Modular units for transfer system TS 5
The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

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Language versions:
- DE: Transfersystem TS 5 – Baueinheiten, 3 842 540 375
- EN: Modular units for transfer system TS 5, 3 842 539 959
- FR: Composants du système de transfert TS 5, 3 842 539 960
- IT: Componenti del sistema di trasferimento TS 5, 3 842 539 962
- ES: Unidades constructivas del sistema transfer TS 5, 3 842 539 963
- PT: Unidades de construção do sistema transfer TS 5, 3 842 539 964
- CS: Konstrukční jednotky dopravnikového systému TS 5, 3 842 539 954
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1 About This Document

These instructions contain important information on the safe and appropriate assembly, transport, commissioning, operation, maintenance, disassembly and simple troubleshooting of the TS 5 modular units.

- Read these instructions completely, especially chapter “General Safety Instructions” 6, before working with the TS 5 modular units.

1.1 Related documents

The TS 5 transfer system is a system component.

- Also observe the instructions for the other system components.
- Also observe the following instructions:
  - 3 842 527 147: “Instructions for Employees on Safety”
  - System documentation from the manufacturer

- Also observe the generally applicable, legal or otherwise binding regulations of the European or national legislation and the rules for the prevention of accidents and for environmental protection applicable in your country.

1.2 Abbreviations used

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 5/...</td>
<td>Drive unit</td>
</tr>
<tr>
<td>CU 5/...</td>
<td>Curve</td>
</tr>
<tr>
<td>DI 5/...</td>
<td>Diverter</td>
</tr>
<tr>
<td>HQ 5</td>
<td>Lift transverse unit</td>
</tr>
<tr>
<td>JU 5/...</td>
<td>Junction</td>
</tr>
<tr>
<td>PE 5</td>
<td>Positioning unit</td>
</tr>
<tr>
<td>ST 5/...</td>
<td>Conveyor unit</td>
</tr>
<tr>
<td>SZ 5/...</td>
<td>Leg set</td>
</tr>
<tr>
<td>TS 5</td>
<td>Transfer system</td>
</tr>
<tr>
<td>VE 5/...</td>
<td>Stop gate</td>
</tr>
</tbody>
</table>
1.3 Symbols used

Connect with T-bolt and flange nut.
Make sure the T-bolt is in the correct position when inserting and tightening in the groove. The notch at the end of the bolt indicates the T-bolt orientation.
1 = T-bolt insertion orientation in the groove.
2 = T-bolt clamping position in the groove.
Maximum tightening torque: 25 Nm

Wrench for hexagonal screw
SW = wrench size (WS) ... mm
MD = required tightening torque ... Nm

Wrench for hex-socket screw
SW = wrench size (WS) ... mm
MD = required tightening torque ... Nm

Screwdriver for recessed head screws
PZ ... = Pozidriv recessed head, size ...
PH ... = Phillips recessed head, size ...

Grease/grease with a specific lubricating grease
• gleitmo 585 K: gleitmo 585 K, www.fuchs-lubritech.com
• Anti-Seize: Food grade anti-seize/Loctite 8014, www.henkel.com

The identified parts are not required for the assembly situation described. Use the parts in another application or dispose of them.

2 General Safety Instructions

The TS 5 modular units have been manufactured according to the accepted rules of current technology. Even so, there is a risk of injury or damage if the following general safety instructions and the warning notes before specific steps given in this manual are not observed.

- Read these instructions completely and thoroughly before working with the TS 5 modular units.
- Read and observe the “Instructions for Employees on Safety” (3 842 527 147) completely and thoroughly before working with the TS 5 modular units.
- Keep these instructions in a location where they are accessible to all users at all times.
- Always include the operating instructions when you pass the TS 5 modular units on to third parties.
2.1 Intended use

TS 5 modular units are components in terms of the EU Machinery Directive 98/37/EC (partial machines). From December 29, 2009, TS 5 modular units are incomplete machines in terms of the Machinery Directive 2006/42/EC. TS 5 modular units are not ready-for-use machines in terms of the EU Machinery Directive. TS 5 modular units are exclusively intended for integration in a machine or system or assembly with other components to form a machine or system. TS 5 modular units may be commissioned only if they have been integrated in the machine/system for which they are designed and the machine/system fully complies with the EC Machinery Directive.

When combined, TS 5 modular units are designed to transport and position WT 5 workpiece pallets.

Despite careful technical development, there are some residual hazards when operating TS 5 modular units. These must be ruled out as far as possible if installing TS 5 modular units in a machine or system.

List of residual hazards → 81, Chapter 7: “Commissioning”.

The designer of a system consisting of TS 5 modular units is obligated to conduct a risk assessment and, if necessary, derive measures to ensure safe operation.

The TS 5 modular units:
- CU 5/… curve
- DI 5/… diverter
- JU 5/… junction
- VE 5/… stop gate
- PE 5 positioning unit
- HQ 5 lift transverse unit

are not intended for direct use in the work area (for a definition, please see DIN EN 619, Safety and EMC requirements for equipment for mechanical handling of unit loads).

If these TS 5 modular units are used in the work area, the operator must observe the operating conditions and performance limits specified in the Technical Data (→ 107).

TS 5 modular units are work appliances for the industrial sector and are not designed for private use.

Intended use includes having read and understood these instructions, especially chapter 2 “General Safety Instructions”.

2.2 Improper use

Any use of the TS 5 modular units other than described in the chapter “Intended use” is considered as improper.

2.3 Personnel qualifications

Assembly, commissioning and operation, disassembly, and service (including maintenance and repair) require basic mechanical, electrical, and pneumatic knowledge, as well as knowledge of the appropriate technical terms. In order to ensure operating safety, these activities may therefore only be carried out by qualified technical personnel or an instructed person under the direction and supervision of qualified personnel.
Qualified personnel are those who can recognize possible hazards and institute the appropriate safety measures due to their professional training, knowledge, and experience, as well as their understanding of the relevant conditions pertaining to the work to be done. Qualified personnel must observe the rules relevant to the subject area.

### 2.4 Warning notes in this document

In this manual, there are warning notes before specific steps whenever there is a danger of personal injury or damage to the equipment. The danger prevention measures described must be observed. Warning notes are set out as follows:

<table>
<thead>
<tr>
<th>SIGNAL WORD</th>
<th>Type of risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Safety sign" /></td>
<td>Consequences</td>
</tr>
<tr>
<td><img src="image2" alt="Signal word" /></td>
<td>Precautions</td>
</tr>
</tbody>
</table>

- Safety sign (warning triangle): draws attention to the risk
- Signal word: identifies the degree of hazard
- Type of risk: identifies the type or source of the hazard
- Consequences: describes what occurs when the safety instructions are not complied with
- Precautions: states how the hazard can be avoided

The signal words have the following meanings:

<table>
<thead>
<tr>
<th>SIGNAL WORD</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER!</td>
<td>Indicates an <strong>imminently</strong> hazardous situation which, if not avoided, will certainly result in death or serious injury.</td>
</tr>
<tr>
<td>WARNING!</td>
<td>Indicates a <strong>potentially</strong> hazardous situation which, if not avoided, could result in death or serious injury.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>Indicates a <strong>potentially hazardous</strong> situation, which, if not avoided, could result in minor or moderate injury or damage to the equipment.</td>
</tr>
<tr>
<td>NOTE!</td>
<td>Indicates a <strong>potentially hazardous</strong> situation, which, if not avoided, could result in damage to the equipment.</td>
</tr>
</tbody>
</table>

If this information is disregarded, the operating procedure may be impaired.
2.5 Observe the following instructions

General notes
• Observe the regulations for accident prevention and environmental protection for the country where the product is used and at the workplace.
• Exclusively use Rexroth products in good technical order and condition.
• Check the product for visible defects.
• Only use the product within the performance range provided in the technical data.
• Persons who assemble, operate, or disassemble Rexroth products must not consume any alcohol, drugs, or pharmaceuticals that may affect their ability to respond.
• Make sure that all safety equipment belonging to the product is present, has been installed properly, and is fully functional. Do not displace, bypass, or disable the safety equipment.
• If it should be necessary to disable any safety equipment temporarily, for example for commissioning or maintenance work, always take the appropriate measures to prevent situations that could endanger persons or property. Also observe the superordinate operating instructions of the machine or system.
• Do not expose the product to any mechanical loads under any circumstances.
• Liability: In no event can the manufacturer accept warranty claims or liability claims for damages arising from improper use of the appliance or from intervention in the appliance other than that described in these instructions.
• Warranty: The manufacturer can accept no warranty claims arising from the use of non-original spare parts!
  MTparts spare parts list: 3 842 529 770
• Environmental protection: Always dispose of parts in the correct manner when replacing parts. Components such as gears contain lubricating oil, which could pollute the environment.

During transport
• Observe the transport instructions on the packaging.

During assembly
• Make sure the relevant system component is not under pressure or voltage before assembling the product or when connecting and disconnecting plugs. Protect the system against being switched on.
• Lay cables and lines so that they cannot be damaged and no one can trip over them.

During commissioning
• Let the product acclimate itself for several hours before commissioning, otherwise water may condense in the housings.
• Make sure that all electrical/pneumatic connections are either used or covered. Check all screwed connections and plugs. All of the relevant protective covers must be assembled. Commission the product only if it is installed completely.
During operation
• Only allow persons who are authorized by the operator to access the system’s direct operating area. This is also valid when the system is standing still.
• In case of an emergency, fault, or any other anomalies, switch the system off and protect it against being switched on again.

During cleaning
• Cover all openings with the appropriate protective equipment in order to prevent detergents from penetrating the system.
• Never use solvents or aggressive detergents. Only clean the product using a slightly damp, lint-free cloth. Only use water to do this and, if necessary, a mild detergent.
• Do not use a high-pressure cleaner for cleaning.

During maintenance and repair
• Perform the prescribed maintenance work at the intervals specified in the operating instructions.
• Make sure that no lines, connectors, or components are disconnected as long as the system is under pressure and voltage. Protect the system against being switched on.

During disposal
Dispose of the product in accordance with the currently applicable national regulations in your country.

2.6 Operator’s obligations
The operator of Bosch Rexroth systems is bound to provide personnel training on a regular basis regarding the following subjects:
• Observation and use of the operating instructions and the legal regulations
• Intended operation of the Bosch Rexroth system
• Observation of instructions from the factory security offices and of the work instructions from the operator.
• How to behave in case of emergency

Bosch Rexroth offers training support for special fields. You can find an overview of the training contents in the Internet under http://www.boschrexroth.de/didactic.

2.7 Safety labels on the system
Warning of hand injuries
3 Scope of Delivery
The delivery contents include:
• Various TS 5 modular units, according to your order. Please consult the shipping documents to make sure that the delivery is complete.
• 1 assembly instructions for modular units for transfer system TS 5

4 Product Description
The TS 5 transfer system transports loads of up to 300 kg. Rexroth offers you a comprehensive system of conveyor modules: drive modules, workpiece pallets, roller sections, curves, diverters, positioning units and components for traffic control. Everything is designed for modular flexibility and pre-assembled and can be combined as needed using a single interface.

Driven by high-quality technology: the king shaft
The TS 5 transfer system with king shaft offers you considerable advantages compared to the normal chain drives:
• Absolutely maintenance-free
• Noise-free operation
• High energy efficiency through effective performance with low drive force requirements
• Friction can be adjusted by hand (after removing the protective cover on the king shaft).

New possibilities in all directions
As opposed to a chain driven conveyor systems, TS 5 can be used without any limitations. Its drive concept gives you a great amount of planning freedom. You can, for example, branch the system off to the right or to the left. This is very economical because no additional drive modules are needed in many system layouts.

Flexible planning, simple set-up, quick commissioning
As a system supplier for all areas of automation, we offer you an extensive, industrially manufactured modular product line-up. The new TS 5 transfer system is also based on a flexible system of modular components. As a Rexroth customer, this offers you many advantages, including the fact that you will be operating in a familiar environment right from the start of assembly – with everything proceeding quickly and smoothly. As the components for the TS 5 are included in our MTpro program, the parts list is generated automatically, which considerably simplifies the entire planning process.

A choice of transport types
Different products require different types of conveyor sections. Accordingly, you can choose whether to transport your goods on a workpiece pallet or directly on a continuous roller conveyor.
Advantages at a glance

- Fast, cost-effective system planning and expansion: The conveyor section design allows branching in both directions. And because the assembly space required for the drive is lower than the conveyor height, you can choose to have the drive mounted on either side. As always, all components are available in the MTpro planning tool.
- Reliable construction and fast commissioning: Industrially manufactured modular system design with standardized components, resulting in short delivery times.
- High system uptime thanks to the maintenance-free king shaft drive concept. Advantages: No more need for lubrication and greasing.
- Sturdy design: Suitable for particularly harsh production environments and heavy loads.
- Everything from a single source: Easy ordering thanks to compatibility with the entire assembly technology product range.

Depending on the expansion stage, the TS 5 transfer system consists of the following TS 5 modular units:

- AS 5/... drive unit
- SZ 5/... leg set
- ST 5/... conveyor unit
- CU 5/... curve
- DI 5/... diverter
- JU 5/... junction
- PE 5 positioning unit
- HQ 5 lift transverse unit
- VE 5/... stop gate

See also the TS 5 transfer system sales catalog, 3 842 540 380.
5 Transport and Storage

Observe the transport instructions on the packaging.
When storing and transporting the product, always observe the ambient conditions specified in the Technical Data (107).

5.1 Transporting TS 5 modular units

<table>
<thead>
<tr>
<th>WARNING!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspended loads may fall if the equipment to hold the loads has not been properly dimensioned or is incorrectly suspended</td>
</tr>
<tr>
<td>Falling objects may result in severe injuries (or even death).</td>
</tr>
<tr>
<td>▶ Do not stand under suspended loads.</td>
</tr>
<tr>
<td>▶ Use lifting equipment with a sufficiently high bearing load</td>
</tr>
<tr>
<td>(see the shipping documents for product weight)</td>
</tr>
<tr>
<td>▶ Carefully secure lifting equipment.</td>
</tr>
<tr>
<td>▶ Only lift the product at the intended locations.</td>
</tr>
</tbody>
</table>

5.2 Storing TS 5 modular units

Always store TS 5 modular units on a flat surface.

6 Assembly

6.1 Unpacking

▶ Using lifting equipment, lift the TS 5 transfer system modular units out of the packaging at the lifting straps.
As an alternative, lift from beneath the support profiles or cross connectors.
**Do not** lift by the rollers!
▶ Dispose of the packaging in accordance with the currently applicable national regulations in your country.

6.2 Installation requirements

When installing the product, always observe the ambient conditions specified in the Technical Data (107).

6.3 Mounting orientation

For reasons of functional safety and to prevent premature wear, the installation of TS 5 modular units on leg sets must be aligned and level at right angles and parallel to the axis.
6.4 Mounting with T-bolts

All transfer system (TS 1, TS 2plus, TSsolar, TS 4plus, TS 5) and chain conveyor system (VarioFlow and VarioFlow S) modules are assembled with T-bolts and flange nuts.

Make sure the T-bolt is in the correct position when inserting and tightening in the groove. The notch at the end of the bolt indicates the T-bolt orientation.

1 = T-bolt insertion orientation in the groove.
2 = T-bolt clamping position in the groove.
Maximum tightening torque: 25 Nm

6.5 Required tools

- Hexagon wrench (flat wrench) WS13, WS24
- Hex socket wrench WS3, WS4, WS5, WS6, WS8
- Phillips head screwdriver PH3
- Level, minimum length 1200 mm
- Snap marking string
- Lifting equipment: 4-leg short lifting chain EN 818-4, load capacity ≥ 500 kg
- Disassembly tool to remove the covers (on the king shaft and passive side): 3 842 545 836
- Recommended for assembling the leg sets:
  One screwdriver each for
  - Recessed head screws PH3
  - Hex socket screws WS8

6.6 Required accessories

- To connect the modular units 23
- To anchor to the floor 51
- For the proximity switches 34
6.7 Lifting straps for lifting equipment

All modules are equipped with lifting straps to hook a 4-leg short lifting chain.

When delivered, the stacked modules are secured at the lifting straps. Release the connection to the bottom module before lifting a module from the stack.

Remove the lifting straps after you have positioned the modules.

Retain the lifting straps for conversion or disassembly purposes. If you are reassembling a module, make sure that the T-bolt is properly situated in the profile groove.

Applies to curves, diverters, and junctions with assembled protective covers (ordering parameter PS = 2):

The protective covers are not assembled at the lifting straps and are included separately. Assemble the protective covers after removing the lifting straps.
6.8 Support when setting down diverter DI 5/... and junction JU 5/...

**Do not set down without a support (min. height of 100 mm)!

The diverter DI 5/... and junction JU 5/... can be damaged if they are set down without a support. The actuating shaft of the diverter arm protrudes downwards beyond the support profile.

Only remove the brackets on the transport retainer when mounting the leg sets.

Retain the brackets on the transport retainer for conversion or disassembly purposes. If you are reassembling, make sure that the T-bolt is properly situated in the profile groove.
6.9  **SZ 5/... leg sets**

**Version**

**Sz** = track width

**hSZ** = height of the leg set

**SZ 5**

3 842 998 506

**SZ 5/U**

3 842 998 507

**Fig. 5**
Scope of delivery
Not assembled, in single parts
A: Strut profile 45x90
B: Strut profile 45x90
C: Bracket 45x90 with fastening kit and cap
D: Bracket 90x90 with fastening kit and cap
E: Plate 45x90 with fastening kit
F: Leveling foot Ø90
1. Grease the threaded spindle.
2. Pre-set the counter nut.
3. Assemble the plate.
4. Screw in the leveling foot.

Pre-assembling the vertical strut profiles

Fig. 7
Assembly

**SZ 5**
3 842 998 506

**SZ 5/U**
3 842 998 507

---

Fig. 8
6.10 ST 5/... conveyor unit

1. Place each conveyor unit on leg sets.

Note: If you want to install a PE 5 positioning unit (⌀ 54) or HQ 5 lift transverse unit (⌀ 65) in the section, this can now be conveniently done from below, before connecting the conveyor unit with the adjacent modules, and thus requires less installation effort.

2. Align the first conveyor unit longitudinally, transversely, and vertically.

3. Insert the connector (⌀ 23, Fig. 10: A, B) in the grooves, insert the intermediate plates (⌀ 23, Fig. 10: C).

4. Align the next conveyor unit longitudinally, transversely, and vertically with the already-standing conveyor unit and connect them (⌀ 23, Fig. 10).

5. Connect the king shaft with the coupling (⌀ 23, Fig. 10). To do this, disassemble the covers on the king shaft (⌀ 23, Fig. 10).

---

Fig. 9
To connect two TS 5 modular units, you will need:

- 4 profile connectors for section profiles (A), 3 842 528 746
- 2 profile connectors for lateral guides (B), 3 842 545 699
- 2 intermediate plates (C), p1/p2:
  - 130/130: 3 842 545 215
  - 130/195: 3 842 545 354
  - 130/260: 3 842 545 216
  - 130/325: 3 842 545 355
  - 195/195: 3 842 545 216
  - 260/260: 3 842 545 217
  - 325/325: 3 842 545 218
- 1 coupling (D), 3 842 545 160

### Disassembling/assembling covers

Place the disassembly tool 3 842 545 836 on the cover and lift up the cover (Fig. 10, X).

Place the cover on the bearing pedestal and snap it in (Fig. 10, X)

### Assembling the coupling (D):

1. Loosely pre-assemble the half-shells.
2. Place the pre-assembled half-shells on the shaft ends.
3. Bring the modular units together, while inserting the intermediate plate (C).
4. Align the coupling, insert the coupling disk, tighten the screws.
6.12 AS 5/... drive unit

The gear motor is provided separately. To assemble the gear motor, see page 52.

The toothed belt in the AS 5 drive unit has been tensioned at the factory.

Do NOT change this pre-tension!

1. Insert the connector (Fig. 10: A, B) in the grooves of the already standing conveyor unit, insert the intermediate plates (Fig. 10: C).

2. If necessary, place the drive unit on a leg set (Fig. 12).

3. Align the drive unit longitudinally, transversely, and vertically with the already-standing conveyor unit and connect them (Fig. 10).

4. Connect the king shaft with the coupling (Fig. 10: D). To do this, disassemble the covers on the king shaft (Fig. 10). The king shaft covers are connected to the adjacent covers for stabilization. The connectors are included in the scope of delivery.

Note: Only commission and operate with assembled protective covers.
The drive unit does not need to be supported if it is assembled between two conveyor units with adjacent leg sets (Fig. 12, A).

Exceptions:

- Assembled after a diverted section of a curve, diverter, or junction (Fig. 12, B).
- Assembled as a head drive at the end of a dead end section. Support with leg sets in these cases (Fig. 12, C).
6.13 CU 5/... curve

Arrangement of
- CU 5/... curve
- DI 5/... diverter
- JU 5/... junction

Due to the different functions, the transport heights of the main and secondary sections (inlet and outlet) differ for curves, diverters, and junctions.

Arrange modules with an opposite orientation, see the graphic (Fig. 13).

For CD..., DD..., JU... ordering options, see the TS 5 transfer system sales catalog, 3 842 540 380, chapter 5.

Take the offset in height into account when aligning the modules.
1. Place the curve on two leg sets.

2. Insert the connector (⌀ 23, Fig. 10: A, B) in the grooves, insert the intermediate plates (⌀ 23, Fig. 10: C).

Note: Profile connector B cannot always be assembled in the center on the inside of the curve (dependent on bWT and lWT).

3. Align the curve longitudinally, transversely, and vertically with the already-standing conveyor unit and connect them (⌀ 23, Fig. 10).

Note: Due to the function, the transport heights of the main and secondary sections (inlet and outlet) differ by 0.5 mm at curves, diverters, and junctions (⌀ 26, Fig. 13). Take into account when aligning (⌀ Fig. 14: x)).

4. Attach the following conveyor unit and align with the curve longitudinally, transversely, and vertically and connect (⌀ 23, Fig. 10).

5. Connect the king shaft with the coupling (⌀ 23, Fig. 10: D). To do this, disassemble the covers on the king shaft (⌀ 23, Fig. 10: x), y)).

Note: If the king shaft is on the inside of the curve, the curve segment must first be removed in order to disassemble the king shaft cover (⌀ 28, Fig. 15: y)).

Note: Before commissioning curves, diverters, and junctions, identify dangerous areas (⌀ Fig. 14: x):
- With a warning sign
- By marking in black/yellow

Fig. 14
1. Place the diverter/junction on two leg sets.

2. Insert the connector (⌀ 23, Fig. 10: A, B) in the grooves, insert the intermediate plates (⌀ 23, Fig. 10: C).

**Note:** Profile connector B cannot always be assembled in the center on the inside of the curve (dependent on bWT and lWT).

3. Align the diverter/junction longitudinally, transversely, and vertically with the already-standing conveyor unit and connect them (⌀ 23, Fig. 10).

**Note:** Due to the function, the transport heights of the main and secondary sections (inlet and outlet) differ by 0.5 mm at curves, diveters, and junctions (⌀ 26, Fig. 13). Take into account when aligning (⌀ Fig. 15: Z)).

4. Attach the following conveyor unit and align longitudinally, transversely, and vertically with the diverter/junction and connect them (⌀ 23, Fig. 10).

5. Connect the king shaft with the coupling (⌀ 23, Fig. 10: D). To do this, disassemble the covers on the king shaft (⌀ 23, Fig. 10: X, Y).

**Note:** If the king shaft is on the inside of the curve, the curve segment must first be removed in order to disassemble the king shaft cover (⌀ Fig. 15: Y)).

**Note:** Before commissioning curves, diveters, and junctions, identify dangerous areas (⌀ Fig. 15: Z)):  
- With a warning sign  
- By marking in black/yellow

---

### 6.14 DI 5/... diverter / JU 5/... junction

---

Fig. 15
6.15 VE/... stop gate

- Position of the stop gate on the workpiece pallet 31...32
- Proximity switches 34
- Openings in the protective covers for VE 5/... 35...37

**Product Description**

**VE 5/200 stop gates**

A = Stop gates
B = 6 mm pushlock-type compressed air connection
C = Possible position inquiry, if the VE stop blade is engaged = stop blade up: yes/no

**VE 5/D-300 stop gate**

A = Stop gates
B = 6 mm pushlock-type compressed air connection
C = Possible position inquiry of VE stop blade
   - Engaged = blade up
   - Not engaged = blade down
D = Possible position inquiry of VE stop blade, damper retracted: yes/no
The proximity switch can be installed on the left or right.
VE 5/D-1000 stop gate

A = Stop gates
B = 6 mm pushlock-type compressed air connection
C = Possible position inquiries of VE stop blade
   • Engaged = blade up
   • Not engaged = blade down
D = Possible position inquiry of VE stop blade, damper retracted:
   yes/no

Fig. 18
Position of the stop gate on the workpiece pallet

Work areas must be secured by protective covers in accordance with DIN EN 619. The user must make the openings in the protective covers for the stop gate and switch bracket, continuous gap ≤ 5 mm.

Dimensioned illustrations of the openings, for installation Fig. 19, for installation Fig. 20.

---

Stop the workpiece pallet at the front in the longitudinal conveyor.
Reference points for installation (in the transport direction):
- Front edge of the bearing pedestal of a roller (1)
- Front edge of the support profile of the stop gate (2)

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Stop the workpiece pallet at the rear in the longitudinal conveyor.
Reference points for installation (in the transport direction):
- Front edge of the bearing pedestal of a roller (1)
- Front edge of the support profile of the stop gate (2)

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Fig. 19
Stop the workpiece pallet in the transverse conveyor.
Reference points for installation (in the transport direction):
- Front edge of the bearing pedestal of a roller (1)
- Front edge of the support profile of the stop gate (2)

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Fig. 20
Assembling the VE 5/... stop gate in the ST 5/... conveyor unit

Note the assembly dimensions (center offset, Fig. 19 and Fig. 20), depending on whether the VE 5/... stop gate stops the workpiece pallet in the longitudinal or transverse conveyor.
**Proximity switches**

The following is required for position inquiry of the VE 5/... stop gate:

- Proximity switch Ø12 mm (M12x1)
  - VE 5/200 stop gate, 3 842 998 518: 1
  - VE 5/D-300 stop gate, 3 842 998 517: 3
  - VE 5/D-1000 stop gate, 3 842 998 516: 2 or 3

- Clamping head for proximity switch Ø12 mm, for screwing onto the stop gate
  - Can be procured from Balluff GmbH, order number BES 12.0-KH-2S

---

**Fig. 22**
Openings in the protective covers for VE 5/...

- Stop the workpiece pallet at the front in the longitudinal conveyor.
- Assemble the VE 5/... in accordance with Fig. 19, 31.

Note: If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
Openings in the protective covers for VE 5/…

- Stop the workpiece pallet at the rear in the longitudinal conveyor.
- Assemble the VE 5/… in accordance with Fig. 19, Fig. 31.

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Note: If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
Openings in the protective covers for VE 5/...

• Stop the workpiece pallet in the transverse conveyor, outfeed to the left/right.

• Assemble the VE 5/... in accordance with Fig. 20, 32.

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**Note:** If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
6.16 **Switch brackets and ID 40, ID 200 identification systems**

Assembly dimensions for switch brackets and identification systems:

- Stop the workpiece pallet at the front in the longitudinal conveyor 40.
- Stop the workpiece pallet at the rear in the longitudinal conveyor 42.
- Stop the workpiece pallet in the transverse conveyor 44, 46.

Openings in the protective covers for the switch brackets and identification systems:

- Stop the workpiece pallet at the front in the longitudinal conveyor 41.
- Stop the workpiece pallet at the rear in the longitudinal conveyor 43.
- Stop the workpiece pallet in the transverse conveyor 45, 47.

Work areas must be secured by protective covers in accordance with DIN EN 619. The user must make the openings in the protective covers for the stop gate, switch bracket, and identification systems, continuous gap ≤ 5 mm.

Application and assembly of the assembly kits for the switch brackets and identification systems:

- **SH 2/U-H in the longitudinal conveyor:**
  - \(b_{WT} = 455\): 3 842 545 132 (Fig. 26)
  - \(b_{WT} = 650\): 3 842 545 134 (Fig. 26)
  - \(b_{WT} = 845\): 3 842 545 134 (Fig. 26)

- **SH 2/U-H in the transverse conveyor:**
  - \(l_{WT} = 455\): 3 842 545 ... (Fig. 26)
  - \(l_{WT} = 650\): 3 842 545 ... (Fig. 26)
  - \(l_{WT} = 845\): 3 842 545 ... (Fig. 26)
  - \(l_{WT} = 845\): 3 842 545 ...

![Fig. 26](image-url)
• ID 40 in the longitudinal conveyor:
  \( b_{WT} = 455: \) 3 842 545 140
  \( b_{WT} = 650: \) 3 842 545 142
  \( b_{WT} = 845: \) 3 842 545 142

• ID 40 in the transverse conveyor:
  \( l_{WT} = 455: \) 3 842 ...
  \( l_{WT} = 650: \) 3 842 ...
  \( l_{WT} = 845: \) 3 842 ...

• ID 200 in the longitudinal conveyor:
  \( b_{WT} = 455: \) 3 842 545 144
  \( b_{WT} = 650: \) 3 842 545 144
  \( b_{WT} = 845: \) 3 842 545 144

• ID 200 in the transverse conveyor:
  \( l_{WT} = 455: \) 3 842 ...
  \( l_{WT} = 650: \) 3 842 ...
  \( l_{WT} = 845: \) 3 842 ...

Fig. 27
Reference positions for assembly (in the transport direction):
- Front edge of the bearing pedestal of a roller (1)
- Front edge of the support profile of the stop gate (2)
- Center axes of the
  - Proximity switch in the SH 2/U-H
  - ID 40/SLK-... read/write head
  - ID 200/A-... antenna

Assembly dimensions for switch brackets SH 2/U-H and ID 40, ID 200 identification systems
Stop the workpiece pallet at the front in the longitudinal conveyor.

1) SH 2/U-H not possible in this position if using ID 40 or ID 200.
Openings in the protective covers for switch brackets SH 2/U-H and ID 40, ID 200 identification systems
Stop the workpiece pallet at the front in the longitudinal conveyor.

Note: If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
Assembly dimensions for switch brackets SH 2/U-H and ID 40, ID 200 identification systems

Stop the workpiece pallet at the rear in the longitudinal conveyor.

Reference positions for assembly (in the transport direction):
- Front edge of the bearing pedestal of a roller (1)
- Front edge of the support profile of the stop gate (2)
- Center axes of the
  - Proximity switch in the SH 2/U-H
  - ID 40/SLK-... read/write head
  - ID 200/A-... antenna

1) SH 2/U-H not possible in this position if using ID 40 or ID 200.
Openings in the protective covers for switch brackets SH 2/U-H and ID 40, ID 200 identification systems

Stop the workpiece pallet at the **rear** in the longitudinal conveyor.

**Fig. 31**

<table>
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<th>IWT [mm]</th>
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<th>SH 2/U-H (Z)</th>
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<th>ID 200 (Y)</th>
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**Note:** If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
Reference points for installation (in the transport direction):
- Front edge of the bearing pedestal of a roller (1)
- Front edge of the support profile of the stop gate (2)
- Center axes of the
  - Proximity switch in the SH 2/U-H
  - ID 40/SLK... read/write head
  - ID 200/A... antenna

Stop the workpiece pallet in the transverse conveyor, outfeed to the left.

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1) SH 2/U-H not possible in this position if using ID 40 or ID 200.

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Openings in the protective covers for switch brackets SH 2/U-H and ID 40, ID 200 identification systems

Stop the workpiece pallet in the transverse conveyor, outfeed to the left.

Fig. 33

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Note: If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
Reference points for installation (in the transport direction):
- Front edge of the bearing pedestal of a roller (1)
- Front edge of the support profile of the stop gate (2)
- Center axes of the
  - Proximity switch in the SH 2/U-H
  - ID 40/SLK-... read/write head
  - ID 200/A-... antenna

1) SH 2/U-H not possible in this position if using ID 40 or ID 200.

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Openings in the protective covers for switch brackets SH 2/U-H and ID 40, ID 200 identification systems

Stop the workpiece pallet in the transverse conveyor, outfeed to the right.

**Fig. 35**

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<th>l_{WT} [mm]</th>
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<th>SH 2/U-H (X)</th>
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**Note**: If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
Assembling the ID 40/MDT... data tag in the WT 5 workpiece pallet

ID 40/MDT...
3 842 406 150
3 842 406 160
3 842 406 170

Required accessories:
• Fastening kit for ID 40:
  3 842 545 448
Assembling the MDT... data tag in the WT 5 workpiece pallet

**MDT 3**
3 842 410 102
3 842 410 105

Required accessories:
- Fastening kit for ID 200:
  3 842 545 450

**MDT 23**
3 842 535 442

Required accessories:
- Fastening kit for ID 200:
  3 842 545 450

---

Fig. 37
6.17 Protective covers

CAUTION!

Do not walk on the TS 5 modular units!
Protective covers only serve as trap guards to prevent hand injuries.
- Do not enter areas with protective covers.

Work areas must be secured by protective covers in accordance with DIN EN 619. The user must make the openings in the protective covers for the stop gate, switch bracket, and identification systems, continuous gap ≤ 5 mm.
Dimensioned illustrations of the openings for installation of
- Stop gates
- Switch brackets and identification systems
- Positioning unit
can be found in the respective chapters.

1. Place the springs on the cover.
2. Swivel the protective cover in the section, the springs will snap into the centering lugs on the bearing pedestals.
After aligning each TS 5 modular unit, bolt each leg set to the floor 2x with foundation brackets and dowels to prevent the legs from moving.

The following is required per connection:

- 1 foundation bracket, 3 842 146 815
- 1 dowel, 3 842 526 560
- 2 T-bolts, 3 842 528 718
- 2 flange nuts, 3 842 345 081

Fig. 39
6.19 Motor

Standard
1. Screw the adapter flange onto the gear motor.
2. Insert the hexagonal shaft greased at the factory into the drive shaft.
3. Attach the motor and tighten with the bearing flange. Insert the plugs.

Note: Only commission and operate with assembled protective covers.

Note: The toothed belt in the AS 5/... drive unit has been tensioned at the factory. Do NOT change this pre-tension! Some blue wear from the toothed belt will appear during the start-up phase. This is intentional, as the blue PA coating on the toothed belt is being worked onto the tooth profiles to achieve higher belt stability.
**Customer-specific motor**

1. Remove the cover.
2. Screw the adapter flange onto the gear motor.
3. Insert the hexagonal shaft greased at the factory into the drive shaft.
4. Attach the motor and tighten with the bearing flange.
5. Assemble the cover.

**Note:** Only commission and operate with assembled protective covers.

**Note:** The toothed belt in the AS 5/... drive unit has been tensioned at the factory. Do **NOT** change this pre-tension! Some blue wear from the toothed belt will appear during the start-up phase. This is intentional, as the blue PA coating on the toothed belt is being worked onto the tooth profiles to achieve higher belt stability.

---

Fig. 41
6.20 PE 5 positioning unit

The PE 5 positioning unit can be assembled from the top or bottom in a conveyor unit using split rollers.

- Assembly from the bottom  55
- Assembly from the top  59
- Openings in the protective covers for PE 5  62
- PE 5 lifting plunger trap guard  62

**Assembly dimensions**

The PE 5 positioning unit can only be assembled at a specified distance from a roller axis, depending on the length of the workpiece pallet (lWT) and the roller dimensions (p).

Reference points for installation (in the transport direction):

- Front edge of the bearing pedestal of a roller (1)
- Rear edge of the support plate of the PE 5 (2)
- Front edge of the support profile of the stop gate (3)
- Note the minimum distance to the leg sets!

Work areas must be secured by protective covers in accordance with DIN EN 619. The user must make the openings in the protective covers for the positioning unit, stop gate and switch bracket, continuous gap ≤ 5 mm.

Dimensioned illustrations of the openings for installation according to Fig. 44  54.
1. Assemble the VE 5/... stop gate.
2. Assemble the support plate on the PE 5 positioning unit.
3. If necessary, remove the cross connector for the conveyor unit in the area where the PE 5 is to be installed  

Fig. 47: A)

4. Support the PE 5 positioning unit on pedestals, lower the ST 5/... conveyor unit onto it with a crane and tighten together. Position of the PE 5:  

Fig. 54
5. Screw the throttles into the cylinders, connect the PE 5 pneumatics.

6. Assemble the covers.

7. Assemble the switch bracket (not with $b_{WT} = 455$ mm).
1. Remove the rollers from the area where the PE 5 positioning unit is to be installed:  87...89
2. Screw the threaded pins back into the lateral guide in the area where the PE 5 is to be installed until they no longer protrude inside.
3. If necessary, remove the cross connector for the conveyor unit in the area where the PE 5 is to be installed (Fig. 49: A)
4. Screw on support plates underneath the conveyor unit. Position of the support plates:  54
Note: Only connect the cords to the strut profile!

5. Insert the PE 5 positioning unit in the ST 5/... conveyor unit, align, and tighten together.

The positioning pin can be used as an insertion aid for pre-centering (Fig. 50: 1).

6. Screw the throttles into the cylinders, connect the PE 5 pneumatics (Fig. 48: step 5).

7. Assemble the covers (Fig. 48: step 6).

8. Assemble the switch bracket (not with lWT = 455 mm) (Fig. 48: step 7).

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Fig. 48

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9. Assemble the VE 5/... stop gate.
   Position of the stop gate: Fig. 54

10. Assemble the rollers and lateral guides.
Openings in the protective covers for PE 5

**Fig. 50**

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**Note:** If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
**Fig. 51**

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**Note:** If the cut-out is interrupted by a separating joint, you should first remove the traverse on the bottom in the area of the cut-out.
PE 5 lifting plunger trap guard

Fig. 52
6.21 HQ 5 lift transverse unit

The HQ 5 lift transverse unit can be assembled from the top or bottom in a conveyor unit.

- Assembly from the bottom 66
- Assembly from the top 70
- Transverse section assembly kit 73
- DA 5/... damper 74

Assembly dimensions

The HQ 5 lift transverse unit can only be assembled at a specified distance from a roller axis, depending on the length of the workpiece pallet (lWT) and the roller dimensions (p).

Reference points for installation (in the transport direction):

- Front edge of the bearing pedestal of a roller (1)
- Rear edge of the support plate of the HQ 5 (2)
- Front edge of the support profile of the stop gate (3)
- Note the minimum distance to the leg sets!

a) Support rollers only if:

- bWT = 455 mm.

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Assembly from the bottom

1. Assemble the VE 5/... stop gate.
2. Assemble the support plates on the HQ 5 lift transverse unit.
3. If necessary, remove the cross connector for the conveyor unit in the area where the HQ 5 is to be installed (Fig. 58: A)

4. Support the HQ 5 lift transverse unit on pedestals, lower the ST 5/... conveyor unit onto it with a crane and tighten together. Position of the HQ 5: 65
5. Screw the throttles into the cylinders, connect the HQ 5 pneumatics.
6. Assemble the covers.
7. Assemble the switch bracket (not with $b_{WT} = 455$ mm).
1. Remove the rollers from the area where the HQ 5 lift transverse unit is to be installed: \( \varnothing 87...89 \)

2. Screw the threaded pins back into the lateral guide in the area where the HQ 5 is to be installed until they no longer protrude inside.

3. If necessary, remove the cross connector for the conveyor unit in the area where the HQ 5 is to be installed (Fig. 49; \( \text{A} \))

4. Screw on support plates underneath the conveyor unit. Position of the support plates: \( \varnothing 65 \)
Note: Only connect the cords to the strut profile!

5. Insert the HQ 5 lift transverse unit in the ST 5/... conveyor unit, align, and tighten together. The positioning pin can be used as an insertion aid for pre-centering (Fig. 61: 1).

6. Screw the throttles into the cylinders, connect the HQ 5 pneumatics (69, Fig. 59: step 5.

7. Assemble the covers (69, Fig. 59: step 6.

8. Assemble the switch bracket (not with bWT = 455 mm) (69, Fig. 59: step 7.
9. Assemble the VE 5/... stop gate.
A transverse section assembly kit is required if parallel transverse sections are installed in a circuit with curves or diverters/junctions and transverse sections with lift transverse units (Fig. 13, Fig. 2). If a circuit only consists of lift transverse units, the transverse sections can be connected directly to the longitudinal section (Fig. 13, Fig. 2).

A) Support rollers are required if:
- \( b_{WT} \times l_{WT} = 455 \times 455 \), \( p = 130 \text{ mm} \)
- \( b_{WT} \times l_{WT} = 455 \times 650 \), \( p = 130 \text{ mm} \)
- \( b_{WT} \times l_{WT} = \)

B) Insert a bolt or screw as a stop when installing the transverse section.

10. Assemble the transverse section assembly kit or the transverse section.
11. Assemble the DA 5/... damper and stops. Use a WT 5 workpiece pallet as a positioning aid:
   - Align the DA 5/... damper to the center of the WT.
   - Align the stops to the guide rollers of the WT.
6.22 PE 5/HQ 5 assembly kit in ST 5/H

Required to install the PE 5 positioning unit or HQ 5 lift transverse unit in an ST 5/H conveyor unit.
PE 5 installation dimensions $\varnothing 54$
HQ 5 installation dimensions $\varnothing 65$

Fig. 63
6.23 Dead end sections

NOTE! Open section ends!
The workpiece pallet can run over the open section ends and fall off. There is a danger of damage to property.

- The user must provide a mechanical transfer safety device.

Examples of mechanical transfer safety devices for open section ends.
6.24 Connecting the power supply

**WARNING!**

Electric shock due to contact with live parts
Severe injuries or death.
- Do not touch live parts
- Before working on the electrical installation, switch off the power supply and protect it against being switched on again.

Select the control and sensor elements taking into account the load to be transported and transportation speed in accordance with EN ISO 13849.

The motor must be connected by a specialist!

Observe regulation VDE 0100 for Germany or the appropriate regulations for the country where the product is used.

6.24.1 Motor connection

Note the existing line voltage!

Note the electrical voltages on the motor type plate, see Fig. A.

Connect the motor as a Y-connection or triangle connection in accordance with the connection plans, see Fig. B and Fig. C, and the connection plan in the terminal box.

The motor is equipped with a bi-metal switch (potential-free thermal contact, 230 V AC, 300 mA) to monitor the temperature. The motor must be connected in such a manner that it becomes currentless when the switch is actuated.

Select a cable entry that prevents damage to the cable during operation.

Connection cable option: 3 842 409 645 (M20x1.5), see Fig. D.

Pay attention to the ballast fuse!

Checking the motor’s direction of rotation

Start the system for a maximum of 2 s and check that the motor is rotating in the correct direction.

Exchange any two wires (L1, L2, or L3, Fig. B/Fig. C) to change the motor’s direction of rotation.

**Note:** In motors with a factory-installed plug, correct the direction of rotation in the switch cabinet or at the plug coupling (socket side). This will simplify exchanges.
Name plate (example)

Fig. A

"Y"

(3 x 400V)

2

(U1) L1


6

(V1) L2


4

7

3

(W1) L3


TW1


TW2

TW 135°C

1

PE

No network connection

Fig. B

"Δ"

(3 x 230V)

7

(U1) L1


6

(V1) L2


4

5

3

(W1) L3


TW1


TW2

TW 135°C

1

PE

Fig. C
Fig. D

\[ L = 400 \text{ mm} \]

3 842 409 645 (M20 x 1.5)
7 Commissioning

Only commission the TS 5 modular units if all safety devices have been installed in the system and are functional. The user must equip the transfer system with an emergency-OFF device! Accident prevention regulations of the German Employers’ Liability Insurance Association, continuous conveyors, VBG 10.

Make sure that all electrical and pneumatic connections are either used or covered. Make sure that all screwed connections and plugs are properly connected. All of the relevant protective covers must be assembled.

Before commissioning curves, diverters, and junctions, identify dangerous areas:

- With a warning sign
- By marking in black/yellow

The surfaces of motors and gears can reach temperatures of over 70°C under certain load and operating conditions. In such cases, the valid accident prevention regulations (in Germany: UVV) must be met by corresponding constructive measures (safety devices) or safety warning signs!

Work areas must be secured by protective covers in accordance with DIN EN 619. The user must make the openings in the protective covers for the stop gate and switch bracket, continuous gap ≤ 5 mm.

Commission the product only if it is installed completely.

---

**CAUTION!**

Unexpected movements, falling workpiece pallets

Injuries due to falling objects

- Make sure that the TS 5 modular units have been correctly assembled by qualified personnel before commissioning them.

**NOTE!**

Malfunctions due to incorrect assembly and commissioning

The TS 5 modular units may be damaged or their service lives shortened.

- Commissioning requires basic mechanical, pneumatic, and electrical knowledge.

- Only qualified personnel may commission the TS 5 modular units (see “Personnel qualifications” on page 7).
7.1 Residual hazards

CU 5/... curve

CAUTION! Injuries to fingers!
When going through a curve, the carrying plate on the workpiece pallet overlaps the lateral guide on the section; fingers may be crushed or torn off here.
▷ Secure access to the work area, identify dangerous areas.

DI 5/... diverter / JU 5/... junction

CAUTION! Injuries to fingers!
When going through a diverter/junction, the carrying plate on the workpiece pallet overlaps the lateral guide on the section; fingers may be crushed or torn off here.
▷ Secure access to the work area, identify dangerous areas.

JU 5/... junction

CAUTION! Injuries to fingers!
When going through a junction, the diverter arm is pushed by the workpiece pallet into the shaft on the inner guide; fingers may be torn off.
▷ In the work area: Separate pallets ahead of the work area, secure access.

VE/... stop gate

CAUTION! Injuries to fingers!
Fingers may be crushed when the workpiece pallet approaches and goes over the stop gate.
▷ In the traffic area: Separate pallets ahead of the work area.
▷ In the work area: Two-hand release or stop gate sequence control.

ST 5/... conveyor unit

NOTE! Open section ends!
The workpiece pallet can run over the open section ends and fall off. There is a danger of injuries and damage to property.
▷ The user must provide a mechanical transfer safety device.
Examples 76/77
8 Operation

CAUTION!

Hot electric motor surfaces during operation
Possible burns if the hot surface (over 70°C) is touched.
- Provide appropriate safety devices to seal off the motors.

8.1 Notes on operation

8.1.1 Wear
Wear is caused by the basic principle of this system and cannot be avoided. Constructive measures and selection of the proper materials will help functional safety last for the lifetime of the system. However, wear depends on the operating, maintenance, and ambient conditions of the system, as well as the location (resistance, contamination).
Overloading the conveyor sections may damage the conveying medium and cause the motor and gears to fail.
Function cannot be guaranteed if the pneumatic components are overloaded.
When the conveying speed increases, impact forces with changes in direction and the rebound force on the stop gates also increase. This may require longer settling periods or shock absorbers before the next movement.

8.1.2 Measures to reduce wear
The following measures reduce wear:
- Switch off conveyor sections when the system is not running, e.g. during breaks, over night, on the weekend.
- Only select speeds that correspond with the particular function.
- Minimize the weight of the workpiece pallet – do not overload workpiece supports with material.
- Especially important: Avoid contamination by abrasive media or reduce contamination through regular cleaning.

8.1.3 Loading the workpiece pallet
When setting up and testing the modular units, the workpieces pallets should not all have the same weight on the conveyor sections, i.e. full and empty pallets should all come through the circuit.
Extreme differences in weight may require special measures to avoid functional disruptions. This applies, e.g. to the permitted accumulation length before stop gates, to the function of dampers and dampened stop gates.
8.1.4 Environmental conditions

Resistant to many common media used in production such as water, mineral oil, grease, and detergents. Contact your Rexroth representative if you have any doubts about resistance to specific chemicals, e.g. test oil, doped oils, aggressive detergents, solvents, or brake fluid.

Avoid long-term contact with acidic or basic reacting materials.

Wear may increase dramatically if the system is contaminated due to environmental factors, particularly with abrasive media such as sand and silicates, but also due to processes running on the transfer system (e.g. welding beads, pumice dust, glass shards, shavings, or lost parts...). In such cases, maintenance intervals must be substantially shortened.

Resistance to media and contamination does not mean that functional safety is guaranteed in every case.

- Liquids that thicken on evaporation and are highly viscous or adhesive (sticky) could lead to a disruption in function.
- Media with lubricating properties may reduce the driving power that is caused by friction if they are carried over onto systems with rollers.

Such cases require special attention when planning the system and adjusting the maintenance intervals.

8.2 Disruptions in transport due to deformed workpiece pallets

NOTE! Forces, loads, and position of the center of gravity influence the transport characteristics of the workpiece pallet, which may result in transport disruptions.

Fastening screws from workpiece fixtures provided by the customer that protrude beneath the carrying plate may deform the base pallet.

If the permissible deflection of the workpiece pallet is exceeded, the transport characteristics will be impaired.

Disruptions may occur when going through diverters (junctions) if the center of gravity of the load on the WT is unfavorable (\( \varrho_2 \)).

- Provide openings in the base pallet for protruding screws, max. depth of openings: 5 mm.
- Note the interdependencies between the permissible load and carrying plate thickness (\( \varrho \) Technical Data, \( \varrho_1 \)).
- Note the interdependencies between the permissible load and transportation speed (\( \varrho \) Technical Data, \( \varrho_1 \)).
- Individually adjust the offset in height for the diverter (junction) (\( \varrho_2 \)).
8.3 Overload protection in CU 5/... and DI 5/... / JU 5/...

**NOTE! Overload protection in curves, diverters, and junctions!**

In curves, diverters, and junctions, the rollers are driven via a coupling with overload protection (bevel wheel drive). This overload protection audibly jumps (clicks) if the rollers are blocked. The bevel wheel drive may be damaged if the overload protection jumps for a longer period of time (more than 60 minutes).

The factory settings for the bevel wheel drive might shift due to vibrations caused by this jumping.

- If the overload protection jumps continuously (for more than 5 minutes), check the curve (diverter, junction) for possible causes (accumulation, jammed WT, etc.) and remedy the problem.
- After you have remedied the problem, check the settings on the bevel wheel drive ( 91).
9 Maintenance and Repair

9.1 Maintenance

**WARNING!** Electric shock due to contact with live parts, unexpected belt section start-up
Severe injuries or death.
- Switch off the power supply before performing any maintenance or repair work.
- Switch off the compressed air supply before performing any maintenance or repair work.
- Take suitable measures to prevent inadvertent restoration.

**CAUTION!** Hot electric motor surfaces during operation
Possible burns if the hot surface (over 70°C) is touched.
- Provide appropriate safety devices to seal off the motors.
- Let the system cool off for at least 30 min. before performing any maintenance or repair work.

9.1.1 Bearings
All bearings are provided with lifelong lubrication and are maintenance-free under normal conditions.
However, if grease-dissolving substances are applied to the system, e.g. for cleaning purposes, a regular check should be made, and, if necessary, the bearings should be relubricated with acid and resin free lubricant only (e.g. “gleitmo 585K” from Fuchs Lubritech)!

9.1.2 Gear
The gears in the AS 5/... drive unit and HQ 5 lift transverse unit are maintenance-free.

9.1.3 Motor
To ensure adequate motor cooling, dirt and dust must be removed at regular intervals from the:
- Motor surface
- Fan housing inlets
- Interior surfaces of the cooling fins
The cleaning intervals are based on the ambient conditions and operating conditions.

9.1.4 Toothed belt
The toothed belts in the HQ 5 lift transverse unit are oiled at the factory. Conduct regular visual inspections for wear, particularly near the weld seam.
9.2 Repairs

**WARNING!**

*Electric shock due to contact with live parts, unexpected belt section start-up*

Severe injuries or death.
- Switch off the power supply before performing any maintenance or repair work.
- Switch off the compressed air supply before performing any maintenance or repair work.
- Take suitable measures to prevent inadvertent restoration.

**CAUTION!**

*Hot electric motor surfaces during operation*

Possible burns if the hot surface (over 70°C) is touched.
- Provide appropriate safety devices to seal off the motors.
- Let the system cool off for at least 30 min. before performing any maintenance or repair work.

9.2.1 Required tools

- Hexagon wrench (flat wrench) WS13, WS24
- Hex socket wrench WS3, WS4, WS5, WS6
- Disassembly tool to remove the covers (on the king shaft and passive side): 3 842 545 836
- Spring tensioner to tension the toothed belt in the drive unit: 3 842 545 871

9.2.2 Required accessories

For wear parts or spare parts, see the MTparts spare parts list, 3 842 529 770

- Replacing the roller 87
- Replacing the friction clutch 90
- Factory settings for the couplings 93
- Replacing the toothed belt in the drive unit 94
- Tensioning the toothed belt in the drive unit 100
- Replacing the diverter arm shock absorber 101
- HQ 5, replacing the motor or gear 102
- HQ 5, replacing the toothed belt 103
- HQ 5, tensioning the toothed belt 104
1. Remove the covers on the king shaft and passive side.

A) The cover on the king shaft in the AS 5/... drive unit is connected to the covers for the adjacent modular units.

**Assembling/disassembling the covers**

x) Place the disassembly tool 3 842 545 836 on the cover and lift up the cover.

y) Place the cover on the bearing pedestal and snap it in.
2. Loosen the threaded pins on the lateral guide profile connector by 2 rotations and slide the profile connector into the neighboring module.

3. Loosen the threaded pins on the lateral guide by 2 rotations and remove the lateral guide.
4. Remove clips and lift up the roller vertically.

Assemble the roller in the reverse order.
9.2.4 Replacing the friction clutch

1. Remove the king shaft cover.

2) The cover on the king shaft in the AS 5/… drive unit is connected to the covers for the adjacent modular units.

Disassembling/assembling covers

3) Place the disassembly tool 3 842 545 836 on the cover and lift up the cover.

4) Place the cover on the bearing pedestal and snap it in.

Fig. 68
2. Release the couplings for the affected section of the king shaft (the king shaft consists of sections, each max. 1500 mm long).

3. Unscrew the friction clutches on the affected section.
4. Swivel the king shaft upwards.
5. Slide the friction clutches off the king shaft.
6. Place the new friction clutches on the king shaft and slide into position approximately.
7. Hook the friction clutches in the bearing pedestals, swivel the king shaft back in (Fig. 73: A, B).
8. Tighten the friction clutches.
9. Connect the king shaft to the couplings (Fig. 72).
10. Replace the king shaft cover (Fig. 71).
Friction clutch
- 3 842 545 046 (polymer)
- 3 842 545 222 (sintered metal)

Used in:
- ST 5/... conveyor unit
- AS 5/... drive unit

Factory settings and adjustment options:

<table>
<thead>
<tr>
<th>x 360°</th>
<th>+A 2</th>
<th>-A 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x 360°</td>
<td>0,136</td>
<td>0,048</td>
</tr>
<tr>
<td>2x 360°</td>
<td>0,18 1)</td>
<td>0,092</td>
</tr>
<tr>
<td>3x 360°</td>
<td>0,224</td>
<td>0,136</td>
</tr>
<tr>
<td>4x 360°</td>
<td>0,268</td>
<td>0,18</td>
</tr>
<tr>
<td>5x 360°</td>
<td>0,312</td>
<td>0,224</td>
</tr>
</tbody>
</table>

1) Factory settings
2) Delivery condition, with ring „A“
3) Ring „A“ removed

Bevel wheel drive
3 842 545 200

Used in:
- CU 5/... curve
- DI 5/... diverter
- JU 5/... junction

Factory setting for the bevel wheel drive: 3 rotations of the adjustment ring (detent ➔ detent)

Fig. 71
1. Remove the covers on the king shaft and the passive side bearing. The cover on the king shaft is connected to the adjacent covers.

Disassembling/assembling covers

*) Place the disassembly tool 3 842 545 836 on the cover and lift up the cover.

*) Place the cover on the bearing pedestal and snap it in.

9.2.5 Replacing the toothed belt in the drive unit
2. Loosen the threaded pins on the lateral guide profile connector by 2 rotations and slide the profile connector into the neighboring module.

3. Loosen the threaded pins on the lateral guide by 2 rotations and remove the lateral guide.

4. Disassemble the motor and cover.
5. Remove clips and lift up the roller vertically.
6. Loosen the belt tensioning screw and screw out as far as possible.

7. Loosen the bearing, remove the screws.

8. Tilt the bearing upwards, slide the toothed belt off, remove the bearing.
9. Loosen the king shaft couplings.
10. Unscrew the friction clutches and bearing pedestal, lift the king shaft out.
11. Slide the friction clutches off the king shaft.
12. Pull the king shaft out of the bearing pedestal.
13. Loosen the retainer ring and slide the toothed belt wheel and bearings out of the bearing pedestal.
14. Check the toothed belt wheels for wear.

Assemble the new toothed belt 3 842 545 367 in the reverse order. Tension the toothed belt \( \mu = 100 \).
Required tools

- Spring tensioner, 3 842 545 871

1. Loosen the bearing screws.
2. Screw in the belt tensioning screw until a belt play of 10 mm is attained.
3. Tighten the bearing screws with 4 Nm, the bearing can now only be adjusted using the belt tensioning screw.
4. Visually inspect the belt course: rotate the king shaft by at least 2x 360°, the toothed belt may not move up the flanged wheel of the toothed belt wheels.
5. Slide the spring tensioner between the toothed belts in the center up to the stop.
6. Tension the toothed belt by tightening the belt tensioning screw.
7. The belt tension is correct (1380 N +220 N/–60 N) if the spring tensioner is pressed together with play of 0.1 – 0.3 mm.
8. Secure the belt tensioning screw with a counter nut.
9. Tighten the screws on the bearing.

Note: The threaded pin in the spring tensioner has been set at the factory. Do NOT change this setting!
1. Remove the protective covers in the swiveling range of the diverter arm.
2. Swivel the diverter arm out over the gap, replace wear parts.
3. Replace the protective covers.

9.2.7 Replacing the diverter arm shock absorber
9.2.8 HQ 5, replacing the motor or gear

Depending on the system width and the situation, it may be necessary to disassemble rollers (⌀ 87) or remove the HQ 5 from the section to provide better access. (⌀ 70)

If only the motor is to be dismantled, begin with step 4.

1. Loosen the two hexagonal screws M6 (WS10) on the flange.
2. Remove the gear motor from the hexagonal shaft.
3. Remove the cover plugs from the faulty gear and fit onto the new gear.
4. Loosen the four hexagonal screws M5 (WS8) with locking washers on the gear flange.
5. Remove the faulty gear from the motor.
   Assemble in the reverse order.
6. Remove the yellow protective cap “X” from the motor shaft on the new motor.
7. Grease the motor shaft and hexagonal gear shaft before assembly. The hub of the new gear has already been greased at the factory.
9.2.9 HQ 5, replacing the toothed belt

1. Relieve the belt tension.
2. Remove the roller conveyor.
3. Remove the guide rollers.
4. Disassemble the drive bearing.
5. Remove the toothed belt.

Assemble the new toothed belt in the reverse order.

6. Tension the toothed belt until the adjusting measurement “x” has been obtained.

<table>
<thead>
<tr>
<th>b = bwT (mm)</th>
<th>x (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>455</td>
<td>18,5</td>
</tr>
<tr>
<td>650</td>
<td>15,5</td>
</tr>
<tr>
<td>845</td>
<td>19,5</td>
</tr>
</tbody>
</table>

Fig. 81
9.2.10 HQ 5, tensioning the toothed belt

Fig. 82
10 Decommissioning

The TS 5 modular units are components that do not have to be decommissioned. As a result, this chapter in these instructions does not contain any information.

How to disassemble and exchange the TS 5 modular units is described in chapter 11 “Disassembly and Exchange” § 105.

11 Disassembly and Exchange

**WARNING!**

Electric shock due to contact with live parts, unexpected belt section start-up

Severe injuries or death.

- Switch off the power supply before performing any maintenance or repair work.
- Switch off the compressed air supply before performing any maintenance or repair work.
- Take suitable measures to prevent inadvertent restoration.

**CAUTION!**

Hot electric motor surfaces during operation

Possible burns if the hot surface (over 70°C) is touched.

- Provide appropriate safety devices to seal off the motors.
- Let the system cool off for at least 30 min. before performing any maintenance or repair work.

**WARNING!**

Suspended loads may fall if the equipment to hold the loads has not been properly dimensioned or is incorrectly suspended

Falling objects may result in severe injuries (or even death).

- Do not stand under suspended loads.
- Use lifting equipment with a sufficiently high bearing load (see the shipping documents for product weights).
- Carefully secure lifting equipment.
- Only lift the product at the intended locations.

Preparing TS 5 modular units for storage/further use

- Always store the TS 5 modular units on a flat surface.
- Observe the environmental conditions.
12 Disposal

The materials used are environmentally sustainable. They may be recycled or reused (if components are converted or replaced). Recyclability is ensured by the selection of material and the possibility to take the components apart.

Careless disposal of the TS 5 modular units may pollute the environment.

- Thus, dispose of the TS 5 modular units in accordance with the currently applicable national regulations in your country.

13 Extension and Conversion

Do not convert the TS 5 modular units.

The Bosch Rexroth warranty only applies to the delivered configuration and extensions taken into account in the configuration. The manufacturer can accept no warranty claims if the system is converted or extended in a manner not listed in these instructions.

14 Troubleshooting and Resolution

If you are unable to remedy the error, please get in touch with one of the contact addresses listed at www.boschrexroth.com.
15 Technical Data

- For dimensions, see the TS 5 transfer system sales catalog, 3 842 540 380.
- Section load: ≤ 300 kg in accumulation operation
- Maximum load: ≤ 50 kg/roller
- Suitable for reversible operation
- Suitable for use in ESD sensitive areas. For more information, please contact your Rexroth representative.

15.1 Ambient conditions

- The transfer systems have been designed for stationary use in a location that is protected from the elements.
- Operating temperature
  - +5°C to +40°C
  - −5°C to +60°C with 20% reduced load
- Storage temperature −25°C to +70°C
- Relative humidity 5% to 85%
- Air pressure > 84 kPa, appropriate height < 1400 m above sea level
- Load values are reduced by 15% when the system is set up in a location that is > 1400 m.
- Avoid molds, fungi, rodents, and other vermin.
- Do not install or operate near industrial systems with chemical emissions.
- Do not install or operate near sandy or dusty sources.
- Do not install or operate in areas that are regularly jarred by high forces caused by e.g. presses or heavy machinery.
- Resistant to many common media used in production such as water, mineral oil, grease, and detergents. Contact your Rexroth representative if you have any doubts about resistance to specific chemicals, e.g. test oil, doped oils, aggressive detergents, solvents, or brake fluid.
- Avoid long-term contact with acidic or basic reacting materials.

15.2 Pneumatics

- Oiled or non-oiled, filtered, dry compressed air.
- Operating pressure: 4 to 6 bar.