

Montage- und Betriebsanleitung Installation- and operating instruction

Einfachspanner
Single vice

KSC-F



H.-D. SCHUNK GmbH & Co. Spanntechnik KG
Lothringer Strasse 23
D-88512 Mengen

Table of contents:

| | | |
|----------|---|-----------|
| 1 | User information | 22 |
| 1.1 | Purpose of document, validity | 22 |
| 1.2 | Illustration of safety instructions | 22 |
| 2 | General safety instructions..... | 23 |
| 2.1 | Intended use..... | 23 |
| 2.1.1 | Technical data..... | 23 |
| 2.2 | Reasonably foreseeable misapplication | 23 |
| 2.2.1 | Alterations and modifications | 24 |
| 2.2.2 | Spare and wear parts and auxiliary material | 24 |
| 2.3 | Residual risk..... | 24 |
| 2.3.1 | Jaw change..... | 24 |
| 2.3.2 | Notes on clamping technology | 24 |
| 2.4 | Duties of the organisation in charge | 24 |
| 2.5 | Operator duties | 25 |
| 2.6 | Operator qualification | 25 |
| 2.7 | Personal protective equipment | 25 |
| 2.8 | Warranty..... | 25 |
| 3 | Description of the clamping device..... | 26 |
| 4 | Operation (standard operation)..... | 27 |
| 4.1 | Clamping / aligning..... | 27 |
| 4.2 | Jaw range | 30 |
| 4.3 | Jaw change | 30 |
| 4.4 | Swivel and adapter plate..... | 31 |
| 4.4.1 | Function..... | 31 |
| 4.4.2 | Servicing, cleaning, maintenance..... | 31 |
| 4.4.3 | Troubleshooting, eliminating faults..... | 31 |
| 4.4.4 | Fitting the 6-fold reversible jaws | 32 |
| 4.5 | Aluminium jaws | 32 |
| 4.6 | Clamping range..... | 33 |
| 5 | Servicing, cleaning, maintenance..... | 33 |
| 5.1 | General cleaning / lubrication | 33 |
| 6 | Troubleshooting, eliminating faults | 34 |
| 6.1 | Removal | 35 |
| 7 | Assembly and adjustment | 36 |
| 8 | Taking out of service | 36 |
| 9 | Appendix | 37 |
| 9.1 | Assembly drawing..... | 37 |
| 9.2 | Parts list | 38 |

1 User information

1.1 Purpose of document, validity



Installation instructions with operating instructions for the clamping device stated on the cover.



These instructions are an integral part of the product supplied and contain important information for the safe installation, commissioning, operation, servicing and maintenance.



These instructions must be read before using the product and must be observed during operation, in particular the "General safety instructions" section.

The document number is shown in the footer.


1.2 Illustration of safety instructions

| DANGER  | |
|---|---|
|  | <p>Indicates imminent danger. If the information is ignored, death or serious injury (permanent disability) will result.</p> |


| WARNING  | |
|--|---|
|  | <p>Indicates a potentially dangerous situation. If the information is ignored, it is possible that death or serious injury (permanent disability) will result.</p> |

| WARNING  | |
|--|---|
|  | <p>Indicates a potentially dangerous situation. If the information is ignored, it is possible that material damage and light to medium injury will result.</p> |

Information on useful tips or for preventing material damage:

| NOTE | |
|---|---|
|  | <p>Indicates general information, useful tips for users and work recommendations which do not impact on the health and safety of operators.</p> <p>... underscores useful tips and recommendations as well as information for efficient and trouble-free operation.</p> |

Important for preventing more extensive material damage (alternative):

| CAUTION | |
|---|--|
|  | <p>Indicates a potentially dangerous situation. If the information is ignored, material damage will result.</p> <p>... points out a potentially dangerous situation that can lead to material damage if it is not avoided.</p> |

2 General safety instructions

2.1 Intended use

The clamping device may only be used in accordance with the technical data. The clamping device has been designed for stationary application on milling machines in an industrial environment.

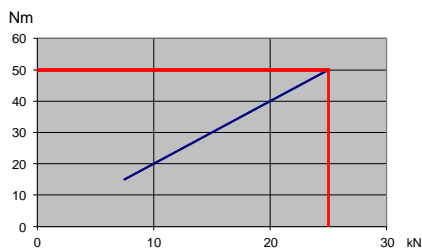
Using the device in accordance with the intended purpose includes compliance with the commissioning, installation and operating instructions, and with the environmental and service conditions as provided by the manufacturer.

Using the device outside of the above parameters is deemed non-intended use. The manufacturer accepts no liability for damage resulting from non-intended use.

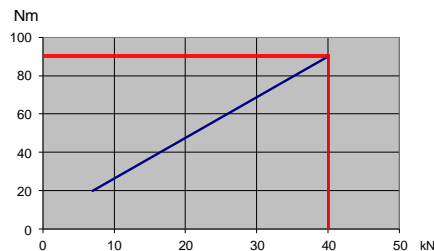
2.1.1 Technical data

| Type | max. torque | max. clamping force |
|-----------|-------------|---------------------|
| KSC-F 80 | 50 Nm | 25 kN |
| KSC-F 125 | 90 Nm | 40 kN |
| KSC-F 160 | 120 Nm | 50 kN |

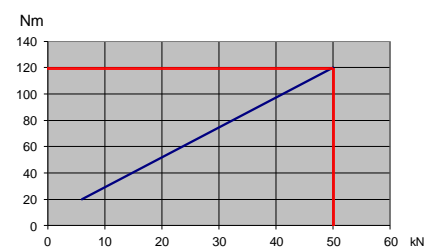
KSC-F 80



KSC-F 125



KSC-F 160



Exposure to loads in excess of the maximum clamping torque results in damage to the spindle.



Weight:

| | | |
|-----------|------------------------------|---------|
| KSC-F 80 | L-214 Standard without jaws: | 5.0 kg |
| KSC-F 125 | L-362 Standard without jaws: | 15.0 kg |
| KSC-F 160 | L-480 Standard without jaws: | 28.5 kg |

For further data, please see the current catalogue >> Schunk stationary Workholding <<

2.2 Reasonably foreseeable misapplication

Any application that is not in accordance with the "Intended use" or exceeds such intended use is considered not in accordance with the regulations, and is forbidden. Any other use of the device is subject to confirmation from the manufacturer.

Examples of foreseeable misapplication:

- Clamping device used on rotating systems.
- Clamping widely protruding workpieces.
- Clamping workpieces with a weight of over 20 kg in vertical position without an additional safeguard to prevent the item falling out.



2.2.1 Alterations and modifications

In the case of unauthorised alterations and modifications of the clamping device, the manufacturer's liability ceases and any warranty is voided.

2.2.2 Spare and wear parts and auxiliary material

Only use original parts or parts approved by the manufacturer. Using spare and wear parts by third party manufacturers may lead to risk.

2.3 Residual risk

This clamping device has been constructed in accordance with the state-of-the-art of technology and the recognised safety rules.



The user is responsible for applying the correct workpiece tension.

New clampings have to be carefully checked by qualified personnel with relevant training.

One always needs to allow for the risk that the workpiece may slip or be dislodged, even when the clamping device is functioning correctly; this is due to the different geometries to be clamped, contact surfaces, clamping friction values, processing force, wrong manipulation of the milling machine etc.

Protective devices are to be attached to the processing machine that will protect the operator from any tool or workpiece parts that may be ejected.

It is mandatory that operators and others in the proximity of the processing machine wear protective goggles.

The clamping device must not be used in any way that impairs its function and operational safety.

2.3.1 Jaw change

Insufficiently tightened system jaws can lead to damage!

For instructions, please refer to Section 4, "Operation".



2.3.2 Notes on clamping technology

The operator is responsible for ensuring that the clamping geometry and clamping forces are suitable for the intended processing.

We recommend that clamping be carried out with a torque wrench in order to achieve consistent clamping results.

The clamping forces can only be achieved if the clamping device functions correctly and the workpiece is correctly held in the device.

Regular servicing and cleaning in accordance with the operating instructions is mandatory in order to ensure correct function.

When clamping thin-walled elastic workpieces, e.g. tubes or packages, it is possible that the clamping force is significantly reduced due to yielding of the workpiece.

When clamping with a high degree of force, the clamping force is significantly reduced due to the increased frictional forces in the carriages.



2.4 Duties of the organisation in charge

The organisation in charge of the device undertakes to only allow operatives to work on the device:

- who are familiar with the basic health and safety regulations and regulations for the prevention of accidents.
- who have completed appropriate induction for working with the machine.
- who have read and understood these operating instructions.

The requirements of the EG Directive 2007/30/EG on the use of work machinery must be complied with.

2.5 Operator duties



All persons who have been instructed to work with the machine undertake to:

- observe the basic regulations for health and safety and for the prevention of accidents.
- read and understand the section on safety and the safety instructions in these operating instructions prior to working with the machine, and to observe these instructions.

2.6 Operator qualification

The installation, initial setup, fault analysis and periodic monitoring have to be carried out by competent personnel with the relevant qualifications.

2.7 Personal protective equipment

| WARNING  | |
|--|---|
|  | <p>Risk of eye injury through ejected, hot fragments! Ejected hot fragments can lead to serious eye injury. The regulations for safety at work and the prevention of accidents always have to be observed when working with the machine. Personal protection equipment must be worn at all times, in particular safety boots, gloves and safety goggles.</p> |

2.8 Warranty

The warranty period is 24 months from the date of delivery; the warranty applies subject to being used as intended and to the following conditions:

- Compliance with concurrent documents.
- Compliance with environmental and operating conditions.
- Compliance with the specified maintenance and lubrication intervals.
- Observance of the maximum service life.

Any parts in contact with workpieces and wear parts are not covered by the warranty.

Warranty – maximum service life

| | |
|--|-----------|
| Warranty period | 24 months |
| Maximum service life [clamping cycles] | 50,000 |

3 Description of the clamping device

The KSC-F has been designed for clamping raw parts and finished workpieces against the fixed jaw.

The quick clamping function of the moving jaw on the workpiece is implemented using the external, trapezoidal spindle.

The subsequent build-up of clamping force is generated purely mechanically. As part of a second stage, a spindle featuring a fine-pitch thread, located and protected within the trapezoidal spindle takes care of this.

As soon as a correspondingly high counterforce applies to the moving jaw, the internal spindle with fine-pitch thread disengages and the force is built up.



The tension force depends on the torque and increases in a linear fashion. Exceeding the maximum torque results in damage to the spindle.

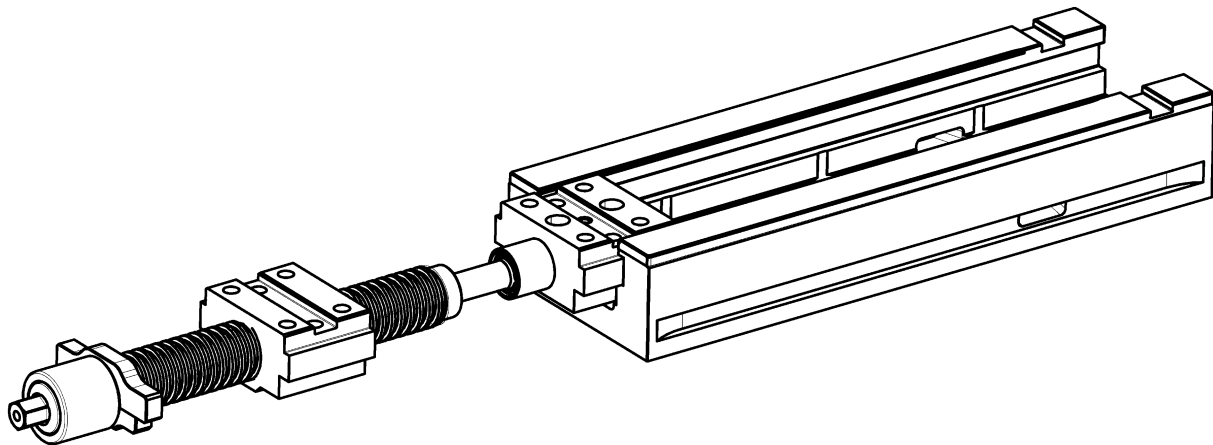
The clamping range depends on the corresponding jaw range.

4 Operation (standard operation)

4.1 Clamping / aligning

Push parts of the entire spindle unit from the tool body to attach the vice.

For this purpose, see Section **6.1 Removal** and Section **7 Assembly and adjustment**.



Design size KSC-F 80

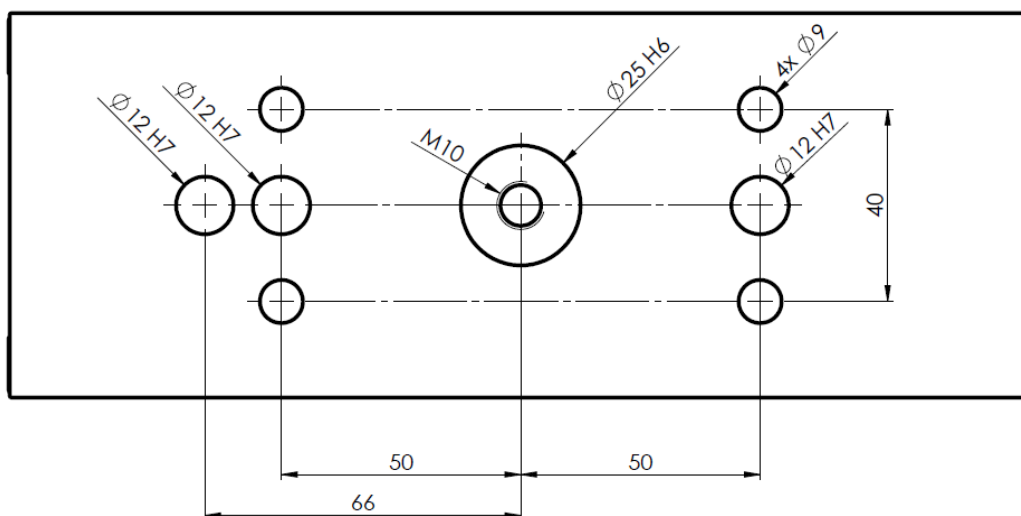
The following interfaces are included in the basic variant:

4 x $\varnothing 9$ cylinder bores for attachment with cylinder screws M8 (DIN 912).

2 x $\varnothing 12$ H7 precision positioning bores, in a centre distance of 100 mm.

$\varnothing 25$ H6 alignment hole and two $\varnothing 12$ H7 positioning bores (distance 100 mm) for the Vero-S quick-change palleting system and $\varnothing 12$ M6 indexing pins.

Longitudinal grooves on the sides to attach clamping claws.



Design size KSC-F 125

The following interfaces are included in the basic variant:

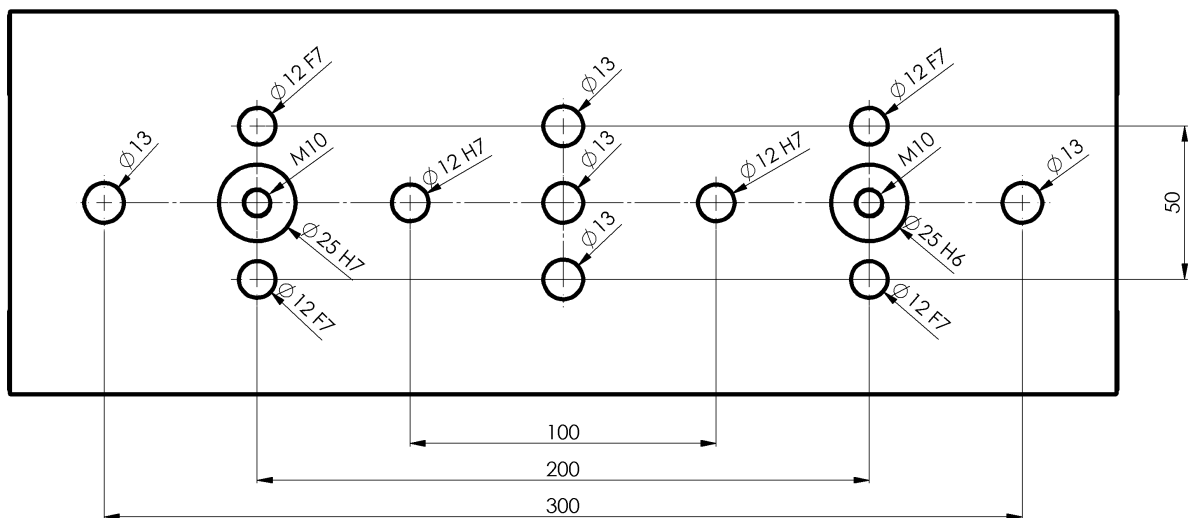
2 x $\varnothing 12$ H7 precision \varnothing positioning bores for alignment of the vice.

3 x $\varnothing 13$ cylinder bores in a distance of 150 mm for attachment with cylinder screws M12.

4 x $\varnothing 12$ F7 precision positioning bores and 2 x $\varnothing 13$ cylinder bores (distance 50), used to position and attach the vice with $\varnothing 12$ F7/M12 fitting screws or cylinder screws M12 (DIN 912) on grid plates with a size 50 grid and T-slot tables.

2 x $\varnothing 25$ H6 alignment holes for Vero-S quick-change palleting system.

Longitudinal grooves on the sides to attach clamping claws.



Design size KSC-F 160

The following interfaces are included in the basic variant:

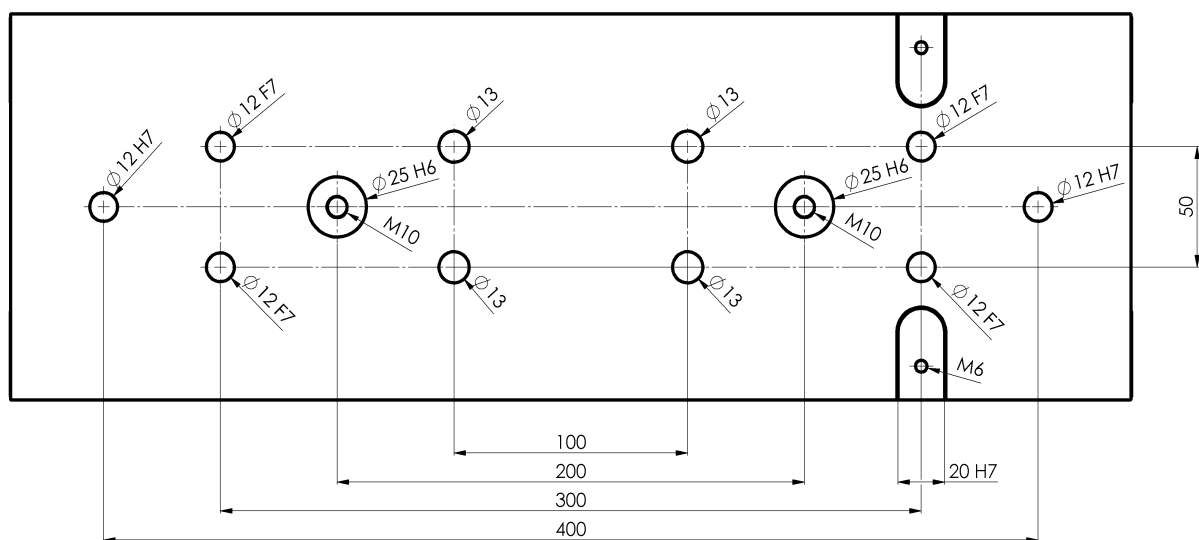
2 x $\varnothing 12$ H7 precision positioning bores for alignment of the vice.

4 x $\varnothing 12$ F7 precision positioning bores and 4 x $\varnothing 13$ cylinder bores used to position and attach the vice with $\varnothing 12$ f7/M12 fitting screws or M12 cylinder screws (DIN 912) on grid plates with a size 50 grid and on T-slot tables.

2 x $\varnothing 25$ H6 alignment holes for Vero-S quick-change palleting system.

Longitudinal grooves on the sides to attach clamping claws.

Alignment with 20 H7 driving slot in tool body, using precision sliding blocks on machine table.



The KSC-F can also be produced at the factory with customer-specific positioning and fixing holes as well as with location recesses for various commonly available zero point clamping systems.

4.2 Jaw range

The reliable function of the clamping device is significantly affected by the selection of the correct jaws.

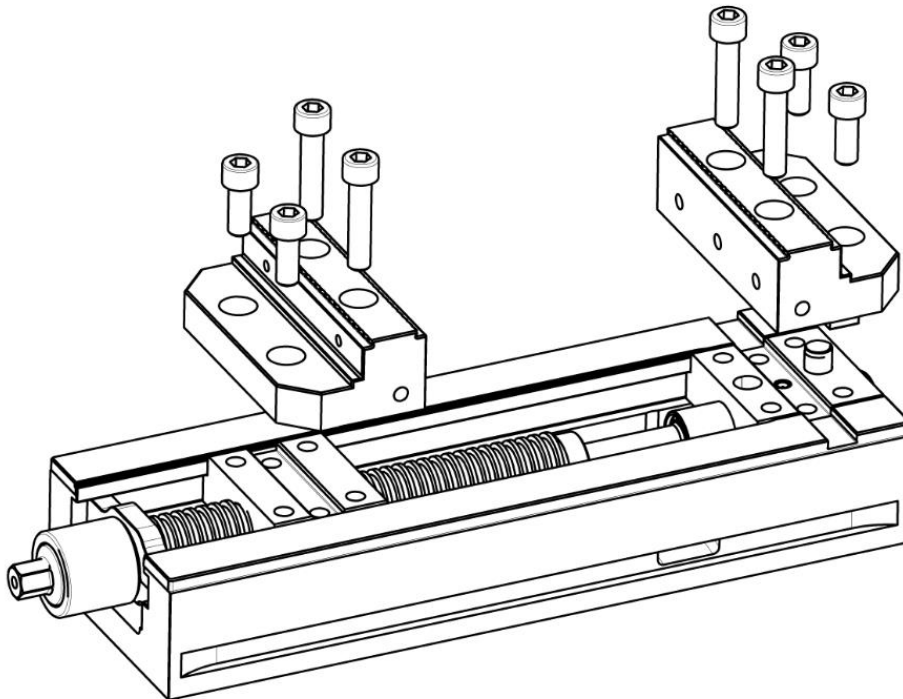


For further data, please see the current catalogue >> Schunk stationary Workholding <<

4.3 Jaw change

System jaws must be attached using cylinder screws with strength class 12.9 (DIN 912):

| | |
|-----------------------|--|
| Design size KSC-F 80 | each 2x M10 cylinder screws, clamping torque 60 Nm. |
| Design size KSC-F 125 | each 4x M10 cylinder screws, clamping torque 60 Nm. |
| Design size KSC-F 160 | each 4x M16 cylinder screws, clamping torque 140 Nm. |



(Figure: KSC-F 125)

4.4 Swivel and adapter plate

4.4.1 Function

Slanted and curved items can be securely clamped with 4-point clamping using the swivel plate system.

The swivel plate is pulled downwards during the clamping process due to its conical swivel plate bearings; this means that the swivel plate is not likely to lift off.

With the 6-fold reversible jaw it is possible to cover numerous clamping solutions in a straightforward way. A total of six different clamping sides are available, at the four sides of the jaw as well as at two places with a convex "grip" profile.

It is also possible to carry out two-sided processing using the tungsten carbide coated side of the 6-fold reversible jaw.

Processing the first side

For raw part clamping using the 6-fold reversible jaw, five different "grip" clamping sides are available with a clamping depth of 3, 8 and 18 mm.

Processing the second side

Clamping with the tungsten carbide coated side of the 6-fold reversible jaw.

It is important to take into account that during the first clamping process, the 6-fold reversible jaws can yield slightly until the play in the peg seating is eliminated.

The workpiece position must be measured; the zero point should not be determined until after 3 to 5 power clampings.

Handling the demounted swivel plate

The conical swivel peg can be pulled out since it is only held in position by an O-ring in the counter direction. When handling the swivel plate, it should not be turned upside down since this could cause the peg to fall out.



4.4.2 Servicing, cleaning, maintenance

The upper shoulder of the swivel peg must be oiled regularly. The swivel bearing is protected by O-rings. In order to ensure that the areas under stress remain well lubricated, the swivel plate should be turned around its entire axis once a week so that the lubrication film can be renewed. Lubrication of the entire peg is recommended once a year.

4.4.3 Troubleshooting, eliminating faults

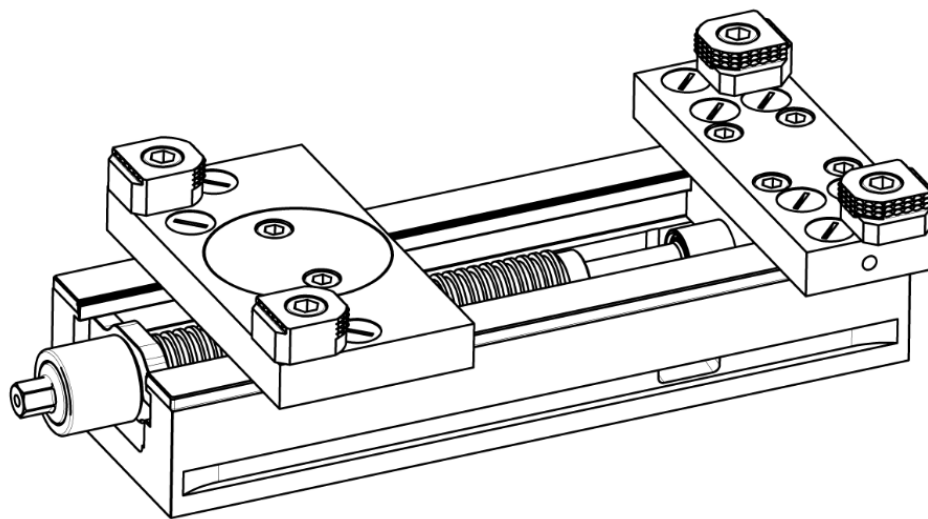
Swivel plate is difficult to turn

- Disconnect the swivel plate and push the swivel peg from below out of the swivel plate.
- Check the vice guide and swivel plate surface for indentations or deformations. If necessary, re-grind the plate and the vice guide.
- Check the peg for soiling.
- Check that the O-rings are correctly positioned. The upper O-ring must make good contact.
- Re-lubricate the entire system with grease and reassemble.

4.4.4 Fitting the 6-fold reversible jaws

- Determine the mounting positions of the 6-fold reversible jaws.
The best clamping results are achieved when clamping parts as far out as possible.
- Move the cover screws so that the selected clamping position is available.
- Position the 6-fold reversible jaws and loosely insert the M12 cylinder screws.
- Turn the 6-fold reversible jaws on to the required clamping faces; slightly pre-clamp the workpiece with the clamping jaws so that the clamping faces are parallel to, and touch, the workpiece.
- Use a torque of 80 Nm to tighten the M12 cylinder screws of the 6-fold reversible jaws.

Attention: When the clamping faces of the jaws are not aligned parallel to the workpiece surface it is possible that the 6-fold reversible jaw becomes loose through the clamping force.

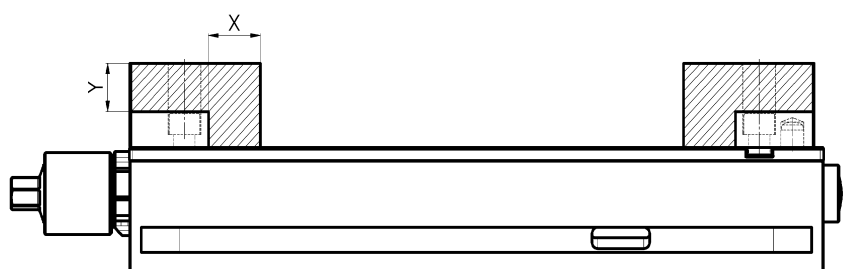


4.5 Aluminium jaws

The aluminium jaws are designed for producing workpiece-specific clamping contours. In order to achieve maximum precision of the contour, it is recommended that the contour milling be carried out with pre-clamping of the aluminium jaws. For this purpose, a narrow spacer piece can be clamped at the bottom and the pre-clamped aluminium jaws can then be milled to achieve the desired clamping contour.



| Permitted milling area: | X | Y |
|-------------------------|----|----|
| KSC-F 80 | 17 | 10 |
| KSC-F 125 | 27 | 23 |
| KSC-F 160 | 30 | 23 |



In view of the fact that clamping may be carried out in different ways, the setting-up technician is responsible for ensuring that adequate clamping cross sections exist and that the workpiece is safely clamped.



4.6 Clamping range

The clamping range depends on the type of jaws used.

For further data, please see the current catalogue >> Schunk stationary Workholding <<

5 Servicing, cleaning, maintenance

Make sure the areas between fixed jaw and moving jaw as well as between spindle guide and moving jaw are free from chips when you adjust the clamping range.

The parts are subject to significant loads and have been protected from contamination by design.



5.1 General cleaning / lubrication

Regularly clean and oil contact surfaces, guides and spindle of the vice, e.g. using MOTOREX Supergliss 68 K slideway oil as per ISO VG 68.

Monthly lubrication of the fine-pitch thread using a funnel-type lubricating nipple (pos. 140) and multi-purpose grease. For this purpose, the vice must be closed so any excess grease is displaced using the scraper. If lubrication is carried out when open, clamping may press out the closing disc (pos. 150) of the fixed carriage (pos. 130).

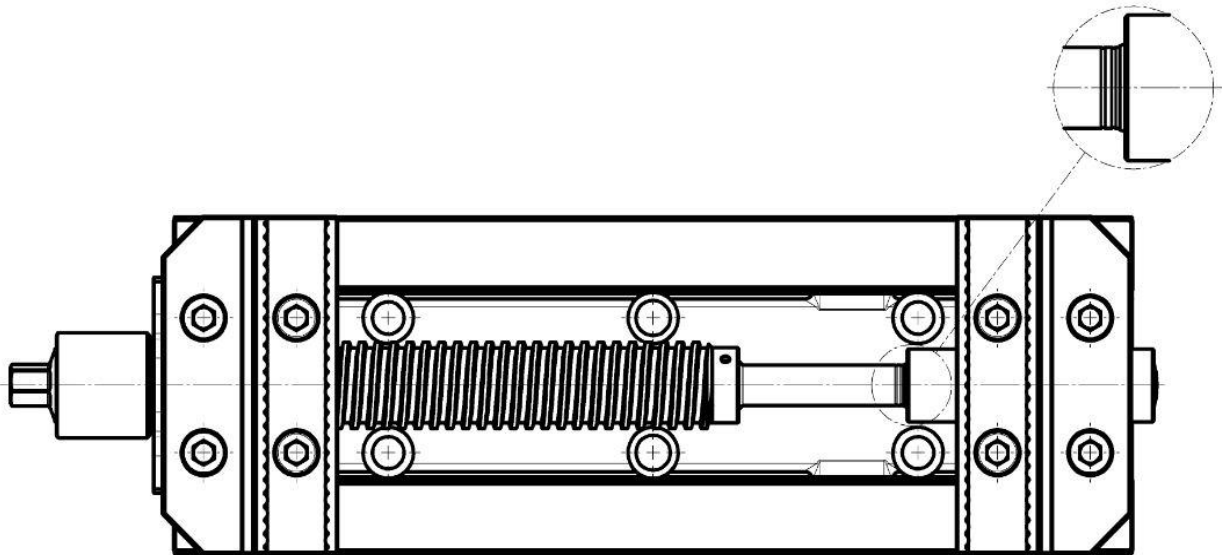
Check whether or not the scraper (pos. 110) is faulty.



6 Troubleshooting, eliminating faults

Basic spindle assembly setting has maladjusted

If the vice is open up to the stop, two grooves must be visible within the spindle area (pos. 10) and the scraper (pos. 110).



If, in this position, three, one or even no grooves are visible at all, the spindle unit must be readjusted as otherwise the scraper (pos. 110) may be damaged or the closing disc (pos. 150) in the fixed carriage (pos. 130) may be pushed out.

The listed clamping range can then also no longer be guaranteed.



Potential reason for maladjustment:

- The Mobile carriage (pos. 120) is stiff. In this case clean the vice and damaged surfaces must be carefully levelled off with a honing stone.
- During the clamping process, an object has jammed between spindle guide (pos. 250, 260) and mobile jaw (pos. 120) which has caused unintentional disengaging of the coupling.
- Something elastic that caused the coupling to disengage has been clamped, yet it required more than one rotation to achieve the necessary clamping force.

Proceed as described in **Section 7, Assembly and adjustment** to restore the basic setting.

Unable to install fixed jaw

The groove in the tool body (pos. 180) and fixed carriage (pos. 130) are misaligned and the carriage cannot be moved into the correct position.

The threaded pin (pos. 190) may have been excessively clamped in the tool body. However, it is merely intended for rough positioning and as an assembly aid. It must only be positioned loosely in the recess and it must be possible to move it slightly.

The correct position of the fixed carriage (pos. 130) must be defined exclusively by the wedge of the fixed jaw.



6.1 Removal

KSC-F 80:

- Removing system jaws
- Pull out the spindle assembly a little
- Remove the two cylinder screws (pos. 190, 230) from the ends of the tool body

KSC-F 125/160:

- Removing system jaws
- Remove fuses (pos. 190, 230)
- Pull out the spindle assembly

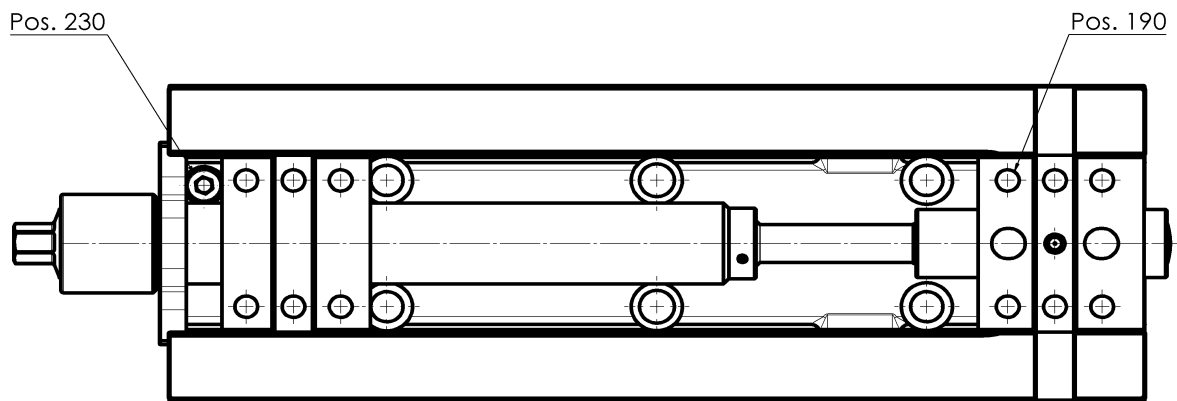
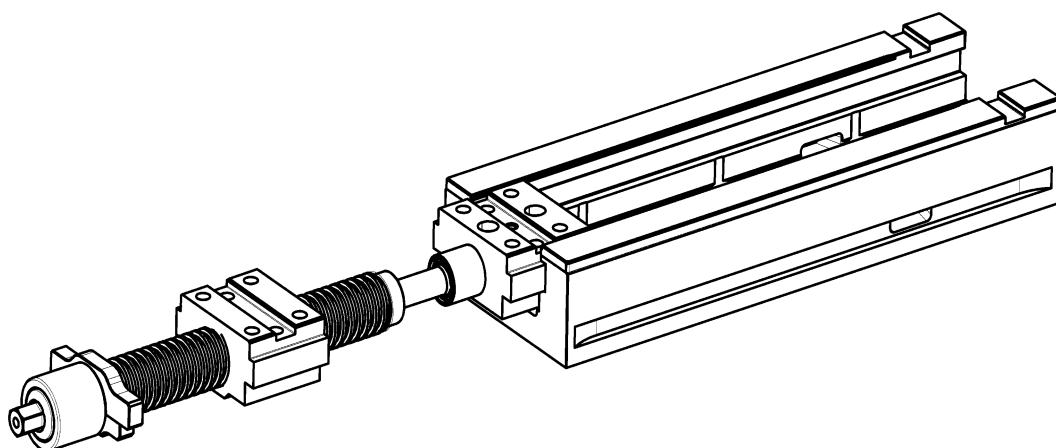


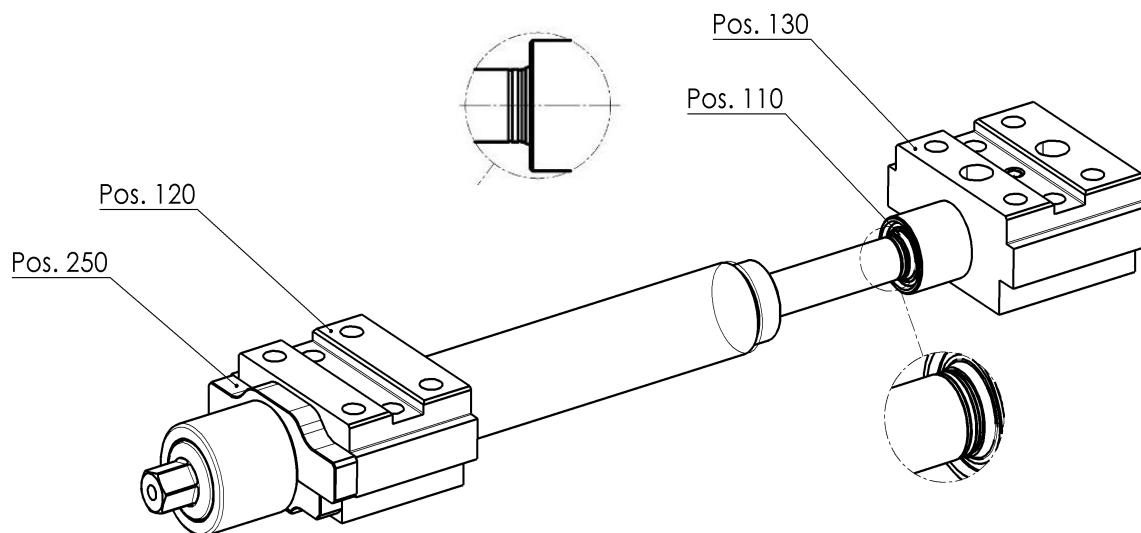
Figure: S2 125

- Pull the spindle assembly from the tool body

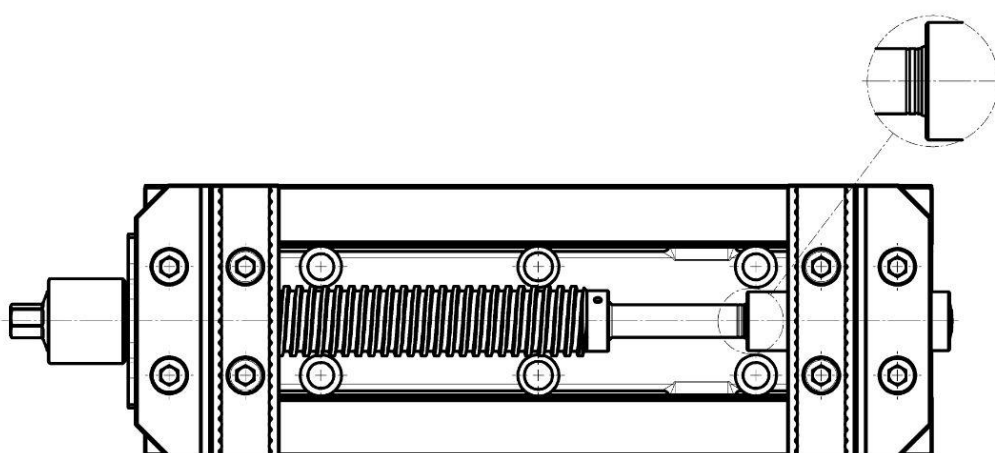


7 Assembly and adjustment

- Turn the moving carriage (pos. 120) towards the spindle guide (pos. 250).
- Secure the carriage (pos. 130) until two grooves are visible on the scraper (pos. 110).



- Additionally align the carriage and spindle assembly with each other so that the guide areas correspond. The two grooves on the scraper (pos. 110) must remain visible. The moving carriage (pos. 120) must no longer be in contact with the spindle guide (pos. 250).
- Push the complete unit into the tool body and once again install the lock bolts (pos. 190, pos. 230). Merely position the threaded pins (pos. 190). The fixed carriage must not be clamped to the tool body as the exact position of the fixed carriage is determined by the fixed jaw.
- **Check:** the two grooves must be visible when it is open to a maximum extent.



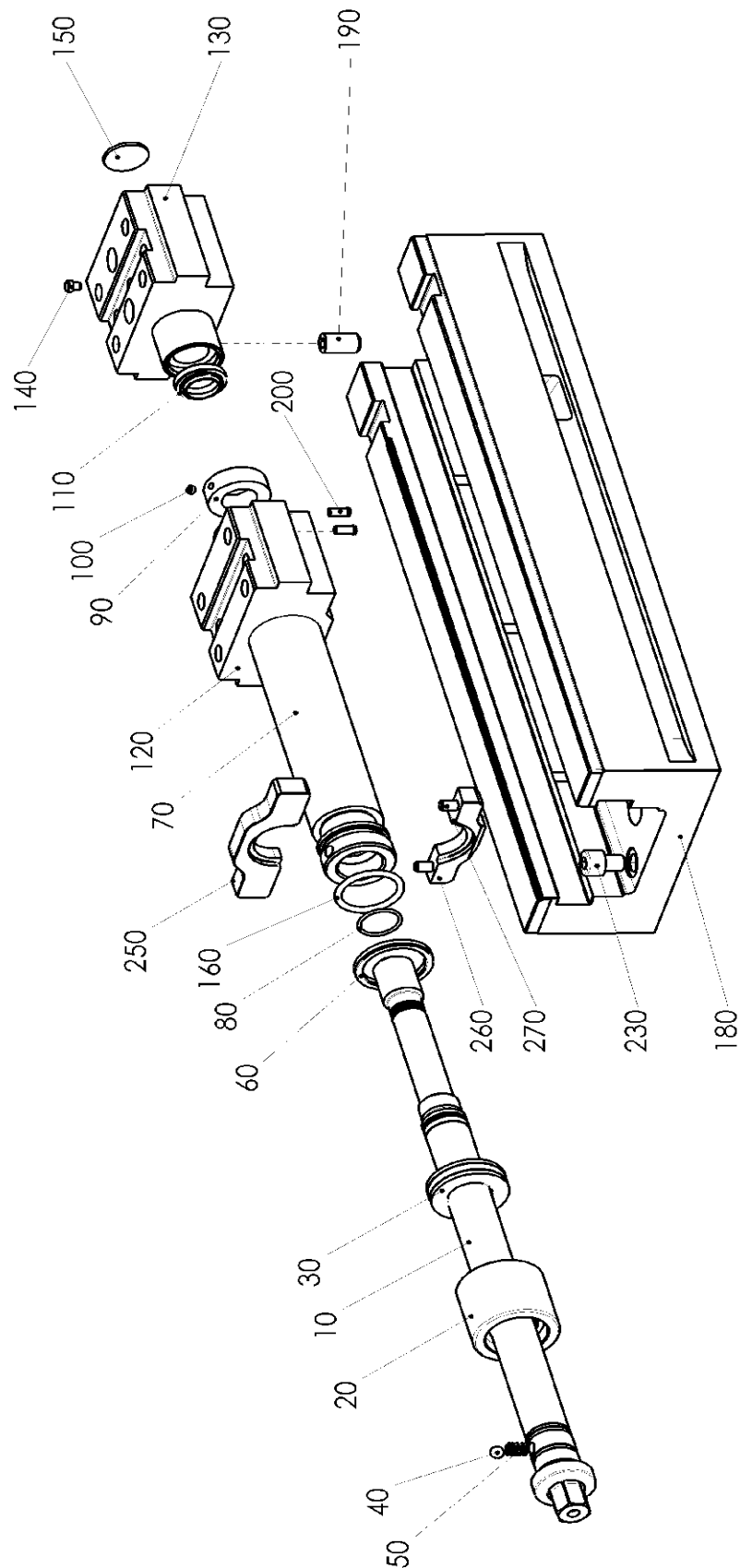
8 Taking out of service

The clamping device and all accessories can be disposed of as scrap metal without any risk.



9 Appendix

9.1 Assembly drawing



KSC-F 125

9.2 Parts list

| Pos. | Art. No. | Designation | Number |
|------|--|----------------------------------|--------|
| 10 | SGM.080.305.11 <i>SGM.125.305.11</i> <u>SGM.160.305.11</u> | Tension rod | 1 □ |
| 20 | SGM.125.310.11 <i>SGM.125.310.11</i> <u>SGM.160.310.11</u> | Bearing sleeve | 1 □ |
| 30 | XNN.20073.304 <i>XNN.20073.304</i> <u>XNN.20073.306</u> | Axial cylindrical roller bearing | 1 □ |
| 40 | XNN.20610.080 <i>XNN.20610.060</i> <u>XNN.20610.080</u> | Ball | 1 □ |
| 50 | XNN.30030.029 <i>XNN.30030.030</i> <u>XNN.30030.029</u> | Pressure spring | 1 □ |
| 60 | XNN.63028.353 <i>XNN.63028.353</i> <u>XNN.63036.353</u> | X-Ring | 1 □ |
| 70 | SGM.080.306.11 <i>SGM.125.306.11</i> <u>SGM.160.306.11</u> | Trapezoidal hollow spindle | 1 □ |
| 80 | XNN.61071.410 <i>XNN.61071.703</i> <u>XNN.61071.874</u> | O-Ring | 1 □ |
| 90 | SGM.080.313.11 <i>SGM.125.313.11</i> <u>SGM.160.313.11</u> | Adjusting nut | 1 □ |
| 100 | XNN.10708.403 <i>XNN.10708.403</i> <u>XNN.10708.403</u> | Threaded pin | 1 □ |
| 110 | XNN.65114.130 <i>XNN.65114.150</i> <u>XNN.65114.201</u> | Scraper | 1 |
| 120 | SGM.080.308.11 <i>SGM.125.308.11</i> <u>SGM.160.308.11</u> | Movable carriage | 1 |
| 130 | SGM.080.307.11 <i>SGM.125.307.11</i> <u>SGM.160.307.11</u> | Fixed carriage | 1 |
| 140 | XNN.90102.040 | Grease nipple | 1 |

| Pos. | Art. No. | Designation | Number |
|------|--|--|-------------|
| 150 | XNN.12620.160 <i>XNN.12620.160</i> <u>XNN.12620.250</u> | Closing disc | 1 |
| 160 | XNN.61072.108 <i>XNN.61072.408</i> <u>XNN.61072.808</u> | O-Ring | 1 |
| 180 | SGM.080.302.11 <i>SGM.125.302.11</i> <u>SGM.160.302.11</u> | Base plate | 1 |
| 190 | XNN.10361.357 <i>XNN.10709.461</i> <u>XNN.10709.616</u> | Cylinder screw Threaded pin Threaded pin | 1 |
| 200 | XNN.90004.040 | Pressure piece | 2 4 6 |
| 230 | XNN.10361.357 <i>XNN.10311.408</i> <u>XNN.10311.408</u> | Cylinder screw | 1 |
| 250 | SGM.080.311.11 <i>SGM.125.311.11</i> <u>SGM.160.311.11</u> | Spindle guide, top | 1 |
| 260 | SGM.080.312.11 <i>SGM.125.312.11</i> <u>SGM.160.312.11</u> | Spindle guide, bottom | 1 |
| 270 | XNN.10301.309 | Cylinder screw | 2 |

Standard items are used for KSC-F 80
Items in italics are used for KSC-F 125
Underlined items are used for KSC-F 160

Note:

Components highlighted with ☒ are unsuitable for individual spare parts deliveries. Repairs can be provided by the manufacturer or an authorised service point.



H.-D. Schunk GmbH & Co.

Spanntechnik KG
Lothringer Strasse 23
D-88512 Mengen

www.schunk.de

Telefon:

+49 7572 7614 0

Fax:

+49 7572 7614 1099

E-Mail:

info@de.schunk.com