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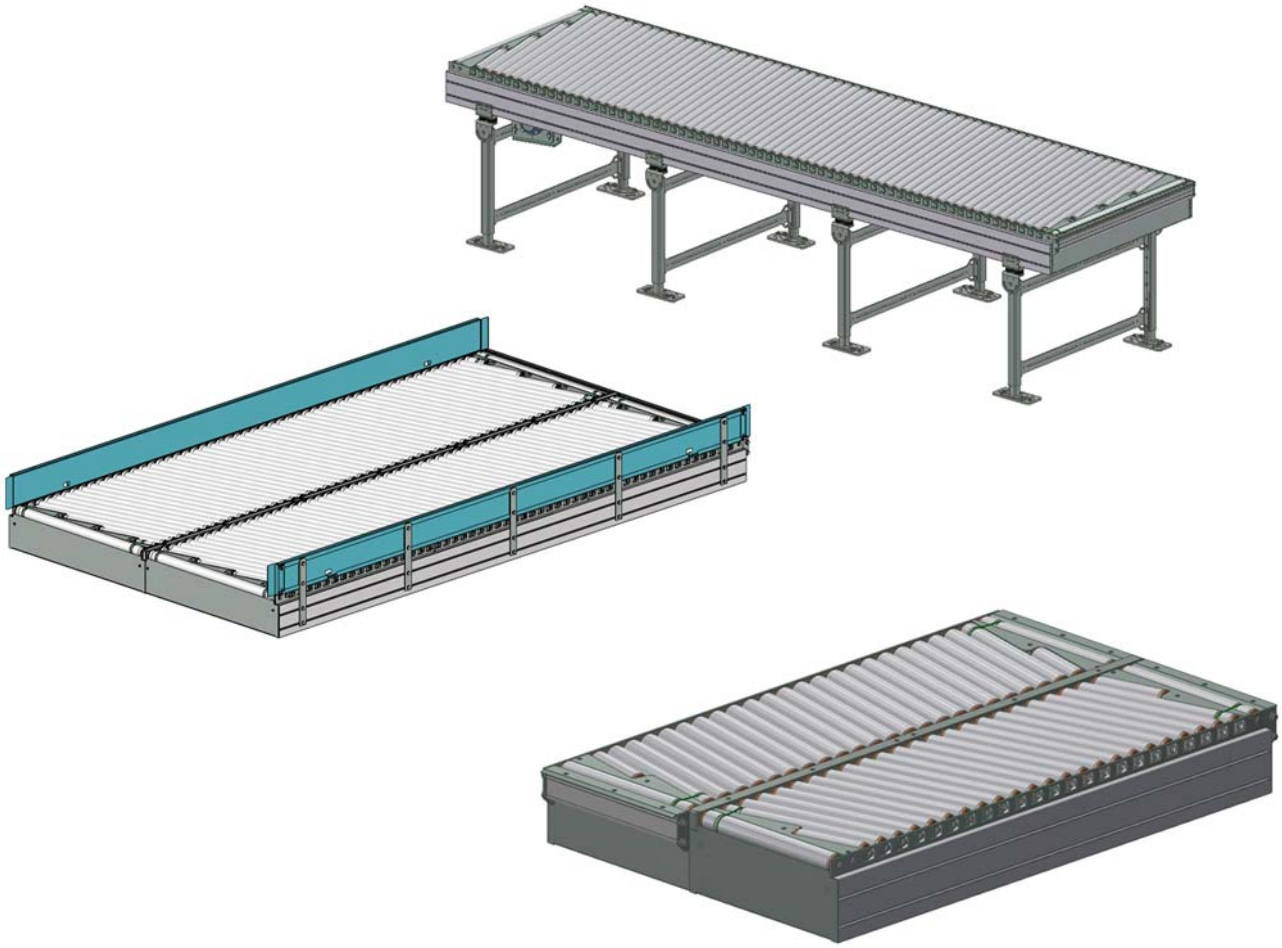

TS 2960/61/62
Roller alignment/centring conveyor
Operating instructions

Product	Roller alignment/centring conveyor TS 2960/61/62
Manufacturer	TRANSNORM SYSTEM GmbH Förster Str. 2 D-31177 Harsum (Germany) Tel. +49 (0) 5127 4020 Fax +49 (0) 5127 4400 info@transnorm.de http://www.transnorm.com
Documentation	Operating instructions -TRANSLATION- Version 1.0 ENG, 23/04/2018
Revision	V 1.0 Initial version

Contents

Applicable documents

EC Declaration of Incorporation

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EC-Declaration of Incorporation

as per EC Machinery Directive 2006/42/EG, Annex II B

Manufacturer: TRANSNORM SYSTEM GmbH
Förster Str. 2 • D-31177 Harsum

Herewith we declare, that the partly completed machinery described below

Machinery denomination: Roller Aligning Conveyor

TRANSNORM Machine model: TS 2960/61/62

is complying with the following requirements of the Machinery Directive 2006/42/EG:

1.1.1 – 1.1.3 / 1.1.5 / 1.3.1 –1.3.4 / 1.3.6 – 1.3.8.1 / 1.3.9 / 1.4.1 – 1.4.2.1 / 1.5.2 / 1.5.4 / 1.5.6 / 1.5.8 / 1.5.9 / 1.6.1 / 1.6.2 / 1.6.4 / 1.6.5 / 1.7

Additional we declare that the relevant technical documentation is compiled in accordance with part B of Annex VII.

EC-Guidelines observed:

2006/42/EG „Machinery Directive“	Directive of the European Parliament and Council dated 17 May 2006 for the harmonisation of laws and administrative regulations of the Member States for machinery.
2014/30/EU „Directive relating to electro-magnetic compatibility (EMC)“	Council Directive dated 26 February 2014 on the harmonisation of laws of the Member States relating to electromagnetic compatibility.

The safety objectives of the Directive 2014/35/EU relating to electrical equipment are observed according to Annex I, no. 1.5.1 of the Machinery Directive 2006/42/EG.

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 2006/42/EC on Machinery, where appropriate, and until the EC Declaration of Conformity according to Annex II A is issued. In the event of a change to the partly completed machinery which has not been prearranged, this declaration will no longer be valid.

We commit to transmit, in response to a reasoned request by the market surveillance authorities, relevant documents on the partly completed machinery.

Harsum, 2018-04-23

Authorised for documentation:
Tillmann Eid
Förster Str. 2
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Dr. Kai Ventz
- Director of Technology and Innovation -

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Introduction

Purpose of the document

These operating instructions enable you to safely operate the delivered machine, defined as partly completed machinery by the EC Machinery Directive, in accordance with its intended use.
Read through these instructions carefully before commissioning the machine. For further technical information, please refer to the order confirmation supplied separately.

You will find information on the following topics in the sections below:

- The safe handling of the machine
- Technical specifications
- Transporting, installing and putting the machine into operation
- Maintenance instructions
- Repairing the machine
- Fault detection and correction
- Taking the machine out of operation and disposal

Validity

These operating instructions apply to the operating company/integrator and all persons working on or with the machine.

Illustrations

The illustrations show simplified views of the machine.
We reserve the right to carry out technical alterations in case of further developments. If assembly is not described, it will be carried out in exactly the opposite order to disassembly.

Due to the numerous possible system configurations of our machines, details shown in the illustrations may differ from the machine supplied.
See the order confirmation for an exact description
of your specific machine.

Using the instructions

Different circumstances are indicated using specific text/formulations. Important information has also been marked with additional symbols. The following is an overview of the different ways information is formulated.

➔ This is a single, complete step.

1. This is the first step in a series of actions.

↳ This is a useful remark on a specific step.

? *This is a problem that may arise.*
This is the cause of the problem.
➔ This is a measure to solve the problem.

✓ You have completed a series of actions.

✓ You have completed the entire activity.

This is a notice.
Notices provide additional information.

Safety instructions

Safety instructions warn of risks and remaining risks and offer information on how to prevent them.

The signal words CAUTION, WARNING and DANGER indicate the level of severity of the risk.
The following overview explains the safety instructions used in this document.

DANGER

This notice warns of risk of death or fatal injury
This states the cause of the danger.
➔ You must take this action to avert the danger.

WARNING

This notice warns of moderate or minor injury
This states the cause of the danger.
➔ You must take this action to avert the danger.

CAUTION

This notice warns of damage to materials or to the machine
This states the cause of the danger.
➔ You must take this action to avert the danger.

Copyright Protection

This publication must be treated as strictly confidential. It is intended only for internal use by an authorised group of persons. and must not be disclosed to third parties without the written approval of TRANSNORM SYSTEM GmbH.

All documents are protected within the meaning of the Copyright Protection Act. The transfer and duplication of documents, also by way of extract, is strictly prohibited. Non-compliance shall be prosecuted and subject to the payment of compensation.

Service

Our service is available for technical information on our products and their systematic application.

Please have the following information ready when contacting us with queries or spare parts orders:

- Machine type
- Order/project number
- Item number

You will find this information on the type identification plate of your machine. It is located in the vicinity of the drive unit.


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TRANSNORM SYSTEM GmbH
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Telefon (05127) 402-0 Fax (05127) 44 00
www.transnorm.com Made in Germany

TS TYP **Förderertyp**

Seriennummer	
Baujahr	
Projekt-Nr.	
Position	

TRANSNORM SYSTEM GmbH type identification plate, sample

You will find our contact data at the back of these operating instructions.

Warranty

We shall accept no responsibility for any defects or damage caused by inappropriate use, operating errors or incorrect servicing and maintenance. We expressly point out that only original spare parts and accessories approved by TRANSNORM SYSTEM GmbH may be used.

Unless otherwise stipulated in the contract, the warranty period begins on the day of delivery or with notification of readiness to deliver.

Please file all claims under warranty immediately upon identifying the defect/s. Please quote the order (project) and item number when making a claim.

The warranty shall be in line with statutory regulations. Further claims are excluded.

Please note that the warranty shall be rendered null and void in the case of:

- Use not in accordance with the intended purpose
- Improper connecting and preparatory work not included within our scope of service
- Improper use of controls
- Failure to use original spare parts and accessories
- Conversions or structural modifications which have not been authorised by us in writing

Wearing parts are generally excluded from the terms of warranty

.

Safety

Operating conditions

The conveyor, hereinafter referred to as the machine, is an incomplete machine as defined by the EC Machinery Directive. The machine has been manufactured in keeping with current scientific and technological developments.

However, the machine may pose risks under the following circumstances:

- Any use other than that intended
- Improper operation
- Non-permitted operating conditions
- Failure to follow these instructions
- Failure to comply with the general safety regulations during transport and installation

Intended use

The machine illustrated on the front page is approved solely for the purpose of transporting unit loads corresponding to requirements defined in the service specifications and is intended to be integrated in a fully automatic intralogistic system with a master controller.

Use other than or use that goes beyond that specified is deemed as not for its intended purpose and is therefore prohibited.

Never use the machine to transport persons.

It may only be used in a protected industrial environment with restricted access.

The manufacturer accepts no liability for damage arising from improper use of the machine.

Non-permitted operating conditions

Operation of the machine is prohibited under the following circumstances:

- There are people or objects in the hazardous areas
- Safety devices are not working or have been removed
- If the machine is malfunctioning or damaged
- Maintenance intervals have been exceeded
- Operating parameters have been changed without authorisation

Responsibilities of the operating company/integrator

Machine safety can only be guaranteed when all necessary measures have been implemented.
The operating company/integrator is responsible for planning and implementing appropriate measures.

These instructions are an integral part of the machine. When selling the machine, the operating company must pass on this document to the buyer.

The operating company/integrator of the machine is responsible for its safety. This applies especially to:

- Installation as a complete machine with functioning and compliant safety devices.
- Integration of the machine in such a way that no additional danger/hazards are created.
- The safety of all persons in the vicinity of the machine.
- Fault-free operation of the machine.

Minimising the danger of injury

Take steps to guarantee the safety of persons in the vicinity of the machine, for example:

- Ensure that all work on the machine is carried out by qualified and authorised personnel.
- Ensure that at least two people carry out any maintenance and repair work.
- Make sure all operators are familiar with the safety devices.
- Ensure that the machine and its environment are kept clean and tidy at all times.
- Provide all personnel with protective equipment, such as suitable safety footwear (S1), close-fitting clothing and gloves to protect against mechanical dangers.
  Make sure the protective clothing is worn.
- Provide instructions on how to proceed or act in the event of malfunctions.
- Clarify any issues relating to occupational health and safety as well as environmental protection.

Operating the machine fault-free

Implement the following measures to ensure fault-free operation of the machine:

- Ensure that these instructions are complete, in legible condition and accessible to all personnel at all times.
- Only operate the machine when fully functional and in perfect working order.
- Regularly check the machine and its safety equipment are functioning correctly.

Implement installation layout

Observe the following basic safety principles when connecting several separate components to form an overall system:

- Install guards in areas where there are tail pulley assembles, apex bends, roller arches, conveyor gates, pre-conveyors and transfer drives.
- In any area where there is a transfer drive or conveyor gate, the conveyor belt must have the same speed or run faster in the outfeed section than in the infeed section.
- The national safety regulations valid in the country of the user as well as additional branch-specific regulations must be observed.

Commissioning

This conveyor system is a "partly completed" machine, as defined by the Machinery Directive 2006/42/EC, Article 2g.
This partly completed machine may only carry out an intralogistic function when combined with an appropriate control system and, where applicable, other (partly completed) machinery. It must not be commissioned until it has been ascertained that the partly completed machinery which is the subject of this documentation or the machinery into which it is incorporated comply with the requirements of the Machinery Directive.

Personnel qualification

Installation, maintenance and repair work as well as commissioning demand specialist know-how and qualification of the personnel above and beyond that required for normal operation.
We recommend that you work only with technical personnel trained and authorised by TRANSNORM SYSTEM GmbH.

All persons working at or on the machine must:

- be suitable and sufficiently qualified to carry out the work required.
- have received instruction on handling the machine and be familiar with the protective devices .
- have read and understood these operating instructions and especially the relevant sections relating to their work.
- be familiar with basic occupational health and safety and accident prevention regulations, and with sector-specific regulations.

In these instructions, a distinction is made between the following groups of personnel:

Definition of the personnel groups

Personnel group	Definition
Operating company	The operating company is defined as that using the machine for its intended purpose and having the machine operated by suitable and instructed persons .
Integrator	The integrator installs the partly completed machine for the operating company and integrates it into an overall system of machines with a master controller and safety technology. (Responsible for ensuring conformity of the overall system)
Operating personnel	Personnel who are appropriately instructed by the operating company in the : ▪ Functional and operating procedures for the machine ▪ Possible dangers arising from improper use ▪ Protective devices and measures
Specialised staff	Technically qualified and authorised by the operating company to carry out specific tasks such as installation, maintenance and troubleshooting. Corresponding training in theory and practice is a prerequisite.

The following work is to be carried out by specialised personnel only:

Work requiring specialised knowledge

Work on	Specialised knowledge
Pneumatic components	Such work may only be carried out by personnel with specialised knowledge of and experience in handling pneumatic systems.
Electrical components	Such work may be carried out under the guidance and supervision of an electrician in accordance with the codes of electrical engineering practice.

Remaining risks regarding the machine

The machine's protective devices offer protection against injury.
For some tasks, however, personnel are required to enter the danger zone.
Therefore, an element of risk always remains.

Remaining risks for operating personnel

The following table will enable operating personnel to identify and avoid fundamental dangers and hazards. Professional conduct and implementation of the corresponding measures will help prevent any remaining risks in advance.

Measures for operating personnel to avert risk and prevent damage

Danger	Cause	Measure
Risk of injury	Sharp-edged machine parts	When troubleshooting: ▪ Be alert and proceed with caution ▪ Avoid hectic movements ▪ Wear appropriate protective clothing
	Rotating parts	When troubleshooting: ▪ Do not reach into rotating parts ▪ Wear appropriate protective clothing ▪ Observe warning labels on the machine
	Hot electric motors	▪ Do not touch
	Accumulation of conveyed material	Before remedying a fault: ▪ Watch the conveyor system carefully ▪ Assess whether the system needs to be stopped due to an unclear situation While remedying a fault: ▪ Keep body parts away from the conveyed loads ▪ Remove any pile-up of conveyed material ▪ Only switch the system on again when pile-up of conveyed material has been removed
	Conveyed loads	During operation: ▪ Do not reach into conveyed loads ▪ Observe warning labels on the machine When troubleshooting: ▪ Assess whether the system needs to be stopped due to an unclear situation ▪ If necessary, secure the system so that it cannot restart inadvertently ▪ Be alert and proceed with caution
Damage to the environment	Leaking operating materials	During operation: ▪ Inform technical personnel/shift supervisor

Remaining risks for technical personnel

The following table is intended to help the technical personnel (responsible for installation, repairs or troubleshooting) to detect and avoid fundamental dangers and hazards. Professional conduct and implementation of the corresponding measures will help prevent any remaining risks in advance.

It is important to observe the instructions and safety instructions described in the relevant sections during installation, maintenance and repairs. This is particularly important for work that requires the removal of protective devices.

Measures for technical personnel to avert risk and prevent damage

Danger	Cause	Measure
Risk of fatal injury	Accidental machine restart	During maintenance/repair work: ▪ Inform your colleagues that it is prohibited to re-start the machine until notified otherwise ▪ Disconnect the power supply ▪ Apply a label to prevent accidental re-connection of the power supply ▪ Prevent accidental re-connection of the power supply as described in the operating instructions of the system
	Electricity	Machine shut-down: ▪ Disrupt power supply ▪ Secure system against accidental re-start ▪ Establish that the power is off
	Falling or slipping loads	Transport and installation: ▪ Observe the centre of gravity of the machine and the permissible lifting load of the hoists ▪ Secure the machine and hoists to prevent slipping ▪ Read the section on "Transport and installation" and carefully observe the instructions For ceiling suspension of conveying systems: ▪ Observe the assembly instructions of the suspensions used
Fire hazard	Non-permitted operating conditions, e.g., accumulation of load residue, packaging abrasion, dust	During maintenance/repair work: ▪ Observe maintenance intervals

Measures for technical personnel to avert risk and prevent damage

Danger	Cause	Measure
Risk of injury	Sharp-edged machine parts	During maintenance/repair work: ▪ Be alert and proceed with caution ▪ Avoid hectic movements ▪ Wear appropriate protective clothing
	Rotating parts	For maintenance and adjusting works: ▪ Do not reach into rotating parts ▪ Wear close-fitting protective clothing ▪ Have one or more other persons assist you ▪ Observe warning labels on the machine
	Falling machine parts	During maintenance/repair work: ▪ Support heavy parts (especially motors) ▪ Do not step under loose parts or touch them ▪ Secure working area so that personnel are not at risk When working at suspended machines: ▪ Cordon off the work area ▪ Have a second person supervise the operation ▪ Put tools and parts down carefully and prevent them from falling
	Hot electric motors	Before touching: ▪ Allow enough time for them to cool down ▪ Wear suitable and thick protective clothing
	Accumulation of conveyed material	Before remedying a fault: ▪ Carefully observe conveyor system ▪ Assess whether the system needs to be stopped due to an unclear situation While remedying a fault: ▪ Keep body parts away from the conveyed loads ▪ Remove any pile-up of conveyed material ▪ Only switch the system on again when pile-up of conveyed material has been removed
	Conveyed loads	During operation: ▪ Do not reach into conveyed loads ▪ Observe warning labels on the machine While remedying a fault: ▪ Assess whether the system needs to be stopped due to an unclear situation ▪ If necessary, secure the system so that it cannot restart inadvertently ▪ Be alert and proceed with caution During maintenance/repair work: ▪ Disconnect the machine from electric supply during works ▪ Secure the system against accidental re-start

Measures for technical personnel to avert risk and prevent damage

Danger	Cause	Measure
Damage to the environment	Leaking operating materials	During disposal: ▪ Collect operating materials in suitable containers ▪ Dispose of waste oil, lubricating grease, cleaning agents containing solvents and similar products correctly

Protective devices

Various covers are installed on the machine to prevent body parts being drawn in and crushed. The protective devices and safety equipment are listed below.

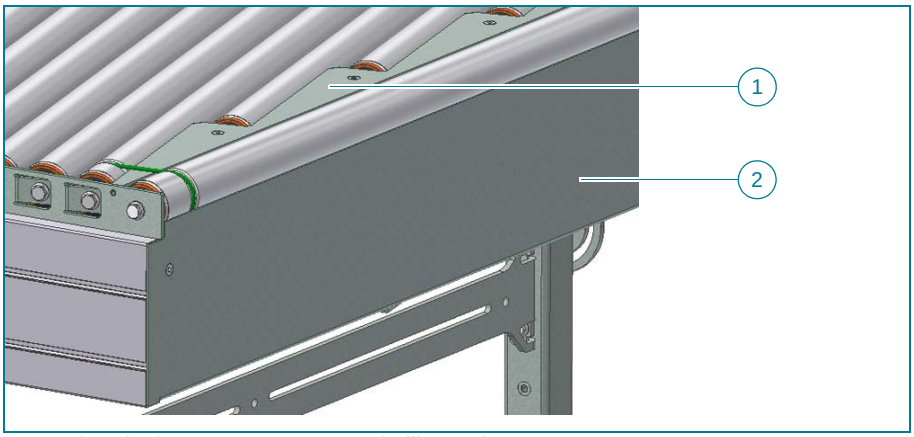
It is expressly prohibited to render unserviceable, bypass or remove protective devices. These devices may only be temporarily removed for maintenance or repair purposes.

If the purchasing contract specifies that certain safety equipment is not included in the scope of delivery, the operating company/integrator must assess the potential dangerous areas in accordance with the Machinery Directive. If it proves to be necessary to install additional guards, especially at the infeed and transfer sections, they must be installed in accordance with the applicable national regulations and directives.

With ceiling suspension of the machine, safety devices that prevent the risk posed by falling parts must be installed in compliance with the valid national regulations and directives.

Information on inspection intervals can be found in the maintenance schedule.

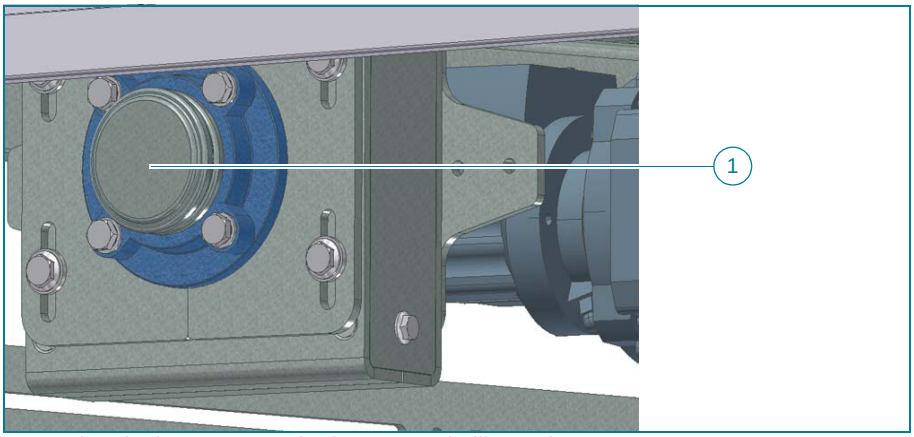
Protective devices on the machine



Protective devices TS 2960, example illustration

Explanation of the illustration

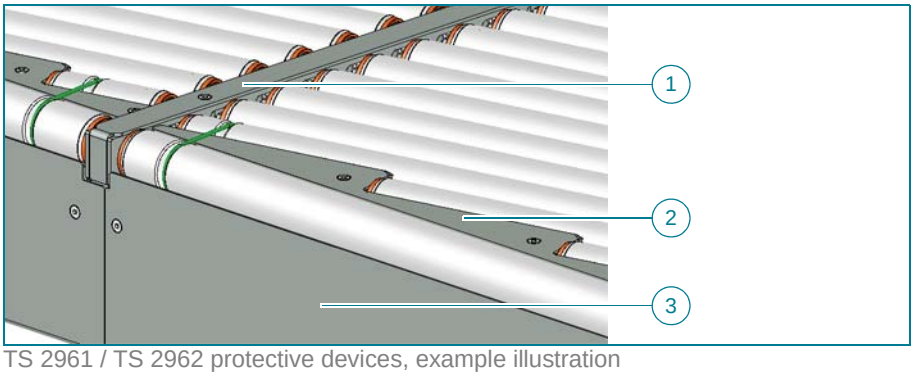
Item	Description
1	Finger guard, infeed/outfeed
2	Cover, infeed / outfeed



Protective devices TS 2960/61/62, example illustration

Explanation of the illustration

Item	Description
1	Protective cap



TS 2961 / TS 2962 protective devices, example illustration

Explanation of the illustration

Item	Designation
1	Transfer plate
2	Finger guard, infeed/outfeed
3	Cover, infeed / outfeed

Description

The TS 2960/61/62 is a Roller alignment/centring conveyor on which the nominal width can be adjusted to the load. The rollers are driven tangentially from below by a 40 mm wide belt.

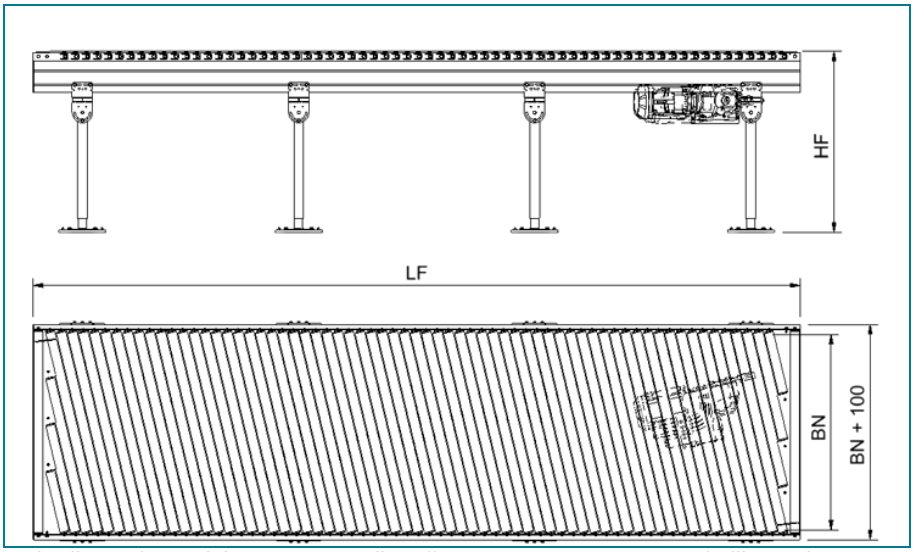
Technical description

The TS 2960 is a belt-driven, roller conveyor for the alignment of loads.In the sturdy base frame of the conveyor, idler rollers are arranged in such a way that the load is aligned to the right or left.

The TS 2961 is a pair of TS 2960 alignment roller conveyors that are connected next to one another. The idler rollers are driven tangentially by the drive belt. All main components are present twice in the complete module.

The TS 2962 is a belt-driven roller conveyor for centring loads at the outfeed of the conveyor.The special feature of the TS 2962 is the double, but mirrored, conveyor track (in contrast to the TS 2961). All main components are present twice in the complete module.

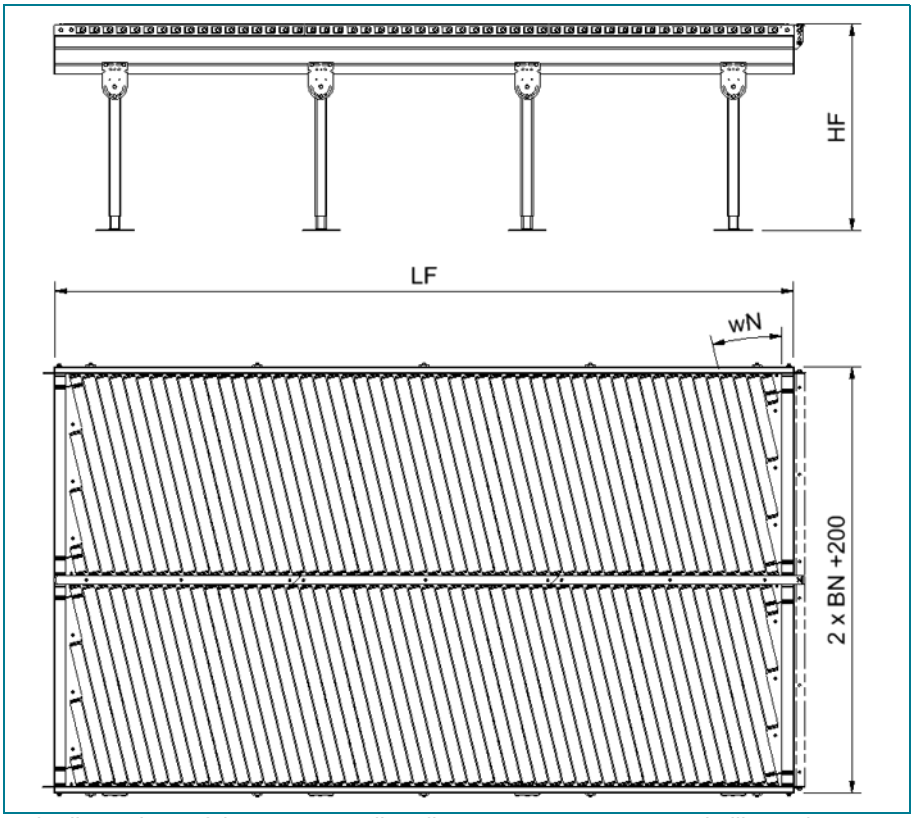
Main dimensions



Main dimensions of the TS 2960 roller alignment conveyor, example illustration

Used variables

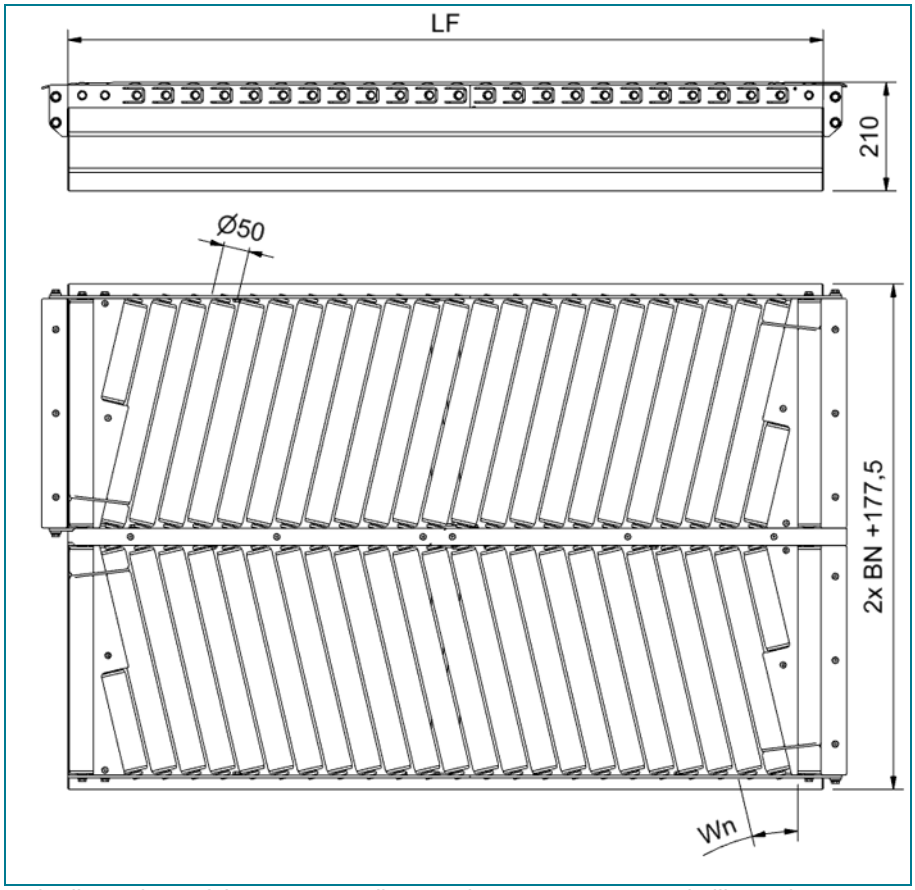
Variable	Description
BN	Nominal width
LF	Conveyor length
HF	Conveying height



Main dimensions of the TS 2961 roller alignment conveyor, example illustration

Used variables

Variable	Designation
BN	Nominal width
LF	Conveyor length
wN	Nominal angle
HF	Conveying height



Main dimensions of the TS 2962 roller centring conveyor, example illustration

Used variables

Variable	Designation
BN	Nominal width
LF	Conveyor length
wN	Nominal angle

Technical data

For the technical data regarding your specific machine, please refer to the performance specifications of your order confirmation. The following section lists the general specifications or preference items.

Technical data

Designation	Data
Carrying capacity, max.	50 kg/m
Conveying speed, max.	150 m/min

Mechanical data

Designation	Data
Nominal width (BN)	600 700 800 900 1000 1100 1200 mm
Conveyor length, max. (LF)	Depending on nominal width, see performance specification
Roller pitch (TFLR)	55 mm
Roller diameter (DR)	50 mm
Conveying height (HF), min.	300 mm
Drive power (PN)	0.55 - 3.0 kW, depending on load and speed, see contract specifications or motor type identification plate
Drive type (YD)	Shaft-mounted gear motor (hollow shaft)

Electrical data

Designation	Data
Motor voltage supply	Standard: 230 V / 400 V AC 50 Hz, see motor type identification plate for deviations
Motor brake voltage	Standard: 230 V AC / 400 V AC, see motor type identification plate for deviations
Protection class	Standard: IP55, not explosion-protected

Location requirements

Designation	Data
Ambient temperature	5 °C to +45 °C (up to +50 °C for short periods (max. 1 h))
Comparative air humidity	max. 80 %, non-condensing

Location requirements (contd.) (contd.)

Designation	Data
Ambient atmosphere	Normal atmosphere, no potentially explosive atmosphere, no oil or gas in the atmosphere, no corrosive components
Installation	In the company - safely protected from rain; in stable position, screwed to solid surface

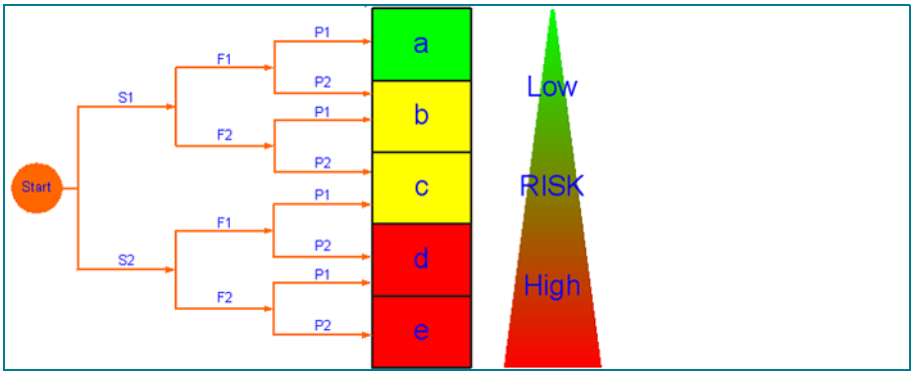
Other data

Designation	Data
Year of construction	See type identification plate
Noise emission	Sound pressure level measured at less than 77 dB(A) in accordance with DIN EN 13023:2003-03.

Required performance level (PLr)

It is necessary to determine the required performance level (PLr) for each safety function. The required performance level for the previously described safety function is determined from the risk graph defined by DIN EN ISO 13849-1.

The path through the risk graph depends on how "severity of injury (S)", "frequency and/or exposure to danger (F)" and "possibility of avoiding the damage (P)" are assessed. The level of each risk situation is categorised in five levels from "a" to "e", the so-called Performance Level (PL). The proportion of the control function to reduce the risk is low at Performance Level "a" and high at PL "e".



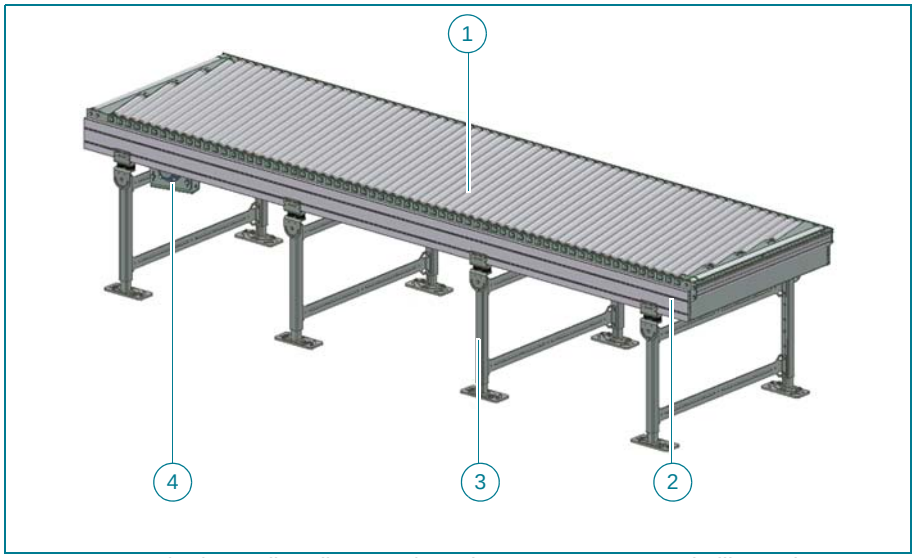
Risk graph

Performance Level (PLr)

Safety function	Required performance level (PLr)
Required Performance Level to prevent unexpected start-up of the roller conveyor (PLr)	C

Areas of the machine

The conveyor consists of the areas shown below:

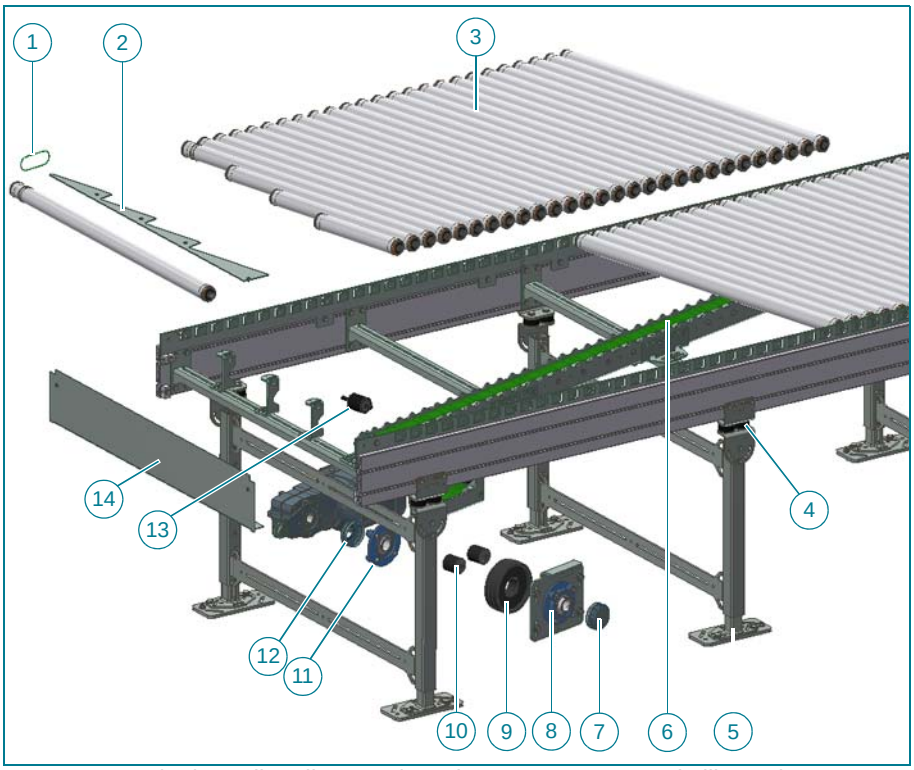


Areas TS 2960/61/62 Roller alignment/centring conveyor, example illustration

Explanation of the illustration

No.	Designation
1	Conveyor track
2	Conveyor bed
3	Support
4	Drive group

Parts of the machine



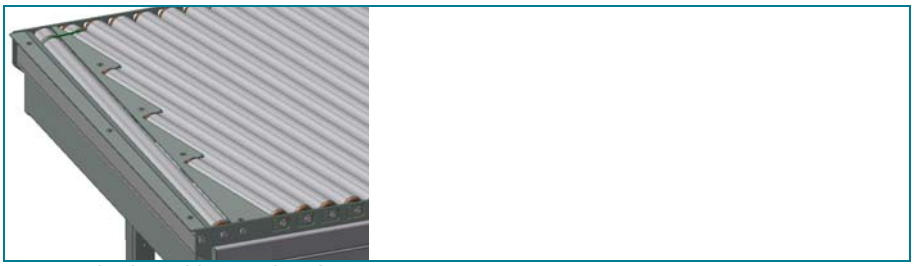
Parts TS 2960/61/62Roller alignment/centring conveyor, example illustration

Explanation of the illustration

No.	Designation	No.	Description
1	Round belt	8	Flange bearing (outside)
2	Finger guard	9	Drive pulley
3	Idler rollers	10	Deflection drum (drive station)
4	Rubber-metal buffer	11	Flange bearing (motor side)
5	Support	12	Protective cap (motor side)
6	Drive belt	13	Deflection drum (drive train)
7	Protective cap (outside)	14	Cover

Optional machine equipment

The conveyor is equipped with a transfer plate at the infeed and/or outfeed as standard.



TS 2960/61/62 with transfer plate

Transport and installation

Delivery of the machine

Conveyors up to a length of approx. 4 m are fully assembled at the factory and are delivered with pre-adjustments. Conveyors with a length exceeding 4 m are generally delivered in several parts. The individual parts are marked with labels at the section points. Supports, suspensions and other attachment parts are included separately in the delivery.

Unpacking the machine

Carry out the following work steps:

1. Remove all transport packaging.
2. Check for possible transport damage.
3. Check that all items listed on the delivery note have been delivered.

✓ The machine has been unpacked and is complete.

Prolonged storage of the machine

When storing the machine for longer than 4 weeks, the conveyor belt must be loosened in order to prevent damage caused by bulges The procedure for slackening the belt is described in the section entitled "Repair". If the machine is transported by sea, seaworthy packaging is required.

Observe the permissible operating conditions described below also for storage periods.

For questions concerning storage and transport, please contact TRANSNORM SYSTEM GmbH.

Disposal of packaging

The individual components of the packaging are correspondingly marked and mainly consist of the following materials:

- Wood
- Cardboard
- PP- and PE-foil
- Styrofoam

Separate the different materials and dispose of them accordingly. Observe the local rules and regulations for disposal.

Installing the machine

Ground requirements

The machine may only be installed stationary on a stable concrete surface (concrete class at least B25 or the corresponding national standard) or on an equivalent steel structure. The carrying capacity must be at least 25 N/mm². The place of installation must be free of vibration and suitable for the static and dynamic loads. The surface must be level.

If special attachments that enable mobile operation are used, this will be stated in the performance specifications.

Permissible operating conditions

DANGER

Explosion hazard!
The machine is not explosion-protected.
➔ Do not operate the conveyor in potentially explosive atmospheres.

The required space for operation and maintenance depends on the individual requirements.

The place of installation must fulfil the following conditions:

- Normal atmosphere (not containing oil or gas, no corrosive components)
- Ambient temperature 5 °C to +40 °C (up to +50 °C for brief periods (max. 1 h))
- Relative air humidity max. 100%
- In-company installation
- Protection against moisture and rain.

In-company transportation

DANGER

Increased risk of accident due to:
Falling or slipping loads.
➔ Observe the maximum permissible lifting load of the hoists and the centre of gravity of the machine. Observe the data provided in the section entitled "Auxiliary equipment."

The internal transportation of the machine to its final place of erection may be carried out with different hoists. Use licensed and suitable hoists only.

It is only permissible to lift the machine or machine parts on the base frame. If there are supporting points on the base frame, only these points are suitable for lifting. This guarantees transport that is free of torsion.

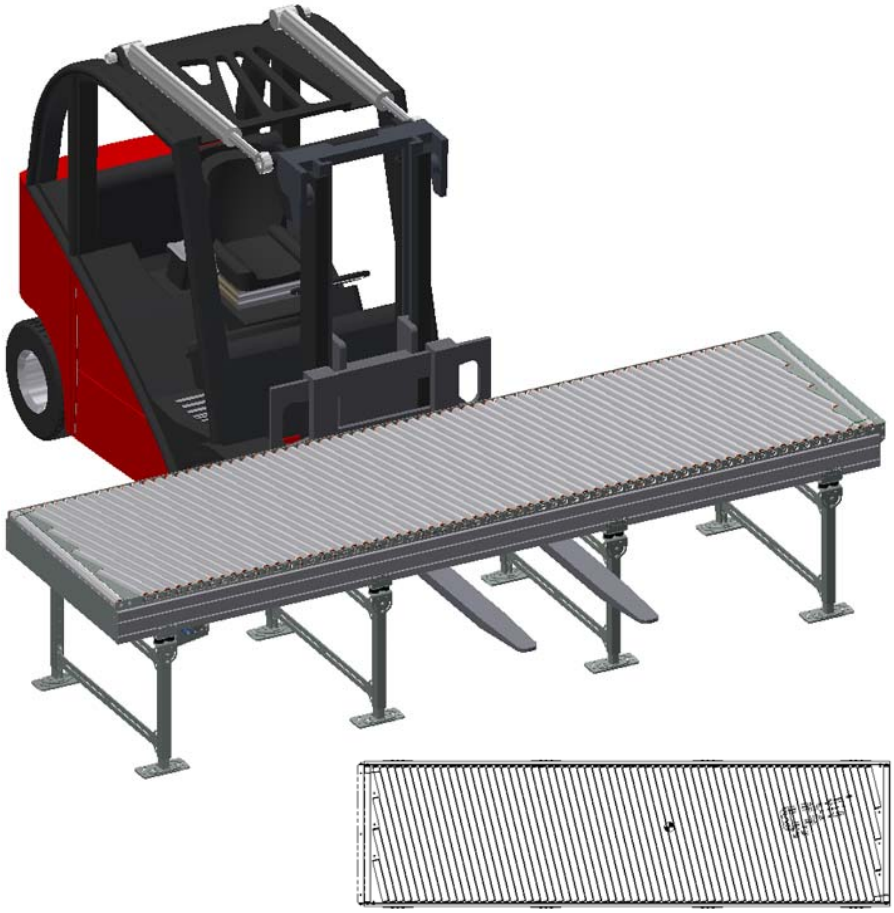
For the gross weight, please see the delivery note.

Auxiliary equipment

Required auxiliary equipment

Overhead crane, gantry crane	Carrying capacity 2,000 kg
Industrial truck	Carrying capacity 2,000 kg min. lifting height 4,000 mm

Transport with industrial truck or crane



Required auxiliary equipment:
Industrial truck

Final installation at the place of installation

We recommend that you have installation carried out by TRANSNORM SYSTEM GmbH. Alternatively, final installation could be carried out under the supervision of or after instruction by TRANSNORM SYSTEM GmbH.

In any case, the installation must be carried out by technical personnel authorised by the operating company.

Please take into consideration that some work steps in the following installation instructions may not apply to your individual conveyor due to variations in the design version and equipment.

To carry out the installation

In the case of long conveyors consisting of several sections, it may be advisable to fit supports to the individual sections before assembling the frame. Depending on the design version, the supports are either equipped with stand pipes or support angles. Installation is carried out in accordance with the support layout drawing. The supports must always stand vertically; this also applies to tracks with an incline.

➔ Mounting the supports

DANGER

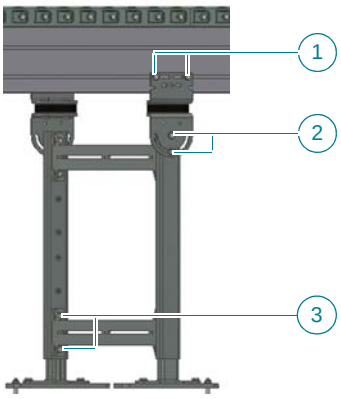
Danger of fatal injury due to parts of the body being crushed!
The motor may tip over and crush body parts.
➔ Secure the machine to prevent it falling.
➔ Use hoists to raise and lower the machine.

DANGER

Danger of fatal injury due to parts of the body being crushed!
The machine falls.
➔ Only use supports/suspensions approved by Transnorm.
➔ Mount the supports/suspensions exactly as described in the system layout or support layout drawing if available.
➔ Do not exceed the minimum clearances defined in the system layout/support layout drawing.

Carry out the following work steps:

1. Attach the supports or suspensions to the framework of the base frame using the joining elements (1) provided.



2. Undo the joining elements (2) and adjust the angle of inclination.
3. Undo the joining elements (3) and adjust the height.

✓ The supports have been mounted.

➔ Aligning and anchoring the machine, all types

DANGER

Danger of fatal injury due to parts of the body being crushed!
If supports are not anchored, the machine can tip and fall over when moved to position it.
➔ Before aligning, lift the machine with suitable hoists. Refer to the information in the section entitled "In-company transportation".

DANGER

Danger of fatal injury due to parts of the body being crushed!
Loose mounting bolts for the height adjustment may allow the machine to slide.
➔ When adjusting supports or suspensions, also support the conveyor.
➔ For suspensions, create a positive locking joint by means of retaining bolts.

Carry out the following work steps:

1. Align the machine horizontally and free of torsion in accordance with the required infeed and outfeed height. To do so, loosen the mounting bolts to adjust the height of the supports (3).
2. Check the levelling. Heed the correct infeed and outfeed heights.

↳ Depending on the system concept, different heights may be useful. The system design engineer will comment on this.

3. Only in case of floor anchorage: Anchor supports so they can no longer change position. The foot plates of the supports are equipped with corresponding bore holes.
4. Only in case of ceiling suspension: Anchor the suspensions so they can no longer change position. The lugs of the suspensions are already equipped with bore holes.
5. Use retaining bolts to secure all joints with positive locking.
6. Manually check the transfer accuracy at the front and back of the machine. To carry out this check, use loads according to specifications.

✓ The machine has been aligned.

✓ The machine has been installed and aligned.

Electrical connection

DANGER

Danger of fatal injury due to electric current!
The machine is operated by 3-phase alternating current.
➔ The electrical installation must only be carried out by qualified and authorised electricians.

Carry out the following work steps:

➔ Connect the motor according to the wiring diagram of the motor manufacturer. This is included in the motor delivery (see interior of the terminal box cover).

↳ If this wiring diagram is missing, the motor must not be connected.

✓ The machine has been connected.

Operation

Commissioning

Essentially the same procedure is carried out for initial commissioning and commissioning after repair work.

The daily commissioning via the control unit of the overall conveyor system is described in the system documentation or in the control documentation.

The machine is designed for the following electrical connection data:

- 3 phases, neutral conductor and earthing conductor
- Alternating voltage 400 V
- Mains frequency 50 Hz.

Initial commissioning and commissioning after repair

Precondition:

✓ The machine has been appropriately installed.

✓ The working area of the machine is inaccessible to unauthorised personnel.

✓ The master switch for the power supply to the machine is switched off and has been secured against being switched on again.

✓ Machine downtime no longer than 4 weeks.

➔ Check the installation

Carry out the following work steps:

1. Check the position of all drums and rollers.
2. Check that the drive elements are correctly attached, aligned and tensioned.
3. Check the machine for foreign objects and remove them if necessary.

✓ The installation has been checked.

➔ Carry out the electrical installation

DANGER

Danger of fatal injury due to electric current!
The machine is operated with 3-phase alternating current.
➔ The electrical installation is to be carried out by qualified and authorised electricians only.

Carry out the following work steps:

1. Install all the required cables.
2. Attach all the required plugs to the cable ends.
3. Connect the cables and install required connections in compliance with the operating instructions of the motor manufacturer (see Appendix, section entitled "Electrical installation").

✓ The machine has been connected.

➔ Check the direction of rotation.

WARNING

Risk of injury due to exposed machine parts!
Parts of the body, hair and clothing can become caught and crushed in rotating machine parts.
➔ Wear close-fitting protective clothing.
➔ Use a hairnet to cover long hair.
➔ Do not reach into running machine.
➔ Do not access the machine.
➔ Ask a second person to supervise.

Carry out the following work steps:

1. Switch on the machine briefly.
2. Check for correct direction of rotation.
3. Switch off the machine.

✓ The direction of rotation has been checked. The machine is running.

➔ Carrying out a test run

WARNING

Risk of injury due to exposed machine parts!
Parts of the body, hair and clothing can become caught and crushed in rotating machine parts.
➔ Wear close-fitting protective clothing.
➔ Use a hairnet to cover long hair.
➔ Do not reach into running machine.
➔ Do not access the machine.
➔ Ask a second person to supervise.

Carry out the following work steps:

1. Remove all foreign objects from the working area of the machine.
2. Switch on the machine.
3. Check that the machine is running smoothly.

? *Noise development*
If excessive noise occurs:
➔ Locate the source and eliminate the fault, see "Fault elimination".

4. Make sure that the drive belt is correctly tensioned and adjusted.

? *The conveyor belt runs out of line.*
The drive belt must be readjusted.
➔ See "Tighten and adjust belt" in the section entitled "Repair".

5. Switch off the machine.

✓ The machine is ready for normal operation.

✓ The machine has been put into operation.

Normal operation

The normal operation includes the daily turn-on and switch-off procedure and operation by the operating personnel.

Operation of the conveyor via the overall conveyor system is normally described in the system documentation or in the control system documentation.

After a machine downtime of more than 4 weeks, the complete maintenance procedure described in the maintenance schedule must be carried out. Afterwards, proceed as described in the section entitled "Commissioning".

Decommissioning

The decommissioning includes switching off the machine before service, maintenance and repair work or before downtimes.

Carry out the following work steps:

1. Turn-off the master switch for the power supply to the machine according to the control unit documentation.
2. Secure to prevent the machine being switched on again.

✓ The machine has been taken out of operation.

Maintenance and care

The work steps described in this section must be carried out by technical personnel only.

Important information regarding electrical installations:

- Regularly check the electrical equipment
- Refasten loose connections and joints
- Immediately replace damaged lines and cables
- Always keep the control cabinet closed

Maintenance work

Routine maintenance is the precondition for safe operation of the machine. Adhere to the intervals given in the maintenance schedule. Maintenance also includes regular cleaning in accordance with the specific operating conditions.

Motor maintenance

Electric motors must be serviced according to the manufacturer's specifications. For detailed information, please refer to the operating instructions of the motor manufacturer in the section entitled "Inspection/Maintenance". These documents can be found in the Appendix to these operating instructions.

Maintenance of the gears

Gear units must be serviced according to the manufacturer's specifications. For detailed information, please refer to the operating instructions of the motor manufacturer in the section entitled "Inspection/Maintenance". These documents can be found in the Appendix to these operating instructions.

Upon request, we can provide an optimised maintenance agreement based on your individual requirements. In order to guarantee the safe operation of the machine, we recommend to make use of our TRANSNORM SYSTEM Service at least once a year.

Lubricants

Lubricants

Type of lubricant	Description
Gear oil	See motor manufacturer's operating instructions (Appendix)
Lubricating grease	ARAL HLP 2, BP Energrease LS-EP 2, ESSO Beacon EP 2, KLÜBER Staburags NBU 12, KLÜBER Centoplex EP 2, MOBIL Mobilux EP 2, SHELL Alvania R2
Chain oil	OKS 340, OKS 341, BECHEM Berumoly P 73, BECHEM Berumoly P 80

Maintenance schedule

The activities described in the maintenance schedule are based on one-shift operation.

Provided that they may be carried out by technical personnel as defined at the beginning, instructions for maintenance can be found in the section entitled "Repair".It is essential to observe the safety instructions in the respective section.

Event-related (e.g. damaged load) maintenance schedule

Interval	Assembly	Inspection/Measures
Immediate	Complete machine	Visual inspection: ▪ Any conveyor belt residues? If so, remove any residues from the machine. ▪ Foreign matter and foreign objects in the area of the conveyor belt and the drums/rollers? If so, remove foreign matter/objects from the machine.

Operational maintenance schedule

Interval	Assembly	Maintenance / inspection
Weekly	Complete machine	Visual inspection: ▪ After work or at change of shift, make sure all possible load remains are cleared out of the machine. ▪ No foreign objects must be left on the conveyor belt or in the drum/roller areas.
Weekly	Protective devices	Visual inspection: ▪ Is all the equipment complete according to the operating instructions? ▪ Is all the equipment undamaged and functional?

Operational maintenance schedule (contd.)

Interval	Assembly	Maintenance / inspection
Weekly	Drive belt	Visual inspection: ▪ Is the belt dirty? If so, replace the belt. ▪ Is the surface damaged? If so, replace the belt. ▪ Is the belt bulging up? If so, correct the belt tension and adjustment.
Weekly	Round belt	Visual inspection: ▪ Are the belts worn or damaged? If so, replace the belt.
Weekly	Idler rollers	Inspection: ▪ Is there abnormal running noise? If so, check or replace the idler rollers.
Depending on the individual case	Gear motor Observe the operating instructions provided by the manufacturer.	Gear: ▪ Are there patches of oil under the gear unit? If so, seal off the leak and correct the oil level. ▪ Check the fixation and alignment. ▪ Is there abnormal running noise? Check the bearings. Motor: ▪ Check the cable routing and temperature. ▪ Is there abnormal running noise? Check the bearings. ▪ Clean the cooling fins and air inlets.
Monthly	Flange bearings	Inspection: ▪ Can abnormal running noise be heard from the bearings? If so, replace the bearings. ▪ Compare the bearing temperatures. If one of them has a significantly higher temperature, replace the bearing.
Every 6 months	Joining elements	Check that bolts subject to dynamic load are tight.
Quarterly	Example*: Bottom conveyor track covers, drive stations	Inspection: ▪ Is there any soiling? If so, remove and clean the covers.
Quarterly	Supports with rubber-metal buffers	Visual inspection: ▪ Rubber-metal buffer damaged? If so, replace rubber-metal buffer. ▪ Rubber-metal buffer loose? If so, tighten the joining elements.

* in a plant network with the same conveyor type and the same operating conditions.

For information on how to carry out maintenance and repair work, please refer to the section entitled "Repair" in these operating instructions.

Cleaning and care

DANGER

Danger of injury from particles that shoot out when working with compressed air!

Blindness and injuries to the skin are possible.

➔ Wear personal protection equipment

➔ Wear safety goggles

DANGER

Increased risk of accident due to:

Exposed machine parts when protective devices are removed.

➔ Do not reach into the running machine.

➔ Do not access the machine.

➔ Take the machine out of operation during cleaning work that does not require it to be running.

➔ Secure the machine against being switched on again.

Clean the machine regularly and appropriately for the degree of soiling. It may only be cleaned dry (with a brush, cloth, compressed air, etc.). Make sure that the machine (and especially the electrical components) are protected from moisture.

Repair

Spare part purchasing

Only genuine TRANSNORM SYSTEM GmbH spare parts may be used. DIN parts may be ordered from specialist retailers.

When making inquiries or placing orders, we recommend sending a copy of the spare parts list to our customer service department, stating the type and amount of parts required. The address is given at the beginning of these operating instructions.

The spare parts list forms part of the technical order documentation.

The work steps described in this section must be carried out by technical personnel only.

Tools, equipment and supplies

Tools, equipment and supplies

Tools	Auxiliary equipment	Equipment
Tool kit (spanner, turn-screw, pliers...)	Pneumatic screwdriver	Electricity and voltage supply
Torque wrench	Toothed belt tension meas-uring tool, mechanical	Compressed air supply for cleaning work
Circlip pliers	Device for lifting and lowering the machine or parts of it	
Combination spanner 10 13 14 15 17 19 22 and 24 mm	Trolley, movable platforms with automatic locking device	
Hexagon socket wrench 2 2.5 3 4 5 6 and 8 mm	Ladders, steps, pedestals on working platforms	
Hexagon socket wrench with ball head 5 and 6 mm	Assembly paste	

Tightening torques

The tightening torque requirements are based on an average coefficient of friction µtot=0.125. They must be followed for screwed connections.

The tightening torques for special connections are stated in the drawings.

Tightening torques

Data for screw connections on steel parts						
	Galvanised screws			Black, untreated screws		
	Tightening torque [Nm]			Tightening torques [Nm]		
d	5.6	8.8	10.9	5.6	8.8	10.9
M5	2.5	5.4	7	2.8	6	8
M6	4.5	9.5	13	4.8	10	14
M8	11	23	32	12	25	35
M10	22	46	64	23	49	69
M12	38	80	110	40	86	120
M14	60	125	180	64	135	190
M16	92	195	275	98	210	295

Data for screw connections on aluminium parts		
	Galvanised screws	
	Tightening torque [Nm]	
d	5.6	8.8/10.9
M5	2.5	5.4
M6	4.5	9.5
M8	11	23
M10	22	46
M12	28	80
M14	60	125
M16	92	195

When using taperlock bushes for drive elements, heed the following tightening torques.

Tightening torque

Bush no.	1008 1108	1310 1315	1210 1215	1610 1615	2012 2017	2517 2525
Tightening torque [Nm]	5.6	20	20	20	30	50
	Check the tightening torques after 1 hour of operation.					

Replacing a side guide

The side guide must be removed for certain maintenance and repair work, but not replaced. When replacing the side guide, have the new side guide as shown in the spare parts list to hand.

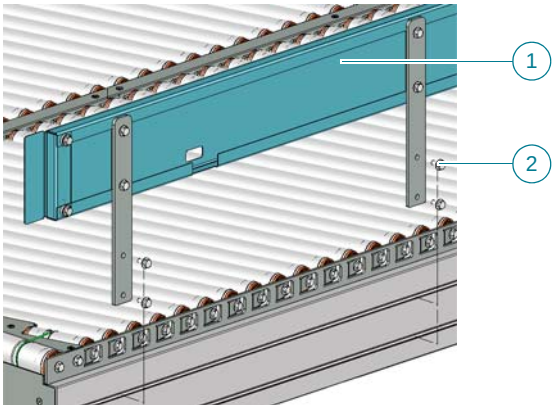
Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.

➔ Removing the side guide

Carry out the following work steps: on both sides

1. Undo the joining elements (1).
2. Remove the side guide (2).



✓ The side guide is removed.

➔ Fitting the side guide

Carry out the following work steps:

➔ Fitting must be carried out in reverse order.
↳ The side guide is aligned.

✓ The side guide has been fitted.

✓ The side guide has been replaced.

Replacing the idler rollers (TS 2960)

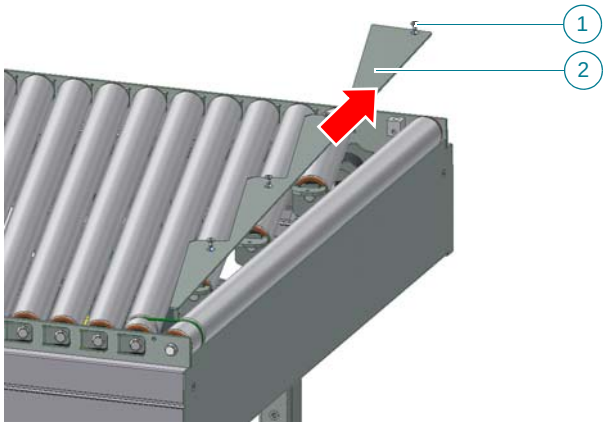
Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.

➔ Remove the finger guard if necessary

Carry out the following work steps:

1. Undo the joining elements (1).
2. Remove the finger guard (2).

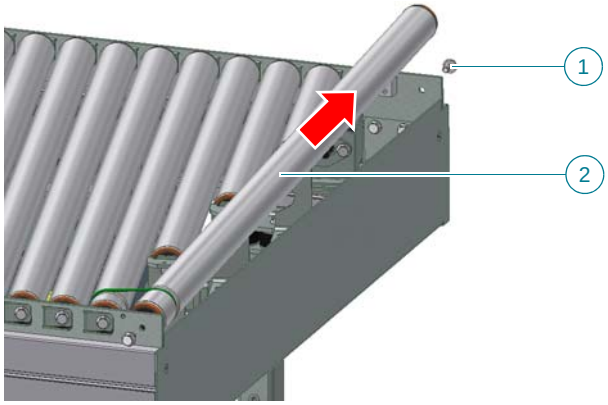


✓ The finger guard has been removed.

➔ Removing the idler rollers

Carry out the following work steps:

1. Remove the joining elements (1) on both sides.
2. Remove the idler rollers (2).



✓ The idler rollers have been removed.

➔ Installing the idler rollers

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The idler rollers have been installed.

➔ Fitting finger guard if necessary

Carry out the following work steps:

➔ The fitting must be carried out in reverse order.

✓ The finger guard has been fitted.

✓ The idler rollers have been replaced.

Replacing the idler rollers (TS 2961 & TS 2962)

Precondition:

✓ The machine has been taken out of operation.

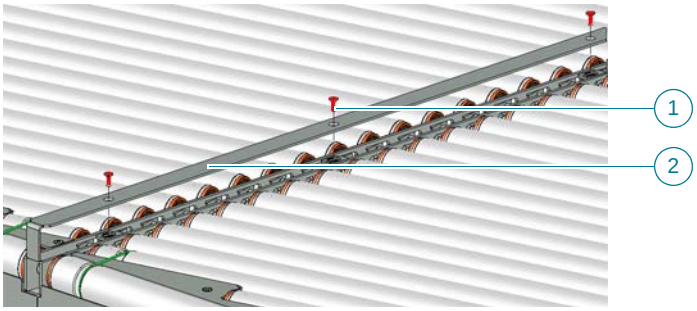
✓ The machine has been secured against being switched on again.

✓ The side guide has been removed.

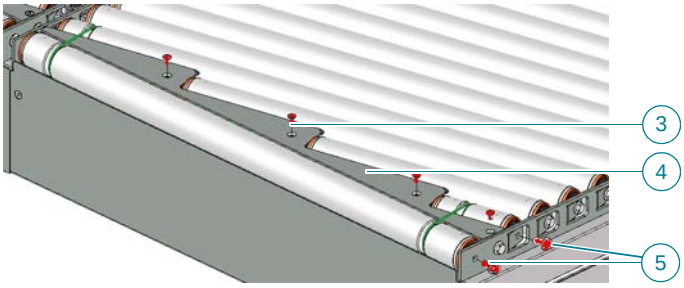
➔ Removing the idler rollers

Carry out the following work steps:

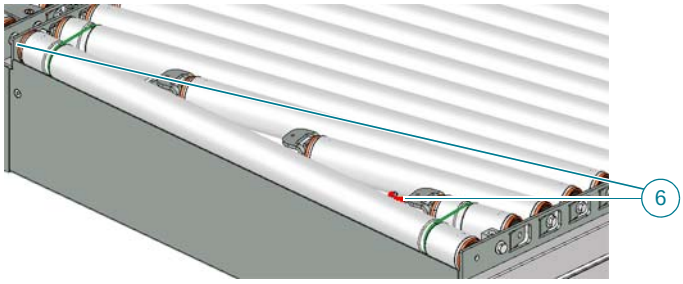
1. Remove the joining elements (1) and transfer plates (2).



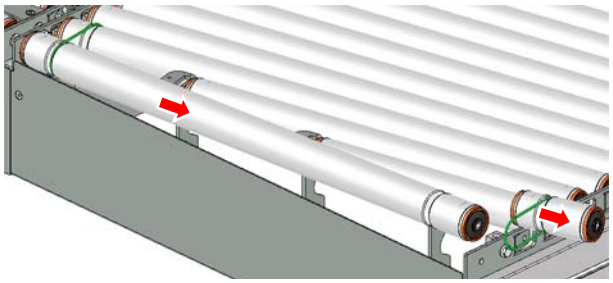
2. Remove the joining elements (3) and finger guard (4).



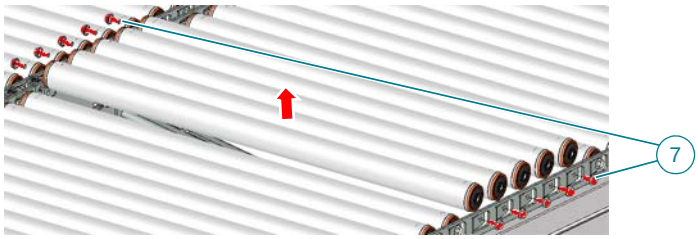
3. Undo the joining elements (5).
4. Remove the joining elements (6).



5. Remove the idler rollers.



6. Remove the joining elements (7).



7. Remove the idler rollers.

✓ The idler rollers have been removed.

➔ Installing the idler rollers

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The idler rollers have been installed.

➔ Install the side guide.

Carry out the following work steps:

➔ Proceed as described in "Replacing the side guide".

✓ The side guide has been fitted.

✓ The idler rollers have been replaced.

Replacing pressure rollers

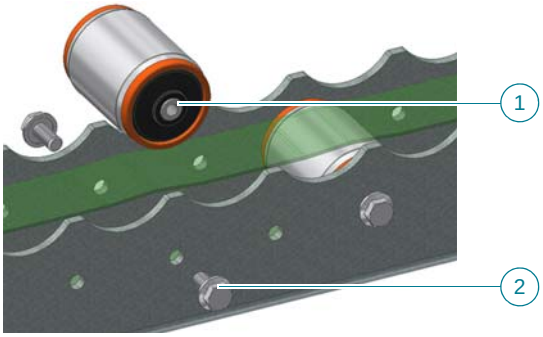
Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.
- ✓ The finger guard has been removed.
- ✓ The drive belt has been loosened.
- ✓ The corresponding idler rollers have been removed.

➔ Removing pressure rollers

Carry out the following work steps:

1. Remove the joining elements (2) on both sides.



2. Remove the pressure rollers (1).

✓ The pressure rollers have been removed.

➔ Installing pressure rollers

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The pressure rollers have been installed.

➔ Installing the idler rollers

Carry out the following work steps:

➔ Proceed as described in "Replacing the idler rollers".

✓ The idler rollers have been installed.

➔ Fitting the finger guard

Carry out the following work steps:

➔ Proceed as described in "Replacing the idler rollers".

✓ The finger guard has been fitted.

➔ Tensioning and adjusting the drive belt

Carry out the following work steps:

➔ Proceed as described in "Loosening/tensioning and adjusting the drive belt."

✓ The drive belt has been tensioned and adjusted.

✓ The pressure rollers have been replaced.

Replacing deflection drums (drive train)

Precondition:

✓ The machine has been taken out of operation.

✓ The machine has been secured against being switched on again.

✓ The drive belt has been loosened.

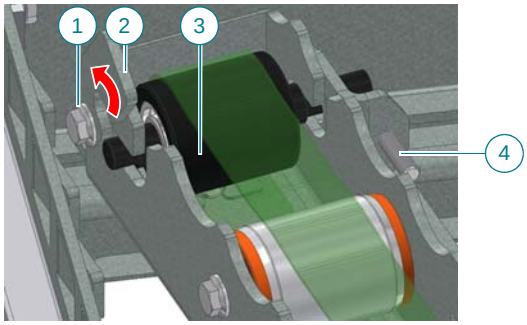
✓ The finger guard has been removed.

✓ The corresponding idler rollers have been removed.

➔ Removing the deflection drum (drive train)

Carry out the following work steps:

1. Undo the joining elements (1).



2. Turn back the locking element (2) in the direction of the arrow.

3. Release the adjusting screw (4).

4. Remove the deflection drum (3).

✓ Deflection drum (drive train) has been removed.

➔ Installing the deflection drum (drive train)

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The deflection drum (drive train) has been installed.

➔ Fitting the idler rollers

Carry out the following work steps:

➔ Proceed as described in "Replacing the idler rollers.“

✓ The idler rollers have been fitted.

➔ Fitting the finger guard

Carry out the following work steps:

➔ Proceed as described in "Replacing the idler rollers"

✓ The finger guard has been fitted.

➔ Tensioning and adjusting the drive belt

Carry out the following work steps:

➔ Proceed as described in "Loosening/tensioning and adjusting the drive belt."

✓ The drive belt has been tensioned and adjusted.

✓ The deflection drums (drive train) have been replaced.

Replacing deflection drums (drive station)

Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.
- ✓ The drive belt has been loosened.
- ✓ One deflection drum (drive train) has been removed.

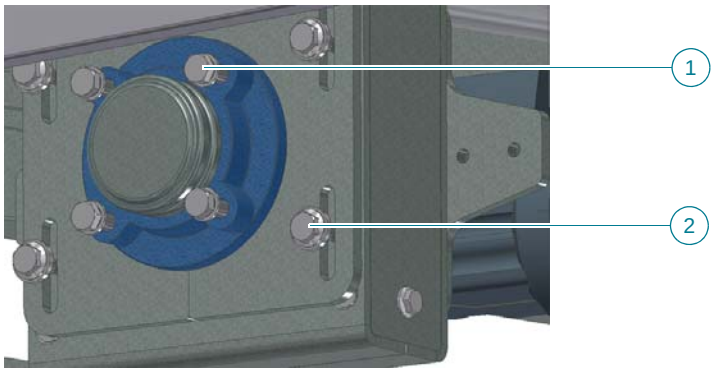
➔ Removing the deflection drums (drive station)

WARNING

Increased risk of accident!
The motor can tip over and crush body parts.
➔ Secure the motor to prevent it falling.
➔ Use hoists to lift the motor on and off.

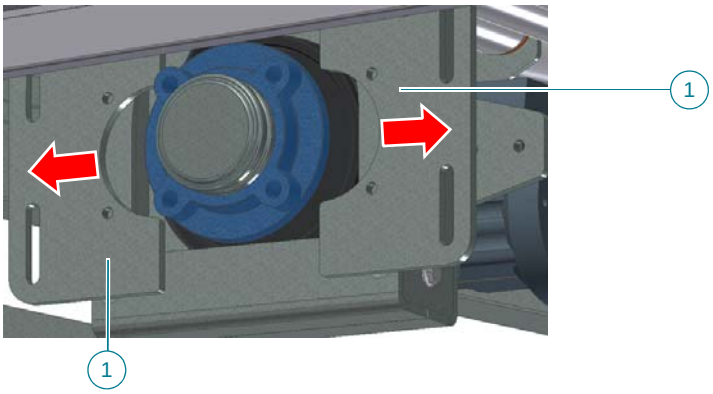
Carry out the following work steps:

1. Remove the joining elements (1).

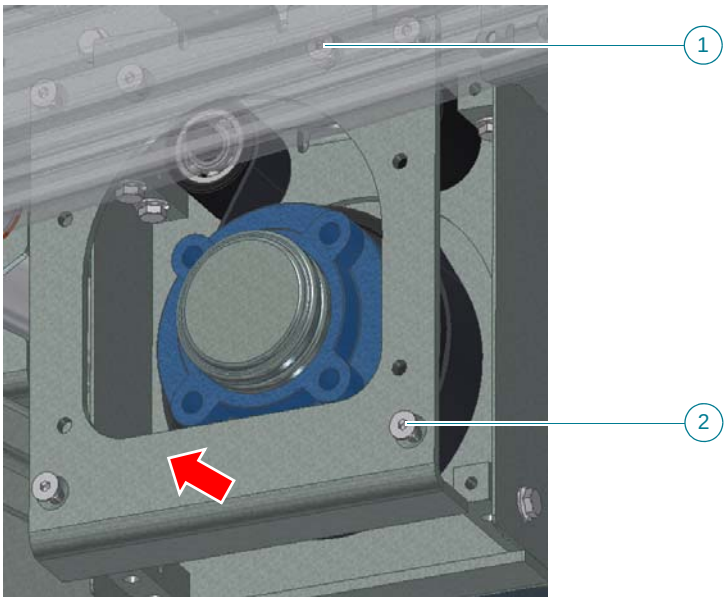


2. Remove the joining elements on both bearing plates (2).

3. Remove the bearing plates (1) by pushing to the side.

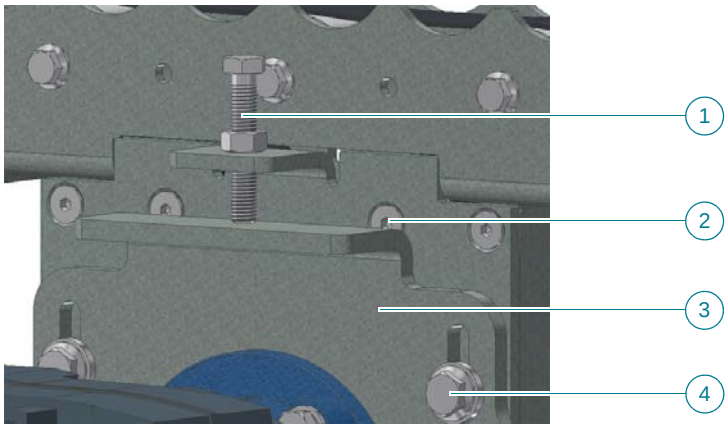


4. Undo the joining elements of the deflection drums on the outside of the conveyor (1).



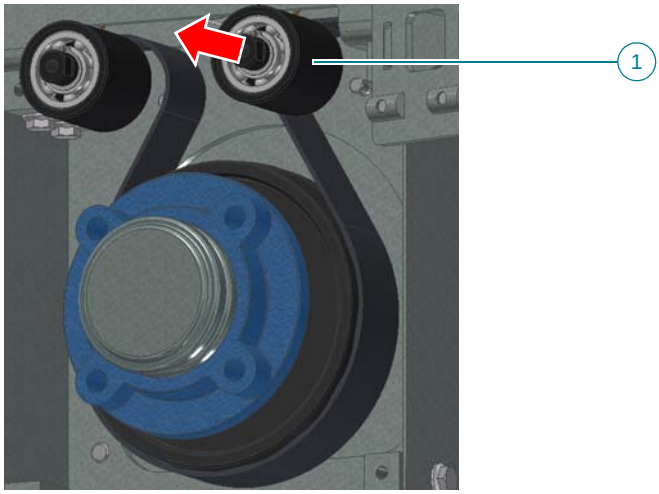
5. Remove the joining elements of the side part of the housing (2) and remove the side part.

6. Undo the joining elements of the deflection drums on the inside of the conveyor (2).



? *Joining elements of the deflection drums (2) on the inside of the conveyor not accessible?*
➔ Undo the joining elements (4).
➔ Push the side part (3) of the housing with motor downwards.
➔ Re-tighten the joining elements (4).

7. Remove the deflection drums (1).



✓ The deflection drums (drive station) have been removed.

➔ Installing the deflection drums (drive station)

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The deflection drums (drive station) have been installed.

➔ Installing the deflection drum (drive train)

Carry out the following work steps:

➔ Proceed as described in "Replacing deflection drums (drive train)".

✓ The deflection drum (drive train) has been installed.

➔ Tensioning and adjusting the drive belt

Carry out the following work steps:

➔ Proceed as described in "Loosening/tensioning and adjusting the drive belt."

✓ The drive belt has been tensioned and adjusted.

✓ The deflection drums (drive station) have been replaced.

Replacing the gear motor

When replacing the gear motor, obtain the new gear motor according to the spare parts list and prepare it according to the manufacturer's specifications.

Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.
- ✓ The motor has cooled down.
- ✓ If there is insufficient space, the corresponding idler rollers have been removed.

➔ Removing the gear motor

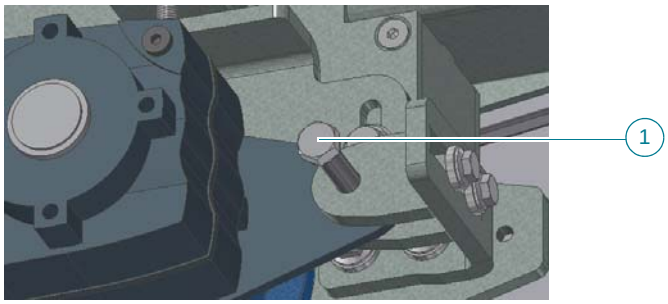
WARNING

Increased risk of accident!
The motor may tip over and crush body parts.
➔ Secure the motor to prevent it falling.
➔ Use hoists to lift the motor on and off.

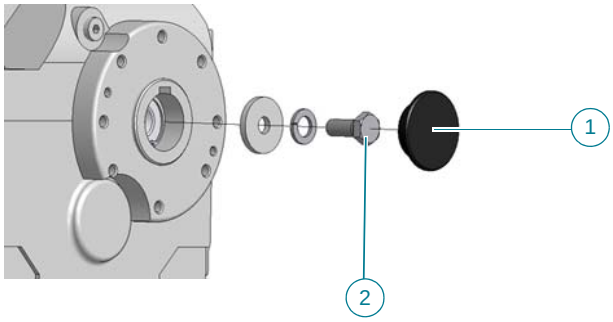
Carry out the following work steps:

1. Observe the motor manufacturer's installation and operating instructions.
2. Remove all the power supply lines from the motor.

3. Remove the joining elements on the bracket of the torque arm (2).



4. Remove the cover (1).



5. Undo the joining elements (2).
6. Pull the gear motor off the shaft and place it on a suitable support.

✓ The gear motor has been removed.

➔ Installing the gear motor

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The gear motor has been installed.

➔ Installing the idler rollers

Carry out the following work steps:

➔ Proceed as described in "Replacing the idler rollers".

✓ The idler rollers have been fitted.

✓ The gear motor has been replaced.

Replacing the flange bearing (outside)

Precondition:

✓ The machine has been taken out of operation.

✓ The machine has been secured against being switched on again.

➔ Removing the flange bearing (outside)

WARNING

Increased risk of accident!

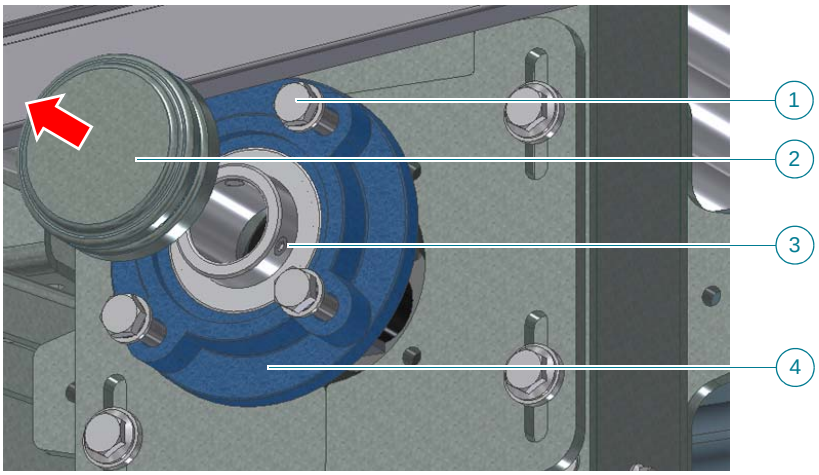
The motor may tip over and crush body parts.

➔ Secure the motor to prevent it falling.

➔ Use hoists to lift the motor on and off.

Carry out the following work steps:

1. Remove the protective cap (2).



2. Loosen the grub screws (3).
3. Undo the joining elements (1).
4. Pull the flange bearing (4) off the shaft.

✓ The flange bearing (outside) has been removed.

➔ Installing the flange bearing (outside)

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The flange bearing (outside) has been installed.

✓ The flange bearing (outside) has been replaced.

Replacing the flange bearing (motor side)

Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.
- ✓ The gear motor has been removed.

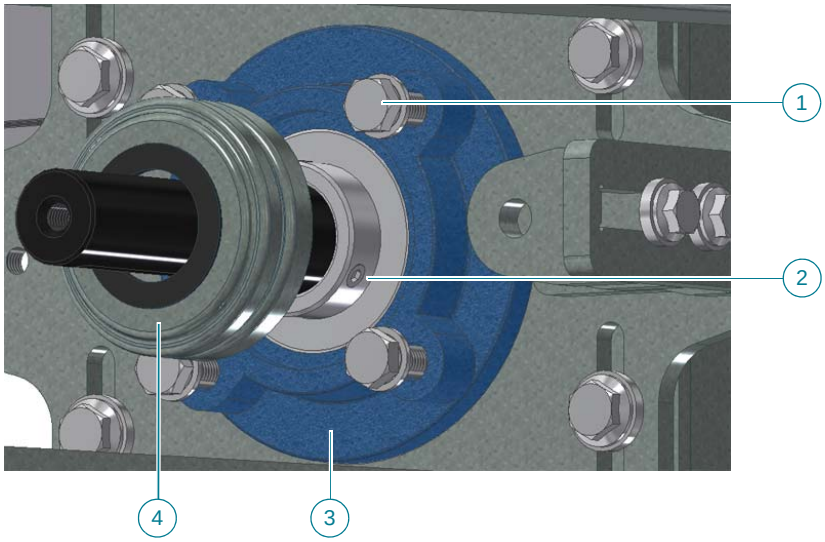
➔ Removing the flange bearing (motor side)

WARNING

Increased risk of accident!
The motor may tip over and crush body parts.
➔ Secure the motor to prevent it falling.
➔ Use hoists to lift the motor on and off.

Carry out the following work steps:

1. Remove the protective cap (4).



2. Loosen the grub screws (2).
3. Undo the joining elements (1).
4. Pull the flange bearing (3) off the shaft.

✓ The flange bearing (outside) has been removed.

➔ Installing the flange bearing (motor side)

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The flange bearing (motor side) has been installed.

➔ Installing the gear motor

Carry out the following work steps:

➔ Carry out the work steps described in "Replacing gear motor".

✓ The gear motor has been installed.

✓ The flange bearing (motor side) has been replaced.

Replacing the drive pulley

Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.
- ✓ The drive belt has been loosened.
- ✓ The flange bearing (outside) has been removed.

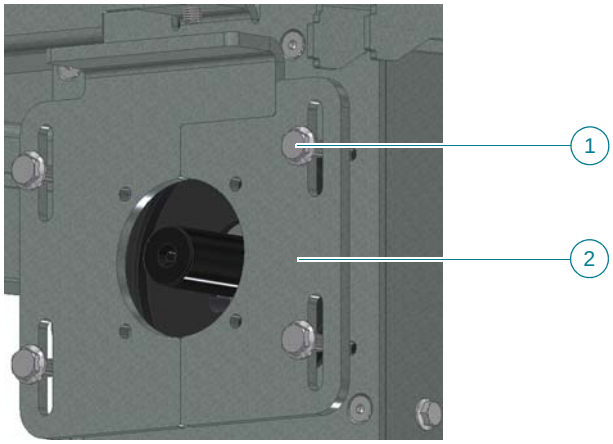
➔ Removing the drive pulley

WARNING

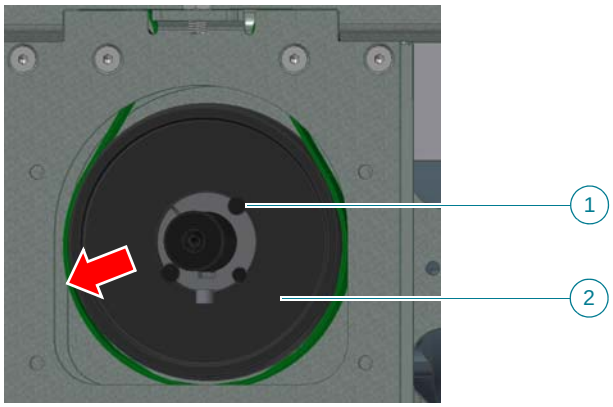
Increased risk of accident!
The motor may tip over and crush body parts.
➔ Secure the motor to prevent it falling.
➔ Use hoists to lift the motor on and off.

Carry out the following work steps:

1. Remove the joining elements (1) and bearing plates (2).



2. Remove the grub screws (1).



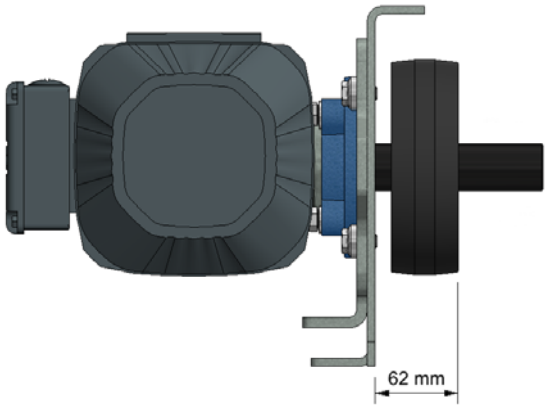
3. Pull off the drive pulley (2) with taper lock bushing.

✓ The drive pulley has been removed.

➔ Installing the drive pulley

Carry out the following work steps:

➔ Installation must be carried out in reverse order.



↳ Align the drive pulley flush.

✓ The drive pulley has been installed.

➔ Installing the flange bearing (outside)

Carry out the following work steps:

➔ Proceed as described in "Replacing flange bearing (outside)."

✓ The flange bearing (outside) has been installed.

➔ Tensioning and adjusting the drive belt

Carry out the following work steps:

➔ Proceed as described in "Loosening/tensioning and adjusting the drive belt."

✓ The drive belt has been tensioned and adjusted.

✓ The drive pulley has been replaced.

Replacing the drive belt

There are two different ways of replacing the drive belt.
The method described first and recommended by TRANSNORM SYSTEM GmbH involves installing a drive belt with no endless splicing and connecting with a belt welding set.
The second method describes how an endless drive belt is installed.

Drive belt, with no endless joint

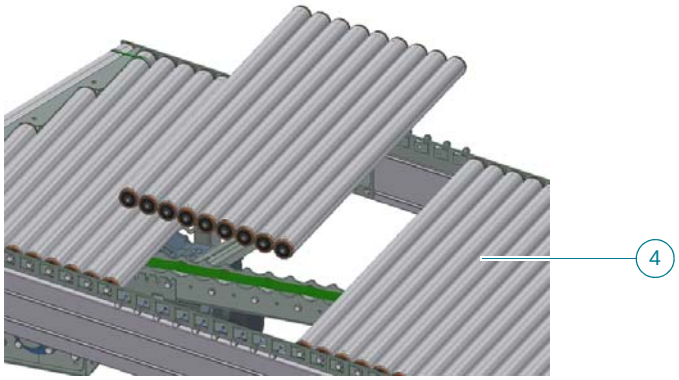
Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.
- ✓ The drive belt has been loosened.

➔ Removing the idler rollers

Carry out the following work steps:

➔ In an easily accessible position, remove enough idler rollers to enable the belt welding set to be used safely.
Proceed as described in "Replacing the idler rollers.“



✓ The idler rollers have been removed.

➔ Replacing the drive belt

Carry out the following work steps:

1. Cut the old belt at an easily accessible point.
2. Connect one end of the open new belt temporarily to one end of the old belt.
3. Fit the new belt by pulling out the old belt.

↳ Check the belt run.

4. Using a belt welding set, join both ends of the new drive belt as described in the manufacturer's specifications and instructions.

✓ The drive belt has been replaced.

➔ Installing the idler rollers

Carry out the following work steps:

➔ Proceed as described in "Replacing the idler rollers".

✓ The idler rollers have been installed.

➔ Tensioning and adjusting the drive belt

Carry out the following work steps:

➔ Proceed as described in "Loosening/tensioning and adjusting the drive belt."

✓ The drive belt has been tensioned and adjusted.

✓ The drive belt has been replaced.

Drive belt, endless joint

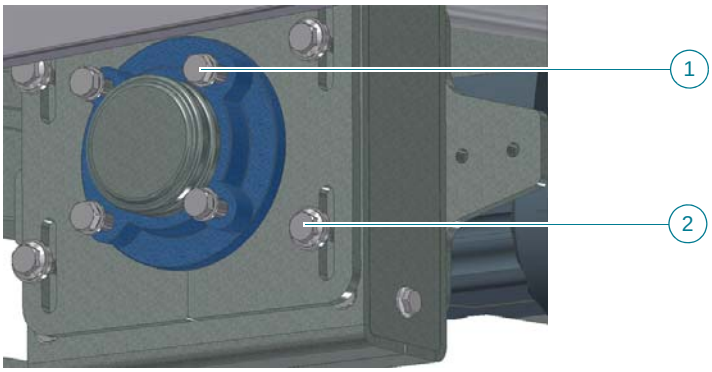
Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.
- ✓ The drive belt has been loosened.
- ✓ The idler rollers have been removed.
- ✓ The pressure rollers have been removed.
- ✓ The deflection drums (drive train) have been removed at both ends.

➔ Removing the drive belt

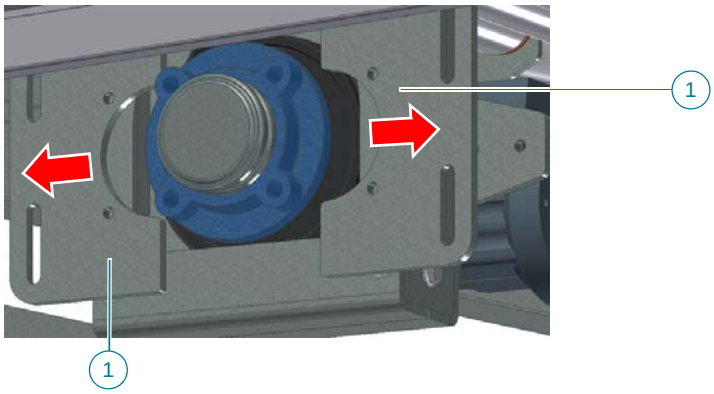
Carry out the following work steps:

1. Remove the joining elements (1).

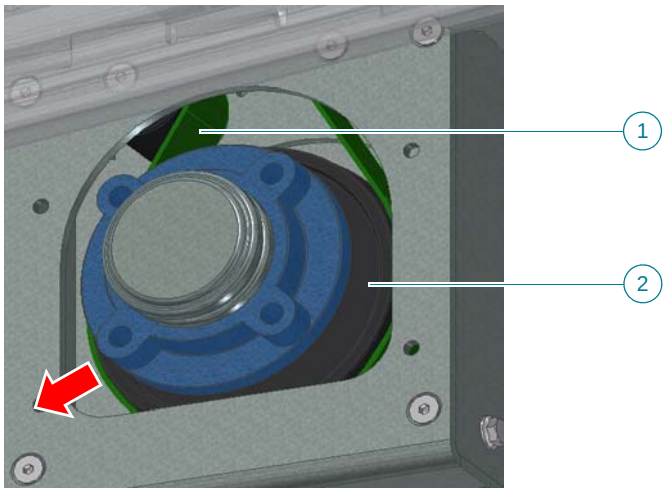


2. Remove the joining elements on both bearing plates (2).

3. Remove the bearing plates (1) by pushing to the side.



4. Pull the drive belt (1) off the drive pulley (2) through the opening in the side part of the housing.



5. Remove the drive belt by pulling upwards.

✓ The drive belt has been removed.

➔ Installing the drive belt

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

↳ Check the belt run.

✓ The drive belt has been installed.

➔ Installing the idler rollers

Carry out the following work steps:

➔ Proceed as described in "Replacing the idler rollers.“

✓ The idler rollers have been installed.

➔ Tensioning and adjusting the drive belt

Carry out the following work steps:

➔ Proceed as described in "Loosening/tensioning and adjusting the drive belt."

✓ The drive belt has been tensioned and adjusted.

✓ The drive belt has been replaced.

Loosening/tightening and adjusting the drive belt

Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.

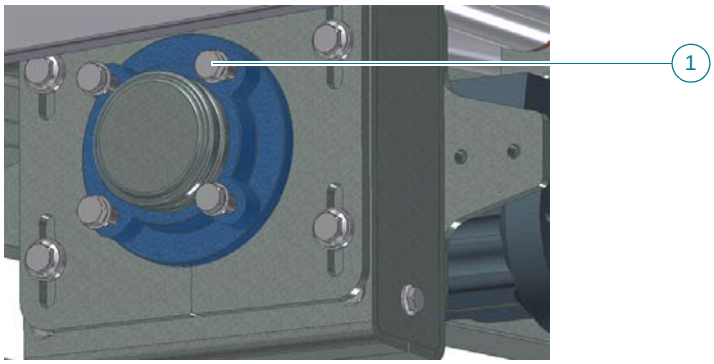
➔ Loosening the drive belt

WARNING

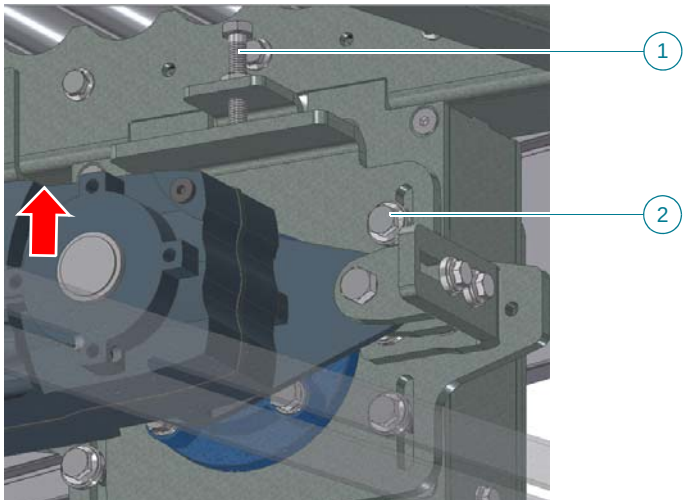
Increased risk of accident!
The motor may tip over and crush body parts.
➔ Secure the motor to prevent it falling.
➔ Use hoists to lift the motor on and off.

Carry out the following work steps:

1. Undo the joining elements (1).



2. Undo the joining elements on the bearing plate (2).



3. Undo the adjusting screws (1) on both sides.
4. Lift the motor and re-tighten the joining elements on the bearing plate (2).
5. Tighten the joining elements on the flange bearing (outside).

✓ The drive belt has been loosened.

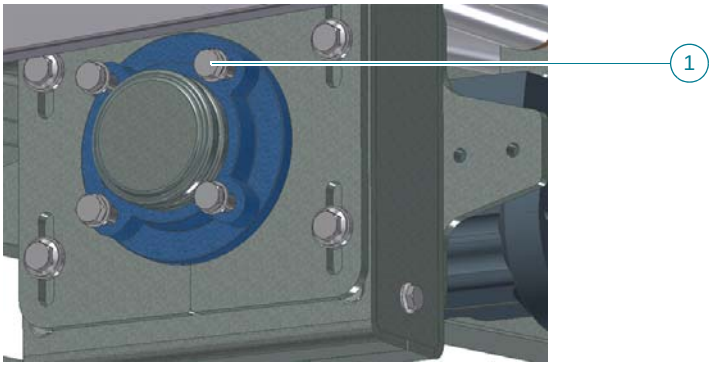
➔ Tightening the drive belt

WARNING

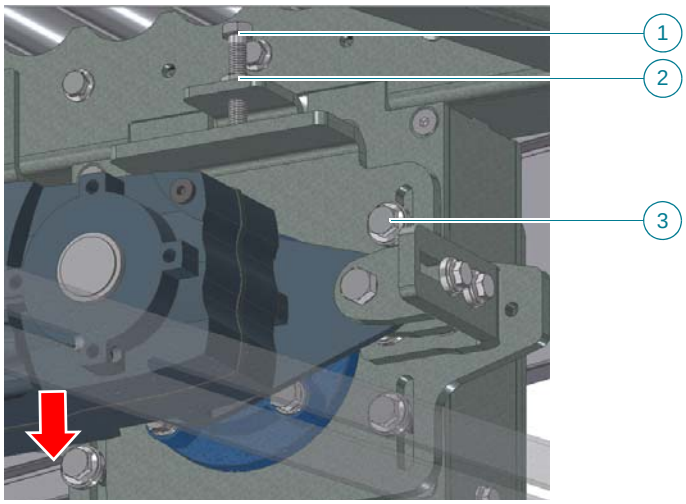
Increased risk of accident!
The motor may tip over and crush body parts.
➔ Secure the motor to prevent it falling.
➔ Use hoists to lift the motor on and off.

Carry out the following work steps:

1. Undo the joining elements (1).



2. Undo the joining elements on the bearing plate (3).



When tightening, the belt may only be stretched by maximum 0.5 %.
To check, mark the belt with adhesive tape or a thin felt-tip pen.

3. Lower the motor to set the required belt tension by screwing in the adjusting screws (1) on both sides.
4. Re-tighten the joining elements on the bearing plate (3).
5. Tighten the counternuts (2) on both sides.
6. Tighten the joining elements on the flange bearing (outside).

✓ The drive belt has been tensioned.

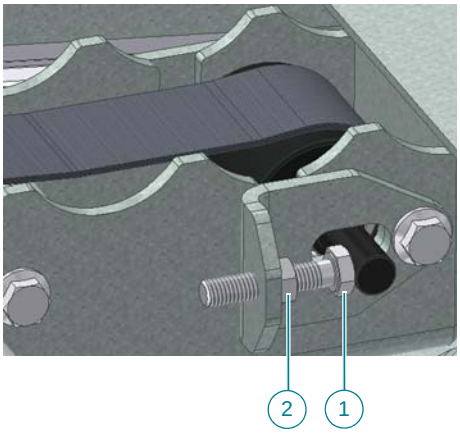
➔ Adjusting the drive belt

WARNING

Risk of injury due to exposed machine parts!
Parts of the body, hair and clothing can become caught and crushed in rotating machine parts.
➔ Wear close-fitting protective clothing.
➔ Use a hairnet to cover long hair.

Carry out the following work steps:

1. Release the counternuts (2) on both deflection drums of the drive train.
2. Adjust the belt by means of adjusting screw (1) on both deflection drums.



↳ There is a delay before the belt responds to the adjustment. Therefore, only adjust the screws a little at a time. Wait for several belt cycles before adjusting again.

3. Switch on the machine.
4. Check that the belt runs correctly.
5. Switch off the machine.
6. Repeat steps 1 to 4 until the belt shows an accurate running cycle.
7. Tighten the counternuts (2) on both deflection drums.

✓ The drive belt has been adjusted.

✓ The drive belt is loosened / tightened and adjusted.

Replacing the round belt

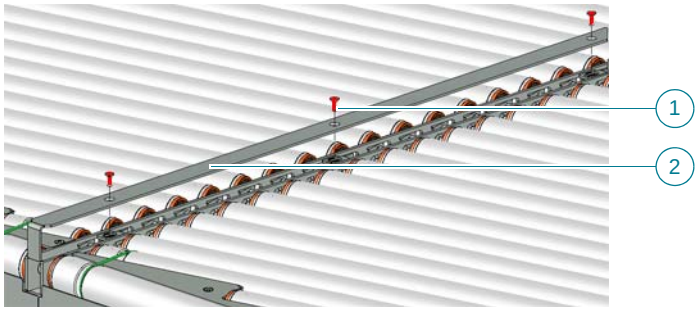
Precondition:

- ✓ The machine has been taken out of operation.
- ✓ The machine has been secured against being switched on again.
- ✓ The side guide has been removed.

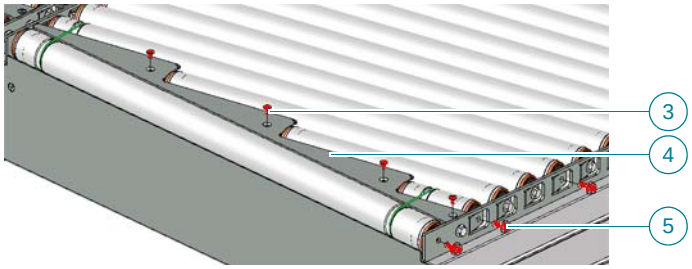
➔ Removing the round belt

Carry out the following work steps:

1. Remove the joining elements (1) and transfer plates (2).

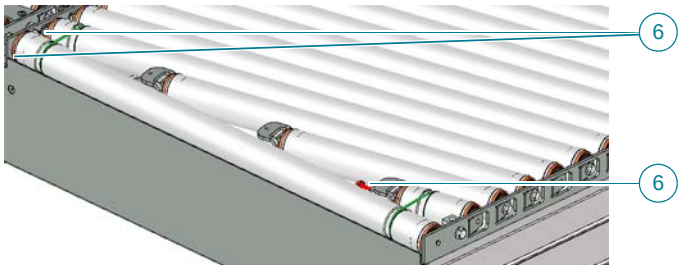


2. Remove the joining elements (3) and finger guard (4).

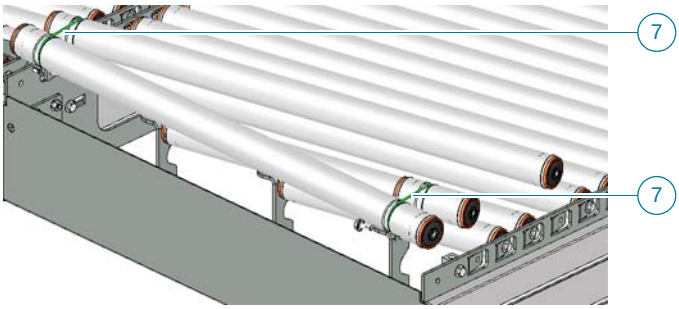


3. Undo the joining elements (5).

4. Undo the joining elements (3).



5. Raise the idler rollers and remove the round belt (7).



✓ The round belts have been removed.

➔ Installing the round belt

Carry out the following work steps:

➔ Installation must be carried out in reverse order.

✓ The round belts have been installed.

✓ The round belts have been replaced.

Fault elimination

This section provides information on what to do if a fault occurs. A fault can have various different causes.

For instructions on the respective fault clearances that may be carried out by technical personnel as defined in "Personnel qualification", please refer to the section "Repair". It is essential to heed the safety instructions in the respective section.

What to do if ...

Mechanical faults

Detected fault	Possible cause	Action for remedying the fault
Machine shuts down	Power supply disrupted, Error message	Have technical personnel establish the cause and eliminate the problem
	Motor defective	Replace the motor
Machine shutdown with running motor	Drive belt slips	▪ Check the belt tension, increase if necessary ▪ Replace the belt ▪ Check all driven shafts for smooth running
	Drive belt torn	
Noise development in idler rollers/deflection drums	Inner bearing ring turning on shaft, bearing defective	Replace the idler rollers/deflection drums

For information on how to rectify the respective fault, refer to the section entitled "Repair" in these operating instructions.

Motor and gear unit

If the drive motor has a fault, please refer to the operating instructions of the motor manufacturer for information on fault clearance.

The operating instructions of the motor are an integral part of the installation.

Decommissioning and waste disposal

Machine disposal

Please comply with local regulations on waste disposal when disposing of the entire machine or parts of it. The regulations will tell you if the machine has to be dismantled for disposal, and to what extent, and how the individual components can be supplied for recycling.

Also observe the instructions for information regarding the individual components of the machine.

Carry out the following procedures:

1. Put the machine out of operation and disconnect from electrical power supply.
2. Drain and dispose of all consumable materials.
3. Dismantle the machine according to the guidelines and regulations valid in the country of use.

✓ The machine has been disposed of.

Main components of the machine

The following table provides information on the different construction materials generally found in machine's main components.
Actual materials may vary depending on the individual design.

Main components of the machine

Machine parts	Material
Cover	Aluminium plate Steel plate
Bed	Wood Polyethylene (PE) (Stainless) steel
Drive belt, conveyor belt	Polyurethane (PUR) Polyvinyl chloride (PVC)
Conveyor roller	Plastic Steel
Gear motor	Cast iron Copper Steel
Base frame, support	Aluminium Steel
Pulley	Steel Polyurethane (PUR) coated steel

Contact details

In the event of uncertainty or problems during installation, maintenance, repair or operation of the machine, please first consult the corresponding section of the operating instructions.
If this information does not solve your problem, please contact TRANS-NORM SYSTEM GmbH.

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Suggestions and information

...on this documentation or the machine should be sent to the first address listed above.