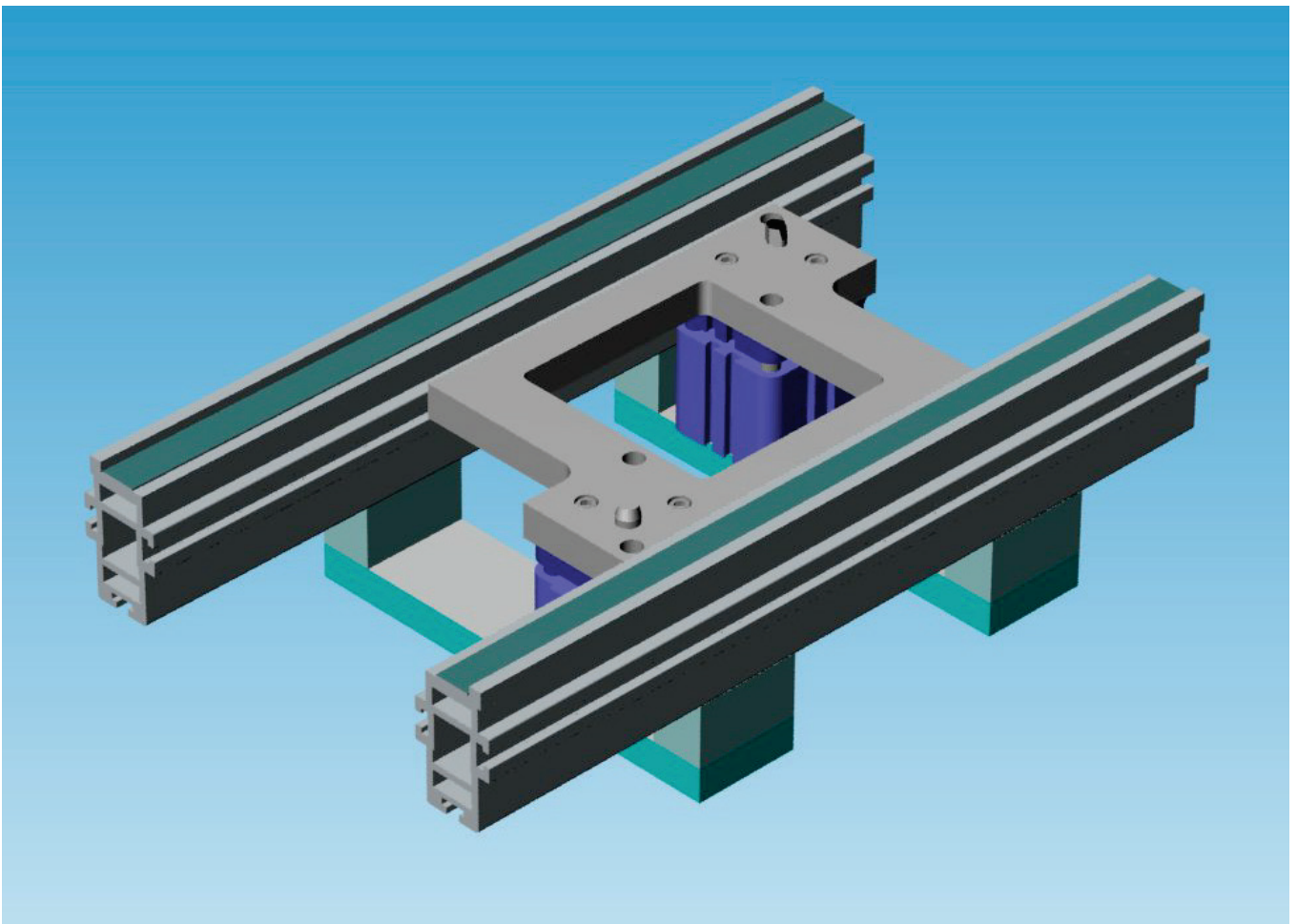


OPEN LIFTING/CENTERING DEVICE (HZEO)

STEIN Workpiece Transport System

Operating instructions

Attention all installation, operating and maintenance personnel -
always keep these instructions by the lifting/centering device.



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The right to make changes in design and construction is reserved.

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1 Abbreviations and Symbols used in these operating instructions

- Action symbol
- 1 Symbol for actions which must be carried out in a specified sequence.
- ⇒ Consequence or result of an action

- Count

HZEO Open lifting/centering device

WT Pallet

BA Operating instructions

Fig. Figure



This sign indicates information that will allow the lifting/centering device to be used more effectively and more economically.

The symbols used in the operating instructions for safety and hazard warnings are described in detail in chapter 3.

1.1 Explanation of safety and warning notices

The following safety signs explain all the situations or actions where danger to life and limb for machine operators or their colleagues exists.

Strictly comply with these instructions and act with particular care in these cases. Pass all safety notices on to all other users.



DANGER!

The symbol with the added designation DANGER describes a directly impending hazards!

The hazard results in serious injury to people or even fatalities.



WARNING!

The symbol with the added designation WARNING describes a potentially impending hazards!

The hazard may result in serious injury to people or even fatalities.



CAUTION!

The symbol with the added designation CAUTION describes a potentially hazardous situation!

The hazard can result in injury to people.

The safety signs appear frequently in the text with a picture to explain what the source of the hazard is.



CRUSHING HAZARD!

This symbol gives warning of a location where there is a risk of being crushed.



HIGH ELECTRICAL VOLTAGE!

This symbol gives warning of possible electric shock.

It appears for all working and operating procedures that must be followed precisely, in order to avoid injury to personnel or damage to the system through high electrical voltage.

Other warning signs:



ATTENTION!

This symbol indicates warnings which, if ignored, will cause a hazard to the machine.



Protective clothing must be worn!

Wear your personal safety clothing:
Safety footwear, hard hat, goggles and safety gloves.



Environmental protection!

This sign indicates warnings that will help to avoid harming the environment.

2 Introduction

The safety of all persons who come into contact with the HZEO depends fundamentally on knowing how the device functions. Therefore:

Read these operating instructions before using the device for the first time.

These operating instructions contain important information which will ensure the correct, economical and safe operation of your HZEO.

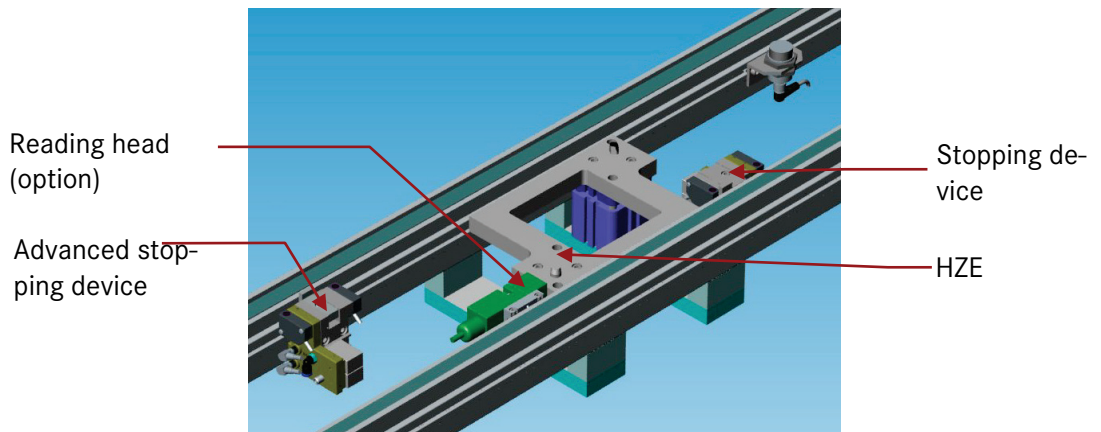
2.1 Short description

Open lifting/centering devices are installed in the WTS 300 Workpiece Transport System.

In conjunction with the Workpiece Transport System, the HZEO provides:

- exact positioning of pallets
(and therefore of the workpieces located on them),
- access to pallets from above and below,
- pallet elevation and support while power transfer operations are carried out on workpieces.

Fig. 2-1:
Lifting/centering de-
vice
- components



Other advantages of these devices are that

- the belt element is not under tension while the workpiece is being processed and
- belt wear is reduced.

2.2 Initial inspection

The open lifting/centering device is bubble-wrapped and securely transported in a solid box.

- Unpack all the components supplied.



Environmental protection.

Dispose of all packaging material in an environmentally responsible way.

Then carry out an initial inspection.

Check that:

- all components detailed on the delivery note have been supplied
- components have not been damaged or lost in transit

2.3 Complaints

In order for claims for damage caused in transit to be accepted, follow this procedure:

- Inform the freight company.
- Draw up a damage report giving the following details
 - Name and address of recipient
 - Item or order number
 - A description of the damage
- Send components, if possible in their original packaging, with the damage report, back to the manufactures.

2.4 Warranty

For the lifting/centering devices and their spare parts we grant the legal guarantee period or rather the defined guarantee period in the contract, starting with the day of delivery.

During this warranty period we will replace any components defective in manufacture or materials free of charge.

STEIN Automation's general warranty conditions also apply.

3 Safety information

3.1 General safety information

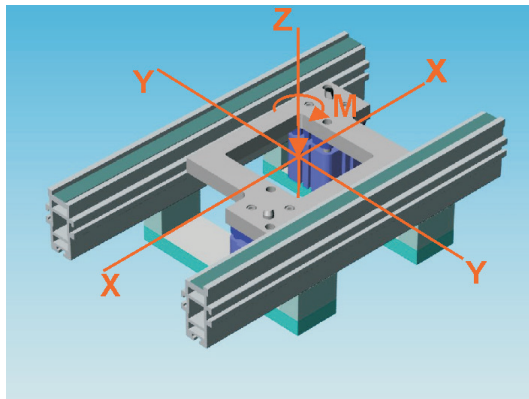
- Opening lifting/centering devices from STEIN Automation are high quality products, manufactured to recognized technical rules. The technical safety features of lifting/centering devices leave our factory in perfect condition.
- All versions of our open lifting/centering devices comply with the requirements of UVV, the German accident prevention regulations.
- To maintain this situation, installation staff, users and service technicians must observe the notices and warnings contained in these operating instructions.
- Open lifting/centering devices must only be installed and repaired by authorised personnel who have been trained by STEIN Automation.
- Only genuine components from STEIN Automation may be used when carrying out repairs on the open lifting/centering device.

3.2 Appropriate use and liability exclusions

Open lifting/centering devices may only be

- installed in fully enclosed workstations,
- used to hold and lift workpieces, and
- operated in conjunction with stopping devices.

Fig. 3-1:
Lifting/centering de-
vice
- loadings



Permitted pallet loadings are:

- in the X axis: 130 N
- in the Y axis: 130 N
- in the Z axis: 120N if loading is centered and under an operating pressure of 6 bar or 80N if loading is centered and under a STEIN operating pressure of 4 bar and
- $M=7$ Nm if loading is not centered

Unauthorised interventions, alterations or repairs carried out on the lifting/centering device invalidate the warranty.

STEIN Automation accepts no liability for any damage caused by unauthorised interventions, alterations or repairs.

3.3 Safety information for installation and repair work



DANGER!

From the Workpiece Transport System starting unexpectedly.



DANGER!

HIGH ELECTRICAL VOLTAGE

Electric shock hazard

- 1. Before carrying out any installation or repair work, disconnect the relevant Workpiece Transport System from its electrical power supply.
- 2. Disconnect the workpiece transport system from its compressed air supply
- 3. Put up warning signs to prevent the system being started up while installation and repair work is being done.
- 4. Remove all pallets from the affected belt element.
- 5. Carry out the work
 - in accordance with the descriptions in this documentation,
 - complying with relevant safety and accident prevention regulations and
 - in a technically correct manner and with the greatest possible accuracy.
- 6. After completing installation or repair work, carry out a test run of the entire system and check that all safety features are functioning correctly.



DANGER!

Never operate the Workpiece Transport System using

- **defective safety equipment and / or**
- **faulty components.**

4 Technical description

4.1 Contents

- The HZEO is either installed in the belt or it is delivered as a complete assembly without any form of cover.

CAUTION Crushing hazard



CAUTION!

The specific machinery manufacturer is required to operate the HZEO as part of a fully enclosed system.

Doors and openings in this fully enclosed system must be secured against being opened during operation using safety locks or switches.

The belts feeding and releasing materials must be fitted with safety tunnel covers of an adequate length (at least 850mm.)

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The following accessories are not part of the normal contents:

- Full enclosure (supplied and installed by the customer)
- Retainer (STEIN Automation option)
- Control unit (STEIN Automation option)
- Stopping device (STEIN Automation option)

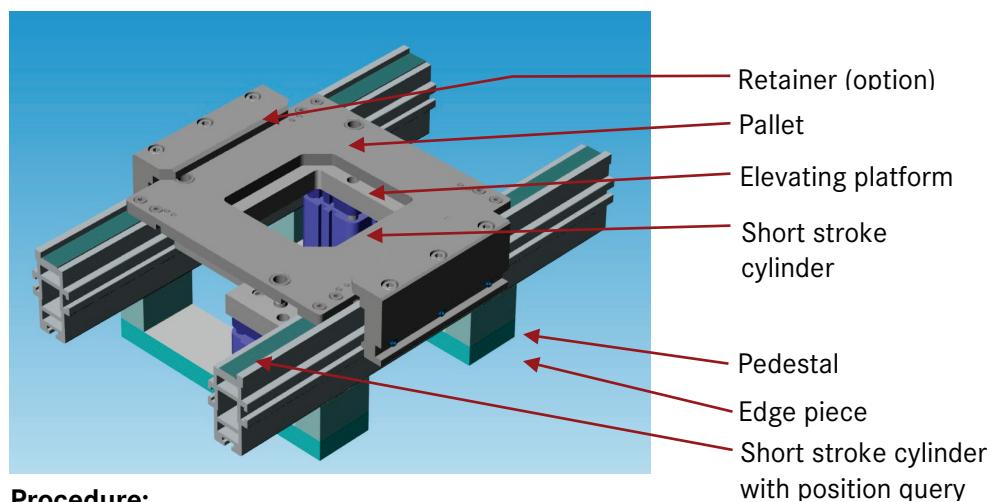
4.2 Installation area

Installing an HZEO will be required in automatic workplaces if

- pallets have to be very accurately positioned,
- the pallet needs to be accessed from above and below,
- pallets are placed under load along their Z axis during processing.

4.3 System components

Fig. 4-1:
Open lifting/centering
device
- overview



Procedure:

Pallets are transported by the two transport belts until they reach the workstation stopping device (STEIN Automation option). Movement of both short stroke cylinders is triggered by the position query and the pallet is elevated. After processing in this raised position, the elevating platform is lowered and the pallet is transferred onto the belt elements' transport belts.

4.3.1 Retainers (option)

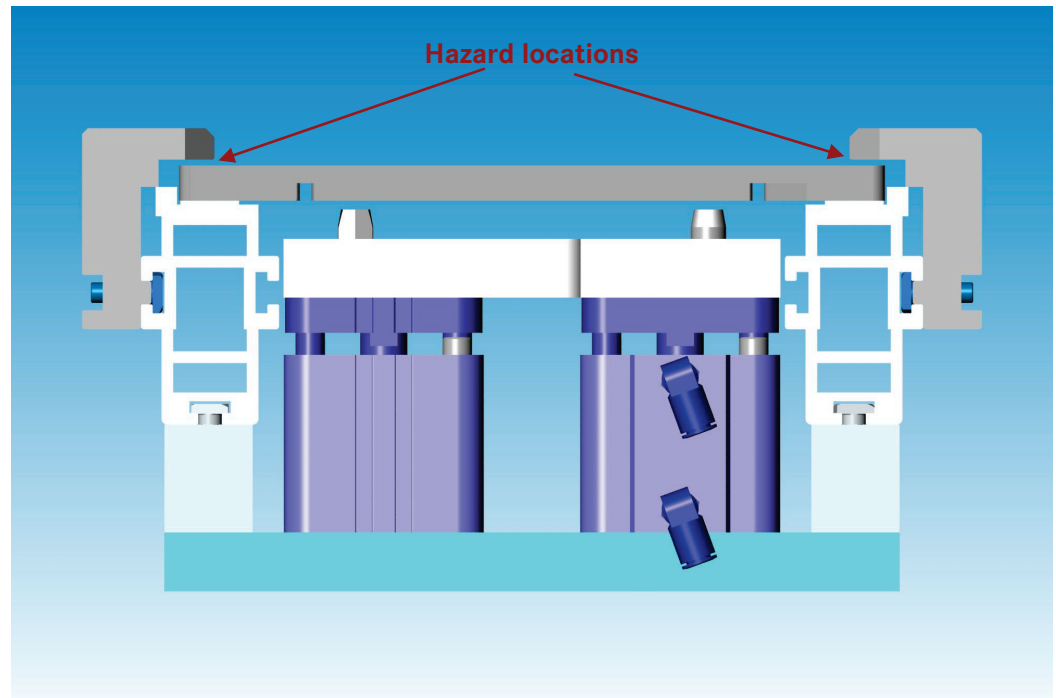
Function

Retainers limit the upward elevation movement of the pallet and ensure the Z axis reaches a pre-defined position.

Contents

Retainers, edge pieces, warning signs, description of hazards

Fig. 4-2:
Retainer hazard locations



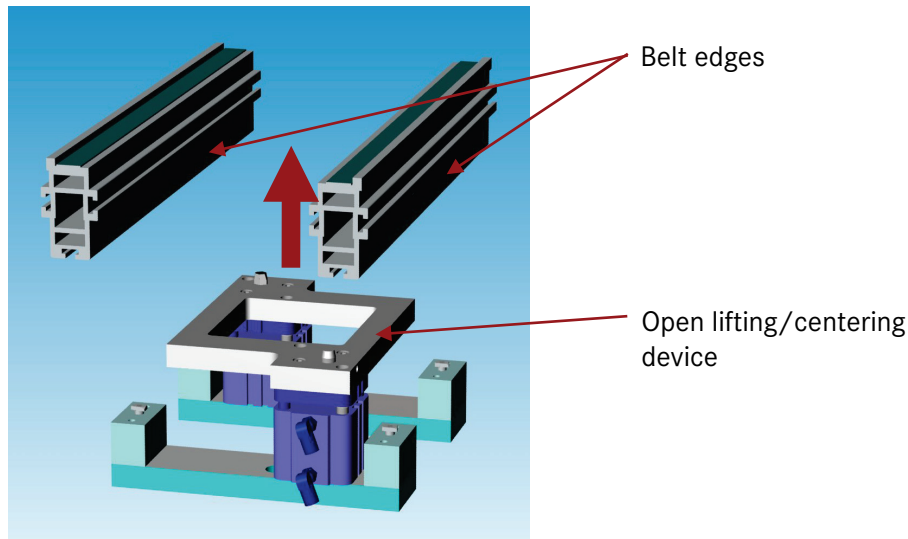
CAUTION!

Crushing hazard

HZEOs with retainers must also only be installed in fully enclosed workstations.

5 Installing the open lifting/centering device (HZEO)

Fig. 5-1:
Open lifting/centering
device
- installation location



The HZEO can be installed in lengthwise or transverse sections from below, between the edges of the two belts.



WARNING!

An HZEO cannot be installed in the vicinity of the band elements' drive fitting.

5.1 Procedure

The installation procedure can be divided into six phases:

- Preparation,
- Installing the HZEO between the edges of the two belts,
- Fitting the stopping devices
- Assembling the pneumatic components
- Connecting up the power and compressed air supply, and
- Fitting the safety equipment.



WARNING

On operating stations which generate shavings (for example drilling or thread-cutting machinery), covers should be installed to avoid shavings or cooling fluid coming into contact with the belt elements or the centering device.



Further information is available from STEIN Automation.

5.2 Preparation



DANGER

From the Workpiece Transport System starting unexpectedly.



DANGER

HIGH ELECTRICAL VOLTAGE

Electric shock hazard

- 1. Before carrying out any installation or repair work, disconnect the relevant Workpiece Transport System from its electrical power supply.
- 2. Disconnect the Workpiece Transport System from its compressed air supply!
- 3. Put up warning signs to prevent the system being started up while installation and repair work is being done.
- 4. Remove any pallets located on the affected belt elements.

5.3 Installing the HZEO between the edges of the two belts



Protective clothing must be worn

Wear your personal safety clothing: Safety footwear and safety gloves.



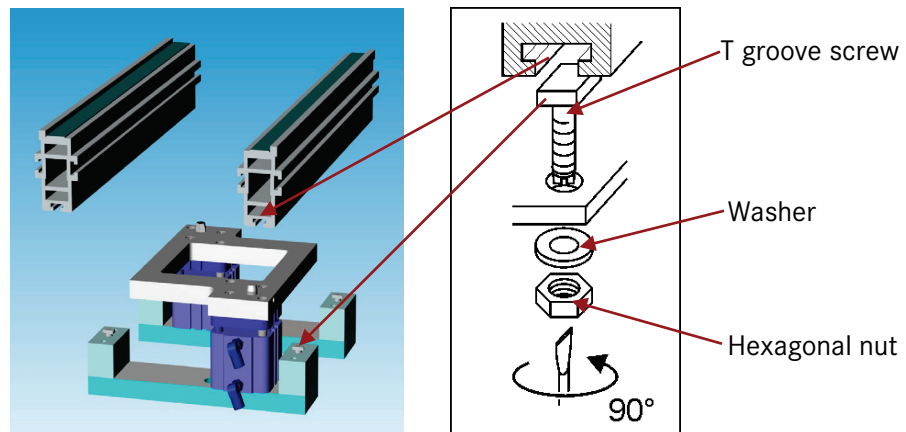
WARNING!

If larger than 320mm then two people will be required to install the HZEO.



Observe the installation dimensions in fig. 5-4.

Fig. 5-2:
Inserting the HZEO



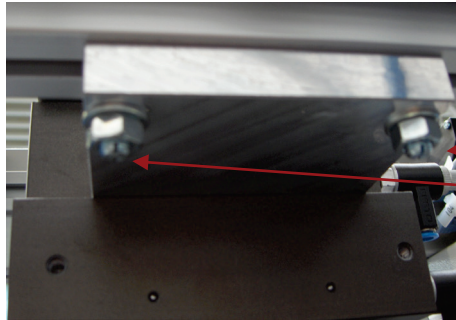
- 1. Push the HZEO from below between the edges of the two belts.
- 2. Rotate the four T groove screws through about 90°.



WARNING!

Make certain that the slot in the head of the screw is at right angles to the edge of the belt.

Fig. 5-3:
HZEO -
viewed from below

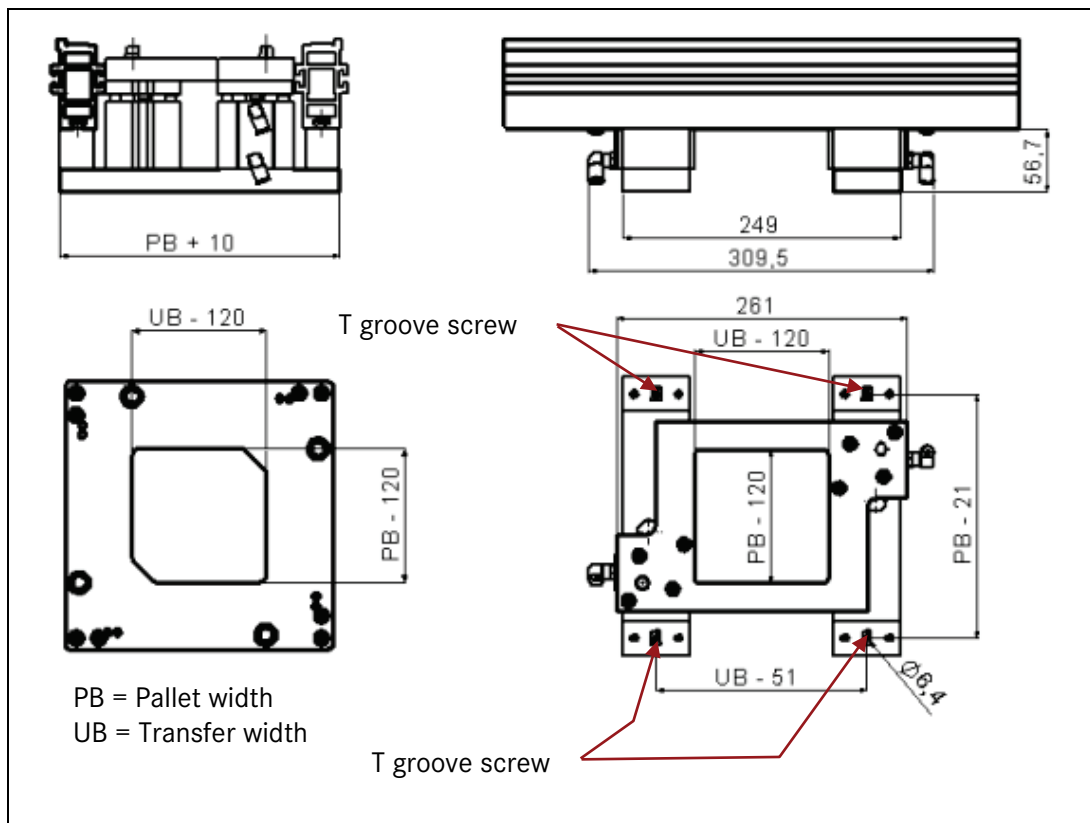


Screw-head slots
at right angles to
the edge of the
belt

⇒ The HZEO has been inserted.

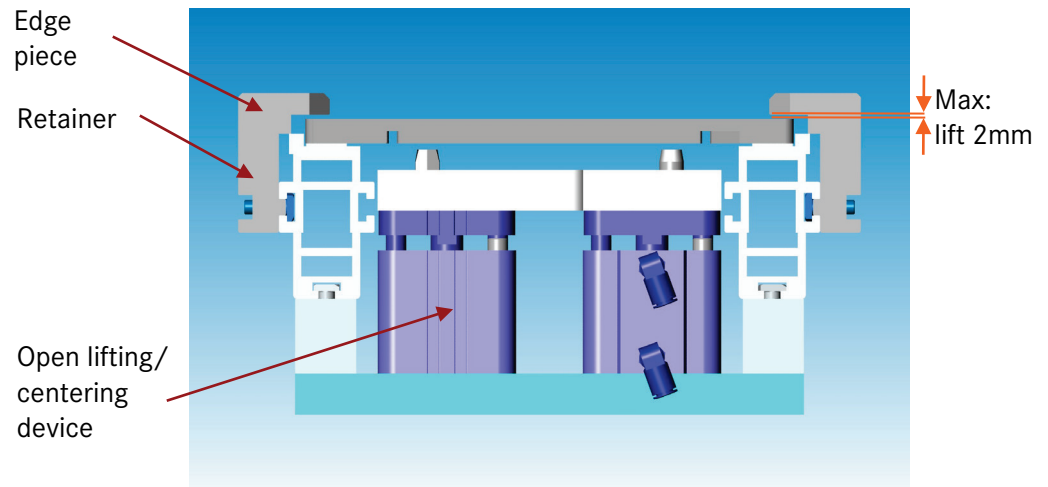
- 3. Straighten the HZEO.
- 4. Attach the nut and tighten it firmly.

Fig. 5-3:
Installation measure-
ments



5.4 Fitting a retainer (option)

Fig. 5-4:
Fitting a retainer



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Observe the installation dimensions in fig. 10-2.

With pallets larger than 320 mm, two retainers must be installed.

- Loosely screw both retainers and the edge piece with 3 T groove nuts each and 3 screws each to the T grooves of the belt edges.
- Position the retainers centrally in accordance with the stop position of the WT on the lifting/centering device and then tighten the screws on the T-grooves of the belts.

5.5 Fitting the stopping devices

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Further information can be found in the technical description of the “Stopping Device” (SE).

5.6 Compressed air and power connections

5.6.1 CONNECTING THE HZEO TO THE COMPRESSED AIR SUPPLY



WARNING!

Maximum operating pressure: 6 bar.
STEIN operating pressure: 4 bar.

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Festo GRLA-1/8-QS6 throttle check valves are used as connectors.

Type PUN-S hoses with an exterior diameter of 6mm and wall thickness of 1mm are used, manufactured by: Festo.

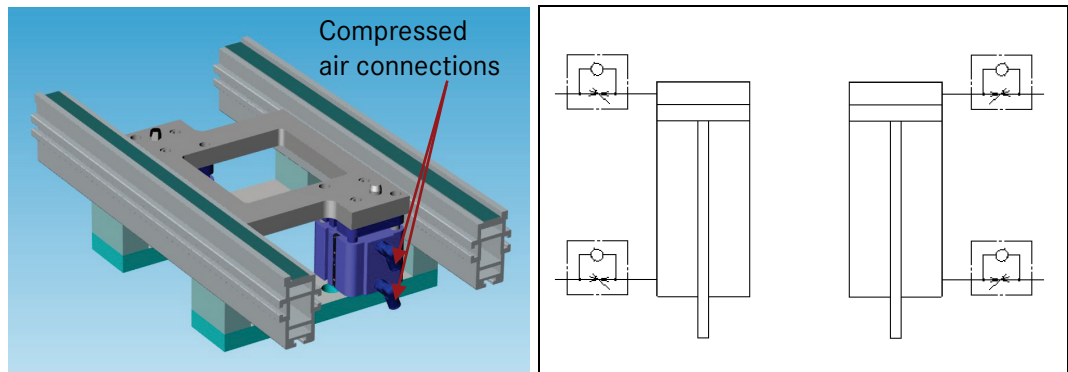


WARNING!

Connect the two short stroke cylinders using hoses of the same length.

Fig. 5-5:
Connecting the HZEO
to the compressed air
supply

Illustration of connec-
tions



Connect the HZEO to the compressed air supply using the two connections.

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Top connection: Cylinder goes down
Bottom connection: Cylinder goes up

5.6.2 CONNECTING INDUCTION PROXIMITY SWITCHES TO THE POWER SUPPLY



DANGER

HIGH ELECTRICAL VOLTAGE

Electric shock hazard

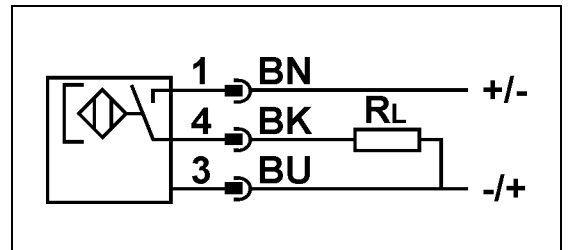
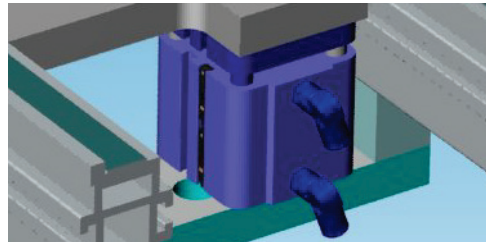


WARNING!

Only type SME-8-S-LED proximity switches manufactured by FESTO may be used.

Fig. 5-6:
Induction
proximity switch

Wiring diagrams



- Connect the induction proximity switches to the power supply as per the wiring diagram.

5.7 Installing safety equipment



WARNING!

CAUTION Crushing hazard

The specific machinery manufacturer is required to operate the HZEO as part of a fully enclosed system.

Doors and openings in this fully enclosed system must be secured against being opened during operation using safety locks or switches.

The belts feeding and releasing materials must be fitted with safety tunnel covers of an adequate length (at least 850mm.)

- Install the full safety enclosure onto the processing station with the HZEO.

6 Initial operation

Carry out the following checks before initial operation:

- Are all the electric and pneumatic leads and hoses undamaged?
- Are all the electric and pneumatic leads and hoses correctly connected?
- Have all the mechanical components been tightly fastened in place?
- Have all tools and other equipment been cleared from the transport area?
- Has all safety equipment been installed and is it working correctly?
- Are any hoses or cables in an area where they may get crushed?

Once you have carried out all these checks, you can continue with the initial operation.

- Switch on the Transport System and its associated processing stations and carry out a trial run.
- Check the functions of the individual elements and processing stations as well as the pre-programmed overall operation of the entire system.
- Check the safety equipment is functioning correctly.



DANGER

Only start the Transport System once you have carried out a successful trial run.

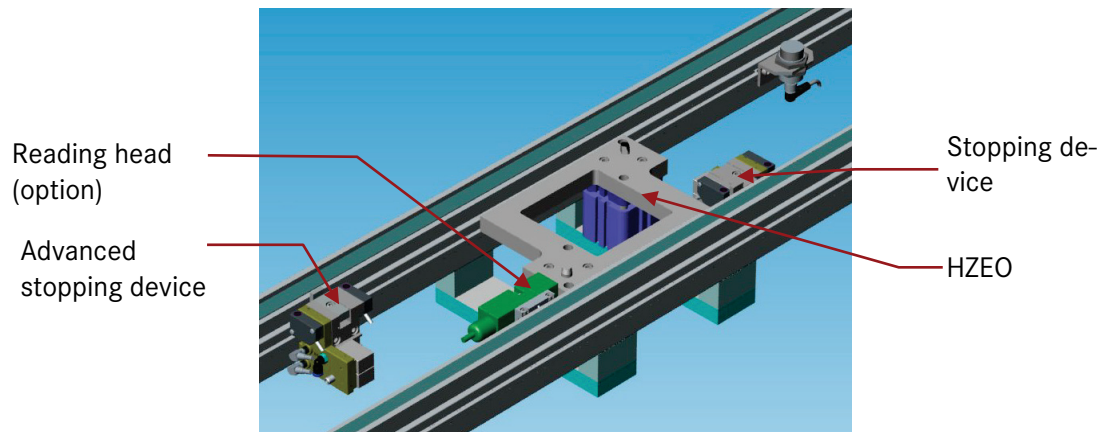
7 Operating the HZEO



DANGER

Only operate the HZEO in fully enclosed stations.

Fig. 7-1:
Lifting/centering de-
vice
- components



In normal operations the customer starts up the HZEO.

If the HZEO is to be controlled by the WTS control system:

- Reading head detects “WT present” – no defective part, processing can start.
If a defective component is detected, the WT moves on unprocessed.
- WT is halted at the processing station by the stopper.
- Further WTs are halted by the advanced stopper
 - ⇒ Extend HZEO and send a signal to the top-level system controller: “Processing on WT can proceed”
- Workpiece processing proceeds
- Signal to the WTS control system “Processing completed”
 - ⇒ HZEO moves down
- Stopper opens, WT moves on

8 Faults



DANGER

When faults, malfunctions or damage affecting safety occur, immediately push the EMERGENCY STOP button to switch the Transport System off.

Have the cause of the malfunction identified and the problem fixed by authorised personnel.

8.1 Troubleshooting problems

Problem	Cause	Solution
Stop handle not releasing	Static load too high.	Install intermediate stopper.
No power	Power supply cut.	Restore power supply.
Variable power supply	Uneven power supply voltage	Ensure power supply voltage is constant.
Compressed air supply fails	Faulty valve.	Replace valve.
	Compressed air supply cut.	Restore compressed air supply.
HZEO does not elevate	WTS transport system control failure.	Restore control system.
	Processing station control failure.	
	Induction proximity switch not connected to power supply.	Connect induction proximity switch to power supply.
	Induction proximity switch faulty.	Replace induction proximity switch.
	Bad contact between plug and socket.	Firmly insert plug into socket.
	HZEO wrongly installed.	Check and if necessary adjust HZEO position and screws.
HZEO rises too soon / too late	Position switch incorrectly set.	Re-set position switch.
HZEO does not position itself exactly right	Too much play. Guides worn.	Replace guides.
	Loose screw connections	Re-tighten screws.



DANGER

Only start the Transport System once you have carried out a successful trial run.

9 Cleaning, inspection, maintenance

9.1 Cleaning

Depending on the environmental conditions of the transport system, the belt element and the open lifting/centering device will get dirty.

Clean the whole transport system regularly. How frequently to do this depends on how dirty it gets.

STEIN Automation recommends cleaning the Transport System once a week.



Cleaning does not mean the transport system needs to be dismantled.



DANGER

From the Workpiece Transport System starting unexpectedly.



DANGER

HIGH ELECTRICAL VOLTAGE

Electric shock hazard

- 1. Before carrying out any installation or repair work, disconnect the relevant Workpiece Transport System from its electrical power supply.
- 2. Disconnect the workpiece transport system from its compressed air supply.
- 3. Put up warning signs to prevent the system being started up while installation and repair work is being done.
- 4. Remove any pallets located on the affected belt elements.



Protective clothing must be worn

When cleaning, wear goggles, safety gloves and a dust-mask.

Only use a vacuum cleaner to remove dust, shavings and other particles.

- 5. Remove dust, shavings and other particles with a vacuum cleaner.



WARNING

When cleaning, do not use any abrasive, corrosive or scouring cleaning fluids or cleaning materials.

Avoid fluid getting into the components of the system or of the processing stations.



STEIN Automation recommends Industrie Clean manufactured by Würth, product number: 893140 or Arecal Clean manufactured by RECA Norm, article no.: 0895014500.

- 6. Clean the top and bottom of the belts, the rails, drives and steering rollers of all dirt and lubricants.

- ❑ 7. Clean the surfaces with a soft, lint free cloth, lightly dampened with cleaning fluid.



Environmental protection

Dispose of waste material and used cleaning cloths in an environmentally responsible way.

9.2 Inspection

Interval	Component	Inspection criterion	Solution
Annually	Screws securing HZEO to belt element	Tightly fastened	Tighten loose screws - see chapter 5
	Induction proximity switch	Tightly fastened	Tightly fasten induction proximity switches
	Compressed air hoses	Stable connections	Re-tighten loose connections Tightly fit push connectors - see chapter 5
	Screw fastening retainer (retainer and edge piece)	Tightly fastened Straightness	Tighten loose screws - see chapter 5
	Entire HZEO	Play, functional accuracy	Re-tighten loose connections Accurately re-position induction proximity switches
Signs of wear		Replace worn elevating platform	

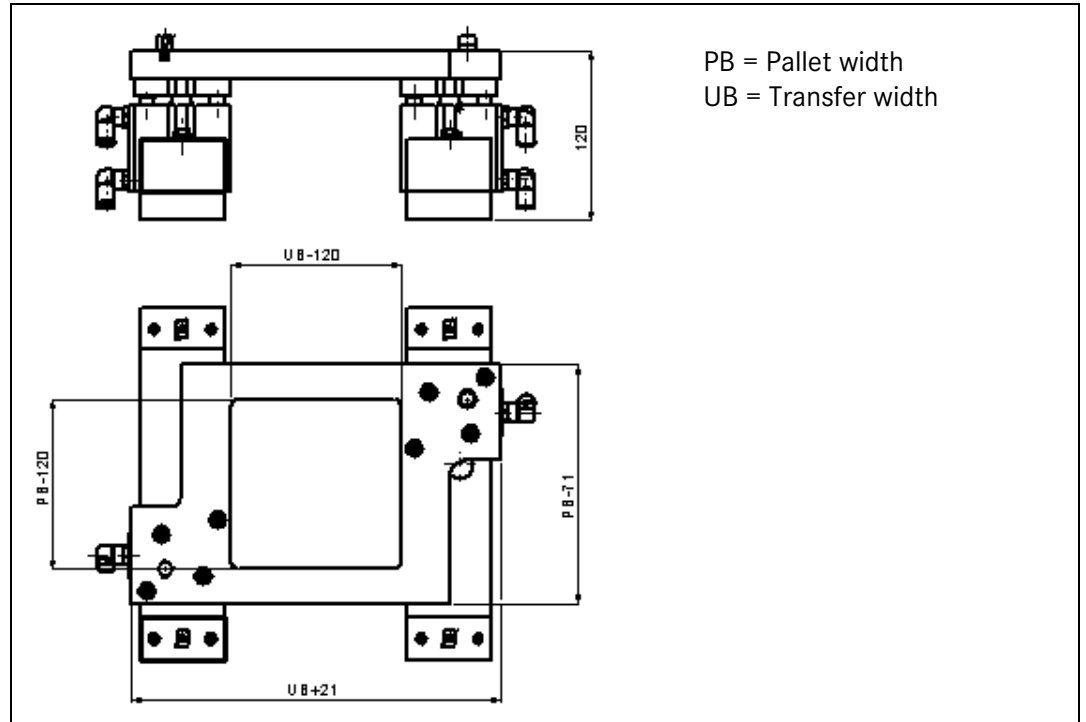
9.3 Maintenance

Lifting/centering units require no maintenance.

10 Dimension sheet

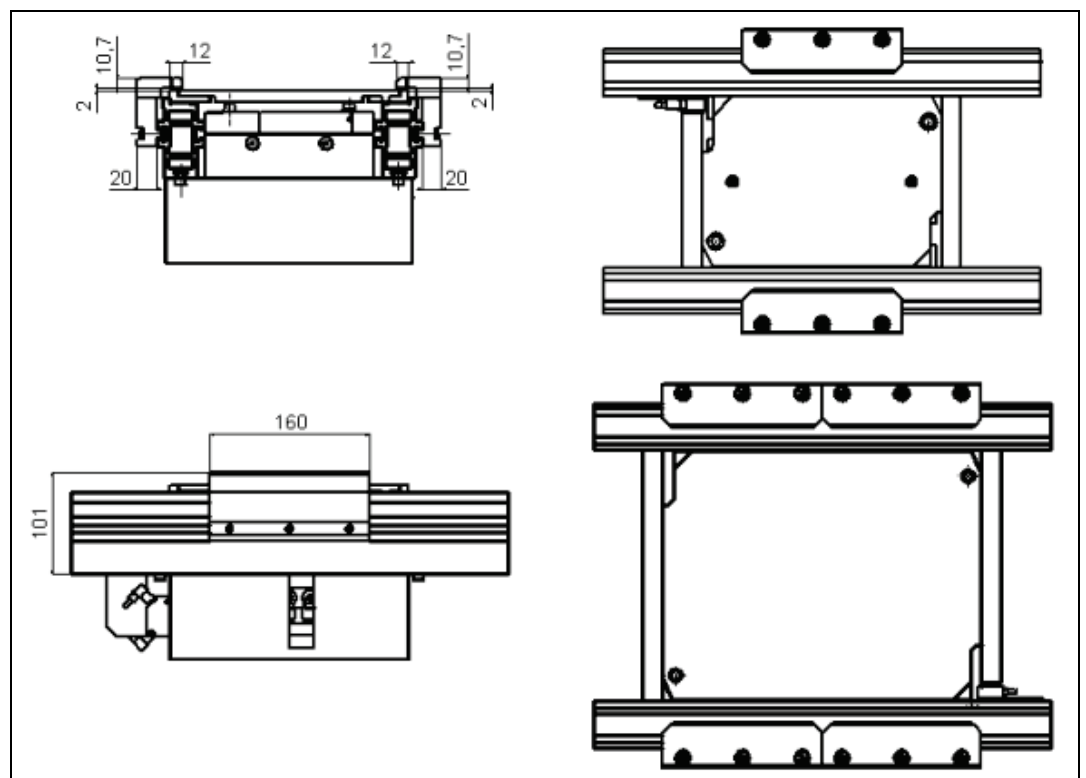
10.1 Lifting/centering device (HZEO)

Fig. 10-1:
HZEO – dimensions
sheet



10.2 Lifting/centering device (HZEO) with Retainer

Fig. 10-2:
Dimensions sheet for
HZEO with retainer

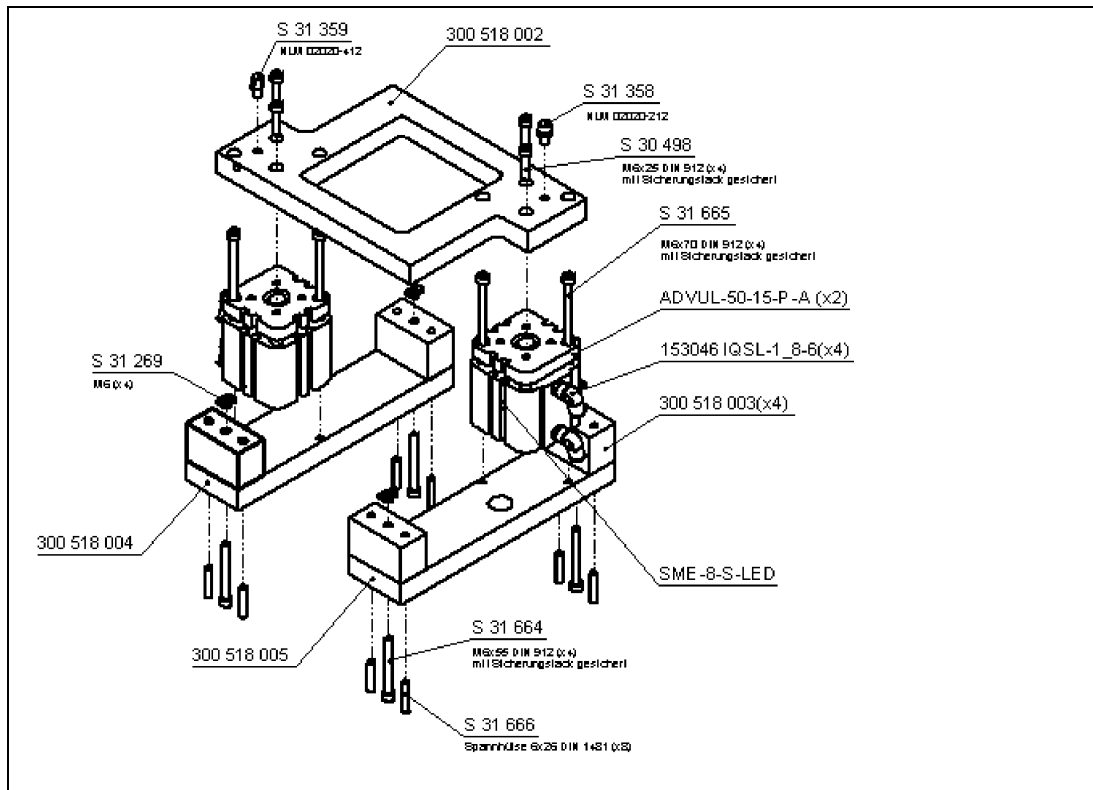







11 Spare parts

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Open lifting/centering devices can be ordered as article no. 300 518 001.
Retainers can be ordered as article no. 320 116 001.

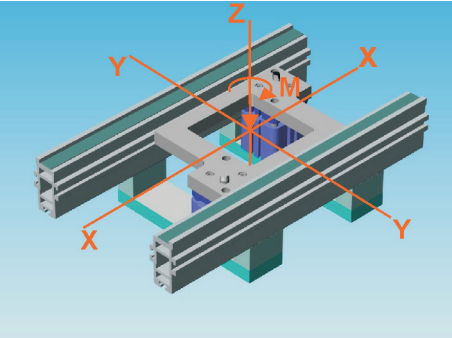
Fig. 11-1:
Spare parts for HZEO
with retainer



	Order number	Description	Number
	300 518 002	Elevating platform	1
	300 518 003	Pedestal	4
	300 518 004	Edge piece	1
	300 518 005	Edge piece	2
	S30498	M6x25 DIN 912 screws	4
	S31355	ADVUL-50-15-P-A 156895	1
	S31269	M6 groove nut	4
	S31358	Pick-up bolt	1
	S31359	Pick-up bolt	1
	S31664	M6x55 DIN 912 screw	4
	S31665	M6x70 DIN 912 screw	4
	S31666	6x25 DIN1481 grab casing	8
	S31358	Pick-up bolt	1
	S31359	Pick-up bolt	1
	ADVUL-50-15-P-A	Short stroke cylinder	2
	153 046 IQSL-1_8-6	Connection	4
	SME-8-S-LED	Switch	2

12 Appendix

12.1 Technical data

Lift	<ul style="list-style-type: none"> • approx 15 mm • Pallet = about 2 mm +1 above the drive belt
Sizes available	Any size with a side length between 240 to 320 mm, square or rectangular.
Dimensions	<ul style="list-style-type: none"> • Height: 120 mm • Length and width: 240 to 320 mm
Weight	6 kg (240x240 mm) – 18 kg (320x320 mm)
Total permissible weight	Workpiece, workpiece pick-up and pallet: 12 kg
Pallet (WT) positioning accuracy	<ul style="list-style-type: none"> • +/- 0.1 mm in its X and Y axes • +/- 0.1 mm in its Z axis (if loading is centered) with Retainer
Permissible pallet loading	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <ul style="list-style-type: none"> • in the X axis: 130 N • in the Y axis: 130 N • in the Z axis: <ul style="list-style-type: none"> 120 N if loading is centered (6 bar operating pressure) 80 N if loading is centered (4 bar STEIN operating pressure) Above 100 N the belt element must be supported with stands or a base plate. • M: 7 Nm if loading is not centered </div> </div>
Control	<ul style="list-style-type: none"> • Automatic interface signal or via hand or foot operated buttons • Induction proximity switch: automation station default
Compressed air supply	<ul style="list-style-type: none"> • PUN 6x1, manufactured by Festo • Max. 6 bar
Accessories	<ul style="list-style-type: none"> • Retainers

This information reflects the technical status at the time of printing.
STEIN Automation reserves the right to make technical updates.

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