

Operating Instructions

Original Instructions

HAUBEX Automation System



Item no.
61110
61085-46
61125
61115

Copyright:



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- Operation of the product when it is defective
- Inadequate monitoring of parts that are subject to wear
- Failure to follow the instructions in the documentation
- Catastrophic events caused by external influences or force majeure

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1.1 UNIT

The HAUBEX clamping system is used to automate tooling machines cost effectively and with minimal effort. This is done by simply attaching the zero-point clamping system to a Quick•Point® 96 zero-point plate on a machine table and placing the workholding hood with 5-axis vise and clamped workpiece in the tool magazine. Thanks to the ability to transfer the HAUBEX Automation System with all of its components on another machine, you have the flexibility to decide which of your machines will run automatically depending on your requirements.

1.2 ACCESSORIES

The HAUBEX Automation System consists of a Workholding Hood, a 5-Axis Vise and a zero-point device. In addition the HAUBEX system requires a Quick•Point® 96 zero-point plate, in which the HAUBEX zero-point device is clamped. All components can be purchased from LANG Technik. The following pages describe all of the components with item numbers.

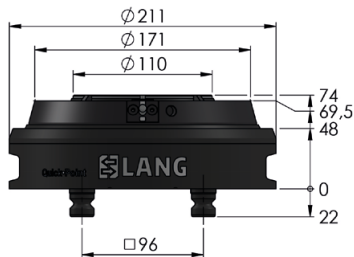


1.3 PRODUCT DESCRIPTION

Description	Item number	Weight [kg]	Tightening torque [Nm]	Clamping range [mm]
Zero-point clamping system	61110	8,6	-	-
5-axis vise	61085-46	2,65	max. 70	0-80
Workholding hood	61125	0,9	30	-
Quick•Point® 96 zero-point plate (example)	45863	10,0	30	-
Tool holder HSK-A63	61500-HSK63	1,0	30	-
Tool holder SK40	61500-SK40	1,1	30	-
Tool holder BT40	61500-BT40	1,3	30	-
Set-up station	61115	1,5	-	-

Tool length and total weight of 5-axis vise + workholding hood + tool holder		
Tool holder	Total weight [kg]	Total length [mm]
HSK-A63	4,55	246,6
SK40	4,65	239,6
BT40	4,85	249,6

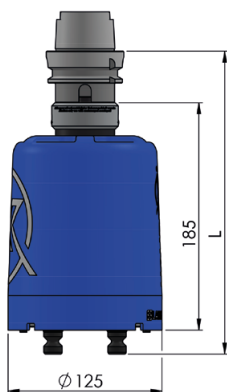
2.1 TECHNICAL SPECIFICATIONS

**Quick-Point® HAUBEX Zero-Point Clamping System**

The patented clamping mechanism of the zero-point unit is operated by the HAUBEX workholding hood for automated production, or manually via a clamping lever, which is described in section 3.3, "Manual Operation".

Quick-Point® HAUBEX Zero-Point Clamping System

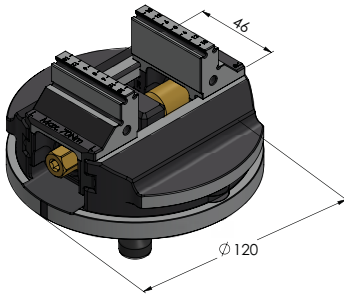
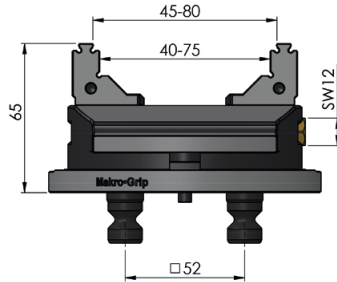
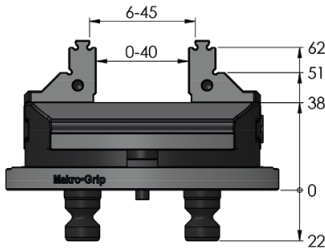
Height [mm]	Dimensions Ø [mm]	Grid size	Tightening torque max. [Nm]	Lower zero-point interface
74	211	52	30	96

**HAUBEX Workholding Hood**

The aluminum hood transfers the clamping device from the magazine to the zero-point clamping system on the machine table and mechanically locks it completely autonomously. See chapter 4, "Set-Up Station".

HAUBEX Workholding Hood

Max. workpiece size [mm]	Lower diameter Ø [mm]	Total height [mm]
ca. 80 x 75 x 70	125	185



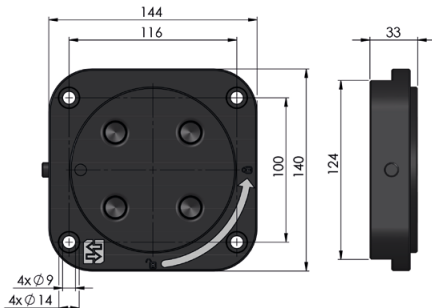
Makro-Grip® 5-Axis Vise

HAUBEX uses a modified version of the Makro-Grip® 5-Axis Vise as the workholding device. The slim design of the vise and the narrow 46 mm jaw width ensure ideal accessibility for 5-sided machining of blanks. Examples of possible dimensions and a formula for these calculations can be found under section 2.2, "Permitted Workpiece Dimensions".

HAUBEX 5-Axis Vise				
Height [mm]	Holding forces [N]	Dimensions Ø [mm]	Grid size	Max. workpiece size [mm]
65	14.000	120	52	ca. 80 x 75 x 70

HAUBEX Set-Up Station

The HAUBEX Set-Up Station offers an easy and fast way to prepare the clamping device hood for automated use.



HAUBEX Set-Up Station		
Length [mm]	Width [mm]	Height [mm]
144	140	33

2.2 PERMITTED WORKPIECE DIMENSIONS (AUTOMATIC OPERATION)

Due to the taper of the workholding hood, the max. permitted diagonal (D) of the workpiece varies depending on the contact surface and workpiece height (H). With the available contact surface used and the workpiece height (H), determine the permitted workpiece diagonal (D) and use that to calculate the permitted workpiece width (W).

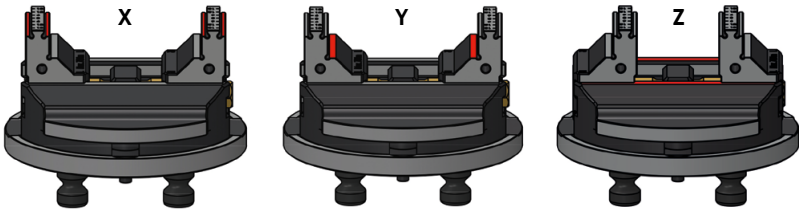
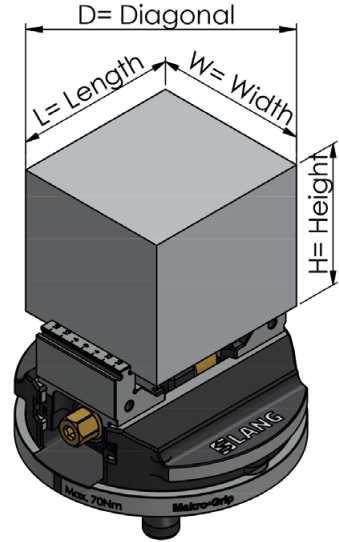
$$W = \sqrt{D^2 - L^2}$$

Example:

Workpiece length: 70 mm
 Contact surface: Y
 Workpiece height: 60 mm
 Determined permitted diagonal: 111 mm

$$W = \sqrt{111^2 [\text{mm}] - 70^2 [\text{mm}]} = 86.1 \text{ mm}$$

The workpiece width in this case must not be greater than 86.1 mm.



Contact surface	X	Y	Z
L[mm]	6-80	40-75	0-40
H[mm]	max. 70	max. 81	max. 94

Permitted diagonal [mm]	Height (X) [mm]	Height (Y) [mm]	Height (Z) [mm]
113	0 - 25	0 - 36	0 - 49
112	>25 - 40	>36 - 51	>49 - 64
111	>40 - 55	>51 - 66	>64 - 79
110	>55 - 70	>66 - 81	>79 - 94

For workpieces with the max. permitted dimensions, the workpiece must be clamped exactly in the center, since otherwise the workholding hood will collide with the workpiece edges. Check this before pre-stamping multiple workpiece blanks. Please feel free to download the CAD data offered on our website for checking purposes.



LANG TECHNIK NOTE

On our website we offer a workpiece size calculator that allows you to easily check if your workpiece is suitable for automated use with HAUBEX.

2.3 MATERIAL

Component	Material
Plate, screws, rods, pins, bearings, tool holder, 5-axis vise	Steel
Cover ring, workholding hood	Aluminum
Seals	NBR70
Cover and protective plug	Plastic IXEF 1032 (PAA Gf60)

2.4 SCOPE OF SUPPLY

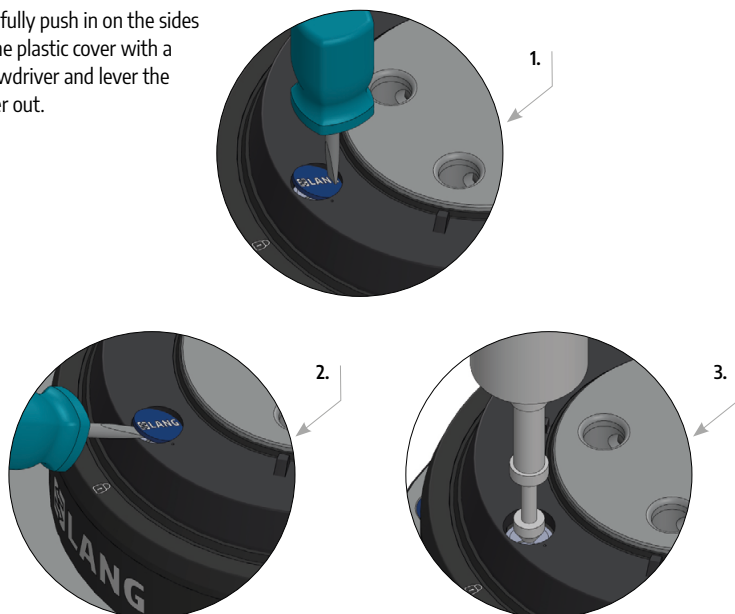
The scope of supply includes only the items you ordered. The Quick•Point® Grip Plate, an example of which is item no. 45863 shown in the table on page 3 as an option, is not included in the scope of supply and must be ordered separately.

2.5 MAINTENANCE AND REPAIR

Zero-point clamping system, Item no. 61110

Grease the bearings every 10,000 clamping cycles with roller bearing grease KP2N-20 (DIN 51825), NLGI Grade 2. Remove the blue plastic covers and grease the bearings with a grease gun (use pointed nozzle).

Carefully push in on the sides of the plastic cover with a screwdriver and lever the cover out.



Workholding hood, Item no. 61125

Check the position of the safety element of the workholding hood before each use, making sure that the axis of the cylindrical pin is in the marked area. See section 3.1 (Workholding hood)

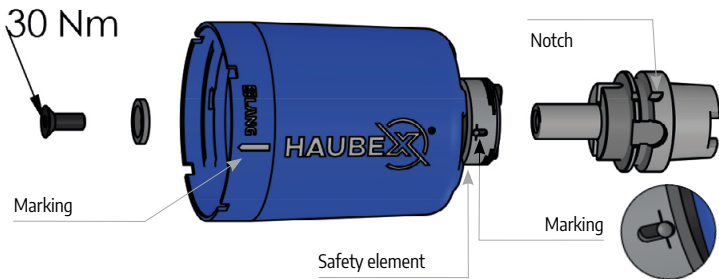
Please contact LANG Technik GmbH directly with any questions or if any item is malfunctioning
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3.1 WORKHOLDING HOOD, ITEM NO. 61125

Position the workholding hood correctly on the tool holder and secure it with the supplied flat-head screw (30 Nm). The notch on the tool holder should be on the same side as the marking on the workholding hood.

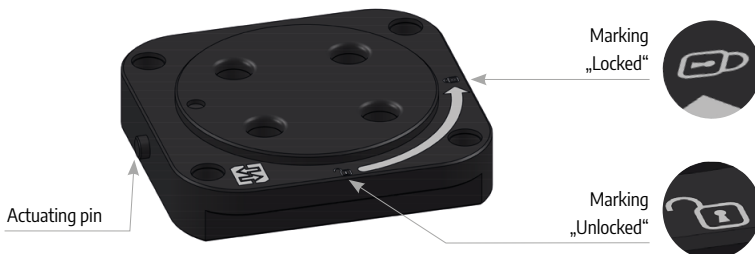
Since the BT40 tool holders don't have any notches and thus can be inserted into the tool magazine in two different positions, the position of the workholding hood must be defined when the tool holder is inserted, e.g. the workholding hood points toward the machine operator when inserted into the tool magazine.

Check the position of the safety element of the workholding hood before each use, making sure that the axis of the cylindrical pin is in the marked area. If this is not the case, the workholding hood has been moved too far onto the clamping tower. In this case, check the workholding hood as well as the safety element for damage and replace any damaged components. Possible causes for this could be incorrect measurement of the workholding hood or incorrect Z axis positioning.

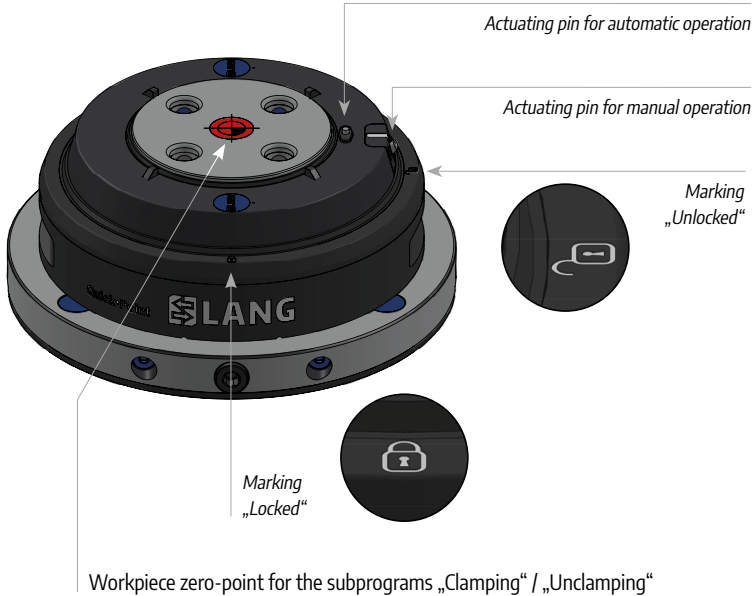


3.2 SET-UP STATION, ITEM NO. 61115

To secure directly to the set-up station (e.g. on a workbench), the rubber feet need to be removed first. Alternatively, the set-up station, when used, can also be clamped in a vise. For information on how the set-up station works, see sections 3.7 and 3.8.



3.3 ZERO-POINT CLAMPING SYSTEM, ITEM NO. 61110



- 1. Clamp the zero-point clamping system (item no. 61110), with the “unlocked” marking pointing to the right, into the Quick•Point® 96 zero-point plate.
- 2. Check whether the zero-point clamping system is unclamped (both actuating pins are extended and are aligned with the “unlocked” marking).
- 3. If not, set manually to the “unlocked” position. (Section 3.4, “Manual Operation”)



Make sure that the zero-point clamping system is set to “unlocked” and the protective plugs have been removed from the locating holes before starting automatic operation. **Collision hazard!**

Make sure that the zero-point clamping system is set to “locked” before starting to machine the workpiece.

3.4 ZERO-POINT CLAMPING SYSTEM, ITEM NO. 61110, MANUAL OPERATION



- 1. Insert the hand lever into the side of the zero-point clamping system.
- 2. Unlock the zero-point clamping system by operating the actuating pin on the side and use the hand lever to twist the clamping ring slightly.
- 3. Take pressure off the actuating pin and continue turning the clamping ring to the desired "locked" or "unlocked" position until the actuating pin extends again, locking the zero-point clamping system.
- 4. Remove the hand lever.



Make sure that the hand lever is removed before machining the workpiece!
Collision hazard!

Compatible workholding device in manual operation:

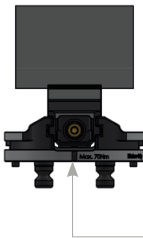
- All Quick•Point® 52 workholding devices up to a length of 210 mm
- Fixtures and workpieces with mounted Quick•Point® 52 clamping studs up to 210 mm long

3.5 INSERTING THE 5-AXIS VISE (WITHOUT SET-UP STATION)



- Clamp the workpiece centrally in the 5-axis vise. For workpieces with the max. possible dimensions, the workpiece must be clamped exactly in the center. Otherwise the workholding hood will collide with the workpiece edges. Check this before pre-stamping multiple workpiece blanks.
- Place the 5-axis vise onto a workbench and set the workholding hood in the center of the 5-axis vise from above, making sure that the marking of the workholding hood and the 5-axis vise are aligned.

Marking



Marking



- Turn the workholding hood counterclockwise until you feel resistance. (Approx. 45°)
- Press in the locking pins on the underside of the 5-axis vise while simultaneously continuing to turn the workholding hood a few degrees further.
- Release the pressure on the locking pins and continue turning the workholding hood until the locking pins extend, locking the 5-axis vise in the workholding hood. (Total rotation = 90°)



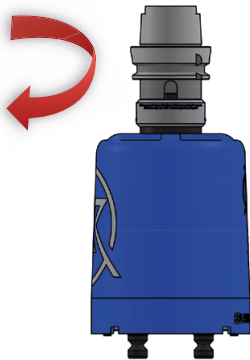
Locking pins



- Check if both locking pins are extended.
- Measure the workpiece length. (Section 3.9, “Measuring”)
- Place the workholding hood into the tool magazine and enter the measured workpiece length into the tool memory (NC program).

Pay attention to the maximum permitted tool dimensions as well as the max. permitted tool weight of your tooling machine. Depending on the machine type, dimensions and total weight of the workholding hood, it may be necessary to leave the areas next to it in the magazine empty and to select a slower tool change speed. Information on the total weight without a workpiece can be found in section 1.3.

3.6 REMOVING THE 5-AXIS VISE (WITHOUT SET-UP STATION)

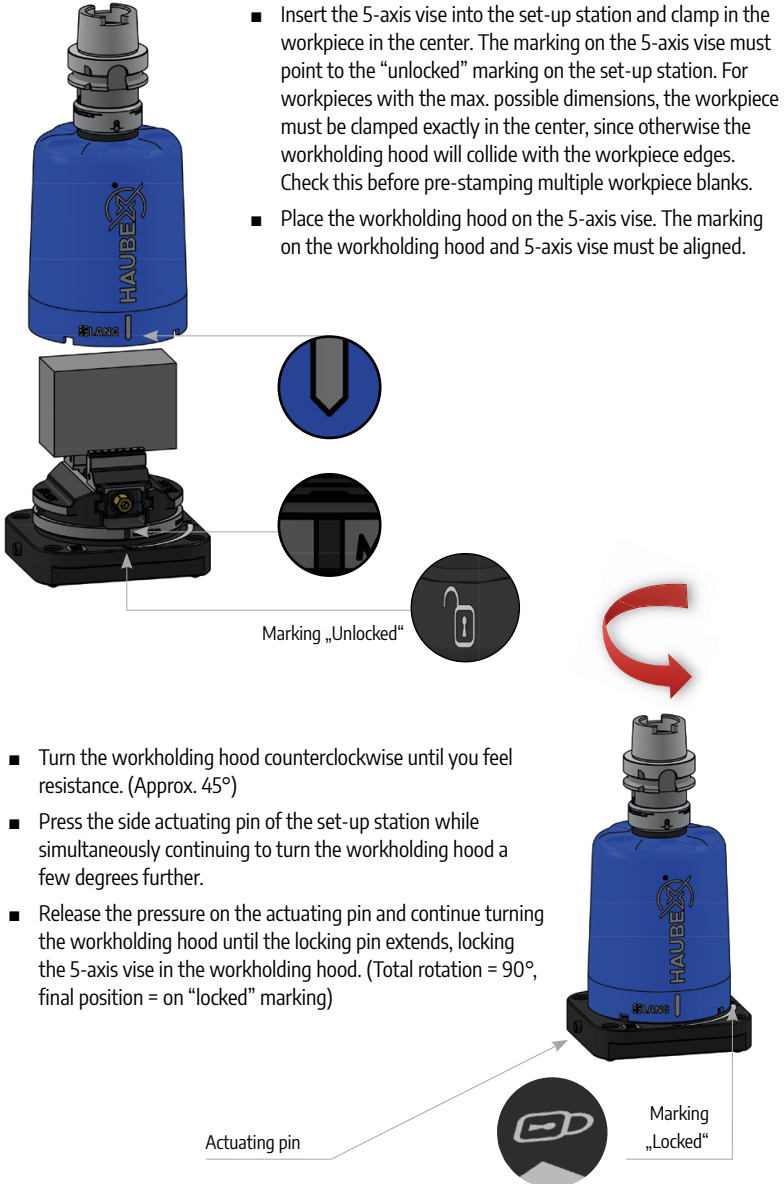


- Set the workholding hood with the 4 clamping studs of the 5-axis vise down on a workbench.
- Press in the locking pins on the underside of the 5-axis vise while simultaneously continuing to turn the workholding hood a few degrees clockwise.
- Release the pressure on the locking pins and continue turning the workholding hood until it can be lifted off. (Total rotation = 90°)

- Remove the workholding hood from above and unclamp the workpiece.



3.7 INSERTING THE 5-AXIS VISE (WITH SET-UP STATION)





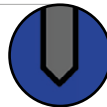
- Remove the 5-axis vise from the set-up station and check whether both locking pins are extended.
- Measure the workpiece length. (Section 3.9, “Measuring”)
- Place the workholding hood into the tool magazine and enter the measured workpiece length into the tool memory. Pay attention to the maximum permitted tool dimensions as well as the max. permitted tool weight of your tooling machine. Depending on the machine type, dimensions and total weight of the workholding hood, it may be necessary to leave the areas next to it in the magazine empty and to select a slower tool change speed. Information on the total weight without a workpiece can be found in section 2.1.

3.8 REMOVING THE 5-AXIS VISE (WITH SET-UP STATION)

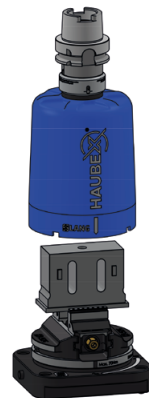


- Insert the 5-axis vise with workholding hood into the set-up station. The marking of the workholding hood should point to the “locked” marking of the set-up station.
- Press the side actuating pin of the set-up station while simultaneously turning the workholding hood a few degrees clockwise.
- Release the pressure on the actuating pin and continue turning the workholding hood until it can be lifted off. (Total rotation = 90°, final position = on “unlocked” marking)

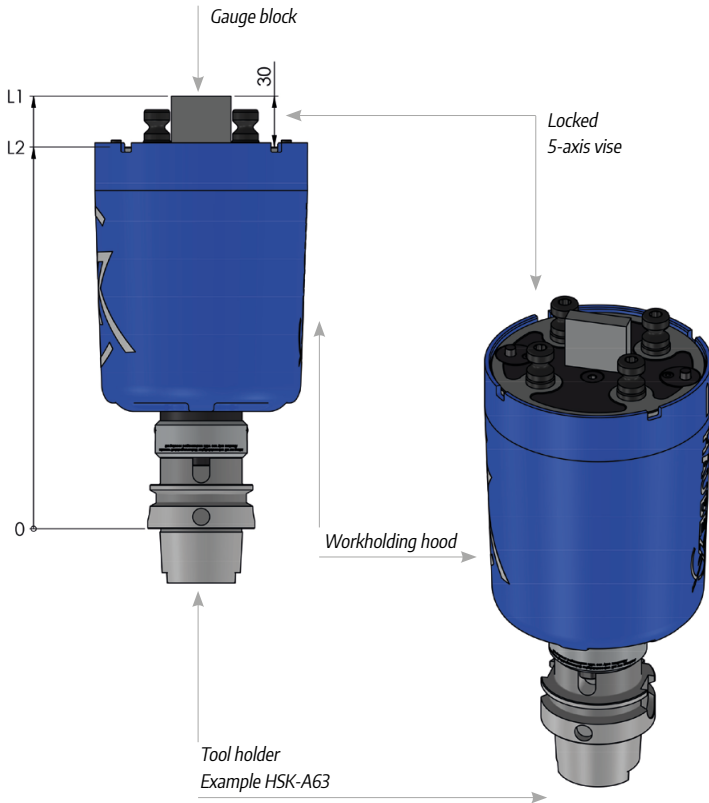
Marking „Locked“



- Remove the workholding hood from above and unclamp the workpiece.



3.9 MEASURING



- Clamp the workholding hood with locked 5-axis vise into a presetting device.
- Place a 30 mm high gauge block in the center of the contact surface of the 5-axis vise.
- Measure the entire length of the workholding hood at the top edge of the gauge block.
- Place the workholding hood into the tool magazine and record the previously measured tool length.

Depending on the subprogram structure, the length measured at the gauge block can be specified directly or will have to be calculated.

Direct entry without calculation (L1):

- The same gauge block height must always be used.
- For all intents and purposes, the calculation is made in the program.
- With a gauge block, 30 is equivalent to the value Z-29.9 ... Contact surface of 5-axis vise is at the same height as contact surface of zero-point clamping system.

Entering a calculated value (L2):

- The gauge block height must be subtracted from the measured total length.
- Z +0.1 equals... Contact surface of 5-axis vise is at the same height as contact surface of zero-point clamping system.

Tool holder	L 1 [mm]	L2 [mm]
HSK-A63	ca. 254,6	ca. 224,6
SK40	ca. 247,6	ca. 217,6
BT40	ca. 257,6	ca. 227,6

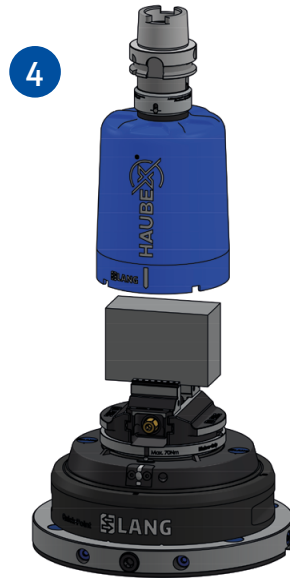
4.1 “CLAMPING” SUBPROGRAM



Workholding hood with locked 5-axis vise is placed into the machine spindle from the tool magazine.

Start of “Clamping” subprogram

- The workholding hood is positioned centrally over the zero-point clamping system.
 - The zero-point clamping system must be in the “unlocked” position. (Section 3.3, “Zero-Point Clamping System”)
 - The marking on the workholding hood must be aligned with the “unlocked” symbol on the zero-point clamping system.
- The machine spindle moves gently into position until the 5-axis vise is on the zero-point clamping system and the actuating pin simultaneously unlocks the mechanism for the zero-point clamping.



- The machine spindle is incrementally rotated 90° clockwise in single steps. (Approx. 5 sec) (92° to clamping position and back 2° again for free travel of the workholding hood)
- This clamps the 5-axis vise in the zero-point clamping system while simultaneously unlocking it in the workholding hood.
- The machine spindle travels upward with the workholding hood and locks the zero-point clamping system by releasing the actuating pin.
- The empty workholding hood is placed in the tool magazine.

End the “Clamping” subprogram

- Start workpiece machining

4.2 EXAMPLE OF HAUBEX “CLAMPING” NC SUBPROGRAM

Control: Siemens Sinumerik 840D sl

N10 SPOS=X (0/90/180/270)

N20 G0 X0 Y0

N30 G0 Z0*

N40 G1 Z-20* F500

N50 G1 Z-29.9* F100

N60 POSITION1: SPOS=IC(0.4)

N70 REPEATB POSITION1 P=229

N80 POSITION2: SPOS=IC(-0.4)

N90 REPEATB POSITION2 P=4

N100 G1 Z30* F100

N110 G0 Z150*

Determine value X:

Place the workholding hood into the machine spindle and position it at **0° / 90° / 180° / 270°**

The angular position at which the marking of the workholding hood points to the right [aligned with (unclamped) marking of 5-axis vise] is entered as positioning in block N10.

- N10 Set the machine spindle angular position. [Marking of workholding hood is aligned with (unlocked) marking of zero-point clamping system]
- N20 Position machine spindle centrally over the zero-point clamping system.
- N30 Position 5-axis vise with clamping studs approx. 8 mm above zero-point clamping system.
- N40 Slower placement of clamping studs of 5-axis vise into the zero-point clamping system.
- N50 Gentle placement of 5-axis vise on zero-point clamping system.
- N60 Turn machine spindle incrementally clockwise by 0.4° .
- N70 Repeat block N60 229 times; results in a total of 91.6° (slow twisting).
Total rotation, block N50 + N60 = 92°
- N80 Turn machine spindle incrementally counterclockwise by 0.4° .
- N90 Repeat block N80 4 times; results in a total of 1.6° (slow twisting).
Total rotation, block N80 + N90 = 2° (free travel of hood)
- N100 Slower free travel in the Z axis.
- N110 Free travel in the Z axis.

* The total length of the workholding hood with inserted 5-axis vise (tool length) is measured via a gauge block (30 mm) on the presetting device.

The determined value can now be entered directly into the tool memory without subtracting the height of the gauge block.

Alternatively, you can also subtract the height of the gauge block from the determined value and enter the length measured up to the contact surface of the 5-axis vise. Please note that in this case other Z axis values apply. See section 3.9, "Measuring".

4.3 “UNCLAMPING” SUBPROGRAM

1



2



- To ensure trouble-free changeover, all interfaces and surfaces involved must be cleaned before removal. We recommend using the Clean•Tec Chip Fan after machining.

The empty workholding hood is taken from the tool magazine and clamped into the machine spindle.

Start of “Unclamping” subprogram

- The workholding hood is positioned centrally over the zero-point clamping system.
- The marking on the workholding hood must be aligned with the marking on the 5-axis vise.



- The machine spindle moves gently into position until the workholding hood arrives at its final position, unlocking the mechanism by pressing down on the actuating pin.



- The machine spindle is turned incrementally counterclockwise 90° in single steps until it reaches the “unlocked” marking. (92° to clamping position and back 2° again for free travel of the workholding hood)
- This unclamps 5-axis vise in the zero-point clamping system while simultaneously locking it in the workholding hood.

5



- The machine spindle moves upward with the workholding hood, locking the 5-axis vise once more.

End of “Unclamping” subprogram

- Workholding hood is placed with the 5-axis vise in the tool magazine.

4.4 EXAMPLE OF HAUBEX “UNCLAMPING” NC SUBPROGRAM

Control: Siemens Sinumerik 840D sl

N10 SPOS=X (0/90/180/270)

N20 G0 X0 Y0

N30 G0 Z135*

N40 G1 Z20* F500

N50 G1 Z-29.9* F100

N60 POSITION1: SPOS=IC(-0.4)

N70 REPEATB POSITION1 P=229

N80 POSITION2: SPOS=IC(0.4)

N90 REPEATB POSITION2 P=4

N100 G1 Z20* F100

N110 G0 Z150*

Determine value X:

Place the workholding hood into the machine spindle and position it at
0° / 90° / 180° / 270°

The angular position at which the marking of the workholding hood points forward [aligned with the 5-axis vise marking] is entered as positioning in block N10.

- N10 Set the machine spindle angular position.
[Marking of workholding hood aligned with marking of zero-point clamping system]
- N20 Position machine spindle centrally over the zero-point clamping system.
- N30 Position the workholding hood with safety distance above the workpiece.
- N40 Slower pre-positioning of the workholding hood in the Z axis.
- N50 Gentle travel to the end pick-up position.
- N60 Turn the machine spindle incrementally 0.4° counterclockwise.
- N70 Repeat block N60 229 times; results in a total of 91.6° (slow twisting).
Total rotation, block N50 + N60 = 92°
- N80 Turn the machine spindle incrementally 0.4° counterclockwise.
- N90 Repeat block N80 4 times; results in a total of 1.6° (slow twisting).
Total rotation, block N80 + N90 = 2° (free travel of workholding hood)
- N100 Gentle pick-up of 5-axis vise.
- N110 Free travel in the Z axis.

* The total length of the workholding hood with inserted 5-axis vise (tool length) is measured via a gauge block (30 mm) on the presetting device.

The determined value can now be entered directly into the tool memory without subtracting the height of the gauge block.

Alternatively, you can also subtract the height of the gauge block from the determined value and enter the length measured up to the contact surface of the 5-axis vise. Please note that in this case other Z axis values apply. See section 3.9, "Measuring".

5.1 WORKHOLDING HOOD

- Before using the HAUBEX automation system, check whether your tooling machine (tool magazine, tool changer) is designed to handle the dimensions and total weight (workholding hood + tool holder + 5-axis vise + workpiece). See chapter 2 (Technical Data)
- When using the 5-axis vise in the workholding hood, the 5-axis vise must be locked, both pins of the 5-axis vise must be extended.
- Check the position of the workholding hood safety element before each use. The axis of the cylindrical pin must be aligned with the marking. See section 3.1 (Workholding Hood)
- The max. permitted spindle speed with which the hood may be operated is limited to 50 rpm.

5.2 MANUAL OPERATION

- The hand lever must be removed before starting workpiece machining.
- The zero-point clamping system must be set to “locked” when using the 5-axis vise.
- The zero-point clamping system must be set to “unlocked” when not using the 5-axis vise.

5.3 AUTOMATIC OPERATION

Program sequence: “Clamping the 5-axis vise”

- The protective plug and hand lever must be removed for automatic operation.
- No workholding devices may be used in the zero-point system.
- The zero-point clamping system must be in the “unlocked” position.
- The 5-axis vise must be locked in the workholding hood (both actuating pins extended).
- The workholding hood with inserted 5-axis vise must be measured correctly. See section 3.9 (Measuring)
- The measured value must be entered correctly in the tool memory for the associated workholding hood.
- The travel paths in the Z axis must fit the type of tool measurement. See section 3.6 (Measuring)
- The machine spindle axis position for inserting or picking up the workholding device must be $0^{\circ}/90^{\circ}/180^{\circ}/360^{\circ}$, depending on the machine.
- The approach to the set-down position must be gentle. See section 4.1 (Example of “Clamping” Subprogram)

- The clamping ring must be moved (turned) $+92^\circ$ from the starting point and then -2° back to release the workholding hood. (Total travel $+90^\circ$)
- The clamping ring must be moved (turned) gently (approx. 5 sec); before using for the first time, check this with the safety distance, but without the 5-axis vise inserted.
- Free travel of the empty workholding hood must be gentle.
- The zero-point clamping system must be locked again after lifting the workholding hood. (Both actuating pins are extended)

Program sequence: “Unclamping the 5-axis vise”

- The hand lever must be removed for automatic operation.
- A 5-axis vise must be inserted in the zero-point clamping system.
- The zero-point clamping system must be in the “locked” position.
- The zero-point system must be locked (both actuating pins extended).
- To pick up the 5-axis vise, an empty workholding hood must be selected.
- The travel paths in the Z axis must fit the type of tool measurement.
See section 3.9 (Measuring)
- The machine spindle axis position for inserting or picking up the workholding device must be $0^\circ/90^\circ/180^\circ/360^\circ$, depending on the machine.
- The approach to the pick-up position must be gentle.
See section 4.3 (Example of “Unclamping” Subprogram)
- The clamping ring must be moved (turned) -92° from the starting point and then $+2^\circ$ back to release the workholding hood. (Total travel -90°)
- The clamping ring must be moved (turned) gently (approx. 5 sec); before using for the first time, check this with the safety distance, but without the 5-axis vise inserted.
- The workholding hood with 5-axis vise must be lifted gently.
- The zero-point clamping system is locked again after lifting the workholding hood. (Both actuating pins are extended)

6.1 MALFUNCTIONS/ERRORS



Serious damage to the tooling machine, tool and workpiece may occur if the marking information and positions are not maintained. Exact compliance with the dimensional specifications in these operating instructions is required to prevent damage.

7 WARNINGS

7.1 INTENDED USE

The operating company is responsible for using the product as intended, with caution and under the appropriate conditions. In the event of improper use, no liability shall be assumed by the manufacturer, nor shall any refund be provided.

7.2 PERSONNEL REQUIREMENTS

Operating company responsibilities:

- Only trained personnel with the relevant background knowledge (specializing in metal), e.g. CNC operators, are authorized to work with the product.
- Personnel responsibilities with regard to installation, commissioning, operation, maintenance and repair must be clearly defined.
- Trainees may work with the product only when supervised by an experienced professional (specializing in metal) or by a CNC operator.

7.3 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY OF PERSONNEL

- Personal protective equipment (work clothes and non-slip safety footwear, gloves, hair net, etc.) must be worn as specified in the guidelines and regulations of the employer's liability association and the operating company. Obtain information from your employer's safety officer.



8.1 DISPOSAL AS SPECIFIED IN EU DIRECTIVE 2018/851

Comply with country-specific disposal regulations when disposing of equipment.



LANG Technik products are not considered household waste.
Failure to comply with disposal requirements is a regulatory offense.



Accessories and packaging are recycled in an environmentally friendly manner.

Product	Material	Disposal
Housing, screws, nuts, etc.	Metal	Separation of materials Recycle by melting down
Protective shield	Plastic	Recycle
Hoses	Rubber, PVC, steel	Separation of materials Recycle
PE film	Plastic	Recycle
Packing material	Pallet wood	Recycle
Hydraulic oil	Mineral oil	As per local regulations

9.1 SYMBOLS

Please pay attention to the following warning symbols



Read all the operating instructions carefully before commissioning for the first time and keep it in a safe place for future use



Please read and follow the technical and safety instructions



Direction indicator, correct rotation



The use of protective gloves made of tough, resistant material is recommended



A helmet and safety goggles are recommended for personal safety



To reduce the risk of eye injuries, wearing protective goggles as specified in EN 166 is recommended



Safety footwear are part of the protective equipment



Materials are recycled in an environmentally friendly manner



Do not dispose of the material in household waste



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