Instruction manual
Interroll Horizontal Cross-Belt Sorter
ST 6160 - 6189

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Translation of original instruction manual
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Introduction

Information about the manual
The Interroll Horizontal Cross-Belt Sorter is generally referred to as "module" in this document.

This manual contains important notes and information about the various operating phases of the module:
• Transport, assembly and startup
• Safe operation, required maintenance tasks, removal of any faults
• Spare parts, supplementary accessories

The operating instructions describe the module at the time of its initial delivery after manufacturing.

In addition to this manual, special contractual agreements and technical documents apply to special versions of the module and its additional equipment.

To ensure trouble-free and safe operation as well as the settlement of possible warranty claims, always read these operating instructions first and observe all the information contained herein.

Keep the manual close to the module.
Pass the manual on to any subsequent operator or occupant.
Interroll does not accept any liability for faults or defects due to non-observance of this manual.

If you have any questions after reading the operating instructions, please contact the Interroll customer service. Contact persons close to you can be found on the Internet under: interroll.com/contacts.

Warning notices in this manual
The warning notices refer to risks which may arise while usage the module. They are available in four danger levels identified by the signal word:

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Meaning</th>
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<tr>
<td>DANGER</td>
<td>Identifies a danger with high risk that can lead to death or serious injury if it is not avoided.</td>
</tr>
<tr>
<td>WARNING</td>
<td>Identifies a danger with medium risk that can lead to death or serious injury if it is not avoided.</td>
</tr>
<tr>
<td>CAUTION!</td>
<td>Identifies a danger with low risk that can lead to minor or medium injury if it is not avoided.</td>
</tr>
<tr>
<td>NOTICE</td>
<td>Identifies a danger that can lead to property damages.</td>
</tr>
</tbody>
</table>
Symbols

This symbol marks useful and important information.

Requirement:
- This symbol represents a prerequisite to be met prior to assembly and maintenance work.
- This symbol marks the steps to be carried out.
Safety

State of the art
The module has been built to comply with the state of the art. Nevertheless, users may encounter hazards during its use.

Disregarding the notices in this manual may lead to serious injury.
- Carefully read the manual and follow its content.

Intended use
The module may only be used for industrial applications and in an industrial environment to convey sortable goods such as small packages, cartons or boxes.

Field of use
The module is dimensioned only for a certain field of use and may not be operated outside of these specific limits. For additional information, see the chapter "Technical Data".

Any other use is considered inappropriate. Deviating operating conditions require additional clarifications, a special release of the module and new contractual agreements.

Changes to the module
Any modifications that affect the safety are not permitted.

Personnel qualification
Unqualified personnel cannot recognize risks and, as a result, is subject to greater dangers.
- Authorize only qualified personnel with the activities described in these operating instructions.
- The operating company must ensure that the personnel follows locally applicable regulations and rules during their work with regard to safety and dangers.

The following target groups are addressed in these operating instructions:

Operators
Operators have been instructed in the operation and cleaning of the module and follow the safety guidelines.

Service personnel
The service personnel features a technical training and performs the maintenance and repair tasks.

Electricians
Persons working on electrical equipment must have undergone technical training and training provided by the manufacturer.
Safety

Dangers

The following list informs you about the various types of danger or damage that may occur while working with the module.

During operation
- Do not reach into the conveyor.

Safety devices
- Perform any maintenance and repair work on the module only in de-energized state and ensure that it cannot be started accidentally.
- In the passage area of persons or if persons can reach between transported goods, additional protective measures may apply.
- Do not remove protective covers or housing.
- Regularly check the safety devices.

Electricity
- Reach into the module only if the module is de-energized.

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

Falling parts/work environment
- Remove equipment or material which is not required from the workspace.
- Wear safety shoes.
- Specify and monitor careful placement of the goods on the conveyor.
- During diverting processes, do not reach into the destination areas.

Faults during operation
- Regularly check the module for visible damage.
- Stop the module at once and ensure that it cannot be started accidentally in case of: Fire vapors, unusual noise, blocked or defective conveyor belt, defective supports, side guides or accessory devices, unauthorized removal of safety covers and a defective suspension.
- Immediately determine the cause of the fault by technical personnel.
- Immediately remove any escaping gear oil.
- Do not step on the module during operation.

Maintenance intervals
- Regularly perform maintenance and inspection work.
- Use only OEM spare parts.

Interfaces to other devices
New hazardous positions may occur while integrating the module into a complete system. These positions are not part of this manual and have to be analyzed during the assembly and startup of the complete system.
- When combining the module with other modules or machinery, check for new hazards before startup. In particular, observe the infeed point at the deflection shaft.
- Additional constructive measures may be required.
Operating modes

**Normal mode**
The module is installed at the customer in a complete system and operated as part of the system.

**Special mode**
Special operation refers to all operating modes which are required to guarantee and maintain regular operation.

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<td>Eliminating the fault</td>
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<td>Removing from the complete system and disassembly</td>
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</tr>
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Product identification

Components

Device design
1 Sorting task 4 Straight
2 Destination 5 Cross-belt carriage
3 Drive station 6 Curve

Property
The horizontal sorter sorts goods with a weight of up to 35 kg, e.g. containers, packages, large letters, bags, cartons.

Depending on the design of the cross-belt carriage, a maximum throughput of 15,000 pieces of goods per hour can be achieved.

Elements and function of sorter
Important elements and their operating principle are presented below, including:
• Cross-belt carriage
• Flap unit
• Rubber block chain
• Drive station and motor
• Destinations and special destinations
• Compressed-air maintenance unit
The most important components of the cross-belt carriages are small conveyor belts (5). These conveyor belts are mounted on a carriage frame. The carriages are equipped with a mechanical drive unit.

Every carriage features a bevel gear (1) with two right-angled bevel wheels. A pneumatically driven swivel flap (4) is used to power a drive roller (2) which is rigidly connected with the driving bevel gear. The driven bevel gear transfers the motion to a second drive roller, which is located below the cross belt and causes the ejection movement via the friction.

The carriages as drive element are pulled by a rubber block chain (3). They run on plastic-coated rollers to minimize any running noise.
The main components of the flap unit are the two steel swivel flaps (1), two pneumatic cylinders (2) and the flap frame (3). The cylinders are pneumatically controlled via valve terminals which, in turn, receive their signals via a bus line. Two flap units each are synchronized with each other and each operate one destination on the left and the corresponding one opposite on the right.
Flap control of cross-belt carriages

To drive a cross belt, flaps are pneumatically controlled which take the driving energy from the sorter drive via a drive roller and deflection gear unit.

Compressed air, which is centrally fed to the sorter, is required for the pneumatic control of the flaps. The pressure is monitored by an encoder. This compressed-air monitoring signals fault with a potential-free contact (NC contact) if the minimum operating pressure is underrun.

Rubber block chain

The 50 mm wide rubber block chain features a gearing for precise position determination of the cross-belt carriages as well as five vulcanized steel cables to minimize expansion. Any number of segments of the rubber block chain are connected with each other via hinges to achieve any required overall length of the sorter. The cross-belt carriages are fastened to the rubber block chain.

Drive motor

The drive motor is a bevel gear motor that is controlled via a frequency inverter. The controlled motor drive of the sorter has a fixed speed and an integrated pulse encoder.
Destinations and special destinations

The goods are discharged at the destinations determined by the barcode by the cross-belt carriages. From the cross-belt carriage of the sorter, the goods slide to the destinations via a sliding plate. The sliding plates are designed so that the goods reach the destinations as smoothly as possible. The design of the destinations depends on the transported goods.

Every transported good that cannot be assigned to the actual intended destination is discharged at two special destinations:

- "No Read" destination for all goods whose barcode could not be read.
- "Overflow" destination for all goods whose destination is occupied/block. The diversion to the "Overflow" destination is done only after the sorter as cycled a few times.

Maintenance unit for compressed-air

The maintenance unit ensures the preparation of the compressed air. It controls and monitors the required air pressure to enable a safe function of the sorter. For maintenance tasks, the sorter can be depressurized at the maintenance unit.

Maintenance unit

1 Pressure gauge

The air pressure can be read at the pressure gauge (1).

Required operating pressure

The on-site compressed-air supply must measure between 7 and 12 bar. The required quantity is calculated on a project-specific basis. The operating pressure must be set to 6 bar (see also manufacturer’s documentation).

If the air pressure drops below 5.2 bar, it signals a fault and the sorter is automatically stopped. The sorter can only be switched on again after an air pressure of at least 5.8 bar has been reached.
### Technical data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
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<tr>
<td>Horizontal crossbelt sorter</td>
<td></td>
</tr>
<tr>
<td>Performance/speed</td>
<td>Project-dependent</td>
</tr>
<tr>
<td>Carrier split</td>
<td>Project-dependent</td>
</tr>
<tr>
<td>Carrier length</td>
<td>Project-dependent</td>
</tr>
<tr>
<td>Carriage width</td>
<td>Project-dependent</td>
</tr>
<tr>
<td>Destination split</td>
<td>Project-dependent</td>
</tr>
<tr>
<td>Drive</td>
<td>Bevel gear motor with frequency inverter, fixed speed</td>
</tr>
<tr>
<td>Motor output</td>
<td>2.2 kW per drive module</td>
</tr>
<tr>
<td>Dimensions of goods</td>
<td>Project-dependent</td>
</tr>
<tr>
<td>Weight of conveyor</td>
<td>See nameplate</td>
</tr>
<tr>
<td>Overall height</td>
<td>Min. 660 mm</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>+5 °C to +40 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>Max. 90 %, non-condensing</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Not suitable for use in areas with aggressive media, such as acids and bases. Exceptions only upon consultation.</td>
</tr>
<tr>
<td>Noise level</td>
<td>Leq &lt; 72 dB(A)</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>6 bar</td>
</tr>
</tbody>
</table>
The information on the nameplate is used to identify the conveyor. The type designation is required to use the conveyor according to its intended use.

The nameplate is located close to the motor.
Transport and storage

Transport

⚠️ WARNING

Risk of injury during transport

- Fix the module securely and slip-proof for the transport.
- Ensure that the lifting device (crane, fork lift, etc.) is rated for the weight of the module.
- Ensure that no persons are located under the suspended load while lifting and moving the module.

Additional information about the transport are located on an information sheet that accompanies the motor.

- Data about weight and requirements for loading capacity and lifting tackle are located on the information sheet.
- Remove any persons from the danger zone.
- Wear safety shoes.
- Check the correct fastening for the transport.

The load lifting points are marked on the conveyor.

Identification of load lifting points

After the delivery

- Inspect module for transport damages.
- Immediately notify the carrier and manufacturer in case of damages to avoid losing any claims for compensation.
Storage

⚠️ WARNING

Risk of injury due to improper storage

- Do not stack modules. Do not place any other objects on the module.
- Check module for stability.

- If the module is not immediately placed in operation, store it at a location protected against humidity and dust.
Assembly and installation

Installation
The module is delivered to the location site as a pre-assembled unit and must be set up, connected and integrated into a system on site.

⚠️ WARNING
Risk of injury due to improper assembly
- Mechanical assembly tasks should be performed only by service personnel. Observe the safety information.
- Electrical assembly tasks should be performed only by authorized electricians. Observe the safety information.
- Carefully install all terminals and connections, such as cables, hoses and pipework, and check for correct fit.

When tightening screws and nuts, always observe the standard tightening torque, unless specifically indicated otherwise. Standard thread lockers should be replaced as needed.

Installing the module
- Align the sorter. Use a spirit level and leveling device for this purpose.
- Anchor or fasten the sorter torsion-free, e.g. to the floor or adjacent components.
- During the alignment, ensure that no moving parts are touching.
- After setting up the sorter, check the passageways for the personnel. Install transitions as necessary.
- When integrating the sorter into the complete system, consider possible danger spots, particularly infeed locations and interfaces.
Electrical installation

⚠️ DANGER

Danger - energized cable ends!
- Electrical installation should only be performed by qualified electricians.
- Ensure a de-energized state.
- Minimum bending radiiuses of cables, hoses and lines must be maintained.

The voltage supply of the module is provided either via CEE plug or a direct installation in the control cabinet.
- Check cables and components for damages before the installation.
- The connection values of the module are located on the motor nameplate.
- Connect the motor according to the standard IEC 60204-1. Information about wiring is located in the motor terminal box.
Initial startup and operation

Initial startup

⚠️ WARNING

Risk of injuries due to incorrect handling

- Check electrical connections and protective devices.
- Remove goods from the sorter.
- Remove unauthorized persons from the danger zone.
- Wear safety shoes and work clothing.

The sorter components (modules, drives, flaps, carriages) have been checked at the factory. The sorter will have been broken in within 20 to 30 operating hours. In general, no further adjustment is required afterwards.

Nevertheless, the following control measure is required:

- Before the initial startup, check the running direction of the sorter. The carriages may never move backwards, otherwise the chassis will be damaged. The sorter is started via the control console of the system in which it is integrated.

Operation

- Check the sorter for visible damage. Pay particular attention to conveyor belt, cross-belt carriage and protective devices.
- Ensure that all safety devices operate flawlessly.
- Ensure that only authorized personnel is in the operating area of the conveyor.
- Remove equipment or material which is not required from the operating area.
- Guide and monitor correct placement of the goods on the conveyor.

⚠️ WARNING

Danger from rotating parts

Crushing and serious injuries from parts of the body and clothing being pulled into the module!

- Do not remove the protective covers.
- Wear close-fitting clothing, avoid jewelry and bands/ribbons.
- If you have long hair, always wear a hair net.

- If goods are jammed between side guides, switch off the module and ensure that it cannot be started accidentally, then remove the fault.
Procedure in case of accident or fault

- Stop the module and ensure that it cannot be started accidentally.
- In case of an accident: Render first aid and make an emergency call if necessary.
- Notify the technical personnel.
- Have the fault removed by qualified personnel.
- Start the conveyor only after this has been approved by qualified personnel.
Cleaning

⚠️ WARNING

Risk of injuries due to incorrect handling
- Only perform cleaning work on the module after you have switched off the power. Switch off the voltage supply and ensure that it cannot be started accidentally.
- Do not remove protective devices.
- Wear safety shoes and close-fitting work clothing.
- Clean belts only dry.
- For the remaining parts of the module, use only suitable cleaning agents (water-soluble, free of phosphate, silicone and potassium, non-acidic). Observe the manufacturer’s instructions.
Maintenance and repair

Observe the following for maintenance and repair

⚠️ DANGER

Danger - electrical voltage!

- Switch off the power supply system, ensure that it cannot be switched on accidentally and that it is de-energized.

- Always have work on electrical equipment carried out by authorized electricians.
- Set up warning signs that indicate maintenance and repair work.
- Block off the area around the module.
- Inform persons who have to enter the blocked-off area about the risks.

Observe for all work on the sorter

⚠️ WARNING

Risk of injury from running sorter

- All the work on the sorter may be performed only with the sorter switched off.
- Switch off the sorter and ensure that it cannot be started accidentally.

NOTICE

Property damages from startup without carriage adapter

If a cross-belt carriage is removed, the adjacent cross-belt carriage tips downward.

- Install a carriage adapter on the adjacent cross-belt carriage.
Installing the carriage adapter for maintenance work
If a cross-belt carriage is removed, the preceding carriage tips downward on the loose side. To allow the carriages to cycle for maintenance work, a carriage adapter has to be installed as support roller.

Cross-belt carriage with carriage adapter
1 Carriage adapter 2 Connecting bolt
**WARNING**

Risk of crushing

De-energize the complete module and ensure that it cannot be started accidentally.

---

**NOTICE**

Damage to the sorter

- The carriage adapter is intended exclusively for maintenance purposes and may be used only in maintenance mode!
  - If the cross-belt carriage is removed, the sorter may not be placed into operation without carriage adapter.

Requirement:

- The conveyor system is out of operation.
- Screw in the connecting bolt (2) at the carriage.
- To place the sorter into operation again, remove the carriage adapter (1) and re-install any removed carriages.
Removing and installing the intermediate cover

The spacer plate is located between the individual carriages and covers the gap to the next carriage.

WARNING

Risk of crushing

De-energize the complete module and ensure that it cannot be started accidentally.

Requirement:
- The conveyor system is out of operation.
- Unscrew the screws (1) at the top side.
- Remove the intermediate cover.
- Install the intermediate cover in reverse order.
Checking the roller diameter

⚠️ WARNING

Risk of crushing
De-energize the complete module and ensure that it cannot be started accidentally.

The minimum roller diameter is 68 mm for the upper drive wheel and 45 mm for the lateral guide wheel.

Requirement:
- The conveyor system is out of operation.
- Remove the intermediate cover behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Check the diameter of the upper drive wheels and lateral guide wheels with a vernier caliper.
- Replace upper drive wheels and lateral guide wheels as necessary, See "Replacing the drive wheels", page 38.
- Re-install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Removing and installing the cross-belt carriage

⚠️ WARNING
Risk of crushing
De-energize the complete module and ensure that it cannot be started accidentally.

⚠️ CAUTION
Risk of injury when lifting heavy loads
- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

After every removal and change of the cross-belt carriage, use new M6 self-locking nuts for the connection (3) with the rubber block chain.

Requirement:
- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.

Loosen the bracket (3) between cross-belt carriage and rubber block chain.
- Remove the connecting bolt (1) between the cross-belt carriages.
- Turn and lift cross-belt carriage out of the guide.
Installing the cross-belt carriage

- Insert cross-belt carriage into the guide.
- Screw in connecting bolts and secure them medium tight with a thread locker (e.g. Loctite 243).
- Loosen the bracket between cross-belt carriage and rubber block chain.

Completing the installation

- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Replacing belt frame with cross belt

⚠️ WARNING
Risk of crushing
De-energize the complete module and ensure that it cannot be started accidentally.

⚠️ CAUTION
Risk of injury when lifting heavy loads
- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

Preparation
Requirement:
- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.

Removing the belt frame

Belt frame on cross-belt carriage
1 Connecting screws 2 Clamping nut

- Remove clamping nut (2) and spring.
- Loosen connecting screws (1) between belt frame and cross-belt carriage.
- Remove belt frame with the cross belt.
Installing the belt frame

- Install the belt frame on the cross-belt carriage in reverse order.
- Turn the clamping nut until the spring shows a setting value of 20 mm between carriage frame and washer.

Completing the installation

- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Replacing the cross belt

A cross belt can be replaced individually. The replacement of the complete assembly, belt bed with belt, is preferable since it takes significantly less time and is easier to do.

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

⚠️ WARNING

Risk of crushing

De-energize the complete module and ensure that it cannot be started accidentally.

⚠️ CAUTION

Risk of injury when lifting heavy loads

- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

Preparation

Requirement:
- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Remove the belt frame with cross belt, See "Replacing belt frame with cross belt", page 33.

Removing the cross belt

1. Loosen deflection shaft by loosening the screws (1) on both sides.
2. Release the deflection shaft by loosening the locknuts (2) of the eye bolt on both sides.
3. Unscrew the eye bolt on both sides for adjusting the pressure roller.
4. Remove the pressure roller.
Pull the loosened cross belt completely off across the complete belt bed.

Installing the cross belt

- Install the new cross belt in reverse order. Replace the self-locking screws and nuts in the process.
The cross belt has the correct tension if it can be raised approx. 20 mm and does not form any folds.

- Tension the deflection shaft via the clamping screws. Ensure that the protruding ends of both clamping screws are equally long to achieve an even cross-belt tension.
- Check the cross-belt tension and correct if necessary.
- Tighten locknuts (2) and screws (1) at the deflection shaft.

Completing the installation

- Install the belt frame with cross belt, See "Replacing belt frame with cross belt", page 33.
- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Replacing the drive wheels

⚠️ WARNING
Risk of crushing
De-energize the complete module and ensure that it cannot be started accidentally.

⚠️ CAUTION
Risk of injury when lifting heavy loads
- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

Preparation
Requirement:
- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Completely remove the respective cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
Replacing the upper drive wheels

Upper drive wheels on the cross-belt carriage
1. M12 self-locking nut
2. Upper drive wheels
3. Width across flats of bolt
4. Washer

- Unscrew the M12 self-locking nut (1). Apply counter-pressure at the width across flats of the bolt (3) with a 27 width A/F wrench.
- Remove the washer (4).
- Replace the upper drive wheel (2). If necessary, use a puller.
- Place the washer (4).
- Always use new M12 self-locking nuts for fastening and tighten them. Apply counter-pressure at the width across flats of the bolt (3) with a 27 width A/F wrench.
- Check wheel for ease of movement.
Replacing drive wheels for the side guide

Drive wheels for the side guide on the cross-belt carriage

- 1 Self-locking nut
- 2 Washer
- 3 Drive wheels for side guide
- 4 Width across flats of bolt

- Unscrew the M8 self-locking nut (1). Apply counter-pressure at the width across flats of the bolt (4) with a 19 width A/F wrench.
- Remove the washer (2).
- Replace the drive wheels for the side guide (3). If necessary, use a puller.
- Place the washer (2).
- Always use new M8 self-locking nuts for fastening and tighten them. Apply counter-pressure at the width across flats of the bolt (4) with a 19 width A/F wrench.
- Check wheels for ease of movement.

Completing the installation

- Install the cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Replacing the drive roller

Drive roller (friction roller) under the cross-belt carriage

1. Drive roller
2. Parallel key
3. Washer
4. Screw
**WARNING**

Risk of crushing

De-energize the complete module and ensure that it cannot be started accidentally.

**CAUTION**

Risk of injury when lifting heavy loads

- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

**Requirement:**

- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Completely remove the respective cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
- Unscrew screw (4) and remove screw with washer (3). Apply counter-pressure to the drive roller (1) during the process.
- Disassemble the drive roller (1) using a puller tool (item no. 63100327).
- Align the new drive roller at the parallel key (2) and push it on.
- Place washer (3) on screw (4).
- Apply medium-tight thread locker (e.g. Loctite 243) onto the thread of the screw.
- Tighten the screw until the washer is seated on the block.
- Install the cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Replacing double joints

Double joints under the cross-belt carriage

1. Long double joint
2. Countersunk screws
3. Short double joint
4. Bolt
5. Self-locking nut
6. Bracket
7. Rubber block chain
WARNING

Risk of crushing

De-energize the complete module and ensure that it cannot be started accidentally.

CAUTION

Risk of injury when lifting heavy loads

- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

Preparation

The bracket can either be loosened together with the cross-belt carriage from the rubber block chain, or the cross-belt carriage is removed for installation only from the bracket.

Requirement:

- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Remove the respective cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31 or See "Loosening connection to the rubber block chain", page 45.
If the complete cross-belt carriage is being removed, new M6 self-locking nuts have to be used during installation to fasten the bracket to the rubber block chain.

If the countersunk screws are accidentally loosened, screw them in again using medium-tight thread locker (Loctite 243).

Observe the order of the spacer sleeves!

a) Order of long double joint:
   Bolt head, 10 mm spacer sleeve, long double joint, 10 mm spacer sleeve, M8 self-locking nut.

b) Order of short double joints:
   Bolt head, short double joint, 10 mm spacer sleeve, short double joint, M8 self-locking nut.

- Loosen M8 self-locking nuts (6) on both bolts (3). Apply counter-pressure to the 13 width A/F of the bolts using a wrench.
- Pull the two short double joints (4) and the spacer sleeve (5) off of one of the bolts.
- Pull the spacer sleeve (5) and the long double joint (7) off of the other bolt.
Double joints under the cross-belt carriage

1. Countersunk screws
2. Bracket joints of cross-belt carriage
3. 5 mm spacer sleeve
4. Short double joints
5. 10 mm spacer sleeves
6. Top bolt
7. Long double joint
8. 15 mm spacer sleeve

Loosening connection to the cross-belt carriage
Observe the order of the spacer sleeves!

- **a) Order of long double joint:**
  Bolt head, 10 mm spacer sleeve (5), long double joint (7), 15 mm spacer sleeve (8).

- **b) Order of short double joints:**
  Bolt head, short double joint (4), 10 mm spacer sleeve (5), short double joint, 5 mm spacer sleeve (3).

- Remove all four countersunk screws (1). Apply counter-pressure at the 13 width A/F of the bolt (6) with a wrench.
- Remove the entire coupling unit from the bracket joint of the cross-belt carriage (2).
- Pull the long double joint (7) and the two short double joints (4) off of the bolts (6).
Installing double joints and checking correct installation

Connect double joints with cross-belt carriage

Install double joints between belt carriage and rubber block chain

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Countersunk screws</td>
<td>4</td>
<td>Rubber block chain block side</td>
</tr>
<tr>
<td>2</td>
<td>Vertical carriage plate</td>
<td>5</td>
<td>Vertical bracket joint of bracket</td>
</tr>
<tr>
<td>3</td>
<td>Long double joint</td>
<td>6</td>
<td>Short double joints</td>
</tr>
</tbody>
</table>

Observe the order of the spacer sleeves when installing the double joints!

a) Order of long double joint:
   Bolt head, 10 mm spacer sleeve (5), long double joint (7), 15 mm spacer sleeve (8).

b) Order of short double joints:
   Bolt head, short double joint (4), 10 mm spacer sleeve (5), short double joint, 5 mm spacer sleeve (3).

- Place the spacer sleeves and double joints onto the bolts in the order listed above (see info box).
- Position bolt between countersunk holes of the vertical carriage plates (2).
- Ensure that the long double joint (3) points against the transport direction.
- Apply medium-tight thread locker (Loctite 243) to the threads of the four countersunk screws (1).
- Screw the four countersunk screws (1) through the countersunk holes of the vertical carriage plates (2) into the bolts.
Connecting double joints with cross-belt carriage

Observe the order of the spacer sleeves when installing the double joints!

a) Order of long double joint:
   Bolt head, 10 mm spacer sleeve, long double joint, 10 mm spacer sleeve, M8 self-locking nut.

b) Order of short double joints:
   Bolt head, short double joint, 10 mm spacer sleeve, short double joint, M8 self-locking nut.

Requirement:
- Bracket (5) is still installed on the rubber block chain. Otherwise, install the bracket on the rubber block chain and use new M6 self-locking nuts.
- Apply medium-tight thread locker (Loctite 243) to the threads of the two countersunk screws (1).
- Position the two bolts in front of the holes in the vertical bracket joint of the bracket (5).
- Screw the countersunk screws through the brackets into the bolts from the outside (block side).
- Place the spacer sleeves and double joints onto the bolts in the order listed above (see info box).
- Screw new M8 self-locking nuts onto the free threads of the bolts and tighten them.

Checking the installation

- Check whether the vertical bracket joint of the bracket (5) is located on the block side of the rubber block chain (4).
- Check whether the long double joint (3) points against the transport direction.
- Check whether all spacer sleeves are have been used and inserted in the correct order (see info box).
- Check whether the vertical bracket joint of the bracket (5) is aligned with the vertical plate of the cross-belt carriage (2).

Completing the installation

- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Replacing rubber wheels in the cam

Rubber wheels in the cam
1 Rubber wheel
2 Snap ring
3 Baseplate
**WARNING**

Risk of crushing

De-energize the complete module and ensure that it cannot be started accidentally.

Never disassemble the baseplate (3)!

Requirement:
- The conveyor system is out of operation.
- Remove the side cover of the sorter in the area of the sorter of the rollers to be replaced.
- Slacken the rubber block chain, See "Replacing the rubber block chain", page 71.
- Remove snap ring (2) on the shaft of the rubber wheel (1).
- Remove the old rubber wheel (1) from the shaft using a puller.
- Place a new rubber wheel onto the shaft and use a tool to press it on until the limit stop.
- Install the snap ring onto the shaft.
- Tension rubber block chain in reverse order of slackening, See "Replacing the rubber block chain", page 71.
- Install the side cover.
Maintenance work on the flap unit

Flap unit - side view
1. Steel swivel flaps
2. Pneumatic cylinder
3. Flap frame

Flap unit - view from the top
1. Steel swivel flaps
2. Pneumatic cylinder
3. Flap frame
The main components of the flap unit are two steel swivel flaps (1), two pneumatic cylinders (2) and the flap frame (3).

The cylinders are pneumatically controlled via valve terminals which, in turn, receive their signals via a bus line. Two flap units each are synchronized with each other and operate two opposing destinations.

There are two options for the repair:

- Replace flap with cylinder,
  See "Replacing flap with cylinder", page 54
- Completely replace the flap unit,
  See "Completely replacing the flap unit", page 58
Replacing flap with cylinder
If a flap is damaged, it has to be replaced.
The flap shaft can be removed from the top.

⚠️ WARNING
Risk of crushing
De-energize the complete module and ensure that it cannot be started accidentally.

⚠️ CAUTION
Risk of injury when lifting heavy loads
- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

![Diagram of flap unit](image)

Components of the flap unit, view from the top
1. Steel swivel flap
2. Pivot head
3. Piston rod
4. Cylinder
5. Self-locking nut
6. Cylinder adapter
7. Rubber buffer
8. Nut, cylinder fastener
Requirement:
- The conveyor system is out of operation.
- Release compressed air from the lines via the pressure switch at the maintenance unit.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Remove at least two cross-belt carriages above the defective flap, See "Removing the cross-belt carriage", page 31.
Removing flap with cylinder

- Push the blue ring back at the screw connection input of the pneumatic lines and pull the lines off of the cylinder.
- Loosen nut (8) at the rubber buffer (7) and remove it.
- Loosen the locknuts (5) of the shaft.
- Remove the flap with connected cylinder (2) to the top.
- If the cylinder is being replaced, secure the cylinder adapter with Loctite 243 (medium-tight) when fastening it.

Steel swivel flap with cylinder

1 Steel swivel flap
2 Pivot head
3 Piston rod
4 Cylinder
5 Self-locking nut
6 Cylinder adapter
7 Rubber buffer
Installing and adjusting the flap

- Install the new flap in reverse order.
- Move flap to "closed" position.
- Adjust the flap between pivot head (2) and piston rod (3) to 70 mm, then secure it with the locknut.

Adjusting the cylinder limit stop dampening

- The limit stop dampening reduces the sound emission, but increases the switching time. For this reason, do not set the dampening too high!

- To obtain better access to the limit stop dampening, loosen the nut (8) and slightly turn the cylinder.
- On the piston rod side, completely open the limit stop dampening with a small screwdriver, but do not overtighten, and then close it by one turn.
- On the foot side, completely open the limit stop dampening, but do not overtighten, and then close it by 1.5 turns.

Completing the installation

- Install the cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
- Pressurize the lines.
Completely replacing the flap unit

Flap unit fastening screws, view from the top

1 Fastening screws  
2 Flap frame
**WARNING**

Risk of crushing
De-energize the complete module and ensure that it cannot be started accidentally.

**CAUTION**

Risk of injury when lifting heavy loads
- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

The cylinders have been factory-set, that is, the limit stop dampening does not have to be performed.

**Requirement:**
- The conveyor system is out of operation.
- Release compressed air from the lines via the pressure switch at the maintenance unit.
- Push the blue ring back at the screw connection input of the pneumatic lines and pull the lines off of the cylinder.
- Remove the intermediate cover in front of and behind the respective cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Remove two cross-belt carriages above the defective flap unit, See "Removing and installing the cross-belt carriage", page 31.
- Mark the position of the defective flap unit on the aluminum profile with a suitable marker to ensure the precise installation position.
- From the side, loosen the four fastening screws (1) of the flap frame (2) and remove the entire unit.
- Install the new flap unit in reverse order.
- Install the cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
- Push the blue ring back at the screw connection input of the pneumatic lines and connect the lines of the cylinder.
- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
- Pressurize the lines.
Replacing the motor

Required tools:
- Maintenance frame, C-shaped, with two clamping screws

⚠️ DANGER

Danger - electrical voltage!
- Switch off the power supply system, ensure that it cannot be switched on accidentally and that it is de-energized.

⚠️ CAUTION

Risk of injury when lifting heavy loads
- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

Preparation

Requirement:
- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Completely remove two cross-belt carriages at the level of the drive console, See "Removing and installing the cross-belt carriage", page 31.
Removing the motor plate

- Remove the aluminum profile (2).
- Unscrew the screws (3) of the motor plate (5) cover (1) and remove the cover (1).
- Unscrew the fastening screws (4) of the motor plate (5).
- Push the maintenance frame (6) into the C-profiles of the drive module.
- Secure the maintenance frame (6) against falling out using two clamping screws (7).
- Pull motor plate (5) out onto the maintenance frame (6).
Removing the drive chain

- Slightly loosen the screws (1) of the sprocket mount.
- Loosen locknuts (2) of chain tensioner.
- Slacken chain with tensioning screws (3).
- Move sprocket until the drive chain is slackened.
- Remove chain locks (4) and remove the drive chain.
Removing sprocket, drive shaft and motor

Unscrew screw (1) at sprocket (3) and remove washer (2).
Pull sprocket off of the drive shaft (4).
Open end cover (8) at the rear side of the motor (6).
The fastening screw (9) securing the drive shaft is accessible.
Unscrew the fastening screw.
Pull drive shaft out of the motor.
Unscrew the four hex nuts (7) that hold the motor onto the rear side of the baseplate (5).
Remove the motor.

Installing sprocket, drive shaft and motor

Install the motor in reverse order of the removal.
Insert the drive chain in reverse order of the disassembly.
Tension drive chain, check clearance of drive chain and correct chain tension as necessary,
See "Inserting and tensioning the drive chain", page 65.
Install the motor plate in reverse order of the removal.

Completing the installation

Install the cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Lubricating the drive chain

Only the chain links of the drive chain may be lubricated.

Template for chain lubrication

⚠️ DANGER

Danger - electrical voltage!

- Switch off the power supply system, ensure that it cannot be switched on accidentally and that it is de-energized.

⚠️ WARNING

Danger from rotating parts

Crushing and serious injuries from parts of the body and clothing being pulled into the module!

- Do not remove the protective covers.
- Wear close-fitting clothing, avoid jewelry and bands/ribbons.
- If you have long hair, always wear a hair net.

NOTICE

Property damages from incorrect lubrication

Malfunction in the drive!

- Avoid lubricating the drive wheels of the cross-belt carriage and the white plastic sleeves of the drive chain.

Lubricant recommendation: Klüberoil CM 1-220, Klüber, part number: 081294

The lubricant is also anti-corrosion, release and lubricant wax. The spray contains a replacement spray head and an extension tube for large area or spot application.
Requirement:
- The conveyor system is out of operation.
- Remove the aluminum profile and cover of the motor plate.
- Remove large dirt particles from the chain.
- Cover the chain with a template made of cardboard.
- Run the sorter at maintenance speed.
- Spray the chain through the cutouts in the template (maximum two rotations).
- Let the sorter run for an additional one to two minutes, then stop it and dab off excess grease.

Inserting and tensioning the drive chain
If the drive chain shows wear or damage or the maximum tension measure of $X = 20$ mm has been reached, then the drive chain must be replaced.

![Play of drive chain](image1)

Play of drive chain

![Tension measure X](image2)

Tension measure $X$: Basic setting 16 mm, maximum tension measure 20 mm
DANGEROUS DANGER

Danger - electrical voltage!

- Switch off the power supply system, ensure that it cannot be switched on accidentally and that it is de-energized.

Requirement:
- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Completely remove two cross-belt carriages at the level of the drive console, See "Removing and installing the cross-belt carriage", page 31.
- Remove the motor plate, See "Removing the motor plate", page 61
- Slacken the drive chain and remove it, See "Removing the drive chain", page 62.
- Affix the new drive chain while installing the chain lock pointing up.
- Check clearance of drive chain and correct chain tension as necessary. The basic setting of the tension measure is $X = 16$ mm.
- Tighten the locknut of the chain tension device and the chain mount.
- Install the motor plate in reverse order of the removal, See "Removing the motor plate", page 61
- Install the cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.

Replacing the sprocket

The sprocket and the drive chain must be replaced if the tooth width $X$ of the sprocket measures less than 8 mm.
Replacing the V-belt

⚠️ DANGER

Danger - electrical voltage!
- Switch off the power supply system, ensure that it cannot be switched on accidentally and that it is de-energized.

⚠️ WARNING

Risk of crushing
De-energize the complete module and ensure that it cannot be started accidentally.

⚠️ CAUTION

Risk of injury when lifting heavy loads
- During the maintenance and repair of conveyor modules or heavy spare parts, work in pairs or use a suitable carriage.

Preparation

Requirement:
- The conveyor system is out of operation.
- Remove the intermediate cover in front of and behind the cross-belt carriage, See "Removing and installing the intermediate cover", page 29.
- Completely remove two cross-belt carriages at the level of the drive console, See "Removing and installing the cross-belt carriage", page 31.
Removing the pressure unit baseplate

Drive module
1 Connecting plate
2 Screws
3 Pressure unit baseplate
4 Drive unit baseplate

To avoid losing the basic settings, do not loosen the drive unit baseplate (4) at the same time with the pressure unit baseplate (3).

- Remove the external connecting plate (1) of the drive module.
- Unscrew the screws (2) and remove the complete pressure unit baseplate (3) from the drive module.
Removing the V-Belt

Unscrew the screws (5) of the V-belt cover and remove the cover.
Loosen the fastening nut (6) of the V-belt shaft.
Loosen the locknuts (7) of the tensioning unit.
Slacken V-belt (10) with tensioning screws (8).
Remove the V-belt (10).
Installing the V-belt

- Insert the V-belt (10).
- Tension V-belt (10) with tensioning screws (8). The maximum play may measure ±10 mm (center of V-belt).
- Tighten locknuts (7) and fastening nuts (6) of the V-belt shaft and install the V-belt cover.
- Insert pressure unit baseplate (3) in drive module and screw it on so that the limit stops (9) are flush with the drive unit baseplate.
- Close the cover plate (1) of the drive module.

Completing the installation

- Install the cross-belt carriage, See "Removing and installing the cross-belt carriage", page 31.
- Install the intermediate cover, See "Removing and installing the intermediate cover", page 29.
Replacing the rubber block chain

Required specialty tool:
- Tensioning device for rubber block chain, part no. 11719

⚠️ WARNING

Risk of crushing

De-energize the complete module and ensure that it cannot be started accidentally.

Disassemble side covers or lower covers of the sorter in the area of the rubber block chain to be replaced.

Disconnect the cross-belt carriage from the rubber block chain (3). To do so, separate the connection (1) from the rubber block chain by loosening the connecting screws (2).
Removing the segment
(sorter with constant conveyor height)

Instructions for replacing a rubber block chain for Interroll cross-belt sorters with height adjustment, See “Removing the segment (sorter with height adjustment)”, page 72.

1. Attach the tensioning device to the chain joint by screwing on the clamping jaws.
2. Tension the chain by turning the threaded spindle (clockwise) until the connecting bolt (2) at the hinge connector (4) is released and turns easily.
3. Remove cotter pin (1) and washers (4) and pull out the connecting bolt.
4. Slacken and remove tensioning unit.
5. The chain is slackened.
6. Remove the connecting bolt at the second joint of the rubber block chain and remove the segment of the rubber block chain.

**NOTICE**

**Property damages from incorrectly inserted connecting bolts!**

- Insert connecting bolts (2) from top to bottom.
  - Use only OEM connecting bolts part no. 1009354.
  - Always use new self-locking nuts for fastening the cross-belt carriages.

- Install the new segment of the rubber block chain in reverse order.
Interroll cross-belt sorters with height adjustment have a connecting bridge (part no. 59940) for the individual rubber block chains. Instead of a bolt with head, washer and cotter pin, the connecting bridge contains a cylinder pin (part no. 60002) for connecting the hinges of the rubber block chains.

Removing the segment
(sorter with height adjustment)

Interroll cross-belt sorters with height adjustment have a connecting bridge (part no. 59940) for the individual rubber block chains. Instead of a bolt with head, washer and cotter pin, the connecting bridge contains a cylinder pin (part no. 60002) for connecting the hinges of the rubber block chains.

- Loosen and remove self-locking nuts (2) and screws (5) of the connecting bridge (1).
- Pull the connecting bridge off to the rear and retain it in the assembled form.
- Attach the tensioning device to the chain joint by screwing on the clamping jaws.
- Tension the chain by turning the threaded spindle (clockwise) until the hinge connectors are (4) released and the cylinder pin (3) can easily be pushed out, e.g. with a drift punch.
- Release and remove the tensioning device.
  The chain is slackened.
- Loosen the other end of the chain in the same way.
Installing a segment of the rubber block chain

When installing the connecting bridge, ensure that the screws are inserted from the bottom (countersunk holes). The down reinforcement may measure only 8 mm! Use only the Interroll cylinder pin (part no. 60002)!

The connecting bridge must be placed flush with the block side of the rubber block chain and screwed on. The installed connecting bridge has a spacing of approx. 14 mm to the drive side of the rubber block chain.

- Install the new segment of the rubber block chain (1) in reverse order.
- Use new self-locking nuts of the connecting bridge (4) and a new cylinder pin!

Completing the installation

- Connect cross-belt carriage with rubber block chain.
- Attach side cover or bottom cover of sorter.
### Maintenance intervals

All bearings of the module feature a life-time lubrication and are maintenance-free within the operating parameters.

### Maintenance and inspection list

<table>
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<th>Component</th>
<th>Interval</th>
<th>Task/check</th>
<th>Work to be performed</th>
<th>Performed by</th>
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<td>Complete sorter</td>
<td>Weekly</td>
<td>General visual and acoustic</td>
<td>Remove loose parts and</td>
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<tr>
<td></td>
<td></td>
<td>remote check</td>
<td>jammed goods</td>
<td></td>
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<tr>
<td></td>
<td>Every 6 months</td>
<td>Check Emergency Stop device</td>
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<td></td>
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<tr>
<td>Photo cell</td>
<td>Monthly</td>
<td>Check for cleanliness</td>
<td>Clean as required</td>
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<td>Complete sorter</td>
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<td>Check screw connections</td>
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<td></td>
<td>Every 6 months</td>
<td>Check for wear</td>
<td>Replace as required</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Rubber block chain</td>
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<td>• Idler wheels in cam</td>
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<tr>
<td>Cross belt</td>
<td>Every 6 months</td>
<td>Check running behavior and tension</td>
<td>Adjust as required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for cleanliness</td>
<td>Clean as required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for damage and wear</td>
<td>Replace as required</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Interval</td>
<td>Task/check</td>
<td>Work to be performed</td>
<td>Performed by</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------</td>
<td>----------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Drive station</td>
<td>Every 6 months</td>
<td>Check for noise, Check, See &quot;Components of the drive station&quot;, page 78:</td>
<td>Remove cause</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Contact pressure of rubber block chain (1)</td>
<td>Retension as required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• V-belt tension (2)</td>
<td>Replace guide of drive chain as required, links may leave running grooves</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wear of drive chain guide (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visual inspection, check sprocket for wear</td>
<td>Replace if tooth width X is less than 8 mm, also replace drive chain, See &quot;Replacing the sprocket&quot;, page 66</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check tension and wear of drive chain, See &quot;Inserting and tensioning the drive chain&quot;, page 65</td>
<td>Correct tension: Loosen screws of bracket of deflection sprocket and adjust play to min. ± 10 mm and max. ± 20 mm, retighten screws</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lubricate drive chain and sprocket (recommendation: Klüber Klüberoil CM 1-220 Spray #081294)</td>
<td>Replace chain if the tension measure X &gt; 20 mm. Ensure that the chain lock is fastened with the head pointing up</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Detailed instructions, See &quot;Lubricating the drive chain&quot;, page 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable/electrical components</td>
<td>Every 6 months</td>
<td>Visual inspection, check for damages</td>
<td>Replace as required</td>
<td></td>
</tr>
<tr>
<td>Rubber block chain</td>
<td>Every 6 months</td>
<td>Visual inspection, check for damages</td>
<td>Replace damaged segment as required, See &quot;Removing the segment (sorter with constant conveyor height)&quot;, page 72</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visual inspection, check for damages to sliding fabric at the tooth flanks</td>
<td>Replace as required if fabric is worn off over the entire width of a tooth flank</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visual inspection, check for:</td>
<td>Replace as required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Damages to bolt connections</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bent hinges or bolts</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Missing washers or cotter pins</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Maintenance and repair

<table>
<thead>
<tr>
<th>Component</th>
<th>Interval</th>
<th>Task/check</th>
<th>Work to be performed</th>
<th>Performed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-belt carriage</td>
<td>Every 6 months</td>
<td>Check drive rollers for cleanliness</td>
<td>Clean with ethanol as required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check roller diameter, See &quot;Checking the roller diameter&quot;, page 30</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replace drive wheel or guide wheel as necessary</td>
<td></td>
</tr>
<tr>
<td>Flap system</td>
<td>Every 6 months</td>
<td>Check function of flap system</td>
<td>Trial run with discharge control</td>
<td></td>
</tr>
<tr>
<td>Pneumatic system</td>
<td>Every 6 months</td>
<td>Check hoses and screw connections for leaks</td>
<td>Replace as required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check pressure indicator</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Readjust to 6 bar as required (see manufacturer's instructions)</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td></td>
<td></td>
<td>Drain condensation, change filter cartridge (Festo part no. 159594 LFP-D-MIDI-5M)</td>
<td></td>
</tr>
<tr>
<td>Gear motor</td>
<td>Every 6 months</td>
<td>Visual inspection</td>
<td>Maintenance according to manufacturer’s guidelines</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for noise</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check oil loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for knocking</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Components of the drive station

Drive station with V-belt, drive chain and rubber block chain

1. Rubber block chain
2. V-belt
3. Drive chain
4. Drive chain guide
Troubleshooting

In case of a fault

⚠️ DANGER

Danger - electrocution

- Only perform maintenance and repair work after you have switched off the power.
- Faults on electrical equipment may be removed only by a trained electrician!

Requirement:
- The danger spots on the module are covered by protective plates and other protective devices.
- Immediately de-energize the complete conveyor system and ensure that it cannot be started accidentally.
- Remove goods and blocking objects.
- Before switching it on again, ensure that no persons are at risk.
- Professionally dispose of any gear oil that has leaked out. Have the motor replaced by technical personnel if necessary.

Troubleshooting

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise development, squeaking/whistling</td>
<td>Bearing defective</td>
<td>Replace bearing</td>
</tr>
<tr>
<td>Sorter cannot be started. Motor does not run.</td>
<td>Main switch and/or control system switched off</td>
<td>Check switch position, switch on main switch and/or key switch of the control system</td>
</tr>
<tr>
<td>Supply line damaged</td>
<td>Check supply line</td>
<td></td>
</tr>
<tr>
<td>Fuse triggered</td>
<td>Check fuse and replace if necessary</td>
<td></td>
</tr>
<tr>
<td>Safety light barrier dirty</td>
<td>Clean safety light barrier and restart sorter</td>
<td></td>
</tr>
<tr>
<td>Safety light barrier damaged</td>
<td>Replace safety light barrier and restart sorter</td>
<td></td>
</tr>
<tr>
<td>Motor defective</td>
<td>Replacing the motor</td>
<td></td>
</tr>
<tr>
<td>Other error sources</td>
<td>See operating instructions of the control system and software</td>
<td></td>
</tr>
<tr>
<td>Sorter runs in a jerky motion.</td>
<td>Foreign parts in deflection or guide area</td>
<td>Immediately activate Emergency Stop. Remove foreign objects. Check sorter for damages and remove them as required. Restart sorter</td>
</tr>
<tr>
<td>Fault</td>
<td>Possible cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Motor circuit breaker is triggered due to excessive current consumption.</td>
<td>Gear box defective, bearing of drive/deflection shaft defective</td>
<td>Replace</td>
</tr>
<tr>
<td>Short circuit</td>
<td></td>
<td>Check electrical connections</td>
</tr>
<tr>
<td>Part weight too high</td>
<td></td>
<td>Observe maximum weight</td>
</tr>
<tr>
<td>Foreign parts in deflection or guide area</td>
<td></td>
<td>Remove foreign objects. Check sorter for damages and remove them as required.</td>
</tr>
<tr>
<td>Cross-belt carriage does not discharge.</td>
<td>Flap system not active</td>
<td>Check pneumatic valve and replace if necessary</td>
</tr>
<tr>
<td></td>
<td>Pneumatic cylinder defective</td>
<td>Replace pneumatic cylinder</td>
</tr>
<tr>
<td></td>
<td>Moisture in pneumatic cylinder</td>
<td>Replace pneumatic cylinder, dry pneumatic lines, remove moisture from maintenance unit and check compressor/dryer</td>
</tr>
<tr>
<td></td>
<td>Air pressure too low</td>
<td>Increase air pressure to 6 bar</td>
</tr>
<tr>
<td></td>
<td>Drive roller dirty</td>
<td>Clean drive roller</td>
</tr>
<tr>
<td></td>
<td>Flap system does not touch the drive roller</td>
<td>Readjust cylinder and check for loose connecting bolts</td>
</tr>
<tr>
<td></td>
<td>Cross belt defective</td>
<td>Replacing the cross belt</td>
</tr>
<tr>
<td>Motor runs and the sorter does not move.</td>
<td>Drive chain defective</td>
<td>Replace drive chain</td>
</tr>
<tr>
<td></td>
<td>Drive chain has no contact with the rubber block chain</td>
<td>Push rubber block chain onto the drive chain with the V-belt tension</td>
</tr>
<tr>
<td>Noise in the cam.</td>
<td>Fixed deflection wheels defective</td>
<td>Replace wheels</td>
</tr>
</tbody>
</table>
Spare and wear parts

Spare part drawings

Drive station for horizontal sorter ST 6160

1 V-belt
2 Deep-groove ball bearing
3 Deep-groove ball bearing
4 Sprocket
5 Double-strand chain
6 Gear motor
7 Sprocket
8 Rubber block chain
Cross-belt carriage with intermediate cover

8 Rubber block chain
9 Cross-belt carriage
10 Conveyor belt
11a Long flap unit
11b Short flap unit
12 Pneumatic cylinder
28 Intermediate cover
Valve terminal

Rubber wheel in the cam

14  Deflection wheel
Rubber block chain with connecting bolt

16  Connecting bolt

Drive wheels under the cross-belt carriage

20  Upper cross-belt carriage drive wheel  27  Cross-belt carriage drive roller
22  Bolt for upper drive wheel  29  Long double joint
23  Lateral guide wheel of cross-belt carriage  30  Short double joint
24  Bolt for lateral guide wheel  31  Rubber block chain specialty screw
Rubber block chain with connecting unit and connecting pin

32 Connecting unit  
33 Connecting pin
### Spare parts list

**N_{recd.}** = recommended number of pieces, **S** = spare part, **W** = wear part, **T** = tool

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation</th>
<th>Comment</th>
<th>S/W/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V-belt</td>
<td></td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>Deep-groove ball bearing</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>3</td>
<td>Deep-groove ball bearing</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>4</td>
<td>Sprocket</td>
<td>Deflection side</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>Double-strand chain</td>
<td>Pitch 33 mm</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>Gear motor</td>
<td>With frequency inverter</td>
<td>S</td>
</tr>
<tr>
<td>7</td>
<td>Sprocket</td>
<td>Drive side</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>Rubber block chain</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>9</td>
<td>Cross-belt carriage</td>
<td>Complete</td>
<td>S</td>
</tr>
<tr>
<td>10</td>
<td>Conveyor belt</td>
<td></td>
<td>W</td>
</tr>
<tr>
<td>11a</td>
<td>Long flap unit</td>
<td>Complete, long</td>
<td>S</td>
</tr>
<tr>
<td>11b</td>
<td>Short flap unit</td>
<td>Complete, short</td>
<td>S</td>
</tr>
<tr>
<td>12</td>
<td>Pneumatic cylinder</td>
<td>With bracket</td>
<td>S</td>
</tr>
<tr>
<td>13</td>
<td>Valve terminal</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>14</td>
<td>Deflection wheel</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>15</td>
<td>Frequency inverter</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>16</td>
<td>Rubber block chain connecting bolt</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>17</td>
<td>Tensioning device for rubber block chain</td>
<td></td>
<td>T</td>
</tr>
<tr>
<td>18</td>
<td>Preassembled cable</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>19</td>
<td>Dynamic brake resistor</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>20</td>
<td>Upper drive wheel (cross-belt carriage)</td>
<td></td>
<td>W</td>
</tr>
<tr>
<td>22</td>
<td>Bolt for upper drive wheel (item 20)</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>23</td>
<td>Lateral guide wheel (cross-belt carriage)</td>
<td></td>
<td>W</td>
</tr>
<tr>
<td>24</td>
<td>Bolt for lateral guide wheel (item 23)</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>27</td>
<td>Cross-belt carriage drive roller</td>
<td></td>
<td>W</td>
</tr>
<tr>
<td>28</td>
<td>Intermediate cover</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>29</td>
<td>Long double joint</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>30</td>
<td>Short double joint</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>31</td>
<td>Rubber block chain specialty screw</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>32</td>
<td>Connecting shaft (incline-decline) of rubber</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>block chain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Interroll Horizontal Cross-Belt Sorter ST 6160 - 6189

Spare and wear parts

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation</th>
<th>Comment</th>
<th>S/W/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>Cylinder pin for connecting unit (item 32)</td>
<td></td>
<td>W</td>
</tr>
<tr>
<td>34</td>
<td>Chain spray for double-strand chain (item 5)</td>
<td></td>
<td>T</td>
</tr>
<tr>
<td>35</td>
<td>Disassembly tool for drive roller (item 27)</td>
<td></td>
<td>T</td>
</tr>
</tbody>
</table>

Ordering information
Ordering spare and wear parts requires the exact identification of the module, See "Nameplate", page 18.

The following information is required for an order:
• Machine number
• Type
• Item number of spare parts list
• Designation
• Comment

For additional information about the spare parts portfolio, please contact your supplier.
Decommissioning and disposal

- When disposing the motor oil, observe the disposal documents of the motor manufacturer.
- The packaging must be recycled to provide environmental relief.

Environmental protection regulations

For all work on and with the module, the legal regulations concerning waste avoidance and proper disposal and recycling must be followed.

**NOTICE**

Substances with a water hazard class, such as greases and oils, hydraulic oils, coolants or cleaning agents with solvents may not be allowed to come into contact with the ground or reach the sewer system!

- Store, transport, catch and dispose these substances in suitable containers!
- Observe the notices on the supply containers.
- Observe any additional 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
D-74889 Sinsheim, Germany

herewith declares that the conveyor module described below is an incomplete machine in accordance with the EU Machinery Directive:

- Interroll Horizontal cross-belt sorter ST 6160-6189

Important Note! The incomplete machine may only be put into operation if it has been determined that the overall machine/system, which the incomplete machine is to be installed, meets the requirements of this directive.

The following safety requirements as stated in Appendix I have been applied:

- 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.8, 1.4.1, 1.5.4, 1.5.8, 1.5.9, 1.6.1, 1.6.4, 1.7.4

The special technical documents mentioned in Appendix VII B have been prepared and will be sent to the responsible authority if necessary. The transmission is done electronically.

Responsible for EC documentation: Interroll Automation GmbH, Dietmar-Hopp-Straße 3, D-74889 Sinsheim, Germany

Applicable EC Directives:

- Machinery Directive 2006/42/EC
- EMC Directive 2014/30/EU

Applicable harmonized standards:

- EN ISO 12100:2011-03 "Safety of machinery - Basic concepts - risk assessment and reduction"
- EN ISO 13857:2008-06 "Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs"
- EN 349:2008-09 "Safety of machinery - Minimum gaps to avoid crushing of parts of the human body"
- EN 60204-1:2007-06 "Safety of machinery - Electrical equipment of machines - Part 1: General requirements"

Sinsheim, dated

Dr.-Ing. Heinrich Droste
(Managing Director)