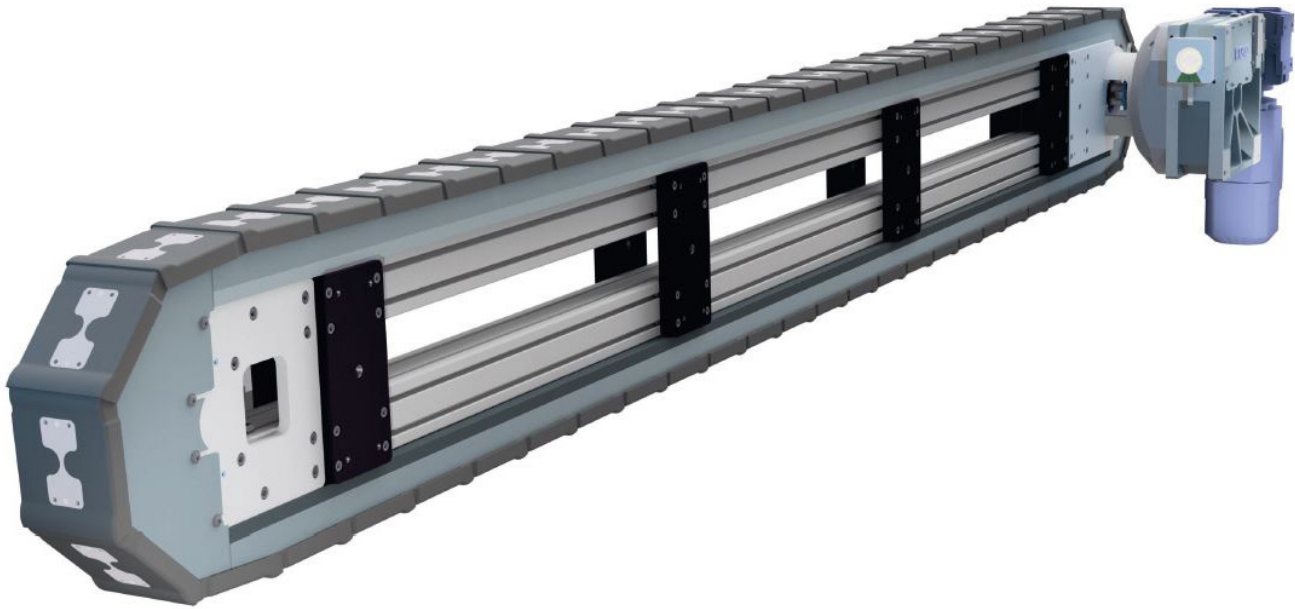




MOTION
INDEX DRIVES



LFA Precision Conveyor

Assembly Instructions

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1 About these instructions

1.1 Purpose

The purpose of these Assembly Instructions is to provide users with all the necessary information they need for the proper and safe assembly of the linear transfer system into a complete machine.

1.2 Contact information

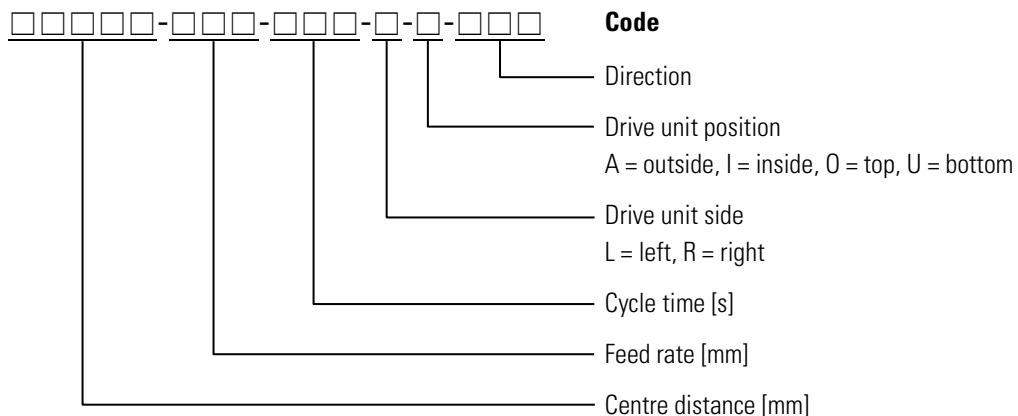
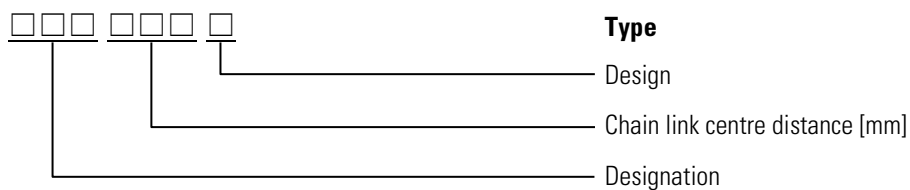
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1.3 Product designation

Linear transfer system LFA



1.4 Symbols

The following symbols are used in these instructions:

Instructions and directions

Requirements for performing an instruction are indicated by a check mark.

The action steps to be executed are numbered.

The results of individual action steps are indicated by a black arrow. The overall result of an instruction is marked by a white arrow in a black circle.

Example

- ✓ Requirement
- 1. Instruction (step 1)
- 2. Instruction (step 2)
 - ⇒ Result or response of system to step 2
- 3. Instruction (step 3)
 - ➡ Overall result of the instruction

Enumerations

Enumerations in no strict order are indicated as follows:

- Property A
 - Detail 1
 - Detail 2
- Property B
 - Detail 1
 - Detail 2

2 Safety

2.1 Safety instructions

General safety instructions

- Read through these instructions completely
- Observe the information and instructions in these instructions
- Keep unauthorized persons away from the working area
- Work on electrical systems may only be carried out by qualified electricians
- Keep the instructions in a safe place and make them available to all employees
- Observe the documentation of the supplier components

2.2 Warnings

2.2.1 Structure of the warnings

All the warnings in these instructions have the following structure:

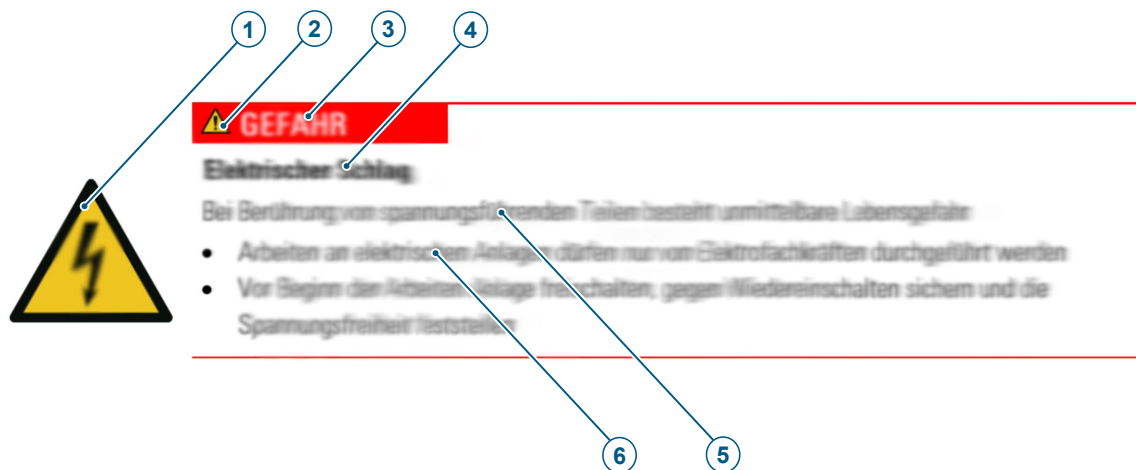


Fig. 1: Structure of the warnings

| | | | |
|---|---|---|---------------------------------|
| 1 | Hazard-specific symbol | 2 | Hazard symbol |
| 3 | Signal word | 4 | Type and source of danger |
| 5 | Possible consequences of non-observance | 6 | Procedure for hazard prevention |

2.2.2 Meanings of the signal words and symbols

The following signal words are used in this document:

| Signal word | Meaning |
|-------------|--|
| DANGER | Indicates a hazardous situation which will result in death or serious injury. |
| WARNING | Indicates a potentially hazardous situation which may result in death or serious injury. |
| CAUTION | Indicates a potentially hazardous situation which may result in minor or moderate injury. |
| NOTICE | Indicates a potentially hazardous situation which may result in property and environmental damage. |

The following symbols for dangers, warnings, requirements and prohibitions are used in this document:



Do not carry metal parts or clocks



No access with cardiac pacemaker or implanted defibrillators



No access with metallic implants



General warning sign



Warning: Electrical voltage



Warning: Magnetic field



Warning: Suspended load



Wear head protection



Wear eye protection



Wear foot protection



Wear hand protection

2.3 Requirements for personnel

The activities described in these instructions may only be performed by qualified personnel.

Qualified personnel are persons who are able to carry out the work assigned to them due to their technical training, knowledge and experience. They are familiar with the relevant standards and regulations and are able to recognize potential hazards on their own.

2.4 Personal protective equipment

Personal protective equipment is used to protect personnel from impairments to safety and health during work. Personnel must wear the personal protective equipment when performing all of the activities described in these instructions. The required personal protective equipment is indicated in the different chapters of these instructions.

2.5 Requirements for incorporation into a complete machine

The linear transfer system is an incomplete machine. Operation of the linear transfer system is only permitted in a complete, CE-compliant machine or system.

The manufacturer of the complete machine or system is responsible for integrating the linear transfer system into the system in such a way that completely safe operation is guaranteed.

- During operation, it is prohibited to remain in the immediate vicinity of the linear transfer system. Staying in the vicinity of the linear transfer system is only permitted within the scope of control activities, maintenance or servicing work by specially trained personnel.
- Maintenance work must be carried out in accordance with the maintenance schedule and the operating instructions.
- All activities at the linear transfer system may only be performed by trained qualified personnel.

3 Product description

3.1 Intended use

The linear transfer system is designed for incorporation in a complete machine or a complete system. The linear transfer system is used to transport workpiece carriers from one processing station to another processing station in the correct position.

All applications deviating from this intended use are not permitted.

- Modifications to the linear transfer system must be approved by **MOTION INDEX DRIVES**
- The linear transfer system may only be operated within the defined operating parameters
- The specified load on the chain links must not be exceeded
- It is not permitted to use the linear transfer system in ex-classified rooms

3.2 Technical data

3.2.1 Operating conditions

| | |
|------------------------|-----------------------------------|
| Application range | in closed rooms |
| Temperature range [°C] | +15 to +30 |
| Relative humidity [%] | 40 to 60 |
| Media | do not expose to aggressive media |

3.2.2 Storage conditions

| | |
|---------------------------|---|
| Application range | in closed rooms |
| Temperature range [°C] | -22 to +50 |
| Relative humidity [%] | 40 to 70 |
| Media | do not expose to aggressive media |
| Storage period > 6 months | provide additional corrosion protection |

3.2.3 Dimensions

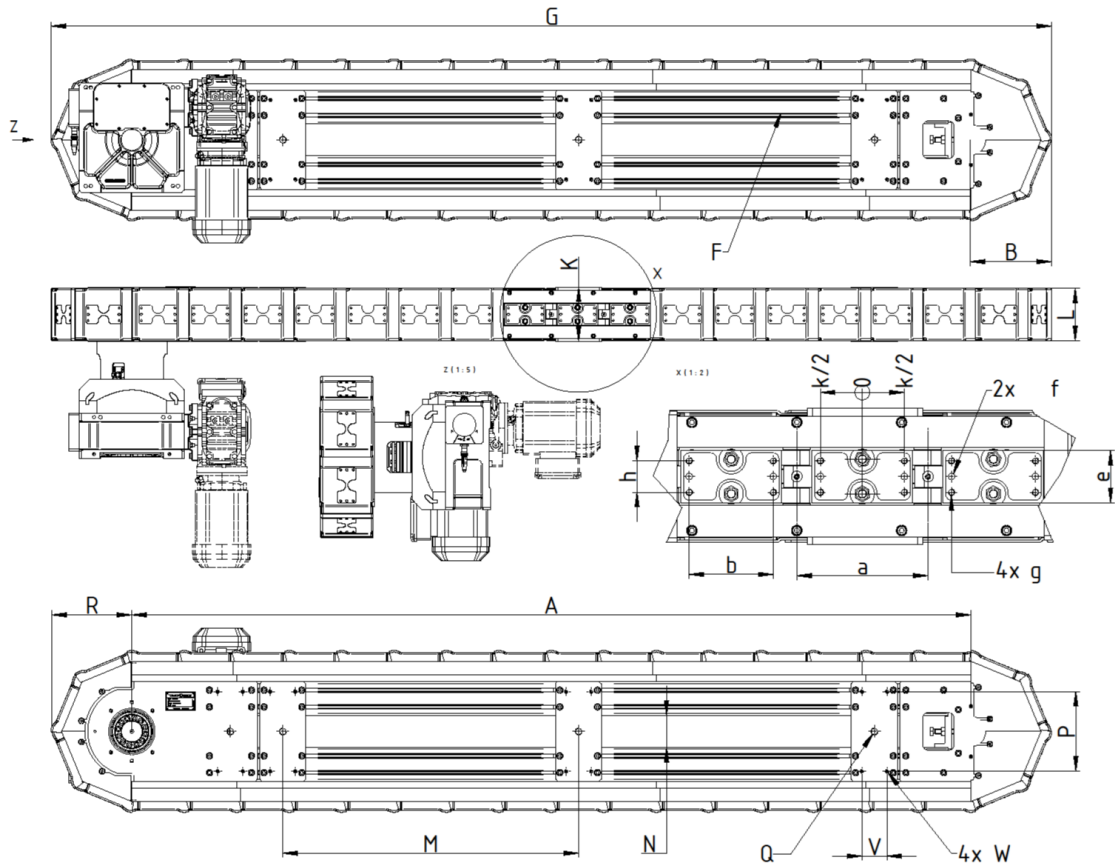


Fig. 2: Dimensional drawing, main dimensions of the linear transfer system

Main dimensions of the linear transfer system, chain link (CL)

| Pos. | Designation | Unit | LFA080 | LFA100 | LFA125 | LFA150 |
|------|---|------|---------|---------|---------|---------|
| a | Chain link centre distance | [mm] | 80 | 100 | 125 | 150 |
| b | Bore spacing workpiece carrier (WC) fastening | [mm] | 37 | 55 | 80 | 85 |
| e | Chain link width | [mm] | 50 | 50 | 50 | 80 |
| f | H7 fitting bore diameter | [mm] | 6 (2x) | 6 (2x) | 6 (2x) | 8 (2x) |
| g | Thread, WC fastening | [mm] | M6 (2x) | M6 (4x) | M6 (4x) | M8 (4x) |
| h | Bore spacing, WC fastening | [mm] | 33 | 30 | 30 | 60 |

Main dimensions of the linear transfer system LFA - LFA S frame

| Pos. | Designation | Unit | LFA080 | LFA100 | LFA125 | LFA150 |
|------|---------------------------------|------|-----------------|-----------------|-----------------|-----------------|
| A | Centre distance | [mm] | see drawing | see drawing | see drawing | see drawing |
| B | Length | [mm] | see drawing | see drawing | see drawing | see drawing |
| F | Profile system | [mm] | Profile 8 80x40 | Profile 8 80x80 | Profile 8 80x80 | Profile 8 80x80 |
| G | Total length | [mm] | see drawing | see drawing | see drawing | see drawing |
| K | Width of linear transfer system | [mm] | 130 | 130 | 130 | 170 |
| M | Intermediate plate spacing | [mm] | see drawing | see drawing | see drawing | see drawing |
| N | Media feed-through spacing | [mm] | 39 | 11.3 | 76.6 | 122 |
| P | Thread mount bore spacing | [mm] | 90 | 135 | 190 | 200 |
| Q | Thread attachment point | [mm] | M16 | M16 | M16 | M20 |
| V | Thread mount bore spacing | [mm] | 50 | 50 | 60 | 80 |
| W | Thread mount | [mm] | M8 (4x) | M8 (4x) | M8 (4x) | M12 (4x) |

3.2.4 Space required

The space required depends on the dimensions of the linear transfer system.

- Provide a clearance of approx. 1 m² in the area of the drive unit for maintenance and service activities.
- Provide a clearance of approx. 1 m² in the area of the deflection unit for setting the chain tension.

3.3 Product overview



Fig. 3: Linear transfer system LFA without drive unit

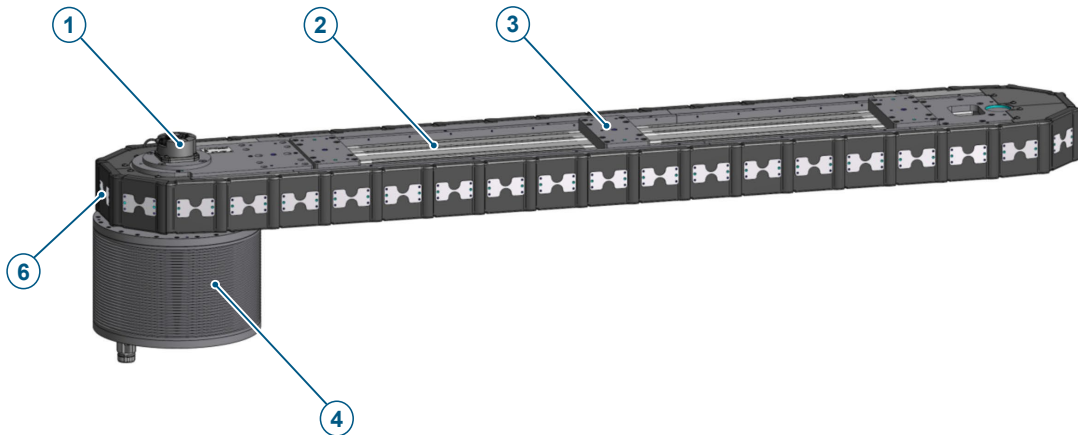


Fig. 4: Linear transfer system LFA with direct drive unit TQMSI

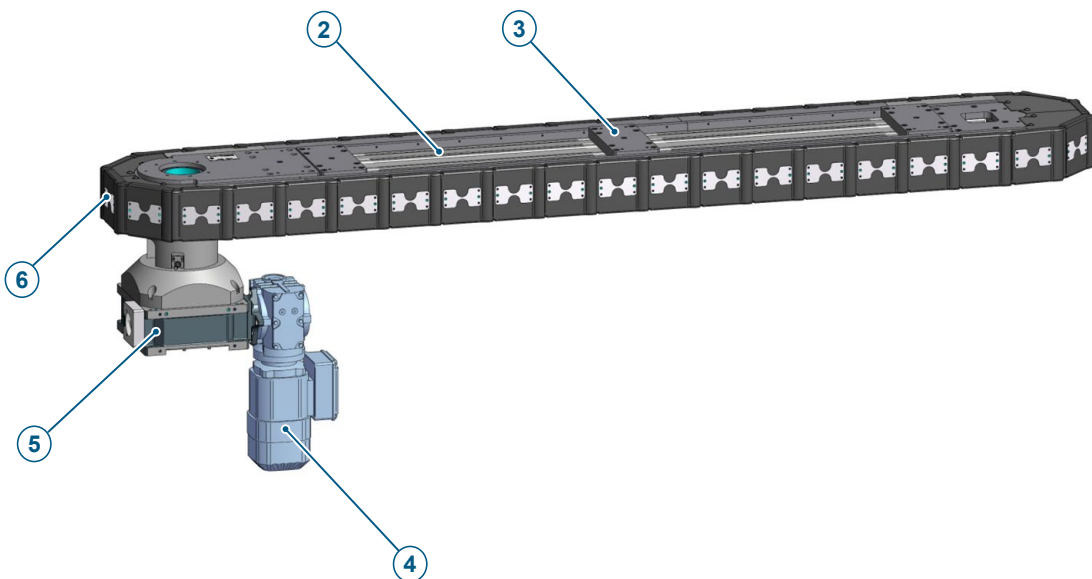


Fig. 5: Linear transfer system driven by rotary indexing table type RT - TT

| | | | |
|---|-----------------------|---|---|
| 1 | Speed sensor | 2 | Aluminium profile frame |
| 3 | Intermediate plate | 4 | Complete drive unit / direct drive unit TQMSI |
| 5 | Rotary indexing table | 6 | Endless chain |

3.4 Overload protection (optional)

An optional safety clutch can be installed to protect the linear transfer system in overload situations. This safety clutch separates the rotary indexing table from the linear transfer system in the event of an overload, thereby preventing major damage to the system.

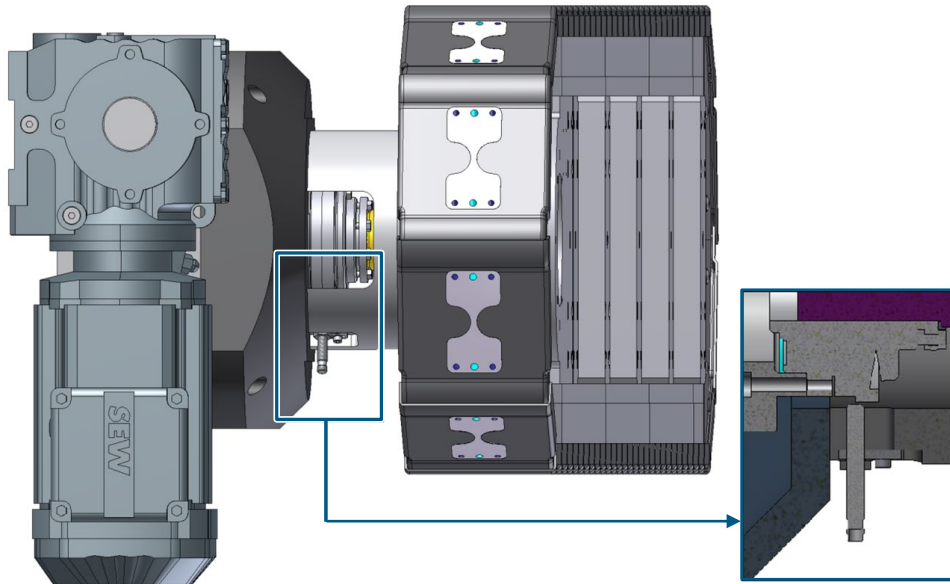


Fig. 6: Overview of the safety clutch

A limit switch is installed to monitor the clutch. The limit switch is mounted on a sensor holder which is attached to the connecting piece (see Figure: Overview of the safety clutch).

The limit switch is set and sealed by MOTION INDEX DRIVES. To monitor the controller, the signal from the limit switch can be processed directly by a controller. When the clutch is engaged, the LED of the limit switch lights up. In the event of an overload situation, the LED goes out.

4 Transport

Required personal protective equipment



WARNING

Tipping or falling loads



Suspended loads can tip or fall down. This can cause serious or fatal injuries to persons.

- Do not step under suspended loads
- Keep unauthorized persons out of the danger zone
- Observe the weight and centre of gravity
- Only use suitable, approved and undamaged load handling attachments

NOTICE



Damage to components

Improper transport may cause material damage to the linear transfer system

- Carry out transport carefully and observe the symbols on the packaging
- Align the lifting eyes in the direction of the load
- Follow the operating instructions for the lifting gear

Check the delivery immediately on receipt for completeness and transport damage.

In the event of externally visible transport damage, observe the following:

- Do not accept the delivery or accept it only with reservations
- Note the extent of the damage on the transport documents or on the transport delivery note
- Report material damage to the manufacturer immediately

4.1 Types of transport

The linear transfer system is packed and transported horizontally or vertically according to the planned installation position at the customer site.

4.1.1 Vertical transport

The linear transfer system is transported vertically using transport feet. The number of transport feet and slings depends on the centre distance A of the linear transfer system (see table below).

Attach the slings at the attachment points as shown below and make sure they are functioning properly.

Only transport with industrial trucks at the marked pick-up points.

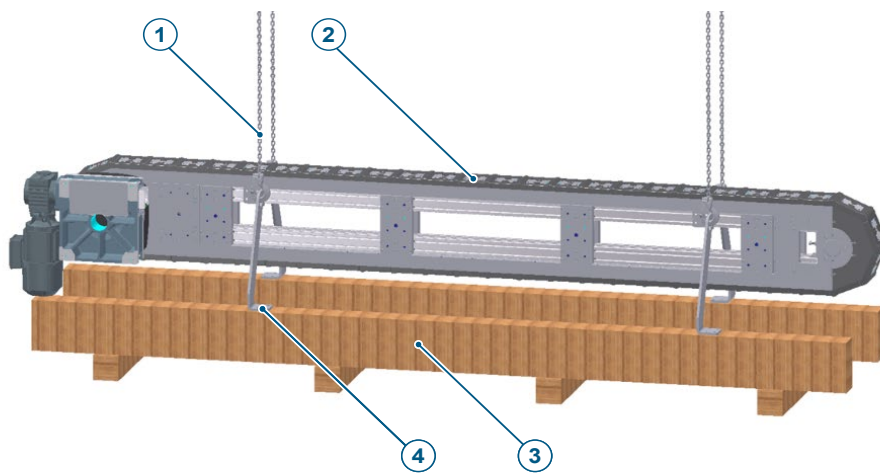


Fig. 7: Linear transfer system in vertical position with slings

| | | | |
|---|------------------------------|---|------------------------|
| 1 | Slings (e.g. chains, straps) | 2 | Linear transfer system |
| 3 | Wooden frame | 4 | Transport foot |

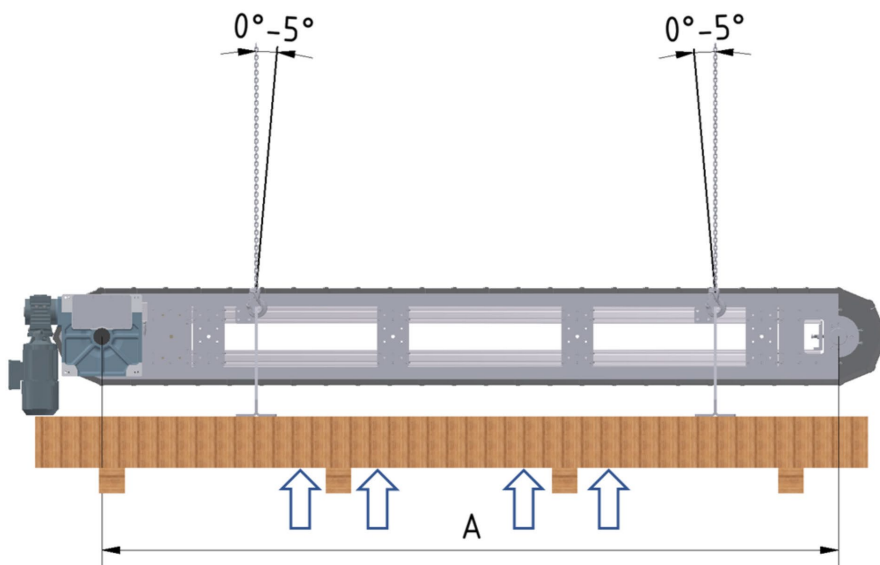


Fig. 8: Specification of inclination angle and pick-up points for industrial trucks

Recommended slings for vertical transport

| Type | Centre distance [mm] | Number of attachment points |
|------------|----------------------|-----------------------------|
| LFA; LFA S | < 3000 | 4 |
| LFA; LFA S | > 3000-6000 | ≥ 6 |
| LFA; LFA S | > 6000 | ≥ 8 |

4.1.2 Horizontal transport

The linear transfer system is transported horizontally using slings. The number of slings depends on the centre distance A of the linear transfer system (see table below).

Attach the slings at the attachment points as shown below and make sure they are functioning properly.

Only transport with industrial trucks at the marked pick-up points (see figure below).

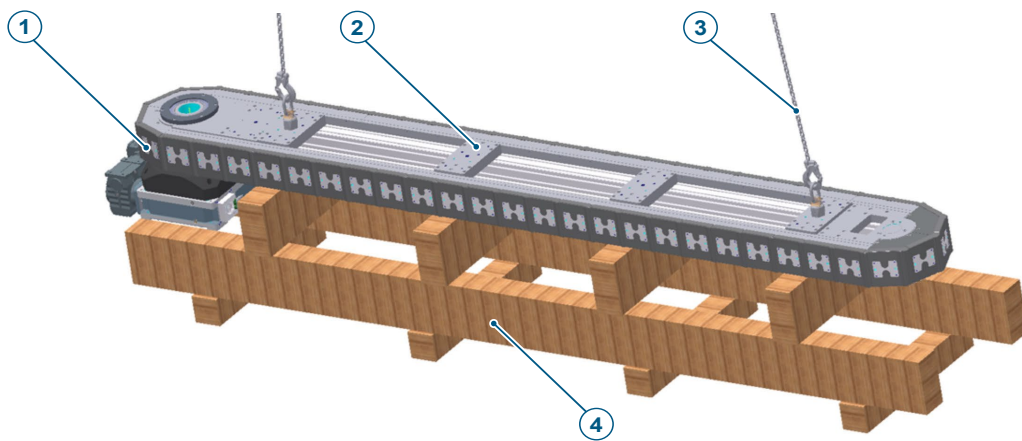


Fig. 9: Linear transfer system with slings

| | | | |
|---|---|---|------------------------------|
| 1 | Linear transfer system | 2 | Sling (see table for thread) |
| 3 | Slings (e.g. chains, straps, attachment eyes, eyebolts) | 4 | Wooden frame |

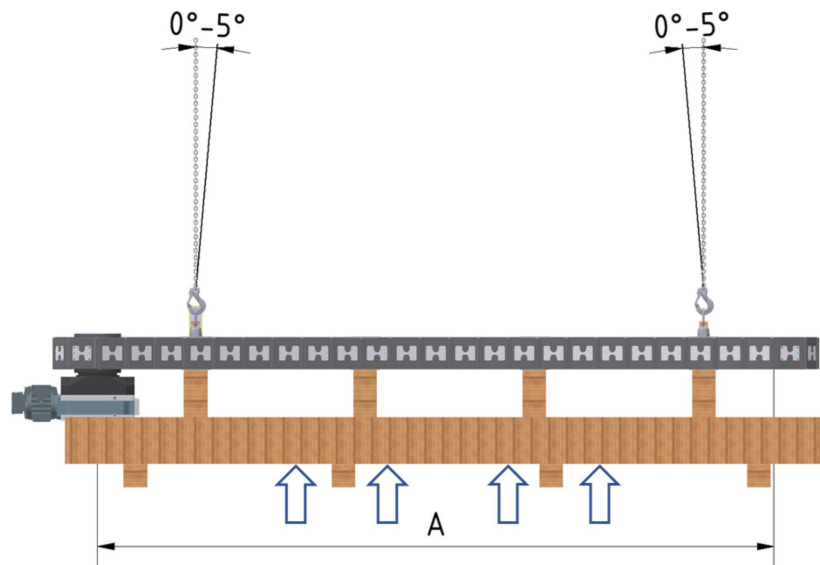


Fig. 10: Specification of inclination angle and pick-up points for industrial trucks

Recommended slings for horizontal transport

| Type | Centre distance [mm] | Number of attachment points | Slinging equipment | Bolt size |
|------------------|----------------------|-----------------------------|--------------------|-----------|
| LFA080 - LFA080S | < 3000 | 2 | VLBG 1.5 t | M16 |
| LFA080 - LFA080S | > 3000-6000 | ≥ 4 | VLBG 1.5 t | M16 |
| LFA080 - LFA080S | > 6000 | ≥ 8 | VLBG 1.5 t | M16 |
| LFA100 - LFA100S | < 3000 | 2 | VLBG 1.5 t | M16 |
| LFA100 - LFA100S | > 3000-6000 | ≥ 4 | VLBG 1.5 t | M16 |
| LFA100 - LFA100S | > 6000 | ≥ 8 | VLBG 1.5 t | M16 |
| LFA125 - LFA125S | < 3000 | 2 | VLBG 1.5 t | M16 |
| LFA125 - LFA125S | > 3000-6000 | ≥ 4 | VLBG 1.5 t | M16 |
| LFA125 - LFA125S | > 6000 | ≥ 8 | VLBG 1.5 t | M16 |
| LFA150 - LFA150S | < 3000 | 2 | VLBG 2.5 t | M20 |
| LFA150 - LFA150S | > 3000-6000 | ≥ 4 | VLBG 2.5 t | M20 |
| LFA150 - LFA150S | > 6000 | ≥ 8 | VLBG 2.5 t | M20 |

5 Assembly

Required personal protective equipment



⚠ DANGER



Electric shock

Touching live parts poses an immediate danger to life

- Work on electrical systems may only be carried out by qualified electricians
- Before starting work, disconnect the system, secure it against being switched on again and make sure that no voltage is present

5.1 Installation position of the linear transfer system

NOTICE



The installation and mounting positions are specified according to the project planning. They may not be changed without consulting MOTION INDEX DRIVES

- Only install the linear transfer system in the specified position

One of the installation positions listed below is specified during project planning. The linear transfer system must be installed in the specified installation position.

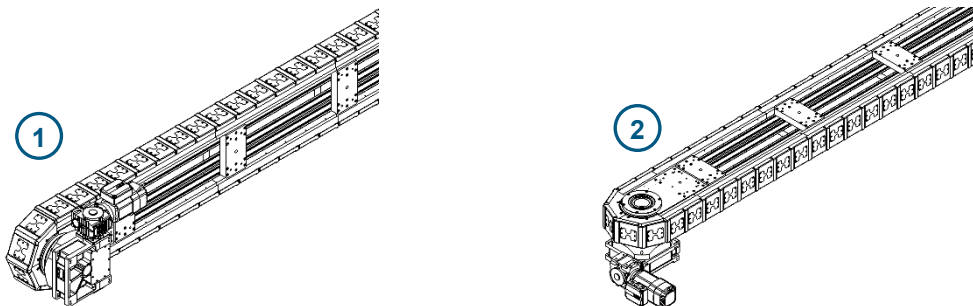


Fig. 11: Installation positions of the linear transfer system

1 Vertical installation position

2 Horizontal installation position

5.2 Mounting position of the drive unit

5.2.1 Mounting positions of the vertical linear transfer system

With vertical linear transfer systems, the drive unit is mounted on either the left or the right side. The viewing direction for defining the installation position is from the deflection side towards the drive unit.

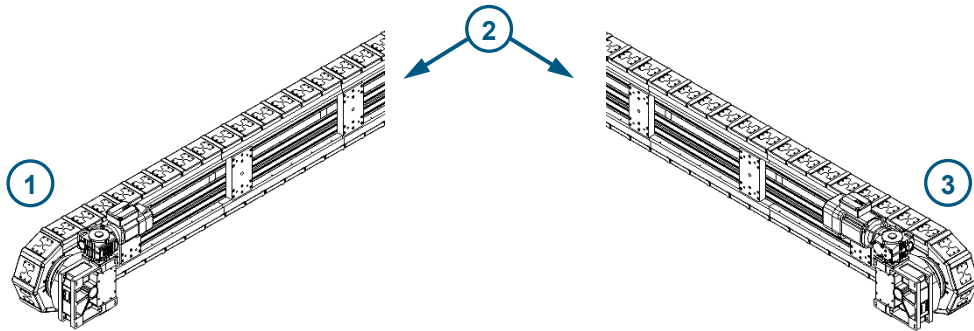


Fig. 12: Mounting positions of the vertical linear transfer system

- | | | | |
|---|-----------------------------|---|-------------------|
| 1 | Mounting position L (left) | 2 | Viewing direction |
| 3 | Mounting position R (right) | | |

In addition, the drive unit is mounted in one of the mounting positions shown below.

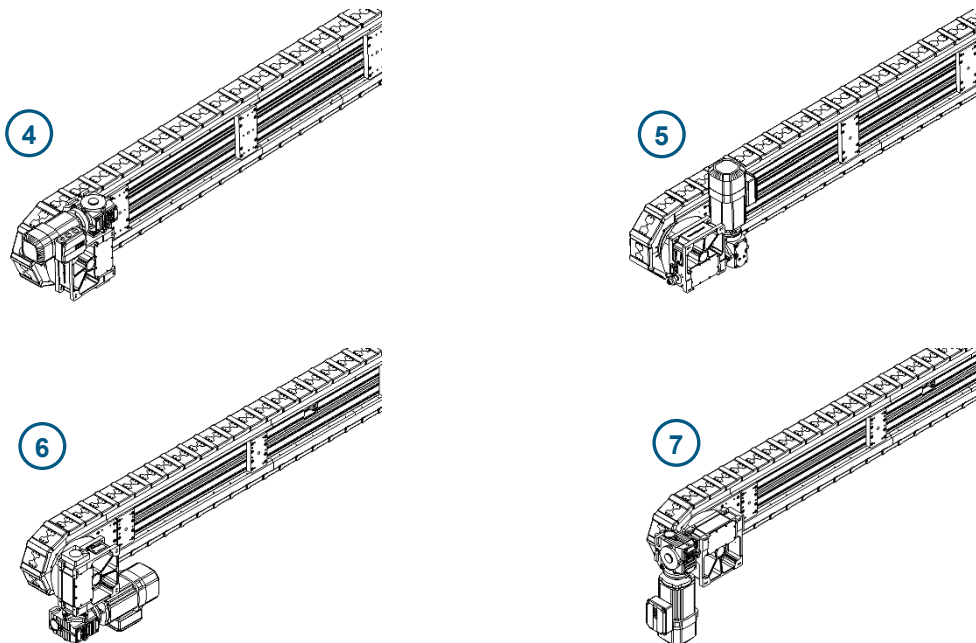


Fig. 13: Mounting positions of the vertical linear transfer system

- | | | | |
|---|------------------------------|---|-------------------------------|
| 4 | Mounting position O (top) | 5 | Mounting position I (inside) |
| 6 | Mounting position U (bottom) | 7 | Mounting position A (outside) |

5.2.2 Mounting positions of the horizontal linear transfer system

With horizontal linear transfer systems, the drive unit is mounted on the bottom side.

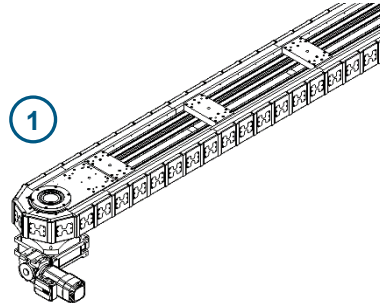


Fig. 14: Mounting positions of the horizontal linear transfer system

- | | |
|---|------------------------------|
| 1 | Mounting position U (bottom) |
|---|------------------------------|

In addition, the drive unit is mounted in one of the mounting positions shown below.

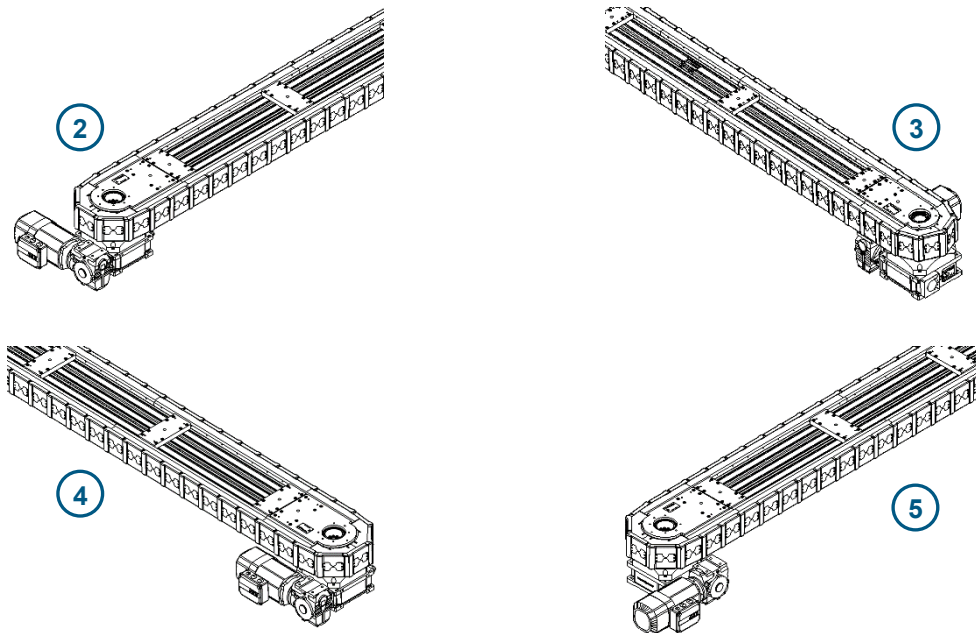


Fig. 15: Mounting positions of the vertical linear transfer system

- | | | | |
|---|-------------------------------|---|------------------------------|
| 2 | Mounting position A (outside) | 3 | Mounting position I (inside) |
| 4 | Mounting position R (right) | 5 | Mounting position L (left) |

5.3 Assembly of linear transfer system LFA

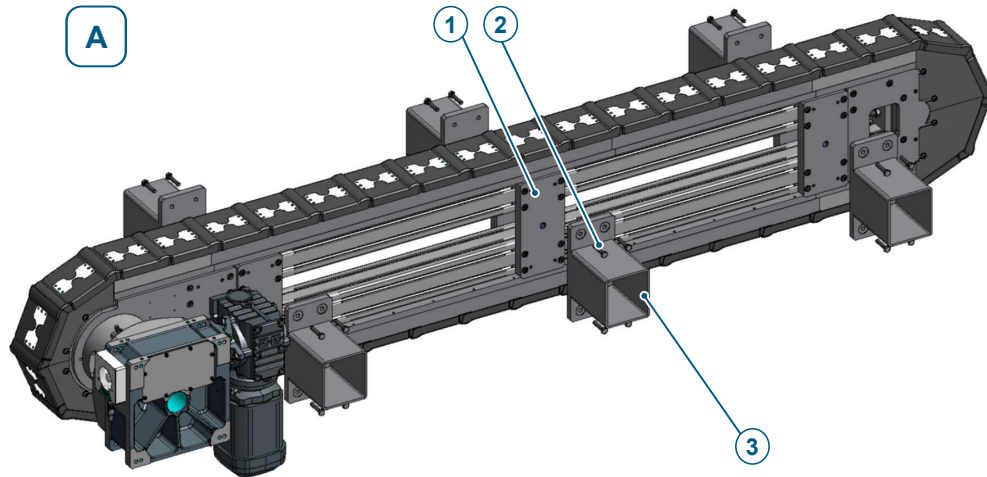


Fig. 16: Example assembly of linear transfer system LFA – LFA vertical

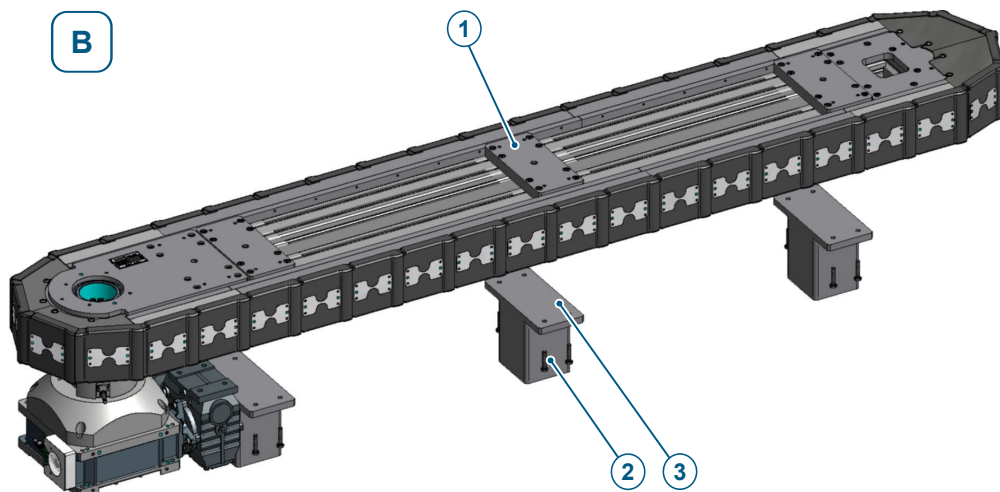


Fig. 17: Example assembly of linear transfer system LFA – LFA horizontal

| | | | |
|---|--|---|-------|
| 1 | Intermediate plate (number dependent on centre distance) | 2 | Screw |
| 3 | Example support | | |

The linear transfer system can be installed vertically (A) or horizontally (B). The linear transfer system is packed and transported according to the planned installation position at the customer site.

For installation in a system, MOTION INDEX DRIVES recommends fastening the LFA linear transfer system with brackets (3).

The brackets are firmly attached to the intermediate plates (1) with screws (2).

If the rotary indexing table has a large overhang, an additional supporting structure for the rotary indexing table is also recommended.

For assembly, proceed as follows:

- ✓ The mounting surface must be level.
 1. Clean the mounting surface.
 2. Place the linear transfer system on the mounting surface.
 3. Fix the linear transfer system in place with screws as specified in to the dimension table (see technical data).

Chain link attachments

For attachments / workpiece carriers (WC) on the chain link, observe the following:

- Maximum mass moved (according to MOTION INDEX DRIVES project planning)
- Minimum time until positioning (according to MOTION INDEX DRIVES project planning)
- Maximum overhang (tilting moment) (according to MOTION INDEX DRIVES project planning)
- Max tightening torque for mounting holes

5.4 Initial start-up

Prior to initial start-up, observe the following:

- Remove any obstacles from the indexing area of the link chain.
- Ensure freedom of movement.

6 Operation



DANGER



Danger to life due to electromagnetic field

Persons with implants that can be magnetically influenced (e.g. pacemakers) or with other ferromagnetic prostheses must not come near this device and must not carry out any work on it. Pacemakers, data carriers and other objects that can be magnetically influenced could be damaged.

- Maintain a safety distance of at least 1 m

General requirements for operation

Operation of the linear transfer system is only permitted in a complete, CE-compliant machine or system.

The linear transfer system must not be operated with defective or disabled safety equipment.

6.1 Operating modes

The linear transfer system is designed for different operating modes. These operating modes must be implemented by means of an external controller.

Normal operation

In normal operation, the chain links are stepped from one stop position to the next.

Intermittent operation

Intermittent operation consists of two phases: the dwell phase and the stepping time.

In the dwell phase, the drive unit stops. External assembly processes can be performed during this time. The dwell time is variable.

During the indexing phase, the endless chain is stepped to the next stop position.

Inching operation

In inching operation, the drive shaft is moved between two dwell positions in small steps.

The barrel cam is unable to accelerate and decelerate the load gently. This results in high accelerations that put a strain on the linear transfer system. Inching may only be carried out with a suitable universal controller that makes it possible to accelerate and decelerate the load gently so as to protect the gearing. A suitable controller is, for example, the TIC controller (MOTION INDEX DRIVES Indexing Controller).

Emergency stop

The emergency stop immediately stops the movement of the linear transfer system. The resultant load that is built up puts a strain on the linear transfer system. The emergency stop should therefore only be used in emergency situations.

7 Maintenance

Required personal protective equipment



DANGER



Electric shock

Touching live parts poses an immediate danger to life

- Work on electrical systems may only be carried out by qualified electricians
- Before starting work, disconnect the system, secure it against being switched on again and make sure that no voltage is present

7.1 General

The maintenance intervals are minimum recommendations for three-shift use. Non-compliance with the maintenance instructions and unauthorized modifications will render warranty claims and the manufacturer's liability void.

Comply with all laws, regulations as well as the regulations of the respective country of operation for the protection of people and the environment.

The maintenance instructions are only valid in conjunction with the instructions of the respective manufacturer. The contents are subject to change without notice.

7.2 Maintenance tasks

Carry out switch-on and switch-off procedures in accordance with the instructions for all maintenance and cleaning work.

Observe the adjustment, maintenance and inspection activities prescribed in the operating and maintenance instructions, including the specifications on parts/equipment replacement.

Ensure that the maintenance area is adequately secured if necessary.

Rework

When carrying out maintenance work, always retighten loosened screw connections.

If it is necessary to remove any safety equipment, the safety equipment must be reinstalled immediately after the work has been completed. After installation, check the function of the safety equipment.

Dispose of operating and auxiliary materials as well as cleaning agents and replacement parts safely and in an environmentally friendly manner. Follow the manufacturer's instructions for hazardous substances.

Spare parts

Spare parts must comply with the technical requirements specified by the manufacturer. This is always ensured if genuine spare parts are used.

Environmental protection

Remove leaking or excess grease from lubrication points and dispose of it in accordance with the applicable local regulations.

7.2.1 Maintenance personnel

The operator must clearly regulate and define the responsibilities and procedures for cleaning, maintenance and servicing work.

Only qualified, trained and instructed personnel must carry out maintenance tasks.

7.2.2 Maintenance schedule

| Interval | Activity | Personnel |
|-----------------|--|---------------------|
| Weekly | General visual and acoustic inspection | Machine operator |
| Monthly | Clean the chain links and guide rails where accessible, remove dust and deposits | Machine operator |
| Quarterly | Check the electromagnetic brake for wear (optional) (observe the instructions of the manufacturer) | Machine operator |
| Quarterly | Check the electrical wiring for damage | Machine operator |
| Annually | Check the rotary indexing table for play in the dwell position (observe the instructions of the manufacturer) | Qualified personnel |
| Annually | Check chain tension and re-tension if necessary, see section "Checking and adjusting the chain tension" | Qualified personnel |

7.2.3 Cleaning

Keep all handles, steps, handrails, platforms and ladders free from dirt.

Compressed air must not be used for cleaning.

Before starting maintenance work, clean all components and especially connections and screw fittings to remove any oil, fuel or cleaning agents. Do not use any aggressive cleaning agents. Use lint-free cleaning cloths.

After cleaning, check all supply lines to ensure that they do not leak, that no connections have come loose, and that they show no signs of abrasion or damage. Immediately rectify any defects.

7.3 Checking and adjusting the chain tension

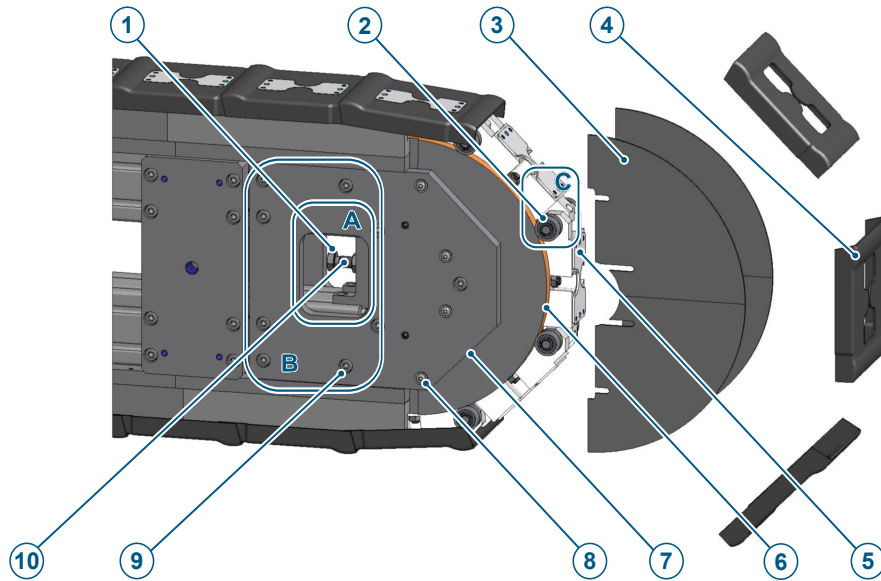


Fig. 18: Detailed view of chain tensioner (deflection unit)

Working areas

| | | | |
|---|---|---|---|
| A | Set screw chain tensioner; consisting of: hexagon bolt, hexagon nut | B | Side panel clamp; consisting of 6 cylinder head screws (both sides) |
| C | Chain link bearing | | |

Components

| | | | |
|---|-------------------------------------|----|--|
| 1 | Hexagon bolt | 2 | Deep groove ball bearing; 4 per chain link |
| 3 | Cover plate | 4 | Protective cover |
| 5 | Chain link | 6 | Deflection wheel |
| 7 | Side panel | 8 | Flanged screw |
| 9 | 6 cylinder head screws (both sides) | 10 | Hexagon nut |

The chain tension can only be checked and adjusted at the deflection unit.

To check the chain tension, proceed as follows:

- ✓ The linear transfer system has been disconnected from all power supplies.
 1. Remove attachments on the chain links at the deflection units.
 2. Remove the protective cover (4).
 3. Loosen the 4 lens flange screws (8) on both sides by a quarter turn.
 4. Remove the 4 cover plates (3) from the side panels (7) in the direction of the arrow.
 5. Turn each deep groove ball bearing (2) (4 per chain link (5)) alternately around the circumference of the deflection wheel.
- ➡ If all deep groove ball bearings can be turned equally tightly, the chain tension is correct.

7.3.1 Re-tensioning the chain

To re-tension the chain, proceed as follows:

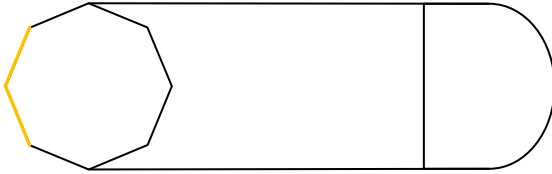
- ✓ The linear transfer system has been disconnected from all power supplies.
 1. Loosen the cylinder head screws (9) on clamp B of the side panel on both sides by a quarter turn.
 2. Slacken chain tensioner A by loosening the hexagon nut (10) and screwing back the hexagon bolt (1).
 3. Set the chain tension by gradually turning the hexagon bolt (1) in the clockwise direction while constantly checking the pretension of the deep groove ball bearing (2) at bearing C on both sides.
 4. Check the 16 deep groove ball bearings (2) for correct pretension along the entire circumference of the deflection wheel (6).
 5. The pretension is correct when the deep groove ball bearings (2) can be turned tightly by hand.
 6. Use a torque wrench (torque 28 Nm) to tighten the cylinder head screws (9) on clamp B on the mounting plate on both sides.
 7. Repeat step 4. If the pretension of the deep groove ball bearings (2) is not correct, start again at step 1.
 8. Secure the hexagon bolt (1) against turning and tighten the hexagon nut (10).
- ➡ The chain tension is correctly adjusted.

7.4 Referencing the chain position

The chain position can be set and referenced to two different positions:

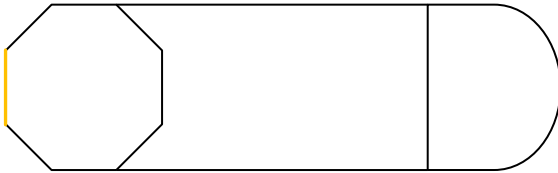
1. Standard position:

Two chain links form a point at the reversal point of the deflection unit.



2. Twisted position:

One chain link lies flat at the reversal point of the deflection unit.



Referencing is carried out by means of reference bores in the drive unit. These bores are located at the top and bottom of the drive side of the linear transfer system. The referencing can be performed at either of the two bores as desired.

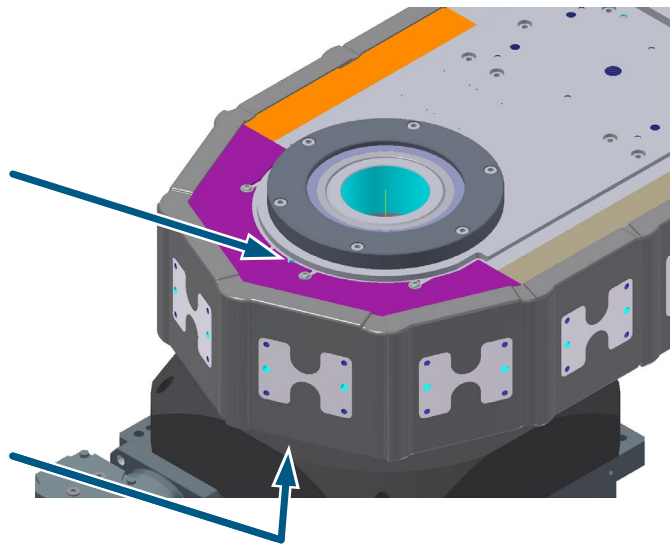


Fig. 19: Position of the reference bores

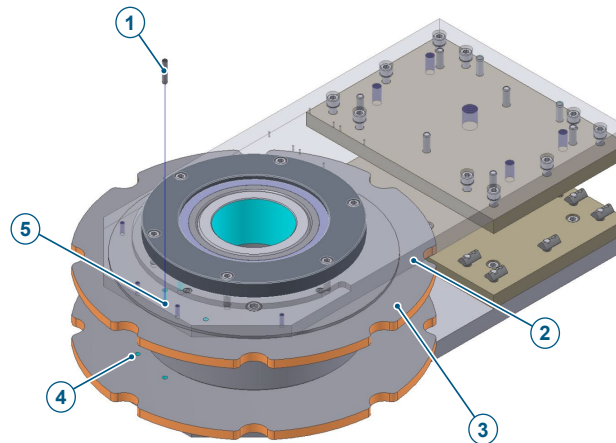


Fig. 20: Position referencing (figure without chain strand)

| | | | |
|---|---|---|----------------------------------|
| 1 | Cylindrical pin with female thread (ISO 8735 A) | 2 | Side plate |
| 3 | Stepping wheel | 4 | Reference bore on stepping wheel |
| 5 | Reference hole on side plate | | |

For referencing, proceed as follows:

1. Release the clamping element on the drive unit.
⇒ The chain can be moved by hand.
2. Slowly move the chain strand until the reference bore in the stepping wheel (4) and the reference bore in the drive unit (5) are superimposed.
3. Compare the position of the stepping wheel (3) with the target position (standard or twisted position). If the desired position has not yet been reached, slowly move the chain strand further.
4. Once the desired position has been reached, slowly drive in a cylindrical pin with female thread (1). The chain must not be blocked as you do this.
⇒ The position is fixed.
5. Tighten the clamping element on the drive unit. In addition, observe the manufacturer's specifications.
6. Remove the cylindrical pin with female thread (1) using a suitable tool (slide hammer / pin extractor).
➡ The chain is referenced. The linear transfer system is ready for operation.

7.5 Separating and joining the chain



Fig. 21: Complete linear guide

1. Release the chain tension and slacken the chain strand.

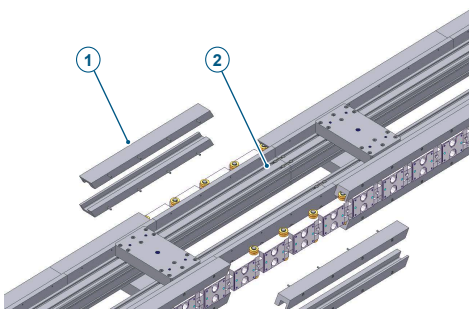
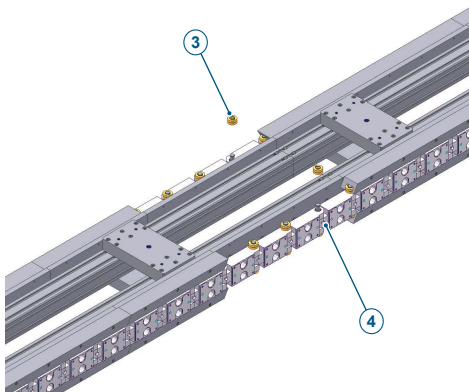


Fig. 22: Tracks removed

2. Remove the tracks (1) on the upper and lower side in the area of the separation point of the profile rail (2) on both sides.



3. Separate the chain strand in the area of the separation point. Remove the Seeger ring (3), the deep groove ball bearing (6) and the grub screw (4) on the axle (5).
4. Knock out the axle (5) (top and bottom). Catch any chain sections if necessary.

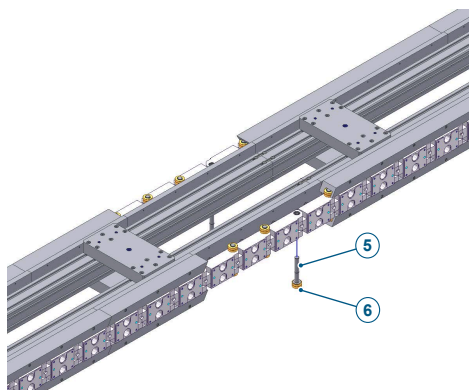


Fig. 23: Separating the chain strand

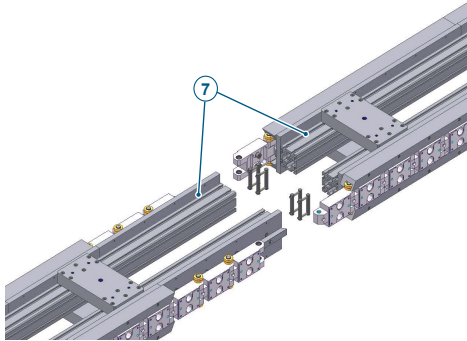


Fig. 24: Chain and linear transfer system LFA separated

5. Release the separation points (7) in the aluminium profile.
6. Pull apart the linear transfer system LFA.
7. Reassemble the components in reverse order.

7.6 Replacing the limit switch (optional)

NOTICE



Damage to components

A malfunction of the clutch may result in damage to the linear transfer system

- Always perform a function test after performing maintenance work in the vicinity of the clutch
- Only use original spare parts
- Observe the switching distance of the limit switch

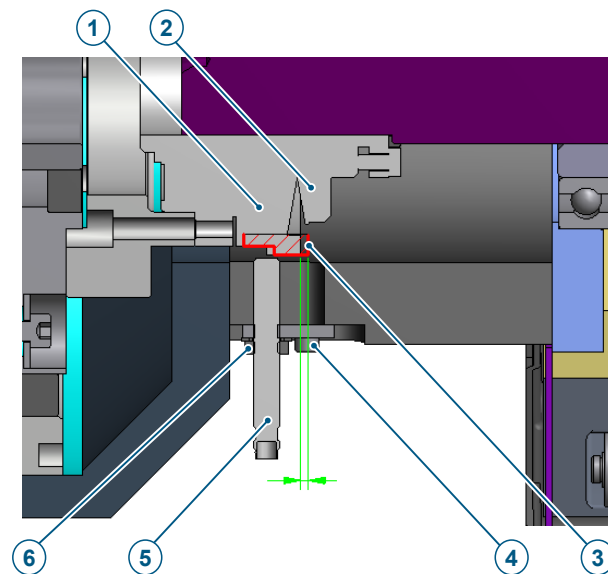


Fig. 25: Detailed view of the drive unit clutch

| | | | |
|---|--|---|---------------------|
| 1 | Pressure disc | 2 | Clutch |
| 3 | Pressure disc in disengaged position | 4 | Cylinder head screw |
| 5 | Limit switch (sensor PNP, NO, 10-30V DC) | 6 | Counter nut |

In the event of overload, the pressure disc (1) of the clutch (2) shifts in the axial direction to the right (see figure: Detailed view of the drive unit clutch). The clutch (2) disengages and disconnects the drive unit from the linear transfer system.

7.6.1 Setting the limit switch distance

NOTICE

Damage to components



The improper setting of the limit switch may result in damage to the linear transfer system

- When installing the limit switch, it is essential to observe the operating instructions
- Cable connections must be freely accessible
- Tighten counter nut of the limit switch with torque wrench
- Set the switching distance of the limit switch exactly

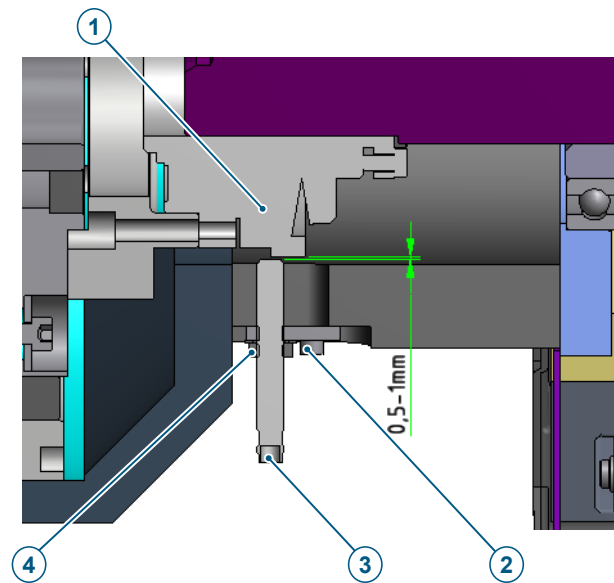


Fig. 26: Detailed view of limit switch distance

| | | | |
|---|---------------|---|---------------------|
| 1 | Pressure disc | 2 | Cylinder head screw |
| 3 | Limit switch | 4 | Counter nut |

The limit switch (3) is installed at a distance of 0.5 mm from the pressure disc (1) and positioned in such a way that the limit switch (3) is always switched in the operating state (clutch engaged) (see figure: "Detailed view of limit switch distance").

To replace the limit switch, proceed as follows:

- ✓ The system has been disconnected from all power supplies and secured against being switched on again.
 1. Remove the cable from the defective limit switch (3).
 2. Loosen the counter nut (4).
 3. Unscrew the limit switch (3).
 4. Replace the limit switch (3).
 5. Carefully screw in the limit switch (3) as far as it will go (clutch).
 6. Unscrew the limit switch (3) by half a turn.
 7. Adjust the distance of 0.5-1 mm with a feeler gauge.
 8. Use a torque wrench to tighten the lock nut with a maximum of 6. Nm.
 9. Engage the clutch.
- ➔ The LED on the limit switch (3) will then light up.

7.6.2 Clutch operating states

The following table shows the operating states of the clutch and the sensor signal depending on the load on the drive unit.

| Drive unit | Clutch | Signal sensor |
|------------------|------------|------------------|
| Normal operation | Engaged | High (logical 1) |
| Overload | Disengaged | Low (logical 0) |

7.6.3 Troubleshooting

The following table lists descriptions of faults, possible causes, and the measures required to rectify them:

| | Problem | Cause | Measure |
|---|--|---|--|
| 1 | No signal from the limit switch | Limit switch incorrectly positioned | Reposition limit switch |
| 2 | No signal from the limit switch | Excessive distance between limit switch and pressure disc | Adjust distance between limit switch and pressure disc to 0.5-1 mm with clutch engaged |
| 3 | No signal from the limit switch | Limit switch is not connected | Check whether the limit switch is connected |
| 4 | No signal from the limit switch | Limit switch is not connected | Check the limit switch cable for damage |
| 5 | No signal from the limit switch | No power supply to the limit switch | Check the power supply to the limit switch |
| 6 | No signal from the limit switch | Limit switch is defective | Connect another limit switch of the same type |
| 7 | The high signal of the limit switch continues to come with the clutch disengaged | Short circuit of the signal line of the limit switch to the line with potential | Check the limit switch cable for damage |
| 8 | The high signal of the limit switch continues to come with the clutch disengaged | Limit switch is defective | Connect another limit switch of the same type |

8 Troubleshooting

| Fault | Possible cause | Remedy |
|---|---|---|
| Motor fails to rotate | <ul style="list-style-type: none"> • No supply voltage • Motor contactor defective • Motor protection switch tripped • Brake not open • Brake improperly connected or worn | <ul style="list-style-type: none"> • Check voltage • Replace motor contactor • Allow motor to cool and engage switch • Open brake • Check sensor setting on position cam • Check sensor cable on sensor |
| Motor rotates, but chain link fails to move | <ul style="list-style-type: none"> • External gear unit defective • Slipping clutch disengages • Cam roller in drive unit broken due to excessive load • Clamping set not mounted correctly | <ul style="list-style-type: none"> • Replace gear unit • Remove external blockage / engage safety clutch • Contact MOTION INDEX DRIVES • Install clamping set according to manufacturer's operating instructions |
| Motor turns with loud humming noises | <ul style="list-style-type: none"> • Motor runs on 2 phases only | <ul style="list-style-type: none"> • Check fuses or motor contactor • Measure current in all 3 phases (voltage measurement is not sufficient) |
| Sensor transmits no signal | <ul style="list-style-type: none"> • Sensor not actuated / not fully actuated • Cable defective • Sensor defective • No supply voltage | <ul style="list-style-type: none"> • Remove blockage • Check cable and replace if necessary • Replace sensor • Check voltage |

9 Disposal

Required personal protective equipment



DANGER

Electric shock

Touching live parts poses an immediate danger to life

- Work on electrical systems may only be carried out by qualified electricians
- Before starting work, disconnect the system, secure it against being switched on again and make sure that no voltage is present



NOTICE

Environmental damage

Improper disposal may result in environmental damage

- Dispose of components and operating materials in accordance with local regulations
- Observe the safety data sheets of the operating materials

Materials used

The components are mainly made of the following materials:

- Copper (complete drive units, electrical cables)
- Steel and grey cast iron (housings, attachments, shafts, bearings)
- Plastic (toothed belts, insulation, bearings)

Preparation for disposal

1. Disconnect the system from all power supplies and secure it against being switched on again.
2. Wait 15 minutes until all live components are completely discharged.
3. Disassemble and dispose of assemblies and components in accordance with local environmental regulations.

10 Spare and wear parts



NOTICE

The use of unsuitable spare parts may result in material damage

Spare parts must comply with the technical requirements specified by the manufacturer

- Only use original spare parts
 - Check spare parts for faults or defects prior to installation
-

Spare and wear parts are always order-specific. A corresponding spare and wear parts list is available from MOTION INDEX DRIVES on request. When ordering spare parts, always specify the serial number. The serial number is located on the nameplate.

11 Annexes

11.1 Declaration of Incorporation

Translation of Declaration of Incorporation in accordance with the EC Machinery Directive 2006/42/EC, Annex II (1) (B) for partly completed machinery

Manufacturer:
Motion Index Drives
1204 East Maple
Troy MI 48081

Description and identification of the partly completed machinery:

Your Order-No.: -
Our order confirmation: -
Product: Linear transfer system
Type: LFA
Serial number: -
Commercial designation: Linear transfer system LFA

The manufacturer declares that the following basic requirements of the Machinery Directive 2006/42/EG applied and complied with:

1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.5.3, 1.5.4, 1.6.1, 1.6.4, 1.7.1, 1.7.4

The reference of the harmonised standard applied to Article 7 (2):
EN ISO 12100.2010 Safety of Machinery – general principles for design

Furthermore, we declare that the relevant technical documentation for this partly completed machinery is compiled in accordance with part B of Annex VII. The manufacturer undertakes to send the relevant documentation for the partly completed machinery electronically to national authorities in case of a duly reasoned request.

This partly-completed machine may be put into operation only if it has been stated, that the machine, into which the uncompleted part has to be incorporated, does comply with the requirement of the machine directive.