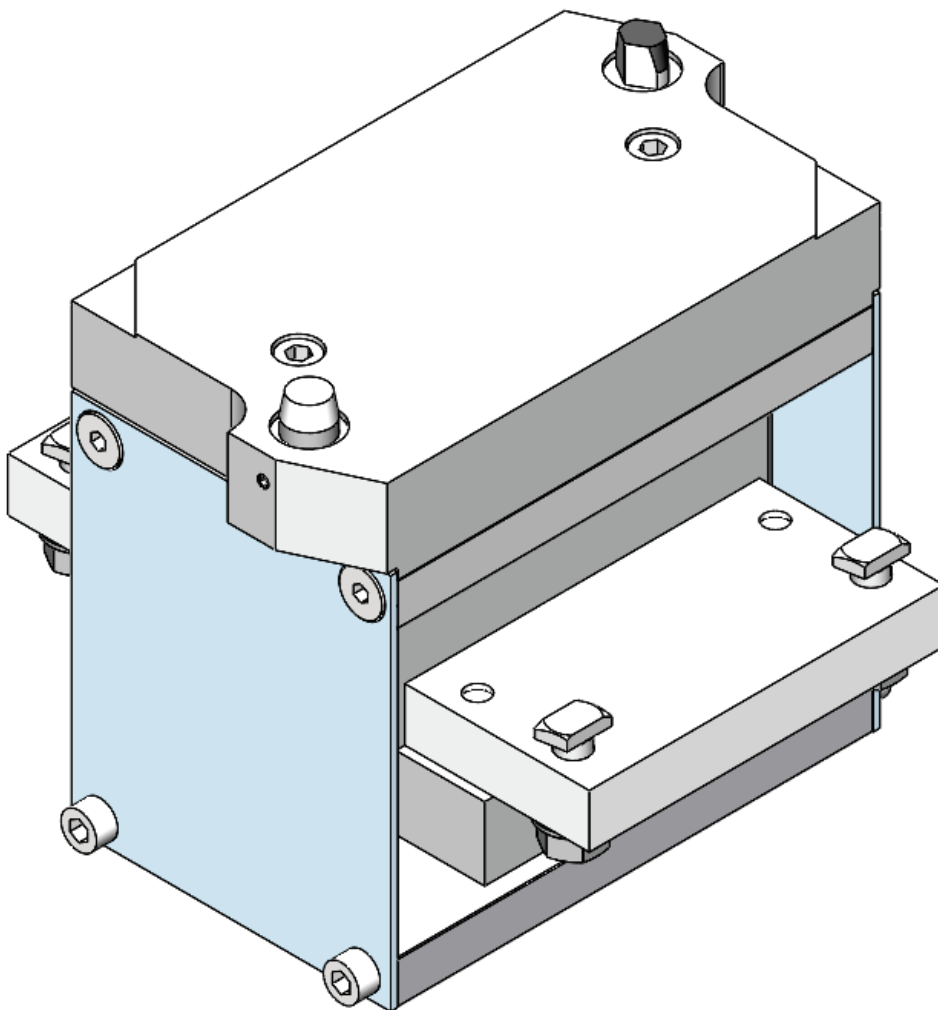


LIFTING/CENTERING DEVICE (HZE)

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

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

HZE Lifting/centering device

WT Pallets

BA Operating instructions

Fig. Figure

i

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 HZE 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 HZE.

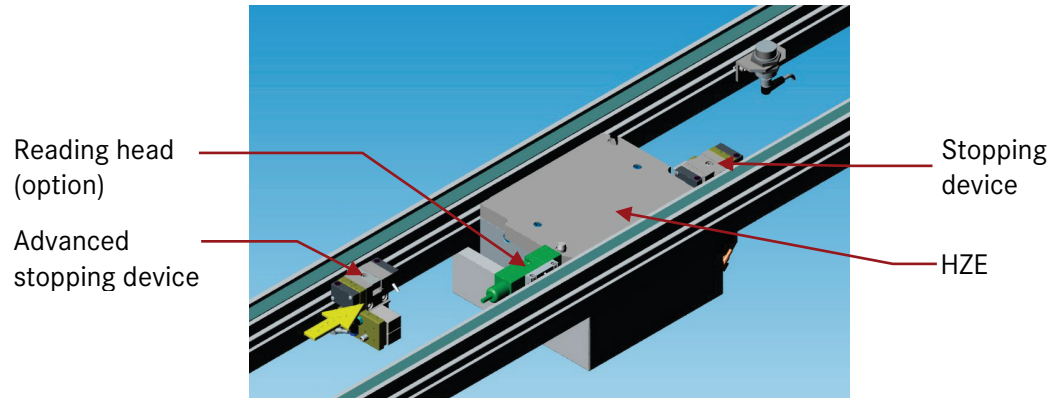
2.1 Short description

Lifting/centering devices are installed in the STEIN 300 Workpiece Transport System.

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

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

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



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 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 manufacturer.

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

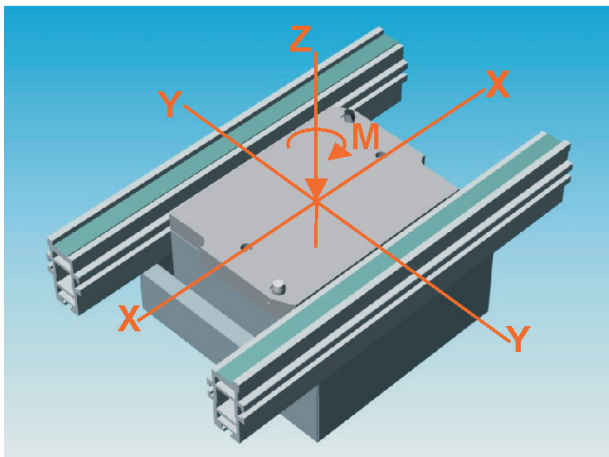
- Lifting/centering devices from STEIN Automation are high quality products, manufactured to recognized technical rules. The technical safety features of lifting/centering devices leave our factory in perfect condition.
- All versions of our lifting/centering devices comply with the requirements of UVV, 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.
- Lifting/centering devices must only be installed and repaired by authorized personnel who have been trained by STEIN Automation.
- Only genuine components from STEIN Automation may be used when carrying out repairs on the lifting/centering device.

3.2 Appropriate use and liability exclusions

Lifting/centering devices may only be

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

Fig. 3-1:
Lifting/centering device
- loadings



Permitted pallet loadings are:

- in the X axis: 50N
- in the Y axis: 50N
- in the Z axis: 800N if loading is centered and under an operating pressure of 6 bar or 540N if loading is centered and under a STEIN operating pressure of 4 bar and
- $M=10\text{Nm}$ if loading is not centered

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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 unexpectedly starting.



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 HZE is completely installed in the belt.
As accessory or subsequent delivery the HZE is supplied with lower cover.
- Induction proximity switches with mounting brackets are included separately.



The following accessories are not part of the normal contents:

- Top cover (supplied and installed by the customer)
- Bottom cover (STEIN Automation option)
- Retainer (STEIN Automation option)
- Control unit (STEIN Automation option)
- Stopping device (STEIN Automation option)

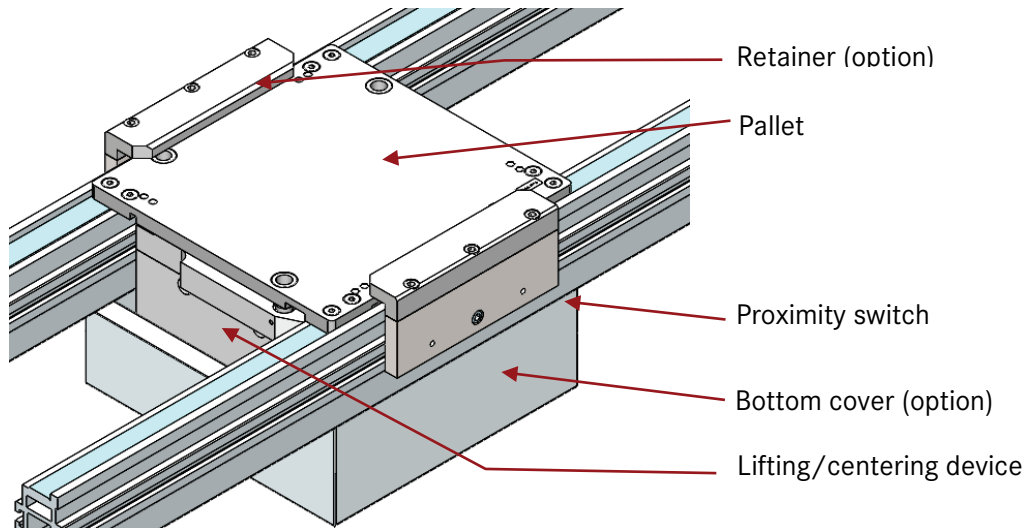
4.2 Installation area

Installing an HZE will be required in automatic workplaces if

- pallets have to be very accurately positioned,
- pallets are placed under load along their Z axis during processing.

4.3 System components

Fig. 4-1:
Lifting/centering de-
vice



Procedure:

Pallets are transported by the two transport belts until they reach the workstation stopping device (STEIN Automation option). The proximity switch located in this position activates the elevating cylinder and the pallet is lifted up. After processing in this raised position, the elevating platform is lowered and the pallet is transferred onto the belt elements' transport belts.

The HZE can be controlled by STEIN Automation (option) or by the manufacturer of the specific machinery.



We recommend the HZE is controlled using the specific manufacturer of the machinery. In this case, assembly and set-up operation can take place independently of the Work-piece Transport System's control.

4.3.1 Retainers (option)

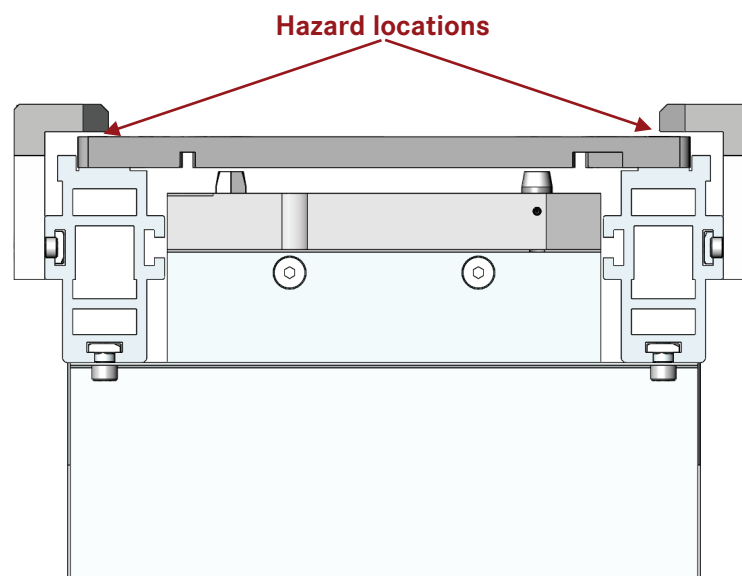
Function

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



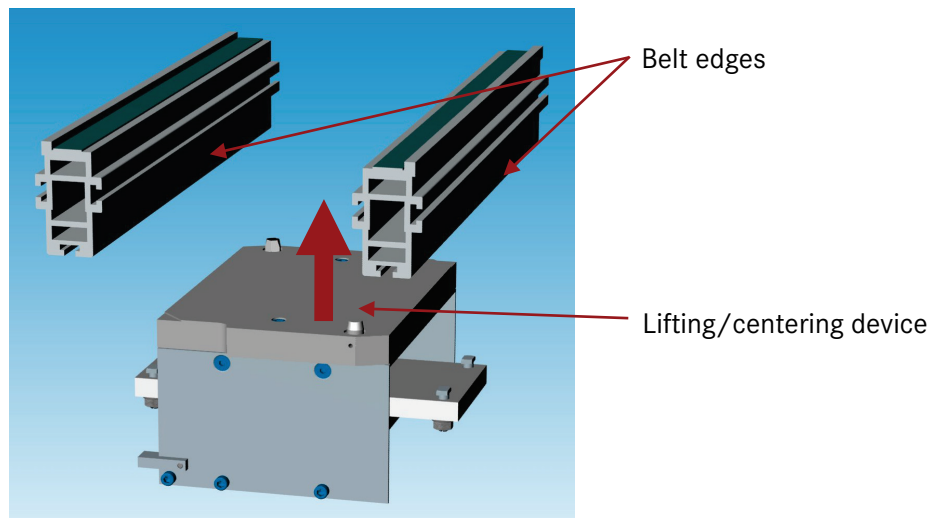
WARNING!

Crushing hazard

Retainers may only be installed on fully enclosed workstations.

5 Installing the lifting/centering device (HZE)

Fig. 5-1:
Lifting/centering de-
vice
- installation location



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



WARNING!

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

5.1 Procedure

The installation procedure can be divided into seven phases:

- Preparation,
- Installing the HZE between the edges of the two belts,
- Fitting the mounting bracket with the proximity switch.
- Fitting the stopping devices
- Fitting the pneumatic elements and installing switches
- 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 HZE between the edges of the two belts



Protective clothing must be worn

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



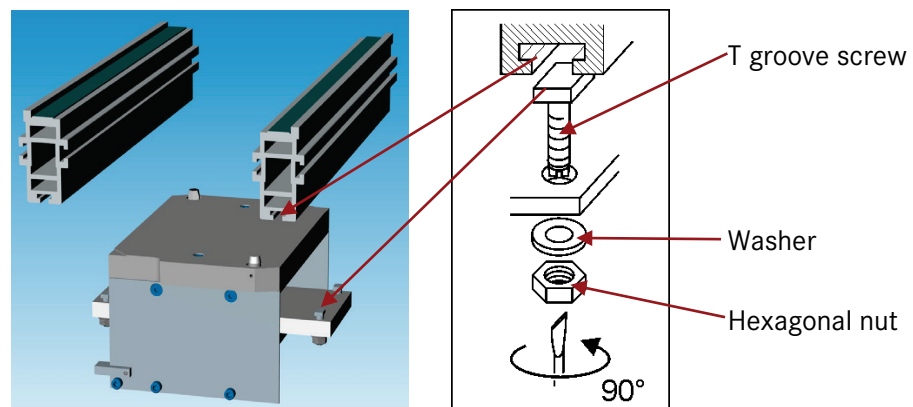
WARNING!

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



Observe the installation dimensions in fig. 5-4.

Fig. 5-2:
Inserting the HZE



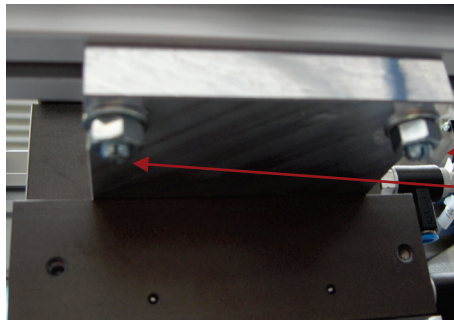
- 1. Push the HZE from below between the edges of the two belts.
- 2. Rotate the four T groove screws through about 90°.



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:
HZE –
viewed from below

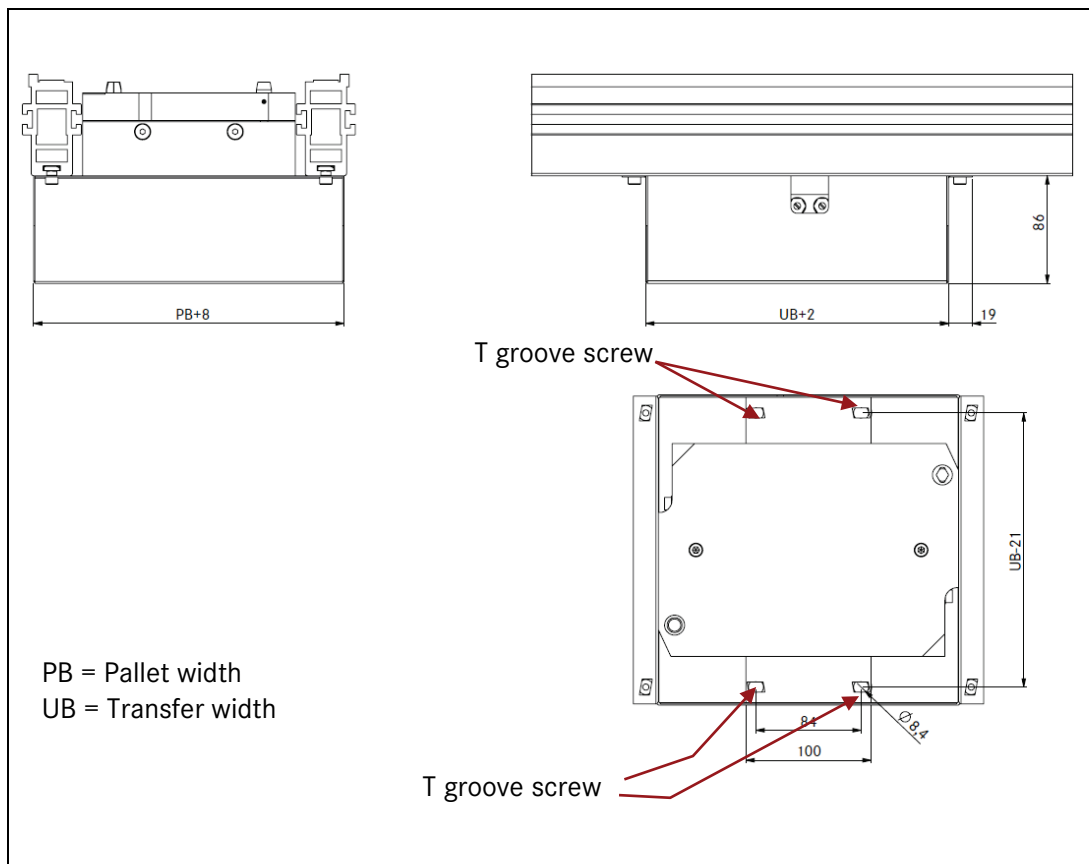


Screw-head slots
at right angles to
the edge of the
belt

⇒ The HZE has been inserted.

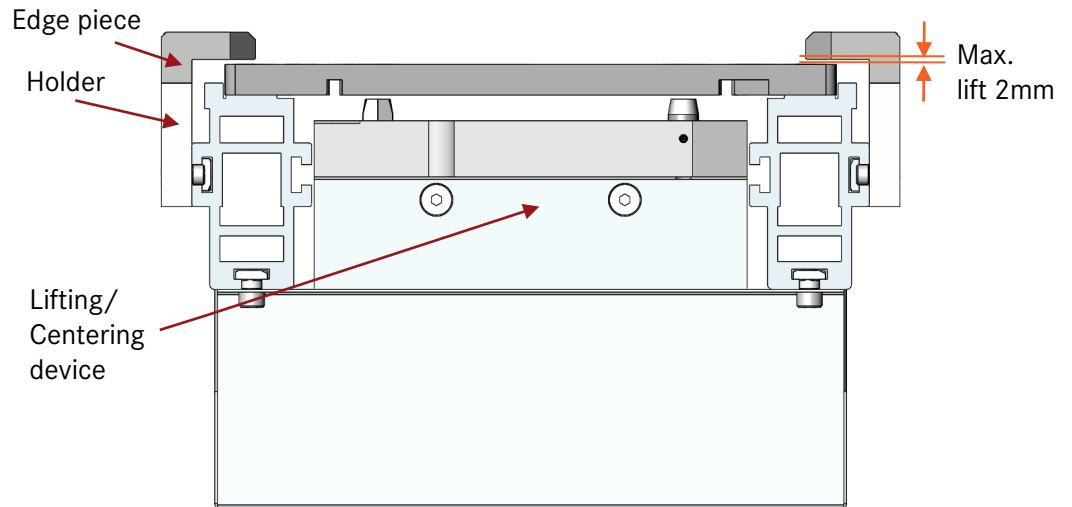
- 3. Straighten the HZE.
- 4. Attach the nut and tighten it firmly.
- 5. Replace the lower cover.

Fig. 5-4:
Installation
measurements



5.4 Fitting a retainer (option)

Fig. 5-5:
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 (see also chapter 10.2, dimensions sheet for HZE with retainer).

- 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 Mounting bracket with the proximity switch

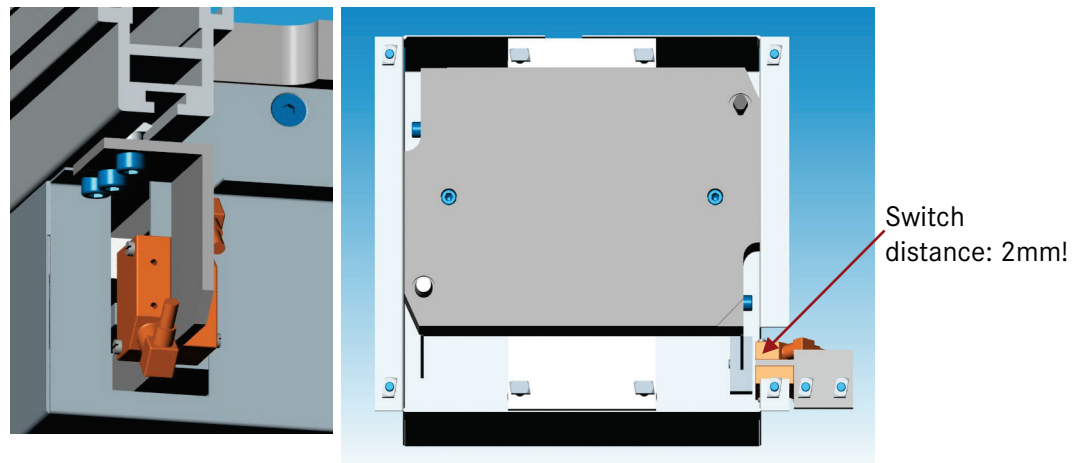
- Fit the separately supplied mounting bracket with the two proximity switches to the belt edge.

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The switching distance between the proximity switch and the control cams on the HZE is 2mm.

Fig. 5-6:
Fitting the mounting
bracket with the prox-
imity switch

Switching distance



5.6 Fitting the stopping devices



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

5.7 Compressed air and power connections

5.7.1 Connecting the HZE to the compressed air supply



WARNING!

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

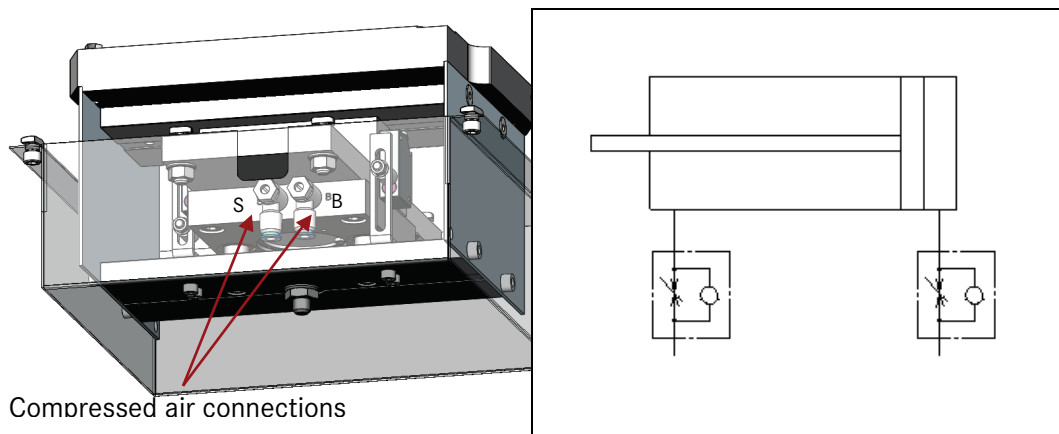


Festo GRLA-1/8-QS6 throttle check valves are used as connectors.

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

Fig. 5-7:
Connecting the HZE to the compressed air supply

Illustration of connections



- Connect the HZE to the compressed air supply using connections “S” and “B”.



Connection “S” (left): Cylinder goes up
Connection “B” (right): Cylinder goes down

5.7.2 Connecting induction proximity switches to the power supply



DANGER

HIGH ELECTRICAL VOLTAGE

Electric shock hazard

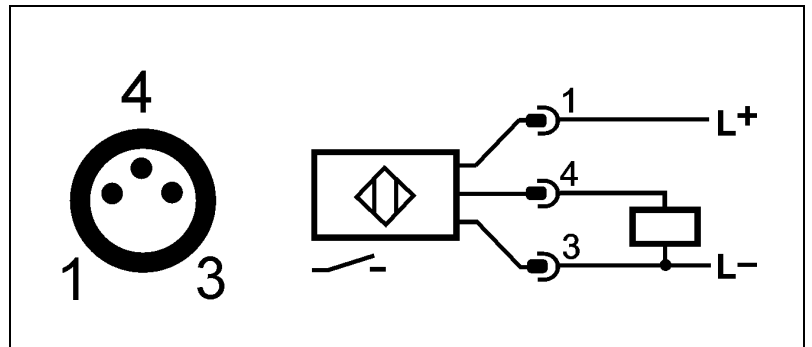
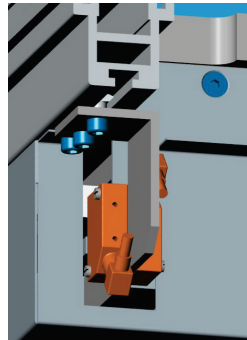


WARNING!

Only type DC PNP induction proximity switches may be used.

Fig. 5-8:
Induction
proximity switch

Wiring diagrams



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

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Exterior induction proximity switch:

Top position query

Interior proximity switch:

Bottom position query

5.8 Installing safety equipment

- Fit the lower cover (option STEIN Automation)
- Fit the upper cover / work station enclosure (neither is included in the scope of delivery from Stein).



ATTENTION!

The lower protective cover is not included in the scope of delivery of the HZE.

The protective cover must be fitted if:

- no protective cover is guaranteed by third parties,
- the HZE is controlled by STEIN Automation.

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.



WARNING!

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

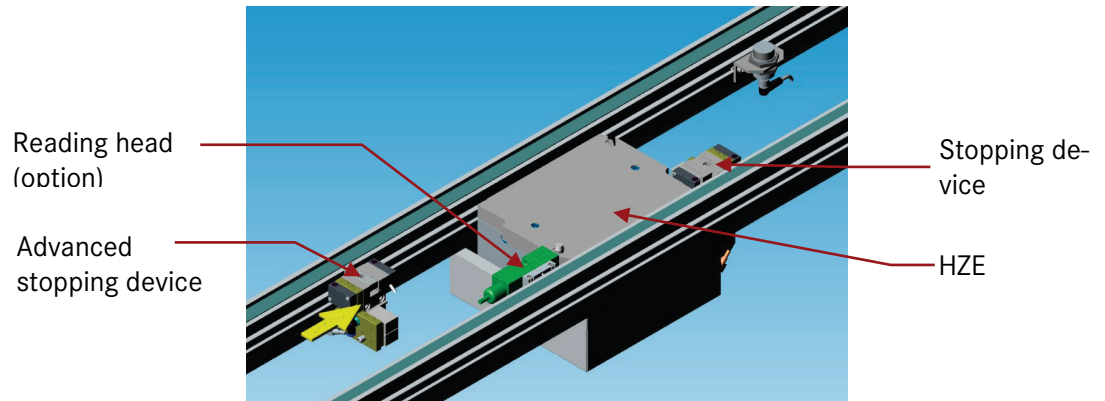
7 Operating the HZE



DANGER

Only operate the HZE in fully enclosed stations.

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



In normal operations the customer starts up the HZE.

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

- Reading head detects “WT present” – no defective component, 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
 - ⇒ HZE goes out and signal sent to top-level control system: “Processing on WT can proceed”
- Workpiece processing proceeds
- Signal to the WTS control system “Processing completed”
 - ⇒ HZE 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.
HZE 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.
	HZE wrongly installed.	Check and if necessary adjust HZE position and screws.
HZE rises too soon / too late	Position switch incorrectly set.	Re-set position switch.
HZE 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 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: 893 140 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 HZE 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 HZE	Play, functional accuracy	Re-tighten loose connections Accurately re-position induction proximity switches
Signs of wear		Replace worn elevating platform	

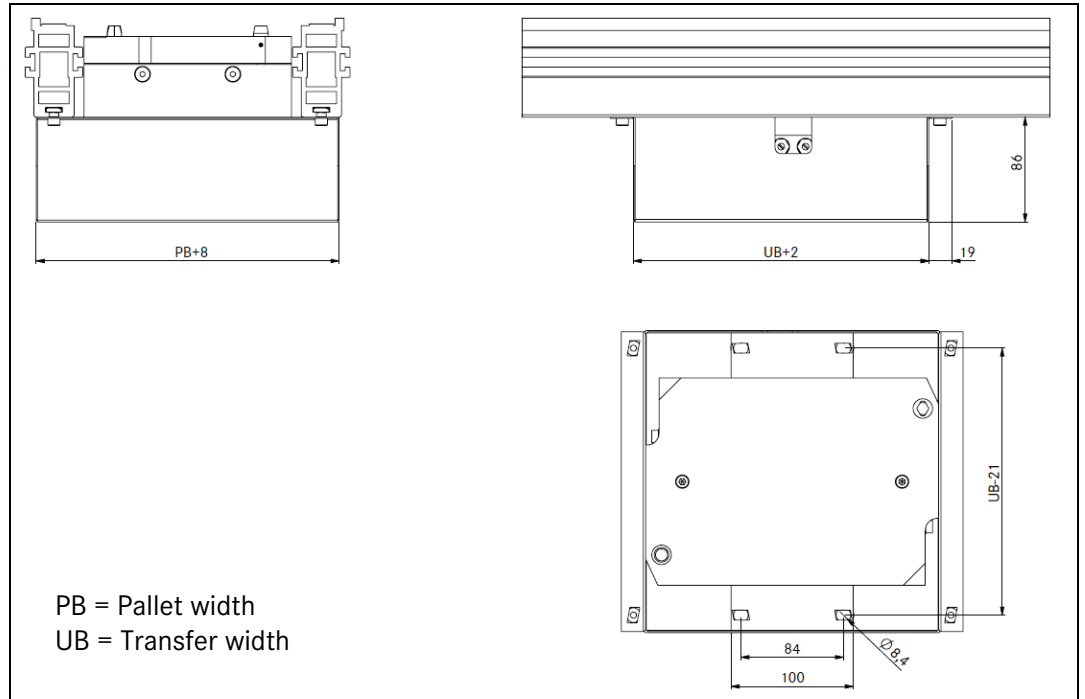
9.3 Maintenance

Lifting/centering units require no maintenance.

10 Dimensions sheet

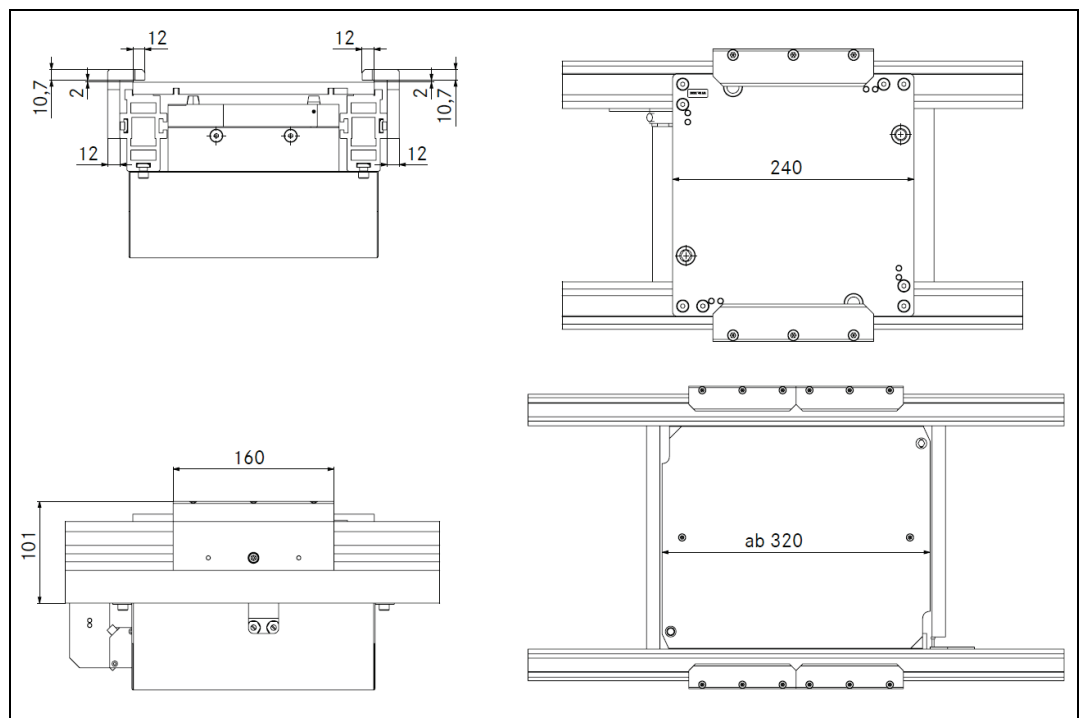
10.1 Lifting/centering device (HZE)

Fig. 10-1:
HZE - dimensions sheet



10.2 Lifting/centering device (HZE) with Retainer

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



11 Spare parts

11.1 300 116 001 Lifting/centering device HZE

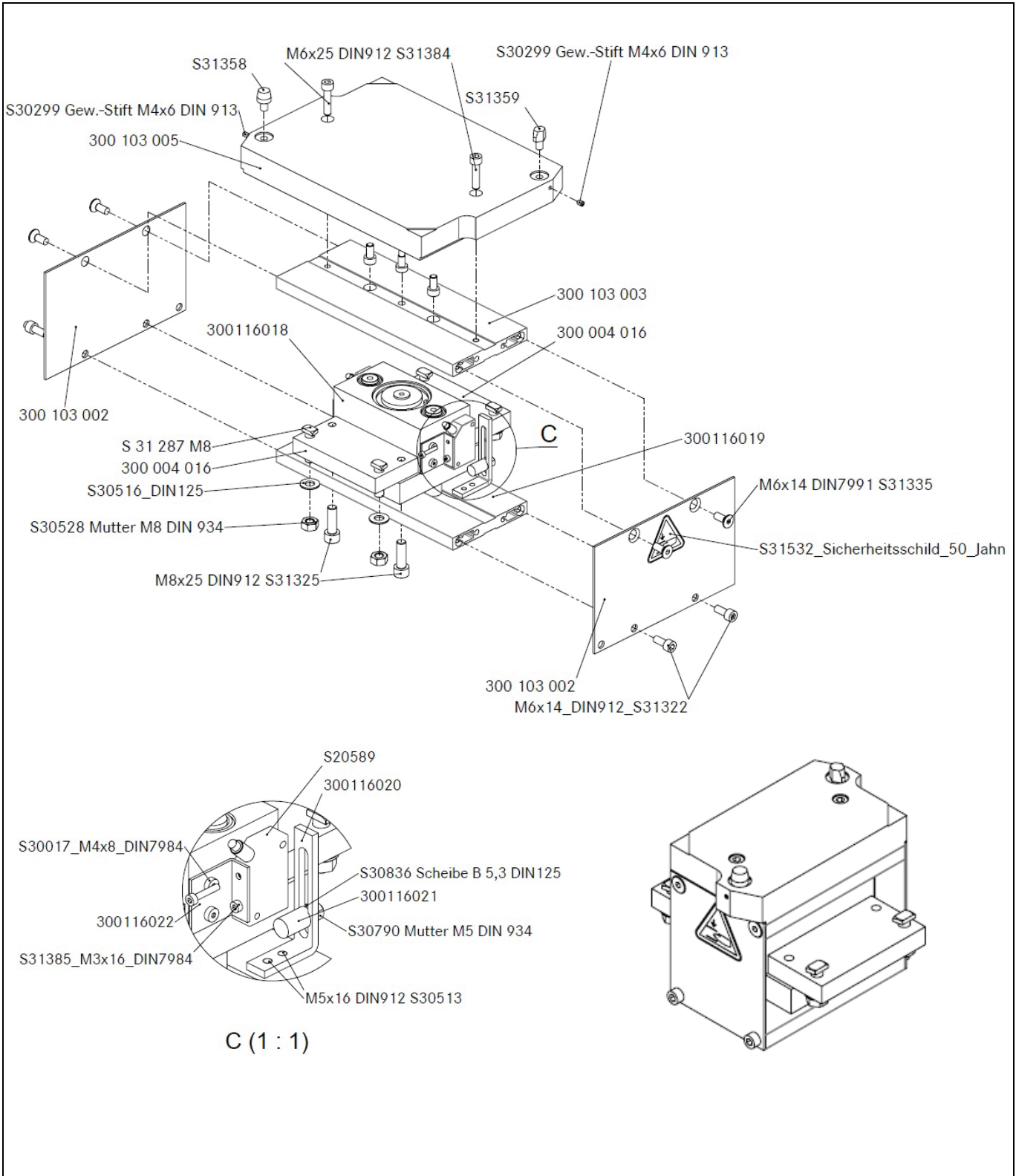


Fig. 11-1: Lifting/centering device HZE. - 300 116 001 - Page 1

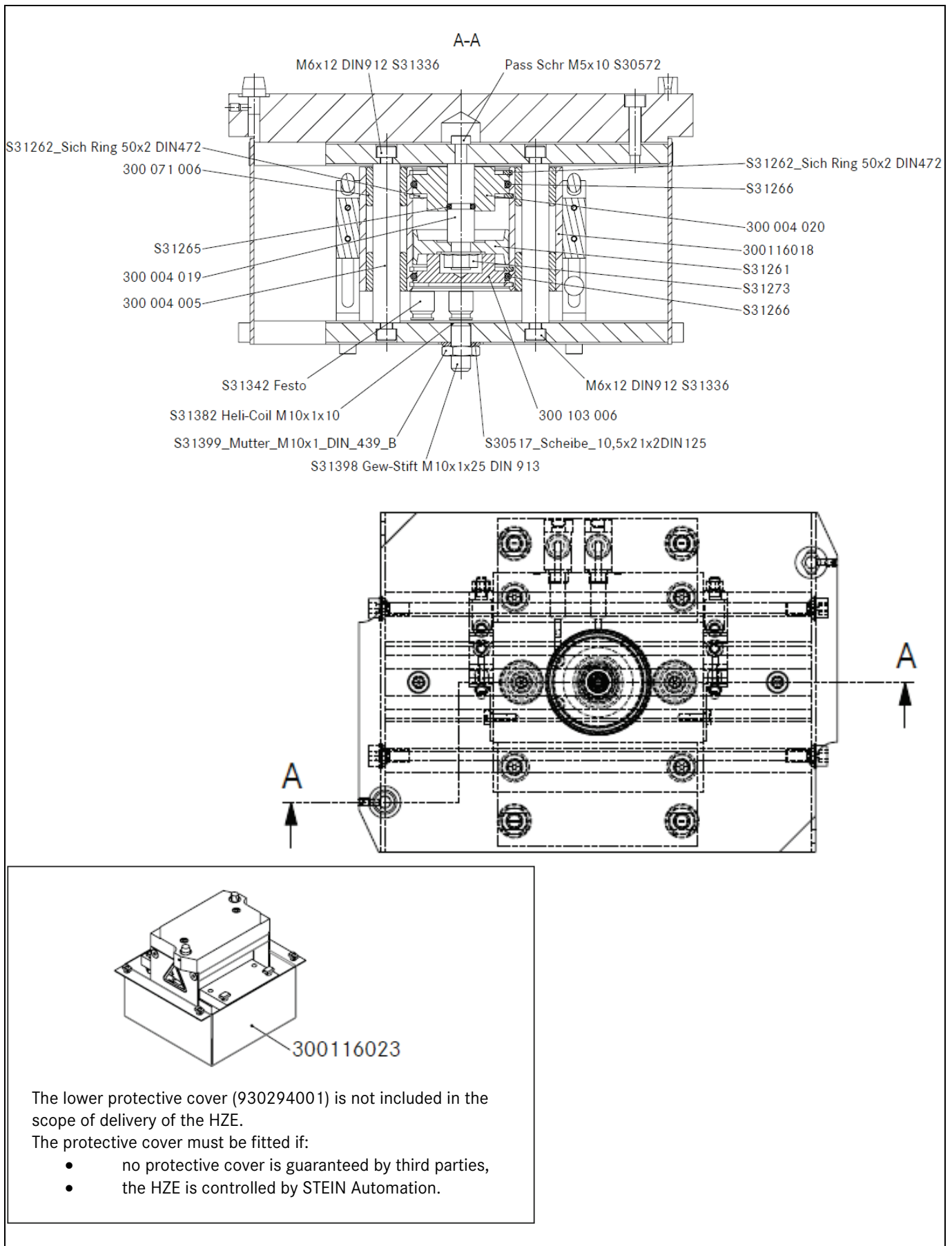


Fig. 11-2: Lifting/centering device HZE. - 300 116 001 - Page 2

Quantity	Order number	Description
1	300116018	Cylinder housing
1	300116019	Stiffener
2	300116020	Angle
2	300116021	Cams
2	300116022	Angle
2	300 004 005	Guide shaft
2	300 004 016	Retainer plate
1	300 004 019	Piston rod
1	300 004 020	Piston guide
4	300 071 006	Bush
2	300 103 002	Side piece
1	300 103 003	Stiffener, top
1	300 103 005	Elevating platform
1	300 103 006	Cylinder lid
2	S20589	Inductive proximity switch
4	S31262	Circlip 50x2
1	S31261	Complete piston
4	S31335	M6x14 DIN7991
2	S31266	O ring 44x3
4	S31322	M6x14 DIN912
1	S31273	Special bolt M8
2	S30790	DIN934_M5
4	S31325	M8x25 DIN912
1	S31398	Grub screw M10x1x25 DIN913
4	S30516	Washer, B M8 DIN125
1	S31358	Pick-up bolt
4	S30017	DIN7984_M4x8
2	S31342	Choke check valve
4	S30513	DIN912_M5x16
4	S31287	Sliding block M8
2	S31384	M6x25 DIN912
4	S30528	Nut M8 DIN934
1	S31399	Nut M10x1 DIN439
1	S30572	Dowel screw M5x10
1	S30517	Washer, B M10 DIN125
1	S31382	Heli Coil M10x1x10
1	S31359	Pick-up bolt
4	S31385	M3x16 DIN7984
1	S31265	O ring 9x2,5
4	S31336	M6x12 DIN912
2	S30299	Grub screw M4x6 DIN913
2	S30836	DIN125_Ø5,3
2	S31532	Safety sign SL50mm

11.2 930 294 001 Protective cover for HZE 300116001 (OPTION)

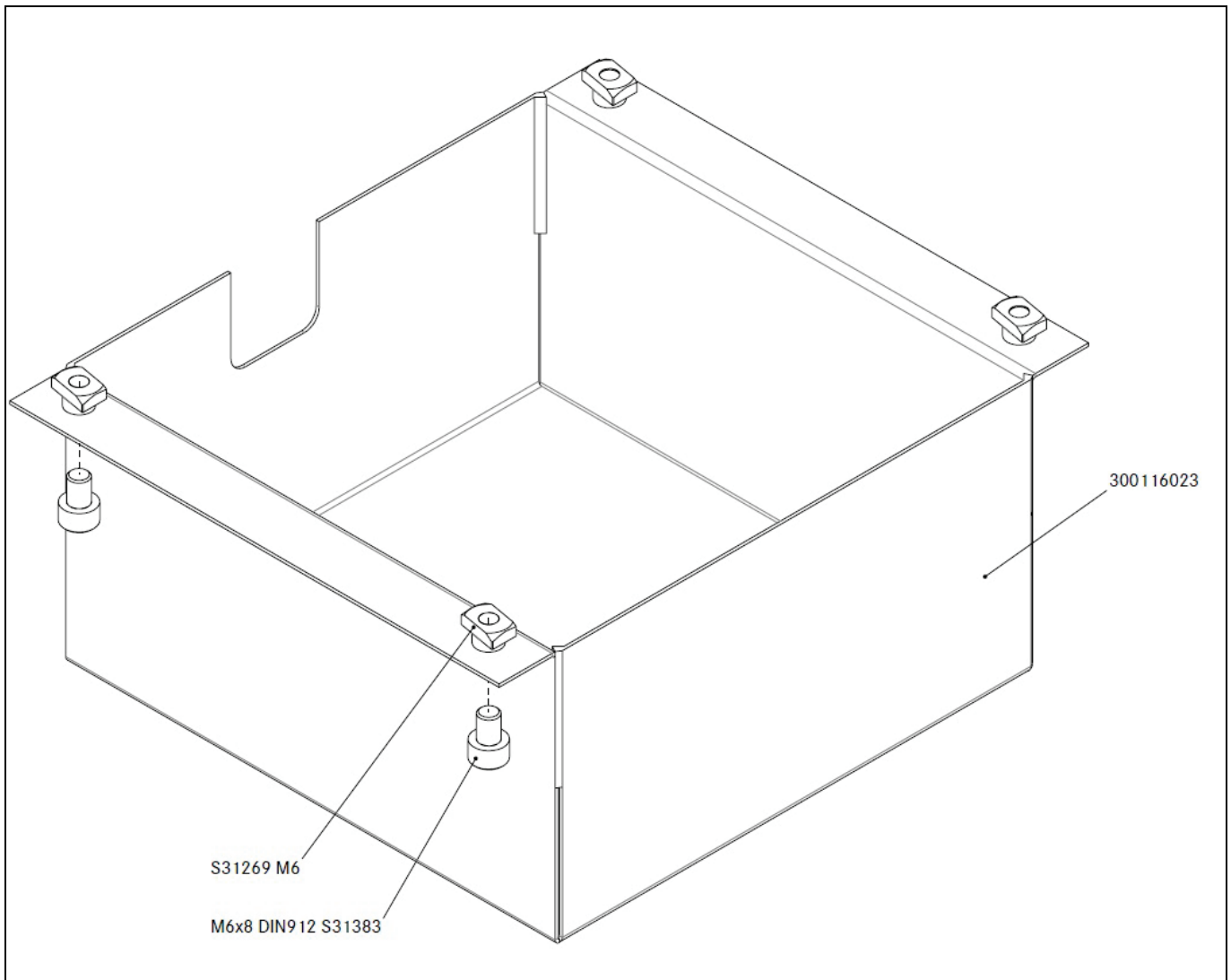


Fig. 11-3: Protective cover for HZE 300116001 (optional) – 930 294 001

Quantity	Order number	Description
1	300116023	Protective plate
4	S31383	DIN9 12_M6x8
2	S31269	Groove nut M6

11.3 930 198 001 Retainer for HZE (slim) – from Dec. 2018

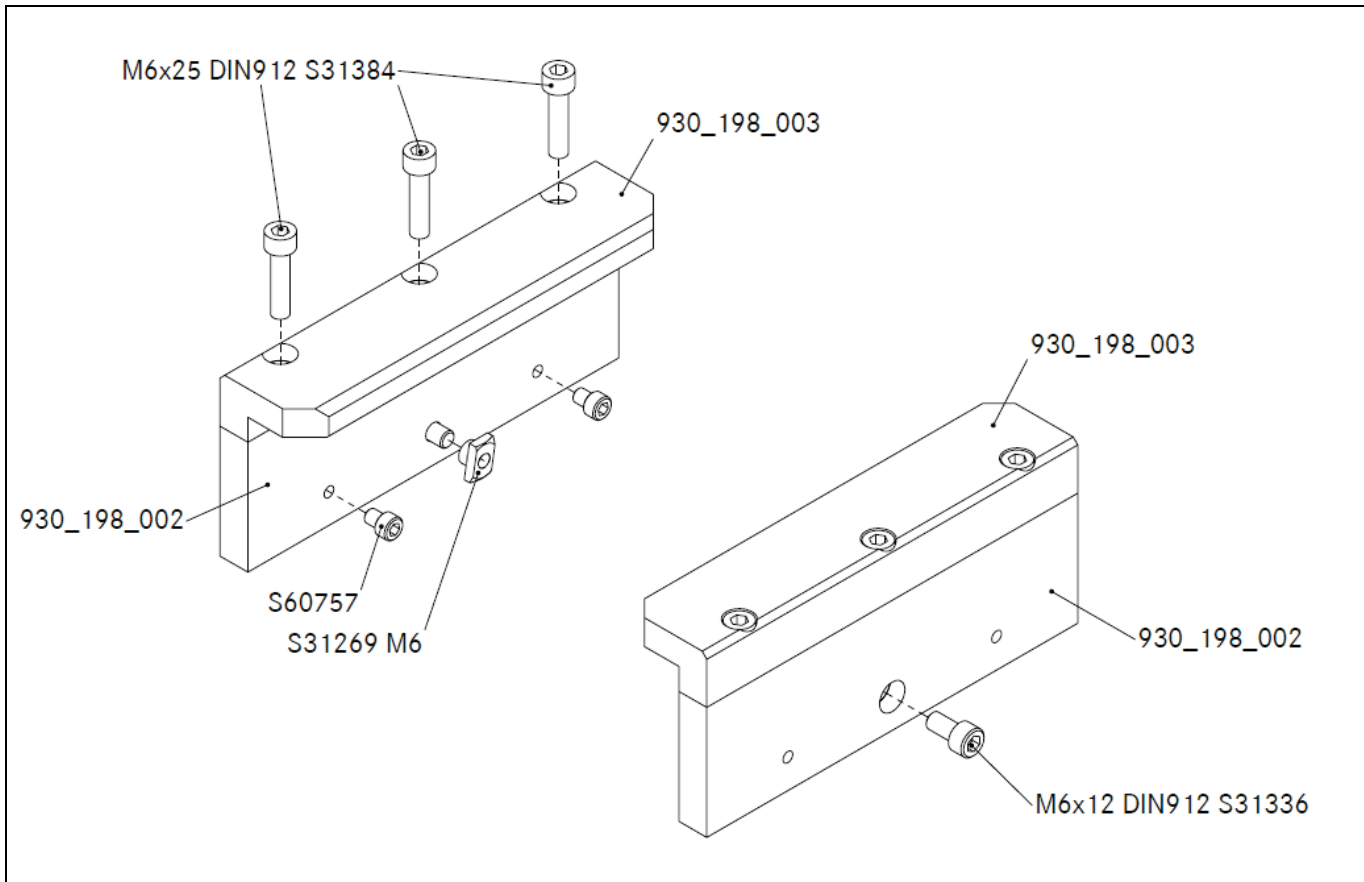


Fig. 11-4: Retainer for HZE (slim) - 930 198 001

Quantity	Order number	Description
2	930_198_002	Holder
2	930_198_003	Edge piece
2	S31336	M6x12 DIN912
6	S31384	M6x25 DIN912
2	S31269	Groove nut M6
4	S60757	M5x6 Screw

11.4 300 265 001 Retainer

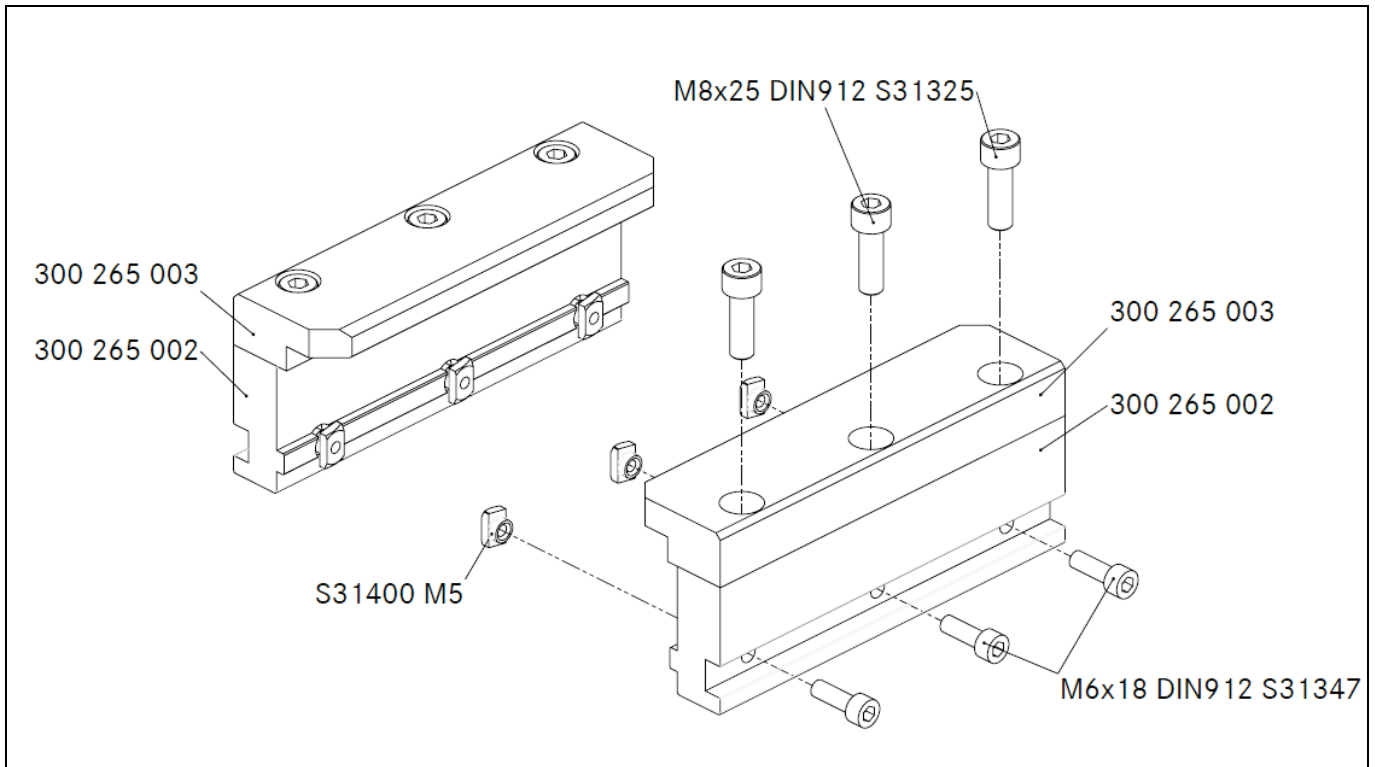


Fig. 11-5: Retainer - 300 265 001

Quantity	Order number	Description
2	300 265 002	Holder
2	300 265 003	Edge piece
6	S31325	M8x25 DIN9 12
6	S31347	M6x18 DIN9 12
6	S31400	Groove nut M5

11.5 930 138 001 Lifting/centering device HZE with HGL valve

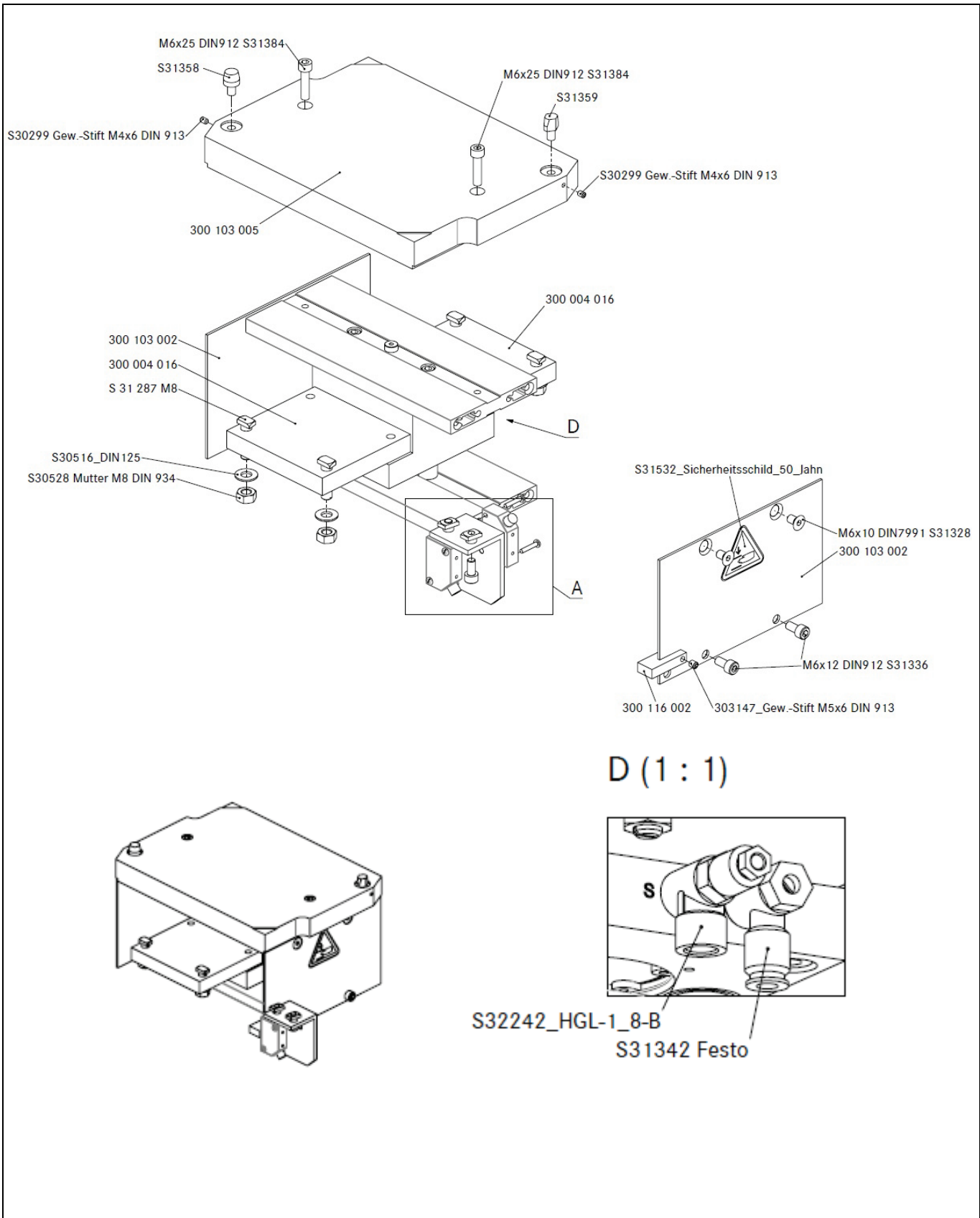


Fig. 11-6: Lifting/centering device HZE with HGL valve - 930 138 001

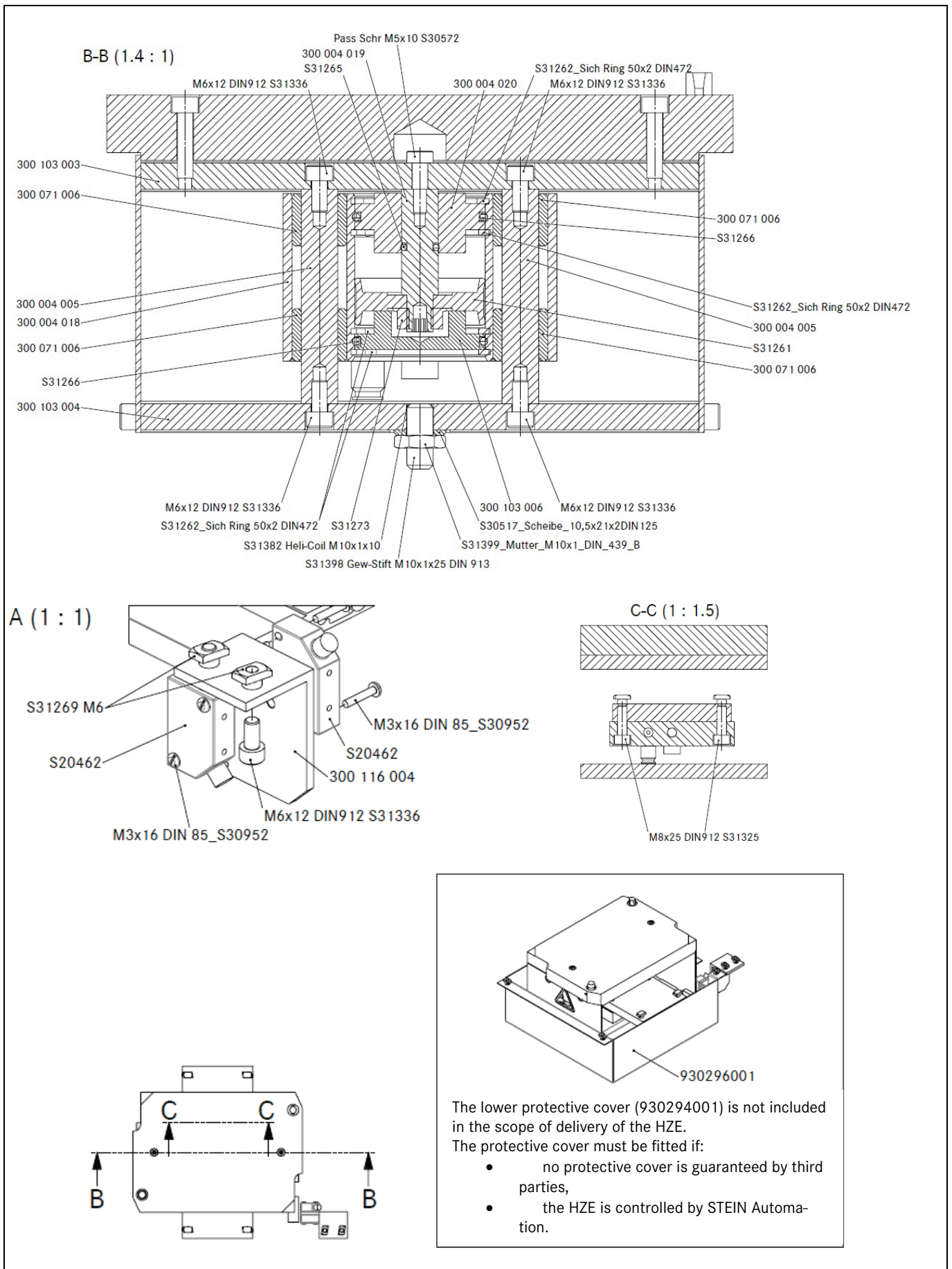


Fig. 11-7: Lifting/centering device HZE with HGL valve - 930 138 001

Quantity	Order number	Description
2	300 004 005	Guide shaft
2	300 004 016	Retainer plate
1	300 004 018	Cylinder housing
1	300 004 019	Piston rod
1	300 004 020	Piston guide
4	300 071 006	Bush
2	300 103 002	Side piece
1	300 103 003	Stiffener top
1	300 103 004	Stiffener bottom
1	300 103 005	Elevating platform
1	300 103 006	Cylinder lid
1	300 116 002	Cam
1	300 116 004	Switch holder
4	S30952	M3x16 DIN85
2	S30299	Grub screw M4x6 DIN913
1	303147	Grub screw M5x6 DIN913
1	S30572	Dowel screw M5x10
4	S31328	M6x10 DIN7991
10	S31336	M6x12 DIN912
2	S31384	M6x25 DIN912
4	S31325	M8x25 DIN912
4	S31262	Circlip 50x2 DIN472
2	S31269	Slot nut M6
4	S31287	Sliding block M8
4	S30516	Washer 8,4x17x1,6 DIN125
1	S30517	Washer 10,5x21x2 DIN125
4	S30528	Hexagonal nut M8 DIN934
1	S31399	Nut M10x1 DIN439 B
1	S31398	Grub screw M10x1x25 DIN913
1	S31382	Heli-Coil M10x1x10
1	S31261	Complete piston KPK 50x10x18N
1	S31273	Special bolt 8
1	S31358	Pick-up bolt DIN6321 02020 -212
1	S31359	Pick-up bolt DIN6321 02020 -412
2	S31266	O ring 44x3
1	S31265	O ring 9x2,5
2	S20462	Proximity switch
1	S32242	Choke check valve HGL-1/8-B
1	S31342	Choke check valve GRLA-1/8-QS 6
2	S31532	Safety sign SL50mm

11.6 930 296 001 Protective cover for HZE with HGL valve 930296001 (OPTION)

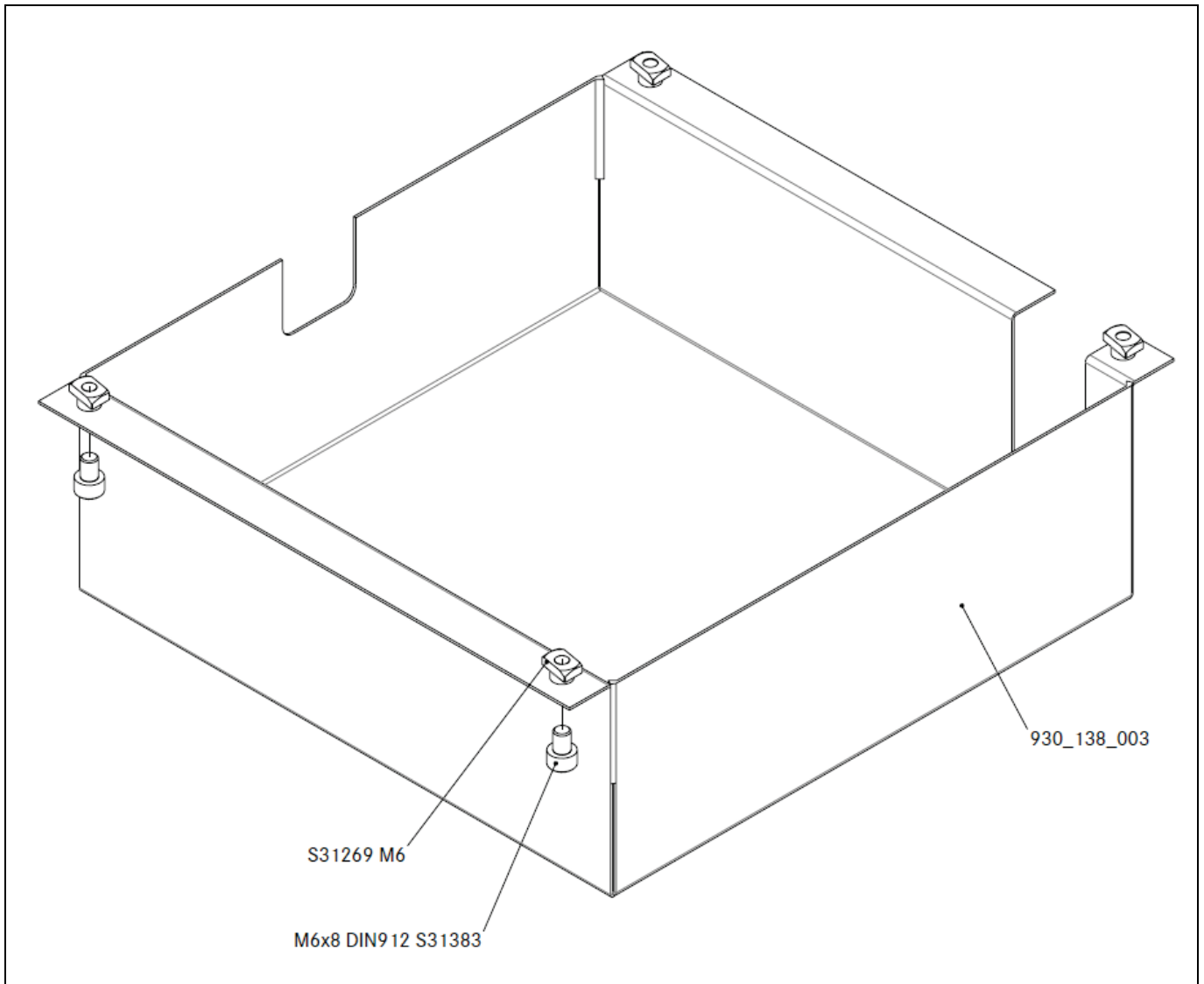
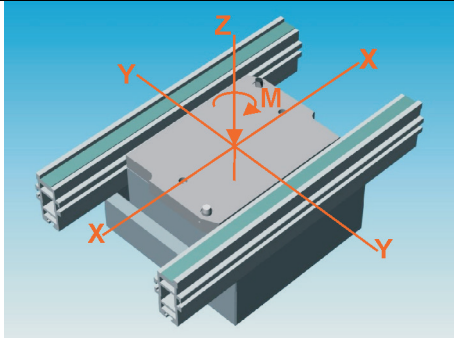


Fig. 11-8: Schutzhaube für HZE mit HGL-Ventil 930138001 (optional) – 930 296 001

Quantity	Order number	Description
1	930138003	Protective plate
4	S31383	DIN9 12_M6x8
4	S31269	Groove nut M6

12 Appendix

12.1 Technical data

Lift	<ul style="list-style-type: none"> • approx 15 mm • Pallet = about 5 mm above the drive belt (+/- 1 mm) • Pallet = about 2 mm above the drive belt (with Retainer)
Sizes available	Any size with a side length between 160 to 400 mm, square or rectangular.
Dimensions	<ul style="list-style-type: none"> • Height: 350 mm • Length and width: 160 to 400 mm
Weight	6 kg (160x160 mm) – 18 kg (400x400 mm)
Total permissible weight	Workpiece, workpiece pick-up and pallet: 12 kg
Pallet (WT) positioning accuracy	<ul style="list-style-type: none"> • +/- 0.02 mm in its X and Y axes • +/- 0.1 mm in its Z axis (if loading is centered)
Permissible pallet loading	 <ul style="list-style-type: none"> • in the X axis: 50 N • in the Y axis: 50 N • in the Z axis: <ul style="list-style-type: none"> 800 N if loading is centered (6 bar operating pressure) 540 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: 10 Nm if loading is not centered
Permissible pallet loading with retainer	<ul style="list-style-type: none"> • X-axis: 130 N at 4bar • X-axis: 180 N at 6bar • Y-axis: 130 N at 4bar • Y-axis: 180 N at 6bar <p>(Pallet and retainer free of grease)</p>
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"> • Retainer

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

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