INSTRUCTION MANUAL SVEA-ALLROUND GRAIN AUGER 152 mm



Original User Guide Subject to alteration



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EC declaration of conformity

This declaration is according to the European Parliament and Council Directive 2006/42/EEC relating to machinery.

Hereby declare that Machinery:

Allround 152 Grain Auger.

- a) is manufactured in conformity with the European Parliament and Council Directive relating to machinery, 2006/42/EC, Annex 2 A.
- b) is, in addition to what is stated under a), manufactured in conformity with the following provisions, directives etc.: LVD 2006/95/EEC, EMC 2004/108/EEC
- c) complies with the following harmonized standards: EN ISO 12100-1, EN ISO 12100-2, EN ISO 14121-1:2007
 EN ISO 12100-1; Safety of machinery Basic concepts, general principles for design Part 1: Basic terminology, methodology

EN ISO 12100-2; Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles EN ISO 14121-1:2007; Safety of machinery – Risk assessment – Part 1: Principles

- d) complies with the following national standards and technical specifications:
- e) qualified person for the technical documentation:

Per Thörner / R&D Mgr Name/function Sveaverken Sveaagri AB

address

f) responsible and authorized person for the declaration:

Katrineholm

Place

Petter Rylén / MD

Name/Function

2016-10-28

Signature



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1 Introduction

1.1 How to use this instruction manual

This instruction manual contains installation instructions, in addition to operating and maintenance instructions for System 152.

Read carefully through the entire instruction manual and all relevant instruction documents for the other components in the system before beginning work. That way, you can avoid injury to personnel, and through the careful and correct installation process, ensure the proper and secure functioning of the auger conveyor.



Important!

Sections in this manual which are marked by a warning triangle require particular attention as they cover areas which may entail a risk of injury to personnel or of damage to the machinery.

1.2 General

The System 152 Screw Conveyor is manufactured as a flexible building system that can be adapted to match the required material and capacity. It can be used at various gradients, for horizontal to vertical transport, with a few restrictions relating to capacity.

The auger conveyors are intended for the transportation of small granulated or powder materials, such as grains, feed, granulate, wood chips, sawdust, sand, etc., for which a high capacity is required. Avoid the transportation of materials with a high water content (grains of over 20%).

This can cause a coating to form around the inner rotating spiral which will reduce capacity and, in the worst case, cause the auger conveyor to jam.

The principle mechanism of the auger conveyor is an inner rotating spiral which works within a steel tube. The system consists of a combination of standard lengths which are assembled together in order to attain the desired length.





1.3 Safety instructions and warranty

- Ensure that children and animals cannot come into contact with the auger when it is in operation, or during installation or maintenance work.
- Keep hands and tools away from the screw conveyor when it is in operation.
- Do not disassemble or remove any protective or security apparatuses.
- Homemade silos etc. must be constructed so that the inner rotating spiral and other rotating parts are out of reach during normal operation.
- All of the facility's electrical installations should be installed by an authorised electrician in accordance with appropriate provisions.

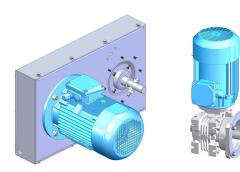
The supplier guarantees that the product is not faulty at the time of delivery.

Any damages that occur during transportation should be reported by the transport company immediately.

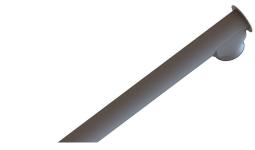
The auger is intended for the transportation of granulated materials as per 1.2. The supplier is not responsible for safety and function if it is used for other purposes.

The warranty does not cover faults caused by improper installation or usage, or from lightning strikes and other disturbances to the power network.

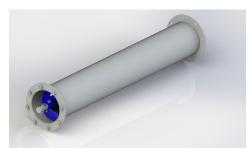
The user is responsible for the proper functioning of their facility, and are responsible for ensuring that animals have access to feed via another means during power disturbances. Upon faults, please contact the retailer.



2.2 Drive unit



2.3 Outlet extension



2.4 Extension



2.5 Inlet extension for hopper



2.6 End bearing (for flange)

2 Main parts

2.1 Introduction

The auger is delivered in several parts from a standardised building system. The final assembled entity will always contain at least the drive unitand out-/inlet extension.

2.2 Drive unit

The drive unit can operate with either a belt, a chain or a worm drive. The electrical motor is flange-mounted and has a current that is adapted to the auger conveyor's length. The drive unit can be placed either at the inlet or the outlet end, depending on the auger conveyor's use.

2.3 Outlet extension

The auger conveyor must always be connected to an outlet extension at one end.

2.4 Extension, spiral and tube

The spiral comprises of a steel spiral welded to a steel tube. Galvanised outer tube Ø152mm. The spiral, outer tube, connecting sleeve and spigot w. profiled washers, screws and nuts are used together to build a so-called extension. This is supplied in standard lengths of either 1, 2 or 3 metres.

2.5 Inlet extension

The inlet comprises ordinarily of an inlet extension with hopper or of an inlet protection. For feed building systems an additional range of extensions are available to enable connection to silos, etc.

2.6 End bearing

At the other end of the drive unit, an end bearing is usually mounted, i.e. at the end of the tube or onto the inlet protection. End bearings are not used when connecting to the bottom of a silo.

2.7 Accessories

Ordinary accessories upon installation include transport wheels, inlet regulators for hoppers and inlet protection.

2.8 Feed/Pellet auger Building System

A complete range for the transport of pellets and feed is available and characterised normally by slow operation, pellet spirals/inlet spirals at half pitch.



3 Assembly

3.1 General

The main parts of the auger conveyor are supplied as per section 2. Check against the delivery slip and ensure that all parts have been delivered and that no damages have occurred during transport.

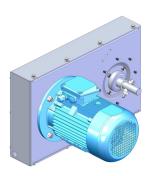
3.1 Pulling drive



Check that the screw conveyor can be mounted with either a pushing or a pulling drive.

Pulling drive is always used together with the inlet protection.

3.1 Pushing drive



3.2 Drive unit with Belt or Chain



3.2 Drive unit with Worm Gear

3.2 The Drive unit

The following kinds of drive units are available and are characterised as per the following:

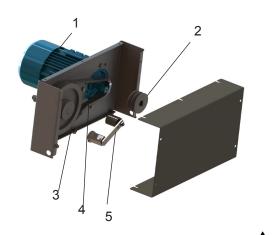
Belt - Quiet when in operation with long service intervals.

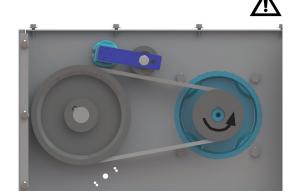
Chain - Intervals for lubricating are required but dependable.

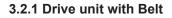
Worm Gear - For slow operating feed systems with minimum maintenance.

Both belt and chain units are run automatically with the correct voltage thanks to their installed 'tensioners' Maintenance is thereby minimised!









Assemble together: the motor, motor pulley, belt, the gear box's lower part.

Thin oil can be used to facilitate mounting onto the shaft.

The pulleys must align!

Continue with the belt tensioner as per the following:

- 1 Electrical motor, flange B5
- 2 Pulley 100-3A
- 3 Pulley 200-3a ø35 w/ keyway
- 4 Belt A40 x3
- 5 Belt tensioners

Pushing force!

Placement of tensioner.



Loading must not be used to retard pulling or pushing force. This can cause the tensioner to become overburdened.





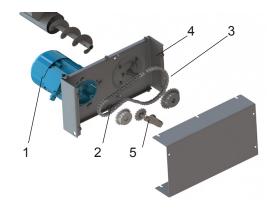
Pulling force!

Placement of tensioner.

The tensioner should be mounted loosely by its central screw so that it can be adjusted as per the following:

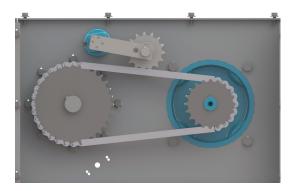
- Turn the tensioner's housing so that the tension roller abuts the belts.
- Turn the housing further so that it just about aligns with the next available hole in the gear box's lower part.
- Lock the housing securely by using an M5 screw.
- Mount the gear box's lid.

The tensioner should be checked and adjusted as needed at least once per every 200 hours in operation.















3.2.2 Drive unit with Chain

Assemble together: the motor, the sprocket, chain, gear box's lower part.

Thin oil can be used to facilitate mounting onto the shaft.

The sprocket and the chain lock should be aligned in the right direction!

Continue with the chain tensioner as per the following:

- 1 Electrical motor, flange B5
- 2 Sprocket Z20 5/8"
- 3 Sprocket Z32 5/8" ø35 w/ keyway
- 4 Chain 5/8" w/ lock
- 5 Chain tensioner

Pushing force!

Placement of tensioner.

Chain lock with rotation direction.

N.B!

Loading must not be used to retard pulling or pushing force. This can cause the tensioner to become overburdened.

Pulling force!

Placement of tensioner.

Chain lock with rotation direction.

The chain tensioner should be mounted loosely by its central screw so that it can be adjusted as per the following:

- Turn the tensioner's housing so that the tension roller abuts the belts.
- Turn the housing further so that it just about aligns with the next available hole in the gear box's lower part.
- Lock the housing securely by using an M5 screw.
- Mount the gear box's lid.

The tensioner should be checked and adjusted as needed at least once per every 200 hours in operation.

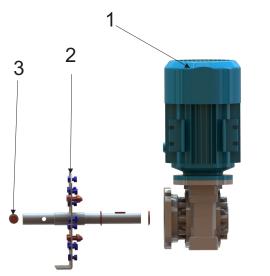


Assemble together: worm drive motor, the drive shaft, the slot wedge, the position washers, the retaining ring.

Thin oil can be used to facilitate mounting onto the shaft.

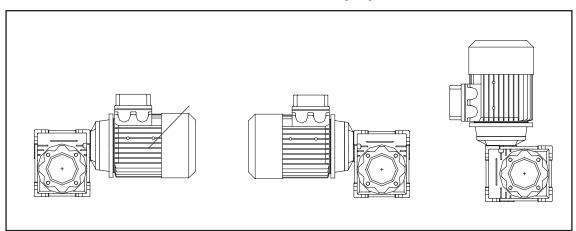
N.B! The drive shaft has two different mounting positions, depending on the size of the worm gear. 10mm hole in the shaft should be positioned around 75mm from the gear's flange. That way, the spiral and the outer tube should align at each end.

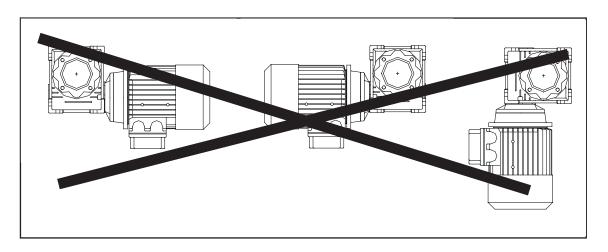
- 1 Worm Gear Motor
- 2 End Plate with drive shaft
- 3 Bolted Joint w/ Profile Washer



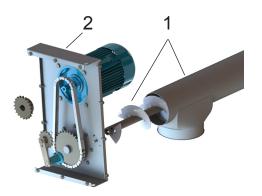


N.B! The worm gear motor should always be mounted so that the motor shaft connects over the outgoing shaft!









3.3 Outlet Extension w/ pulling chain





3.4 Pushing force with end bearing

3.3 Outlet Extension

An outlet extension does not comprise of a connecting sleeve or connecting plug/spigot.

The spiral in an outlet extension is provided with a counter-loop which prevents material from being pressed against the bearing.

The outlet extension should be mounted to the pulling drive unit and to pushing end bearing.

Thin oil can be applied to the drive shaft in order to facilitate alignment.

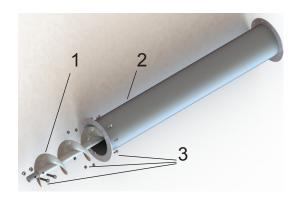
- 1 Outlet extension
- 2 Gear unit (chain drive)

N.B! Mount the spiral on the drive shaft/end bearing shaft using the corresponding profile washer in the bolted joint for optimal strength.

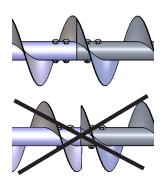
Required torque of around 80Nm.

Also assemble the spigot at the spiral's other end in order to facilitate the rest of the assembly.

Then securely screw the outer tube to the drive unit/end bearing.







3.4 Extension

In addition to an outer tube with flanges, an extension contains a spiral, spigot and bolted joints for the flanges.

The spiral in an extension is always the same length as the outer tube.

- 1 Extension spiral
- 2 Outer tube with flanges
- 3 Spigot with screws and nuts. (packaged in a screw pouch*)
- *delivered taped to the spiral

N.B! Spirals are joined by spigot in the appropriate bolted joints for optimal strength.

Required torque of around 80Nm.

It is important that the auger has continuity and is not disjointed by 180 degrees. See the figure to the left.

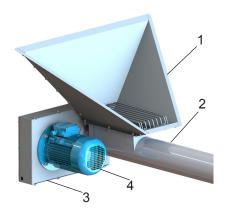
Mount the spigot on the other end of the spiral to facilitate further assembly.

The ends of the other tubes should be fastened tightly together so that no angular deviation occurs when the flanges in the tube joint are screwed together.

Pull the flange's bolted joints alternately at each side.

Eventual adaption of length for a spiral at the mounting place can be carried out by:

- * Weld the spiral to the inner tube where it will be cut to maintain the right pitch.
- * Ensuring that the screw spirals are properly aligned with one another (compare with the picture above).
- * Then drilling a 10mm hole in the truncated inner tube for the connecting plugs.
- * Assembling an M10 screw and tightening as per above.



3.5 Inlet Extension for Hoppers or inlet protections

An inlet extension containes outer tube with flange or a inlet protection always a spiral and a spigot and bolted joints for the flange.

- 1 Hopper
- 2 Inlet Extension*
- 3 Gear Unit (w/ belt or chain)
- 4 Electrical motor, flange B5

*Spigot with bolts is not shown in the image. (delivered in a screw pouch taped to the spiral)



N.B! Spirals are joined by spigot in the appropriate bolted joints for optimal strength.

Required torque of around 80Nm.

3.6 End bearing



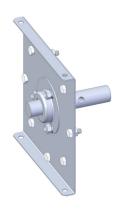
End bearings are

End bearings are usually mounted to the non-driving end of the auger conveyor. Their function is adapted in accordance with whether they are mounted to the end of the tube or to an inlet protection.

When connecting to the bottom of a silo, end bearing is not used.

Within silos it is possible to cut away the upper half of the outer tube with a length of around 200mm. The spiral rests in its entire length in the chute.

No space at the bottom of the silo should be created where feed is not consumed.





3.7 Transportation wheels for drive units with belt/chain



3.7 Inlet regulation for hopper



3.7 Inlet regulation for inlet protection



3.7 Accessories

A number of different accessories are available in our range that can be used to optimise the auger conveyor's functionality and performance.

The following are some of the most common:

- * Transportation wheels for easier displacement
- * Inlet regulation/damper for hopper
- * Inlet regulation for inlet protection
- * See also Building system feed augers for other types of inlet and outlet accessories.

3.7.1 Accessories for inlets/outlets

In order to ensure that the outlet is protected from contact, open outlets should sit at a height of more than 2.7 metres as calculated from the ground to the spiral's hem.

Mount the droptube and/or pipes securely with screws and/or pipe clamps depending on which type of outlet is being used.

Ensure that the droptube's gradient is great enough (at least 60o) to avoid sagging.

Hoppers and other open inlets should be equipped with protective grating.

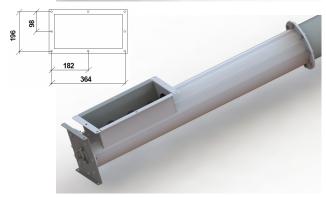
Homemade silos and similar items should not be positioned in a way that leaves rotating parts accessible.

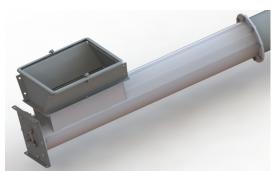
3.7.2 Reinforcement via stays

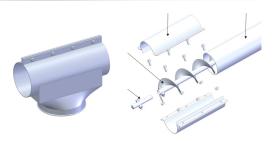
The screw should always be reinforced by stays at both ends. When the auger is positioned horizontally it should be reinforced by stays at every third meter. With greater lengths, set up a measuring line so that all fixed points are at the same level.

Stays can be fixed to the floor, ceiling or walls.









3.8 Building System for Feed/Pellet Screw

The building system comes divided in two different main parts.

- * Spiral Ø134mm for grain and smaller pellets
- * Spiral Ø120 for pellets.

The same type of spiral should be used from the inlet to the outlet. When using an extension with two screws connected in series, the receiving screw should be full pitch.

The outlet extension has a J200 connection and comes in the following types:

2568312 1m, spiral ø134mm

2568332 3m, spiral ø134mm

251765 1m, spiral ø120mm

Inlet extensions are available with three different connection types: J200 rectangular with flange (-8435) and square 300. Respective models with different spirals in accordance with that given above.

The inlet extension J200 is available in the following types:

25683391m, spiral ø134mm full pitch 25683401m, spiral ø134mm half pitch

251769 1m, spiral ø120mm full pitch 251770 1m, spiral ø120mm half pitch

Inlet extensions with rectangular connection are available in the following types:

2568393 1m, spiral ø134mm full pitch 2568394 1m, spiral ø134mm half pitch 251771 1m, spiral ø120mm half pitch

Inlet extension #300 is available in the following types:

2568480 lm, spiral ø134mm half pitch

Accessories - see price list!

For e.g. extra inlet/outlet and connecting at lengths other than the whole tube length, the following accessories are available:

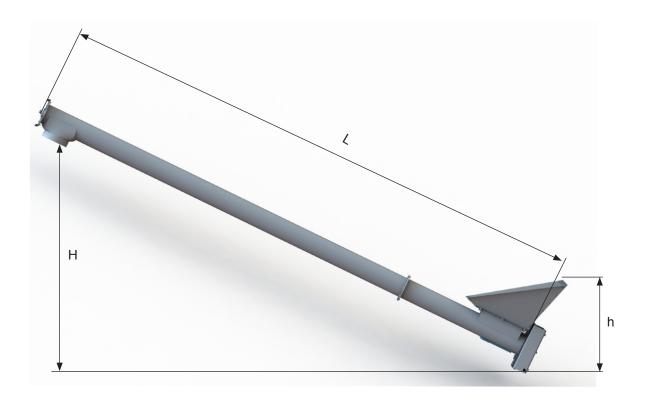
315631 In-/outlet 90gr ø160

315633 In-/outlet 45gr ø160

315638 Connecting sleeve S150

3.9 Lift elevation at 45° climb

Length (L)	Height (H)	Height (h)
6m	5,1m	0,7m
7m	5,9m	0,7m
8m	6,8m	0,7m
8m	7,6m	0,7m
10m	8,5m	0,7m



3.10 Electrical equipment



Electrical equipment shall be installed by certified electrician. A current breaker shall always be installed, easy accessible near drive unit.



4 Care & Maintenance



Shut down and lock the operating switch before commencing work on the auger!

4.1 Checks and maintenance Every 200th operational hour:

- * *Drive unit with chain/belt*: Check that the tensioner is functioning properly. Adjust as necessary. Lubricate the chain with chain lubricant spray.
- * Drive unit with worm gear: Check that no loosening has occurred. Change out broken parts if necessary.
- * Electrical motor and cables: Dust the electrical motor so that it is able to operate at the appropriate temperature. Check that all cable glands are in place so that the cables are properly delivered and that the glands are sealed. Replace any damaged cables or cable glands immediately.
- * Spiral conection to axel/spigot: check acording capter 3.4, tighten if necessary and replace damage parts.

4.2 Changing the spiral

If it seems that the spiral has come broke, it is likely that the fault is close to the drive unit.

Loosen one of the bonds and turn the spiral with help of a pipe wrench in order to localise the

If it is necessary to change the whole spiral:

- 1. Split the auger at one of the bonds, preferably at the one closest to the end bearing.
- 2. Remove the outer tube with end bearing from the auger.
- 3. Loosen the spiral from the drive shaft.
- 4. Pull the spiral out of the outer tube.

Repeat these instructions in reverse order to assemble the new spiral, and consult relevant assembly instructions where applicable.



5 Troubleshooting

Shut down and lock the operating switch before commencing work on the auger!

5.1 Jamming

Check to see if the jamming has occurred at the inlet or the outlet. Loosen the relevant part and clean thoroughly.

If the problem persists, pull the auger in reverse with help of a pipe wrench. Attach the wrench at the end bearing shaft or at the hub of the belt / chain sprocket. Loosen some of the bonds so that the material can fall out of the auger.





6 Power requirement

Depending on the auger's function, gradient, the material to be transported, the moisture content of the material etc, different power levels can be required in order to maintain maximum capacity. The different functions are summarised bellow:

6.1 Output requirement with protective gage.

Length	Required motor output		
3,5 m	2,2 kW		
4,5-5,5 m	3,0 kW		
6,5-7,5 m	4,0 kW		
8,5-9,5 m	5,5 kW		
10,5-12,5 m	7,5 kW		

6.2 Output requirement with hopper-

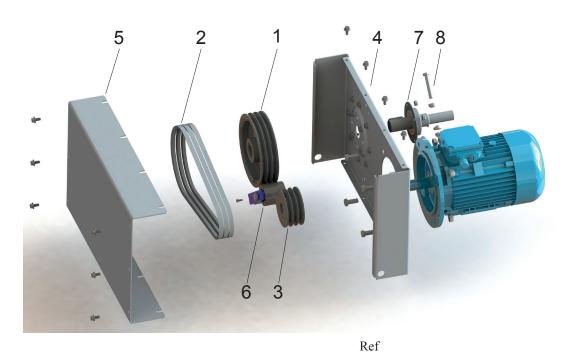
Required motor output
3,0 kW (2,2 kW)
4,0 kW
5,5 kW (7,5 kW)
7,5 kW

7 Technical data

Diameter outer tube	152 mm
Screw diameter	135 mm
Protective cage, diameter	250 mm
Funnel, volume	50 litres
Max length	12 m
Screw speed approx.	Variable
Motor speed approx.	1,450 r/m
Sound level	85 dBA (with wheat)

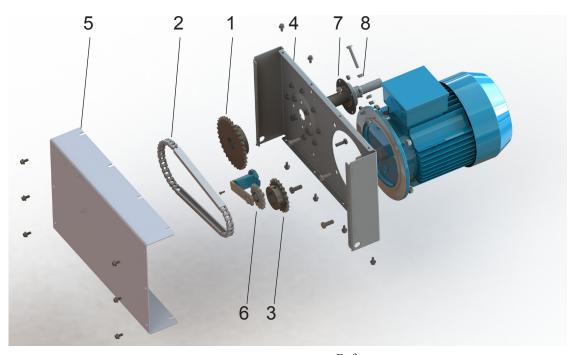
8 Spare parts

8.1 Drive unit with belt



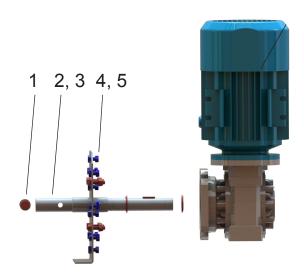
1	250615	Pulley 100-3A ø35 w/ keyway	Drive unit 251712 & -17
2	260748	Belt A40 x3 required	Drive unit 251712 & -17
3	250613	Pulley 100-3A ø28 w/ keyway	Drive unit 251717
3	250614	Pulley 100-3A ø38 w/ keyway	Drive unit 251712
4	251715	Gear box 152 f-B5 flange ø180mm	Drive unit 251717
-		e e e e e e e e e e e e e e e e e e e	
4	251706	Gear box 152 f-B5 flange ø230mm	Drive unit 251712
5	251707	Gear box lid 152	
6	260742	Belt tensioner w/ roll	
O			
7	251710	Bearing 152 w/ shaft	
8	250632	M10-screw + nut w/ profile washer	

8.2 Drive unit with Chain



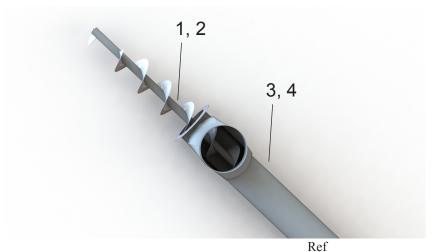
1	260882	Sprocket Z32 5/8" w/ keyway	Ref Gear unit 251711 0- 16
2	260880	Chain 62R 5/8" incl. lock	Gear unit 251711 0- 16
3	315872	Sprocket Z20 5/8" ø28 w/ keyway	Gear unit 251716
	315873	Sprocket Z20 5/8" w/ keyway	Gear unit 251711
4	251715	Gear box 152 f B5-flange ø 180 mm	Gear unit 251716
	251706	Gear box 152 f B5-flange ø 230 mm	Gear unit 251711
5	251707	Gear box lid 152	
6	260762	Chain tensioner 5/8" w/ sprocket	
7	251710	Bearing 152 w/ shaft	
8	250632	M10-screw + nut w/ profile washer	

8.3 Drive Unit with Worm Gear.



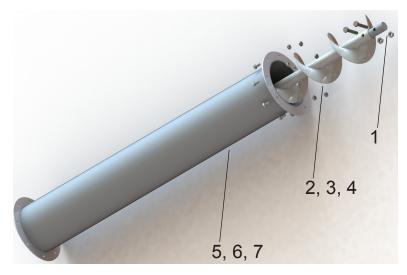
Ref
1 250632 M10-screw + nut w/ profile washer Gear unit 2568001 & -02
2 251055 Drive shaft ø 25 / ø 27 (FRT50 / FRS 60)
3 251050 Drive shaft ø 30 / ø 27 (FRS 70)
Gear unit 2568001
4 250735 Screw pouch t 251055
Gear unit 2568001
5 250740 Screw pouch t 251050
Gear unit 2568002

8.4 Outlet Extension



1	250637	Outlet spiral 152 955 mm, ø 134 mm	2568312
1	314760F-FLIS	Outlet spiral 152 955 mm, ø 120 mm	251765
2	250445	Outlet spiral 152 2955 mm, ø 134 mm	2568332
3 4	251423	Tube 1m w/ J200, flanged end	2568312, 251765
	251424	Tube 3m w/ J200, flanged end	2568332

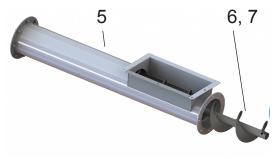
8.5 Extension

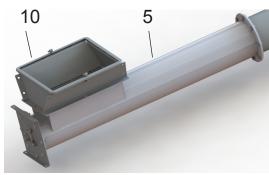


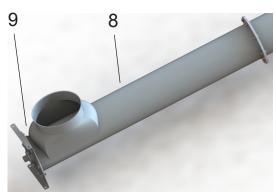
		Ref
1	250360 Spigot ø 27 mm incl. M10-screw+ nut	Spiral ø 134 mm
1	250632 M10 screw + nut w/ profile washer	Spiral ø 134 mm
1	315681 Spigot ø 30 mm inc. M8 screw + nut	Spiral ø 120 mm
ø 134	4 mm	
2	250342 Spiral 1m, full pitch, incl. spigot	2568210
3	250343 Spiral 2m, full pitch, incl. spigot	2568220
4	250344 Spiral 3m, full pitch, incl. spigot	2568230
ø 120) mm (pellet)	
2	315662-FLIS Spiral 1m, full pitch, excl. spigot	251766
3	315663-FLIS Spiral 2m, full pitch, excl. spigot	251767
4	315664-FLIS Spiral 3m, full pitch, excl. spigot	251768
5	250352 Tube 1m, with flanges	2568210 / 251766
6	250353 Tube 2m, with flanges	2568220 / 251767
7	250354 Tube 3m, with flanges	2568230 / 251768

8.6 Inlet Extension w/ hopper or inlet protection









1	250360	Spigot ø27mm incl. M10 screw + nut	
1	250632	M10 screw + nut w/ profile washer	
	315681	Spigot ø30mm incl. M8 screw + nut	

Ref Spiral ø 134 mm Spiral ø 134 mm Spiral ø 120 mm

Ø134mm

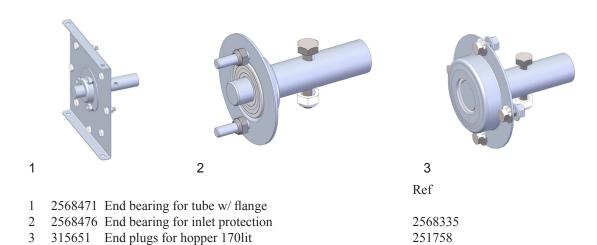
2	250395	Spiral 0.5m, full pitch, incl. spigot	2568335
2	250397	Spiral 0.5m, half pitch, incl. spigot	2568351
6	250624	Spiral 955mm, full pitch, incl. spigot	2568339, -8393
6	250636	Spiral 955mm, half pitch, incl. spigot	2568340, -8394,-8480

Ø120mm (nellet)

Ø120mm (pellet)				
7	315670-F	FLIS Spiral 1m, full pitch, excl. spigot	251769	
7	253800	Spiral 1m, half pitch, excl. spigot	251770, 251771	
3	251420	Inlet protection	2568335	
4	2568476	Bearing f protective basket	2568335	
5	251404	Tube 1m direct opening with flanges	2568393, -8394,251771	
8	251404	Tube 1m J200, with flanges	2568339, -8340,251769,-70	
9	2568471	Bearing	Spiral ø 134 mm	
9	251772	Bearing f pellet	Spiral ø 120 mm	
10	2548456	Adapter -8435 to #300	-	
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8.7 End bearings





- 1 251713 Transport wheels 2 251738 Hopper adjustment
- 3 2568463 Inlet adjustment for Inlet protection

Other - see the Accessories price list

Ref 251711 - 251717 2568393, -8394 / 251718 2568335



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