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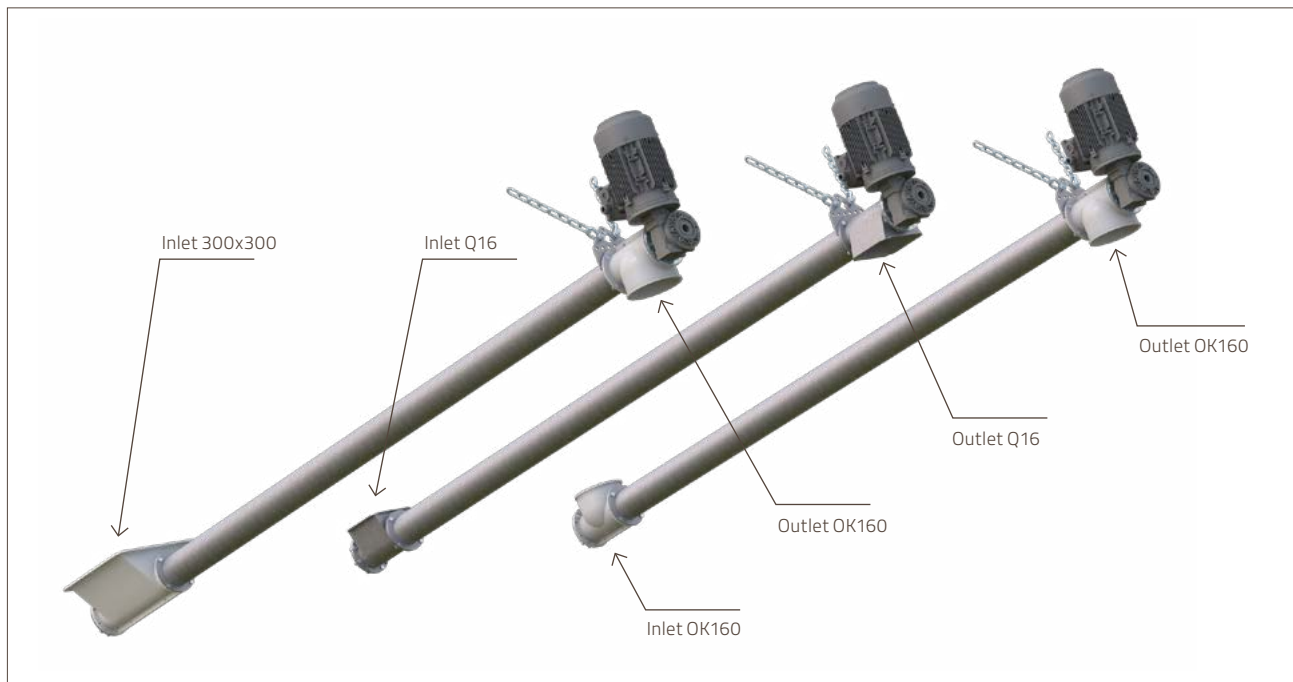
USER MANUAL

TRANSPORT CONVEYORS

TT 102 – TT 127 – TT 152 – TT 205 – TT 254



TUNETANKEN



Transport conveyors from Tunetanken.

Contents

1. General instructions.....	3	7. Electrical components	8
2. Safety instructions	4	8. Operation.....	8
3. Use of transport conveyor	5	9. Maintenance.....	8
4. Residual risk	5	10. Engine performance overview.....	9
5. Subcomponents.....	5	11. Troubleshooting.....	9
6. Mounting	6		



1. General instructions

Read the user manual carefully to ensure proper mounting and use of Tunetanken transport conveyor.

Any type of warranty from Tunetanken is void if the buyer makes technical changes to the equipment.

The following conditions must be met for Tunetanken to provide a warranty.

- > The equipment must be mounted, used and operated in compliance with this manual.
- > If parts need to be replaced or changes need to be made, recertification may be necessary.
- > Only use original spare parts from the manufacturer.
- > Documentation of interval compliance in connection with maintenance needs to be ensured.
- > To avoid dust in the equipment, seal the joints with silicone.
- > In accordance with the applicable standard EN 60204 – 1, an emergency stop must be installed.
- > In relation to the current machinery directive and the instructions of the Danish working environment authority, open inlets must be screened with a grate at a sufficient safety distance. Extra care must be taken at the inlet with the basket by the conveyor foot, in order to ensure that the requirement for a sufficient safety distance is met when using the transport conveyor. The minimum distance from grid to conveyor is 850 mm with a mesh size of max 44 mm. cf. current DS/EN ISO 13857.
- > The transport conveyor should be installed in an area, where it is not exposed to unnecessary influences from its surroundings e.g., from mechanics that can be damaging.
- > In areas with a risk of explosion, the safety of people and equipment depends on those the relevant safety regulations are complied with. People performing work in high-risk areas have a special responsibility to maintain security. In addition, working in high-risk areas, requires an in-depth knowledge of laws, rules and standards in the field. This user manual is a short instruction to explain the most important security conditions in connection with how the equipment is mounted, fitted, maintained and used.
- > Note, that it is the end user's responsibility to clarify hazardous areas in accordance with safety regulations, including requirements for zoning and any reporting to local authorities.

- > Repairs, service and maintenance must be performed in accordance with Tunetanken instructions. Repairs, service and maintenance must also be carried out by personnel with the necessary qualifications, in relation to handling the unit, with regard to explosion safety. The electrical equipment should be inspected and maintained in accordance to the instructions in EN60079-17.
- > Regarding the conveyors' mechanical parts throughout its entire life cycle and in connection with application, be aware of the following:

- Life cycle.
- If there are damages to pipes or screens.
- Equipment corrosion.
- Bolts and screws must be retightened.
- It is not allowed to make modifications or changes, that can affect the explosion safety of the equipment.
- Before use, control that the equipment is undamaged and mounted according to Tunetanken instructions.
- Recognized standards relevant to the equipment.
- National safety regulations.
- National requirements for safety and health at work.
- National mounting regulations applicable to the equipment.
- Safety information provided in this manual.
- Instructions according to type certificate for equipment, mounted on the equipment.
- Data and information on the permitted installation and operating conditions according to the rating plate.

The manufacturer reserves the right to make technical changes.

Use

The equipment can be used for transportation of feed, which provides an opportunity for ATEX-zone 21. Engine and gear must be suitable for zone 21 in the case that this zone is applicable.

The equipment can be used to transport the following materials:

- Grain, mixed dust.
- Flour.
- Rapeseed/beans.
- Minerals.
- Soybean meal.

If the transported media contains stone or metal, there is no guarantee for the explosion safety of the equipment.

Standard EN60079-10-2:215 about explosive atmosphere/dust atmosphere must be complied with.



	Particle size [µm]	Ignition tem- perature Dust cloud [°C]	Ignition tem- perature 5 mm dust layer [°C]	LEL [g/m ³]	MIE [mJ]	Kst [bar m/s]	Reference
Limit values	12	400	280	30	50	131	-

2. Safety instructions

Before mounting, using, operating and maintaining the transport conveyor, it is necessary to read the user manual and safety instructions thoroughly.

To prevent accidents, the transport conveyor and equipment must be mounted in relation to the current machinery directive.

According to the current machine directive, the machine must be shielded correctly. This means that it must not be possible to come into contact with the moving parts of the equipment. Before using the machine, all designated guards must be mounted. It should only be possible to remove guards using tools.

According to regulations, the engine must be protected with overload protection equipment. In addition, suitable equipotential bonding of the conveyor must be ensured in accordance with the regulations.

The electrical source must be separated from the drive engine when doing repairs or maintenance.

It must not be possible to put your hand into the drive system, inlet and outlet, as well as the control damper, while the conveyor is in use.

Maintenance of guards to prevent or remove risks must be carried out regularly.

There must be ergonomically good conditions for making service on the equipment.

If the safety equipment is removed when doing repairs or maintenance work, it must be reinstalled before using the conveyor again.

Screws, bolts and attachments should all be tightened.

In the event of a machine stop, heating may occur in the transmission.

The conveyor must be secured for defects before use. The user is obliged to only use the equipment once it has been checked and ensured that the equipment is in flawless condition.

If damages occur due to misuse or technical changes to the equipment, Tunetanken is not liable for the damages. Tunetanken is also not liable for damages if the instructions in the user manual are ignored.

Engine and gearbox must be specially approved for use in potentially explosive areas. If in doubt, Tunetanken must be contacted for further information. The ambient temperature in the area must be in accordance with the permissible limit values of the equipment – $20^{\circ}\text{C} \leq T_a \leq 40^{\circ}\text{C}$. When installing the transport conveyor, consideration must be given to whether any external heat sources may affect the ambient temperature in the installation area of the equipment.

Adequate work lighting is required under all circumstances when working with the conveyor.

When working with the conveyor the following equipment is needed:

- Respiratory protection.
- Safety shoes.
- Hearing protection.
- Precautions required by the local workplace.

During mounting, dismantling and service of the conveyor, a helmet must be used.

Before mounting the conveyor, the user manual must be read thoroughly. There may be heavy lifting during mounting and it is therefore important that everyone involved in the process has read the user manual. When mounting and setting up, suitable lifting equipment must be used.

There is a danger of sharp edges when handling the machine, therefore all handling should be done wearing gloves.

The conveyor must not be subjected to greater dust loads (dust layers) than allowed in standard EN60079-14.

Note that if the conveyor is expected to run without material for more than 30 sec, a dry run sensor must be installed to ensure that the conveyor stops. In addition, it must be ensured that the outlet does not get clogged, this can e.g. be prevented with the use of a detector. If the equipment makes unknown sounds, the cause of the sounds must be detected and defective parts replaced.



3. Use of transport conveyor

The transport conveyor can be used to transport most types of grain as well as most types of kernels, seeds and flour products that are found in agriculture. (See p. 4 about material data). The transport conveyor can be used both horizontally and inclined at an angle up to 45° and not outside this range. The transport conveyor has a speed of 140-1000 rpm and the length of the pipe can maximum be 12 meters.

4. Residual risk

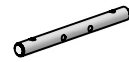
The transport conveyor is constructed in accordance with the ATEX and machine directory's safety and health regulations. These requirements must be complied with so that the transport conveyor is not to any danger to the user or the life and limbs of a third party.

5. Subcomponents

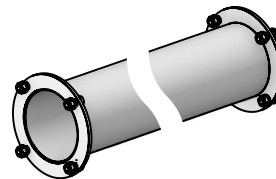
Overview of the transport conveyor parts.



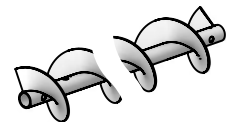
Suspension



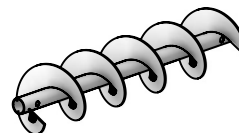
Thru axle



Flange pipe



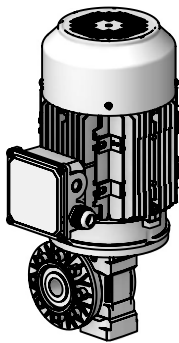
Transport conveyor



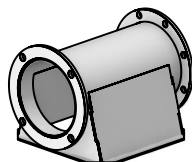
Inlet conveyor



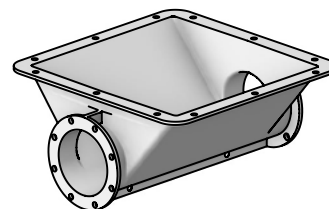
Inlet axel



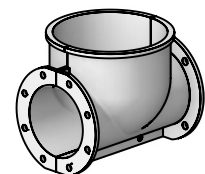
Gear engine



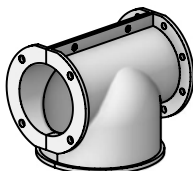
Q16 outlet



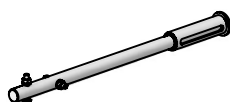
Inlet 300x300



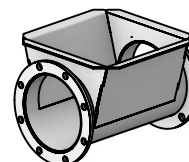
Inlet OK160



OK 160 outlet



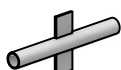
Top axle



Inlet Q 16



Bearing



Ejector



Washer

6. Mounting

The transport conveyor must be mounted in accordance with this user manual in order to be used correctly.

6.1. Mounting of gear engine to the conveyor – See fig. 6.1.

1. The conveyor shaft is mounted to the engine shaft with M6 screws.
2. The flange pipe is mounted on the outlet with M8 nuts.
3. The suspension is mounted along with the flange pipe before the conveyor can be used.

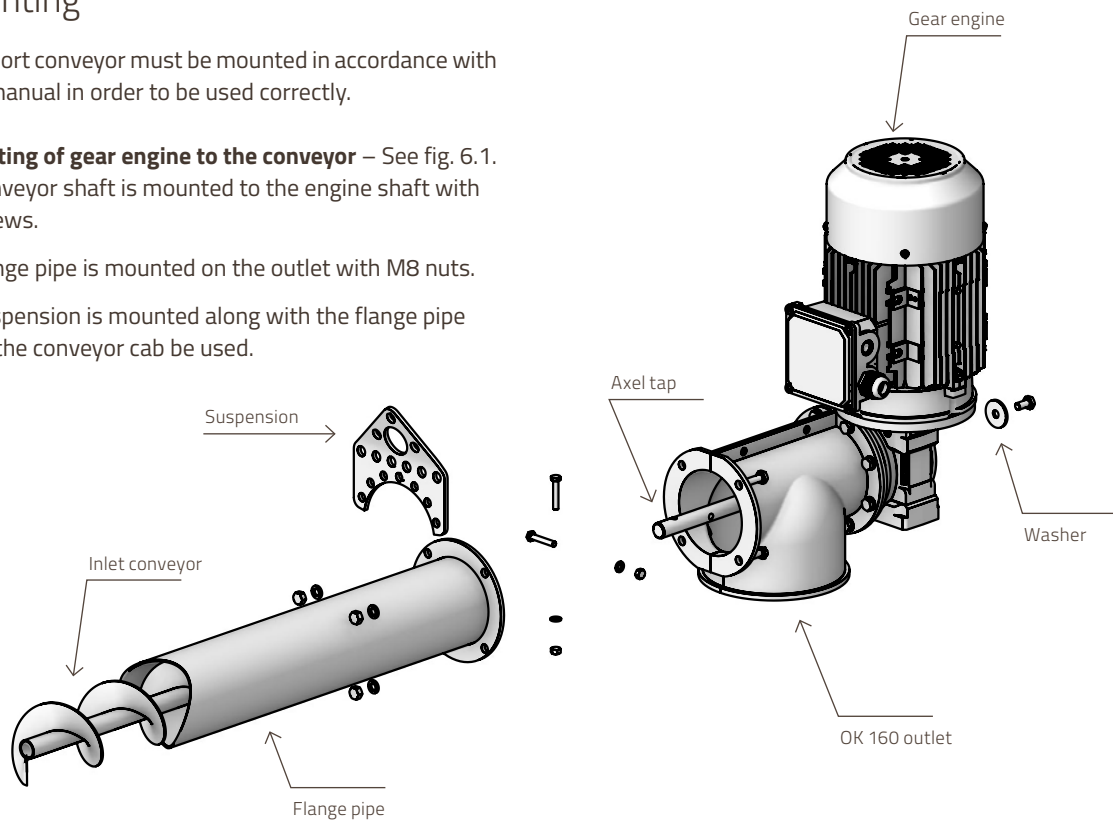


Fig. 6.1.

6.2. Assembly of two conveyors – See fig. 6.2.

1. Two conveyors are assembled using a thru axel with M6 nuts.
2. The flange pipes assembled using M8 nuts.

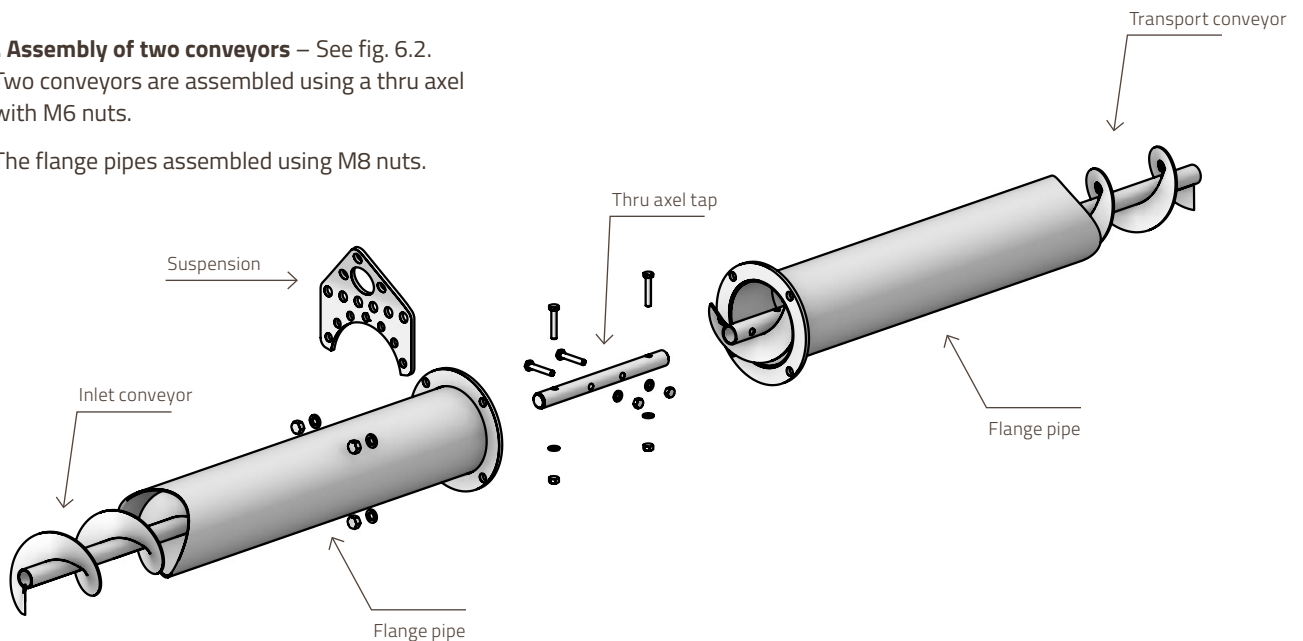


Fig. 6.2.

6.3. Mounting of the bottom inlet – See fig. 6.3.

1. Washer is mounted on the inlet shaft.
2. The inlet conveyor is mounted on the inlet shaft with M6 screws.
3. The thru axle tap is mounted between the inlet and the transport conveyor with M6 screws.
4. T flange pipe is mounted to the inlet with M8 screws.
5. Once everything is assembled, the thru axel must extend min. 1 cm to the outlet in order to secure that there is enough move-ment tolerance. If there is not a minimum of 1 cm, the mounting is incorrect.

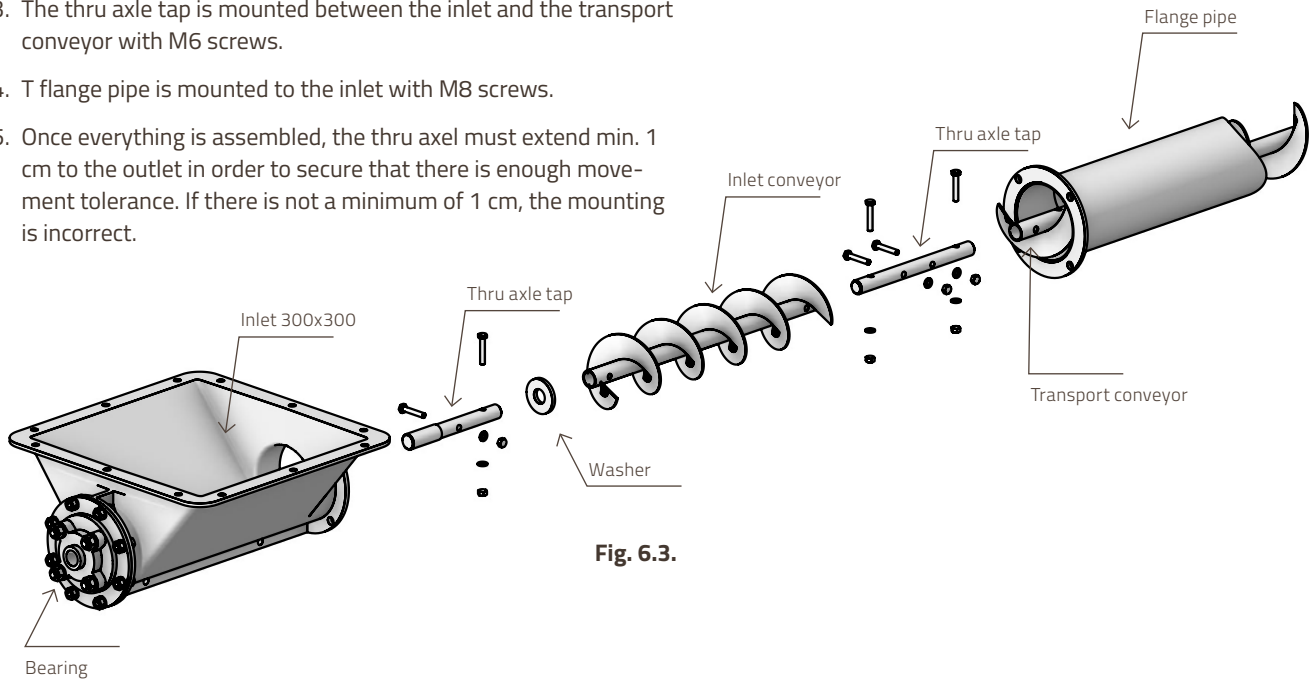


Fig. 6.3.

6.4. Flange sealing between the gear and the engine – See fig. 6.4.

It important to seal the joint so that water cannot penetrate into the gear and the engine.

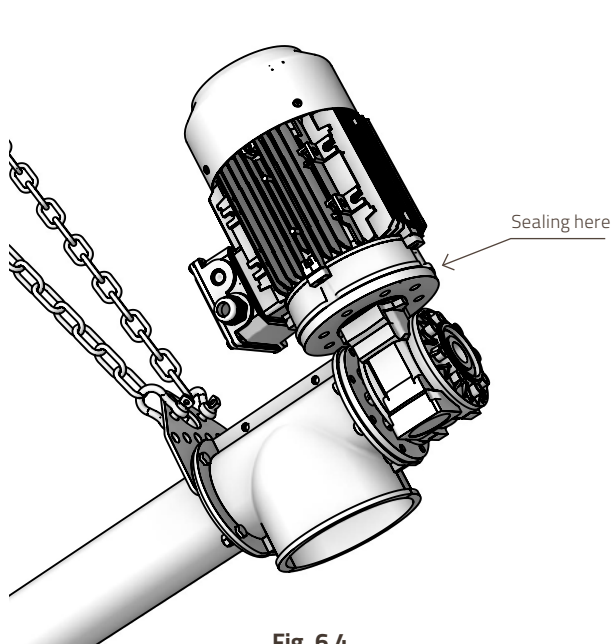


Fig. 6.4.



Fig. 6.5.

6.5. Supports and suspensions – See fig. 6.5.

The transport conveyor must be supported or suspended for every 6 meters. All joints between the parts must be performed correctly.



7. Electrical components

The equipment may only be connected to electricity by specially instructed staff. Note voltages and data indicated on the engine type plate during installation. Follow the instructions on the engine type plate for connecting the engine terminals. The engine must be secured with overload protection equipment and a lockable main switch, otherwise the manufacturer's warranty is void. (This equipment is not included in standard delivery).

The equipment must be installed and connected in accordance with the national installation regulations as well as the requirements specified in the executive order on high voltage, EN60201-1 and EN60079-17.

The electrical components must be put into operation and maintained in accordance with EN60079-17.

Refer to the manufacturers' instructions for engine and gear maintenance as well as other requirements regarding maintenance intervals or service in relation to maintenance for safety explosions.

Note the data from the converter and the type plate, if any frequency converter is inserted. Also, note the declaration of the electrical components in classified areas.

Equipotential bonding:

External terminal for the attachment of the bonding connection is present and must be carried out in accordance with EN60079-14.

Note that the direction of the rotation must follow the arrow below when the transport conveyor is connected.

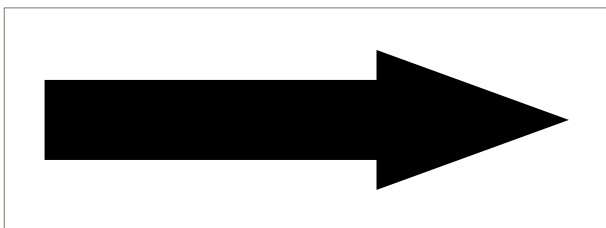


Figure 6

8. Operation

The current safety and prevention requirements of the machinery directive for accident prevention must be complied with when the conveyor is in use.

The transport material is fed to the conveyor (see chart p. 4) to ensure that the material can exit.

The conveyor should not run while empty. Running the conveyor empty may wear the conveyor blades out as well as causes unwanted noise while increasing the risk of explosion. During normal operation, the transport conveyor should be full.

9. Maintenance

The described safety instructions must be complied with during all maintenance work.

The inside of the conveyor is worn in relation to the dirt proportion in the transported material. The inside of the conveyor should be checked for wear and/or damages once a year. The conveyor can be damaged by foreign objects in the transported material such as wood, stones and iron pieces.

In case of the foreign object getting stuck in the conveyor, it can be removed by the help of suitable assistive devices. Do not, under any circumstances use your hands.

If necessary, disassemble the transport conveyor to remove foreign objects. If the inside parts of the conveyor are damaged or worn out, they must be replaced.

Note that the safety of the engine, gear and bearings are dependent on the maintenance intervals and that the subsequent replacements are maintained.

The equipment must be maintained according to the following schedule:

Equipment	Manufacturer	Interval for maintenance
Bearing	RS Components	Must be replaced for every 10.000 operating hours.
Engine	Cantoni	Must be replaced for every 10.000 operating hours.
Gear	Varvel	Explosion safety is depending on the required maintenance: Remove dust layers greater than 5 mm with a vacuum cleaner. Gaskets are reviewed for leaks every 500 operating hours. Oil seals must be visually inspected every 3.000 hours or every 6 months and replaced if there are signs of wear. Oil change must be done every 5 years.
Conveyor pipe	Tunetanken	Must be controlled every 1.000 hours for signs of corrosion.



10. Engine performance overview

Length of conveyor pipe	TT 102 Conveyor: 400 rpm Engine: 1400 rpm	TT 127 Conveyor: 400 rpm Engine: 1400 rpm	TT 152 Conveyor: 400 rpm Engine: 1400 rpm	TT 205 Conveyor: 400 rpm Engine: 1400 rpm	TT 254 Conveyor: 400 rpm Engine: 1400 rpm
3 meters	1,5 kW	2,2 kW	2,2 kW	3,0 kW	3,0 kW
4 meters	1,5 kW	2,2 kW	3,0 kW	3,0 kW	3,0 kW
5 meters	1,5 kW	2,2 kW	3,0 kW	3,0 kW	3,0 kW
6 meters	2,2 kW	3,0 kW	4,0 kW	4,0 kW	4,0 kW
7 meters	2,2 kW	3,0 kW	4,0 kW	4,0 kW	4,0 kW
8 meters	2,2 kW	3,0 kW	4,0 kW	5,5 kW	5,5 kW
9 meters	2,2 kW	4,0 kW	4,0 kW	5,5 kW	5,5 kW
10 meters	3,0 kW	4,0 kW	5,5 kW	7,5 kW	7,5 kW
11 meters	3,0 kW	4,0 kW	5,5 kW	7,5 kW	7,5 kW
12 meters	3,0 kW	4,0 kW	5,5 kW	7,5 kW	7,5 kW
13 meters	-	-	5,5 kW	7,5 kW	7,5 kW
14 meters	-	-	5,5 kW	7,5 kW	7,5 kW
15 meters	-	-	5,5 kW	7,5 kW	7,5 kW

11. Troubleshooting

Error	Possible cause	Assess and repair
Transport conveyor will not start	Disconnected power	Check if power cord works, if not, replace.
	Deficient engine fuses	Replace engine fuses with new ones.
	Deficient engine safety switch	Replace engine safety switch with new one.
	Deficient engine	Replace engine with new one.
The engine stalls/is exposed to congestion	Transport conveyor blocked	Remove blockage using appropriate tools.
	Clogged outlet	Clean outlet so that the flow is free.
	Excessive inflow of material into pipe	Inlet adjusted – smaller amounts of material transported through.
	Disconnected power supply	Check if power cord works, if not, replace.
	Deficient engine fuses	Replace engine fuses with new ones.
	Broken/cracked drive shaft	Replace drive shaft with new one.
Unstable transport through transport conveyor	Worn inner conveyor	Check if the inner conveyor is work. If it is, replace with new one.
	Bent inner conveyor	If the inner conveyor is bent, check for blockage. Blockage is removed and conveyor is straightened. If the conveyor cannot be straightened, it should be replaced with a new one.
	Polluted transport material	If the transport material is polluted it should be decontaminated before going through the transport conveyor.
	Moist transport material	If the material is moist, it must be dried before going through the conveyor.
	Not enough transport material	If there is not enough material, more material should be added.