rexroth
A Bosch Company

HD 2/H

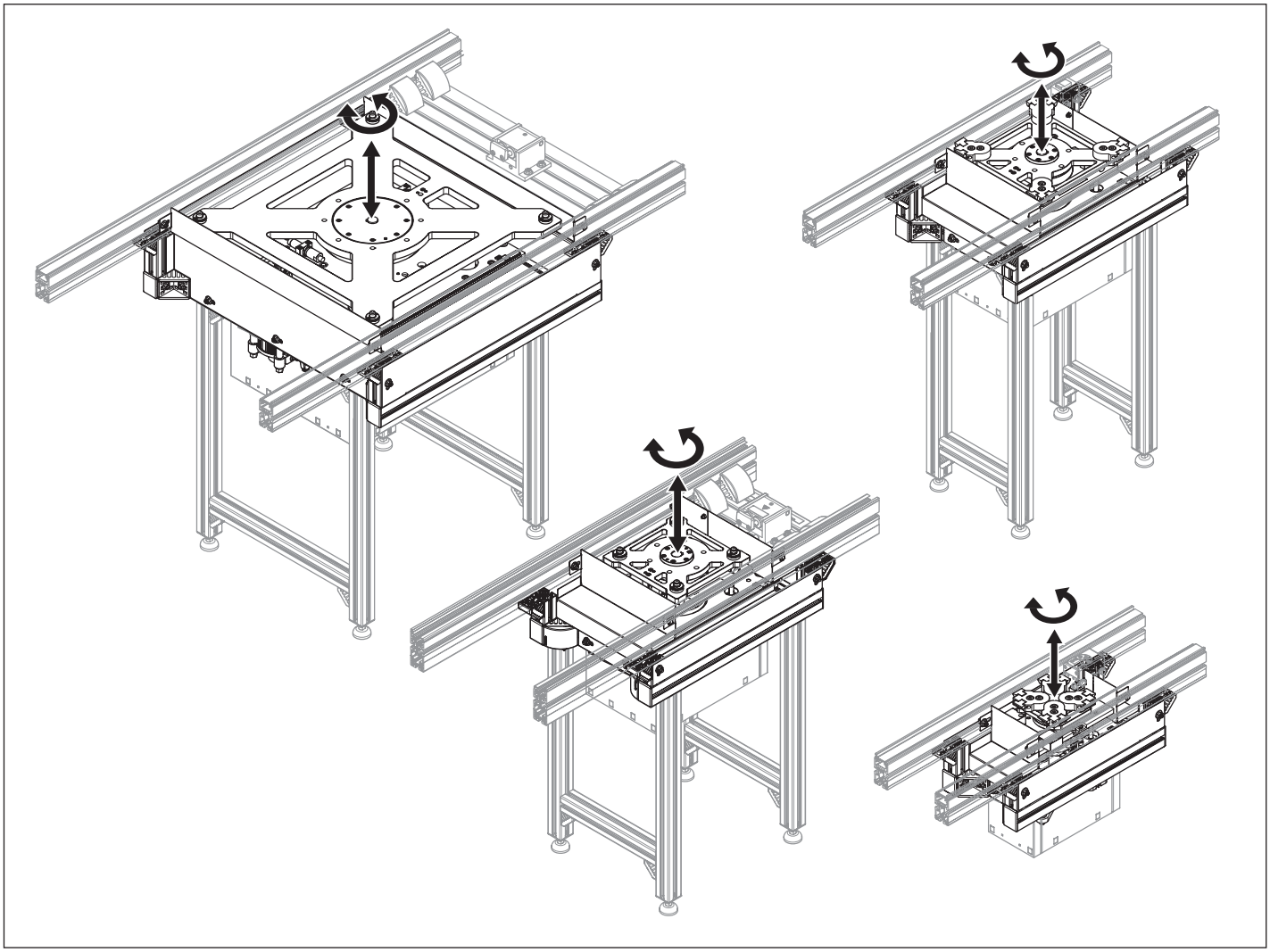
Lift rotary unit

ENGLISH

3 842 994 229
3 842 998 760
3 842 998 761
3 842 998 762

Assembly instructions
3 842 572 391/2024-02

Replaces: 2015-01
ENGLISH



The information in these instructions is for product description purposes only. Any information in these instructions on how to use the product only constitutes examples and recommendations. Catalog information is not binding. The information given does not release the user from the obligation of own judgment and verification. Our products are subject to natural wear and aging.

An example configuration is shown on the title page. The delivered product may thus vary from the illustration.

The original assembly instructions are in German.

DE Die vorliegende Montageanleitung ist in den hier angebenen Sprachen verfügbar. Weitere Sprachen auf Anfrage.
Als gedruckte Version (print) oder als PDF-Datei (media) zum Download aus dem Medienverzeichnis:
www.boschrexroth.com/medienverzeichnis
Geben Sie in die Suchmaske (oben rechts, unter "**Suche**") **3 842 572 390** ein, dann klicken Sie auf "▶**Suche**".

EN These assembly instructions are available in the languages indicated here. Other languages on request.
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Enter **3 842 572 391** in the search mask (at the top right, under "**Search**"), then click "▶**Search**".

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ES Las presentes instrucciones de montaje están disponibles en los idiomas indicados. Hay más idiomas a petición.
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En el buscador (en la parte superior derecha, donde pone "**Search**") introduzca **3 842 572 407**, a continuación haga clic en "▶**Search**".

PT-BR Este manual de montagem está disponível nos idiomas especificados aqui. Outros idiomas mediante pedido.
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ZH 本安装说明书有这里给出的语言版本。有印刷版本 (print) 或者电子版 PDF 文件 (media) 供使用，电子版文件可在下列的公司网站媒体网页上下载: **www.boschrexroth.com/mediadirectory**
1. 在搜索窗口 (右上角，"**Search**" 窗口) 内输入编号 **3 842 572 394**。2. 点击 "▶**Search**"。

CS Tento návod k montáži je k dispozici ve zde uvedených jazycích. Jako tištěná verze (print) nebo jako soubor PDF (media) je ke stažení z adresáře médií: **www.boschrexroth.com/mediadirectory**
1. Zadejte do vyhledávací obrazovky (nahoře vpravo, pod "**Search**") **MTCS 572 390**. 2. Klikněte na "▶**Search**"

PL Dana instrukcja montażu jest dostpna w podanych tutaj językach. W postaci wydrukowanej lub w wersji pdf (media) do pobrania ze strony: **www.boschrexroth.com/mediadirectory**
1. Do wyszukiwarki wpisać (w prawym górnym rogu "**Search**") **MTPL 572 390**.2. KKliknać "▶**Search**"

3 842 572 390	print	media	HD 2/H Hub-Dreheinheit	DE Deutsch
3 842 572 391	print	media	HD 2/H Lift rotary unit	EN English
3 842 572 406	print	media	HD 2/H Unité de levée et de rotation	FR Français
3 842 572 392	print	media	HD 2/H Unità di sollevamento e rotazione	IT Italiano
3 842 572 407	print	media	HD 2/H Unidad de elevación y giro	ES Español
3 842 572 393	print	media	HD 2/H Unidade de rotação e elevação	PT Português
3 842 572 394	print	media	HD 2/H 升降旋转装置	ZH 中文
MTCS 572 390		media	HD 2/H Zvedací otočná jednotka	CS Česky
MTPL 572 390		media	HD 2/H Jednostka podnośnikowo-obrotowa	PL Polski

Bosch Rexroth AG, MIT: HD 2/H, 3 842 572 391/2024-02

Contents

1 About this documentation

1.1 Validity of the documentation

This documentation applies to the following products:
- 3 842 998 760, lift rotary unit HD 2/H size 1 (for WT 2, WT 2/F)
- 3 842 998 761, lift rotary unit HD 2/H size 2 (for WT 2, WT 2/F)
- 3 842 994 229, lift rotary unit HD 2/H size 2 (for WT 2/H, WT 2/F-H)
- 3 842 998 762, lift rotary unit HD 2/H size 3 (for WT 2/H, WT 2/F-H)

This documentation is intended for fitters, operators, service engineers and system owners.
This documentation contains important information relating to the safe and proper assembly, transportation, commissioning, operation, use, maintenance and disassembly of the product, and on how to rectify simple faults yourself.

▶ Read this documentation in full prior to working with the product, particularly section 2 "Safety instructions" and section 3 "General notes on property and product damage".

1.2 Required and supplementary documentation

▶ Only commission the product if the documentation marked with the book symbol 🕮 is available and you have understood and followed the instructions in it.

Table 1: Required and supplementary documentation

	Title	Document number	Document type
🕮	Employee safety training	3 842 527 147	
	MT*parts*	3 842 529 770	Spare parts list on CD

1.3 Presentation of information

Standardized safety instructions, symbols, terms and abbreviations are used so that you can use this documentation to work quickly and safely with your product. These are explained in the following sections to help you understand them better.

1.3.1 Safety instructions

This document contains safety instructions in chapter 2.6 "Product-specific safety instructions" and chapter 3 "General notes on property and product damage", as well as before any sequence of actions or any required action which involves a risk of personal injury or property damage. Be sure to observe all safety precautions.

Safety instructions are set out as follows:

⚠ SIGNAL WORD
Type and source of danger! Consequences of non-compliance ▶ Measures to prevent danger ▶ ...

- **Warning sign:** Points out the danger
- **Signal word:** Indicates the severity of the danger
- **Type and source of danger:** Indicates the type and source of the danger
- **Consequences:** Describes the consequences of non-compliance
- **Prevention:** States how the danger can be avoided

Table 2: Risk classes according to ANSI Z535.6-2006

Warning sign, signal word	Meaning
⚠ DANGER	Indicates a hazardous situation that will result in serious injury or death if not avoided.
⚠ WARNING	Indicates a hazardous situation that may result in serious injury or death if not avoided.
⚠ CAUTION	Indicates a hazardous situation that may result in minor to moderate injury if not avoided.
NOTICE	Property damage: The product or the surrounding area could get damaged.

1.3.2 Symbols

The following symbols indicate important information that is not safety-relevant but increases the comprehensibility of the documentation.

Table 3: Meaning of the symbols

Symbol	Meaning
	If this information is not observed, the product cannot be used and/or operated as designed.
▶	Single, independent action
1. 2. 3.	Numbered steps: The numbers indicate that the action steps are sequential.

1.3.3 Designations

This document uses the following designations:

Table 4: Designations

Designation	Meaning
HD 2/H	Lift rotary unit from the Rexroth transfer system TS 2*plus*
WT 2	Workpiece pallet from the Rexroth transfer system TS 2*plus*
BG	Size

2 Safety instructions

2.1 About this chapter

The product has been manufactured in accordance with the generally accepted rules of current technology. Nevertheless, there is a risk of personal injury and property damage if you do not read this chapter and follow the safety instructions in this document.

- ▶ Read this documentation carefully and completely before you start working with the product.
- ▶ Keep the documentation accessible to all users at all times.
- ▶ Always include them when giving the product to a third party.

2.2 Intended use

The product is an incomplete machine.
You may use the product as follows:
• For installation in a Rexroth transfer system TS 2*plus*.
• For lifting and rotating of Rexroth workpiece pallets WT 2 from the conveyor section.
• Maximum load/section load: See technical data on page 53.
• For ambient conditions, see page 56.

The product is strictly intended for professional use and not for private use.
The intended use also includes having read and understood these instructions, especially chapter 2 "Safety instructions".

2.3 Improper use

Any use other than that described in the section "Intended use" is considered improper and is not permitted.
Bosch Rexroth AG is not liable for any damage resulting from improper use.
The user alone bears any risks associated with improper use.
The following foreseeable misuses also constitute improper use:
• Transporting goods other than those specified.
• Using the product without protective case or other contact protection provided by the customer.
• Using the product in accumulation operation.
• Transporting people on the product or transported material.
• Climbing onto the product.
  – The product is not accessible.
• Private use.

2.4 Personnel qualifications

The activities described in this document require basic knowledge of mechanical, electrical and pneumatic systems, as well as familiarity with the corresponding technical terms. Additional knowledge regarding the use of lifting gear and corresponding slings is required for transporting and handling the product. To ensure safe use, these activities should therefore only be performed by qualified personnel or by an instructed person acting under the direction of such qualified personnel. "Qualified personnel" refers to those who can recognize potential hazards and take appropriate safety measures based on their technical training, knowledge, experience, and understanding of the relevant regulations pertaining to the work being performed. Qualified personnel must comply with the relevant technical regulations and have the necessary expertise.

Bosch Rexroth offers training support for specialized fields. You can find an overview of the training content online at: http://www.boschrexroth.de/didactic

2.5 General safety instructions

- Observe the applicable accident prevention and environmental protection regulations.
- Observe the safety rules and regulations of the country in which the product is being used.
- Only use Rexroth products that are in proper working order.
- Observe all the notices on the product.
- Persons who assemble, operate, disassemble or maintain Rexroth products should not be under the influence of alcohol, drugs or medication that may affect their ability to respond.
- Use only original accessories and spare parts from Rexroth in order to prevent hazards to people due to unsuitable spare parts.
- Observe the technical data and ambient conditions specified in the product documentation.
- Only start up the product if it has been determined that the end product (for example, a machine or system) into which the Rexroth products have been installed complies with national provisions, safety regulations and application standards.

2.6 Product-specific safety instructions

General

- Do not attempt to modify the product.
- Do not expose the product to any mechanical loads under any circumstances. Never use the product as a handhold or step. Do not place any objects on the product.
- Always ensure that the product cannot topple over.

During transport

- Observe the transport instructions on the packaging.

During assembly

- Inspect the product for obvious transport damage.
- Lay cables and lines so that they cannot be damaged and no one can trip over them.
- Make sure the system component you are working on is depressurized and de-energized before assembling the product or inserting or removing plugs.
- Ensure that the system component cannot be switched back on.
- Before commissioning, make sure that all seals and plugs for the plug-in connections are correctly installed and not damaged to prevent liquids and foreign bodies from entering the product.

During commissioning

- Allow the product to acclimatize for a few hours prior to commissioning in order to prevent water condensation from forming in the housing.
- Make sure that all electrical and pneumatic connections are either in use or covered.
- Check the safety requirements according to DIN EN 619.
- Only start up a product that has been completely installed.
- Make sure that all the safety equipment which forms part of the product is present, has been properly installed, and is fully functional. Do not move, bypass or disable any safety equipment.
- Do not reach into moving parts.
- Check the product for malfunctions.

During operation

- Make sure that only authorized personnel perform the following tasks within the scope of the product's intended use:
  – Starting or operating the system or interfering with its normal operation.
  – Operating component or part adjusters.
- Only allow people to be in the immediate vicinity of the product when it is operating if they are authorized by the owner to be there. This also applies when the product is idle.
- Make sure that:
  – There are no obstacles preventing access to the EMERGENCY STOP controls.
  – All delivery points, workstations and passages are kept clear.
- Do not use EMERGENCY STOP controls for routine stopping.
- Regularly check the EMERGENCY STOP controls to ensure that they are functioning properly.
- Following an EMERGENCY STOP or in the event of a fault or other irregularity, turn the product off and secure it against being switched back on.
- Do not reach into moving parts.
- An idle system is not necessarily a safe system, as stored energy can be released unintentionally or through improper maintenance procedures.

EMERGENCY STOP, malfunction

- After an EMERGENCY STOP or a malfunction, only switch the system back on once you have established and rectified the cause of the fault.

During servicing and repair
- Make sure that access to maintenance and inspection points is kept unobstructed.
- Perform the prescribed maintenance use at the intervals specified in chapter 10.3 "Maintenance".
- Make sure that no line connectors, connections or components are disconnected as long as the system is supplied with pressure and voltage. Secure the system against being switched back on.

During disposal
- Dispose of the product in accordance with the regulations in your country.

2.7 Personal protective equipment

- Appropriate protective equipment should be worn when handling/using the product (e.g. safety shoes, close-fitting clothing, a hair net for long, loose hair).
  As the system owner or operator, you are personally responsible for ensuring the use of appropriate protective equipment when the product is being used.
  All component parts of the personal protective equipment must be free of damage.

2.8 Owner responsibilities

- Before the initial commissioning or re-commissioning of a conveyor system, carry out a risk assessment in accordance with DIN EN ISO 12100.
- Please also observe the residual risks of the individual components (see section 8.2 "Residual risks" on page 38).
- Before the initial commissioning, ensure that there are no protruding or sharp-edged parts that may be a hazard to personnel working or moving in the area.
- Provide safety-related instructions to the operating personnel before initial commissioning or re-commissioning, and then at regular intervals.

3 General notes on property and product damage

The warranty only applies to the delivered configuration.
- The warranty is void in the event of incorrect assembly, commissioning and operation, as well as improper use and/or improper handling.

During cleaning
- Prevent cleaning agents from getting into the system.
- Never use solvents or corrosive cleaning agents.
- Do not use a pressure washer for cleaning.

4 Scope of delivery

The scope of delivery includes the following:
- 1x lift rotary unit HD 2/H
- Fastening material
- Pneumatic elements such as fittings, throttle check valves, etc.
- 1x assembly instructions "HD 2/H, lift rotary unit".

The protective case kit is not included in the scope of delivery and must be ordered separately.

4.1 Condition on delivery

- Lift rotary unit HD 2/H assembled ready-to-install.

5 About this product

5.1 Specifications

Please note:
- For non-square workpiece pallets, only 180° horizontal rotation.
- With size 1 and 2, rotation angle 90°, the rotary table is turned back below the belt section.
- With size 3, rotation angle 90°, the rotary table is turned back above the belt section.

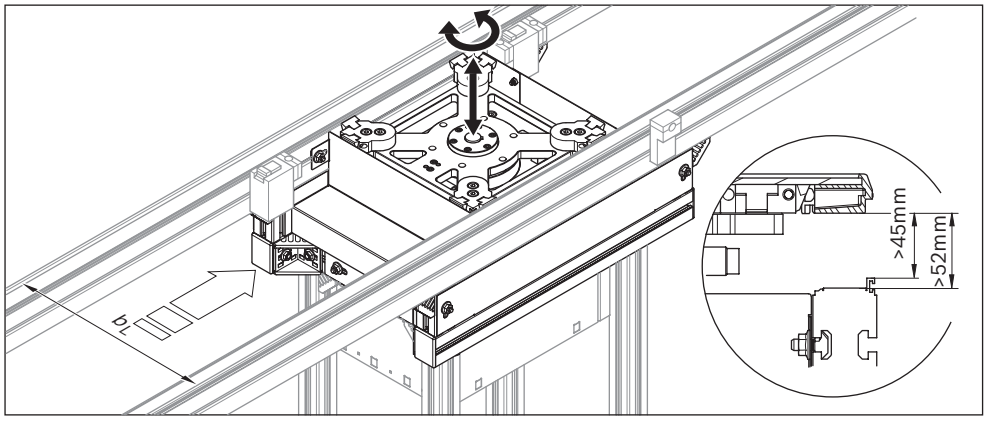


Fig. 1: Specifications of the lift rotary unit HD 2/H

5.1.1 Lift rotary unit HD 2/H applications
- Installation in belt section BS 2... or section ST 2...
- Lifting out of the section (>45 mm above transport level, see Fig. 1, detail X) and turning (90° / 180°) of workpiece pallets WT 2.

5.1.2 Lift rotary unit HD 2/H version
- Extremely compact construction. Suitable for tight spaces.
- Pneumatic drive.

5.2 Product description

Please note:

- For non-square workpiece pallets, only 180° horizontal rotation.
- With size 1 for WT 2 and WT 2/F, rotation angle 90°, the rotary table is turned back below the belt section.

A: Lift rotary unit HD 2/H, size 1 for WT 2 and WT 2/F. For possible WT sizes, see page 16.
A[1]: Protective case kit (not included).
E: Rotary table
F: Lifting plate
G: Base plate
H: Rotary position sensor threaded hole
I: Damper
J: Installation frame

*)
b = Width in direction of transport
l_T = Length in direction of transport

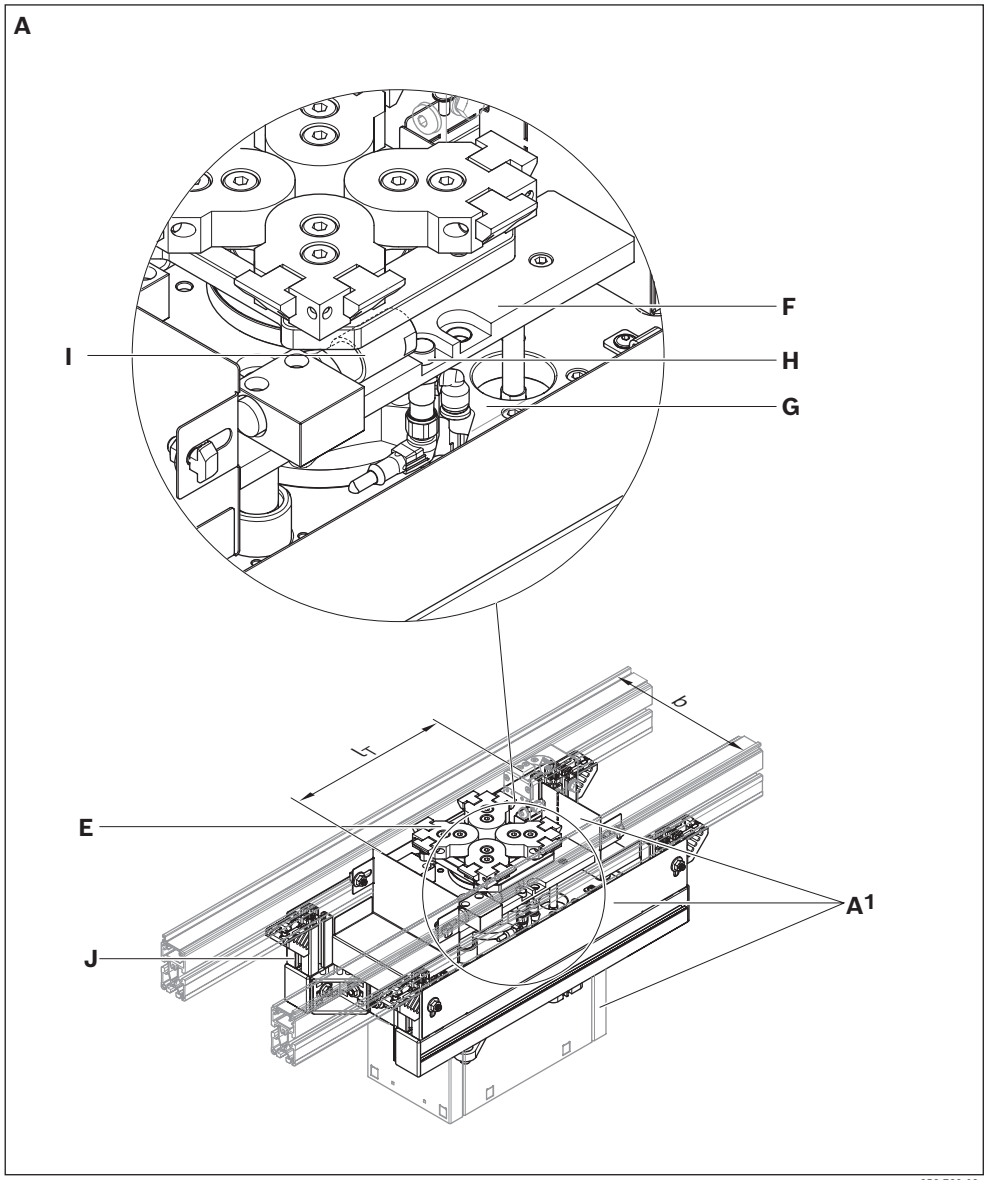


Fig. 2: Lift rotary unit HD 2/H size 1 (for WT 2, WT 2/F)

Please note:

- For non-square workpiece pallets, only 180° horizontal rotation.
- With size 2 for WT 2 and WT 2/F, rotation angle 90°, the rotary table is turned back below the belt section.

B: Lift rotary unit HD 2/H, size 2 for WT 2 and WT 2/F. For possible WT sizes, see page 16.
B[1]: Protective case kit (not included).
E: Rotary table
F: Lifting plate
G: Base plate
H: Rotary position sensor threaded hole
I: Damper
J: Installation frame
K: Additional leg sets for load > 50 kg (not included).

*)
b = Width in direction of transport
l_T = Length in direction of transport

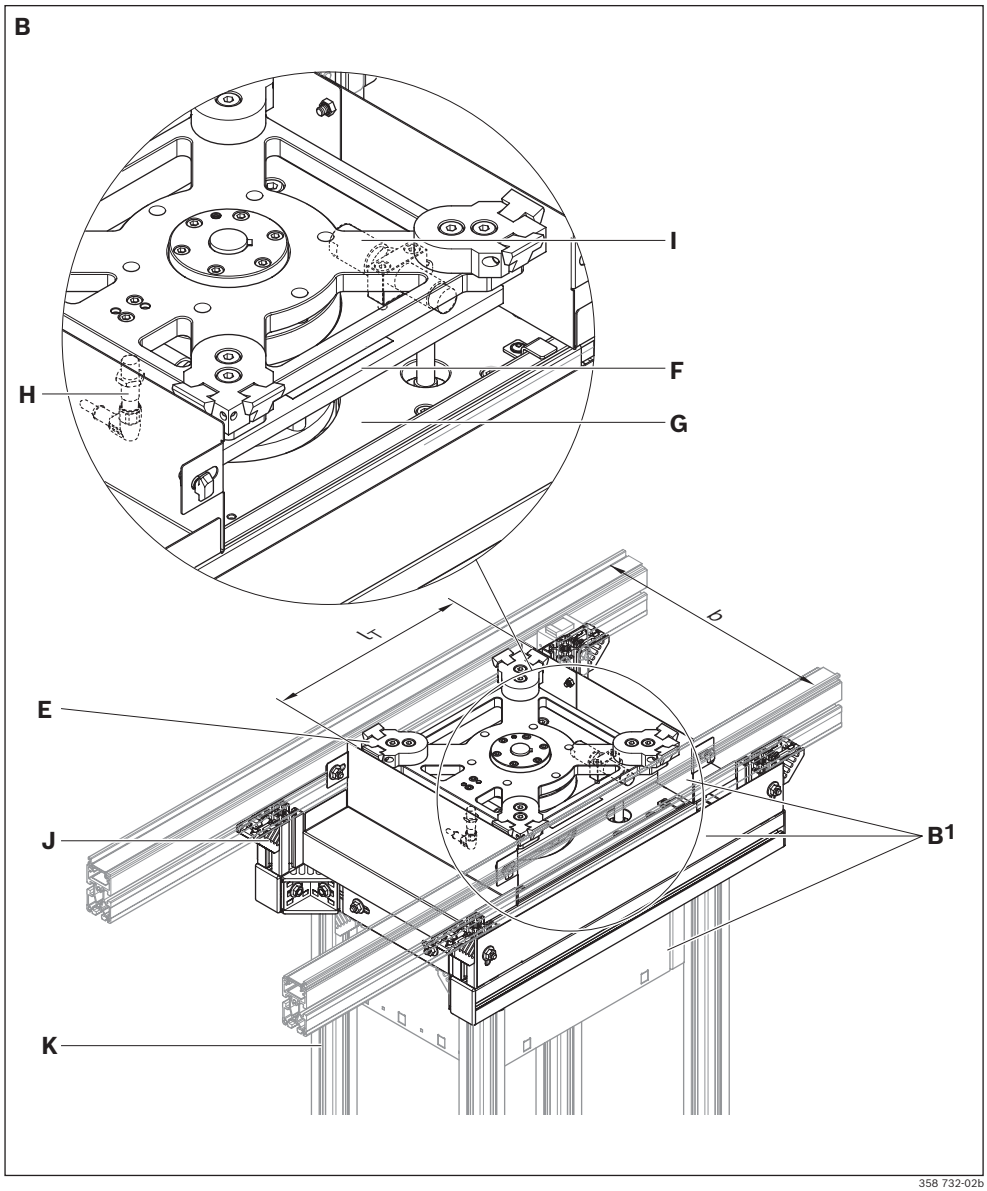


Fig. 3: Lift rotary unit HD 2/H size 2 (for WT 2, WT 2/F)

Please note:

- For non-square workpiece pallets, only 180° horizontal rotation.
- With size 2 for WT 2/H, rotation angle 90°, the rotary table is turned back below the belt section.

C: Lift rotary unit HD 2/H, size 2 for WT 2/F and WT 2/F-H. For possible WT sizes, see page 16.
C[1]: Protective case kit (not included).
E: Rotary table
F: Lifting plate
G: Base plate
H: Rotary position sensor threaded hole
I: Damper
J: Installation frame
K: Additional leg sets are mandatory (not included).

*)
b = Width in direction of transport
l_T = Length in direction of transport

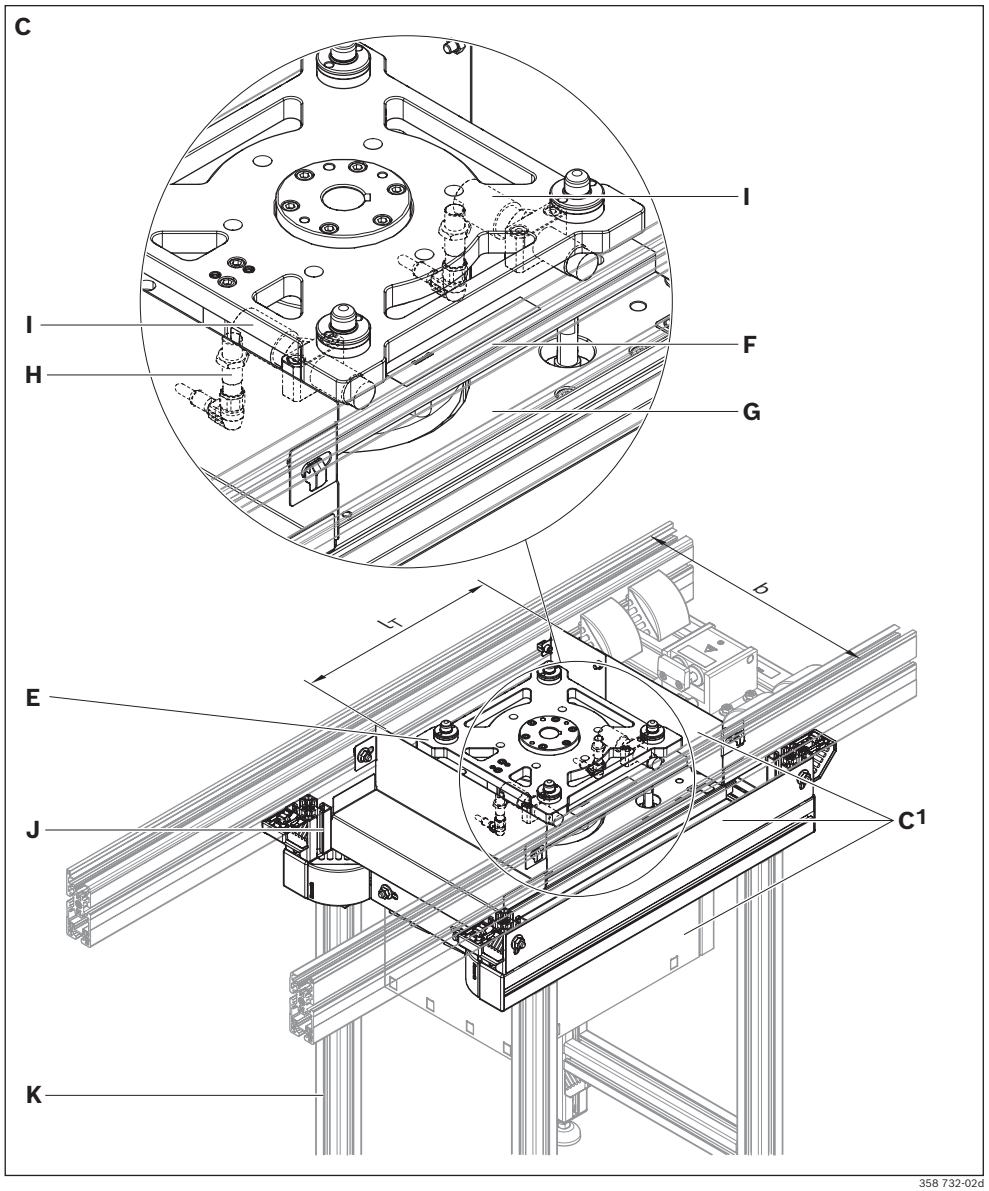


Fig. 4: Lift rotary unit HD 2/H size 2 (for WT 2/H, WT 2/F-H)

Please note:

- For non-square workpiece pallets, only 180° horizontal rotation.
- With size 3 for WT 2/H and WT 2/F-H, rotation angle 90°, the rotary table is turned back above the belt section.

D: Lift rotary unit HD 2/H, size 3 for WT 2/F and WT 2/F-H. For possible WT sizes, see page 16.

D[1]: Protective case kit (not included).

E: Rotary table

F: Lifting plate

G: Base plate

H: Rotary position sensor threaded hole

I: Damper

J: Installation frame

K: Additional leg sets are mandatory (not included).

*)
b = Width in direction of transport
l_T = Length in direction of transport

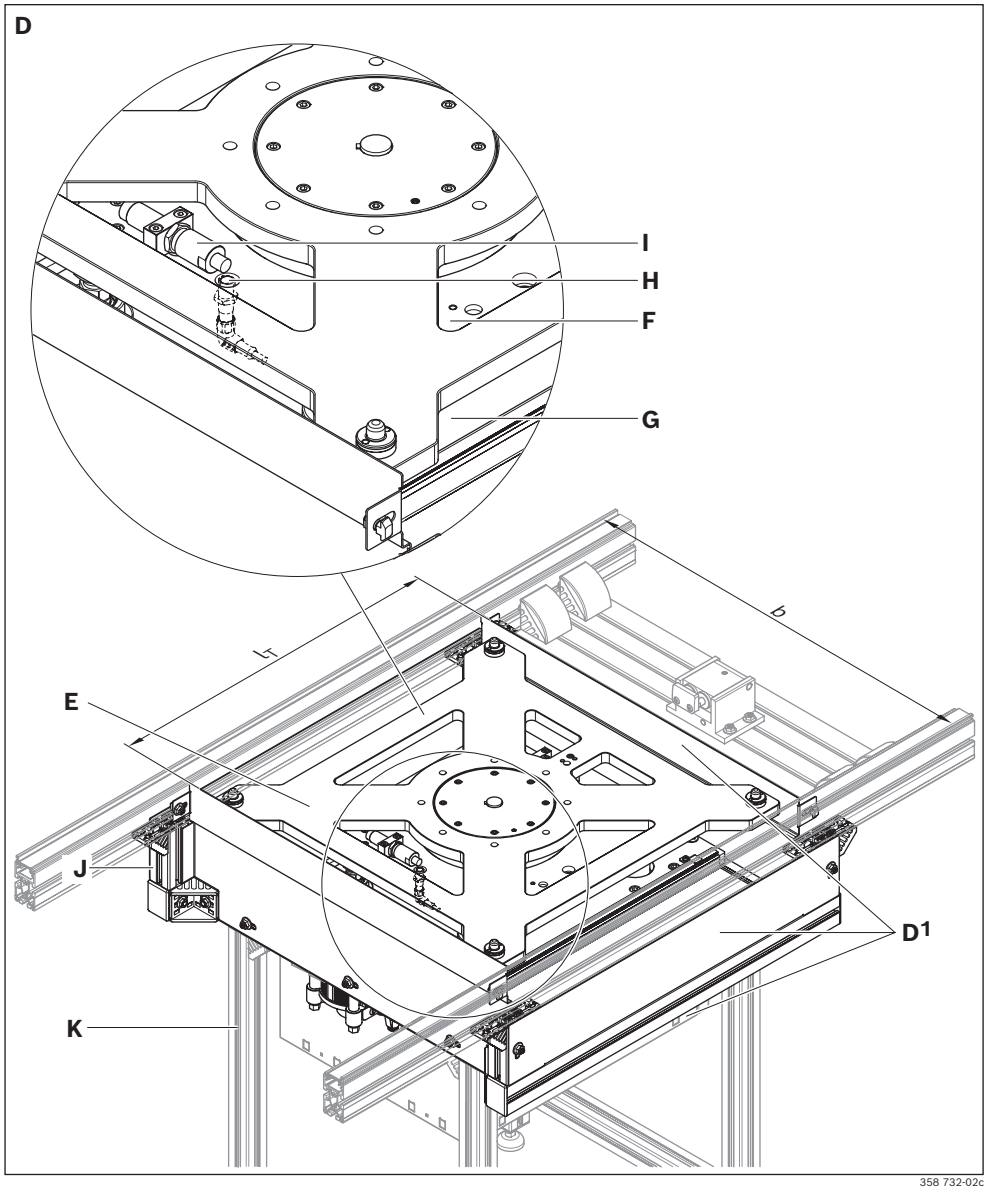
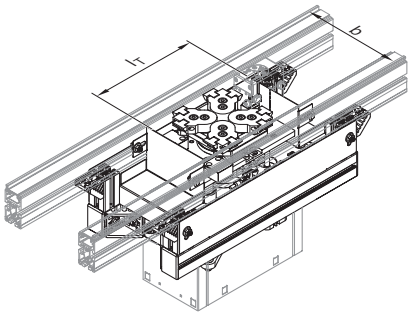
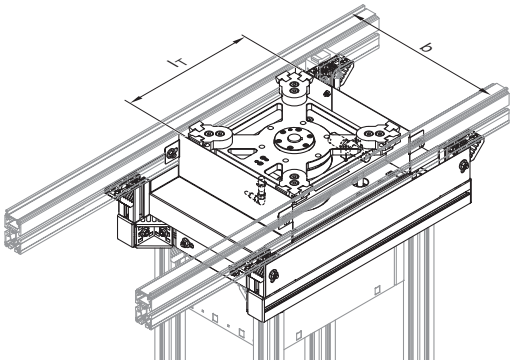
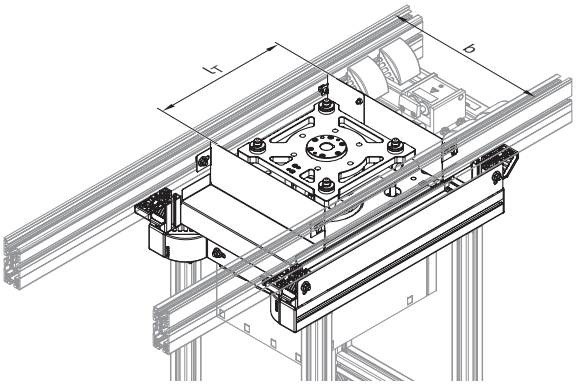
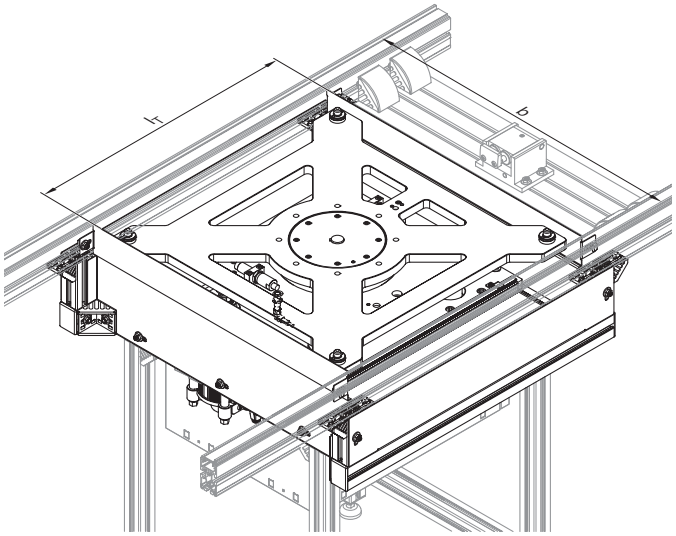


Fig. 5: Lift rotary unit HD 2/H size 3 (for WT 2/H, WT 2/F-H)

Table 5: Possible WT sizes for size ...

Size HD 2/H	Applicable workpiece pallets	Width in direction of transport w [mm]	Length in direction of transport l_t [mm]
Size 1 for WT 2 and WT 2/F **3 842 998 760**  Load up to 50 kg *	WT 2 WT 2/F	240	240
			320
			400
		320	240
			320
			400
			480
		400	320
Size 2 for WT 2 and WT 2/F **3 842 998 761**  Load up to 128 kg * Additional leg sets for load > 50 kg (not included).	WT 2 WT 2/F	400	400
			480
		480	400
			480
			640
			800
		640	480
			640
			800
			1040
		800	640
Size 2 for WT 2/H and WT 2/F-H **3 842 994 229**  Load up to 128 kg * Additional leg sets for load > 50 kg (not included).	WT 2/H WT 2/F-H	400	400
			480
		480	400
			480
			640
			800
		640	480
			640
			800
			1040
		800	640

Size HD 2/H	Applicable workpiece pallets	Width in direction of transport w [mm]	Length in direction of transport l_t [mm]
Size 3 **3 842 998 762**  Load up to 240 kg * Additional leg sets are mandatory (not included).	WT 2/H WT 2/F-H	800	800
			1040
		1040	800
			1040
			1200
		1200	1200

* Observe the conveyor section's maximum section load (see section 16 "Technical data" on page 53)

ENGLISH

5.3 Identification of the product

A: Material number (order number)

B: Designation

C: Information on design and dimensions

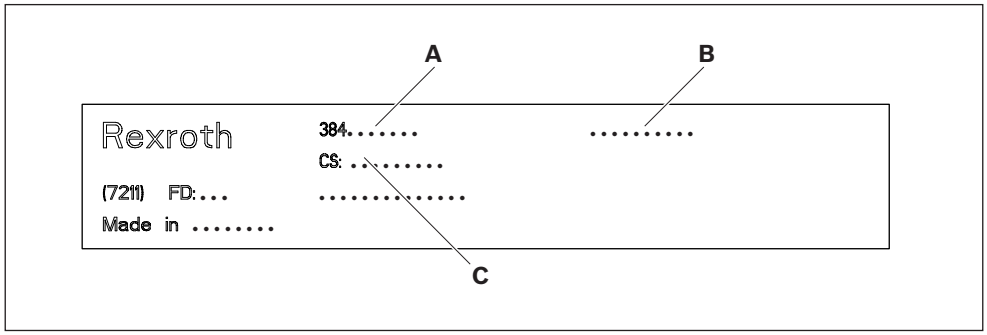


Fig. 6: Nameplate

6 Transport and storage

- Observe the transport instructions on the packaging.
- Transport weight: see delivery documents.
- Secure the product to prevent toppling!
- Always maintain ambient conditions during loading and transport, see page 56.

6.1 Transporting the product

⚠ WARNING

Suspended loads may fall!

Falling objects can result in severe injury (or even death).

- ▶ Use only slings with sufficiently high bearing loads (for product weight, see delivery documents).
- ▶ Make sure the lifting straps are correctly fastened before lifting the product!
- ▶ Secure the product against tipping over when lifting!
- ▶ Make sure that no one but the operator is in the danger zone during lifting and lowering!

6.2 Storing the product

- Only set the product down on a flat surface.
- Protect the product from mechanical stress.
- Protect the product from environmental influences, such as dirt and moisture.
- Observe the ambient conditions, see page 56.
- Support the product so that suspended motors/actuators/cylinders will not be strained.

7 Installation

7.1 Unpacking

▶ Lift the product out of its packaging.

Use a lift aid to lift the product. The lifting eye bolt (X) in the base plate serve as attachment points for a round sling, for example (see e.g. Fig. 7 on page 21).

▶ Dispose of the packaging material in accordance with the applicable regulations in your country.

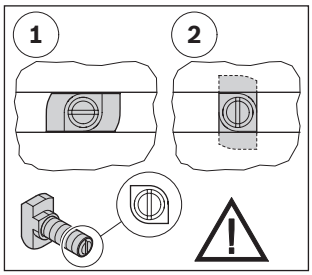
7.2 Installation requirements

▶ During installation, be sure to maintain the ambient conditions specified in the technical data (see page 56).

7.2.1 Installation position

▶ Install the product level and plumb, at right angles, and axially parallel. This ensures proper functioning and prevents premature wear.

7.2.2 Fastening with T-bolts



- Mount the transfer systems TS 1, TS 2*plus*, TS 2*pv*, TS 4*plus*, TS 5 and the chain conveyor systems VarioFlow and VarioFlow S with T-bolt and flange nut.
- Make sure the T-bolt is in the correct position when inserting it into the slot and tightening it. The notch at the head of the screw indicates the orientation of the T-bolt.

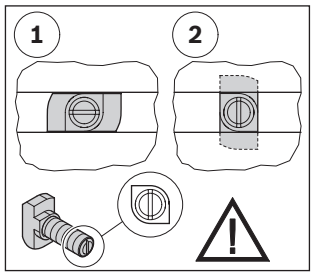
▶ 1 = T-bolt insertion position in the slot.
▶ 2 = T-bolt clamping position in the slot.
▶ Tightening torque: 25 Nm (M8).

7.3 Required tools

- Hex wrench SW13.
- Hex socket wrenches SW3, SW4, SW5, SW6.
- Cross-head screwdriver PZ2
- Rubber mallet
- Spirit level

7.4 Symbols used

Table 6: Symbols used

	Connection with T-bolt and flange nut. Make sure the T-bolt is in the correct position when inserting it into the slot and tightening it. The notch at the head of the screw indicates the orientation of the T-bolt. 1 = T-bolt insertion position in the slot. 2 = T-bolt clamping position in the slot. Tightening torque: 25 Nm
 M_D = 20Nm	Hex wrench SW = wrench size ... mm M_D = required tightening torque ... Nm
 M_D = 8Nm	Hex socket wrench SW = wrench size ... mm M_D = required tightening torque ... Nm
 	Screwdrivers for cross-head screws PZ ... = Pozidriv screw driver, size ... PH ... = Phillips cross-head screw driver, size ...
   ISO-FLEX TOPAS NCA 52 Klüber Struktovis GHD	Lubricate with specific grease: • ISO-FLEX TOPAS NCA 52: www.klueber.com • Klüber Struktovis GHD: www.klueber.com
  Loctite 243 Loctite 601	Secure the screws with: • Loctite 243: Medium strength (detachable), www.loctite.de • Loctite 601: High-strength screw retention (non-detachable), www.loctite.de
	The marked parts are not required for the described assembly. Dispose of the parts or use them for other purposes.
	Graphical depiction of the installation steps. The numbers correspond to the sequence of installation steps, in accordance with the instructions in the accompanying text.
	Graphical depiction of the designation of components. The letters denote the components mentioned in the accompanying text.
	Detail view from a different direction, for example, the back or the bottom side of the product.

7.5 Product installation

NOTICE

Property damage due to incomplete installation
The product can get damaged, shortening its service life.
▶ For size 3, be sure to install the additional leg sets (mandatory).

7.5.1 Installing the lift rotary unit HD 2/H size 1 in section ST 2

Please note:
Due to its low weight, size 1 can be installed directly into the section profile from below without removal.

1. Mark the assembly position of the HD 2/H.
2. Pre-install the T-bolts.
3. Install the lift rotary unit HD 2/H from the bottom at the section profile.

Please note:
Use a lift aid to lift the product. The lifting eye bolt (X) in the base plate serve as attachment points for a round sling, for example (see Fig. 7).

4. Insert the T-bolts into the section profiles.
5. Gently tighten the flange nuts.

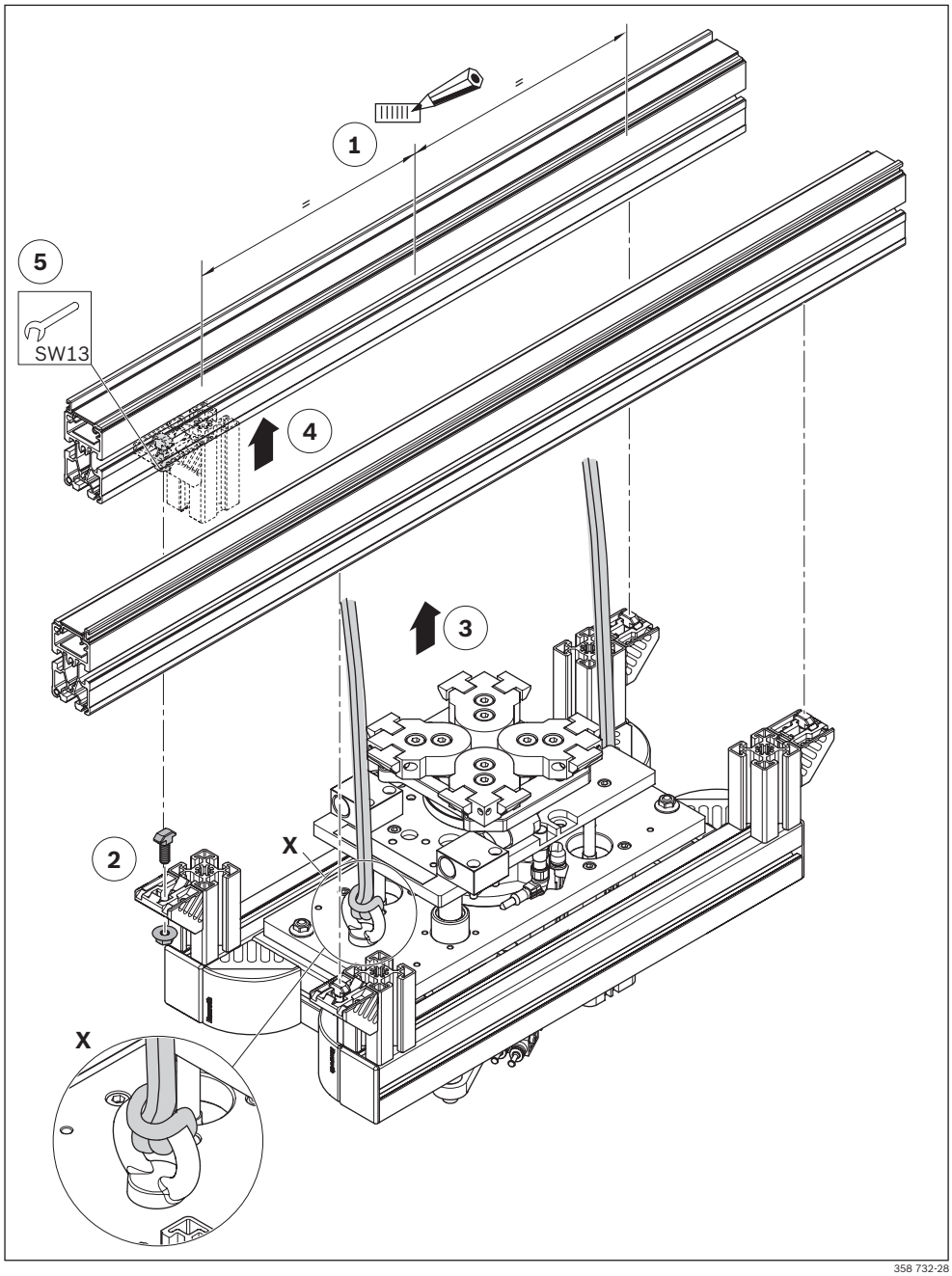


Fig. 7: Installing the lift rotary unit HD 2/H size 1 in section ST 2 (here size 1 180°)

6. Adjust the base plate (F) between the transport sections.
7. Tighten down the flange nuts.
8. Remove the lifting eye bolts.

Please note:
Optionally, install size 1 as described in chapter 7.5.2 on page 23.

NOTICE

Property damage due to incorrect setting
The product can get damaged, shortening its service life.

- The rotation angle must be checked and, if necessary, precisely adjusted during commissioning. Otherwise the lift rotary unit may be damaged or wear out prematurely. See chapter 8.4 "Checking and adjusting the rotation angle of the lift rotary unit" on page 39.

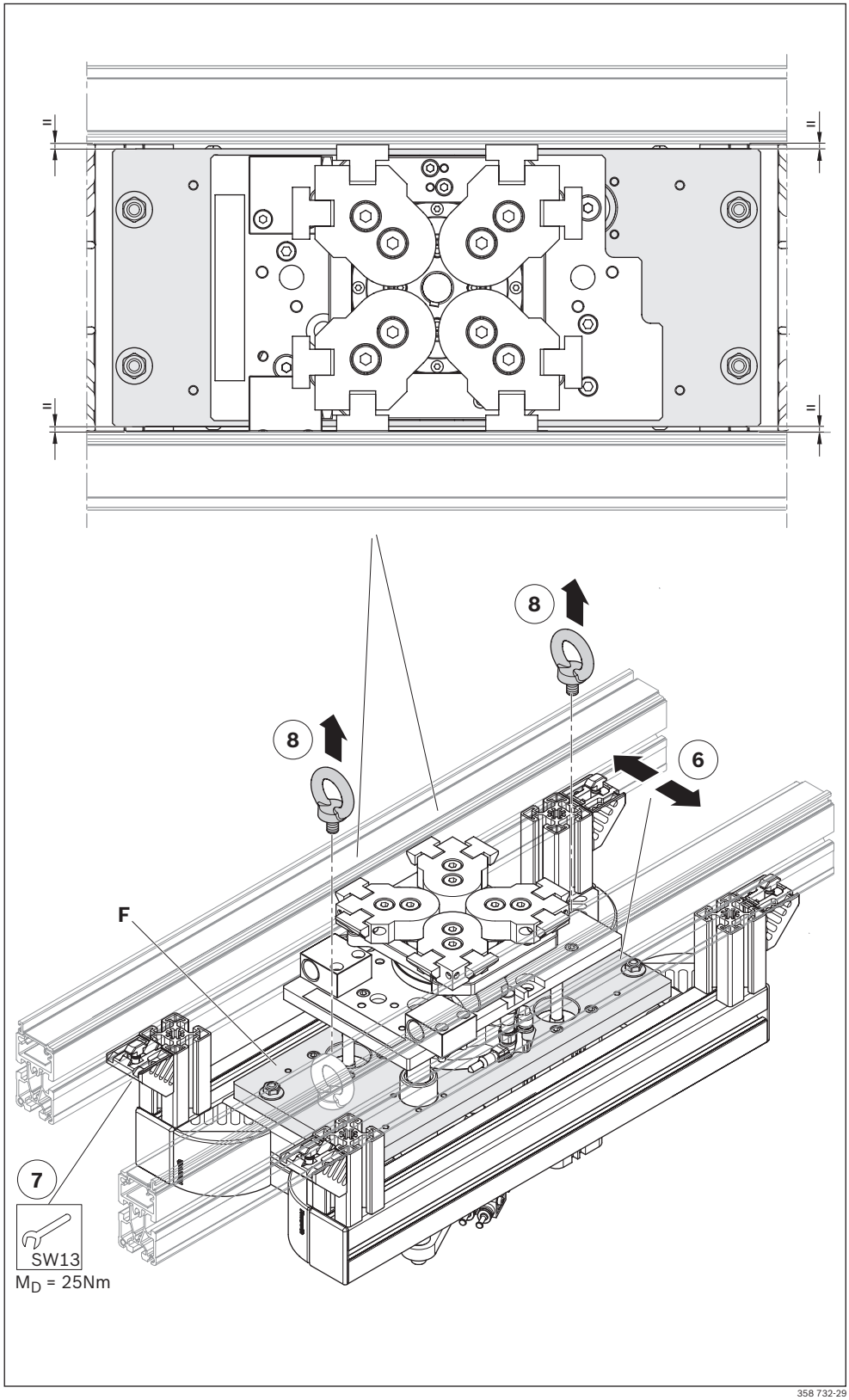


Fig. 8: Adjusting the lift rotary unit HD 2/H size 1 in section ST 2 (here size 1 180°)

7.5.2 Installing the lift rotary unit HD 2/H size 2 and size 3 in section ST 2

Please note:
Due to the high weight, sizes 2 and 3 should be removed before installation in the section profile.
This allows the mounting frame of the HD 2/H to be installed from below first and then the HD 2/H to be inserted from above.

1. Mark the position of the lift rotary unit on the installation frame.
2. Remove the lift rotary unit from the installation frame.

Please note:
Use a lift aid to lift the product. The lifting eye bolt (X) in the base plate serve as attachment points for a round sling, for example (see Fig. 9).

3. Mark the assembly position of the HD 2/H.
4. Pre-install the T-bolts.
5. Insert the T-bolts into the section profiles.
6. Gently tighten the flange nuts.

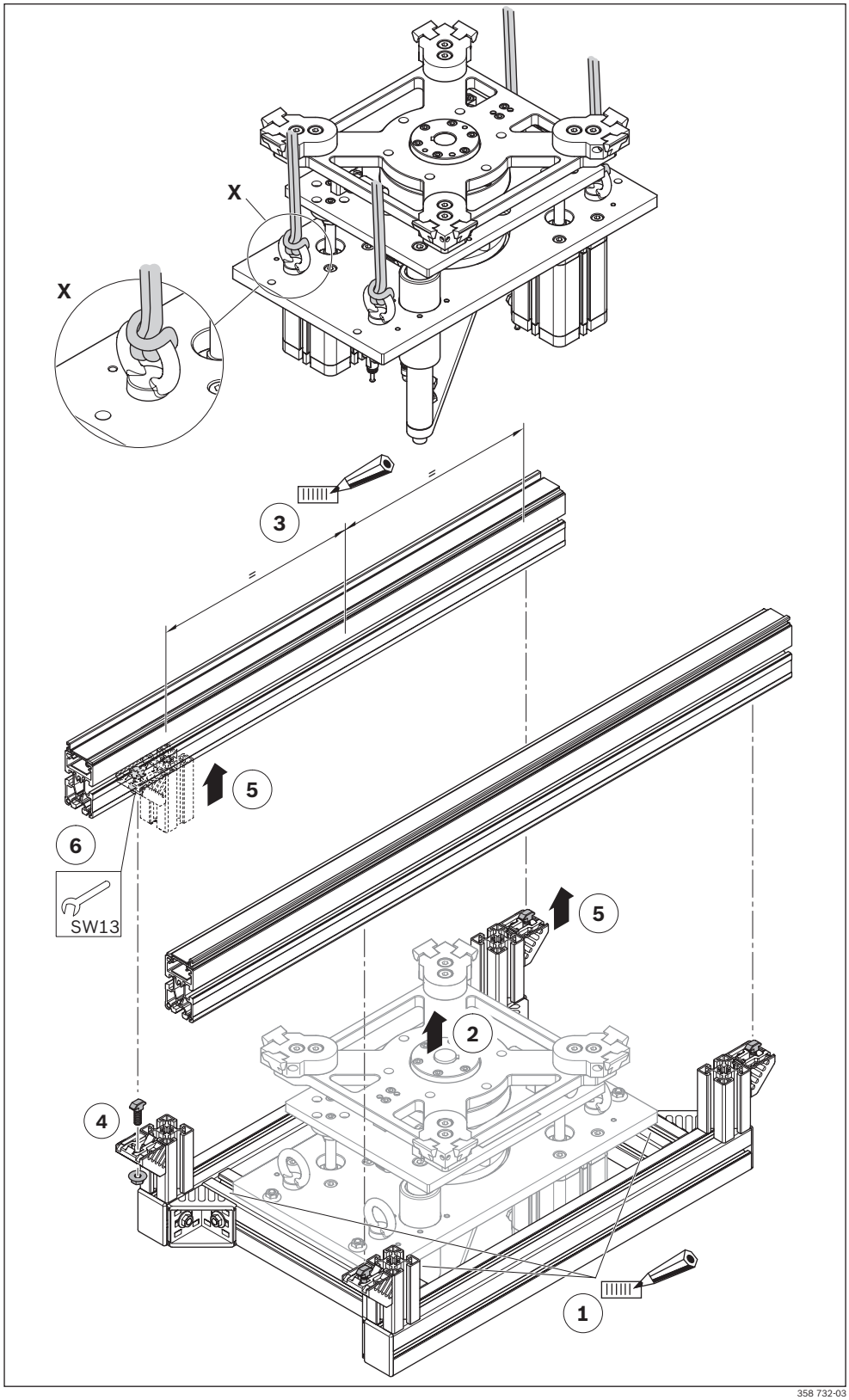


Fig. 9: Installing the lift rotary unit HD 2/H size 2 and 3 in section ST 2 (here size 2 180° for WT 2, WT 2/F)

7. Install the HD 2/H on the installation frame from above (observe markings).
8. Adjust the base plate (F) between the transport sections.
9. Tighten down the flange nuts.
10. Remove the lifting eye bolts.
11. For size 3, be sure to install the additional leg sets (mandatory). For size 2 for loads > 50 kg.
    For **size 2**:
    3 842 993 324
    For **size 3**:
    3 842 993 325

NOTICE

Property damage due to incorrect setting

The product can get damaged, shortening its service life.

- ▶ The rotation angle must be checked and, if necessary, precisely adjusted during commissioning. Otherwise the lift rotary unit may be damaged or wear out prematurely. See chapter 8.4 "Checking and adjusting the rotation angle of the lift rotary unit" on page 39.

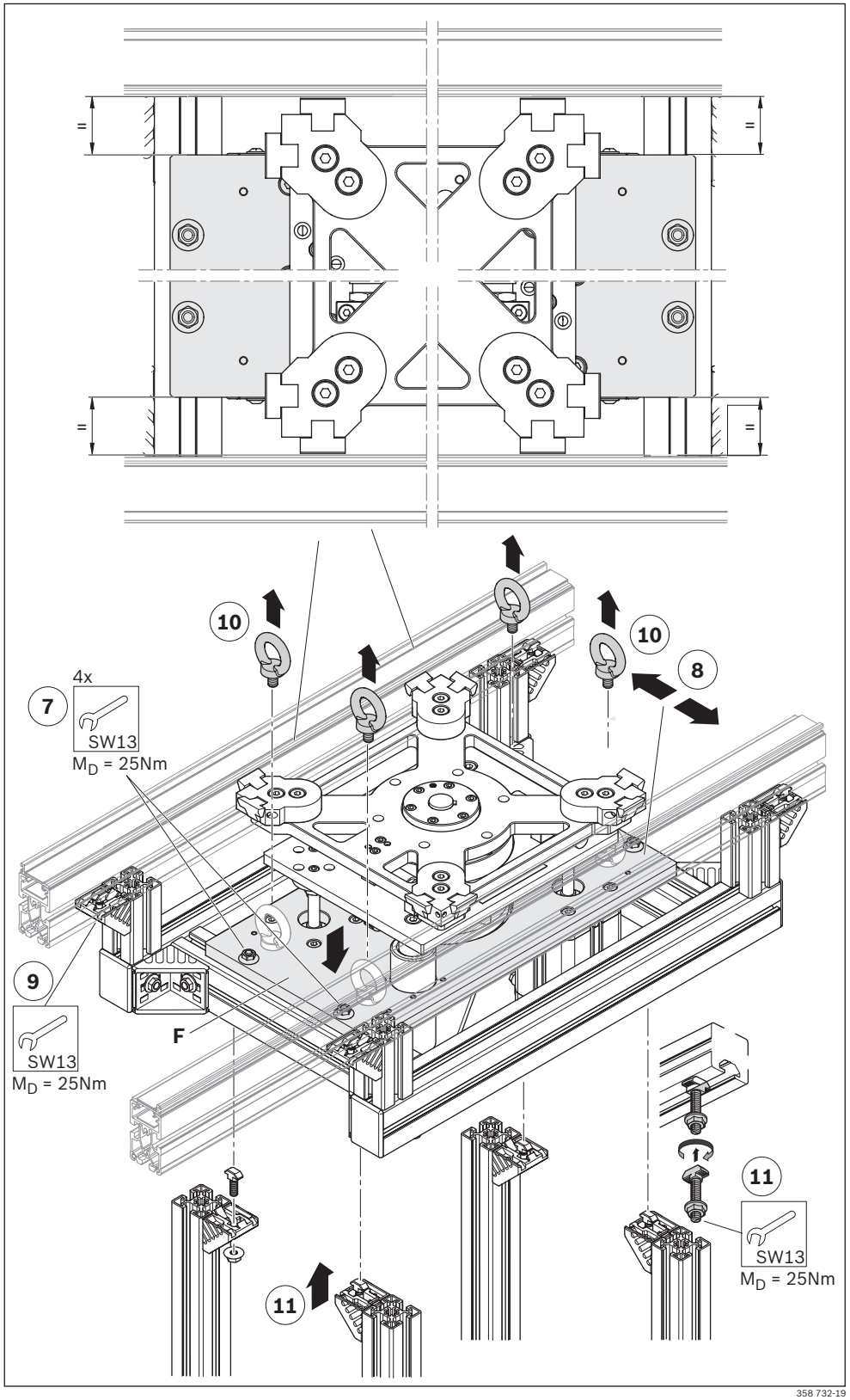


Fig. 10: Adjusting the lift rotary unit HD 2/H size 2 and 3 in section ST 2 (here size 2 180° for WT 2, WT 2/F)

7.5.3 Installing additional leg sets

Please note:

- For size 3, be sure to install the additional leg sets (mandatory).
- For size 2 for loads > 50 kg.

1. Set the lock nut in advance.
2. Grease the threaded spindle.
3. Install the plate.
4. Screw in the leveling foot with a screwdriver.
5. Install the remaining components of the leg sets.

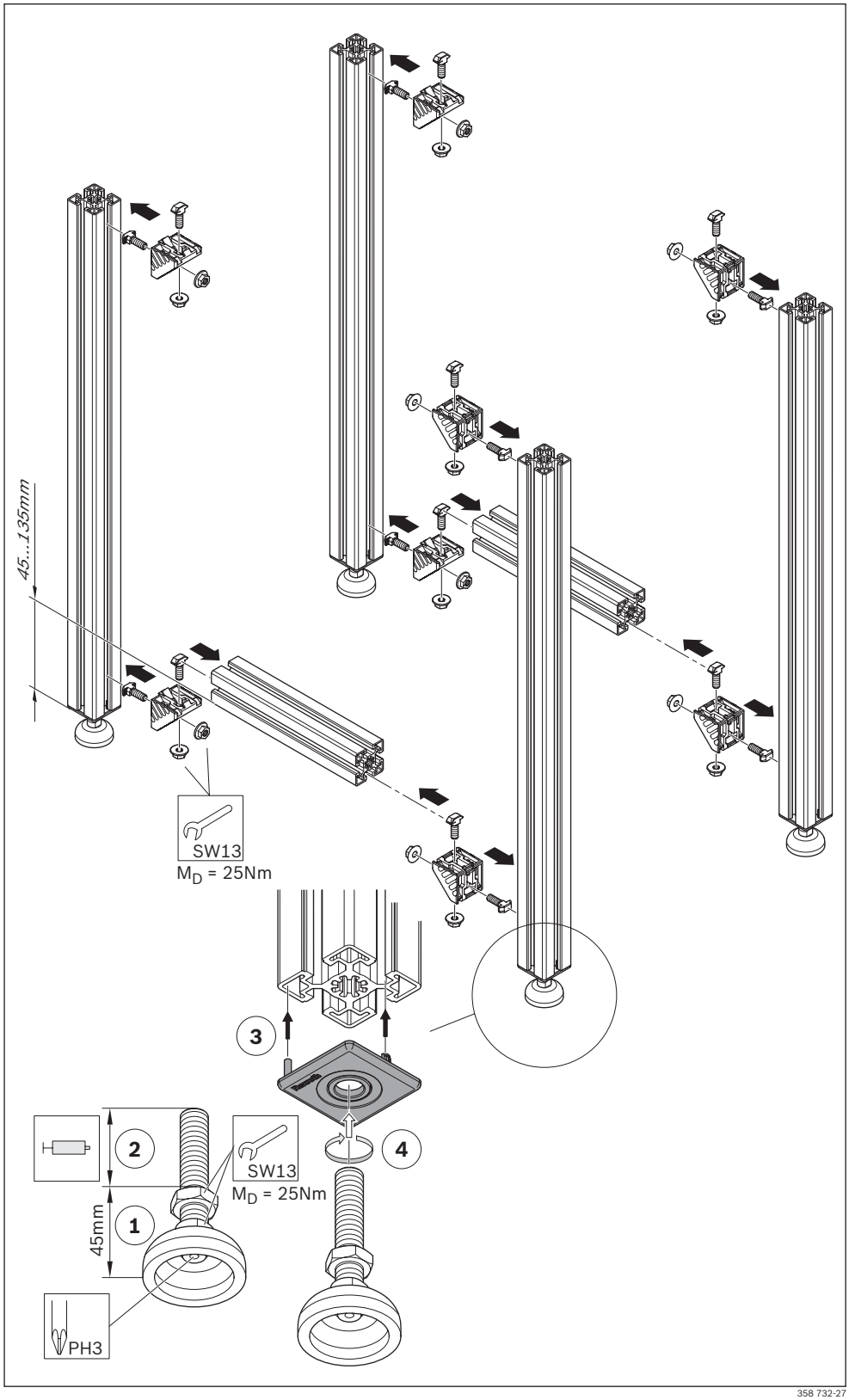


Fig. 11: Installing additional leg sets

7.5.4 Installing the position sensor for vertical stroke and horizontal rotation

Required accessories

- Cylinder switch ST6-PN-M12R-030 SENSOR, **0 830 100 433**.
- Proximity switch short IEC/EN 60947-5-2-2004, **3 842 549 811**.

1. Install the cylinder switches (A) on the profile cylinder.

Please note:

- For size 1/2/3, rotation angle 180° and size 3 rotation angle 90° two switches per cylinder.
- For size 1 and 2, rotation angle 90°, three switches per cylinder (multiple position cylinder).

2. Install two proximity switches (B) on the lifting plate.

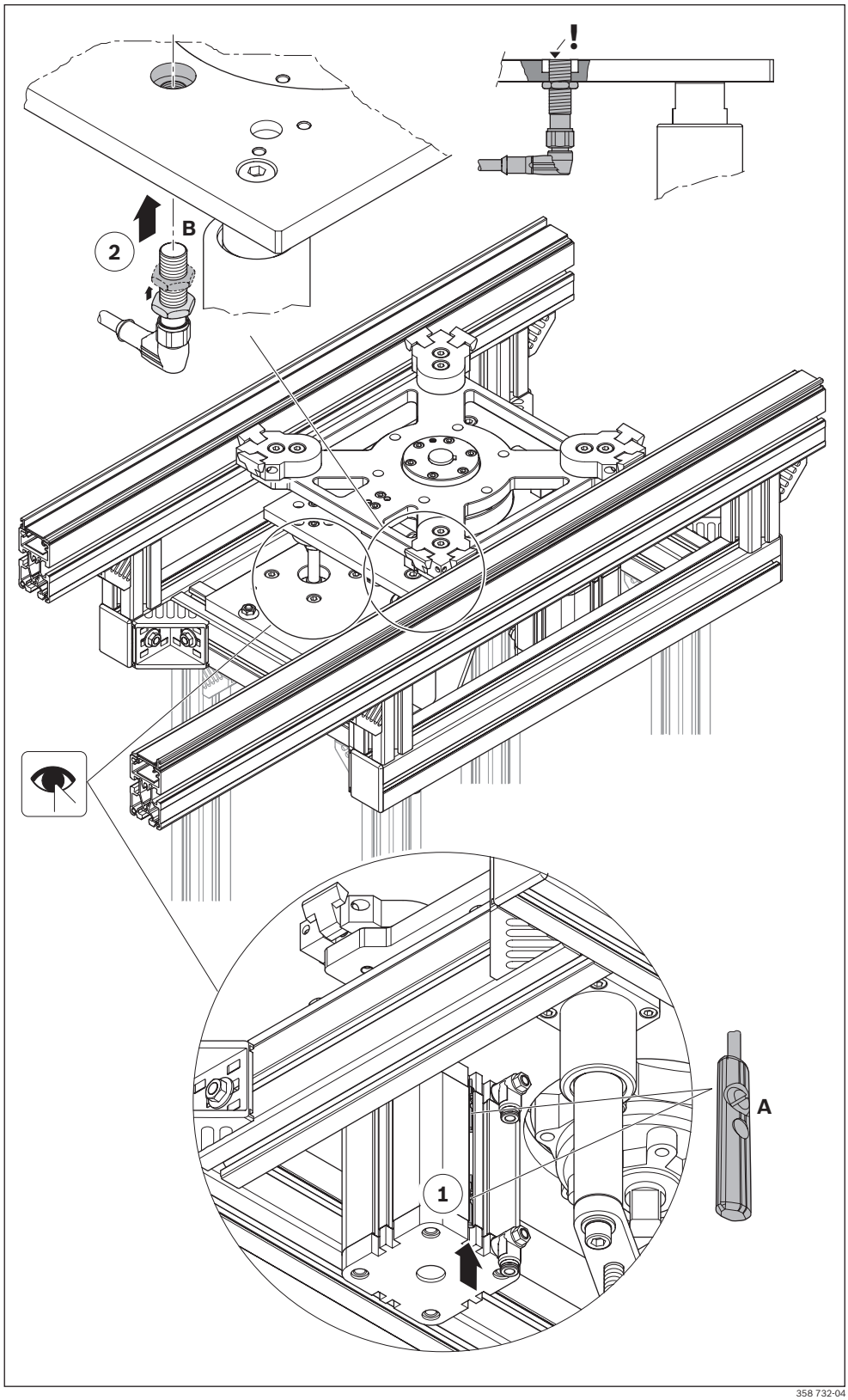


Fig. 12: Installing the position sensor for vertical stroke and horizontal rotation (here size 2 180° for WT 2, WT 2/F)

7.5.5 Installing parts for control WT 2 (size 1 and size 2 for WT 2, WT 2/F)

Required accessories

- Stop gate VE 2, see catalog TS 2*plus*.
- Proximity switch IEC/EN 60947-5-2-2004, 3 842 537 995.

1. Install the stop gates (2 x VE 2) and the proximity switches (S 1, S 2, S 3) on the section profile.

Testing functionality

1. Starting position: Pre-separator (A) open, main separator (B) closed; lift rotary unit in lower end position.
2. S1 actuated by passing WT 2: VE (A) closes.
3. S2 actuated by WT 2: Cylinder moves to upper end position, WT 2 is lifted.
4. Switch upper end position actuated: Rotation 90 ° or 180 °.
5. End position of rotation reached: Start operation if applicable.
6. If applicable, end operation, cylinder moves to lower end position, WT 2 is lowered.
7. Lower end position switch actuated: Main stop gate (B) opens.
8. S3 actuated by WT 2: Main stop gate (B) closes, pre-stop gate (A) opens (starting position).

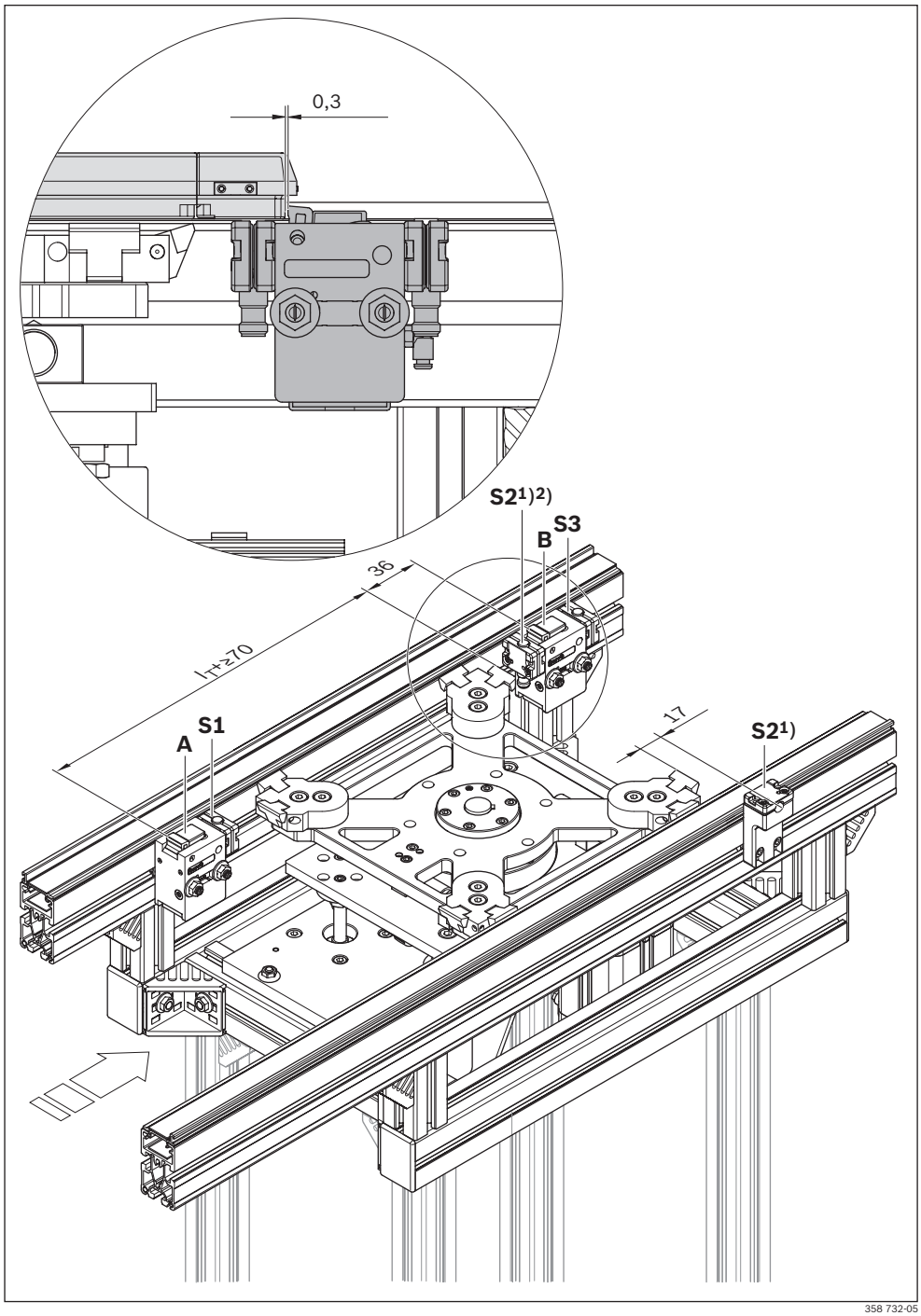


Fig. 13: Installing stop gate and proximity switch (here size 2 180° for WT 2, WT 2/F)

1) S2: WT position sensing either from below or from the side
2) S2: WT position sensing only possible from the side for size 1, WT 240 mm x 240 mm

7.5.6 Installing parts for control WT 2 (size 2 for WT 2, WT 2/F-H and size 3)

Required accessories

- Stop gate VE 2, see catalog TS 2*plus*.
- Proximity switch IEC/EN 60947-5-2-2004, **3 842 537 995**.

1. Install the stop gates (2 x VE 2) and the proximity switches (S 1, S 2, S 3) on the section profile.

Testing functionality

1. Starting position: Pre-separator (A) open, main separator (B) closed; lift rotary unit in lower end position.
2. S1 actuated by passing WT 2: VE (A) closes.
3. S2 actuated by WT 2: Cylinder moves to upper end position, WT 2 is lifted.
4. Switch upper end position actuated: Rotation 90 ° or 180 °.
5. End position of rotation reached: Start operation if applicable.
6. If applicable, end operation, cylinder moves to lower end position, WT 2 is lowered.
7. Lower end position switch actuated: Main stop gate (B) opens.
8. S3 actuated by WT 2: Main stop gate (B) closes, pre-stop gate (A) opens (starting position).

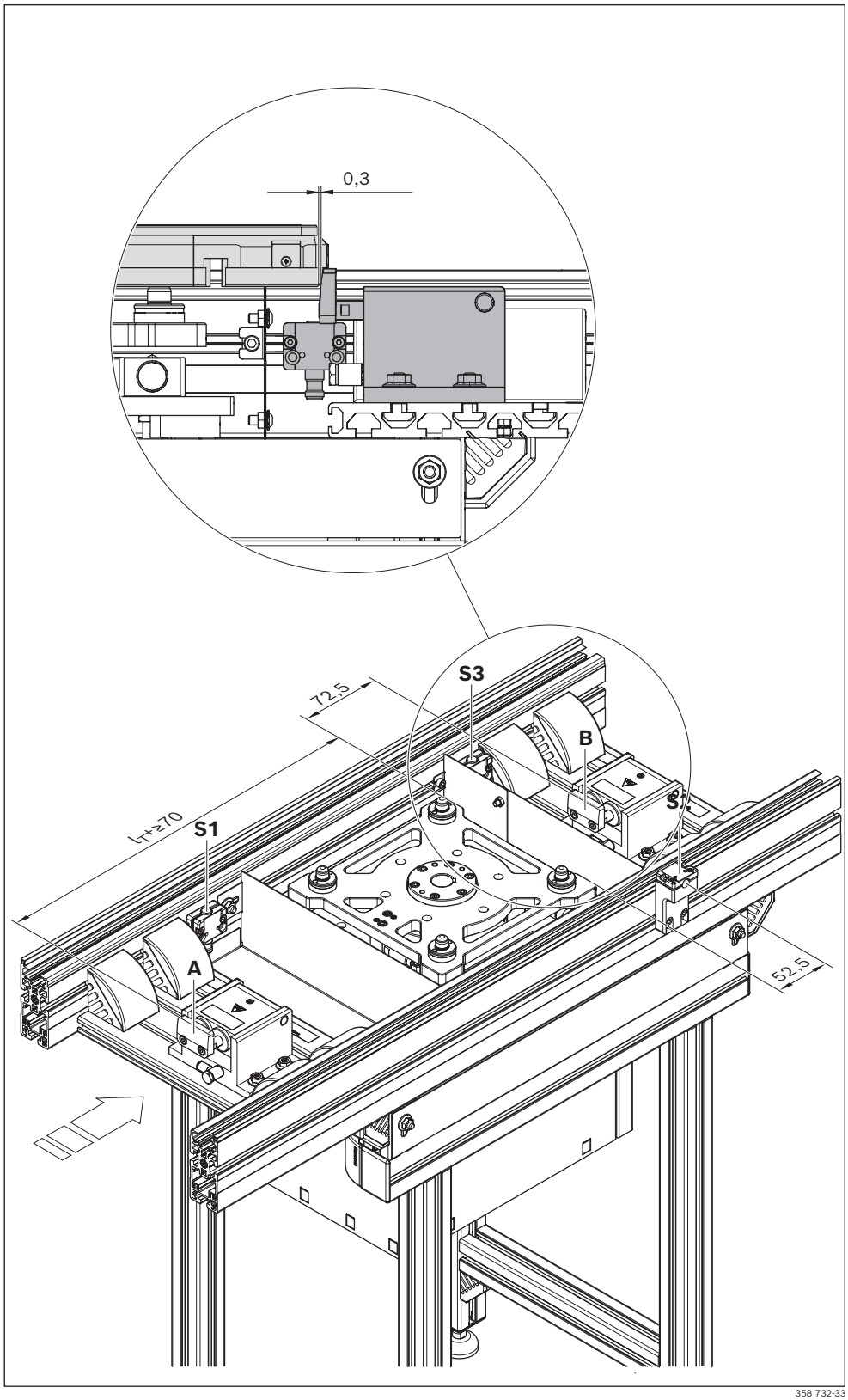


Fig. 14: Installing stop gate and proximity switch (here size 2 for WT 2/H, WT 2/F-H)

7.5.7 Installing the protective case kit

Please note:
Drill any additional holes/cut-outs required before latching the side walls (non-detachable connection).

1. If present, remove the protective film from the sheets.
2. Install the edge protector in the cable hole.
3. Install the side walls (B) in the floor (A).
   The side walls click audibly into the floor.
4. Install the covers of the inspection openings (C).

Please note:
1) The requirement of the Machinery Directive 2006/42/EC for captive screws on inspection openings is only fulfilled by fitting the lock washer (X, 3 842 542 330).

5. Install the mounting bracket (D).

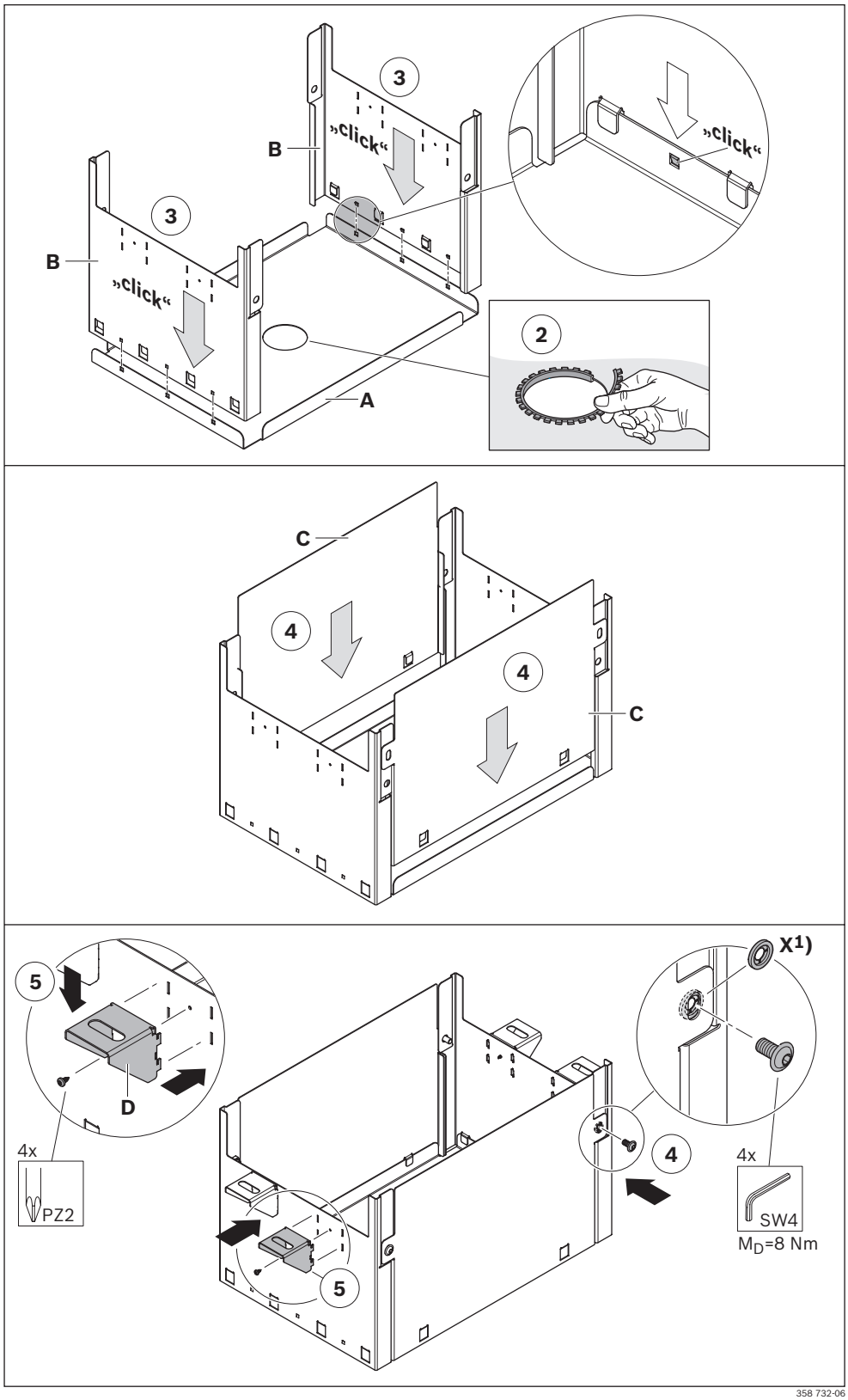


Fig. 15: Pre-installing the protective case (here size 2 180° for WT 2, WT 2/F)

6. Lead the connection cables through the opening in the base of the protective case.
7. Slide the housing element over the HD 2/H from below. Screw the protective case to the installation frame.

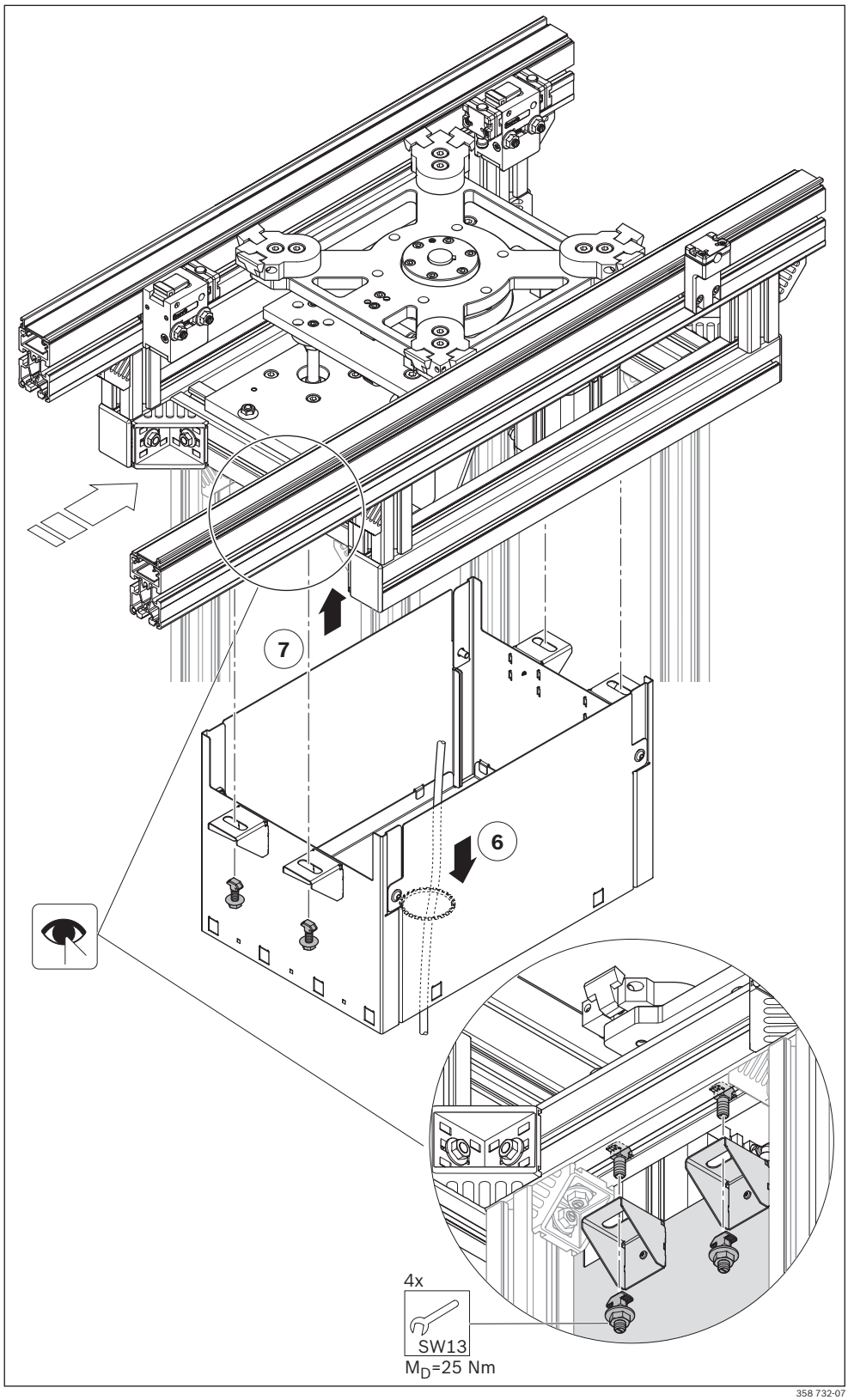


Fig. 16: Installing the protective case (here size 2 180° for WT 2, WT 2/F)

8. Install the lateral guard plates.

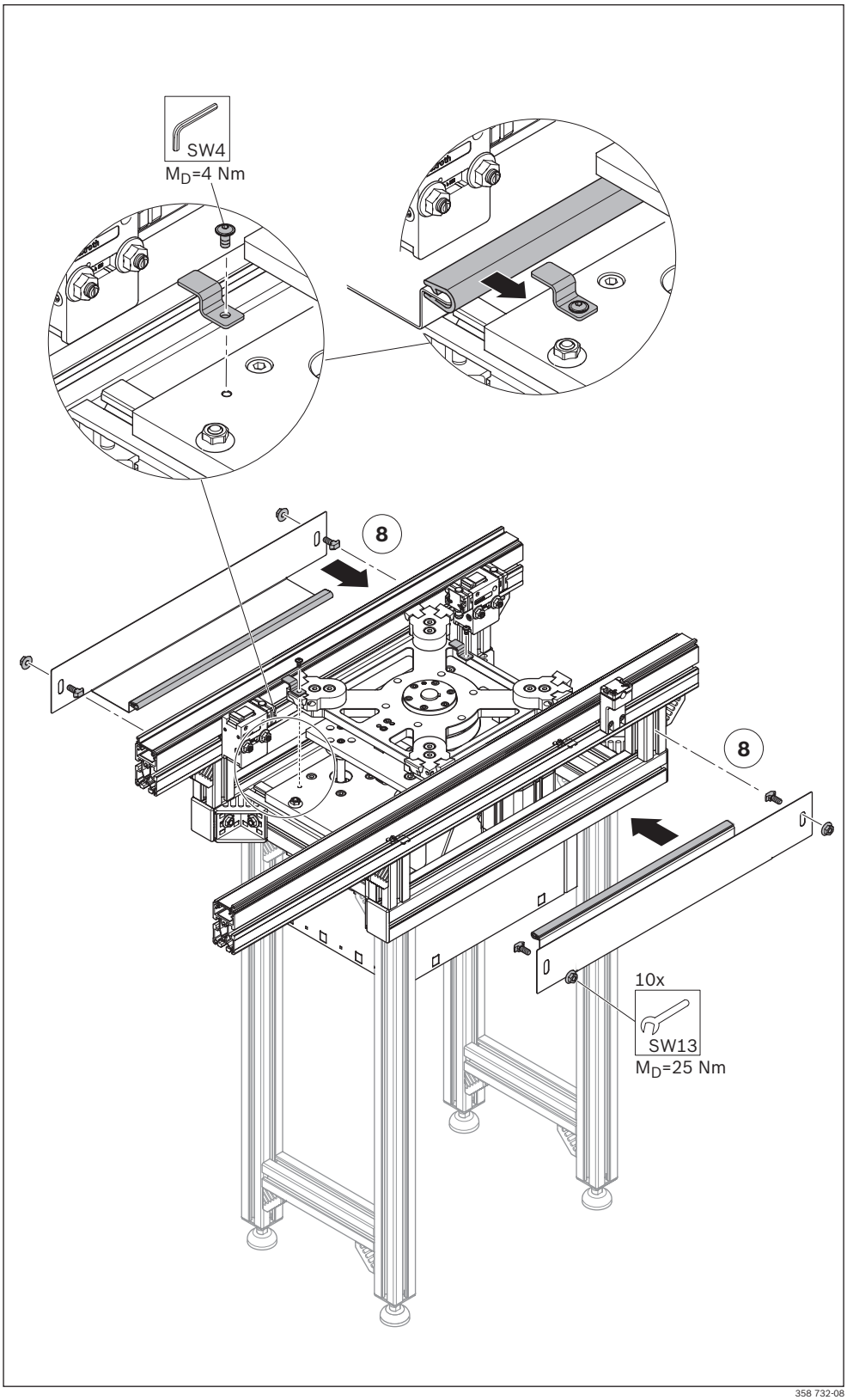


Fig. 17: Installing front guard plates (here size 2 180° for WT 2, WT 2/F)

9. Install the front guard plates.

Please note:
Depending on the configuration of the workpiece pallet and the stop gates used, it may be necessary to cut off (saw) the guard plates at the perforation (X, Y).

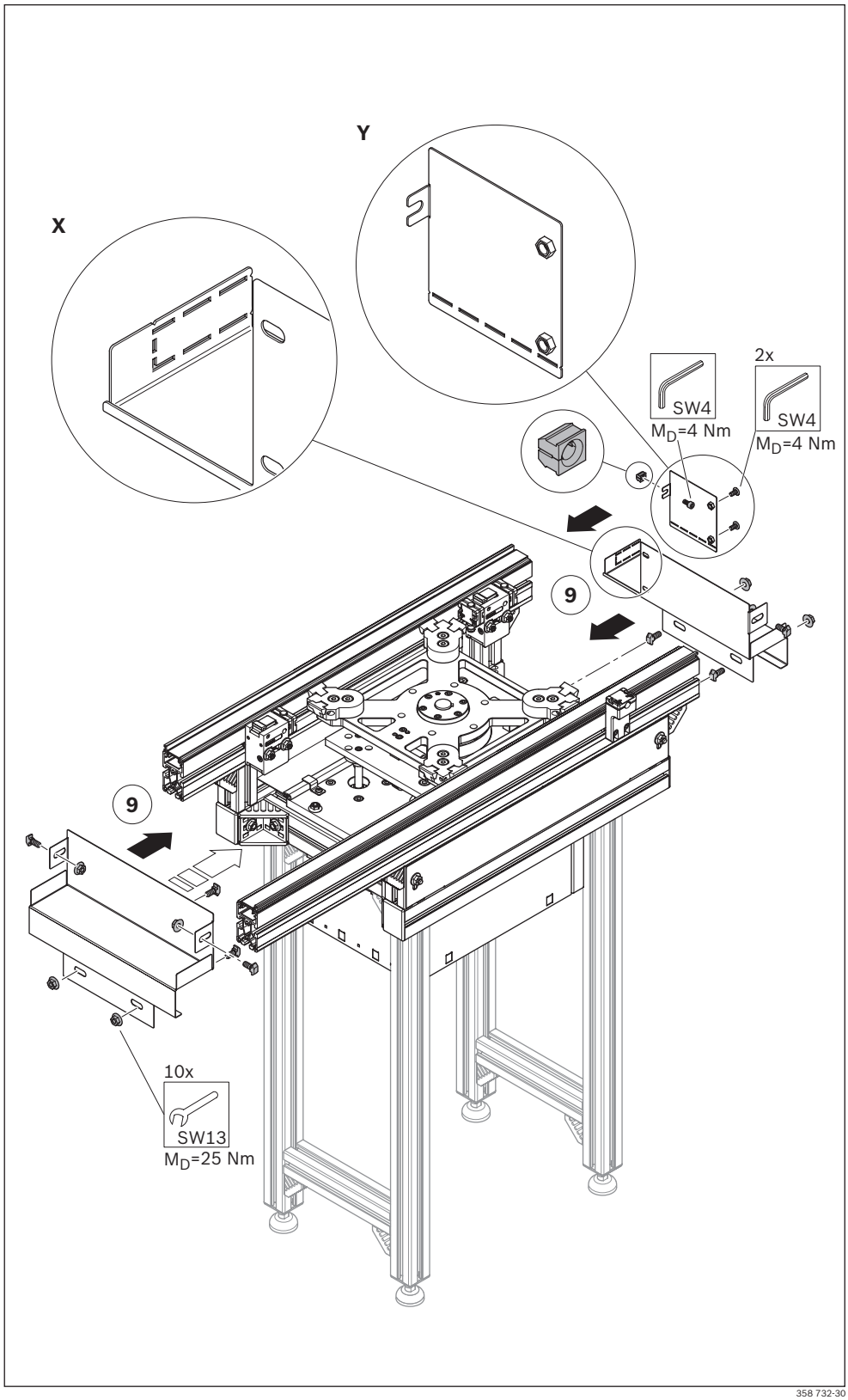


Fig. 18: Installing lateral guard plates (here size 2 180° for WT 2, WT 2/F)

7.5.8 Pneumatic connection of the product

⚠ WARNING

High pneumatic pressure!

Risk of severe injury or death.

- ▶ Switch off the compressed air supply to the relevant system component before assembling, disassembling or connecting the product to the pneumatic system.
- ▶ Secure the system against being unintentionally switched on again.

⚠ CAUTION

Unintentional fast rotary movements, falling objects

- ▶ Injuries caused by unintentionally fast rotary movements and falling objects.
- ▶ Make sure that the rotary cylinder in its original position is under pressure (exhaust-throttled) before commissioning/re-commissioning and especially each time before restarting the system after a shutdown, malfunction, break, shift change or idle period.

• For the compressed air and operating pressure specifications, see page 56.

- ▶ Remove the covers of the inspection openings (C) and connect the HD 2/H to the compressed air supply.

1. Loosen the screws.
2. Pull the covers upwards.
3. Remove the cover (C).

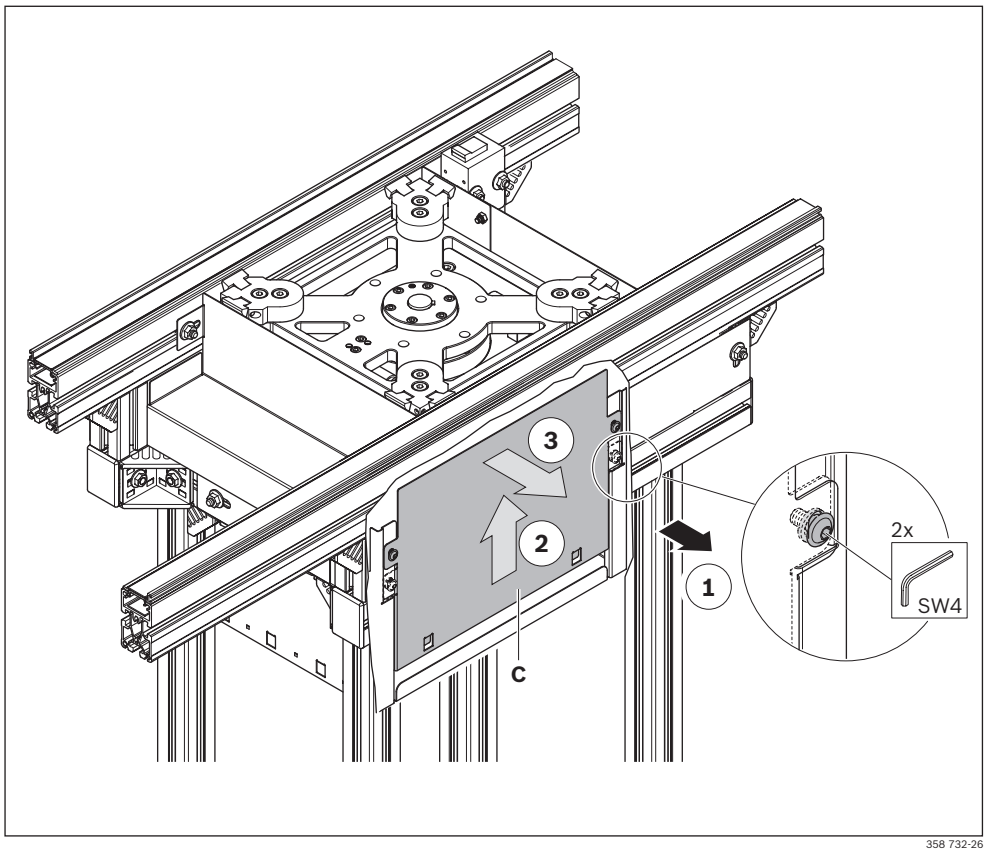


Fig. 19: Opening the inspection openings (here size 2 180° for WT 2, WT 2/F)

Use the pneumatic diagram:
- **A**, rotary cylinder for size 1/2/3, rotation angle 90° and 180°.
- **B**, lifting cylinder for size 1/2, rotation angle 90° (multiple position cylinder).

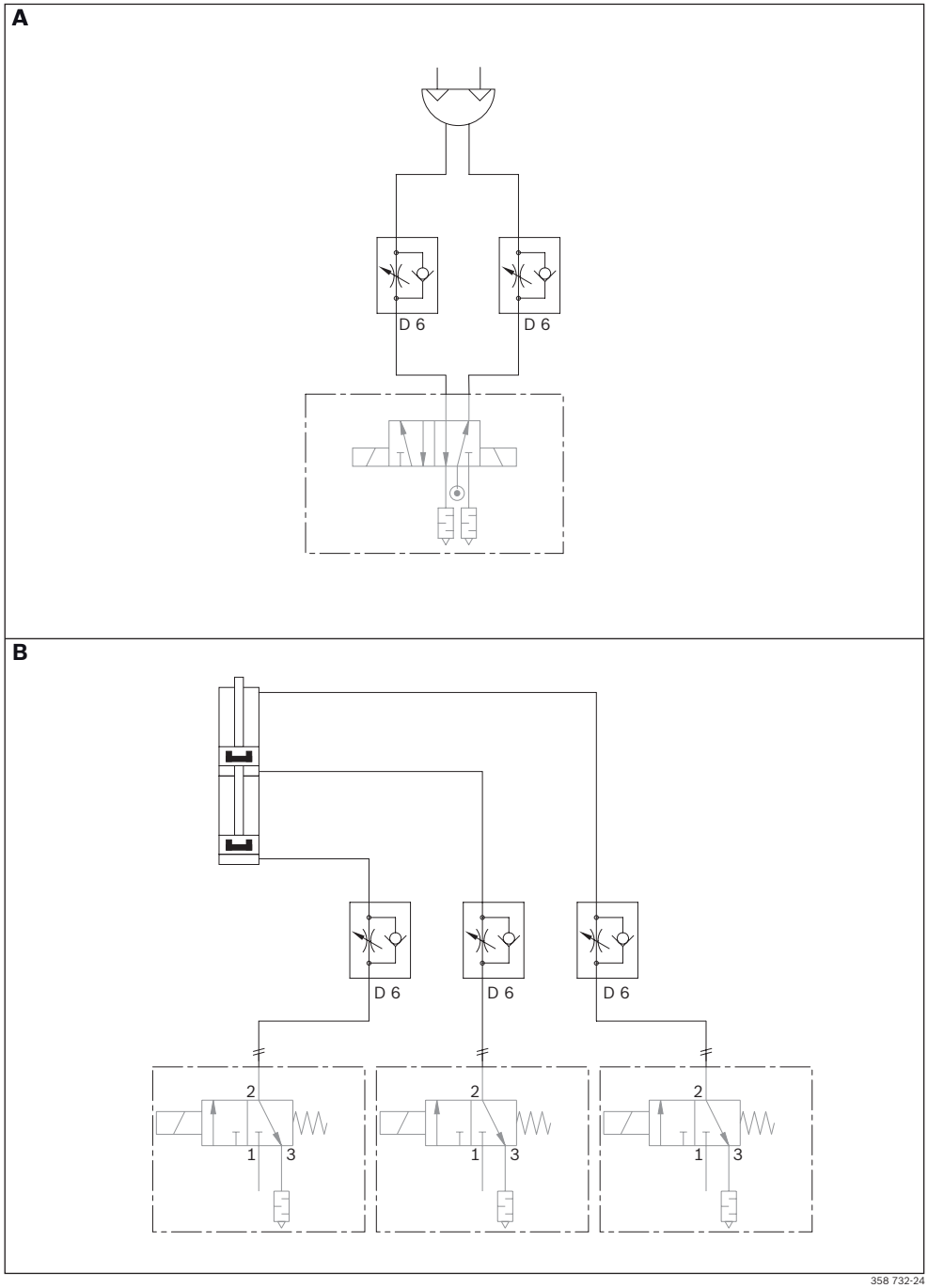


Fig. 20: Pneumatic diagrams A and B

Use the pneumatic diagram:

- **C**, lifting cylinder for size 1/2, rotation angle 180°.
- **D**, lifting cylinder for size 3, rotation angle 90° and 180°.

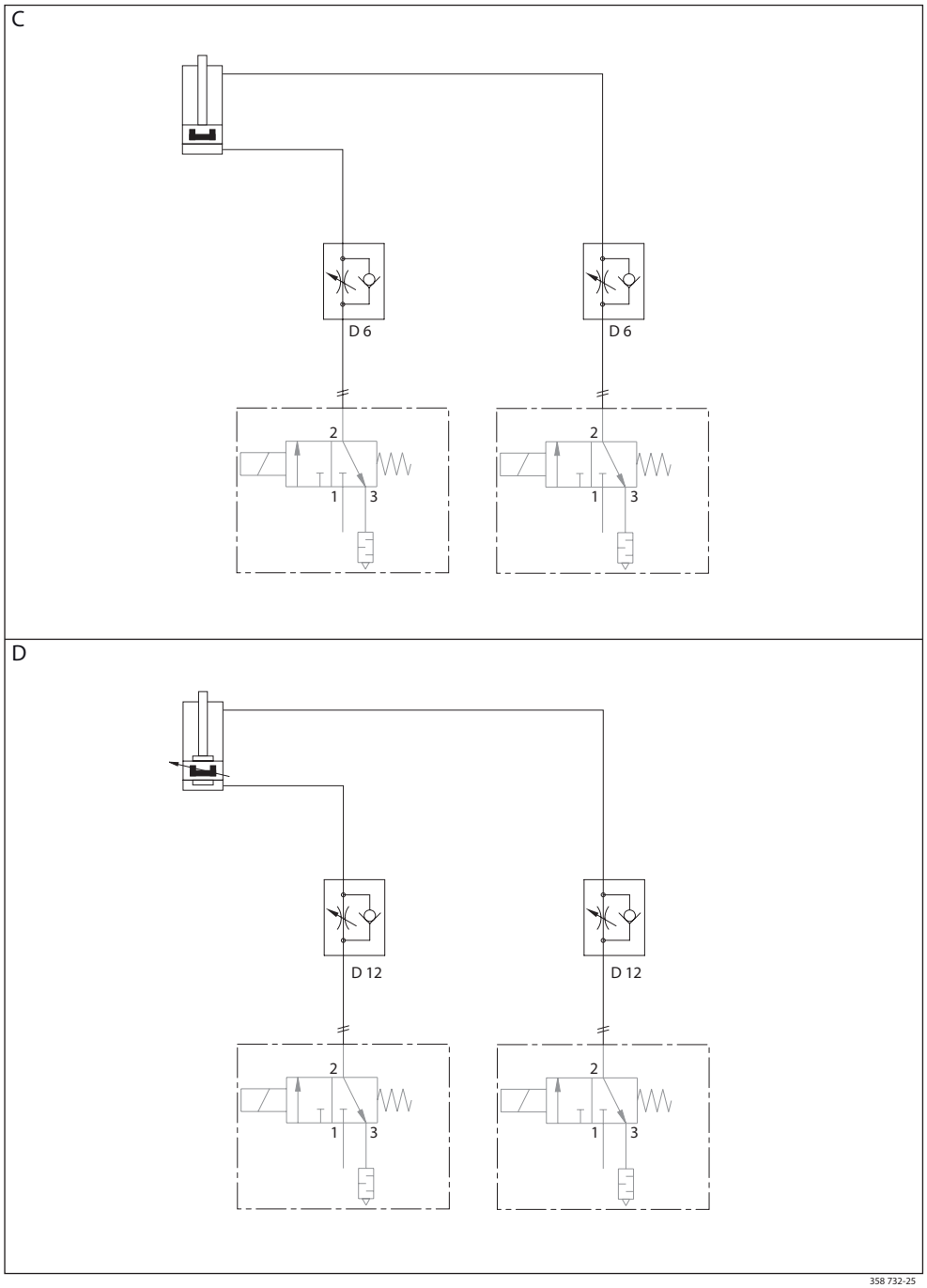


Fig. 21: Pneumatic diagrams C and D

8 Commissioning

8.1 Initial commissioning

⚠ CAUTION

Sudden movements, falling workpiece pallets

- ▶ Risk of injury caused by sudden movements and falling objects.
- ▶ Make sure that the product has been assembled properly by qualified personnel (see page 8) before starting it up.

⚠ CAUTION

Unintentional fast rotary movements, falling objects

- ▶ Injuries caused by unintentionally fast rotary movements and falling objects.
- ▶ Make sure that the rotary cylinder in its original position is under pressure (exhaust-throttled) before commissioning/re-commissioning and especially each time before restarting the system after a shutdown, malfunction, break, shift change or idle period.

NOTICE

Malfunctions due to incorrect assembly and commissioning

The product can get damaged, shortening its service life.

- ▶ Commissioning requires basic mechanical, pneumatic and electrical knowledge.
- ▶ The product should only be started up by qualified personnel (see page 8).
- ▶ During commissioning, the rotation angle must be checked and adjusted if necessary (see chapter 8.4 "Checking and adjusting the rotation angle of the lift rotary unit" on page 39).

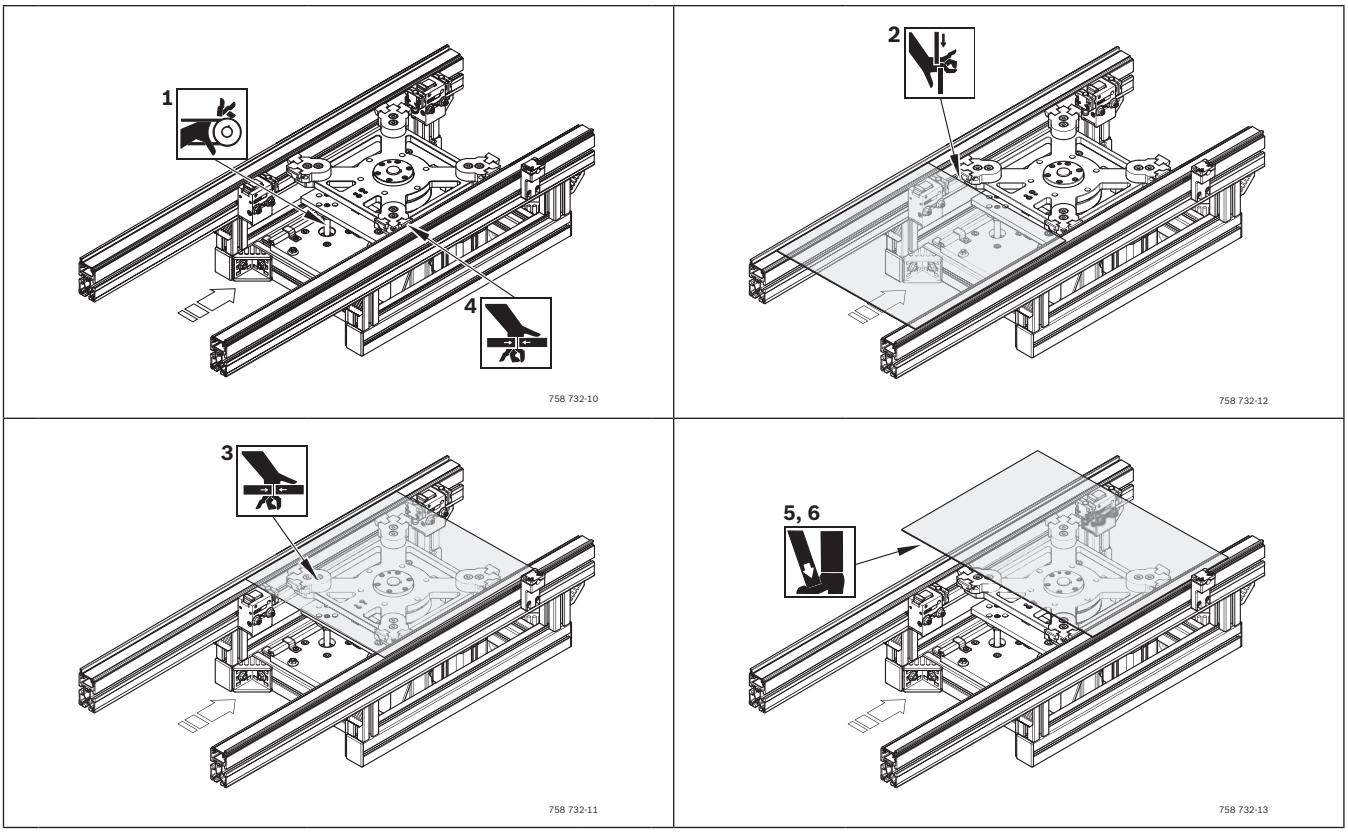
- Before the initial commissioning or re-commissioning of a conveyor system, carry out a risk assessment in accordance with DIN EN ISO 12100.
- Before the initial commissioning, ensure that there are no protruding or sharp-edged parts that may be a hazard to personnel working or moving in the area.
- According to EU Machinery Directive 2006/42/EC, you must equip the transfer system with EMERGENCY STOP devices.
- The surfaces of motors and gears can reach temperatures of over 65 °C under certain load and operating conditions. In these cases, you must comply with the respective applicable accident prevention regulations (UVV) by taking appropriate constructive measures (safety guards) or by affixing/displaying appropriate warning signs!
- Make sure that all the electrical and pneumatic connections are either in use or covered. Make sure that all bolted connections and plug-in connections are properly seated. All relevant protective covers must be fitted.

- Only inspect and adjust continuous conveyors that are in motion or operation when the protective equipment is in place.
- Observe DIN EN ISO 13857 when you remove or replace protective equipment and/or bypass safety equipment.
- Test runs with open paneling should only be performed by a person with appropriate knowledge and experience using jog switches, and if there is no possibility of interference from other switching devices.
- Only commission the product if all safety equipment has been installed in the system and is ready for use.
- Only start up a product that has been completely installed.
- Check again the correct adjustment of the lift rotary unit in the section profile (see Fig. 8 on page 22 and Fig. 22 on page 39).

8.2 Residual risks

Table 7: Residual risks

	Location	Situation	Hazard		Action
1	Lifting plate; housing: Between fixed and moving product parts	Trapping of body parts		Crushing	Hazard should be removed with a safety measure, e.g. protective equipment.
2	Lifting plate: Between component and workpiece pallet	Body parts can be caught when retracting the workpiece pallet		Shearing	
3	Lifting plate: Between component and workpiece pallet	Body parts can be caught during lifting		Crushing	
4	Lifting plate: Between component and section profile	Body parts can be caught during lowering			
5	Workpiece pallet: Improper setting of the adjusting throttle will cause the lifting plate to strike the end stop hard.	Body parts can get caught by falling workpiece pallet			Only relevant during the adjustment process. Installation and commissioning only by qualified personnel.
6	Workpiece pallet: Improper adjustment of the rotation angle can cause workpiece pallet to be incorrectly oriented on the belt section	Body parts can get caught by falling workpiece pallet			



8.3 Re-commissioning after a standstill

Follow the steps outlined for the initial commissioning.

8.4 Checking and adjusting the rotation angle of the lift rotary unit

Please note:

- Carry out the check/adjustment under operating pressure of the rotary cylinder in both end positions. This is the only way to ensure that the end position dampers are fully retracted.
- Carry out the check/adjustment under operating conditions (rotary speed/load).

1. Move the rotary table to the end position (under operating pressure).
2. Check the parallelism of the rotary table to the belt section and adjust if necessary.
3. To do this, depressurize (vent) the rotary cylinder.
4. Correct the end position of the rotary table by screwing the damper in/out. To adjust the damper, see chapter 10.4.2 "Replacing dampers for rotary table" on page 50.

⚠ WARNING

Sudden movements

Risk of severe injury or death.

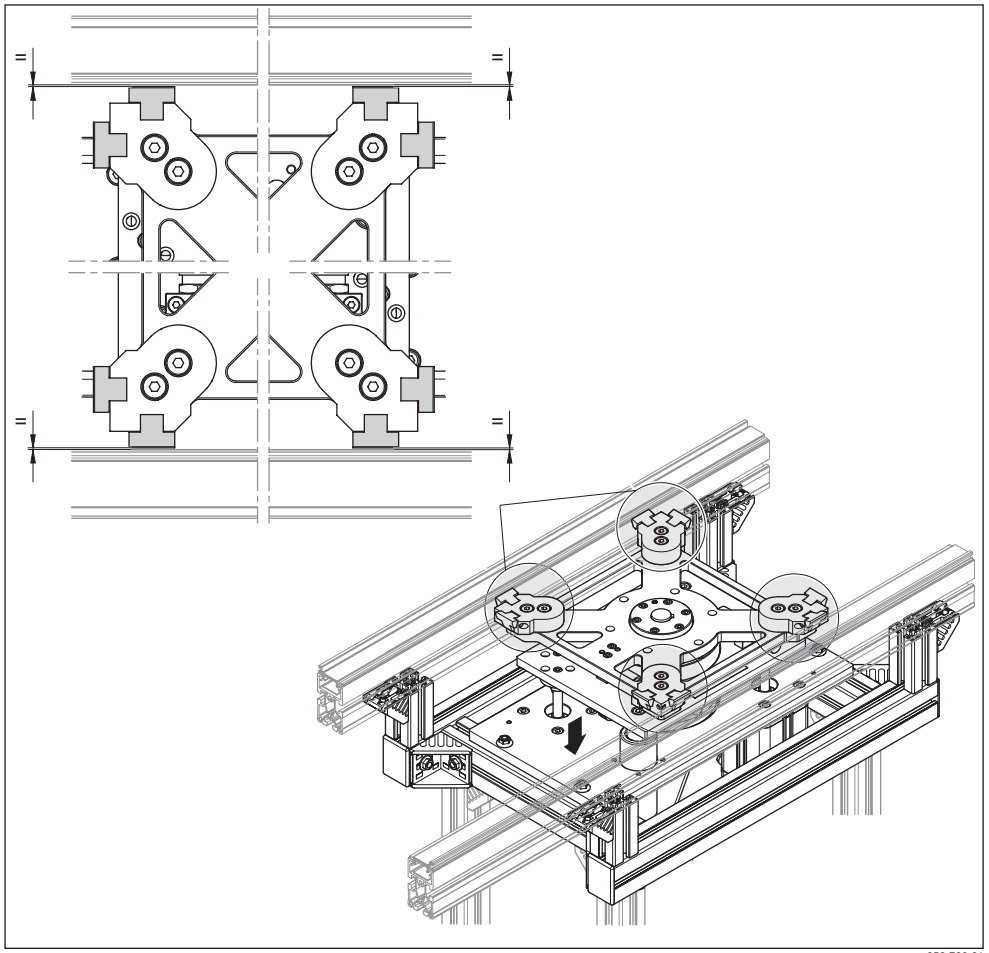
- ▶ Final commissioning may only be performed with protective equipment in place. These must be provided by the customer.
- ▶ Do not leave objects on the lift rotary unit.

NOTICE

Property damage due to incorrect setting

The product can get damaged, shortening its service life.

- ▶ The rotation angle of the lift rotary unit is preset at the factory and must be checked and, if necessary, precisely adjusted during commissioning. Otherwise the lift rotary unit may be damaged or wear out prematurely.



358 732-31

Fig. 22: Checking and adjusting the rotation angle (here size 2 180° for WT 2, WT 2/F)

ENGLISH

8.5 Adjusting stroke, lift and rotary speed

Please note:

- Before setting the stroke speed, mount the WT workpiece pallet (working load).
- On delivery, the setting achieves an even, smooth lifting and rotary movement of the lift rotary unit.
- Set the non-return throttle valves for both lifting cylinders to the same position.

▶ To adjust the speed of the lift or rotary movement, throttle the exhaust air.

- Rotate in the "**+**" direction

  The movement is slower.

- Rotate in the "**–**" direction

  The movement is faster.

Exhaust air throttling function

BG* 1/2/3 180°	**A:**	Clockwise
	B:	Counter-clockwise
	C:	Lowering
	D:	Lifting
Only BG* 1/2 90°	**C_2:**	Lowering upper to middle position
	C_1:	Lowering middle to lower position

*)BG = size

WARNING

Sudden movements

Risk of severe injury or death.

▶ Final commissioning may only be performed with protective equipment in place. These must be provided by the customer.

▶ Do not leave objects on the lift rotary unit.

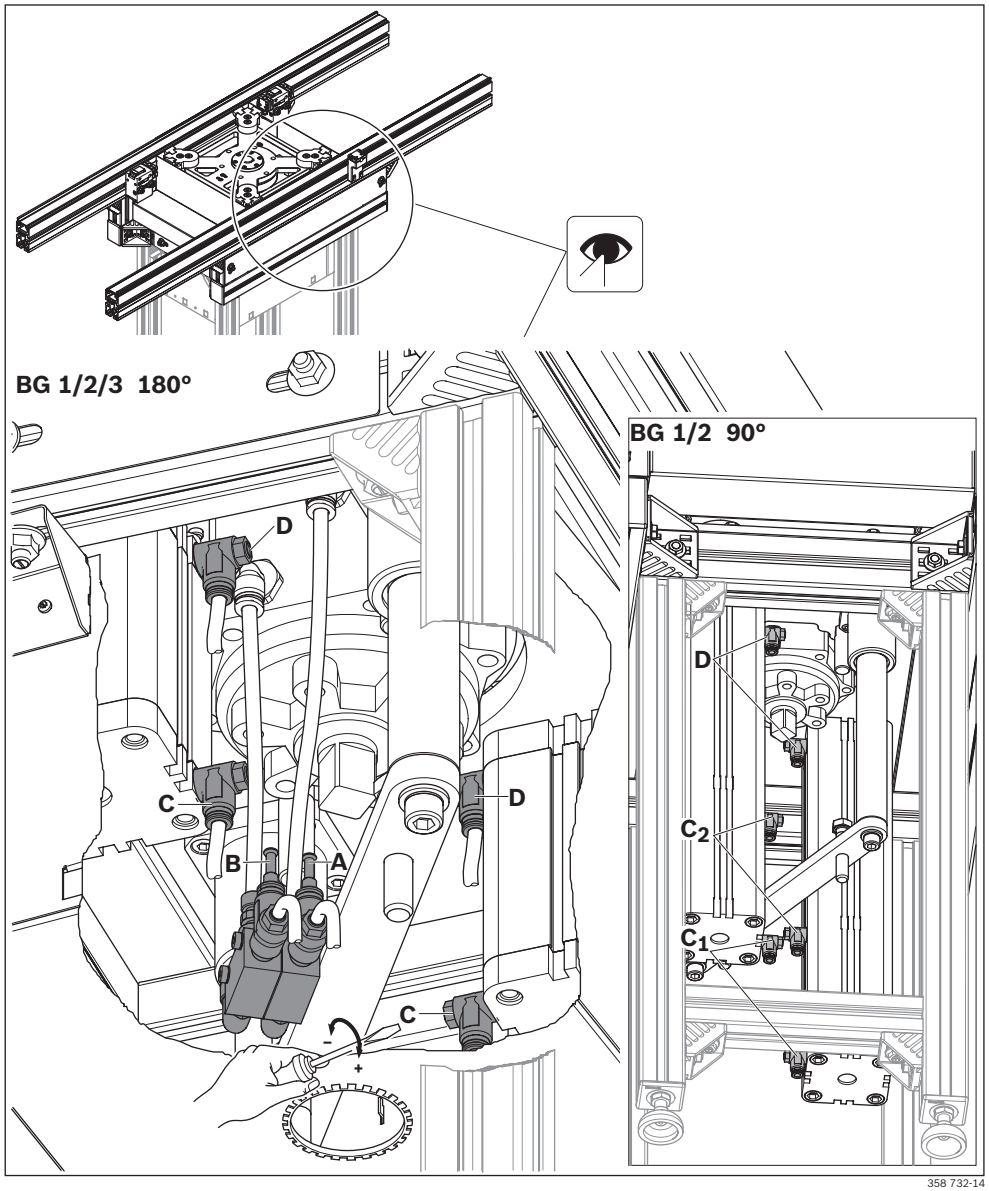


Fig. 23: Adjusting stroke, lift and rotary speed (here size 2 for WT 2, WT 2/F)

8.6 Reduction of stroke above transport level

Please note:

- It is recommended not to change the factory-set stroke.
- If the stroke still needs to be reduced, both stop screws must be set to the same height ± 0.1 mm.
- Carry out the stroke adjustment with the lift rotary unit in the lower end position.

1. Loosen the lock nut.
2. Set the stop screw to the desired height.
3. Counter the stop screw.
4. Check the stop screws for identical height adjustment.

Stop screws and lock nuts

Size HD 2/H	A SW [mm]	B M_D [Nm]
BG* 1	16	20
BG* 2/3	18	25

*)BG = size

⚠ WARNING

Sudden movements

Risk of severe injury or death.

- ▶ Final commissioning may only be performed with protective equipment in place. These must be provided by the customer.
- ▶ Do not leave objects on the lift rotary unit.

NOTICE

Property damage due to incorrect setting

The product can get damaged, shortening its service life.

- ▶ If both stop screws are not set to the same height ± 0.1 mm, the lift rotary unit may be damaged or wear out prematurely.

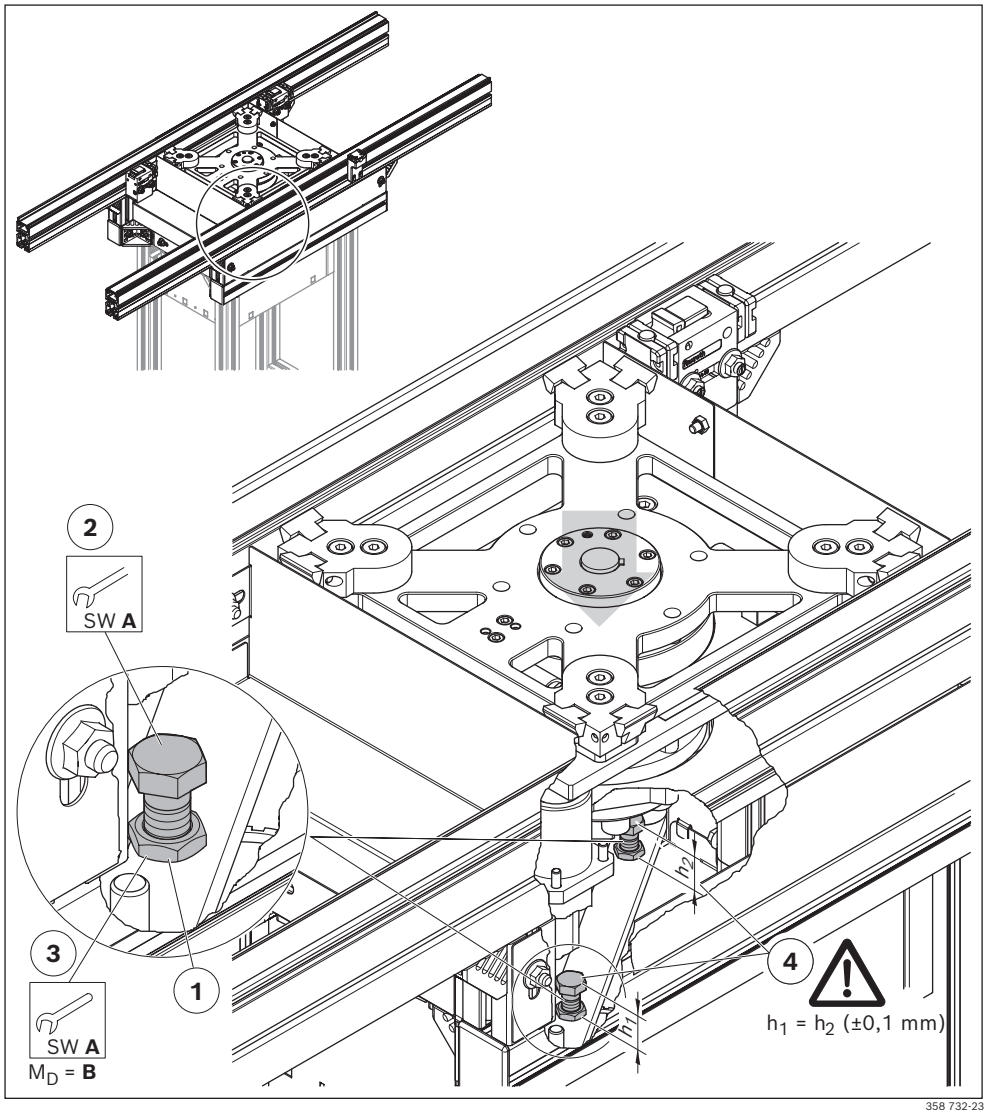


Fig. 24: Adjusting stroke above transport level (here size 2 180° for WT 2, WT 2/F)

8.7 Example of protective equipment provided by the customer

Final commissioning may only be performed with protective equipment in place.
These must be provided by the customer.
See also chapter 2.8 "Owner responsibilities" on page 10.

A: Contact protection from below
B: Contact protection from above

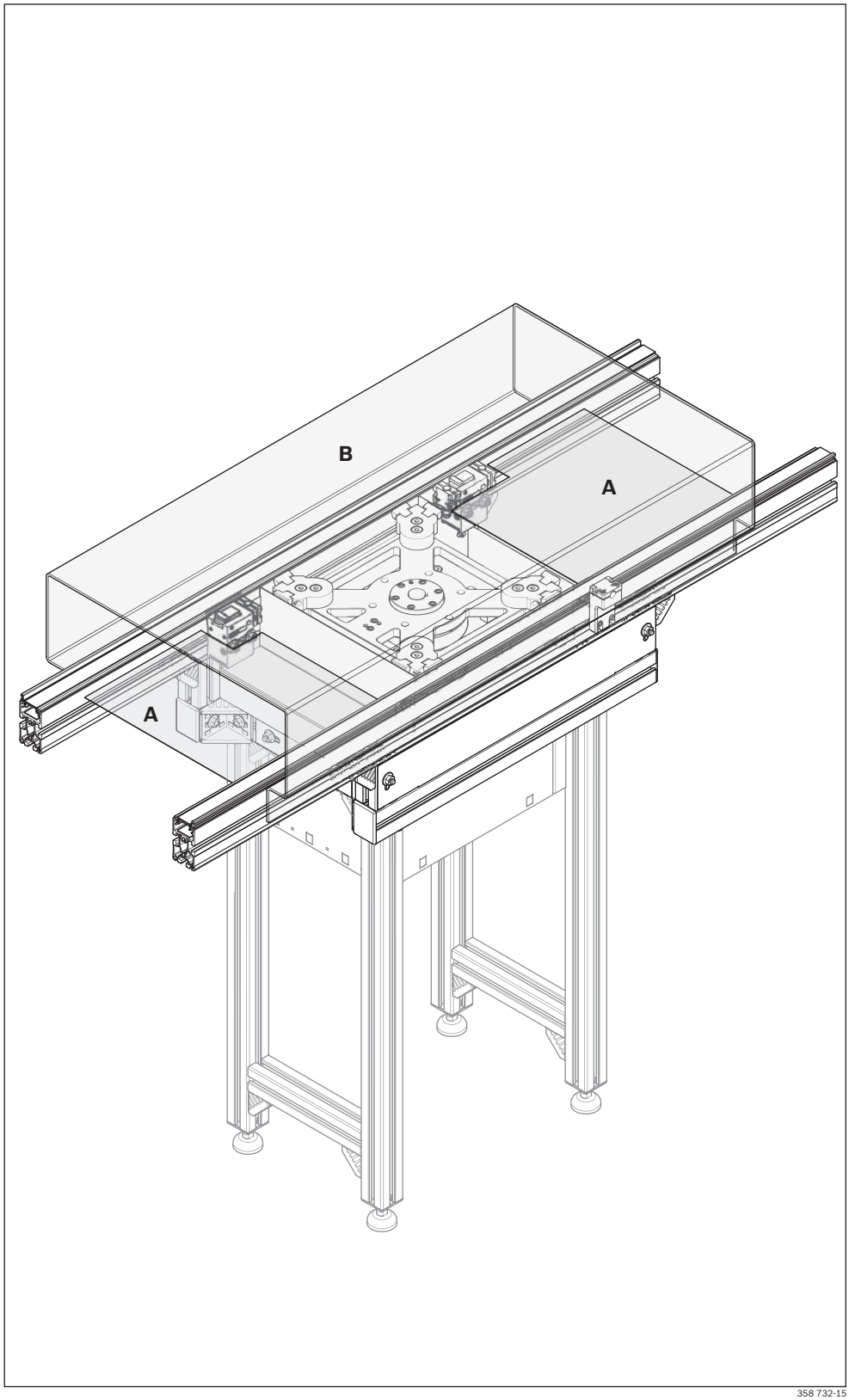


Fig. 25: Example of protective equipment provided by the customer

9 Operation

⚠ CAUTION

Hot electric motor surfaces during operation!
Risk of burns from touching hot surfaces above 65 °C.
- ▶ Install appropriate guards.
- ▶ Let the unit cool down for at least 30 minutes before performing maintenance and/or repair work.

9.1 Information on operation

9.1.1 Wear

- Individual components are subject to unavoidable wear by their very nature. Constructive measures and the selection of materials help ensure functional safety over the full service life. However, wear is also dependent on the operating, maintenance and ambient conditions at the place of use (resistance, contamination).
- Overloading the conveyor sections can cause the conveyor medium to malfunction and lead to the premature breakdown of motors and gears.
- If pneumatically activated components are overloaded, it is not possible to guarantee their function.

9.1.2 Measures to reduce wear

The following obvious measures will reduce wear:
- Switch off the conveyor section during line downtime, e.g. during breaks, at night and on weekends.
- Do not select a higher speed for the conveyor section than that required for the corresponding function.
- Avoid contamination caused by abrasive media, reduce contamination by cleaning on a regular basis.

9.1.3 Loading the workpiece pallet

The modular units are designed and tested under the assumption that the workpiece pallets will not all have the same weight during one cycle on one conveyor section. Workpiece pallets (WT) are both loaded and unloaded. Significantly different weights may require special measures to avoid malfunctions. This applies to:
- The permitted congestion length before stop gates.
- Damper functionality.
- Dampened stop gates.

9.1.4 Permissible center of gravity on the workpiece pallet

In order to absorb acceleration forces without any problems when separating and changing the direction of the pallets (in curves, when changing to transverse conveyors), the location of the load center of gravity on the WT must be noted. In the arrangement of supports and workpieces on the WT, it must be ensured that the center of gravity of the loaded WT is within ⅓ of the length/width of the WT around the center of the WT. The maximum height of the center of gravity above the transport level should not exceed ½ of the WT length or width.

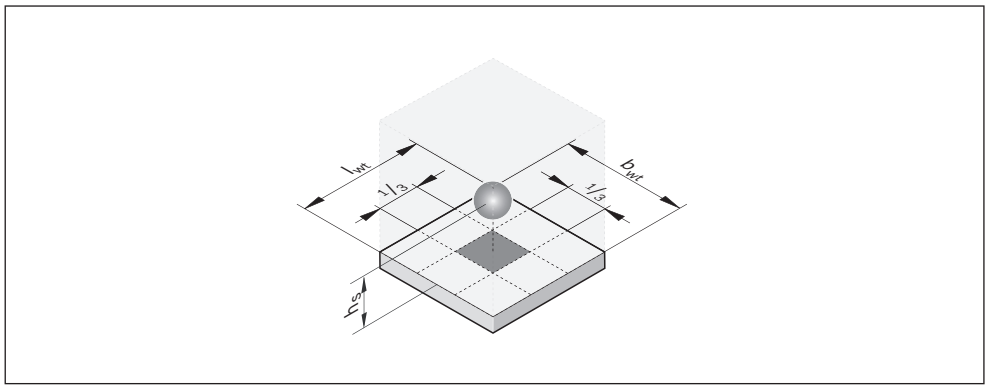


Fig. 26: Center of gravity on the WT

We generally recommend that:

- the load should be positioned in the center of the workpiece pallet.
- the load center of gravity should not exceed a height h_s of ½ b_{WT} (with $b_{WT} \leq l_{WT}$).

Failure to comply with this requirement can impair transport safety, especially at higher transport speeds.

For the maximum mass moment of inertia, see "Mass moments of inertia" on page 53.

9.1.5 Environmental factors

- Our products are resistant to many media that are commonly found in manufacturing, such as water, mineral oil, grease and detergents. Contact your Rexroth representative if you have any doubts about resistance to specific chemicals, such as test oil, doped oils, aggressive cleaning agents, solvents or brake fluid.
- Avoid prolonged contact with highly reactive acidic or alkaline materials.
- Contamination can greatly increase wear – specifically from abrasive media from the surrounding area, such as sand and silicates, e.g. from construction as well as machining processes in the transfer system (e.g. welding beads, pumice dust, glass shards, chips, loose parts, etc.). Maintenance intervals should be significantly shortened under these circumstances.

- Resistance to media and contamination does not mean that functional safety is guaranteed in every case.
  - Liquids that thicken as they evaporate and become highly viscous or adhesive (sticky) can lead to malfunctions.
  - If they get carried onto systems with rollers, media which have lubricating properties can lead to a reduction in the drive power that is transmitted via friction.

  In such instances, special care must be taken when planning the system, and the maintenance intervals must be correspondingly shortened.

10 Maintenance and repair

⚠ WARNING

High electrical voltage!
Risk of severe injury or death from electric shock.
- ▶ Disconnect the relevant system component before performing any maintenance or repair work.
- ▶ Secure the system against being unintentionally switched on again.

High pneumatic pressure!
Risk of severe injury or death.
- ▶ Switch off the compressed air supply to the relevant system component before performing any maintenance or repair work.
- ▶ All pneumatic cylinders must be depressurized (vented).
- ▶ Secure the system against being unintentionally switched on again.

⚠ CAUTION

Hot electric motor surfaces during operation!
Risk of burns from touching hot surfaces above 65 °C.
- ▶ Install appropriate guards.
- ▶ Let the unit cool down for at least 30 minutes before performing maintenance and/or repair work.

- Only inspect and adjust continuous conveyors that are in motion or operation when the protective equipment is in place.
- Observe DIN EN ISO 13857 when you remove or replace protective equipment and/or bypass safety equipment.
- Test runs with open paneling should only be performed by a person with appropriate knowledge and experience using jog switches, and if there is no possibility of interference from other switching devices.

10.1 Cleaning and care

NOTICE

Failure of bearings
Applying grease-dissolving substances to the bearing points, e.g. during cleaning, leads to bearing failure. There is a risk of damage to property, and the service life may be reduced.
- ▶ Keep degreasers or aggressive cleaning agents away from the bearings!
- ▶ Only clean the product with a damp cloth.

Failure of the toothed belt
Applying grease-dissolving substances to the toothed belt, e.g. when cleaning, leads to the failure of the toothed belt. There is a risk of damage to property.
- ▶ Keep degreasers or corrosive cleaning agents away from the toothed belt!
- ▶ Only clean the product with a damp cloth.

10.2 Inspection

Lift rotary unit

Check the pneumatic connections regularly for leaks.

Pressure points of fingers in rotary table latches (only sizes 1 and 2 for WT 2 and WT 2/F)

Regularly check the spring action **of all** pressure points, every 2000 h or every 500,000 cycles (whichever comes first). The spring action of the pressure points must be felt across the entire movement of the finger.

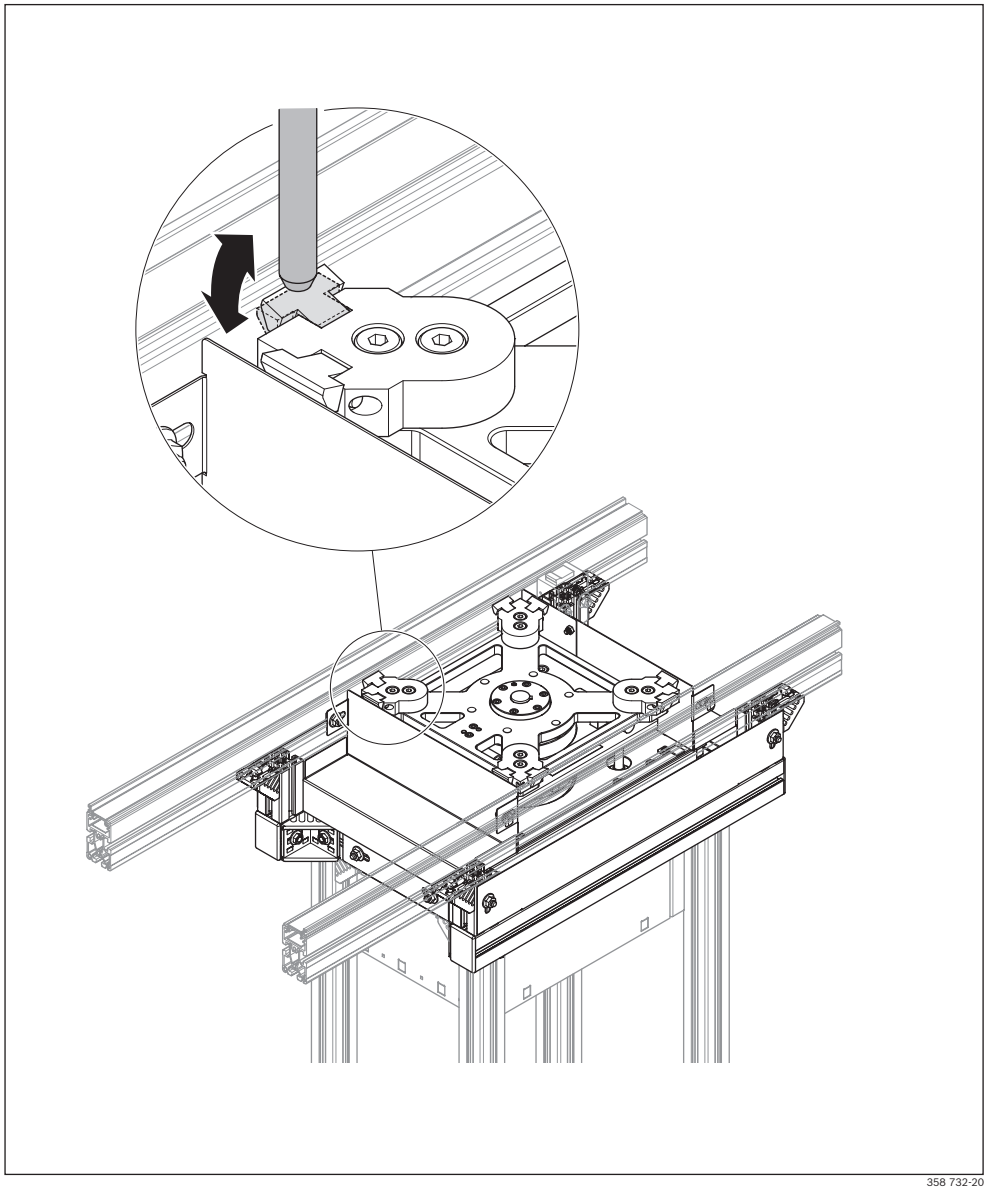


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Fig. 27: Checking the spring action of pressure points (only size 1 and 2 for WT 2, WT 2/F)

Worn pressure points must be replaced (see chapter 10.4 "Replacement of wear parts" on page 49),

10.3 Maintenance

NOTICE

Failure of the lift rotary unit due to non-compliance with the maintenance cycles
The bolt preload of the dampers must be lubricated every 2000 h or every 500,000 cycles (whichever comes first).
There is a risk of damage to property, and the service life may be reduced if the maintenance intervals are not complied with.

Please note:
- Perform the work at the upper end position of the lift rotary unit.
- The rotary cylinder must be depressurized (vented). The rotary table may need to be rotated for removal/installation.

▶ Lubricate the load adapter of the dampers.

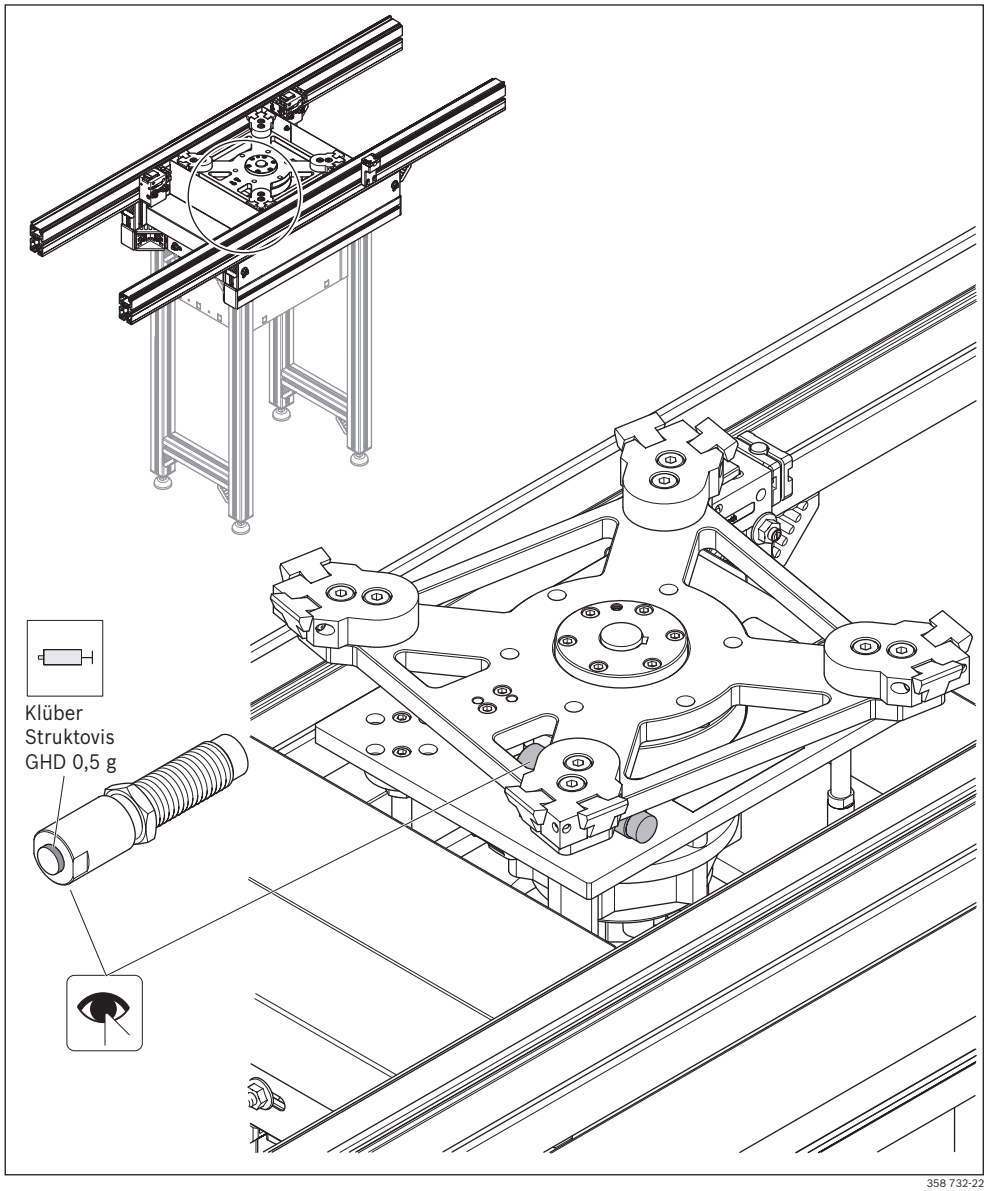

Fig. 28: Lubricating the load adapter of dampers (here size 2 for WT 2, WT 2/F)

10.4 Replacement of wear parts

Required tools

- Hex wrench SW13.
- Hex socket wrenches SW3, SW4, SW5, SW6.
- Cross-head screwdriver PZ2
- Caliper, 500 mm
- Rubber mallet
- Drift punch

10.4.1 Replacement of pressure points of fingers in rotary table latches (only sizes 1 and 2 for WT 2 and WT 2/F)

Please note:

- Carry out replacement with the lift rotary unit in the upper end position.
- The rotary cylinder must be depressurized (vented).

Required tools

- Hex socket wrench SW6.
- Drift punch

1. Remove the latch (A) from the rotary table.
2. Remove the finger (B).
3. Replace the pressure points (C).
4. Lubricate pressure points.
5. Re-install the finger and latch.

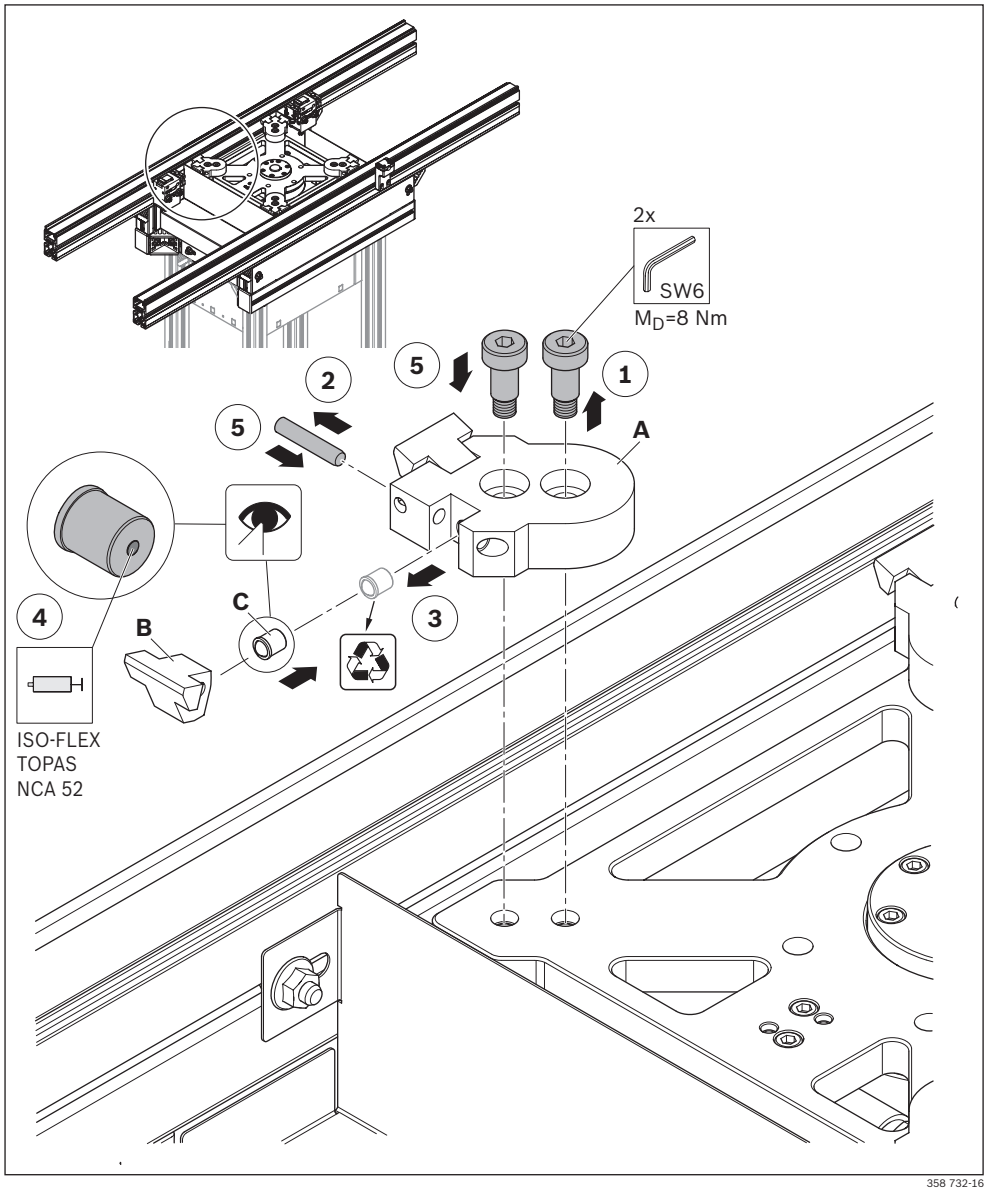

Fig. 29: Replacement of pressure points of fingers in rotary table latches (only sizes 1 and 2 for WT 2, WT 2/F)

10.4.2 Replacing dampers for rotary table

Please note:

- Carry out replacement with the lift rotary unit in the upper end position.
- The rotary cylinder must be depressurized (vented). The rotary table may need to be rotated for removal/installation.

1. Remove the dampers (A).
2. Install the new dampers.
3. Adjust the dampers by turning the damper housing in/out so that the rotary table is parallel to the belt section in the end position (see chapter 8.4 "Checking and adjusting the rotation angle of the lift rotary unit" on page 39).
4. Lubricate the load adapter.

Please note:

Repair of the lift rotary unit must only be carried out by Rexroth!

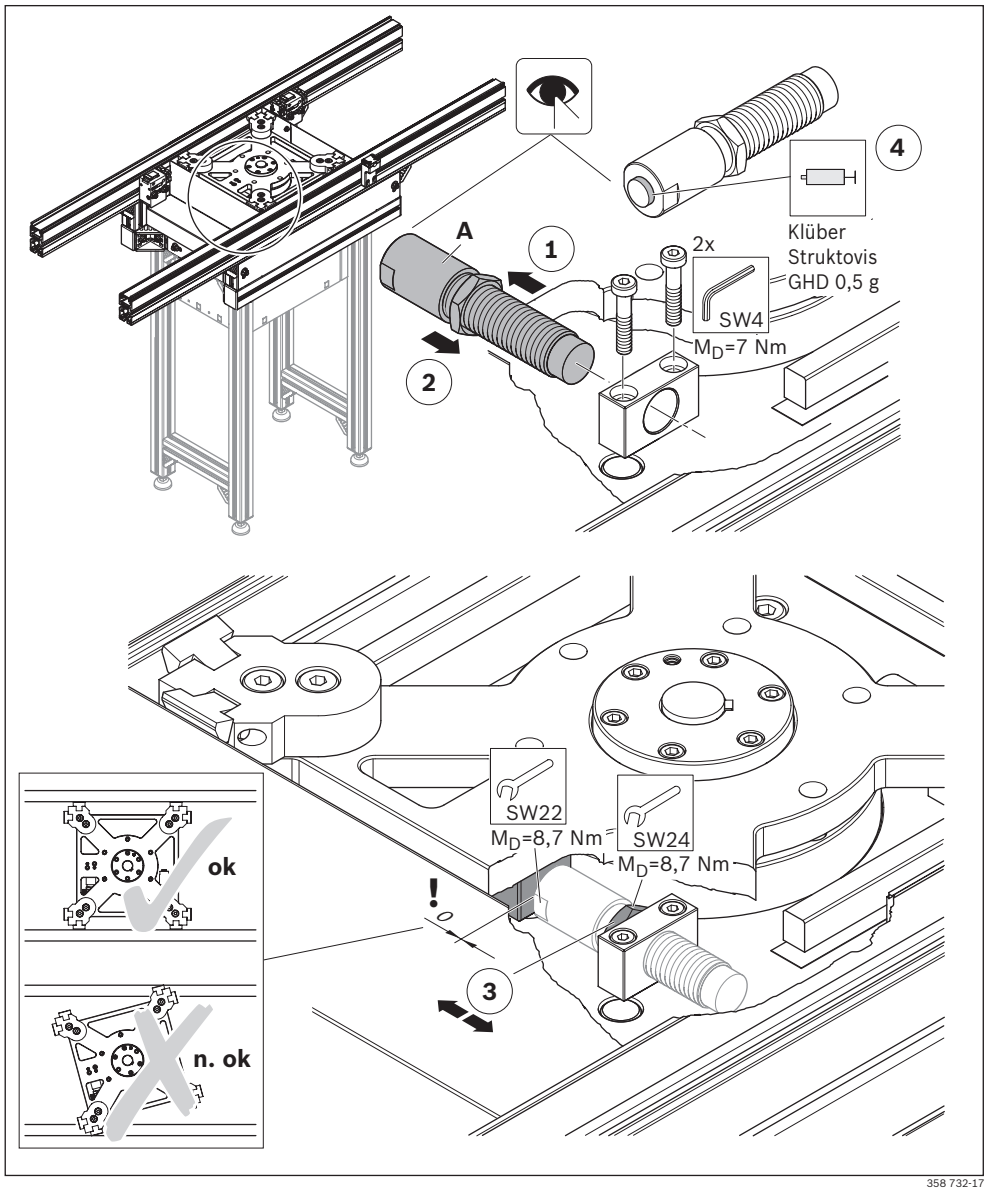

Fig. 30: Replacing dampers for rotary table (here size 2 180° for WT 2, WT 2/F)

10.4.3 Spare parts

For spare parts, see MT*parts* spare parts list, **3 842 529 770**.

11 Decommissioning

This product is a component which does not need to be decommissioned.
Accordingly, this section has been left blank.

12 Disassembly and replacement

⚠ WARNING

High electrical voltage!
Risk of severe injury or death from electric shock.
- ▶ Disconnect the relevant system component before performing any maintenance or repair work.
- ▶ Secure the system against being unintentionally switched on again.

High pneumatic pressure!
Risk of severe injury or death.
- ▶ Switch off the compressed air supply to the relevant system component before performing any maintenance or repair work.
- ▶ Secure the system against being unintentionally switched on again.

Suspended loads may fall!
Falling objects can result in severe injury (or even death).
- ▶ Use only slings with sufficiently high bearing loads (for product weight, see delivery documents).
- ▶ Make sure the lifting straps are correctly fastened before lifting the product.
- ▶ Secure the product against tipping over when lifting!
- ▶ Make sure that no one but the operator is in the danger zone during lifting and lowering!

12.1 Preparing the product for storage/later use

- Only set the product down on a flat surface.
- Protect the product from mechanical stress.
- Protect the product from environmental influences, such as dirt and moisture.
- Observe the ambient conditions, see page 56.
- For products with a mounted motor: Support the product so that the motor is not placed under mechanical load.

13 Disposal

- The materials used are environmentally friendly.
- They can be recycled or reused (components may have to be processed and replaced). Recyclability is ensured by the selection of materials and the ability to take the components apart.
- Careless disposal may lead to environmental contamination.
- Dispose of the product in accordance with the regulations in your country.

14 Upgrading and modification

- Do not modify the product.
- The Bosch Rexroth warranty only applies to the configuration as delivered, and to approved upgrades. The manufacturer will not accept any warranty claims for systems with unapproved modifications or upgrades.

15 Troubleshooting

- If you cannot correct a fault, please contact one of the addresses you can find at www.boschrexroth.com.

16 Technical data

- For dimensions, see sales catalog TS 2*plus*, 3 842 531 138.
- Maximum section load: Up to 2.0 kg/cm support length (depending on the belt section used)
- Maximum load: Size 1 50 kg
  Size 2 128 kg
  Size 3 240 kg
- Noise emission: < 70 dB (A)

16.1 Mass moments of inertia

For permissible center of gravity, see page 42.
Exception: HD 2/H, size 3, b_{WT} x l_{WT} = 1200 x 1200, here the center of gravity **must** be in the middle.
The minimum rotation times for different mass moments of inertia J_{total} are shown in the following figures. Please note the respective maximum mass moment of inertia for sizes 1 to 3.

Lift rotary unit HD 2/H, 3 842 998 760 (size 1 for WT 2, WT 2/F)
Weight max. 50 kg; mass moment of inertia max. 1.8 kgm²

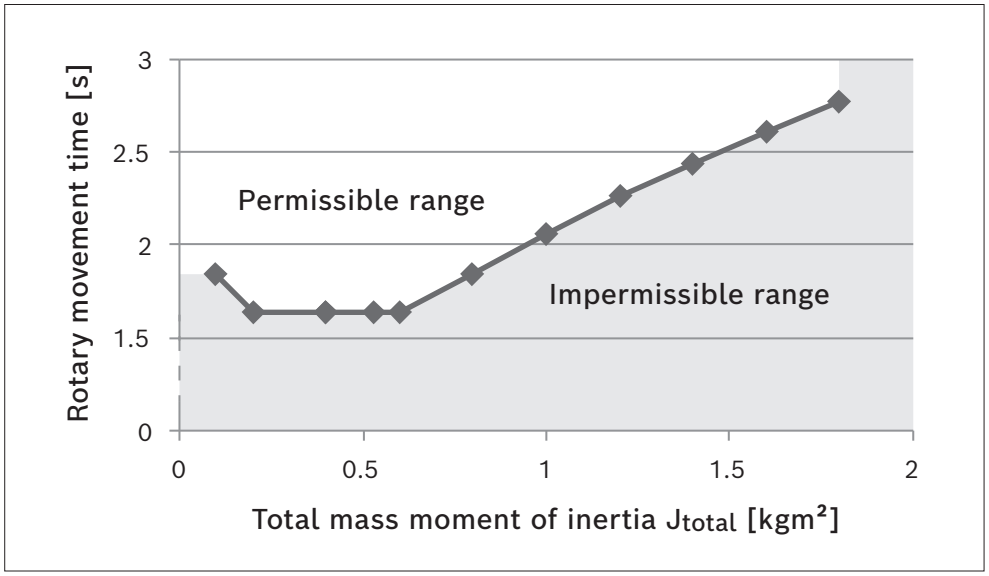

Fig. 31: Mass moment of inertia diagram, size 1

Table 8: Mass moment of inertia, size 1

Mass moment of inertia [kgm²]	0.1	0.2	0.4	0.53	0.6	0.8	1.0	1.2	1.4	1.6	1.8
Rotation time [s]	1.84	1.64	1.64	1.64	1.64	1.84	2.06	2.26	2.44	2.61	2.77

Lift rotary unit HD 2/H, 3 842 998 761 (size 2 for WT 2, WT 2/F)
Lift rotary unit HD 2/H, 3 842 994 229 (size 2 for WT 2/H, WT 2/F-H)
Mass max. 128 kg; mass moment of inertia max. 15.9 kgm²

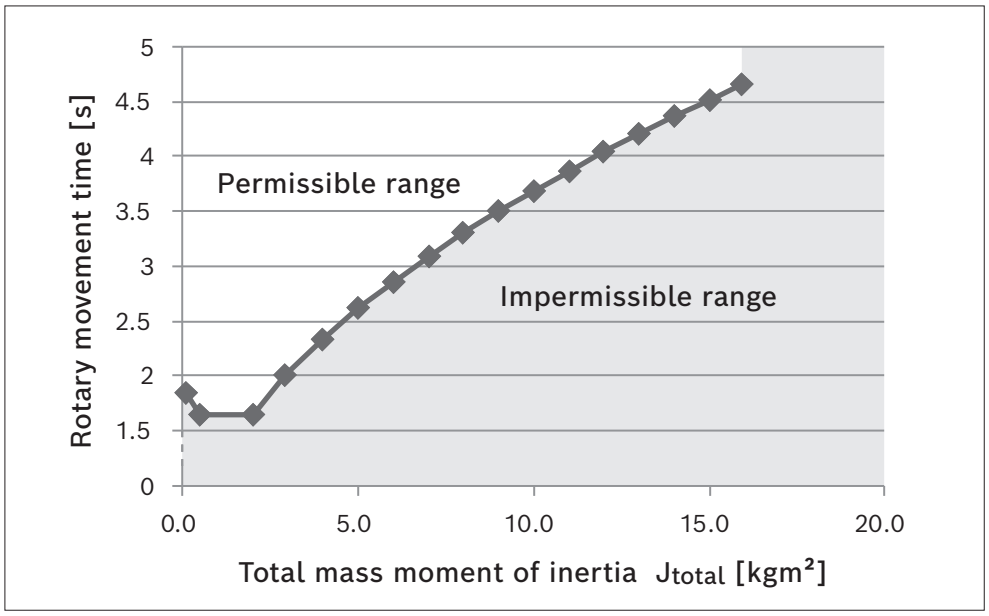

Fig. 32: Mass moment of inertia diagram, size 2

Table 9: Mass moment of inertia, size 2

Mass moment of inertia [kgm²]	0.1	0.5	2.0	2.93	4.0	5.0	6.0	7.0	8.0	9.0	10.0
Rotation time [s]	1.84	1.65	1.65	2.0	2.33	2.61	2.86	3.09	3.3	3.5	3.69

Mass moment of inertia [kgm²]	11.0	12.0	13.0	14.0	15.0	15.9
Rotation time [s]	3.87	4.05	4.21	4.37	4.52	4.66

Lift rotary unit HD 2/H, 3 842 998 761 (size 3 for WT 2/H, WT 2/F-H)
Mass max. 240 kg; mass moment of inertia max. 57.6 kgm²

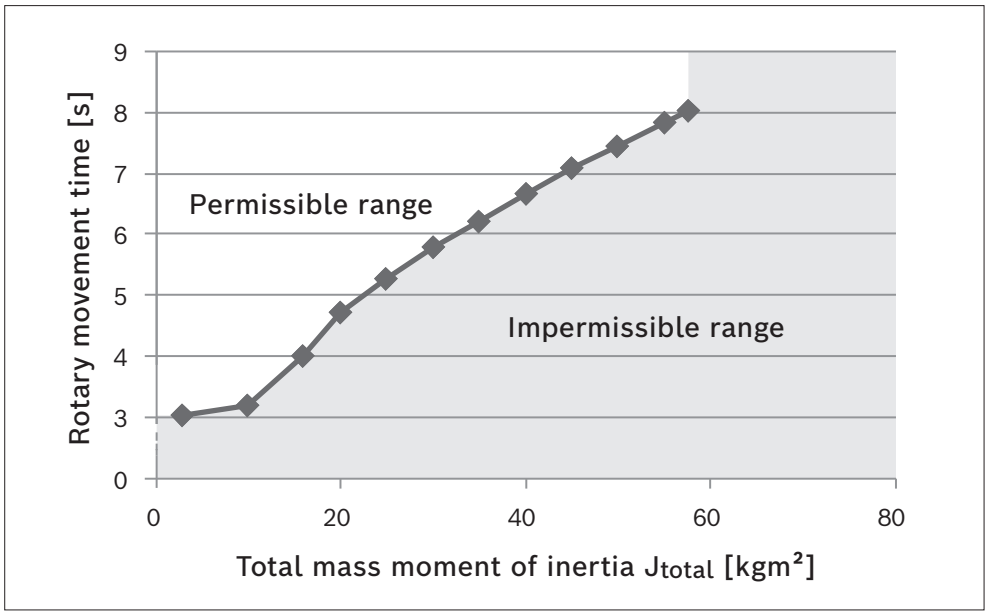

Fig. 33: Mass moment of inertia diagram, size 3

Table 10: Mass moment of inertia, size 3

Mass moment of inertia [kgm²]	2.8	10.0	15.84	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	57.6
Rotation time [s]	3.03	3.2	4.0	4.7	5.27	5.78	6.22	6.67	7.07	7.45	7.82	8.02

The following formulas are used for calculation:

$$J_x = {}^1/_{12} \times m(b_{wt}^2 + l_{wt}^2)$$

$$J_z = m \times d^2$$

$$J_{total} = J_x + J_z$$

J_x = Mass moment of inertia of the uniformly distributed load
J_z = Steiner's theorem
J_{total} = Total mass moment of inertia [kgm²]
m = Weight (including workpiece pallet) [kg]
b_{wt} = Width of workpiece pallet [m]
l_{wt} = Length of workpiece pallet [m]
d = Displacement to the axis of rotation [m]

16.2 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 at 20% reduced load
- Storage temperature: –25 °C to +70 °C
- Relative humidity: 5% to 85%, non-condensing
- Air pressure: > 84 kPa, corresponds to an installation altitude < 1,400 m above sea level
- Permissible load capacity of the floor: 1000 kg/m^2
- At installation altitudes > 1,400 m, the load values of the electric drives are reduced by 15%.
- The area should be kept free of mold, fungus, rodents and other vermin.
- Do not install or operate in the immediate vicinity of industrial equipment producing chemical emissions.
- Do not install or operate near sources of sand or dust.
- Do not install or operate in areas that are regularly subjected to high-energy forces caused, for example, by presses or heavy machinery.
- Resistant to many media that are commonly found in manufacturing, such as water, mineral oil, grease, and detergents. Contact your Rexroth representative if you have any doubts about resistance to specific chemicals, such as test oil, doped oils, corrosive detergents, solvents or brake fluid.
- Avoid prolonged contact with highly reactive acidic or alkaline materials.

16.3 Pneumatics

- Oiled or non-oiled, filtered, dry compressed air.
- Operating pressure: 4 to 6 bar
- Solids
  - Particle size: ≤ 5 µm (Class 6 as per ISO 8573-1:2010)
  - Particle quantity: ≤ 5 mg/m^3 (Class 6 as per ISO 8573-1:2010)
- Humidity – water content
  - Pressure dew point[1]): ≤ +3 °C (Class 4 as per ISO 8573-1:2010)

[1]) The pressure dew point should be at least 15 °C below the ambient temperature.

- Oil content
  - Oil quantity: ≤ 1 mg/m^3 (Class 3 as per ISO 8573-1:2010)

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