



ROBOTUNITS®

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PROJECT:



LIFT STATION

Operating Instructions

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1. GENERAL INFORMATION

1.1 SYSTEM MANUFACTURER

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1.2 VERSION

Version	Type	Date
01	New document	4/29/2022
02	Belt replacement adjustment	5/13/2024

2. SAFETY



2.1 INTENDED USE

The lift station complements the Robotunits roller conveyor system and enables the vertical transport of conveyed material. For technical data, see chapter 3.

Since the lift station is supplied with a control system, it is a "complete machine" as described in the Machinery Directive 2006/42/EC. Declaration of conformity: see appendix.

The lift station is designed and built for:

- vertical transport of unit loads or liquids in closed containers with zero pressure accumulation.
- being used in industrial and commercial applications.

 CAUTION	
	<p>Danger due to operation by untrained personnel</p> <p>The lift station may only be operated by trained personnel</p>

2.2 REASONABLY FORESEEABLE MISUSE





The following is not permitted:

- the operation of the machine without safety equipment
- the manipulation, bypassing or disabling of existing safety equipment
- using the machine in or under water
- the transportation of animals or people
- the transportation of hot substances and objects (> 40°C)
- the transportation of and submersion in acids, corrosive / abrasive materials or substances
- transportation at excessive speed
- damages due to improper installation
- the use in potentially explosive atmospheres
- the use in corrosive atmospheres

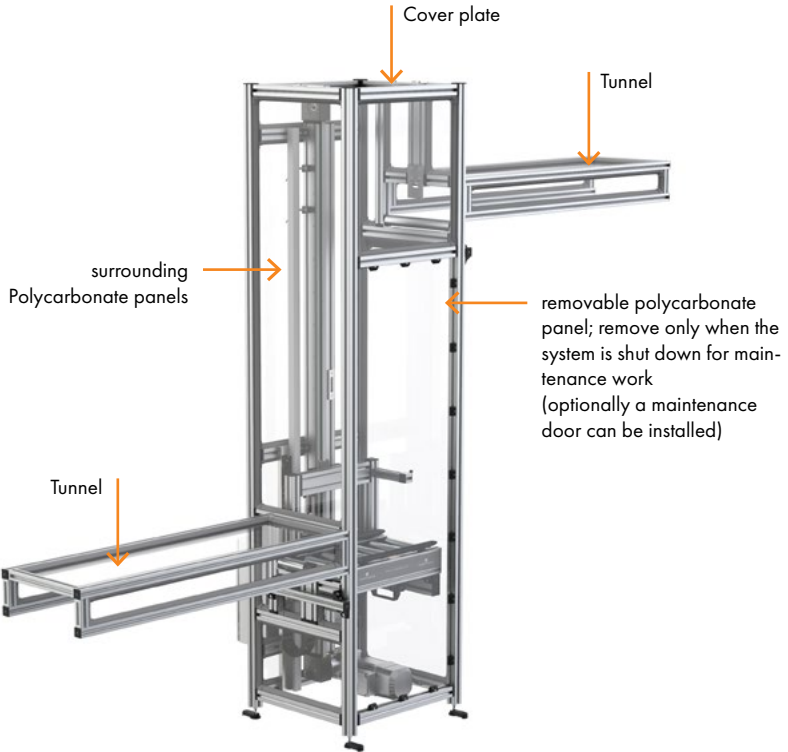
2.3 SAFETY INSTRUCTIONS FOR NORMAL OPERATION

- wear tight-fitting work clothes
- for long hair wear a hair net
- wear safety shoes with protective cap
- observe national laws and regulations on safety and health protection
- check the function and proper condition of the lift station
- make sure to read and understand the instructions of the lift station

2.4 MECHANICAL SAFETY INFORMATION



 DANGER	
  	Hazard due to misconduct / improper use It is not permitted to: <ul style="list-style-type: none">➤ Stand or walk on the lift station, the tunnel or the frame➤ Reach into the tunnel➤ Stand under the conveyed material

The lift station may only be operated in its original condition (with all safety equipment). All supplied safety components must be installed and must fulfill the safety function flawlessly.



integrator or operator must ensure that further suitable protection and safety equipment are implemented where required.

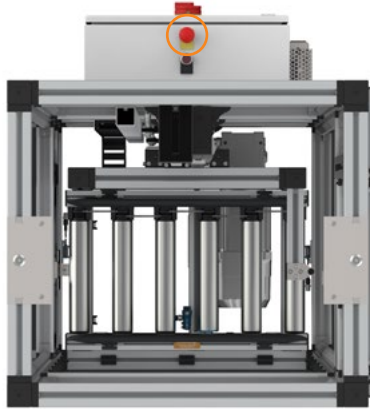
2.5 ELECTRICAL SAFETY INFORMATION

 WARNING	
	<p>Danger due to inadequate power supply unit</p> <p>Only connect the lift station to a sufficiently rated power supply unit</p>

- Installation must be carried out by a qualified and authorized electrical specialist
- Observe technical data in chapter 3

2.6 EMERGENCY STOP

The EMERGENCY STOP button on the lift station cuts the power to the motor and engages the standstill brake on the motor.



2.7 EMERGENCY POWER OFF

An EMERGENCY POWER OFF to disconnect the motors from the power supply is not provided and must subsequently be installed by the operator if required (see wiring diagram X5:1 and X5:2).

3. TECHNICAL DATA

3.1 MECHANICAL

- > Stroke: mm
- > Infeed height: mm
- > Weight of conveyed material: kg (max. 50kg)
- > Weight of lift station: max. 500 kg (depending on version)
- > Speed: max. 1 m/s
- > Acceleration / Deceleration: 0.7m/s^2
- > Positioning accuracy: $\pm 1\text{mm}$
- > Torque: max. 60Nm
- > Airborne noise emission: 75 dBA

3.2 CONVEYED MATERIAL

- > Dimensions: mm
- > Material:

3.3 LAYOUT

Layout see appendix!

3.4 ELECTRICAL

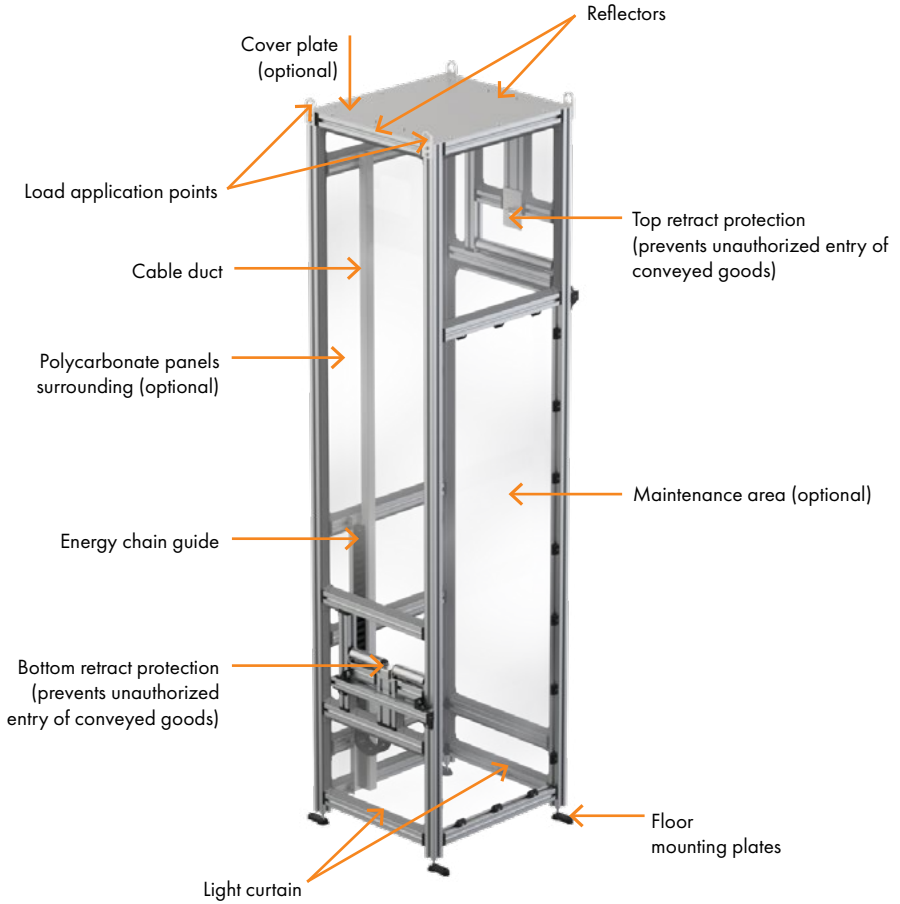
- > Voltage: 400 VAC
- > Connection: CEE plug (16A)
- > Connected load: 1,1 kW

3.5 AMBIENT CONDITIONS

- > Ambient temperature: $+ 2^{\circ}\text{C}$ to $+ 40^{\circ}\text{C}$
(avoid thermal shocks)
- > Humidity: $< 90\%$
- > Vibrations: $< 0.5\text{g}$

4. MECHANICAL DESIGN

4.1 BASE FRAME

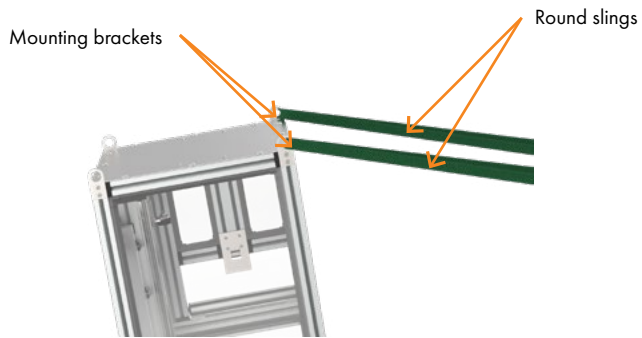


INFORMATION

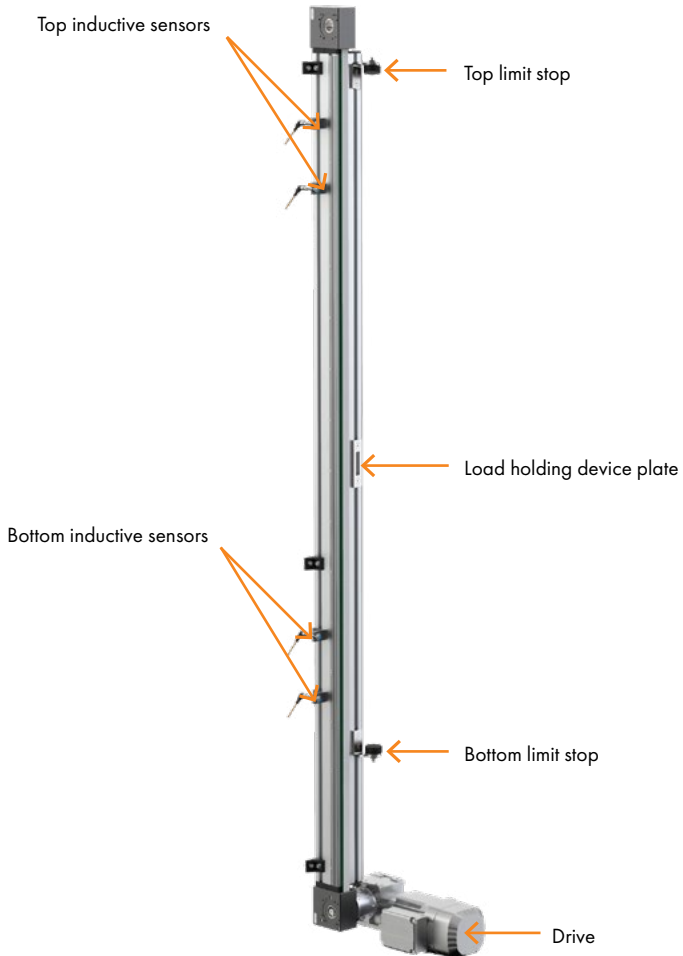


Hazard due to misconduct / improper use

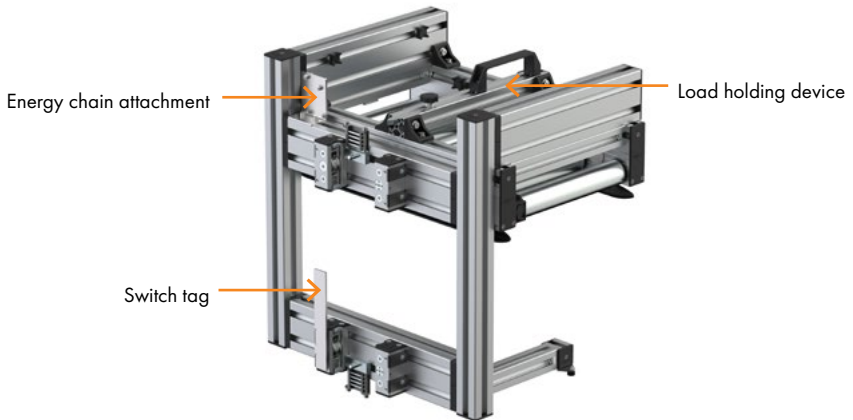
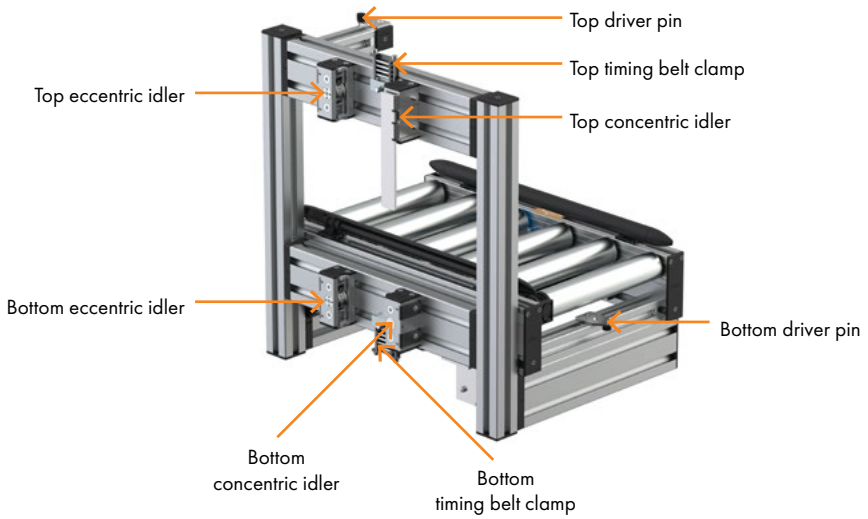
Use mounting brackets as assembly aids



4.2 LINEAR UNIT



4.3 CARRIAGE



5. FUNCTIONS

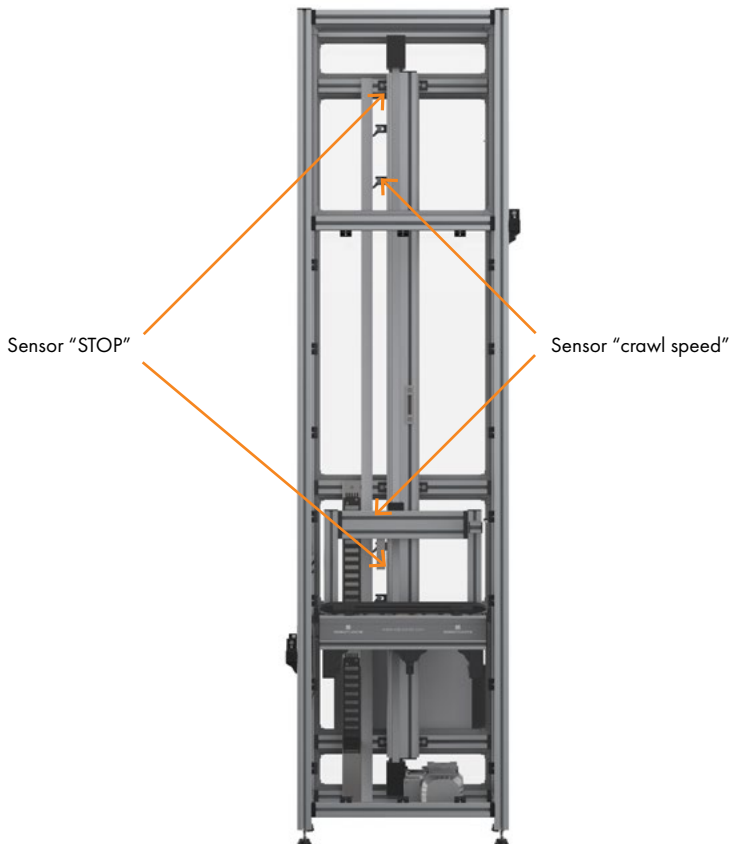
5.1 AUTOMATIC MODE

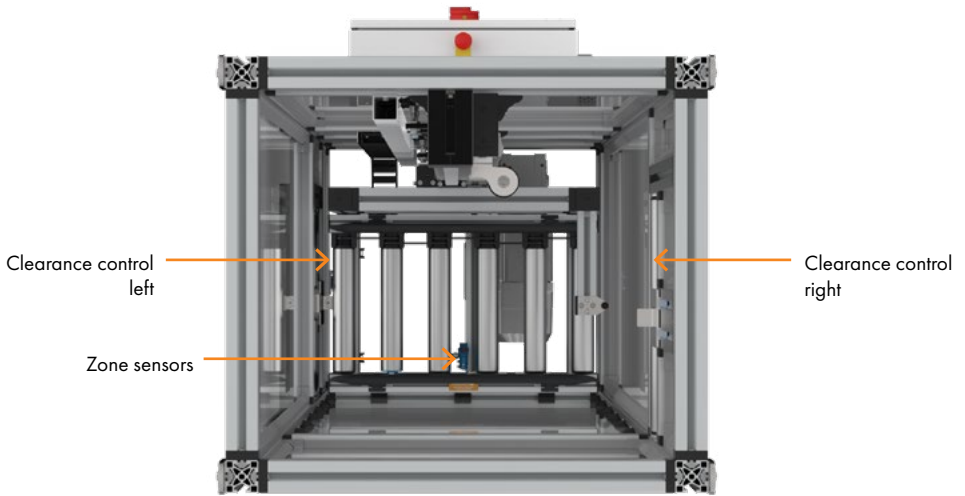
The conveyed material can only enter the lift station if the zone sensor and both clearance controls are unoccupied. After the conveyed material is positioned within the lift station (the zone sensor is occupied and both clearance controls are clear), the lift station will move in the direction of the outfeed.

200mm before the exit, the lift station is slowed to a “crawl speed” by a sensor. It then stops exactly at the outfeed position (stop sensor).

If the outfeed zone is unoccupied, the conveyed material is transported out of the lift station.

The lift station then returns to the infeed position.



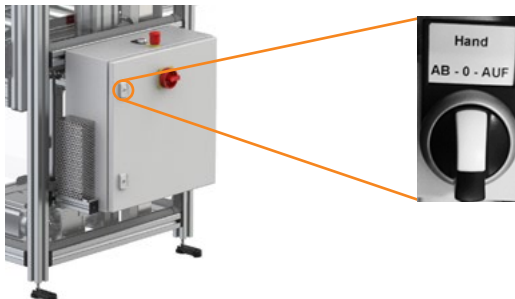


5.2 MANUAL MODE

The carriage can be moved in manual mode. The rotary switch for activating the manual mode is located in the control cabinet of the lift station.




In manual mode, the carriage is moved manually to the maintenance position.

Pressing and holding down the rotary switch causes the lift station to move at a slow speed. Briefly pressing and releasing the rotary switch will cause the lift station to move at a fast speed to the selected end position.






6. TRANSPORTATION

6.1 STORAGE/TRANSPORTATION CONDITIONS

 DANGER	
 	<p>Hazard due to improper storage</p> <ul style="list-style-type: none">➤ During transport and storage, secure the machine to prevent it from tipping over➤ Do not store outdoors

6.2 TRANSPORTATION EQUIPMENT REQUIREMENTS





 DANGER	
 	<p>Hazard due to lifted load</p> <ul style="list-style-type: none">➤ Use a suitable means of transport➤ Consider the center of gravity when lifting the machine➤ Standing under the load is prohibited

7. COMMISSIONING

7.1 PERSONNEL REQUIREMENTS

All work on the machine must be carried out by qualified and authorized specialists.

7.2 CONNECTING THE MACHINE

 DANGER	
  	<p>Hazard due to misconduct / improper use</p> <ul style="list-style-type: none">> Anchor the machine to the floor by means of floor mounting plates (see chapter 4.1) Recommendation: Use Robotunits anchor bolts BAP2900. If necessary, additionally secure against moment load at the top.> Measures regarding electromagnetic compatibility (EMC) must be observed> Ensure continuous potential equalization

- > Connection/wiring must be carried out by trained electricians
- > Observe wiring diagram (see appendix)
- > Connect frame with protective grounding
- > Connect the 0V of the power supply unit with protective grounding
- > If required, install a mains disconnection device for switching off in an emergency.

7.3 COMMISSIONING

WARNING



Hazard due to misconduct / improper use

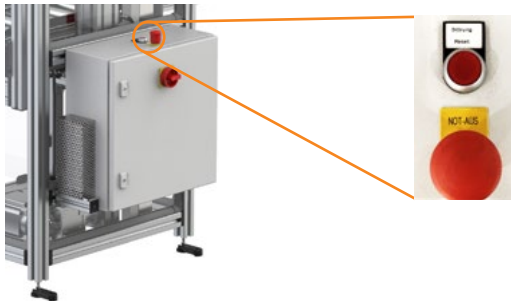
Before initial commissioning, check the following:

1. The proper installation of all safety equipment and covers. In case of an increased risk due to conveyed material falling down, additional safety equipment must be installed.
2. The proper connection of the conveyor system to and from the lift station.
3. The speed and running direction after the first operation of the powered roller conveyor.

7.4 MOVE THE LIFT STATION TO THE START POSITION

The start position is the position where the conveyed material enters the lift station.

By pressing the acknowledge button for two seconds, the lift station moves to the start position.

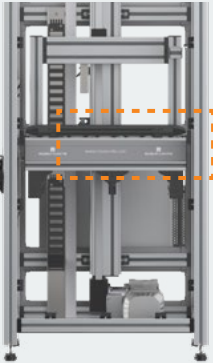



8. OPERATION

- Main switch ON
- The system switches on automatically and is then ready for operation. If necessary, move the lift station to the start position (see chapter 7.4)
- To shut down, turn the main switch to OFF.

In an emergency, press the emergency stop button!


9. ERROR MATRIX

Error/cause	Correction
<p>The conveyed material travels too far in the lift station and thus triggers the clearance control. This can occur upon entry and during the lifting movement.</p> 	<p>The following must be performed by a qualified and authorized specialist.</p> <ol style="list-style-type: none"> 1. Main switch OFF  <ol style="list-style-type: none"> 2. Open the safety guard 3. Push all conveyed material onto the roller conveyor 4. Close the safety guard <p>If the carriage is not at the start position, use the acknowledgement button to move the carriage to the start position (see chapter 7.4)</p>

No lifting movement.

After switching on the system, the carriage is not at the start position.

Move the carriage to the start position using the acknowledgement button (see chapter 7.4)

<p>No lifting movement.</p> <p>The carriage is at the start position and the conveyed material is properly positioned on the powered roller conveyor.</p>	<p>Visually check the condition of the sensors. The following LEDs must be permanently lit:</p> 
	<p>Check contacts</p>
	<p>Replace the sensor</p>

10. MAINTENANCE, SERVICING AND CLEANING

Proper maintenance of the machine is essential for reliable operation and a long service life.

Work to be performed by the operating personnel:




- > Machine shutdown
- > Clean with dry or slightly damp, soft cloths (Polycarbonate panels are susceptible to scratches)
- > Use a vacuum cleaner to remove larger quantities of contamination.
- > Clean sensors, if necessary
- > Check timing belt for correct tension using a frequency meter (see chapter 11.2)
- > Visual inspection for damage; if necessary, request repair from the plant maintenance department

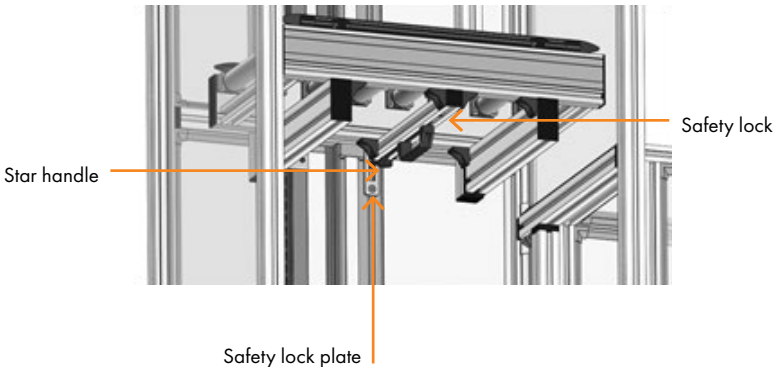
11. MAINTENANCE, REPAIR AND TROUBLESHOOTING

The spare parts list can be found in the appendix.

Work to be carried out by trained specialists from the plant maintenance department:

11.1 SECURING THE CARRIAGE

 DANGER	
 	<p>Hazard due to lifted load</p> <p>Secure the carriage with the load holding device, procedure:</p> <ul style="list-style-type: none">> Switch to manual mode and move the lift station to the maintenance position (see chapter 5.2)> Loosen the star handle> Push the load holding device forward as far as it will go> Tighten the star handle



If moving the carriage to the maintenance position is not possible for any reason, e.g. failure of the control system, the carriage must be secured in an alternative way (e.g. suspended or placed underneath).

11.2 LINEAR MOTION UNIT

Maintenance schedule

Maintenance point / Activity	Maintenance interval	Info
Belt tension	after 1,000 operating cycles	once
Slider play	after 1,000 operating cycles	once
Clean linear guide	every 600 h	
Lubricate wiper unit	every 600 h	Slideway lubricant according to DIN CGLP ISO VG68 (e.g. Mobil Vactra No. 2)
Check belt condition	every 600 h	visually
Check machine for loose screws	every 2,000 h	

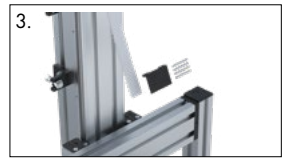
Belt replacement



1. Secure the carriage



2. Loosen the belt tensioner unit at the top and bottom



3. Remove the top and bottom belt tensioner



4. Loosen the fastening screws of the bottom pulley



5. Pull out the old belt



6. Insert the new belt at the top



7. Insert the new belt at the bottom



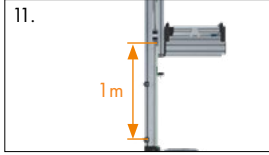
8. Tighten the fastening screws of the lower pulley



9. Attach and fasten the belt tensioner at the top and bottom



10.
Tighten the old screws of the belt tensioning unit, all with the same torque



11.
Tension the belt with 36 Hz to 1 m (incl. load)



12.
Unlock the carriage



11.3 POWERED ROLLER CONVEYOR

Maintenance schedule

Maintenance Point / Activity	Maintenance interval	Info
Electrical installations	2 times per year	Visual inspection for damages and check for firm attachment
Poly-V drive belts	Every 3 months	visual inspection for damages (such as cracks or porosity)
Poly-V protection guard	Every 3 months	check for firm attachment
Screw connections after initial commissioning	1 month after initial commissioning	check for tight fit
Screw connections	Once a year	check for tight fit
Sensor	as required	remove any dirt that may be present
Checking of the electrical installations by a qualified electrician	Once a year	

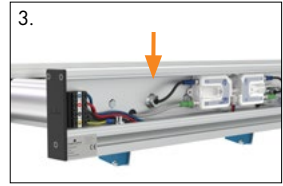
Replacing the Poly-V belt



1. Remove protective elements



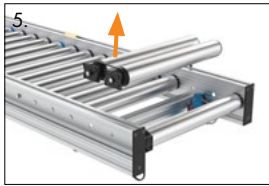
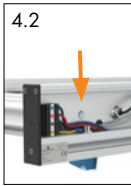
2. Remove the cover profiles from both sides



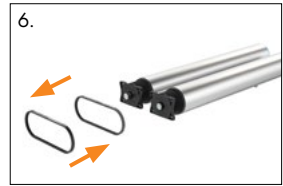
3. Loosen the hexagonal nut and remove the torque support if necessary (only for motor rollers)



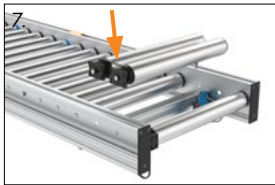
4.1 Press the spring axis to the stop in the direction of the rollers



5. Lift the rollers out of the mount



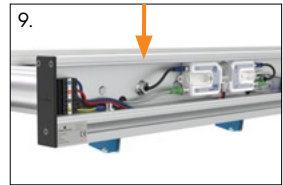
6. Replace the Poly-V belt



7. Insert the rollers into the mount



8.1 The spring axis snaps into the mount



9. Attach the hexagonal nut (and torque support if needed) to the cable outlet (50Nm)



10. Mount the cover profiles



11. Snap in protective elements



12. DISPOSAL

The product contains valuable materials (metals, plastics, electrical assemblies) which can be recycled separately.

At the end of its service life, the machine must be taken to a specialist disposal center.

12.1 WIRING/CONNECTION DIAGRAM

See appendix.



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