



HEINRICH KIPP WERK



OPERATING INSTRUCTIONS **KIPPFlexX 5-axis vice**

Edition 2021

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1. INTRODUCTION AND GENERAL INFORMATION



- Before using the KIPPflexX 5-axis clamping system, read all of the following information in these instructions carefully.
- The basis for operating the clamping system is knowledge of the general safety instructions and safety regulations.
- The accident prevention regulations (APR) for the respective location must also be observed.
- Observe the generally applicable technical rules when handling, cleaning and using the vice and its accessories.
- The vice may only be used with original spare parts and accessories.
- All the information must be observed by all persons who work with the KIPPflexX 5-axis clamping system.
- The clamping system is constructed according to the latest technology including all relevant safety regulations.
- The clamping system is to be used exclusively for holding workpieces that are machined on milling machines.
- This KIPPflexX 5-axis clamping system may only be used if all safety devices of the machine are absolutely functional.
- The KIPPflexX 5-axis clamping system can cause serious material damage if it is operated or mounted incorrectly. HEINRICH KIPP WERK GmbH & Co. KG will not in any circumstances be responsible for any type of damage caused by the operator.
- Exchange any components that are not in a perfect condition.
- If any additions or conversions are made to the 5-axis clamping system, all liabilities and quality feature guarantees expire.
- Basically, the General Terms of Sale, Delivery and Payment of HEINRICH KIPP WERK GmbH & Co. KG apply.



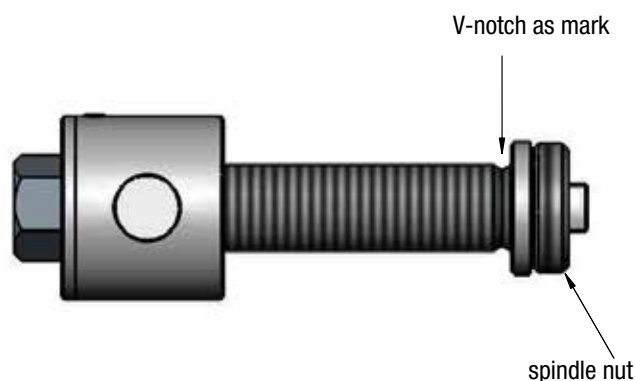
Attention: The following points must be observed!

- Do not exceed the permissible tractive force of 60 kN (at 140 Nm).
- The maximum clamping travel of 1 mm per jaw must not be exceeded at the downthrust clamping.
- Check that everything is correctly and securely mounted before any milling work.
- Check that all the screw connections are completely tightened to the correct torque.
- The clamped workpiece may only have a maximum parallel displacement of 0.5 mm along the entire clamping width.

- K0946 pin with \varnothing 6 mm cup point; universal pin for positive clamping without pre-embossing (e.g. machining blanks).

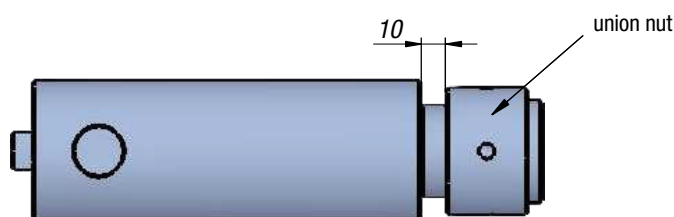


- The spindle nut may not be moved beyond the marking (V-notch) on the shaft. This ensures that a sufficient number of threads is always used.



- The union nut must contact the face of the extension shaft before assembly.

- To prevent damage to the thread, the distance between the union nut and the extension / adapter shaft when mounted must not exceed 10 mm.



3. DESCRIPTION

The KIPPflexX 5-axis clamping system is characterised by high stability, flexibility and user-friendliness. This 5-axis clamping system can be used as a positive-down force vice or as a normal vice for holding e.g. blanks. The user can decide if positive-down force is desired or not when operating the clamping unit.

- If both jaw units are locked, positive-down force is effected.
- If one jaw unit remains unlocked, this jaw can be moved and clamps using the normal vice principle.

(see 3.2 Technical explanation of the difference between positive-down force clamping and normal clamping)

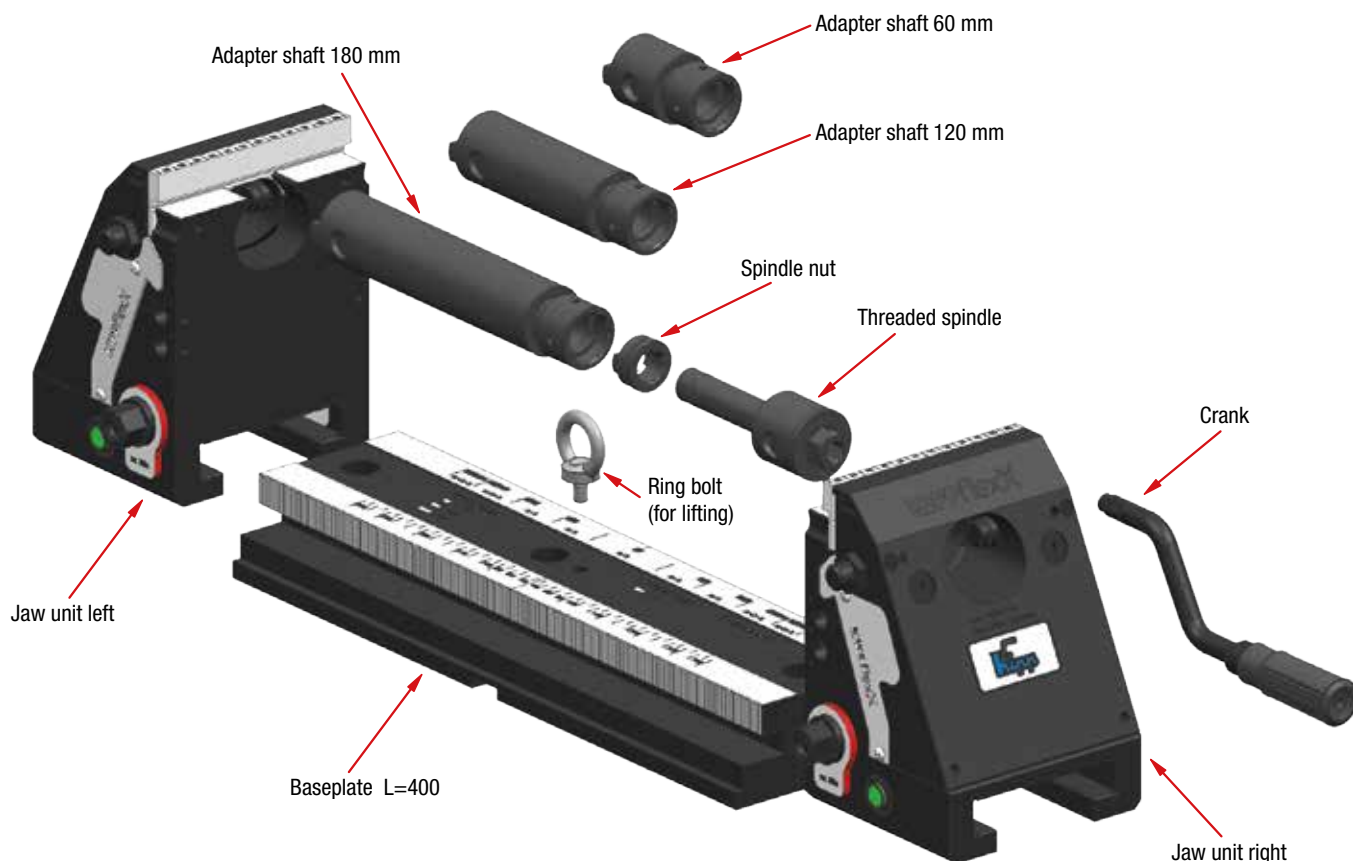
When using the positive-down function, the workpiece is pulled down onto the rest with a repeat accuracy of ± 0.01 mm. A workpiece clamping height of 180 mm enables very good accessibility with short tools when machining.

The clamping width is infinitely adjustable using a hand crank, thus reducing set-up times. Clamping is done using a torque wrench with max. 140 Nm, which results in an enormous clamping force of 60 kN directly in the spindle under the workpiece.

In addition, the closed geometries and the associated imperviousness to dirt reduce maintenance and service time to a minimum.

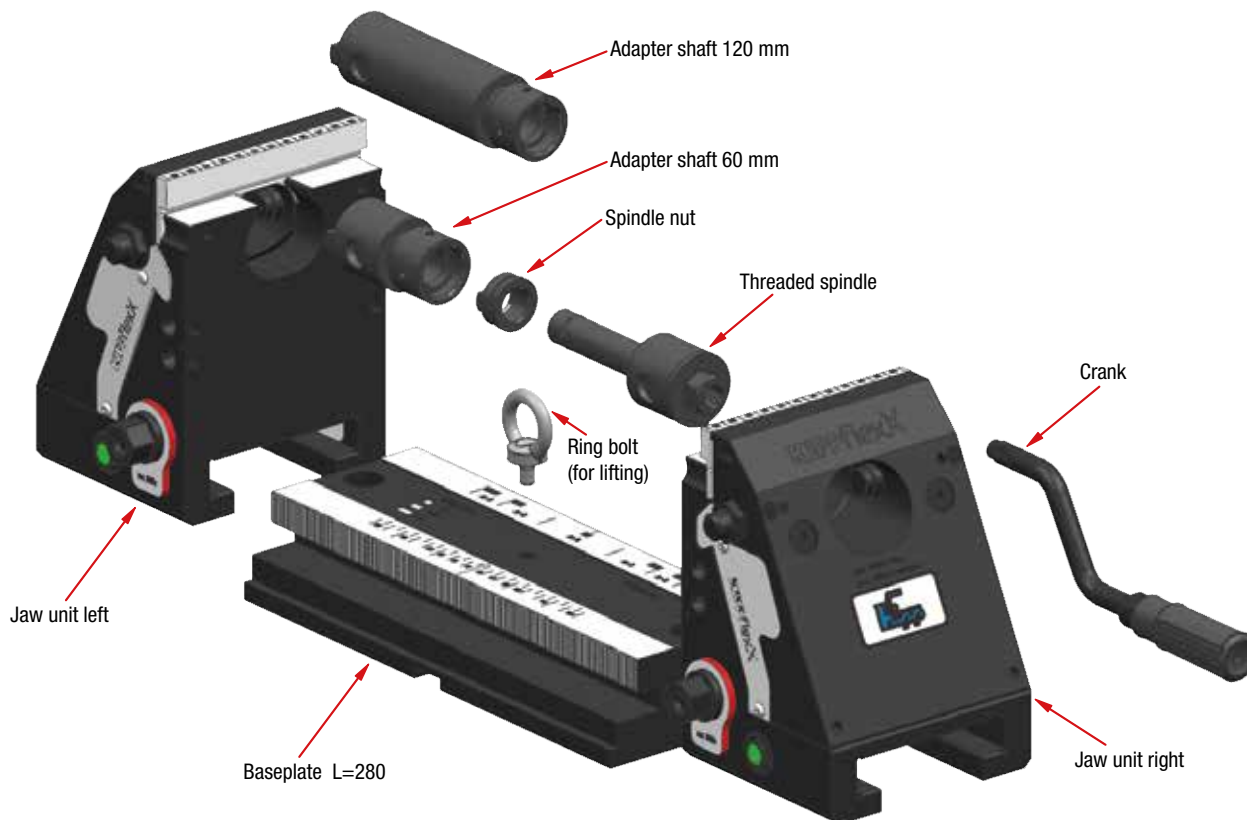
3.1 Clamping system overview

KIPPflexX 5-axis clamping system L=400 (package contents)

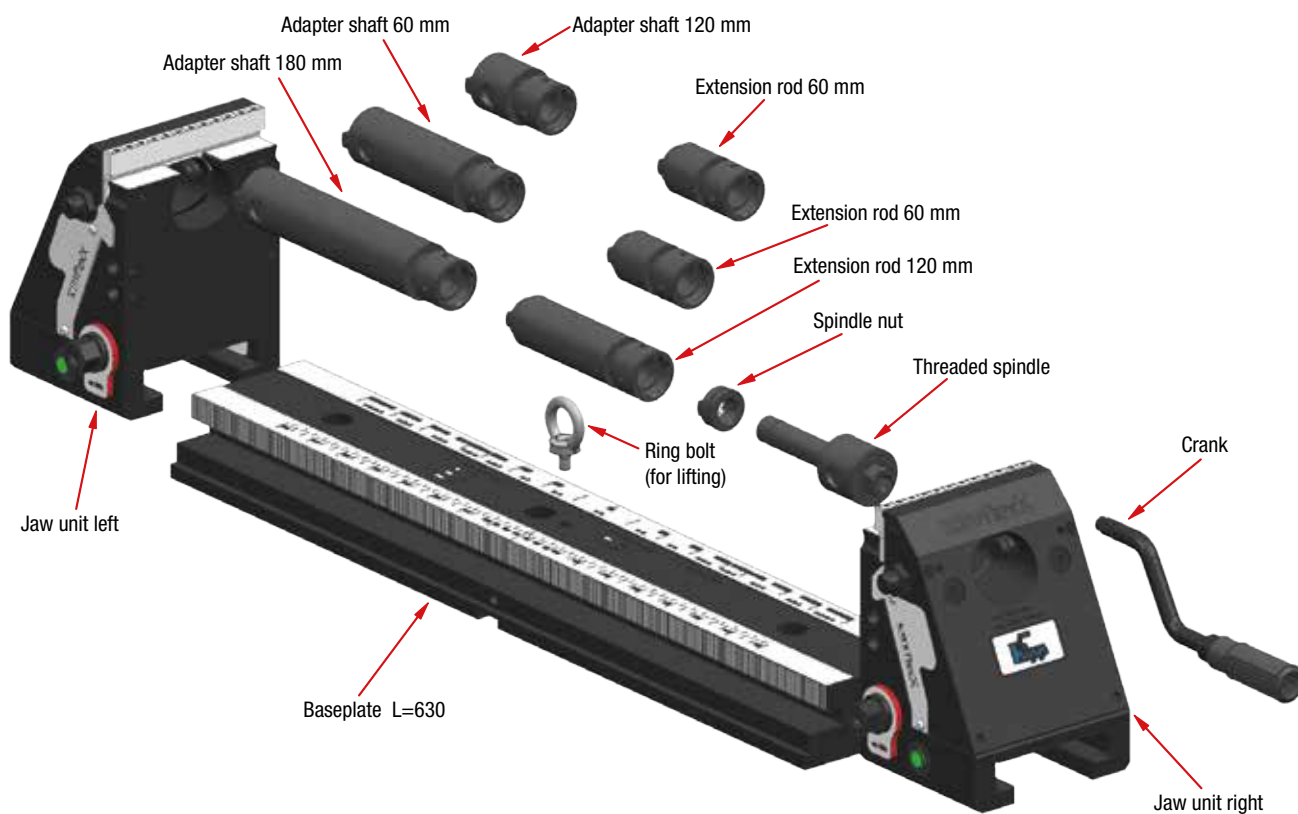


3. DESCRIPTION

KIPPflexX 5-axis clamping system L=280 (package contents)



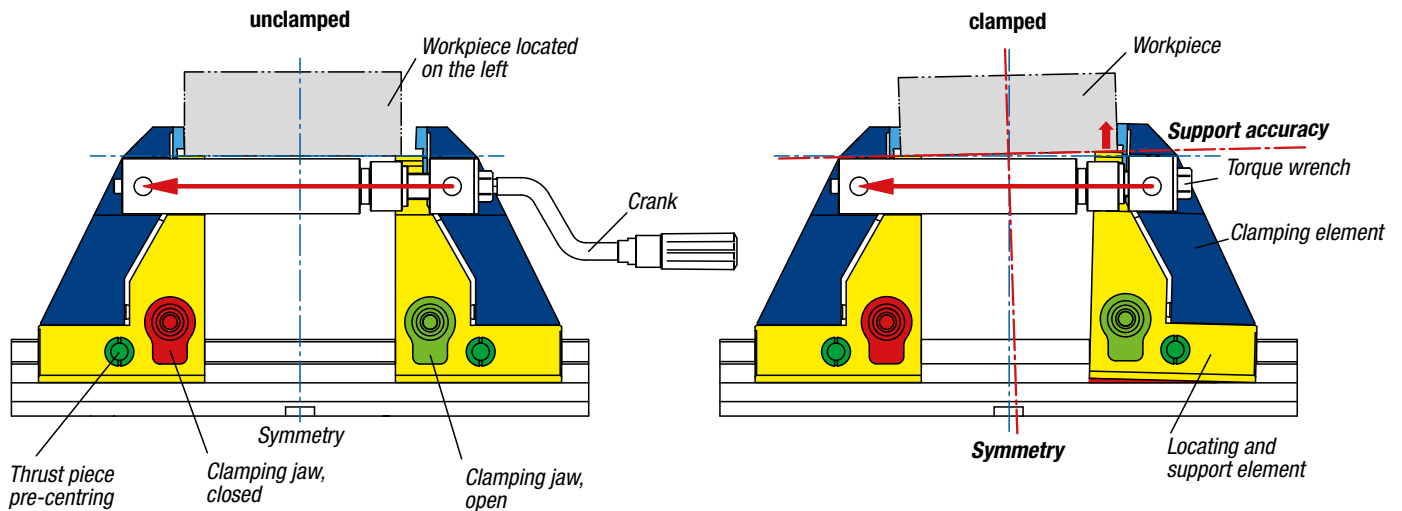
KIPPflexX 5-axis clamping system L=630 (package contents)



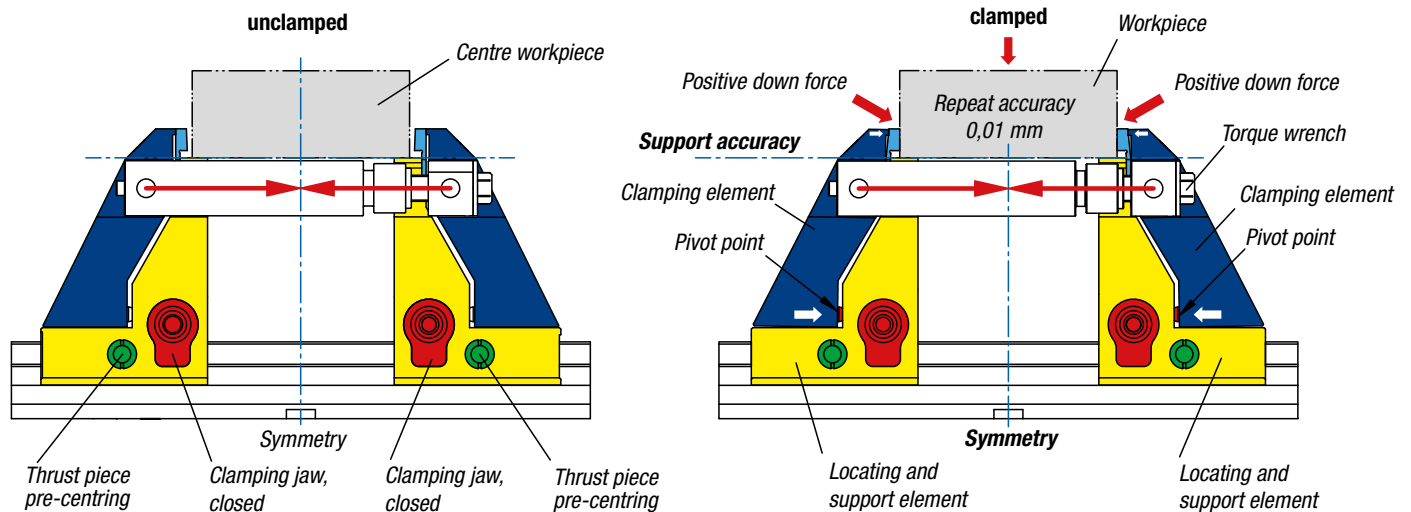
3. DESCRIPTION

3.2 Technical explanation of the difference between positive-down force clamping and normal clamping

Blank clamping / Vice principle

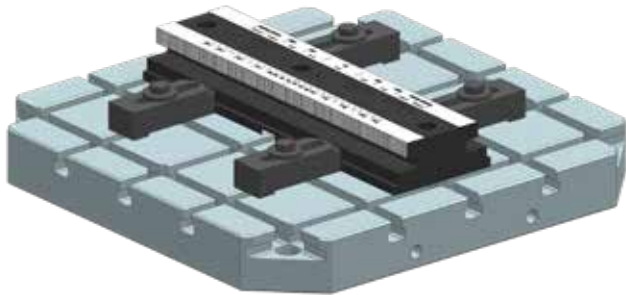


Downthrust clamping



3. DESCRIPTION

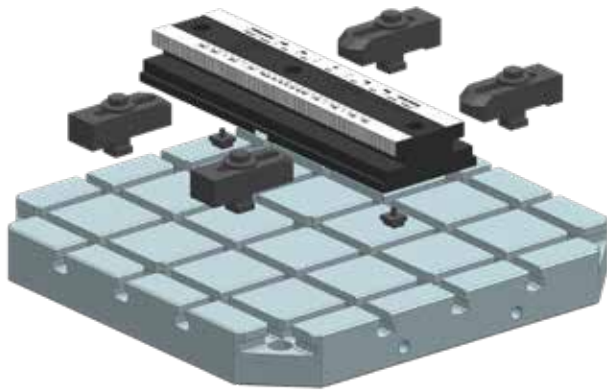
3.3 Mounting and positioning possibilities of the baseplate



Base plate on pallet with T-slots / machine table

→ using clamping claw sets

Positioning and fastening with clamping claw set **K1008** which is available as standard for M12 or M16

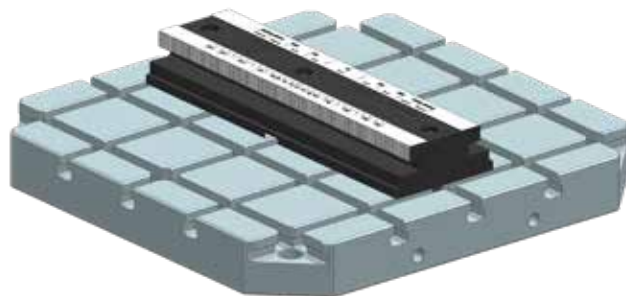


Clamping claw set **K1008** consisting of:

- 4x claw clamps (M12 or M16)
- 4x T-slot nuts (M12 or M16)
- 4x cap screws (M12 or M16)
- 4x washers (M12 or M16)

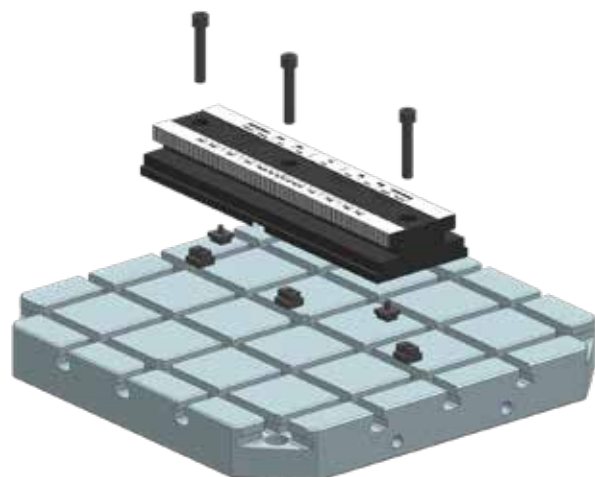
Optional:

- 2x slot guide keys for 14 mm or 18 mm T-slots
- 2x M6x12 fastening screws for slot guide keys



Base plate on pallet with T-slots / machine table

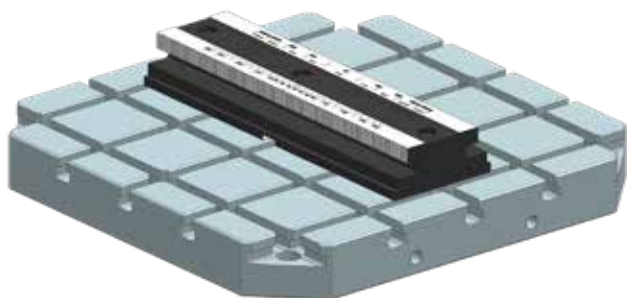
→ 3x M12x65 cap screws through the baseplate



Positioning and fastening with:

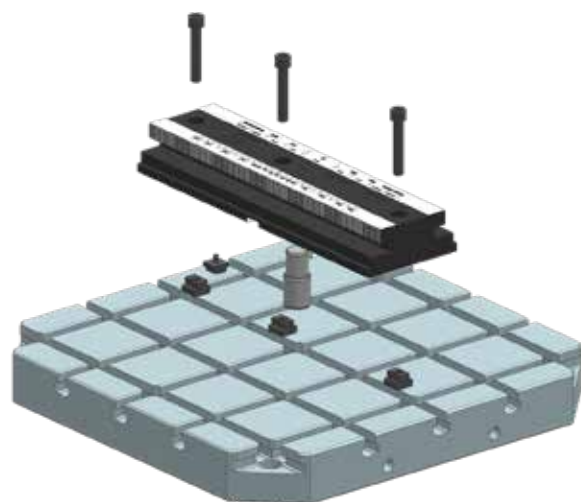
- 2x T-slot keys 14 or 18 mm
- 2x M6x12 fastening screws for slot guide keys
- 3x M12x65 cap screws
- 3x T-slot nuts (M12)

3. DESCRIPTION



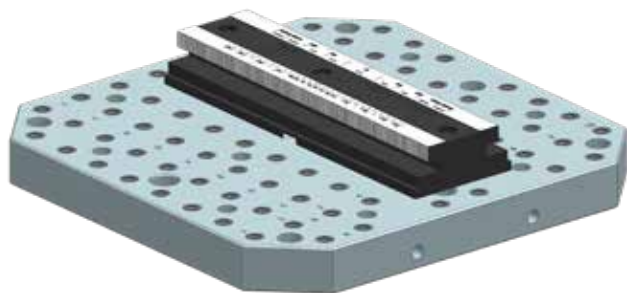
Baseplate on pallet with T-slots / machine table with central bore

→ over a central bolt + 1x slot guide key

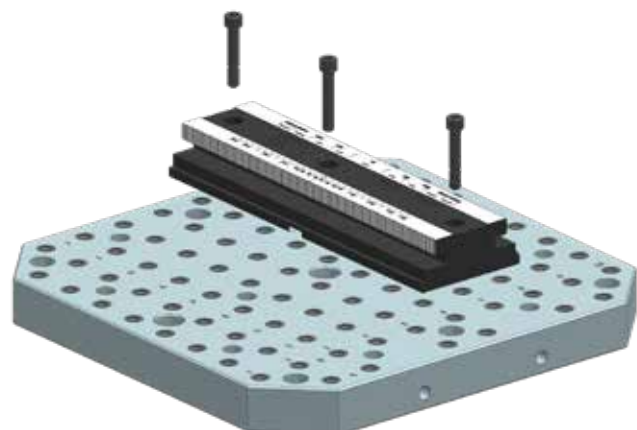


Positioning and fastening with:

- 1x central bolt
(customer specific depending on the central bore in the machine table)
- 1x 14/18 mm slot guide key
- 1x M6x12 fastening screw for slot guide key
- 3x M12x65 cap screws
- 3x 14 or 18 mm T-slot nuts



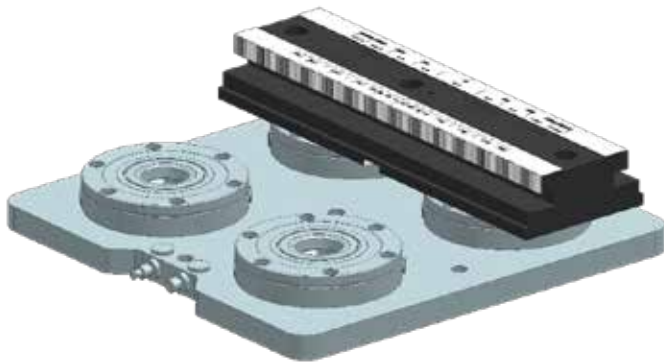
Baseplate on pallet with grid holes / grid hole plate



Positioning and fastening with:

- 2x M12x65 shoulder screws with f7 shaft (ends)
- 1x M12x65 cap screw (middle)

There are 3 reamed holes available for a 50 mm grid.



Baseplate on a zero-point clamping system

1x clamping pin form A

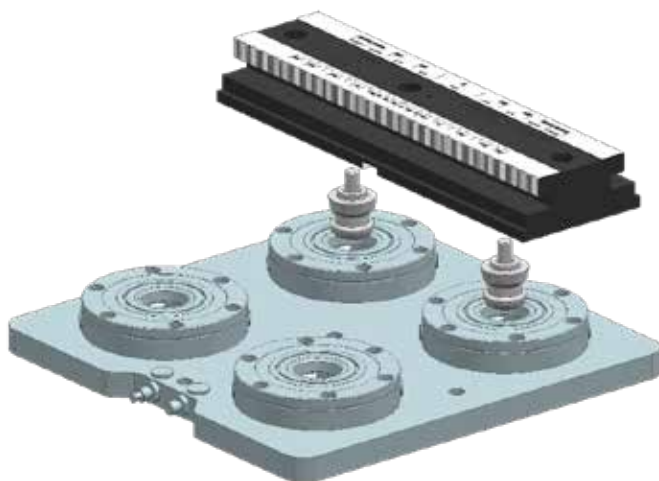
for 25 H7 bores, collar height 5 mm.

for M12 cap screw (centring pin)

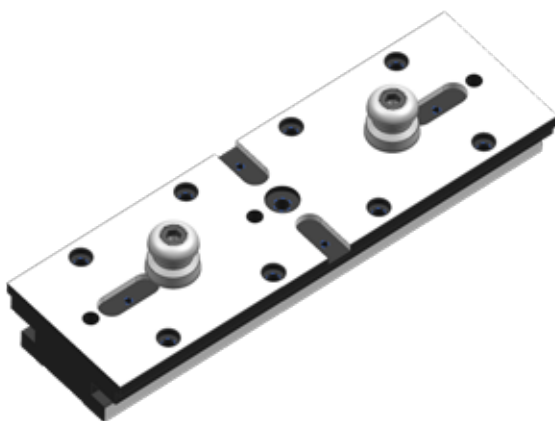
1x clamping pin form B

for 25 H7 bores, collar height 5 mm.

for M12 cap screw (compensating / bayonet pin)

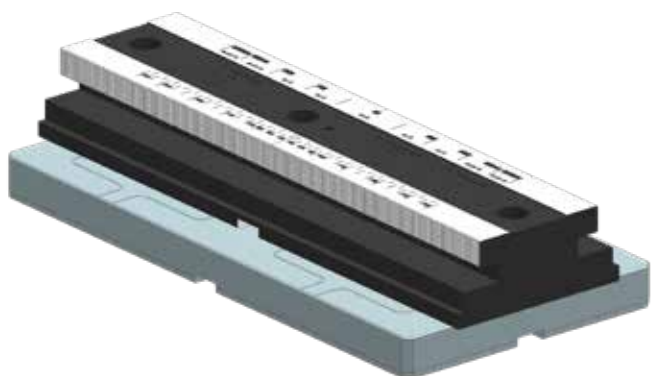


The clamping pins are screwed into the baseplate using M12 screws.
The centring in the baseplate takes place via 2x $\text{\O}25\text{H7}$ bores, whereby the clamping pins are positioned with repeat accuracy.



Bottom view of the baseplate with mounted zero point clamping pins.

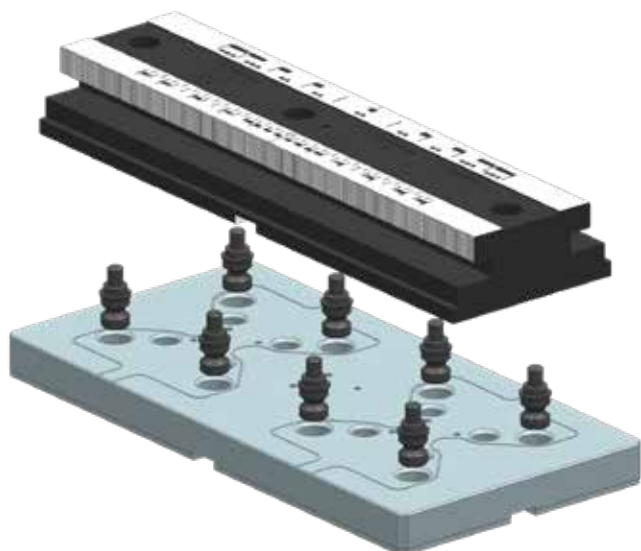
3. DESCRIPTION



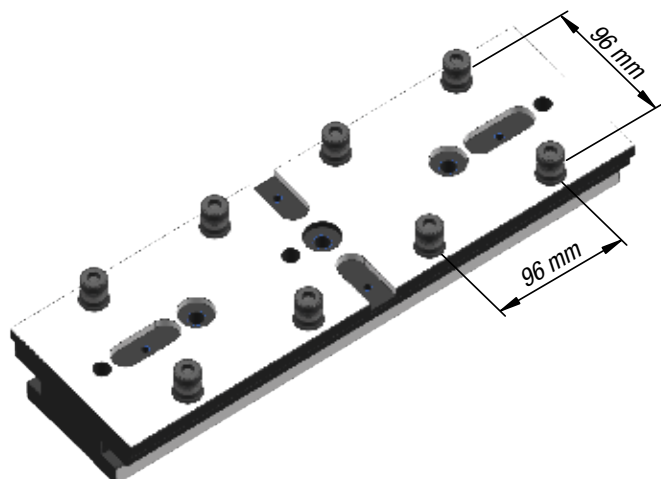
Base plate on zero point clamping system (96 gauge)

8x clamping bolts, can be screwed to the baseplate from below

Fit diameter $\varnothing 16H6$, thread M10, gauge 96mm

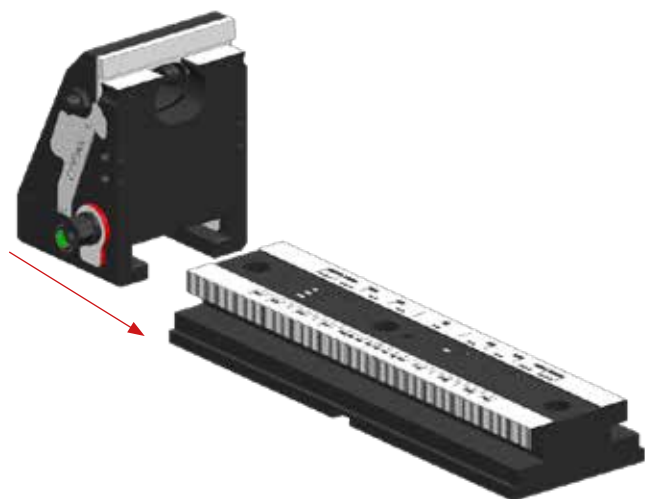


The clamping bolt is screwed to the baseplate using M10 screws.
The centring in the baseplate takes place via 8x $\varnothing 16H6$ bores, whereby the clamping pins are positioned with repeat accuracy.



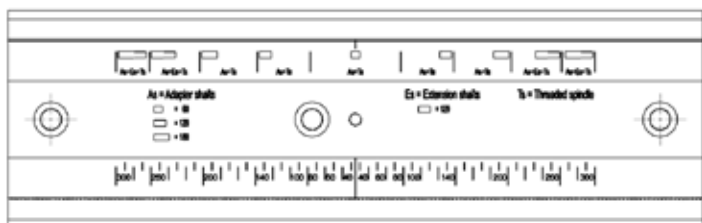
3. DESCRIPTION

3.4 Clamp construction sequence for vice/normal clamping



Slide the left jaw unit with clamping elements open onto the baseplate to the desired position.

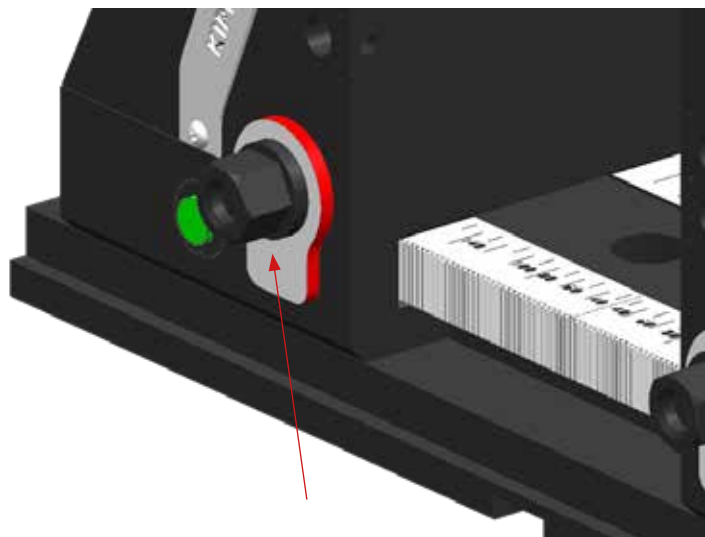
Ensure that the clamping elements do not protrude into the T-slot of the jaw unit, otherwise they may jam in the baseplate when pushed on.



The desired workpiece size and required adapter shafts can be read off using the symbols and scale and set on the base plate.

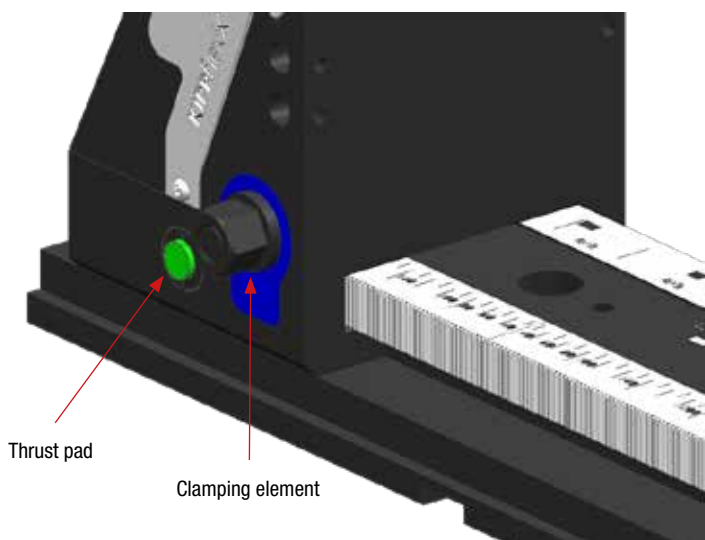
This enables a quick pre-positioning of the jaw unit in the desired clamping range.

3. DESCRIPTION



A red mark is visible on the periphery when the clamping element is open. This should be at least 2 mm clear.

Once the clamping element is later tightened, no red marking should be visible.

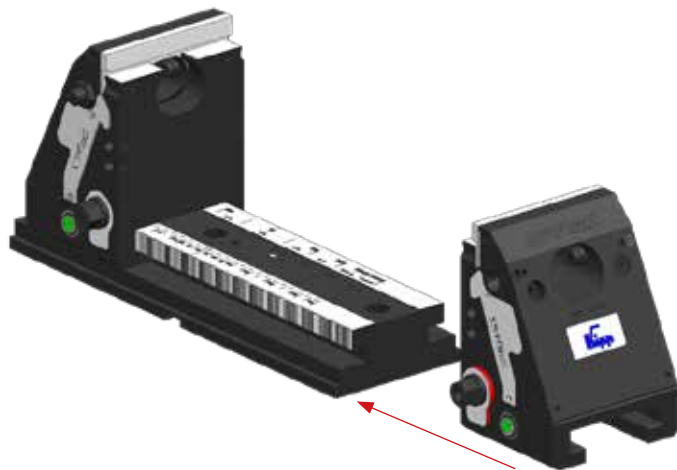


Pre-centre the jaw unit via thrust pins (shown in green) by pushing into the toothing.

Now tighten the nut on the clamping element (shown in blue) using a torque wrench set to min. 50 Nm / max.100Nm until the red marking is no longer visible.

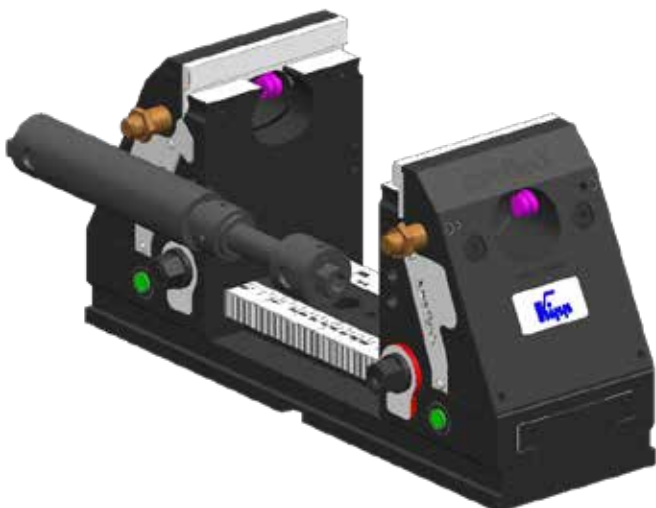
The jaw unit is now completely positively engaged with the baseplate through the toothing.

3. DESCRIPTION



The left jaw unit is now firmly fastened to the baseplate.

Slide the right jaw unit with clamping elements open onto the baseplate.



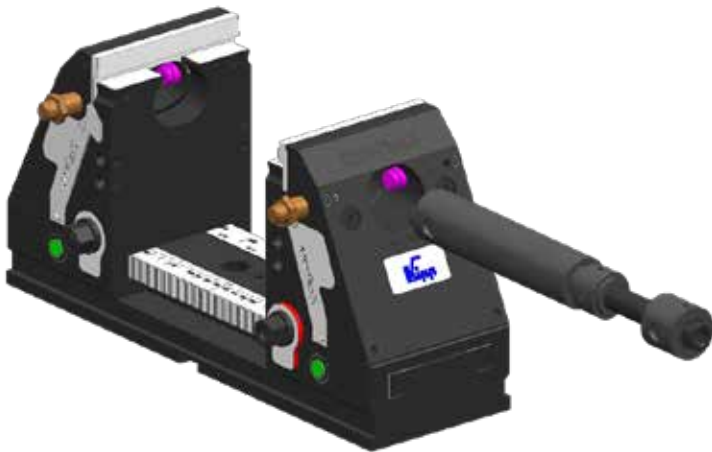
Pre-set the threaded spindle with the corresponding adapter shaft on the movable locking pin (shown in brown) before mounting on the vice.

The clamping shaft is later hung onto the fixed locking pin (shown in pink).



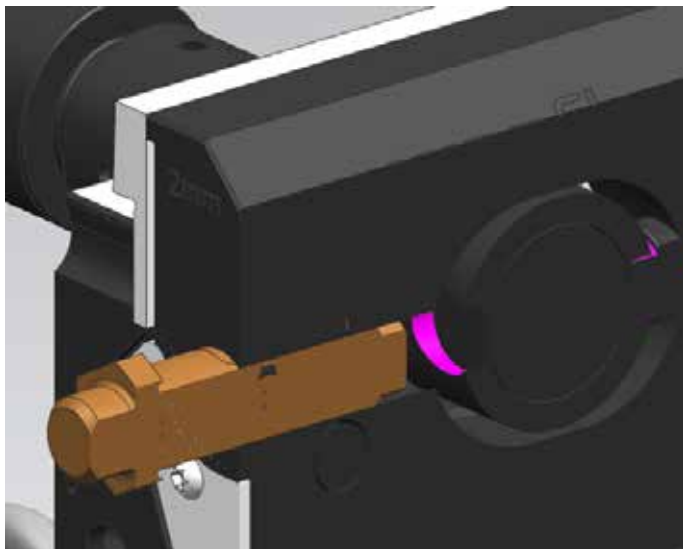
By presetting with the locking pins, a quick assembly of the threaded spindle incl. adapter shaft is achieved.

3. DESCRIPTION



Insert threaded spindle with corresponding adapter shaft. This can be done from both sides.

Then insert into the fixed locking pin (shown in pink) at the back.



Secure the indexing plunger (shown in brown) by turning it clockwise into the hole (shown in pink) of the threaded spindle and adapter shaft.

3. DESCRIPTION



The force-transmitting spindle is now secured in the KIPPflexX via the locking pins.

This type of mounting enables the KIPPflexX 5-axis clamping system to be used as a normal vice.



Use the crank handle to move the right-hand jaw unit to the appropriate clamping width.

The jaw unit can be infinitely adjusted through 60 mm via the threaded spindle.

The torque wrench **K1489.01** is recommended for tightening.

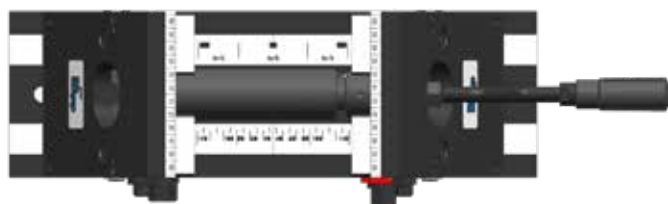
3. DESCRIPTION

3.5 Clamp construction sequence - positive-down force clamping

Follow all the previous steps carried out for the normal vice version



When using the KIPPflexX as a positive-down vice, the following must then be observed



Preset the KIPPflexX 5-axis clamping system using the crank handle

Example:

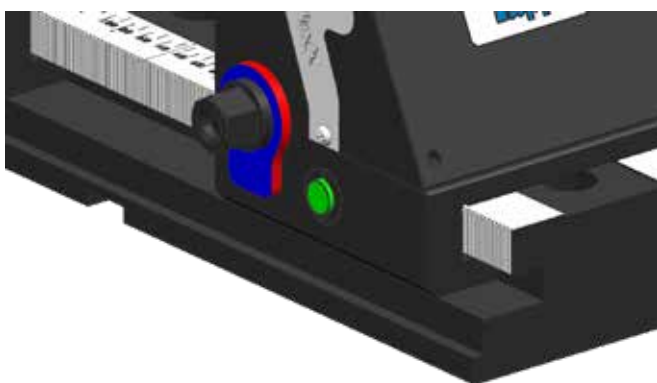
A workpiece is 145 mm long

To create a pull-down effect, a maximum of 2 mm must be added to the actual workpiece length (here max. 147 mm)

3. DESCRIPTION



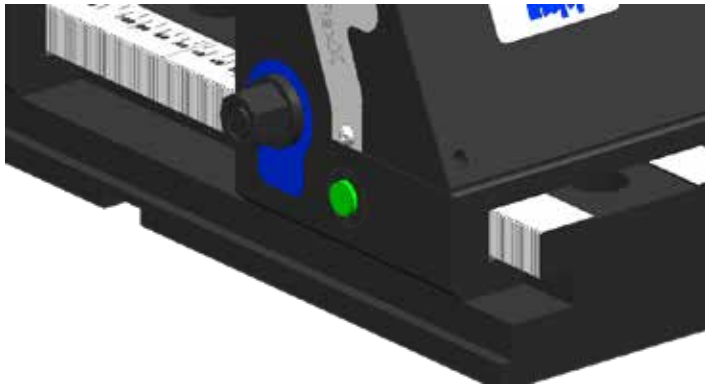
Lay the workpiece in and position it against the fixed jaw unit (here left).



Pre-centre the clamping unit in the tothing using the thrust piece (shown in green).

Then tighten the clamping piece (shown in blue) with the nut. (min. 50 Nm - max. 100 Nm).

3. DESCRIPTION



The red mark on both clamping elements is no longer visible and produces a form fit on the baseplate with the toothing.



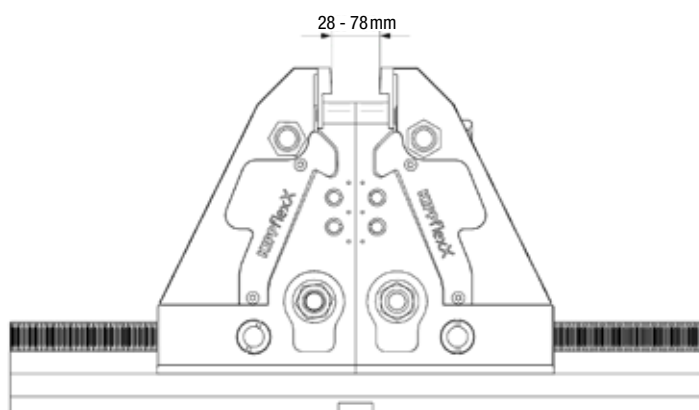
This type of mounting enables the KIPPflexX 5-axis clamping system to be used as a positive-down force vice.

The KIPP torque wrench **K1489.01** is recommended for tightening.

3. DESCRIPTION

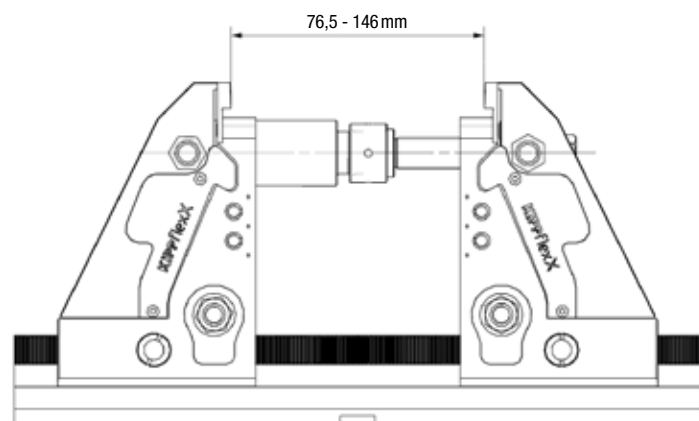
3.6 Match the clamping shaft to the workpiece length

Clamping width overview base plate L=400 mm



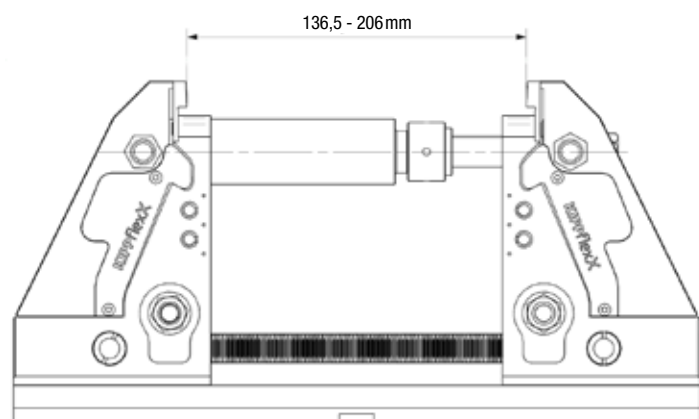
Clamping width 28 – 78 mm

Adapter shaft 60 mm + Threaded spindle



Clamping width 76,5 – 146 mm

Adapter shaft 120 mm + Threaded spindle



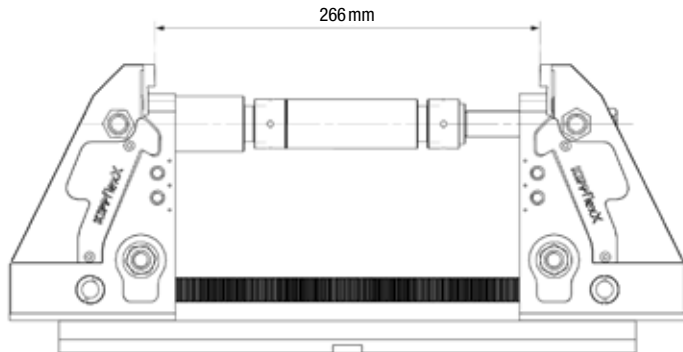
Clamping width 136,5 – 206 mm

Adapter shaft 180 mm + Threaded spindle



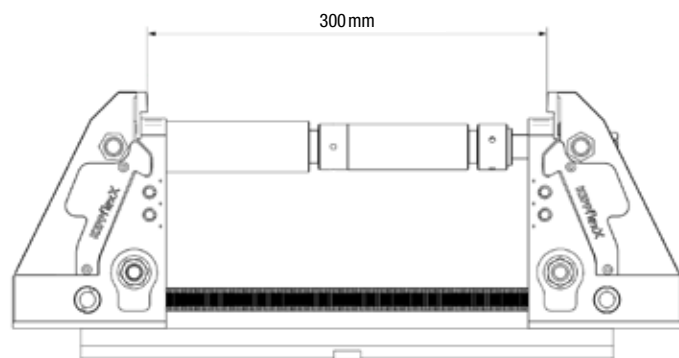
3. DESCRIPTION

For wider clamping widths (beyond the crank range) the 120 mm extension shaft (accessory) can be added.



Clamping width up to 266 mm

Adapter shaft 120 mm + Extension shaft 120 mm + Threaded spindle

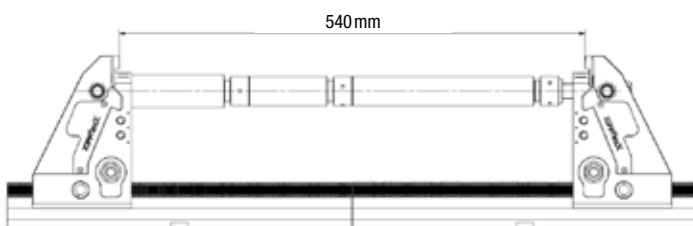


Clamping width up to 300 mm

Adapter shaft 180 mm + Extension shaft 120 mm + Threaded spindle

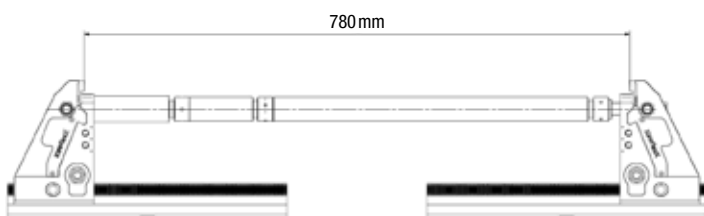


An infinite clamping range is achieved using a combination of 60, 120, 240, 480 mm extension shafts.



Clamping width up to 540 mm

Additional baseplate L=400 mm + Adapter shaft 180 mm +
Extension shaft 120 mm +
Extension shaft 240 mm + Threaded spindle



Clamping width up to 780 mm

Additional baseplate L=400 mm + Adapter shaft 180 mm +
Extension shaft 120 mm +
Extension shaft 480 mm + Threaded spindle

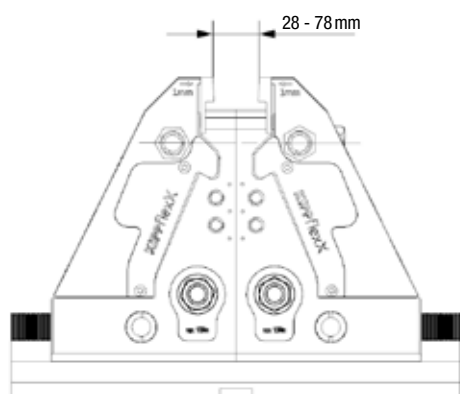


Clamping ranges up to ca. 1000 mm possible in combination with other base plates.

3. DESCRIPTION

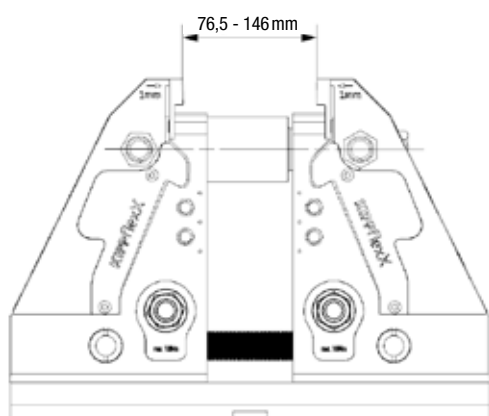


Clamping width overview base plate L=280 mm



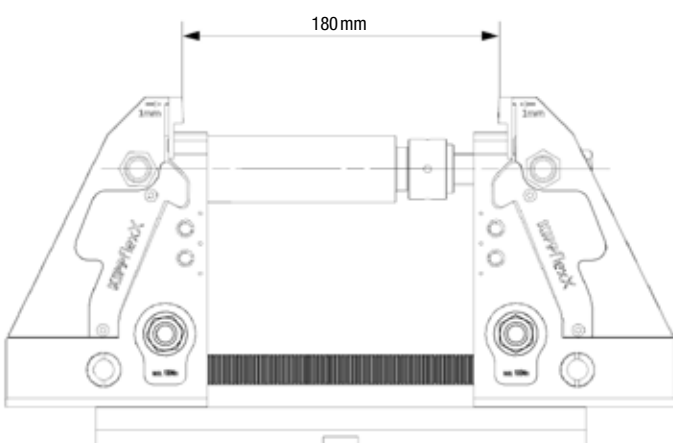
Clamping width 28 – 78 mm

Adapter shaft 60 mm + Threaded spindle



Clamping width 76,5 – 146 mm

Adapter shaft 120 mm + Threaded spindle



Clamping width up to 180 mm

Adapter shaft 180 mm* + Threaded spindle

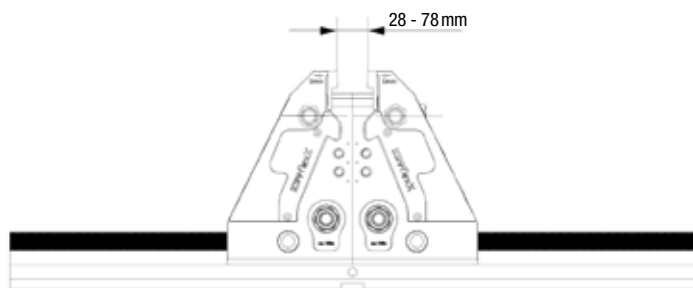


*Accessories

3. DESCRIPTION

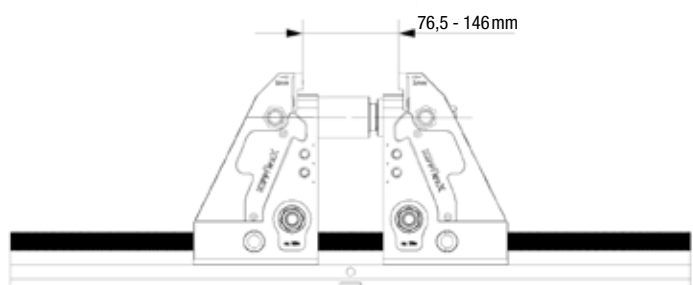


Clamping width overview base plate L=630 mm



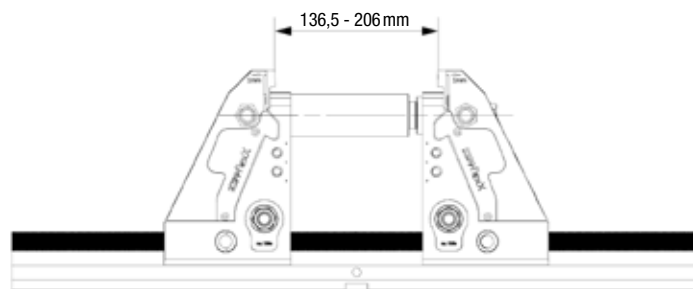
Clamping width 28 – 78 mm

Adapter shaft 60 mm + Threaded spindle



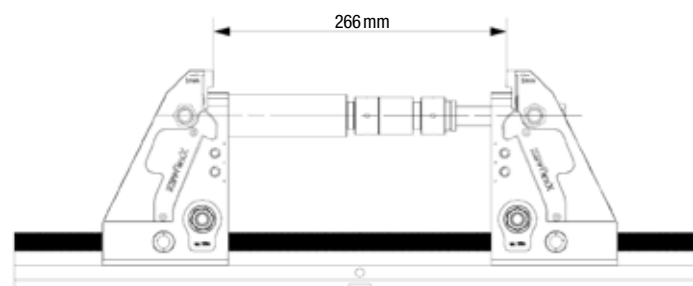
Clamping width 76,5 – 146 mm

Adapter shaft 120 mm + Threaded spindle



Clamping width 136,5 – 206 mm

Adapter shaft 180 mm + Threaded spindle

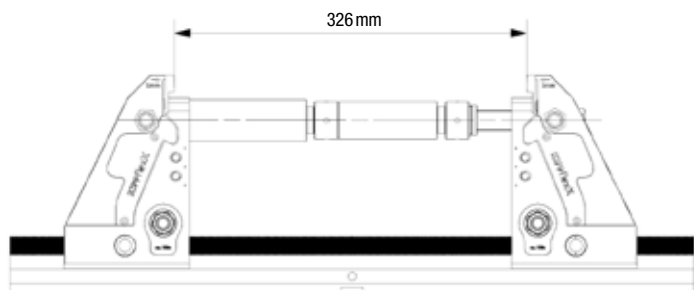


Clamping width up to 206 mm

Adapter shaft 180 mm + Extension shaft 60 mm + Threaded spindle

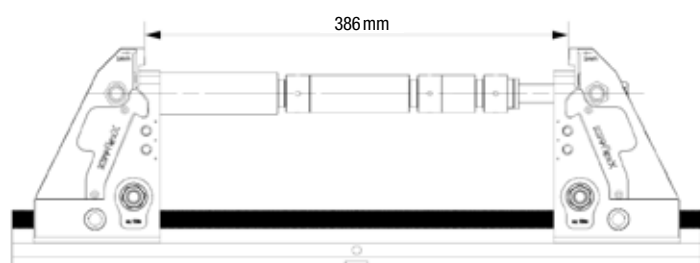


3. DESCRIPTION



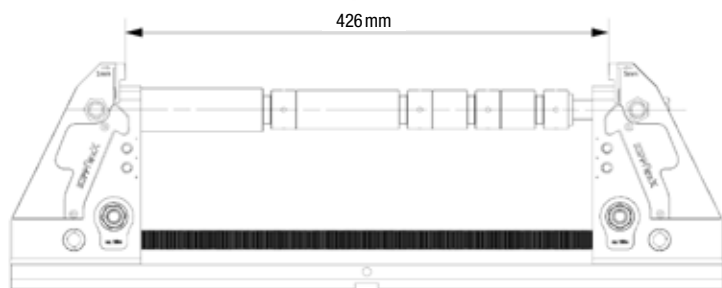
Clamping width up to 326 mm

Adapter shaft 180 mm + Extension shaft 120 mm + Threaded spindle



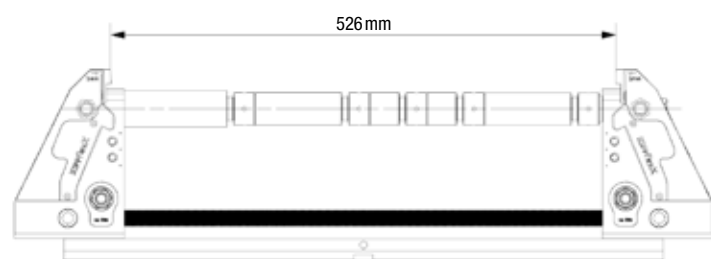
Clamping width up to 386 mm

Adapter shaft 180 mm + Extension shaft 120 mm +
Extension shaft 60 mm + Threaded spindle



Clamping width up to 426 mm

Adapter shaft 180 mm + Extension shaft 120 mm +
Extension shaft 60 mm + Extension shaft 60 mm + Threaded spindle



Clamping width up to 526 mm

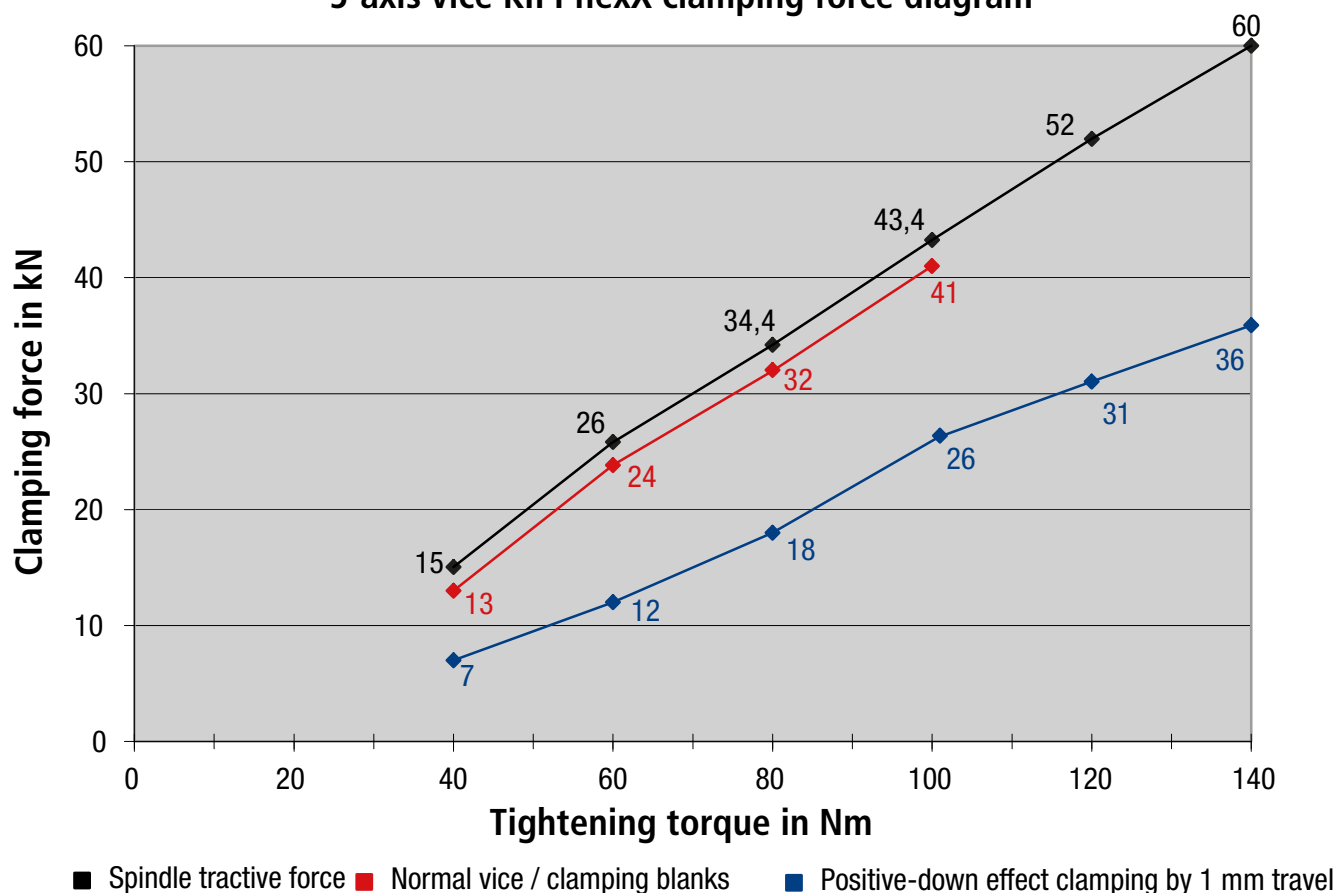
Adapter shaft 180 mm + Extension shaft 120 mm + Extension shaft
60 mm + Extension shaft 60 mm + Extension shaft 120 mm* +
Threaded spindle



*Accessories

3.7 Technical data

5-axis vice KIPPflexX clamping force diagram



* When clamping blanks the highest value of 41kN was achieved with 100Nm.

* With <2mm clamping travel the force is greater.

For maximum force with the positive-down function a tightening force of 140Nm can be used.

General information:

The values shown for the normal vice and positive-down effect refer to the force applied directly to the workpiece.

- Clamping height over machine table 180 mm (without optional seating ledge)
- Clamping width up to 180 mm on baseplate L=280
up to 300 mm on baseplate L=400
up to 530 mm on baseplate L=630
- Clamping force acc. to diagram
- Jaw width 125 mm
- Weight 35 kg (L=280 mm), 41 kg (L=400 mm), 52 kg (L=630 mm)
- Baseplate length L=280, L=400, L=630 mm
Other lengths on request

3. DESCRIPTION

3.8 Accessories

In addition to the equipment supplied, other articles suitable for the KIPPflexX 5-axis clamping system are available as accessories. You can find the details in the catalogue or online on our homepage.

- Jaw plates smooth **K1557.1250** (supplied singly)



- Jaw plates with pins **K1557.1251** (supplied singly)



- Combination jaw plates smooth and with pins **K1557.1252** (supplied singly)



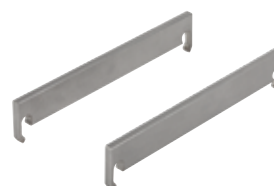
- Jaw plates machinable **K0975.1252** (supplied singly)



- Cylinder clamping set **K0989.12535** (supplied in pairs)



- Seating ledges **K0974.1250312, K0974.1250317** (supplied in pairs) Available in H = 12 mm, 17 mm



- Seating ledges screw-on **K0974.1250515** to mill to size (supplied in pairs)



- Extension shafts **K0990** L=120, 240, 480 mm (required for clamping ranges over 206 mm)



3. DESCRIPTION



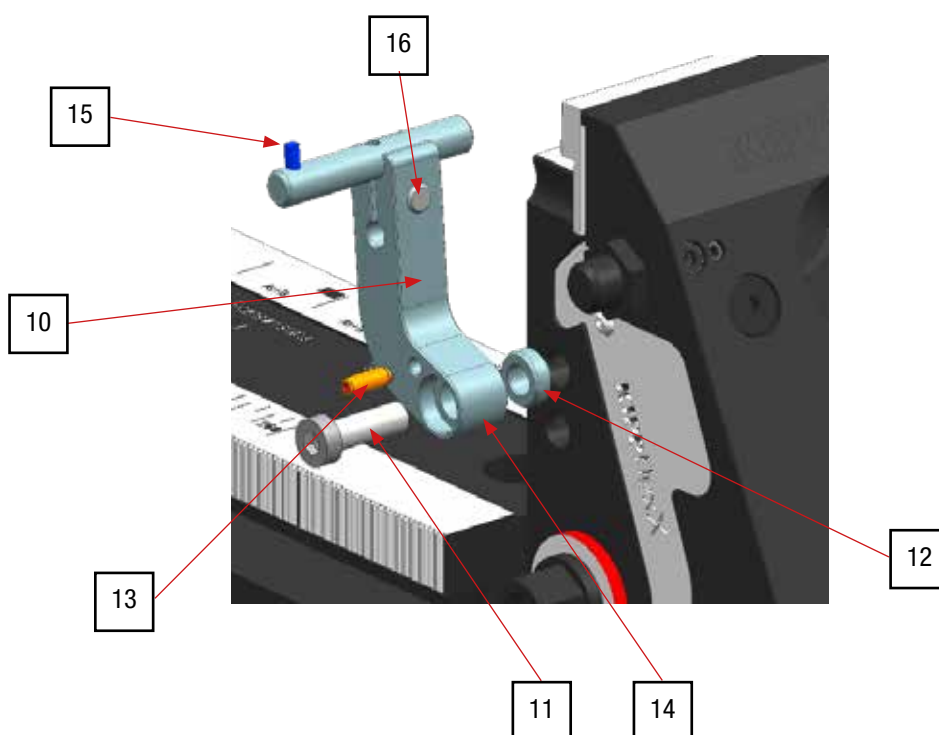
Stop set **K0993.150**

The stop can be mounted either fixed or to swivel.

This stop can be swung down to allow machining on the workpiece stop face. It engages with a spring plunger. It can be mounted on both sides and facing front or back.



- Mount the stop as shown in the illustration. Make sure that only the ball of the spring plunger (13) is projecting from the back of the stop arm (10)!
- Only tighten the swivel screw (11) where required so much so that the stop can still swivel. Secure the screw (11) against loosening with the spring washer (14). The spring washer (14) pre-tensions the stop. The centring ring (12) guides the stop.
- Slide the stop pin (15) into position and clamp with the cap screw (16).



- | | |
|----|------------------------------|
| 10 | Body stop |
| 11 | DIN 6912 screw 8x30 10.9 |
| 12 | Centring ring |
| 13 | Spring plunger |
| 14 | Spring washer |
| 15 | Stop pin incl. dowel pin |
| 16 | DIN 6912 cap screw 8x16 10.9 |

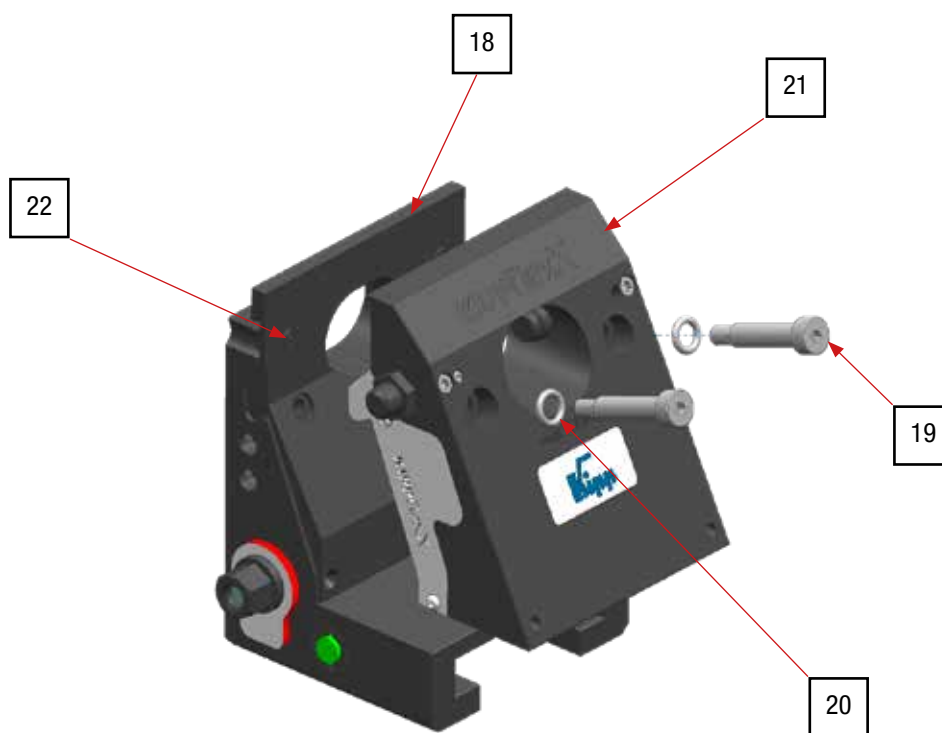
3. DESCRIPTION

3.9 Exchanging the jaw plates

To exchange the jaw plates (18, smooth or with holes for pins) or for a thorough cleaning, the jaws must be separated.

Proceed as follows:

- Remove the 2 screws (19), ensuring that the 2 O-rings (20) are not damaged or misplaced
- Remove „rear“ clamping element (21) from the jaw by lifting diagonally upwards
- Screw out the 2 M6x10 Torx screws
- Exchange the jaw plate (18)
- To re-assemble, follow the previous instructions in reverse. Only tighten the screw (19) hand tight.



18	Jaw plate
19	Shoulder screws similar to DIN ISO 7379, M10x40
20	O-ring Ø 10x3
21	Clamping element „rear“
22	Torx screws M6x10

4. CARE AND MAINTENANCE



Clean the vice regularly from accumulated swarf and dirt. The traction spindle must be lightly oiled repeatedly during purely dry machining. Make sure that all threads are clean and not damaged.

After cleaning and when not in use for a long period, oil all parts lightly to prevent corrosion. To reach the space between the jaw components, please note point 3.9 on dismantling the parts.

5. SERVICE

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