).



#### Note

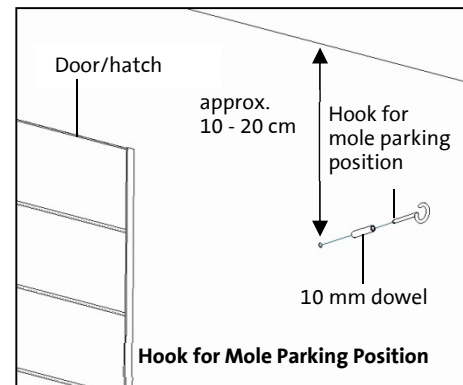
For installation of the manual lifting gear see later under Chapter 5 Installation of Manual Lifting Gear.

#### 4.8 Parking Position of Basic Mole

Before filling, the mole must be put into a secure parking position. If at all possible, this is in the area of the door / hatch and just below the ceiling.

With the basic mole, the parking position is provided using a hook on the wall.

- Mark the parking position below the ceiling and close to the inspection opening.
- Screw the suitable hooks into the wall with 10 mm dowel.



#### WARNING

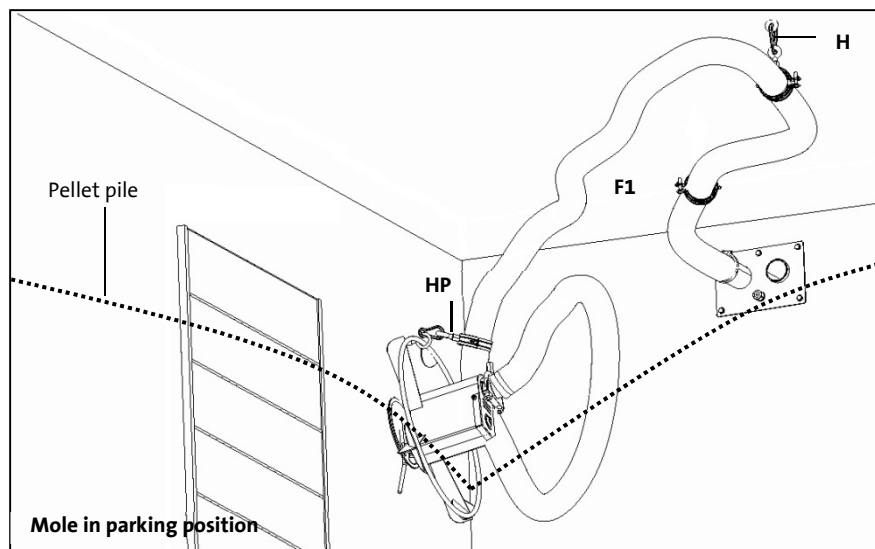
The parking position is to be selected, so that the mole and tube are not damaged or spilt during filling.

The inspection opening (door/hatch) and parking position are to be arranged, so that the mole is accessible in the freshly-filled store.

#### Adapt the tube bracket HP to parking position

An optimum positioning of the mole parking position is important for a smooth filling process and the associated positioning of the mole for the operational start.

- Hang the mole on the hook attached to the wall with the outer red ring.
- Pull the tube from the pellet filling stream and hang this using the bracket **HP** on this hook as well.
- The tube bracket **HP** is to be adjusted so that the tube runs as taut as possible on the ceiling when suspended.





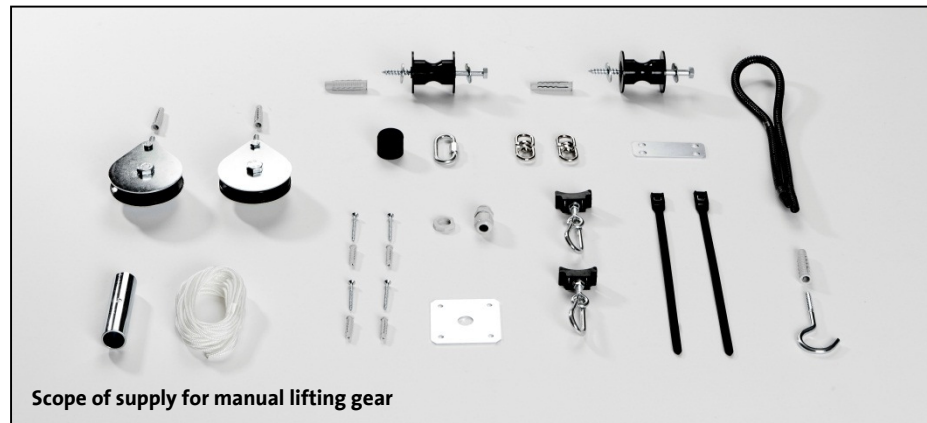
**Note:**

If you have chosen a mole system with "comfort module" (optional), please have the "comfort module installation instructions" to hand (included in the comfort module package).

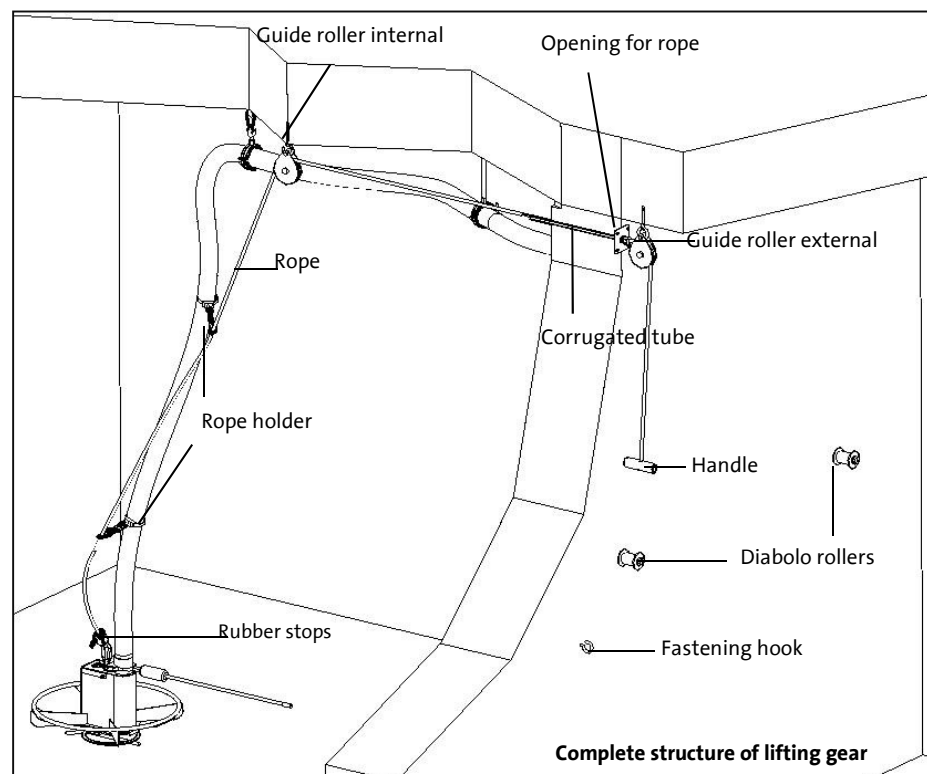
## 5. Installation of Manual Lifting Gear

### 5.1 System Overview

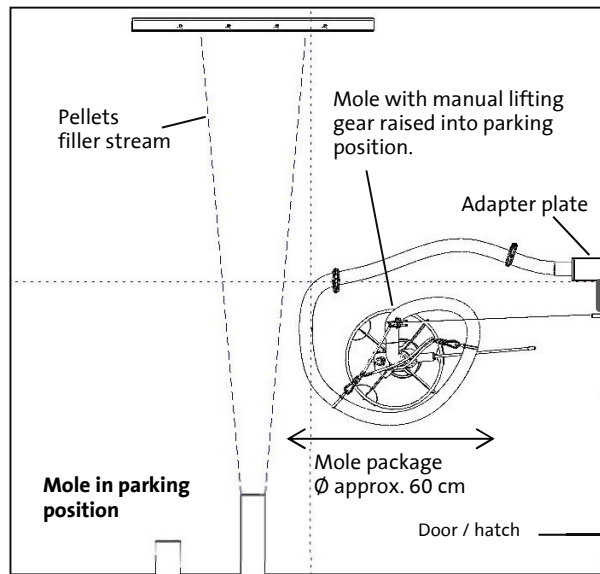
Scope of supply for manual lifting gear for cellar storage



This overview is used for orientation during installation. The following ideal dimensions are established for the room geometry shown:  
2.5m x 2.5m x 2.3m (L x W x H). The dimensions given are guidelines which must be adjusted to the local conditions.



### Plan view of mole with manual lifting gear in parking position

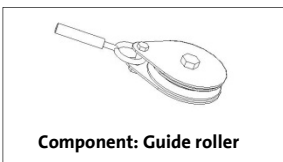


### WARNING

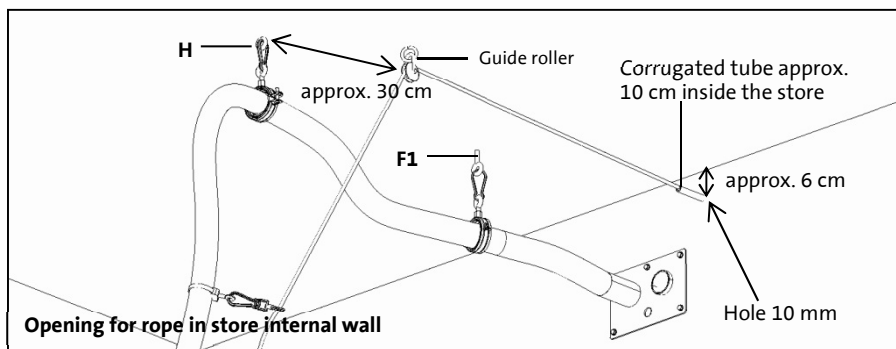
To avoid damage, the guide roller must be positioned in such a way that the mole and hose hang from the ceiling in the parking position outside the filling stream. The tube package has a diameter of approx. 60 cm.

## 5.2 Installing Components

### Guide roller internal Placement.

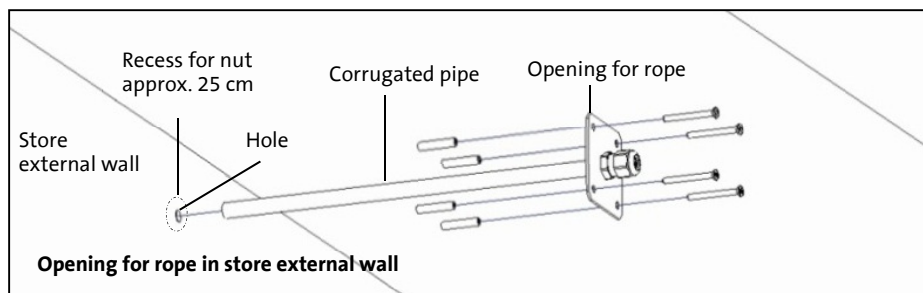


- First position guide roller internal on the store ceiling. The starting point is the central hose bracket **H**. At a distance of 30 cm, attach the guide roller to the ceiling in the direction of the wall leadthrough. The rope pulley is available as a prefitted component with eye bolt.



### Installing opening for rope

- Install the opening for the rope in the store wall in the direct range of the guide roller. Prepare the opening with a 10 mm drill bit.
- Prepare an additional recess (approx. 25 cm) for the nut of the opening for the rope.
- Complete the opening for the rope assembly and push into the hole from the outside.
- The length of the corrugated tube is to be trimmed down, based on the thickness of the wall. To guide the rope, allow the corrugated pipe to go approx. 10 cm into the store.
- Fasten the opening for rope with the 4 screws.

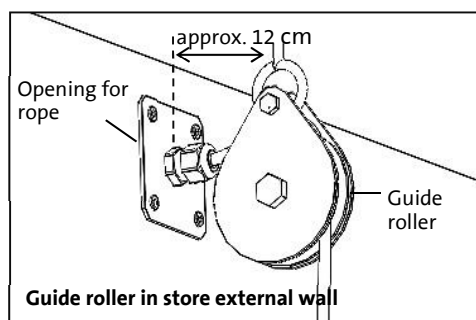


### Note

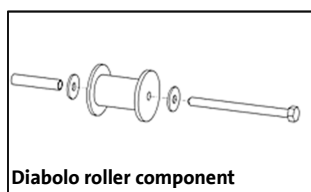
The opening for rope must always be provided in the area of the door / hatch, if possible, so the mole can be reached from the door in the parking position.

### Fit the guide roller external

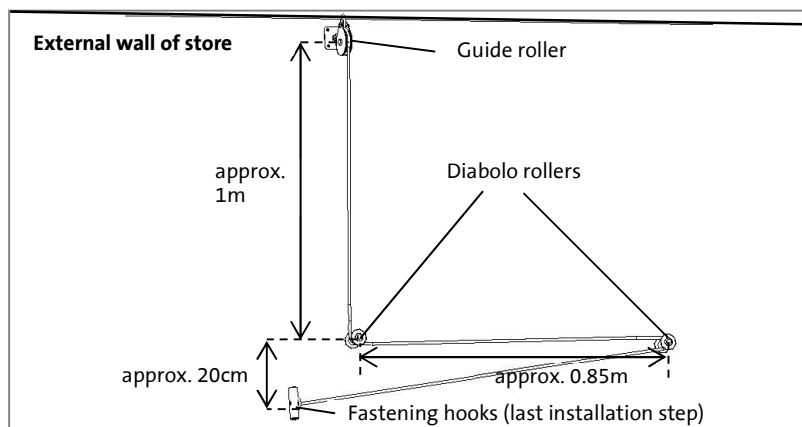
- Determine the position of the outer guide roller (see Fig.) and screw to the ceiling.



### Fit diabolo rollers external



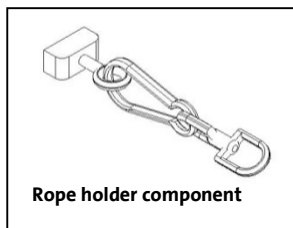
- Install the first diabolo roller vertically approx. 1 m below the guide roller with 8x120 screws and both washers. Depending on the circumstances, adjust to the conditions in the building.
- Offset the second diabolo roller approx. 0.85 m - 1 m horizontally to the first diabolo roller and install as described above.
- Check that the rollers are free to rotate.



### Note

The position of the fastening hook for fastening the handle in parking position is only determined in the last installation step.

### Positioning the rope holder on the tube



- Measure the positions of the rope holders starting from the mole and mark. The guidelines are mentioned in the table shown below.
- Fasten the rope holder loosely onto the tube with the black cable ties.
- Align the rope holder (ring eye with carabiner and rope swivel) on the stretched tube parallel to the tuning set.
- After installing the rope, pull the mole into parking position, optimise the tube flow by pushing the rope holder and then fasten the cable ties.

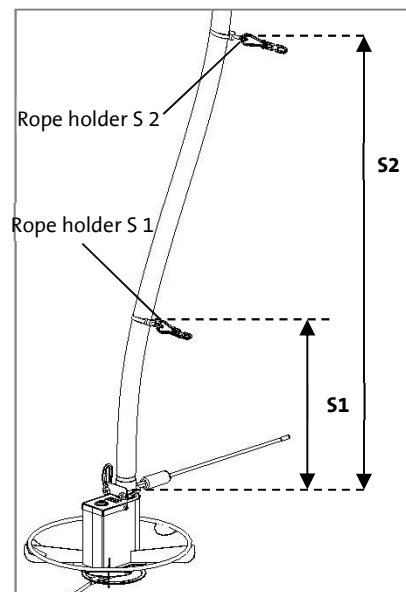


Table for Rope Holder Position

Room Height	1.80 – 2.00 m	2.00 – 2.30 m	2.30 – 2.50 m	2.50 – 3.00 m
Rope holder item S 1	0.85 – 0.95 m	0.90 – 1.00 m	0.95 – 1.10 m	0.95 – 1.15 m
Rope holder item S 2	1.50 – 1.60 m	1.60 – 1.90 m	1.80 – 2.10 m	1.60 – 1.80 m
Rope holder item S 3	–	–	–	2.30 – 2.70 m



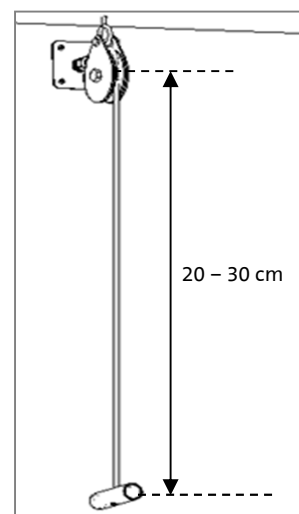
### Note

Depending on the height of the room, the position of the rope holder must be adjusted, so that the tube is in a further loop around the mole in the parking position. For low storage rooms (< 190 cm), depending on the circumstance, one rope holder will be enough. For higher rooms (> 250 cm) a third rope holding point is recommended (not included in the scope of supply).

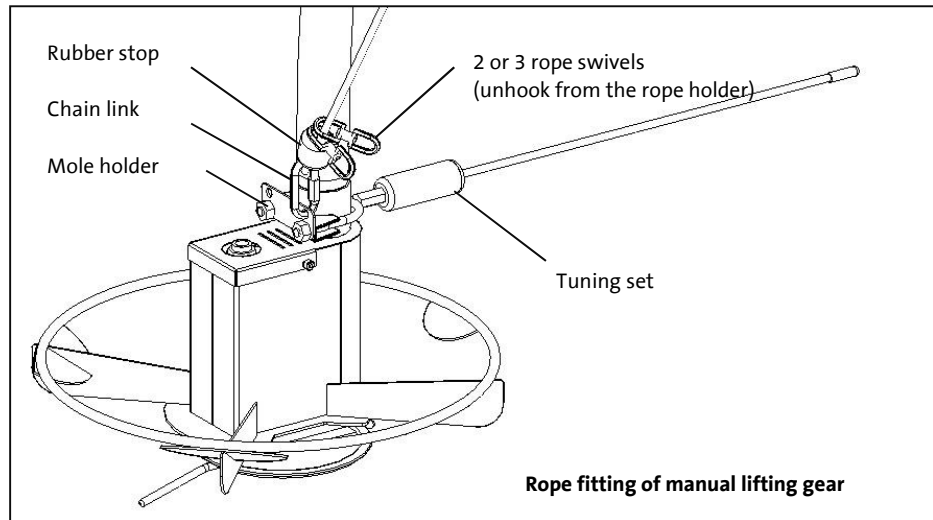
### Thread through and shorten rope

Lay the rope from the inside of the store outwards.

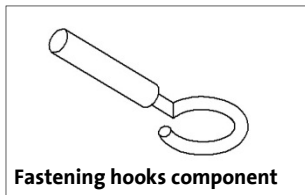
- Knot the end of the rope on the inside with the chain link hanging from the mole.
- Thread the rope from the inside first using the rubber stops, then using the rope swivel of the rope holder (rope swivel must be unhooked from the rope holder) and the guide roller inside on the store ceiling. Then guide the rope outside through the opening for the rope in the wall and guide over the second guide roller.
- Guide the mole to the working point with the greatest possible distance to the internal guide roller and establish the maximum length of rope.
- Thread handle onto the rope, secure the rope with a double knot approx. 20-30 cm below the opening for the rope and cut off the remaining rope.
- Then hook the rope swivel back into the rope holder.



## Rope fastening on the mole

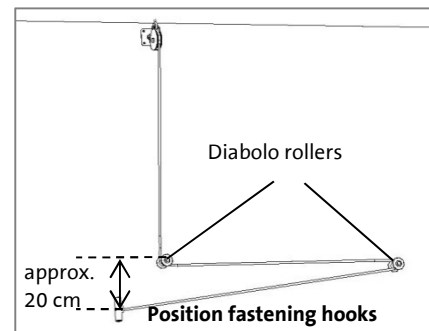


## Fastening hook installation



To determine the position of the fastening hook, pull the mole in the parking position using the manual lifting gear.

- Pull the rope over the diabolo rollers as illustrated.
- When the upper stop is reached, mark the position of the handle slightly offset from the diabolo rollers.
- Install fastening hooks for parking position.



### Note

The handle is also a weight to hold the rope tight during the operation. Therefore, it must be ensured that the handle always hangs freely during operation and does not get caught.



### Note

To instruct the operator before filling the system, attach the supplied filling instructions next to the door / hatch or on the filling nozzle.

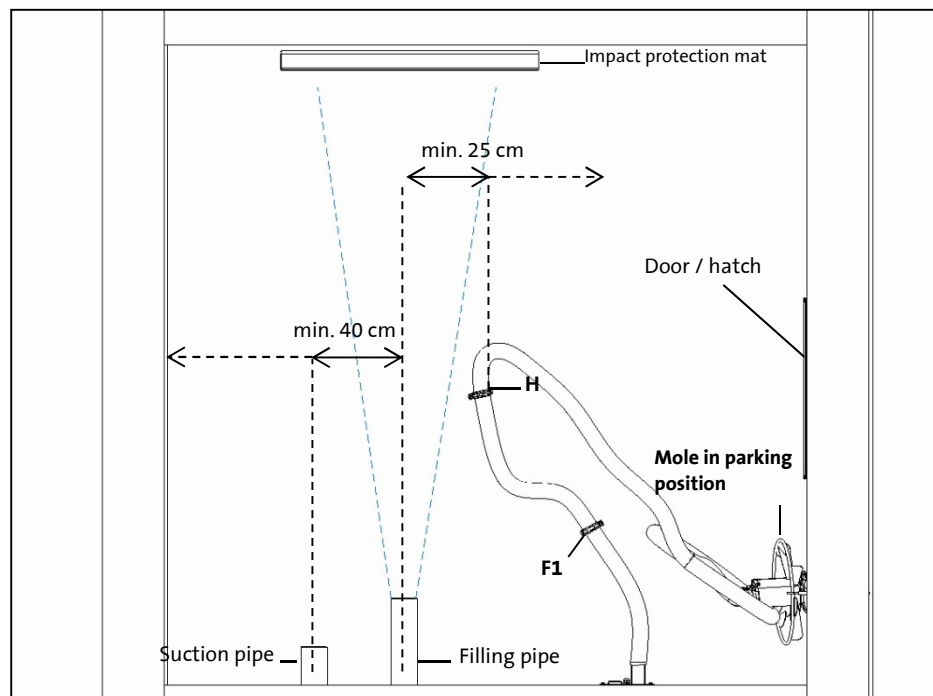
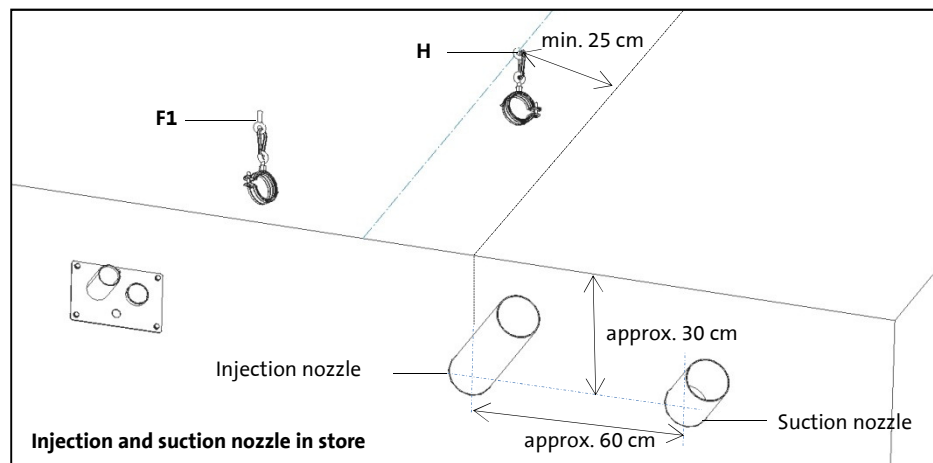
## 6. Installation of Accessories

### 6.1 Filling Set

#### Arrangement of injection and suction nozzle in mole store

The filling system is not contained in the standard scope of supply and must be ordered separately.

- Install the injection nozzle with at least 25 cm side offset to the central tube bracket **H** and approx. 30 cm below the ceiling.
- Install the suction pipe at the same height or higher at a distance of 60 cm from the injection nozzle.

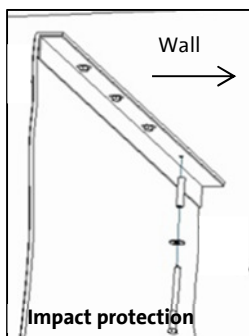


#### Note

In the ideal arrangement, the central tube bracket **H**, wall opening, door or hatch, and mole parking position are in a square of the storage room. Ideally, the mole will be accessible from the room opening even with the pellet store completely filled.



## Installation of impact protection mat



### 6.2 Impact protection mat

The impact protection mat is not included in the basic scope and supply and must be ordered separately.

- Attach the impact protection mat opposite the filling pipe.
- The track is aligned on the rear of the impact protection mat in the direction of the wall
- Install on the ceiling with a gap of approx. 20 cm from the rear wall.

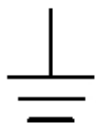


#### Note

Access to the pellet store is not provided behind the impact protection mat.

### 6.3 Tube cables to the boiler

#### Tube earthing

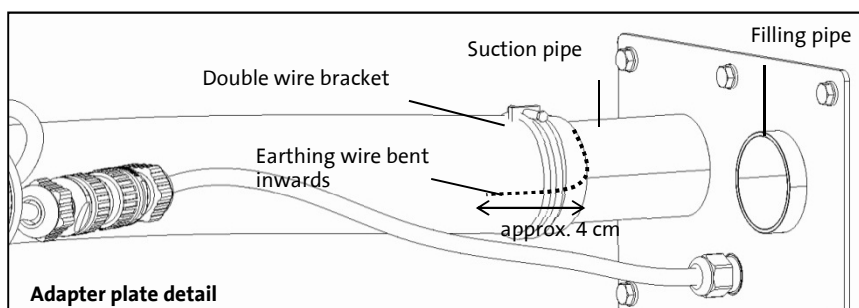


#### CAUTION

When laying the suction and return cables from the store room to the heating boiler, you must follow the safety instructions for tube earthing:

To carry away the electrostatic charge, all suction and backflow tubes on the connections must be earthed, electrically conducting through the flexible earthing lead:

- Strip the flexible earthing leads on the ends of the tube approx. 4 cm and push into the inside of the tube.
- Push tubes over the suction and backflow pipe of the adapter plate in the store and outside the store.
- Fasten tubes with clamping plates or double wire plates. The flexible earthing lead can also be fastened to the adapter plate with an earthing strip bracket.
- Leave painted surfaces on the mole free for earthing as appropriate.



#### Note

The pellet suction tube must be laid from the adapter plate to the heating boiler in one piece. Before laying, the various tubes are to be marked so that the connections cannot be confused. The backflow tube can have an additional connection as required.

<b>Cable lengths</b>	For the maximum permitted suction length from the boiler to the store, remove the length of the mole suction tube in the pellet store. When laying without major gradients, a cable length between the pellet store and heating boiler of up to 15 m is possible.
<b>Bending radii</b>	The suction tube is to be laid in wide arcs as much as possible. The bending radius must be at least 30 cm.
<b>Height difference</b>	A height difference of more than 3 m is to be interrupted by a horizontal cable guide of at least 1 m in length. Differences in height of more than 6 m are to be avoided. The maximum permitted cable length is shortened accordingly.
<b>Tube connections</b>	To guarantee the maximum suction power, connect all connecting brackets with the suitable tube clamps securely and durably. The tube connections must be accessible at any time for checking the brackets are securely seated or to replace the hoses in the context of maintenance.
<b>Fastening</b>	For installing the cables, special bearing cups (or drain pipes) and installation brackets are recommended. The tube must not sag and must be durably protected from damage.
<b>Outside area</b>	The tube is <u>not</u> suitable for unprotected laying in the outside area. If needed, lay the hoses and the electric cabling in an empty pipe or similar protective devices. As a result, the tube is protected from the weather, UV radiation, damage by animals or vandalism and against other mechanical effects.
<b>Weather effects</b>	Salty air (near the sea) and more sustained cold/heat can accelerate the ageing of the tube and reduce lifetime. Additional protective measures are to be provided for this in the building.
<b>Durability</b>	Suction tubes undergo a natural ageing process and must be able to be replaced when needed. To allow optimum life, the tube is to be selected according to the boiler power.



## 7. Electrical Activation of Pellet Mole®

For an optimum operation of the mole system, the specifications described below are to be set on the various parameters of the boiler control system.

### 7.1 General Description

With the start of the filling process, the heating boiler control system starts the suction turbine. The mole motor obtains a start signal with a delay of approx. 5 s (preliminary time, phase 1) from the heating boiler control system.

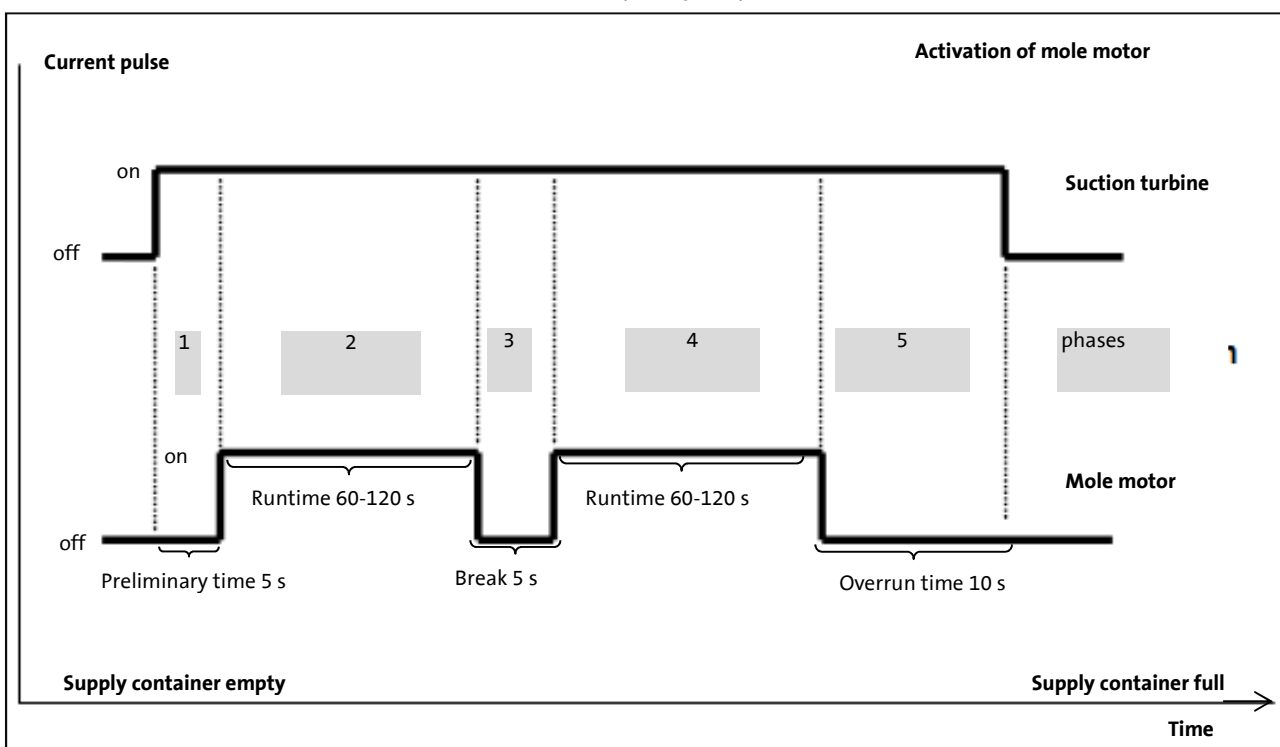
During the runtime of the mole motor of approx. 60 - 120 s in phase 2 and 4, pellets are transported by the rotational movement of the base in front of the suction opening of the mole and then into the supply container.

There are basically two different types of suction system: pressure-tight and atmospheric supply containers.

### 7.2 Suction system with pressure-tight supply containers

During the filling process, the suction turbine runs continuously (max. 30 minutes) until the container is filled at the boiler.

- The mole is briefly switched off again during the suction process (pause time 5 s, phase 3), the pellet conveying interrupts and the suction hose is sucked empty again.
- After a break of approx. 5 s, the mole restarts (phase 4). Using the electronic switch logic (integrated into the mole) the direction of rotation of the base is reversed.
- If the supply container of the heating boiler has reached its fill level, the suction process is terminated: The heating boiler control system first switches off the mole. The suction turbine runs for 10 s longer (overrun time phase 5). In this time, the suction tube is completely emptied.



### 7.3 Suction system with atmospheric supply containers

For suction systems with atmospheric intermediate container and a small underpressure chamber (cyclone/separator for 3 - 8 kg pellets), suction times of 20 to 70 s can be set, as the suction turbine shuts down for emptying the underpressure chamber. In each suction cycle, the mole needs a preliminary and overrun time (PT and OT).

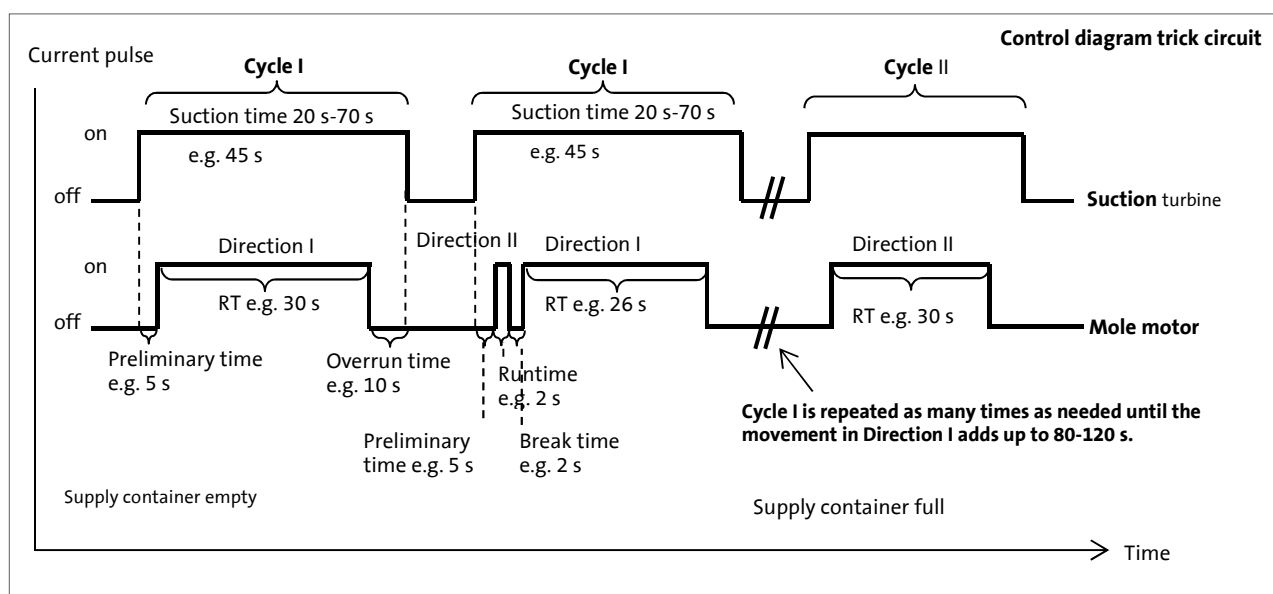
So that the runtime of the mole (RT) can be adjusted in each direction according to the specifications, in various boiler control systems, a so-called trick switch (short intermediate pulse to switch off the change of the direction) is possible. It is important that the runtime in a direction adds up to approx. 80 to 120 seconds in the sum.

With shorter mole runtimes, the radius of action on the floor is reduced accordingly. The result of this is larger residual quantities. The basic function of the mole system is always the same.



#### Note:

The boiler-specific settings can be found from your boiler manufacturer or Schellinger KG.



## 8. Electrical installation

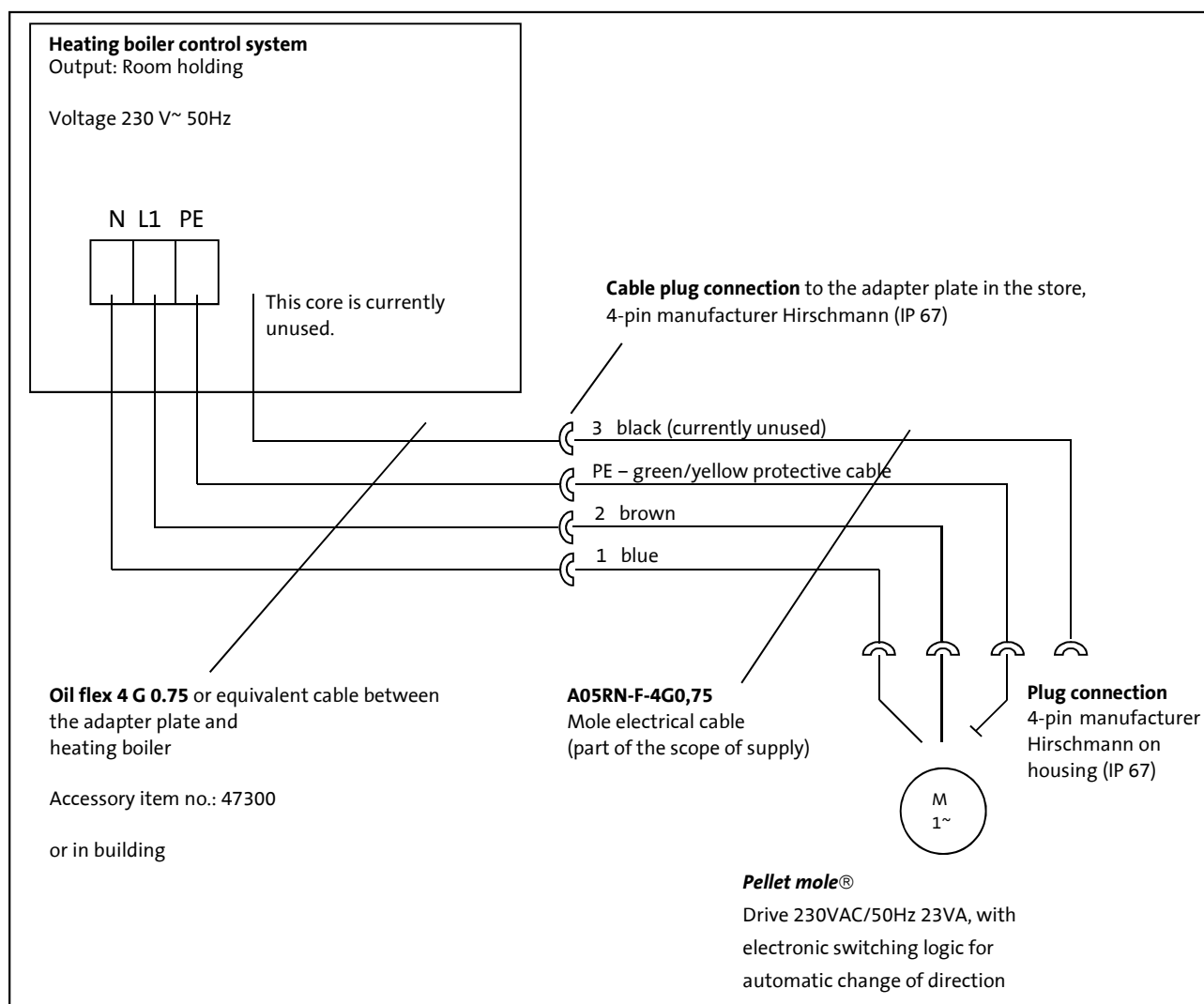
### General Description

The connection of the pellet mole® is made to the boiler control system. General, the output of the room holding for this (230 VAC/50 Hz) is available.

The mole motor is equipped with an internal thermal protection device. No thermal protection is wired into the heating boiler control system.

The electrical supply cable to the mole is laid in the same way as the suction tubes to the boiler. This supply cable must be made of at least oil-flex cable (e.g. 4 G 0.75) or equivalent.

### Circuit diagram



### Note

Some boilers require an additional time relay and customer-specific attachments. Please follow the relevant instruction sheets. Necessary information is contained in the heating boiler release list (see [www.schellinger-kg.de](http://www.schellinger-kg.de)).

When ordering the boiler, please indicate that the pellet mole is used as a removal system.



## 9. Commissioning the pellet mole®

The mole is an integral part of the complete system. Satisfactory operation depends variously on the correct installation and on the correct settings for the boiler control system.

### 9.1 System review

#### In filled pellet store

Before commissioning, all tube and cable connections must be checked.

The mole is put into a small recess on the pellets in the direction towards the centre of the store. Align the tuning set with the steel cable in the direction of the slope provided. Lay out the remaining hose in large radii as far as possible from the mole (see filling instructions).

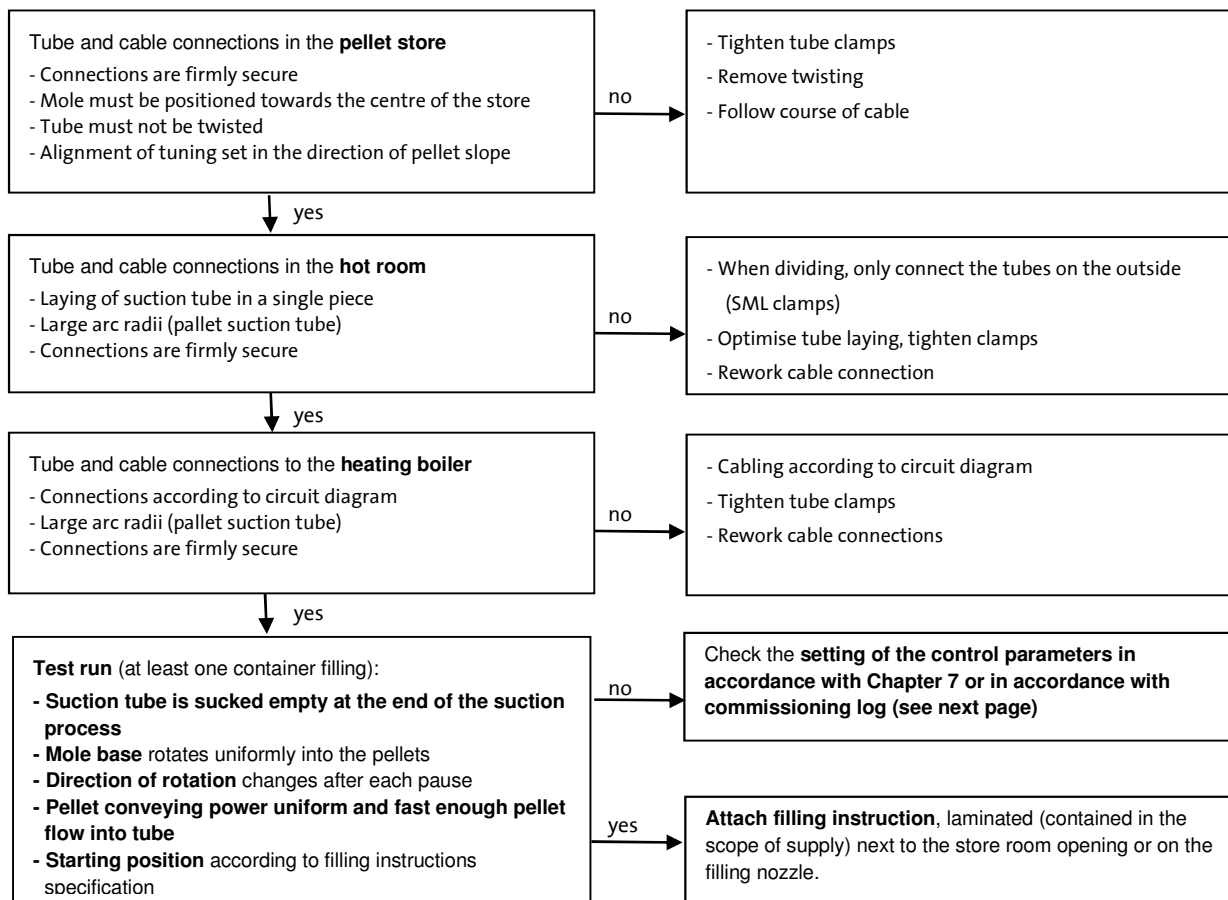
#### In heating room

The pellet suction tube must be laid in one piece from the adapter plate (through the outer wall of the store) to the heating boiler.

#### Runtime setting

The information on the settings on the boiler control system can be found in Electric Activation of the Mole in Chapter 7. The overrun time prevents tube clogging through pellets falling down. The duration of the overrun time depends on the tube length and laying. The basic setting is 10 s. The tube is to be largely empty after the filling process has completed – if not: Extend overrun time.

### 9.2 Schematic sequence of commissioning



## 10. Commissioning Log

Please complete this commissioning log and in the event of functional faults which cannot be located, send together with a detailed description of the fault and photos of the installation situation to Schellinger KG (info@schellinger-kg.de / Fax: 0751 56 094 950).

### System operator

Name: \_\_\_\_\_

Street: \_\_\_\_\_

Town: \_\_\_\_\_

Tel: \_\_\_\_\_

### Heating installer

Name: \_\_\_\_\_

Street: \_\_\_\_\_

Town: \_\_\_\_\_

Tel: \_\_\_\_\_

<b>Heating boiler</b>			
		Nominal power:	
<b>Pellet store</b>			
Type of construction:	<input type="checkbox"/> Cellar room <input type="checkbox"/> Mole tank <input type="checkbox"/> Ground tank <input type="checkbox"/> Other _____	Sketch:	
Dimensions (L x B x H):			
Floor area:			
Fill level:		Fill quantity:	
Pellet supplier:		Pellet quality:	
<b>Removal system</b>			
Mole, no.:		Connections tight:	
Length of suction pipe:		Difference in height:	
<b>Settings are to be made on the boiler control system</b>			
<b>Runtimes</b>	<b>Tgt</b>	<b>Act</b>	
Preliminary time for suction system (seconds)	5		Overrun time for suction system (seconds)
Switch on time for mole (seconds)	120		Break time for mole (seconds)
Max. fill time (minutes)	30		
<b>Boiler suction system</b>			
Volume of the supply container:		Filling time in test run:	

Place / date / signature: \_\_\_\_\_

## 11. Troubleshooting



### CAUTION

The following faults can be resolved without opening the equipment! If the equipment is opened, the warranty becomes void.

#### a) Fault: Pellets do not reach the supply container of the heating boiler

Cause	Measure
Pellet store is almost empty. (up to the system-dependent residual quantity)	<ul style="list-style-type: none"><li>- Residual quantity depends on the store room geometry (5-10% is normal). --</li><li>- Check fill level and top up as appropriate.</li></ul>
Mole has not been removed as instructed for the filling process of the store and redeployed.	<ul style="list-style-type: none"><li>- Follow the installation steps according to instructions / filling instructions.</li><li>- If the mole spills, order a second mole system ("rescue mole") as a replacement system and install again.</li></ul>
Tube connection has come loose or is leaky.	<ul style="list-style-type: none"><li>- Check connections and refasten as appropriate (pay attention to earthing).</li></ul>
Suction tube is blocked (turbine runs at increased speed, pellets are in the hose).	<ul style="list-style-type: none"><li>- Check the suction hose and remove blockage: e.g. raise mole or blow through suction tube; to do that switch the suction and pressure tube on the suction turbine, increasing overrun time as necessary.</li><li>- Remove foreign bodies.</li><li>- Check/clean screen/protective grid in the container.</li></ul>
Suction power of the suction turbine is too low.	<ul style="list-style-type: none"><li>- Check/clean screen/protective grid in the container.</li><li>- Tighten the tube clamps.</li><li>- Check the tube for tears.</li><li>- Empty/clean the dust bag (if there is one)</li></ul>
Mole drive does not rotate.	<ul style="list-style-type: none"><li>- Check activation/control of the room holding on the boiler.</li><li>- Check cable connections</li><li>- Check supply cable to the mole (see circuit diagram Chapter 8).</li><li>- Check connection between mole base and motor shaft and tighten as necessary.</li><li>- Motor damage: Replace motor.</li><li>- Concealed core tear is possible with undamaged sheath</li></ul>
Mole motor runs, base does not rotate (motor noise can be heard).	<ul style="list-style-type: none"><li>- Check connection between base and motor shaft and tighten as necessary.</li><li>- Gear damage: Replace motor.</li></ul>
Mole motor/base only rotate in one direction.	<ul style="list-style-type: none"><li>- Check the cycle setting on the heating boiler.</li><li>- Switch relay faulty: Replace motor.</li></ul>
Mole motor/base changes direction under load (e.g. when the base holds firm).	<ul style="list-style-type: none"><li>- Motor damage: Replace motor.</li></ul>
Mole drive blocked (shaking of the mole).	<ul style="list-style-type: none"><li>- Dig out mole and put pellets onto it.</li><li>- Equipment lid should always be immediately visible.</li></ul>



- |   |  |
|---|--|
| Mole is stuck on the wall or has tipped over.               | <ul style="list-style-type: none"> <li>- Raise mole on the tube and redeploy in a hollow in the direction of the centre of the store.</li> <li>- Check tube alignment/tuning set.</li> </ul>   |
| Mole hardly moves and conveys too few pellets on the floor. | <ul style="list-style-type: none"> <li>- Check runtime settings.</li> <li>- Adapt tube length.</li> <li>- Install or align tuning set.</li> <li>- Floor surface must not be too smooth (e.g. tiles, etc.).</li> <li>- Pulling cable has caught on the manual lifting gear - cable must run loose.</li> </ul> |

**b) Fault: Pellet suction tube tends to block**

- | <b>Cause</b>  | <b>Measure</b>   |
|---|--|
| Overrun time of the suction turbine too low<br>(Time between shutdown of the mole motor and the suction turbine). | <ul style="list-style-type: none"> <li>- Increase overrun time until the suction tube is completely empty.</li> </ul>  |
| Pellets are transverse to the suction tube.   | <ul style="list-style-type: none"> <li>- Check pellet length (max. 45 mm permitted, quality ENplus).</li> </ul>  |
| Suction power of the suction turbine is too low   | <ul style="list-style-type: none"> <li>- Check/clean screen/protective guard in front of the turbine</li> <li>- Tighten tube clamps.</li> <li>- Check the seals on the container.</li> <li>- Empty/clean the dust bag (if there is one)</li> </ul> |

**c) Fuse in the boiler control system (room holding) blows**

- | <b>Cause</b>                                 | <b>Measure</b>  |
|--|---|
| Supply cable is faulty or wrongly connected. | <ul style="list-style-type: none"> <li>- Check supply cable and replace as required.</li> </ul> |
| Cable plug connection faulty.                | <ul style="list-style-type: none"> <li>- Check cable if firmly in the plugs.</li> </ul>         |
| Drive motor is faulty.                       | <ul style="list-style-type: none"> <li>- Replace motor.</li> </ul>                              |

## 12 Maintenance



### DANGER

Starting the removal system during maintenance work can cause injuries.

Before starting maintenance work

- Disconnect the power supply
- Secure the power supply against being switched on again

### 12.1 Regular maintenance work

<b>General visual inspection</b>	The maintenance is restricted to visual inspection as part of the prescribed annual heating boiler maintenance. In particular, the tube connection and the screw and plug connections of the electrical cable are to be checked. The cable must be fastened with a cable tie on the tube approx. every 30 cm.
<b>Checking for material wear</b>	The hose and the cable are to be investigated for wear or damage as part of annual boiler maintenance. The tubes are made of high quality materials. They are nevertheless subject to wear and ageing.
<b>Mole base</b>	The base is to be checked regularly for firm seating. The ends of the round rod are hardened. This surface can be worn away depending on the roughness and quality of the floor surface. The base must be replaced as necessary.
<b>Manual lifting gear</b>	The movement of the rope rollers is to be checked regularly. The rope must be able to run unhindered over the rollers when raising and lowering. Furthermore, the rope is to be checked for wear and the knots on the holding plate and rope bracket must be secure.
<b>Warranty</b>	The warranty is legally two years from date of purchase for systems up to a max. 75 kW heating power. Tube and mole base are wear parts. The warranty on wear parts is restricted to the fault-free supply.

### 12.2 Customer Services

The mole is a component of the heating system and is activated by the pellet boiler. The review of the correct function and parameter setting is done through the authorised heating installer or through the site customer service of the boiler manufacturer.



### Note

For a better assessment of the possible faults, you must send the completed commissioning log with detailed description of the fault and decisive photos (installation situation, malfunction) to the manufacturer.

## 13 Putting out of operation

Putting the pellet mole® out of operation is done in the context of putting the heating boiler system out of operation. When dismantling, proceed in the reverse order to installation.

## 14 Disposal

The device and accessories and the transport packaging largely consists of recyclable raw materials.

You can dispose of the device, accessories and transport packaging through collection points. Follow the applicable national regulations.

### **Disposing of packaging**

The specialist engineer who installed the equipment is responsible for disposing of the transport packaging.

### **Disposing of the equipment**

The equipment and accessories do not go into general waste. Ensure that the used equipment and any accessories there may be are taken to the proper place of disposal.

Follow the applicable national regulations.

## 15 Appendix



### DANGER

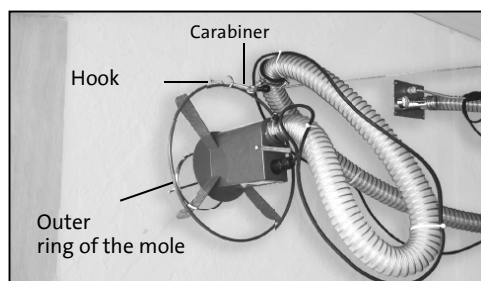
Before filling the pellet store, disconnect the heating boiler from the power.

### 15.1 Filling instructions for the pellet store of the basic mole

#### Before filling

Put the pellet mole® into parking position:

- Open the inspection opening (door/hatch).
- Pull the pellet mole® forwards with the tube and hang onto the hook in the parking position with the outer ring.
- Hang the tube onto the outer ring with the tube bracket HP.
- Close the inspection opening (door/hatch) so that it is dust-tight.



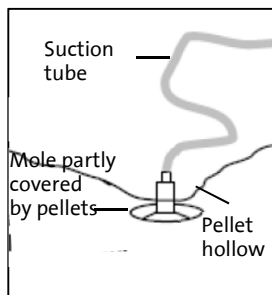
#### Note

Installation parts must not be in the injection route. The mole in parking position must be accessible after filling.

#### After filling

Restore operating mode:

- Open the door and distribute the pile a bit.
- Hang the tube onto the equipment
- Put the pellet mole® as central as possible in the store room into a hollow in the pellets.
- Cover the outer ring of the mole with pellets.
- Close door and put the heating boiler back into operation.



#### Note

The tube must not hinder the pellet mole®.

## 15.2 Filling instructions for the pellet store of the mole with manual lifting gear

### Before filling:

Put the pellet mole® into parking position:

- Pull the mole into parking position by pulling the rope and hang into the hook by the handle. (For course of rope and position of the handle in the parking position PP, see image)
- Check whether the mole and tube are in the parking position (see image).



#### Note

The opening for the rope can be sealed when filling the store. (Seal must then be reopened, so that the rope can run through smoothly.)



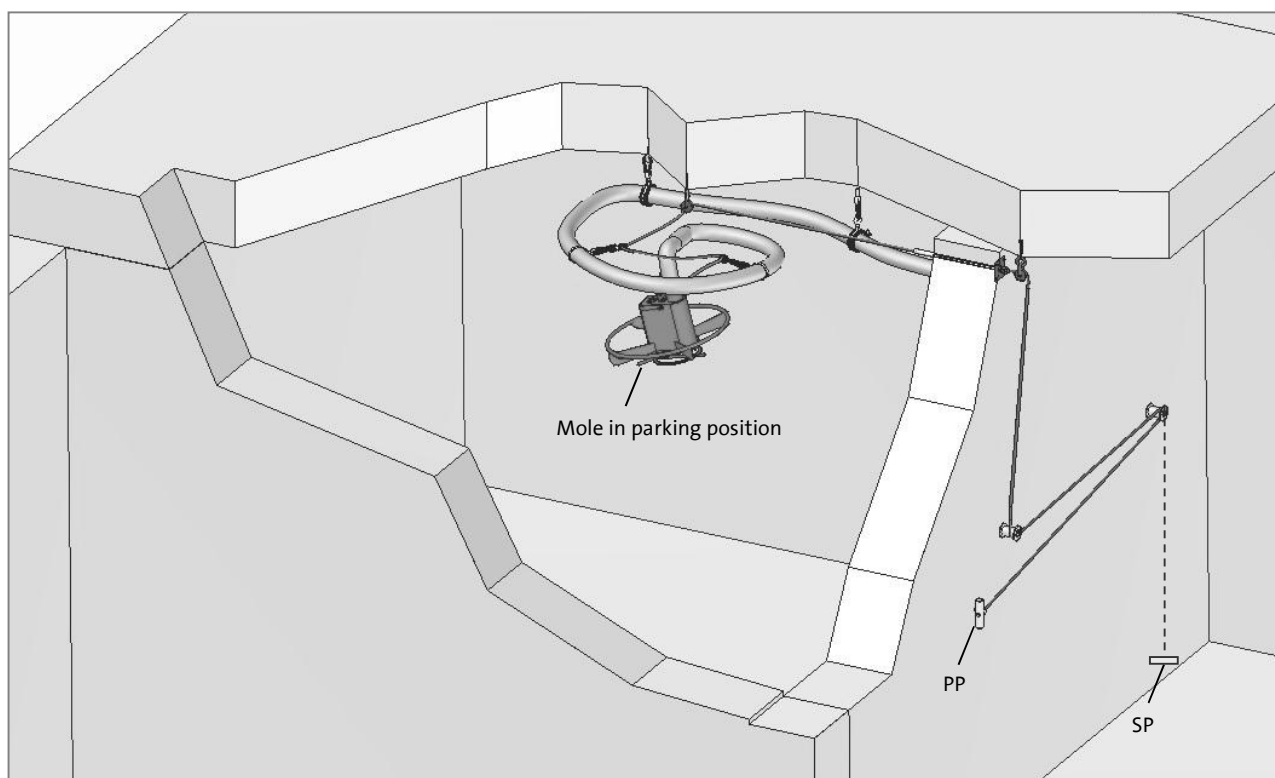
#### Note

Installation parts must not be in the injection route. The mole in parking position must be accessible after filling.

### After filling:

Return to operating mode:

- Level off the pellet angle underneath the mole.
- Unhook the handle with rope and slowly lower the mole onto the pellets. Mole and rope with handle are now in the starting position (SP).
- The handle and rope must hang freely so that the mole is not obstructed during the suction process.



### 15.3 EC Declaration of Conformity

Company: Schellinger KG  
Address: Schießplatzstraße 1-5, D-88250 Weingarten  
Product: **Pellet Mole®**  
Description: Removal system for wooden pellets in connection with normal suction systems for wooden pellet heating boilers.

EU Directives:

11th GPSGV      Eleventh ordinance on equipment and product safety law, short title: explosion protection ordinance - 11th GPSGV of 12 December 1996 (German Federal Law Gazette I p. 1914), last amended on 06/01/2004

2006/42/EC      Directive of the European Parliament and Council for harmonising the legal and administrative regulations of Member States for machines - machinery directive of 17 May 2006.

2006/95/EC      Directive of the European Parliament and the Council on harmonising the legal regulations of Member States concerning electrical operating equipment for use within certain voltage limits - low voltage directive of 12 December 2006.

2006/108/EC      Directive of the European Parliament and the Council on Electromagnetic Compatibility of 15 December 2004

National technical guidelines:

EN 14961-2      Standard for wooden pellets as fuel

EN 61000-6-3; EN 61000-6-2; EN 61000-3-2; EN 61000-4-5  
Directives for the electromagnetic compatibility of motors

VDE 0701-0702      Standard for maintenance and repeated checks for securing electrical safety

DIN EN 50106      Safety of electrical equipment for household use and similar purposes

We hereby declare the product mentioned above meets the conditions listed in its production version.

Weingarten, 01/05/2011

Schellinger KG, Management

*Space for notes:*

[illegible]

## ***Schellinger KG***

Schießplatzstraße 1-5  
88250 Weingarten

Tel: 0751 56 094 50

Fax: 0751 56 094 950

Email: [info@schellinger-kg.de](mailto:info@schellinger-kg.de)

[www.schellinger-kg.de](http://www.schellinger-kg.de)

The logo consists of the word "Schellinger" in a bold, white, sans-serif font, set against a solid black rectangular background.

*Agrar. Energie. Zukunft.*

