User manual

Interroll Crossbelt Sorter Vertical

ST 6130 - 6159

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Translation of the original instructions
Manufacturer's address

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### Installation declaration
About this document

Information about the operating instructions

Contents
These operating instructions contain important details and information about the various operating phases of the conveyor:
• Transport, assembly and start-up
• Safe operation, required maintenance, remedy of possible faults
• Spare parts, supplementary accessories

Product affiliation
The operating instructions describe the finished conveyor at the time of initial delivery.

Supplementary to these operating instructions, special contractual agreements and technical documents apply for special conveyor versions and additional appliances.

These operating instructions are an integral part of the conveyor
➢ To ensure trouble-free and safe operation as well as the settlement of any warranty claims, always read these operating instructions first and observe all the information contained herein.
➢ Keep these operating instructions close to the conveyor.
➢ Always give the operating instructions to each subsequent owner or user. Interroll shall not accept liability for any damages or malfunctioning caused by non-adherence to these operating instructions.
➢ Please contact Interroll Customer Service if you have any further questions after reading these operating instructions. See the last page for your local contact.
Warning signs in this document

The warning signs in this document provide information about dangers which may arise during conveyor operation. The relevant warning signs are displayed in the "safety" section, see "Safety", page 5 and at the beginning of each chapter.

There are three types of warning signs:
• DANGER
• WARNING
• CAUTION

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Meaning</th>
<th>Consequences of non-adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER</td>
<td>warns of an imminent danger</td>
<td>death or serious injuries.</td>
</tr>
<tr>
<td>WARNING</td>
<td>warns of a possible danger</td>
<td>death or serious injuries are possible.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>warns of a possibly dangerous situation</td>
<td>slight injuries are possible.</td>
</tr>
</tbody>
</table>

Warning sign design

➢ Always read and carefully observe all warning signs.

Other symbols

➢ This symbol displays safety instructions.

➢ This symbol refers to an actual task.
Safety

Basic safety instructions

The conveyor meets the highest technical specifications and is safe to operate after correct installation. Nevertheless, dangers may still arise during utilisation:

- Danger of death or personal injury to operators and others
- Adverse effects on the conveyor and other areas

The system may only be operated by qualified and authorised persons who are familiar with the operating instructions and can work according to these.

Non-adherence to the information in these operating instructions can result in life-threatening injuries!

- Read these operating instructions carefully and adhere to the information contained herein to ensure safe conveyor operation.
- Adhere to all warning signs attached to the system.

Intended use

The sorter is intended for use in industrial environments and should only be applied to transport sortable goods, e. g. parcels, letters, boxes or crates.

Application area

The sorter is intended for certain application areas only (see "Product identification", page 8 and the following) and its defined capacity limits must not be exceeded during operation.

Any other use is not permitted. Operating conditions which deviate from those specified require additional declarations, special approval for the conveyor and new contractual agreements.

 Modifications at the sorter

Users are not permitted to carry out alterations or modifications which will have an adverse effect on safety.

Incorrect use

The sorter is not intended for transporting people, bulk goods, small parts, rolling parts (e. g. bottles), barrel-shaped parts and dimensionally instable parts.

![NOTICE]

**Incorrect use**

Damage to the sorter

- Never climb on the sorter.
- Only operate the sorter in the specified transport direction.

Specialists

Specialists are personnel who have the knowledge to read and understand the operating instructions and the ability to carry out work professionally while observing national regulations.
Safety

Electricians

According to German accident prevention regulations (BGV A2), electricians must be able to assess and recognize possible dangers when performing entrusted tasks due to their professional training, know-how, experience and knowledge of relevant regulations.

Dangers

This section provides information about various dangers and damages which may occur when operating the conveyor.

During running operation

- Do not place hands in the conveyor.

Safety equipment

- Only carry out maintenance and repair work once the machine has been de-energized and measures have been taken to ensure that it cannot be started accidentally.
- Organize additional safety measures for passageways and to stop people reaching into the moving conveyor.
- Never remove protective covers or housings.
- Regularly inspect safety equipment.

Electricity

- Never reach into a live machine.

Rotating parts

- Never wear loose clothing.
- Never wear jewellery, such as necklaces or bracelets.
- If you have long hair, always wear a hair net.

Falling objects/Work environment

- Always remove materials and objects which are not required from the work area.
- Wear safety shoes.
- Regulate and monitor the positioning and removal of conveyed goods.
- With discharging, do not place hands in the destination section.

Malfunctioning during operation

- Regularly inspect the conveyor for visible damage.
- Stop the device immediately and ensure that it cannot be started accidentally.
- Smoke, unusual noises, trapped or broken goods, defective support stands, side guides or accessory appliances.
- A specialist must locate the source of the fault immediately.
- Immediately clean up any leaked gear oil.
- Do not climb on the conveyor during operation.

Maintenance intervals

- Carry out maintenance and inspections regularly.
- Only use original spare parts.
Safety

Interfaces to other devices

Danger zones can arise when integrating the sorter into a system. These zones will not be described in these operating instructions and must be analyzed during installation and initial start-up of the respective system.

- After connecting the sorter to other modules, machines, destinations or equipment, always check the entire system for new danger zones prior to initial start-up.
- If necessary, implement further constructional measures.

Operating modes

Normal mode
Operation of the installed device at the end customer as a conveyor in a complete system.

Special mode
All operating modes which are required to guarantee and maintain safe and normal operation.

<table>
<thead>
<tr>
<th>Special operating mode</th>
<th>Explanation</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport/Storage</td>
<td>Loading and unloading, transport and storage</td>
<td>-</td>
</tr>
<tr>
<td>Assembly/Initial start-up</td>
<td>Installation at the end customer's and execution of a test run</td>
<td>-</td>
</tr>
<tr>
<td>Cleaning</td>
<td>Cleaning the outside without removing safety equipment</td>
<td>When de-energized</td>
</tr>
<tr>
<td>Maintenance/Repairs</td>
<td>Maintenance and inspection tasks</td>
<td>When de-energized</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>Troubleshooting in case of faults</td>
<td>When de-energized</td>
</tr>
<tr>
<td>Fault elimination</td>
<td>Eliminating the fault</td>
<td>When de-energized</td>
</tr>
<tr>
<td>Shut-down</td>
<td>Removal from the system</td>
<td>When de-energized</td>
</tr>
<tr>
<td>Disposal</td>
<td>Removal from the system and disassembly</td>
<td>When de-energized</td>
</tr>
</tbody>
</table>
Product identification

Components

<table>
<thead>
<tr>
<th>1</th>
<th>Drive station</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Module</td>
</tr>
<tr>
<td>3</td>
<td>Conveyor belt</td>
</tr>
<tr>
<td>4</td>
<td>Crossbelt carrier</td>
</tr>
<tr>
<td>5</td>
<td>Deflection station</td>
</tr>
<tr>
<td>6</td>
<td>Transport route optional</td>
</tr>
</tbody>
</table>

Device design

Characteristic

The vertical sorter sorts goods weighing up to 35 kg, e.g. containers, parcels, large letters, bags, boxes. Depending on the type of crossbelt carriers, a maximum throughput of 12000 pieces an hour can be achieved.

Elements and functionality of the sorter

The most important elements and their functionality are described below, this includes the:

- Crossbelt carrier
- Flap unit
- Rubber block chain
- Drive and deflection station
- Destinations and special destinations
- Automatic sorter shutdown
The most important crossbelt carrier components are small conveyor belts ①. The conveyor belts are assembled on a carrier support. The carriers are equipped with a mechanical drive unit.

Each carrier has a helical bevel gear ② with two right-angled drive wheels ③. A pneumatically driven pivoting flap ④ drives a drive wheel which is rigidly fixed to the driving bevel gear. The momentum is transferred to a second drive wheel via the driven bevel gear. This is located below the crossbelt and the actual friction results in the discharging motion.

The carriers are pulled by a rubber block chain ⑤ as the drive element. They run on plastic coated rollers to minimise the operating noise.
Flap unit

The main flap unit components are the two steel pivoting flaps 1, the two pneumatic cylinders 2 and the flap support 3. The cylinders are pneumatically controlled via valve terminals which in turn receive a bus line signal. Two flap units are always synchronised and together they supply a left and right-hand destination.

Flap control of the crossbelt carriers

To drive a crossbelt, flaps are pneumatically controlled and use the sorter drive energy via a drive wheel and a reverse gear.

Compressed air supplied centrally to the sorter is required for pneumatic control of the flaps. The pressure is monitored by a sensor. The compressed air monitor uses a potential-free contact (normally closed contact) to indicate a fault when the pressure falls below the specified minimum operating pressure.

Rubber block chain

The vulcanised steel wire-reinforced rubber block chain ensures greater conveyor lengths and helps to prevent possible strain. The rubber block chain is 50 mm wide and contains 5 steel wires. The carriers are attached to the rubber block chain via spring plates.
Product identification

Drive station

The drive station consists of a compact steel frame with a console for the drive motor \( \circ \). The drive shaft \( \oplus \) is driven via an intermediate chain drive. The drive disc \( \odot \) and the guiding disc of the crossbelt carriers are located on the drive shaft. The guiding disc guides the carrier units in the pulley area. The rubber block chain \( \ominus \) with the mounted carrier units \( \varnothing \) is driven via the drive disc.

There is an extraction point \( \odot \) for the crossbelt carriers in both the drive wheel and the deflection sprocket. The drive chain is secured with a chain joint.

Drive motor

The drive motor is a parallel shaft geared motor controlled by a frequency converter. The controlled motor drive of the sorter has a constant speed and fitted encoder.

Deflection station

The deflection station design corresponds exactly to the drive station without drive elements.

Destinations and special destinations

Conveyed goods are discharged by the crossbelt carriers at a destination specified by the barcode. The goods slide from the crossbelt carriers down a chute into the destinations. The design of the chutes ensures that goods reach the destinations gently. The layout of the destinations depends on the conveyed goods.

Goods which cannot be allocated to the actual specified destination are discharged into two special destinations:

- "No Read" destination for all goods whose barcode could not be read.
- "Overflow" destination for all goods whose destination is occupiedblocked.

The sorter is shutdown once the overflow destination indicates that it is full.
Safety shutdown of the sorter

The sorter is automatically shutdown if conveyed goods enter the safety section of the drive station. This prevents conveyed goods falling into the sorter deflection section.

**NOTICE**

**Damage to the sorter caused by conveyed goods entering the safety section**

- Conveyed goods which enter the safety section must be removed by maintenance personnel.
- Subsequently acknowledge the fault message and restart the system.

If this type of safety shutdown occurs, the goods which have caused the fault are located at the end of the sorter in the drive station. The maintenance personnel must open the door ① of the safety section and manually remove the conveyed goods from the monitoring light barriers ②.

After removal of the conveyed goods, the safety section fault must be acknowledged.

After safety shutdown, the fault must be acknowledged before the system can be restarted. This prevents the system being restarted before the conveyed goods have been removed from the safety section.

Automatic sorter shutdown resulting from loss of compressed air

If the compressed air pressure falls below 5.5 bar, a fault is indicated and the sorter is automatically stopped.
The air pressure can be read at the pressure gauge 1.
## Product variants

<table>
<thead>
<tr>
<th>ST 6130 - 6159</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity/Conveying speed</strong></td>
<td>The conveying speeds depend on the size of the crossbelt carriers and the throughput.</td>
</tr>
<tr>
<td><strong>Carrier pitch</strong></td>
<td>462 mm, 561 mm, 660 mm, 726 mm</td>
</tr>
<tr>
<td><strong>Carrier length</strong></td>
<td>400 mm, 500 mm, 600 mm, 660 mm</td>
</tr>
<tr>
<td><strong>Carrier width</strong></td>
<td>400 mm, 500 mm, 600 mm, 900 mm</td>
</tr>
<tr>
<td><strong>Drive</strong></td>
<td>Parallel shaft geared motor with frequency converter, fixed conveying speed</td>
</tr>
<tr>
<td><strong>Motor capacity</strong></td>
<td>Depends on the load and conveying speed</td>
</tr>
<tr>
<td><strong>Conveyor weight</strong></td>
<td>The weight is indicated on the type plate</td>
</tr>
<tr>
<td><strong>Weight of conveyed material</strong></td>
<td>From 50 g to max. 35 kg</td>
</tr>
<tr>
<td><strong>Dimensions of conveyed material (L x W x H)</strong></td>
<td>Min. 100 x 80 x 5 mm&lt;br&gt;Max. 600 x 600 x 500 mm or 1200 x 800 x 800 mm for double carrier assignment</td>
</tr>
<tr>
<td><strong>Incline of conveyor belts</strong></td>
<td>Max. 7°</td>
</tr>
<tr>
<td><strong>Overall heights</strong></td>
<td>Small pulley 1,330 mm, large pulley 1,780 mm</td>
</tr>
<tr>
<td><strong>End roller diameter</strong></td>
<td>Small pulley Ø839.4 mm, large pulley Ø1,302.6 mm</td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td>+5 °C to +40 °C ambient temperature</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>Max. 90%, non-condensating</td>
</tr>
<tr>
<td><strong>Ambient conditions</strong></td>
<td>Not suitable for application in areas with chemically aggressive media, e.g. acids or alkalis. Exceptions only after prior consultation.</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td>Leq &lt; 68 dB(A)</td>
</tr>
<tr>
<td><strong>Operating pressure</strong></td>
<td>6 bar</td>
</tr>
</tbody>
</table>
Product identification

Type plate

The type plate specifications identify the conveyor. The type designation is required for correct application of the conveyor.

The type plate is located close to the motor.
Transport and storage

Transport

**CAUTION**

Risk of injuries due to incorrect transport!
> Transport must be carried out by qualified and authorized personnel.

Refer to the enclosed data sheet for details about the weight and requirements for load carrying and load securing equipment.
> Ensure people are not in the danger zones.
> Wear safety shoes.
> Check secure fastening for transport

The lifting points are marked on the conveyor.

**CAUTION**

Risk of injuries due to incorrect transport!
> Transport must be carried out by qualified and authorized personnel.

Lifting point identification

After delivery

> Inspect the delivery for transport damages. Notify the transport company and the manufacturer immediately if any defects are detected to prevent claims being refused.

Storage

**WARNING**

Risk of injuries due to incorrect storage!
> Do not stack conveyors on top of each other. Do not place other objects on the conveyor.
> Check the stability of the conveyor.

> If the conveyor is not to be used immediately, store and protect it from moisture and dust.
Assembly and installation

Assembly

The conveyor is supplied in fully pre-assembled modules at the installation site and has to be erected, connected and integrated into a system on-site.

Assembling the conveyor

- Aligning the sorter. Use a spirit level and a level for this task.
- Secure the sorter ensuring it is not twisted or warped, for example on the floor or to adjacent components.
- When aligning the module, make sure there is no contact between moving parts.
- After sorter installation, make sure passageways are clear of obstacles. If necessary, assemble walkways.
- When integrating the sorter in a system, always consider possible danger zones, especially where cuts and crushing can occur.

Electrical installation

- Power is supplied to the conveyor either via a CEE plug or direct installation in a control panel.
- Always check cables and assemblies for damages prior to installation.
- Refer to the motor's type plate for connection values.
- Connect the motor in accordance with EN-IEC 60204-1. Refer to the motor's terminal box for wiring information.
Start-up and operation

Initial start-up

The sorter components (modules, drives, flaps, carriers) are factory tested. The sorter should initially run for 20 to 30 operating hours. Generally speaking, further adjustments are then no longer required.

Nevertheless, the following check must be carried out:

- Check the sorter’s direction of travel prior to initial start-up. The sorter is started via the control console of the system in which it is integrated.

Operation

Prior to each operation

- Check the sorter for visible damage. Pay particular attention to the conveyor belt, crossbelt carriers and protective equipment.
- Ensure that all safety equipment is functioning correctly.
- Make sure that only authorized persons are in the conveyor’s work area.
- Always remove materials and objects which are not required from the work area.
- Provide instructions about and monitor correct loading of the conveyor.

During operation

**WARNING**

Risk of injuries due to incorrect handling!

- Check electrical connections and protective equipment.
- Remove conveyed material from the sorter.
- Ensure unauthorized persons are not in the danger zones.
- Wear safety shoes and suitable work clothes.

**WARNING**

Rotating parts!

Crushing and serious injuries due to being caught and pulled into the conveyor!

- Never wear loose work clothes, jewelry or chains.
- If you have long hair, always wear a hair net.

Procedure for accidents or malfunctioning

- Stop the device and ensure that it cannot be started accidentally.
- In case of an accident: If necessary, apply first aid treatment and make an emergency call.
- Inform a specialist.
- A specialist must eliminate the fault.
- Only restart the device after it has been deemed safe and released by a specialist.
Cleaning, maintenance and repairs

Cleaning

⚠️ WARNING

Risk of injuries due to incorrect handling
- Ensure the conveyor is de-energized before cleaning it. Disconnect the power supply and ensure that it cannot be connected accidentally.
- Do not remove safety equipment.
- Wear safety shoes and close fitting work clothes.

- Only dry clean the belts.
- Clean drive wheels with spirit.
- Only dry clean chutes and covers or use a damp cloth for cleaning.
- Clean panels on the underside with compressed air (max. 8 bar).

Maintenance and repair work information

⚠️ DANGER

Danger of death due to high voltages!
- Switch off the supply network system, ensuring that the device cannot be started accidentally and that the power supply has been disconnected correctly.

- Work at electrical appliances should only be carried out by authorized and qualified electricians.
- Display signs warning of maintenance and repair work when carrying out tasks.
- Cordon off the area around the conveyor.
- Inform people entering the cordoned off area of the risks.

Always observe safety rules when working on the sorter

⚠️ WARNING

Risk of injuries when the sorter is live and running
- Always make sure the sorter is switched off before carrying out work.
- Disconnect the sorter completely and secure it against reconnection.

Disassembling crossbelt carriers

The crossbelt carrier can be disassembled at either the deflection station or the drive station. However, disassembly at the drive station at the sorter end is the simplest.
Disassembling the guide segment

Retaining screws of the guide segment

Two removable guide segments ① are located at the crest of the pulley guide.

To disassemble the crossbelt carrier, it is sufficient to just disassemble one guide segment on the middle tracking profile side.

➢ Unscrew the four retaining screws ②.
   The guide rollers of the crossbelt carrier are now accessible.
Detaching the crossbelt carrier from the block chain

- Detach the crossbelt carrier from the block chain ①. Disconnect the leaf springs from the rubber block chain by loosening the connecting bolts ②.
Assembling the crossbelt carrier

➤ Assemble the belt support with crossbelt in the sorter - in reverse order to disassembly, see "Disassembling crossbelt carriers", page 19.
➤ Re-attach the guide segment.
➤ Prior to renewed start-up, manually rotate the sorter through a whole turn and check for any collisions and unusual noises.

Replacing the belt support with belt

The belt support with belt can be disassembled at either the deflection station or the drive station. However, disassembly at the drive station at the sorter end is the simplest.

Disassembling the belt support

➤ Remove the clamping nut and spring ①.
➤ Loosen the connecting bolts ② between the belt support and the crossbelt carrier.
➤ Remove the belt support with the belt.
Assembling the belt support

- Assemble the belt support on the crossbelt carrier in reverse order.
- Adjust the clamping nut until the spring is 20 mm long between the belt support and the washer.

Replacing the crossbelt

A crossbelt can be replaced individually. However, it is recommended to disassemble the entire assembly, belt bed with belt, since this is much quicker and easier.

In both cases, the complete belt bed with belt must be disassembled.

Disassembling the crossbelt

- Remove the belt support with the crossbelt, see "Replacing the belt support with belt", page 22.
- Loosen the end roller shaft by slightly unscrewing the bolts ①.
- Release the end roller shaft tension by loosening the counternuts ② of the eye bolt.
- Unscrew the eye bolt to adjust the contact pressure roller.
Assembling the crossbelt

➤ Pull the slack crossbelt off the entire belt bed from the side.

➤ Assemble the new crossbelt in reverse order. Always replace the self-securing nuts and bolts.

Tensioning the crossbelt

➤ Tension the end roller shaft via the tensioning bolts. Make sure the protruding ends of both tensioning bolts are the same length to achieve equal tensioning of the crossbelt.

➤ Check and, if necessary, correct the crossbelt tension.

➤ Tighten counternuts and shaft bolts.

Slack crossbelt

Crossbelt with 20 mm of play

The crossbelt tension is correct when the belt can be raised approx. 20 mm and there are no creases or folds.
Disassembling and assembling the distance plate

The distance plate 2 is located between the individual carriers and covers the gap to the following carrier.

- To disassemble the distance plate, loosen both bolts 1 at the end roller shafts on the respective side.
- Unscrew/Extract the distance plate from the loosened bolt connection.
- Assemble the distance plate in reverse order.
- Prior to renewed start-up, manually rotate the sorter through a whole turn and check for any collisions and unusual noises.
Always observe safety rules when working on the flap unit and the cylinder

**WARNING**

Risk of injuries when the system is live

- Before carrying out work on the flap unit and cylinder, make sure the system is fully de-energised and de-pressurised.
- Disconnect the system and secure it against reconnection.
- Always wear protective goggles.

Flap unit

The main flap unit components are the two steel pivoting flaps ①, the two pneumatic cylinders ② and the flap support ③.

**Disassembling the flap unit/components**

There are two possibilities when carrying out repairs:

- Disassemble individual components
- Disassemble the entire flap unit
Replacing the cylinder

The cylinder can be replaced individually. The entire flap unit does not have to be replaced.

Prior to replacing the cylinder, determine the adjustment dimension X in order to adjust the new cylinder correctly.
Disassembling the cylinder

- Measure the adjustment dimension $X$ of the cylinder when retracted.
- Push the blue release ring towards the front at the connection and detach the hose at both pneumatic lines $\odot$.
- Unscrew the screw $\odot$ at the ball joint head.
- Loosen the adjusting rings $\odot$ on the cylinder shaft.
- Unscrew the nuts $\odot$ of the cylinder shaft.
- Remove the cylinder.

Assembling the cylinder

- Adjust the new cylinder using the previously determined adjustment dimension $X$ and assemble it in reverse order.
- Connect both pneumatic lines.

Replacing a flap

If a flap becomes damaged, it must be replaced to guarantee correct functioning.

- Disconnect the pneumatic lines from the cylinder, see "Disassembling the cylinder", page 28.
- Disassemble at least two crossbelt carriers, see "Disassembling crossbelt carriers", page 19.

**NOTICE**

**Damage to the sorter**

- Never operate the sorter with an open guide segment or a disassembled crossbelt carrier.

- Manually push the gap created by the disassembled crossbelt carriers above the location of the defective flap unit.

Flap shaft bolt connection

- Unscrew the flap shaft bolts $\odot$.
- From the top, turn the flap and extract it together with the shaft from the cut-out.
- Assemble a new flap in reverse order.
Replacing the complete flap unit

- Disconnect the pneumatic lines from the cylinder, see "Disassembling the cylinder", page 28.
- Disassemble at least three crossbelt carriers, see "Disassembling crossbelt carriers", page 19.

**NOTICE**

**Damage to the sorter**

- Never operate the sorter with an open guide segment.

- Manually push the gap created by the disassembled crossbelt carriers above the location of the defective flap unit.

**Fastening screws of the flap unit**

- Use an appropriate marker pen to mark the position of the defective flap unit on the aluminium profile. This facilitates correct installation of the new flap unit.
- From the side, unscrew the four fastening screws $1$ from the corners of the flap unit.
- Raise the exposed rubber block chain and turn the entire flap unit to the side in order to extract it from the top.

The cylinders are factory set, i.e. adjustment of the end of stroke damping is not required.

- Assemble a new flap unit in reverse order.
Replacing the motor

Removing the drive chain
- Loosen the four console bolts 1 and the counternuts 2 of the dowel pins.
- Slacken the chain via the motor tensioning screws.
- Open the chain joint and remove the drive chain 2.

Removing the sprocket
- Loosen the centring bolt 1 and the set screw.
- Remove the sprocket.

Removing the motor
- Unscrew the console bolts and the counternuts.
- Disconnect the motor from the power supply.
- Remove the motor.

Assembling the motor
- Assemble a new motor in reverse order.
- Assemble the drive chain in reverse order.
- Tension the chain via the motor tensioning screws (10 mm sag)

Replacing the drive chain
Replace the drive chain if it is worn or damaged.
- Remove the drive chain, see "Removing the drive chain", page 30.
- Install and tension a new drive chain (10 mm sag).
- Lubricate the drive chain with commercially available chain spray.
Replacing the rubber block chain

Required special tool:
- Tensioning device for rubber block chain, parts no. 11719

Loosening the connecting bolts of the rubber block chain

- Disassemble the sorter’s side panelling or bottom panelling in the area around the block chain which is to be replaced.
- If the panelling cannot be disassembled (e. g., because it is not accessible), disassemble all the crossbelt carriers of the block chain which is to be replaced, see "Disassembling crossbelt carriers", page 19.
- Detach the crossbelt carrier from the block chain ①. Disconnect the leaf springs from the rubber block chain by loosening the connecting bolts ②.
Removing a rubber block chain section

- Attach the tensioning device to the chain joint by screwing on the clamping jaws.
- Turn the threaded spindle (clockwise) to tension the chain until the connecting bolt 2 at the hinge connector 4 is released and rotates easily.
- Remove the split pin 1 and washers 3 and withdraw the connecting bolt.
- Release and remove the tensioning device.

The chain is now slack.

- Withdraw the connecting bolt from the second rubber block chain joint and remove the block chain section.

Tensioning device and chain joint
Assembling a rubber block chain section

- Assemble a new block chain section in reverse order.
  Do not overtighten the connecting bolts between the leaf spring and block chain. Ensure that the length of thread is approx. 9 mm (see figure).

The connecting bolts between the rubber block chain and crossbelt carriers are hexagon socket countersunk bolts M8x80, thread-to-head, 10.9.
Do not overtighten these connecting bolts! The rubber block chain must be able to move in the fixing bracket.

Re-tensioning the rubber block chain

**NOTICE**

- Damage to the rubber block chain and the sorter
  - The rubber block chain should only be re-tensioned by authorised Interroll Automation GmbH employees.

- Commission Interroll Automation GmbH maintenance personnel to carry out this task.
## Maintenance intervals

Refer to the manufacturer's documentation for information about lubricating intervals and maintenance tasks at the motor.

All sorter bearings have lifetime lubrication and are maintenance free within the operating parameters.

### Maintenance and inspection list

<table>
<thead>
<tr>
<th>Mach. no./Type:</th>
<th>Interval</th>
<th>Task/Inspection</th>
<th>Required work</th>
<th>Carried out by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire sorter</td>
<td>Weekly</td>
<td>General visual inspection</td>
<td>Remove loose parts and any jammed goods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monthly</td>
<td>Check emergency off equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light barrier</td>
<td>Monthly</td>
<td>Check for cleanliness</td>
<td>Clean, if necessary</td>
<td></td>
</tr>
<tr>
<td>Entire sorter</td>
<td>Quarterly</td>
<td>Check screwed connections</td>
<td>Retighten if necessary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the rubber block chain for wear</td>
<td>Replace, if necessary</td>
<td></td>
</tr>
<tr>
<td>Crossbelt</td>
<td>Quarterly</td>
<td>Check operating behaviour and voltage</td>
<td>Adjust, if necessary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for cleanliness</td>
<td>Clean, if necessary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for wear and damage</td>
<td>Replace, if necessary</td>
<td></td>
</tr>
<tr>
<td>Drive and deflection station</td>
<td>Quarterly</td>
<td>Listen for noise development</td>
<td>If necessary, apply talcum to the guiding disc in the area of the blue rollers of the crossbelt carriers</td>
<td></td>
</tr>
<tr>
<td>Cables/Electrical parts</td>
<td>Quarterly</td>
<td>Visual inspection, check for damages</td>
<td>Replace, if necessary</td>
<td></td>
</tr>
<tr>
<td>Crossbelt carrier</td>
<td>Half-yearly</td>
<td>Check drive wheels for soiling</td>
<td>Clean with spirit, if necessary</td>
<td></td>
</tr>
<tr>
<td>Flap system</td>
<td>Half-yearly</td>
<td>Check flap system functioning</td>
<td>Test run with discharge check</td>
<td></td>
</tr>
<tr>
<td>Pneumatic system</td>
<td>Half-yearly</td>
<td>Check hoses and screw connections for leaks</td>
<td>Replace, if necessary</td>
<td></td>
</tr>
<tr>
<td>Drive station</td>
<td>Half-yearly</td>
<td>Check the drive chain for wear</td>
<td>Replace, if necessary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the drive chain tension</td>
<td>Tension the drive chain</td>
<td></td>
</tr>
</tbody>
</table>
# Cleaning, maintenance and repairs

<table>
<thead>
<tr>
<th>Part</th>
<th>Interval</th>
<th>Task/Inspection</th>
<th>Required work</th>
<th>Carried out by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical bearing</td>
<td>Yearly</td>
<td>Visual inspection</td>
<td>Re-lubricate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geared motor</td>
<td>Yearly</td>
<td>Listen for noise</td>
<td>Maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>development</td>
<td>according to</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for oil loss</td>
<td>manufacturer's</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for true running</td>
<td>guidelines</td>
<td></td>
</tr>
</tbody>
</table>

**Mach. no./Type:**

**Date:**

**Part Interval Task/Inspection Required work Carried out by**
Troubleshooting

In case of malfunctioning

---

**DANGER**

Danger of death due to electric shock!
- Ensure that the conveyor has been de-energized before carrying out maintenance and repair work.
- Faults at electrical appliances should only be eliminated by qualified electricians!

The danger zones at the conveyor are covered by guards and protective equipment.

- Stop the device immediately and ensure that it cannot be started accidentally.
- Remove conveyed material and/or blocking objects.
- Always make sure that nobody can be injured before restarting the conveyor.
- Dispose of any leaked gear oil correctly. If necessary, a specialist must replace the motor.

---

### Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise development / squeaking / whistling.</td>
<td>Bearings defective</td>
<td>Replace</td>
</tr>
<tr>
<td>Sorter cannot be started and motor not running.</td>
<td>Main switch and/or control switched off</td>
<td>Check the switch position; if necessary, actuate the main switch and/or key-operated switch of the control</td>
</tr>
<tr>
<td></td>
<td>Supply line damaged</td>
<td>Check supply line</td>
</tr>
<tr>
<td></td>
<td>Fuse tripped</td>
<td>Check fuse and replace it, if necessary.</td>
</tr>
<tr>
<td></td>
<td>Safety light barrier has triggered the emergency off</td>
<td>Remove foreign particles and restart the sorter</td>
</tr>
<tr>
<td></td>
<td>Overflow destination full</td>
<td>Empty the overflow destination and restart the sorter</td>
</tr>
<tr>
<td></td>
<td>Safety light barrier soiled</td>
<td>Clean the safety light barrier and restart the sorter</td>
</tr>
<tr>
<td></td>
<td>Safety light barrier damaged</td>
<td>Replace the safety light barrier and restart the sorter</td>
</tr>
<tr>
<td></td>
<td>Motor defective</td>
<td>Replace the motor.</td>
</tr>
<tr>
<td></td>
<td>Other error source</td>
<td>See the control and software operating instructions</td>
</tr>
<tr>
<td>Jerky movement during sorter operation.</td>
<td>Foreign particles in the deflection or belt tracking area</td>
<td>Actuate emergency off immediately. Remove foreign particles. Check the sorter for damages and, if necessary, carry out repairs. Restart the sorter</td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective motor switch is triggered by excessive power input.</td>
<td>Gearing, drive/end roller shaft bearing defective</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>Short circuit</td>
<td>Check electrical connections</td>
</tr>
<tr>
<td></td>
<td>Excessive unit load weight</td>
<td>Observe max. weight.</td>
</tr>
<tr>
<td></td>
<td>Foreign particles in the deflection or belt tracking area</td>
<td>Remove foreign particles. Check the sorter for damages and, if necessary, carry out repairs</td>
</tr>
<tr>
<td>Crossbelt carrier does not discharge goods.</td>
<td>Flap system not active</td>
<td>Check pneumatic valve and replace it, if necessary</td>
</tr>
<tr>
<td></td>
<td>Pneumatic cylinder defective</td>
<td>Replace the pneumatic cylinder</td>
</tr>
<tr>
<td></td>
<td>Moisture in the pneumatic cylinder</td>
<td>Replace pneumatic cylinder, dry pneumatic lines, drain maintenance unit and check the compressor/dryer</td>
</tr>
<tr>
<td></td>
<td>Air pressure is too low</td>
<td>Increase air pressure to 6 bar</td>
</tr>
<tr>
<td></td>
<td>Drive wheel soiled</td>
<td>Clean drive wheel</td>
</tr>
<tr>
<td></td>
<td>Flap system has no contact with the drive wheel</td>
<td>Re-adjust the cylinder and check for loose connecting bolts</td>
</tr>
<tr>
<td></td>
<td>Crossbelt defective</td>
<td>Replacing the crossbelt</td>
</tr>
</tbody>
</table>

---

Version 3.0 (07/2010) en
Translation of the original instructions
Spare and wear parts

Spare parts drawing
## Interroll Crossbelt Sorter Vertical
### ST 6130 - 6159

**Spare and wear parts**

### Spare parts list

Nrec. = Recommended number, S = Spare part, W = Wear part, T = Tool

<table>
<thead>
<tr>
<th>Mach. no.:</th>
<th>Sorter 6...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type:</strong></td>
<td>6130 - 6159</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos. no.:</th>
<th>Name</th>
<th>Comment</th>
<th>Nrec.</th>
<th>S/W/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Geared motor</td>
<td></td>
<td>1</td>
<td>S</td>
</tr>
<tr>
<td>2</td>
<td>Pneumatic cylinder</td>
<td></td>
<td>2</td>
<td>S</td>
</tr>
<tr>
<td>3</td>
<td>Rubber block chain with connector</td>
<td></td>
<td>2</td>
<td>S</td>
</tr>
<tr>
<td>4 a</td>
<td>Flap unit long</td>
<td>Complete</td>
<td>2</td>
<td>S</td>
</tr>
<tr>
<td>4 b</td>
<td>Flap unit short</td>
<td>Complete</td>
<td>2</td>
<td>S</td>
</tr>
<tr>
<td>5</td>
<td>Crossbelt carrier</td>
<td>Complete</td>
<td>3</td>
<td>S</td>
</tr>
<tr>
<td>6</td>
<td>Conveyor belt</td>
<td></td>
<td>2</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>Valve manifold</td>
<td></td>
<td>1</td>
<td>S</td>
</tr>
<tr>
<td>8</td>
<td>Tensioning device for rubber block chain</td>
<td></td>
<td>1</td>
<td>T</td>
</tr>
<tr>
<td>9</td>
<td>Vertical bearing</td>
<td></td>
<td>2</td>
<td>S</td>
</tr>
</tbody>
</table>

**Order details**

Precise identification of the device is imperative when ordering spare and wear parts, see "Product identification", page 8.

The following information is required for an order:

- Machine number
- Part number
- Number

Please contact your supplier for further information about the spare parts on offer.
Shut-down and disposal

Shut-down and disposal

- Adhere to the manufacturer's disposal documents when disposing of the motor oil.
- To protect the environment, recycle the packaging.

Environmental regulations

When working on and at the conveyor, always observe legal rules and regulations as regards waste avoidance, correct disposal and material recycling.

**NOTICE**

Ensure that materials which are hazardous to waters, such as grease, lubricants, hydraulic oil, coolants or solvent-based cleaning fluids, do not pollute the ground or enter the sewage system during operation!

- Always keep, transport, collect and dispose of these materials in suitable containers.
- Observe information about suitable storage containers.
- Adhere to further national regulations.
Installation declaration

in accordance with the EC Machinery Directive 2006/42/EC, Appendix II 1 B

The manufacturer:

Interroll Automation GmbH
Dietmar-Hopp-Strasse 3, 74889 Sinsheim, Germany

hereby declares that the conveyor module described below:

• Interroll Crossbelt Sorter Vertical
• ST 6130 - 6159

is an incomplete machine according to the EC Machinery Directive and therefore does not fully comply with the requirements of this directive. Initial start-up of these conveyor modules is not permitted until conformity of the entire machine/system in which they are installed has been declared via the EC Machinery Directive!

Safety and health protection requirements according to Appendix I were applied. The special technical documents according to Appendix VII B were drawn up and will be passed on to the responsible authority if required.

Person responsible for EC documentation: Tobias Gilbert, Interroll Automation GmbH, Dietmar-Hopp-Strasse 3, 74889 Sinsheim, Germany

Applied EC directives:

Machinery Directive 2006/42/EC
Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC

Applied harmonized standards:

EN ISO 12100-1 "Safety of machinery - basic terms, general design principles - Part 1: fundamental terminology, methodology"
EN ISO 13857 "Safety of machinery - safety distances to prevent reaching danger zones with the upper and lower limbs"
EN 349 "Safety of machinery, minimum distances to avoid crushing of body parts"
EN 60204-1 "Safety of machinery - electrical equipping of machines - Part 1: general requirements"

Sinsheim, on

Dr.-Ing. Heinrich Droste
(Managing Director)