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1 User information

1.1 Purpose of document

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.

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>
NOTE	
	<p>Indicates general information, useful tips for users and work recommendations which do not impact on the health and safety of operators. ... underscores useful tips and recommendations as well as information for efficient and trouble-free operation.</p>
CAUTION	
	<p>Indicates a potentially dangerous situation. If the information is ignored, material damage will result. ... points out a potentially dangerous situation that can lead to material damage if it is not avoided.</p>

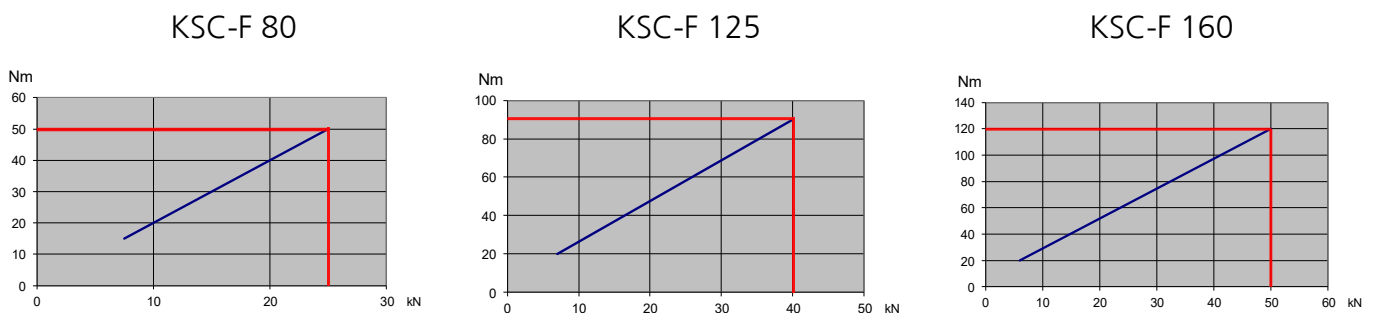
2 General safety instructions

2.1 Intended use

The clamping device may only be used in accordance with the technical data and 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. The manufacturer accepts no liability for damage resulting from non-intended use.

2.1.1 Technical data

Version	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



Exceeding the max. torque results in damage to the spindle.



Weight:

KSC-F 80 without system jaws: 5.0 kg
 KSC-F 125 without system jaws: 15.0 kg
 KSC-F 160 without system jaws: 28.5 kg

For further data, please see homepage >> schunk.com <<

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 protection against the workpiece falling out as a protective measure for the operator.

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

The user is responsible for applying the correct workpiece clamping.

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.

Do not use methods of operation that impair the function and operational safety.



2.3.1 Jaw change

Damage may result if system jaws are insufficiently tightened.



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 sliders.



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 EC Directive 2007/30/EC 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>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.</p> <p>Personal protection equipment must be worn at all times, in particular safety boots, gloves and safety goggles.</p>

2.8 Warranty

Warranty	24 months
Maximum service life	50'000 clamping cycles

The warranty period is valid from the date of delivery ex-works, provided the machine is used as intended and subject to the following conditions:

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

Parts in contact with the workpiece are not covered by the warranty.

3 Description

The KSC-F has been designed for clamping unprocessed 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 clamping force is generated 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 disengages and the force is built up.

When clamping from the inside out, the servo power is not activated and the clamping force is only about 20% of the nominal clamping force.

Important:

The nominal clamping force is only achieved when the inner spindle is decoupled. When decoupling, it is easy to notice when disengagement takes place.

Should decoupling not take place, the inner spindle has to be manually turned back to its home position.

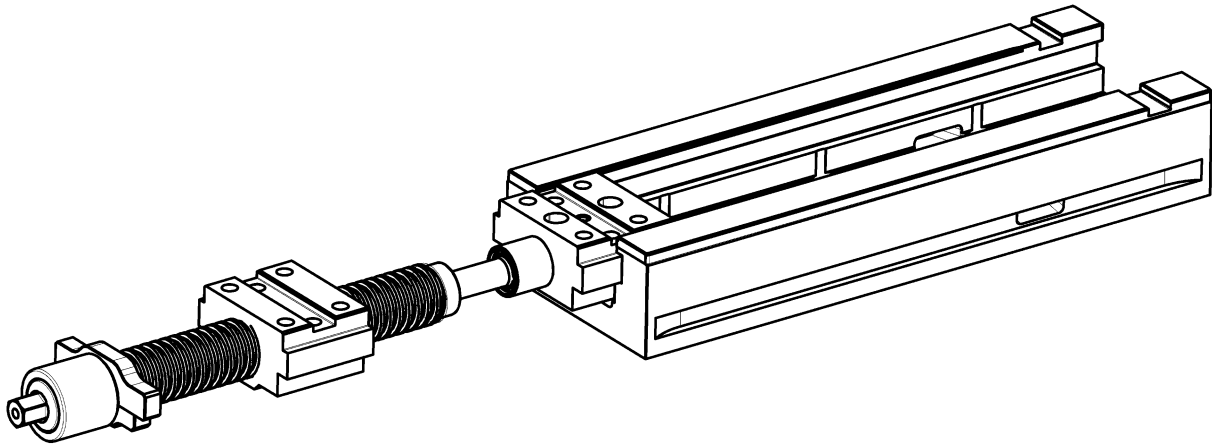
A sudden foreshortening of the clamping angle at the torque wrench is another indication that insufficient clamping force is available.



4 Operation

4.1 Aligning / Fastening

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



KSC-F 80

Alignment and fastening with cylinder pin $\varnothing 12$ m6 in the positioning holes $\varnothing 12$ H7 with distance 100 mm and cylinder screws M8 through the fixing holes $\varnothing 9$ with distance of 40 mm or with two fitting screws $\varnothing 12$ f7/M12 through the positioning holes $\varnothing 12$ H7 with distance of 100 mm on grid plate.

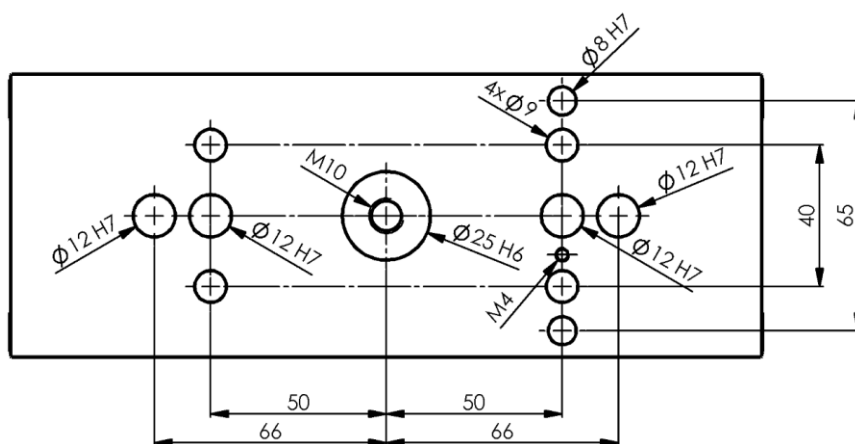
Locating hole $\varnothing 25$ H6 and positioning hole $\varnothing 12$ H7 with distance of 66 mm to attaching the clamping and indexing pin for the NSE3 and GFD quick-change pallet system.

Important:

When using VERO-S clamping pins, make sure that a shortened screw is used, otherwise the slide may be damage. (See Schunk catalogue)



Fastening with clamping claws.



KSC-F 125

Alignment and fastening with cylinder pin $\varnothing 12$ m6 in the positioning holes $\varnothing 12$ H7 with distance 100 mm and cylinder screws M12 through the fixing holes $\varnothing 13$ with distance 300 mm or with two fitting screws $\varnothing 12$ f7/M12 through the positioning holes $\varnothing 12$ H7 with distance 100 mm on grid plate or T-slot machine table.

Positioning holes $\varnothing 12$ F7 and fixing holes $\varnothing 13$ with distance 50mm used to position and attach with fitting screws $\varnothing 12$ f7/M12 or cylinder screws M12 on grid plate or T-slot machine table.

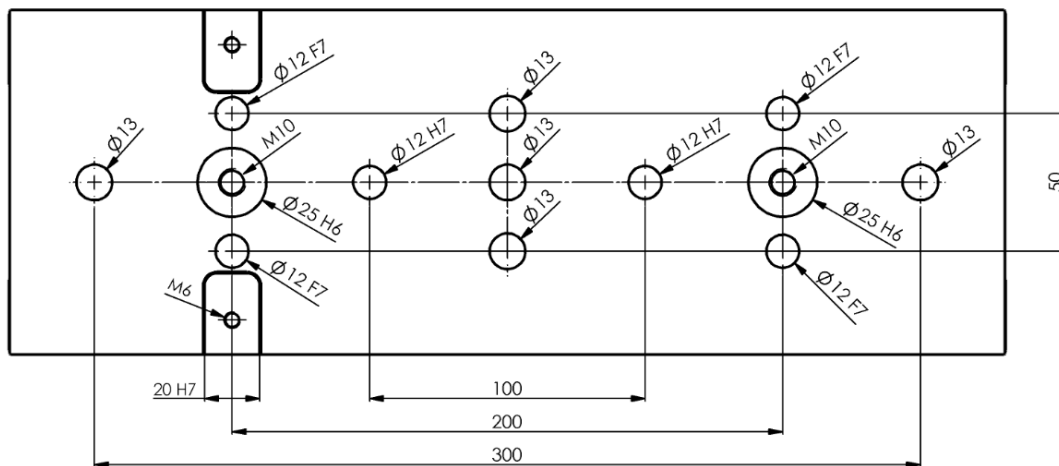
Locating holes $\varnothing 25$ H6 to attaching the clamping pins for the NSE3 and GFD quick-change pallet systems.

Important:

When using VERO-S clamping pins, make sure that a shortened screw is used, otherwise the slide may be damage. (See Schunk catalogue)



Alignment with precision slot on the T-slot machine table with cross slots 20 H7 in the base body.
Fastening with clamping claws.



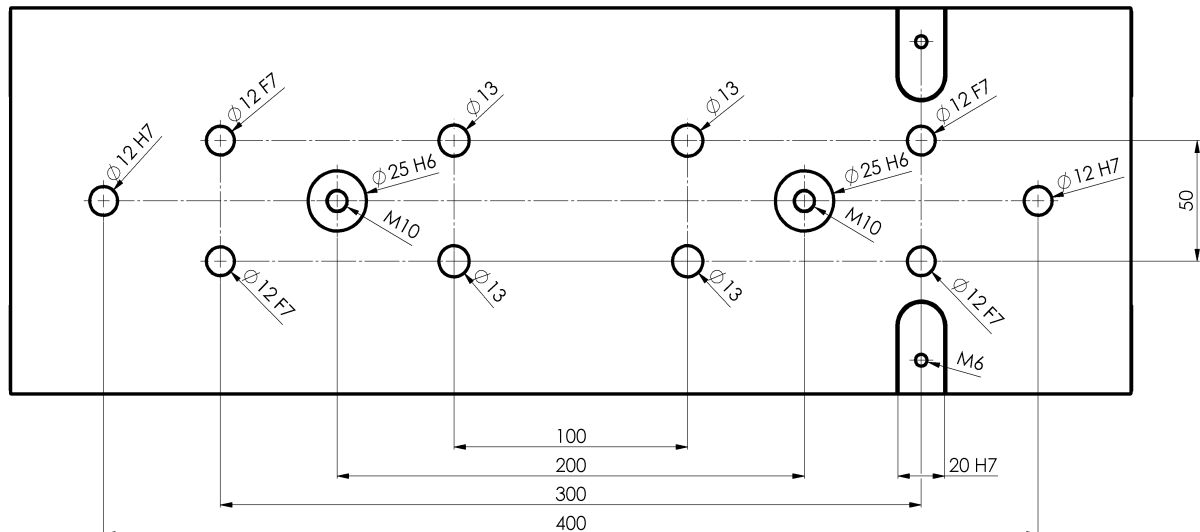
KSC-F 160

Alignment with cylinder pin $\varnothing 12$ m6 in the $\varnothing 12$ H7 positioning holes with distance 400 mm.
 Positioning holes $\varnothing 12$ F7 and fixing holes $\varnothing 13$ with distance 50mm used to position and attach with fitting screws $\varnothing 12$ f7/M12 and cylinder screws M12 on grid plate or T-slot machine table.

Locating holes $\varnothing 25$ H6 to attaching the clamping pins for the NSE3 and GFD quick-change pallet systems.

Alignment with precision slot on the T-slot machine table with cross slots 20 H7 in the base body.

Fastening with clamping claws.



4.2 Jaw range

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

4.3 Jaw change

- Release cylinder screws and remove the jaws.
- Clean and oil the contact surfaces, e.g. with MOTOREX Supergliss 68 K.
- Insert the jaws and tighten the cylinder screws (strength class 12.9) with 60 Nm for jaws of widths 80 mm respectively 125 mm and 140 Nm for 160 mm.

5 Servicing, cleaning and maintenance

Regularly clean and oil contact surfaces, guides and spindle of the vice, e.g. with MOTOREX Supergliss 68 K.

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.



Cleaning / Lubrication

Monthly lubrication of the fine-pitch thread using a lubricating nipple (pos. 60) 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. 70) of the fixed slider (pos. 30).

Monthly lubrication of the spindle guide (pos. 100) with multi-purpose grease through the grease nipple.

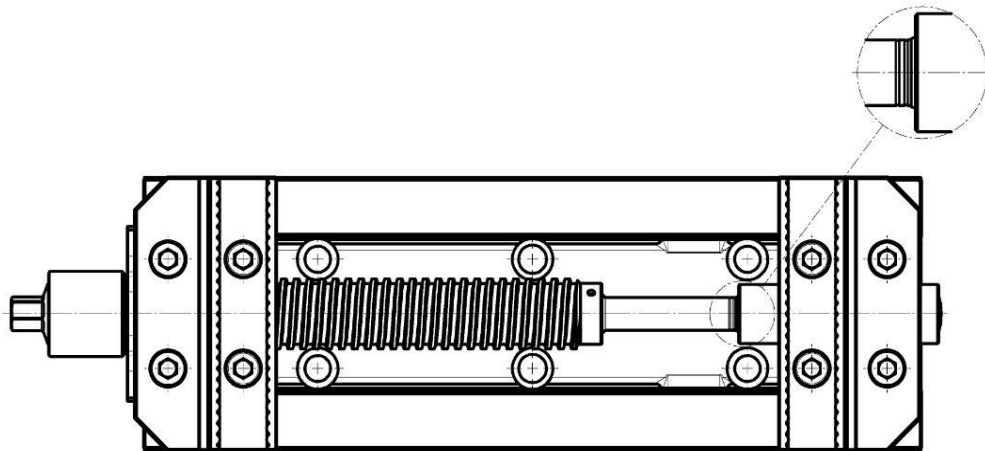
Check whether or not the scraper (pos. 120) is faulty.



6 Troubleshooting / Eliminating faults

The basic setting of the spindle assembly is not correct

If the vice is open up to the stop, two grooves must be visible within the spindle area (pos. 10) and the scraper (pos. 120).



Should no, one or three groove(s) be visible in this position, the slider was turned during assembly respectively disassembly and has to be reset since otherwise the scraper can suffer damage or the closing disc (pos. 70) in the fixed slider (pos. 30) will be pushed out. The listed clamping range can then also no longer be guaranteed.



Proceed as described in Section 7 to restore the basic setting.

The spindle does not decouple

Clean the guide and the spindle as the clamping device is soiled and causes too much friction so that the force increase is triggered before contact is made with the workpiece and no tension is applied.



When turning back, the unit does not couple into the home position

(e.g. due to a very deep grip profile)

Restrain the outer spindle manually and turn the inner spindle back until it engages.

The vice is very stiff when opening and closing it

Re-grease the spindle brake through the grease nipple, as the spindle guide / spindle brake (pos. 100) has dried out and there is too much friction.



Unable to install fixed jaw

The groove in the base body (pos. 40) and fixed slider (pos. 30) are misaligned and the slider cannot be moved into the correct position.

The threaded pin (pos. 90) may have been excessively clamped in the base 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 slider (pos. 30) must be defined exclusively by the wedge of the fixed jaw.



The clamping force is not reached

If the inner spindle does not decoupling then must the inner spindle turned back to the original position manually.

A sudden foreshortening of the clamping angle at the torque wrench is another indication that insufficient clamping force is available.



7 Removing / Assembly

Removing

KSC-F 80

- Removing system jaws.
- Pull the spindle assembly slightly out.
- Remove the cylinder screw. (pos. 80)

KSC-F 125 / 160

- Removing system jaws.
- Remove the securing screws. (pos. 80 and pos. 90)

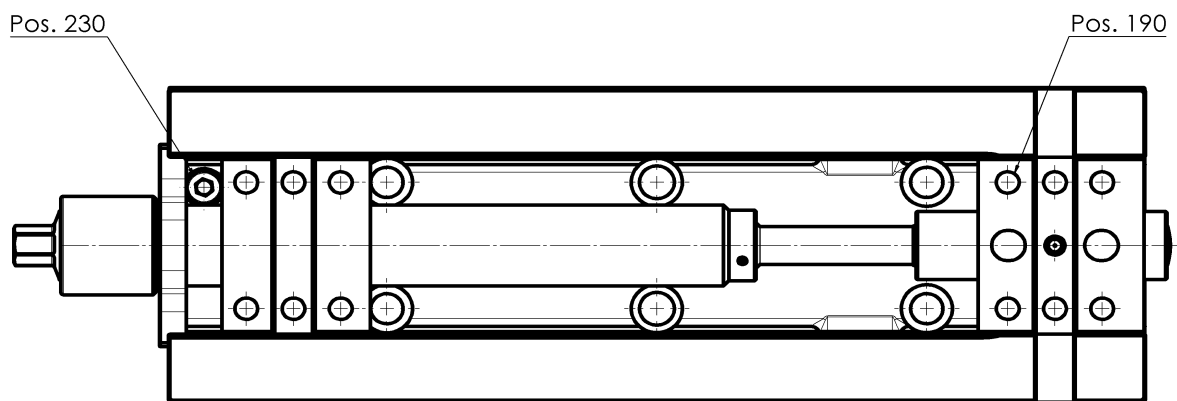
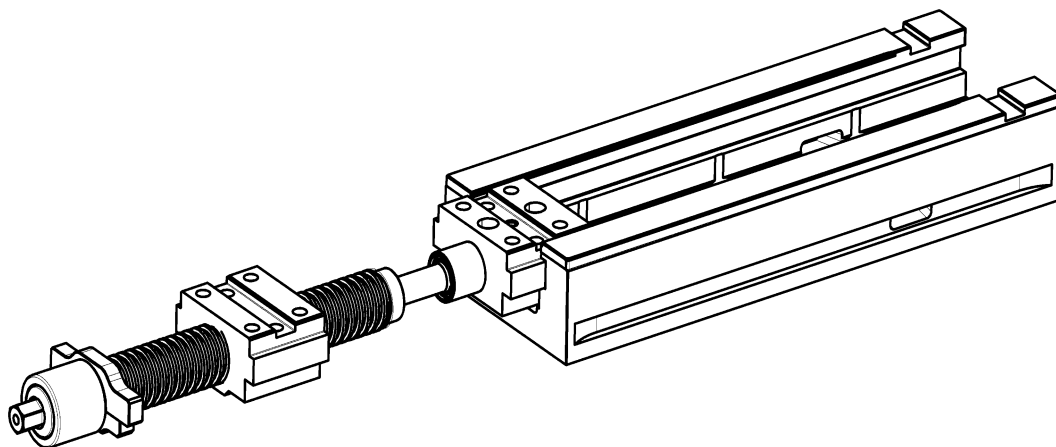


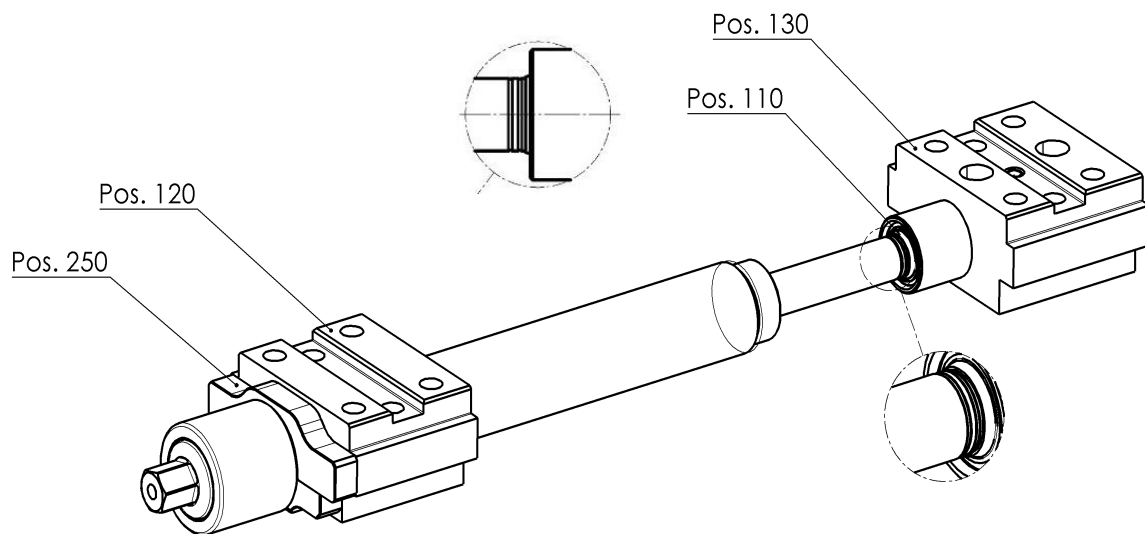
Figure: KSC-F 125

- Pull the spindle assembly from the base body.



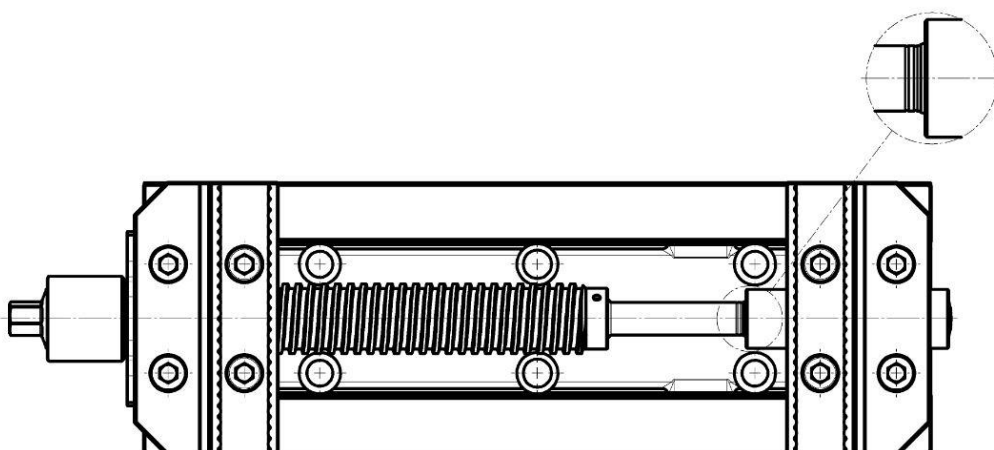
Assembly

- Turn the moving slider (pos. 20) towards the spindle guide. (pos. 100)
- Secure the slider (pos. 30) until two grooves are visible on the scraper. (pos. 120)

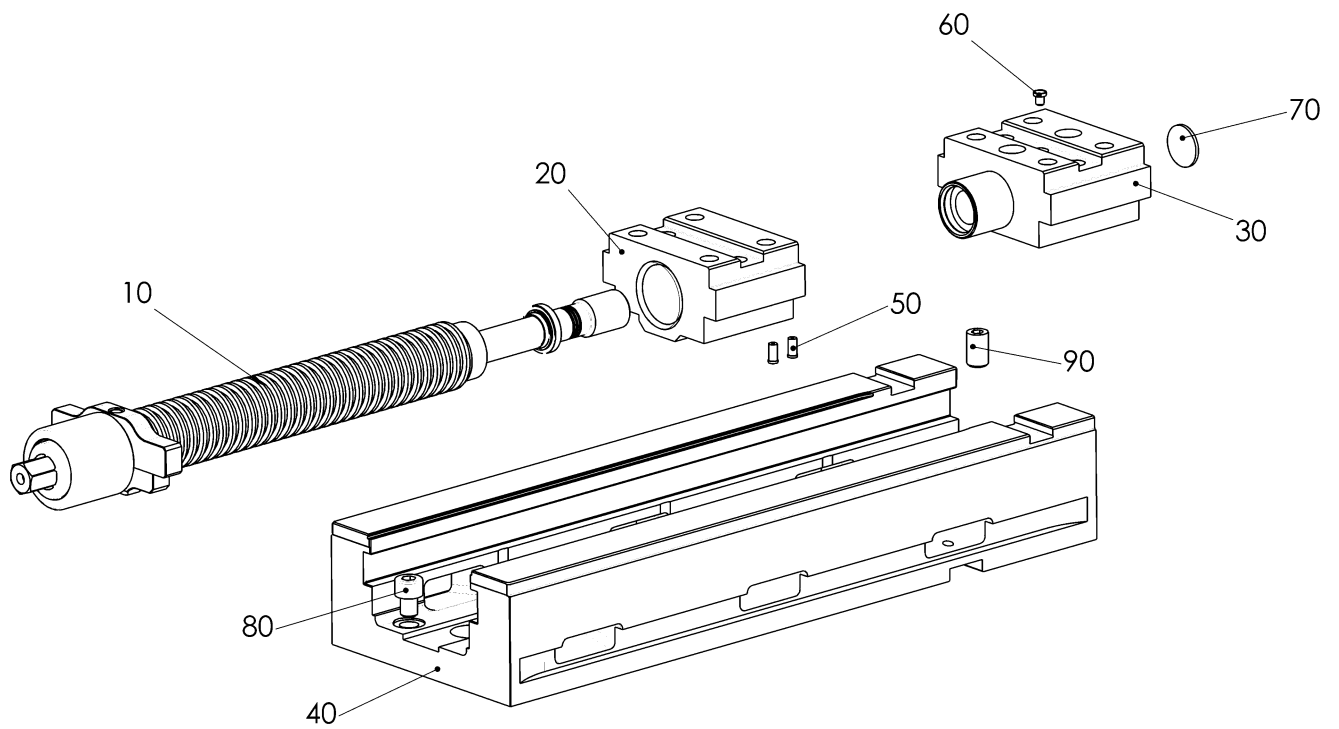


- Carry out alignment of the slider and spindle assembly so that the guide surfaces match each other and at the scraper (pos. 120) the two grooves still have to be visible. The third groove must not be visible.
- Move the complete unit into the base body and turn somewhat together.
- Re-insert the securing screws.
KSC-F 125 / 160: Only fit the threaded pin, because the fixed slider must not be clamped to the base body. The exact position of the fixed slider is determined by the fixed jaw.

Check: In the maximum open position must be the two grooves visible.



8 Assembly drawing



8.1 Parts list

Pos.	Part. No.	Designation	Quantity
10	SGM.080.203.82 <i>SGM.125.203.82</i> <u>SGM.160.203.82</u>	Spindle assembly	1
20	SGM.080.308.11 <i>SGM.125.308.11</i> <u>SGM.160.308.11</u>	Movable slider	1
30	SGM.080.307.11 <i>SGM.125.307.11</i> <u>SGM.160.307.11</u>	Fixed slider	1
40	SGM.080.302.11 <i>SGM.125.302.11</i> <u>SGM.160.302.11</u>	Base body	1
50	XNN.90004.040	Spring-loaded pressure piece Ø4	2 4 6
60	XNN.90102.040	Grease nipple Ø4	1
70	XNN.12620.160 <i>XNN.12620.160</i> <u>XNN.12620.250</u>	Closing disc Ø20 Closing disc Ø20 Closing disc Ø25	1
80	XNN.10361.357 <i>XNN.10311.408</i> <u>XNN.10311.408</u>	Internal hexagon cylinder screw NK M6x8 Internal hexagon cylinder screw M8x10 Internal hexagon cylinder screw M8x10	1
90	XNN.10361.357 <i>XNN.10709.461</i> <u>XNN.10709.616</u>	Internal hexagon cylinder screw NK M6x8 Internal hexagon threaded pin M10x16 Internal hexagon threaded pin M10x16	1
100	SGZ.080.010.01 <i>SGZ.125.048.01</i> <u>SGZ.160.024.01</u>	Spindle guide / Spindle brake	1
120	XNN.65114.130 <i>XNN.65114.150</i> <u>XNN.65114.201</u>	Scraper WWS Ø14 Scraper WWS Ø15 Scraper WWS Ø20	1

Positions in plain font are used for S2 80

Positions in italic font are used for S2 125

Under Positions in underscored font are used for S2 160



9 Swivel and adapter plate

9.1 Function

Slanted and curved items can be securely clamped with 4-point clamping using the protected O-ring 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 unprocessed 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.



9.2 Servicing, cleaning and maintenance

The upper shoulder of the swivel peg must be greased regularly.

Turn the swivel plate once a week so that the lubrication film can be rebuilt.

Lubrication of the swivel peg is recommended once a year.

9.3 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.
- Lubricate the entire system with grease and reassemble.

9.4 Fitting the 6-fold reversible jaws

- Determine the mounting positions of the 6-fold reversible jaws.
The best clamping results are achieved when workpieces 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 cylinder screws.
- Turn the 6-fold reversible jaws to the required clamping surface and slightly pre-clamp the workpiece so that the clamping faces are parallel to the workpiece.
- Use a torque of 80 Nm to tighten the cylinder screws of the 6-fold reversible jaws.

Important:

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

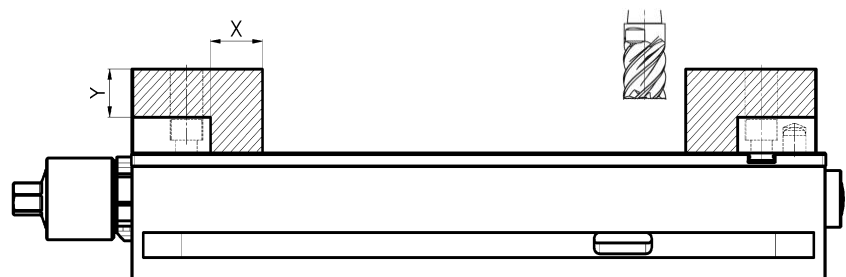


10 Aluminium jaws

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	18
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.



11 Taking out of service

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



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

Tel.: +49-7572-7614-1300
Fax: +49-7572-7614-1039

CMM@de.schunk.com
schunk.com