



Clamping force block

TANDEM KSP plus, KSP-LH plus, KSP-F plus

Assembly and Operating Manual

Translation of Original Operating
Manual

Imprint

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Technical changes:

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Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

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Please read the operating manual in full and keep it close to the product.

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1 General

1.1 About this manual

This manual contains important information for the safe, correct use of the product.

It is an integral part of the product and must be kept accessible for personnel at all times.

Personnel must have read and understood this manual before beginning any work. The observance of all safety notes in this manual is a prerequisite to ensure safe work processes.

The illustrations are intended to provide a basic understanding and may deviate from the actual version.

Besides this manual, other documents which apply are those listed under ▶ 1.1.2 [6]

1.1.1 Illustration of warning notices

To make risks clear, the following signal words and symbols are used for safety notes.



⚠ DANGER

Denotes a hazard with a high degree of risk that, if not avoided, will result in death or serious injury.



⚠ WARNING

Denotes a hazard with a medium degree of risk that, if not avoided, could result in death or serious injury.



⚠ CAUTION

Denotes a hazard with a low degree of risk that, if not avoided, could result in a minor or moderate injury.

NOTICE

Information about avoiding material damage.

1.1.2 Applicable documents

- General Terms and Conditions *
- Catalog data sheet for the attached product *
- Technical data sheet for optional attachments *
- Approval drawings

Documents marked with a star (*) can be downloaded at **schunk.com**.

1.1.3 Sizes

This operating manual applies to the following sizes:

- KSP plus 64, 100, 140, 160, 250
- KSP-LH plus 64, 100, 140, 160, 250
- KSP-F plus 64, 100, 140, 160, 250

1.2 Warranty

The warranty for standard products is 24 months from the date of delivery from the factory, or 50,000 cycles* for manually operated clamping devices and 500,000 cycles* for power operated clamping devices. For special clamping devices, it is 12 months from the date of delivery from the factory, assuming appropriate use in accordance with the following conditions:

- Observe the applicable documents, ▶ 1.1.2 [6]
- Observance of the ambient conditions and operating conditions, ▶ 2.5 [8]
- Observance of maintenance and lubrication intervals, ▶ 5 [20]

Parts touching the workpiece and wearing parts are not covered by the warranty.

* One cycle comprises one complete clamping procedure ("opening" and "closing").

1.3 Scope of Delivery

Clamping block

KSP plus or KSP-LH plus or KSP-F plus

(without top jaws)

ACCESSORY PACK:

(for contents, see sealing kit and parts list) ▶ 8.1 [25]

2 Basic safety notes

Improper handling, assembly and maintenance of this product may result in risk to persons and equipment if this operating manual is not observed.

2.1 Appropriate use

- The product is used for clamping metal and plastic workpieces on machine tools.
- The product may only be used within the scope of its technical data.
- The product is designed to be set up on a machine table or machine pallets.
- The product is intended for industrial and commercial use.
- Appropriate use of the product includes compliance with all instructions in this manual.
- Use suitable top jaws with a suitable interface.
- Clamping workpieces with temperatures between 0°C and 100°C.
- The outer dimensions of the workpiece must be smaller than or at most equal to the outer diameter of the clamping device.
- The workpiece must not undergo plastic deformation while under clamping force (clamping indentations are permissible).

2.2 Inappropriate use

The product is not being used appropriately if:

- the product is used as a press or a punch, as a toolholder, as a lathe chuck, as a drill or as a cutting tool.
- the technical data specified are exceeded during usage.
- workpieces are not properly clamped, paying particular attention to the specified clamping forces.
- the top jaws are not mounted properly.
- the product is not being operated properly.
- the product is operated in the stroke end positions.
- the guideways are overloaded due to the chuck jaws being too high or the selected clamping point being too high.
- the product has been insufficiently maintained.
- the product is used for turning applications over 100 RPM without consulting SCHUNK.
- the product is brought into contact with aggressive media, especially acids.
- the product is used in abrasive blasting processes, especially sandblasting.

2.3 Structural changes

Implementation of structural changes

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- Structural changes should only be made with the written approval of SCHUNK.

2.4 Spare parts

Use of unauthorized spare parts

Using unauthorized spare parts can endanger personnel and damage the product or cause it to malfunction.

- Only use original spare parts and spares authorized by SCHUNK.

2.5 Ambient conditions and operating conditions

Required ambient conditions and operating conditions

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction in the service life of the product

- Make sure that the product is only used within its defined application parameters.
- Ensure that the product is of a sufficient size for the application.
- Ensure that maintenance and lubricating intervals are observed.
- When machining, use only coolant emulsions with anti-rust properties.
- Depending on the operating conditions, the function must be checked after a certain period of operation.

2.6 Material limitations

The product is made of steel alloys, elastomers, aluminum alloys and brass. In addition, Microgleit LP 410 grease, Branotect anti-rust oil and Renolit HLT2 are incorporated into the product as auxiliary and operating materials. The safety data sheet for Microgleit LP 410 can be found at www.schunk.com.

2.7 Chuck Jaws

Requirements of the chuck jaws

When using chuck jaws, please observe the following rules:

- Change chuck jaws at a standstill and without a clamped workpiece.
- Do not use welded jaws.
- Design the chuck jaws to be as low as possible. The clamping point must be as close as possible to the housing. (clamping points at a greater distance cause higher surface pressures in the jaw guides and can significantly reduce the clamping force.)
- If the clamping point is at a greater distance from the housing, the operating pressure must be reduced.
- After a collision, the clamping device and the chuck jaws must be subjected to a crack detection test before being used again. Replace damaged parts with original SCHUNK spare parts.
- The chuck jaw mounting screws and if present, the T-nuts, must be replaced if there are signs of wear or damage. Only use screws of quality grade 12.9 in compliance with the specified tightening torques. For clamping devices with fine serration, the jaw mounting screws must be screwed into the holes closest to the clamping point.

2.8 Personnel qualifications

Inadequate qualification of personnel

Any work on the product by inadequately qualified personnel can lead to serious injuries and considerable material damage.

- All work must be performed by appropriately qualified personnel.
- Personnel must have read and understood the complete manual before beginning any work on the product.
- Observe country-specific accident prevention regulations and the general safety notes.

The following personnel qualifications are required for the various activities on the product:

Qualified electrician

Qualified electricians have the professional training, knowledge, and experience to work on electrical systems, to recognize and avoid potential dangers, and know the relevant standards and regulations.

Specialist personnel

Specialist personnel have the specialized training, knowledge, and experience to perform the tasks entrusted to them, to recognize and avoid potential dangers, and know the relevant standards and regulations.

Instructed person

Instructed persons have been instructed by the operator regarding the tasks entrusted to them and the potential dangers of inappropriate behavior.

Manufacturer's service personnel

The manufacturer's service personnel have the specialized training, knowledge, and experience to perform the work entrusted to them and to recognize and avoid potential dangers.

2.9 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff in the event of a danger that may interfere with their health or safety at work.

2.10 Transport

Handling during transport

Incorrect handling during transport can make the product unsafe and risks the danger of serious injuries and considerable material damage.

- During transport and handling, secure the product to prevent it from falling.
- Use the transport thread on the clamping device.

2.11 Protection during handling and assembly

Incorrect handling and assembly

Incorrect handling and assembly can make the product unsafe and can risk the danger of serious injuries and considerable material damage.

- All work must only be performed by appropriately qualified personnel.
- Secure the system against accidental operation during all work.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

2.12 Protection during commissioning and operation

Falling or violently ejected components

Falling and ejected components can lead to serious injury or death.

- Take suitable protective measures to secure the danger zone.

2.13 Notes on safe operation

Incorrect manner of working by personnel

An incorrect manner of working can make the product unsafe and risks serious injuries and considerable material damage.

- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. Products for special ambient conditions are excluded.
- Rectify malfunctions as soon as they occur.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention, and environmental protection regulations for the application field of the product.

- Do not start the machine spindle until the force has built up in the chuck jaw and clamping is complete in the permissible operating range.
- Unclamping may only occur once the machine spindle has come to a standstill.

IMPORTANT!

Following a longer shutdown period (more than 8 hours), always re-tension the clamping device in order to compensate for the setting properties of the clamping situation or possible pressure losses and the resulting loss of clamping force.

2.14 Disposal**Handling of disposal**

Incorrect handling during disposal can make the product unsafe and risks serious injuries and considerable material and environmental harm.

- Follow local regulations on dispatching product components for recycling or proper disposal.

2.15 Fundamental dangers**General**

- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- Do not reach into the open mechanism or movement area of the product during operation.

2.16 Protection against dangerous movements**Safe condition**

1. Clamping force block with workpiece:
Workpiece clamped outside the end positions of the clamping force block with clamping pressure applied.
2. Clamping force block without workpiece, without clamping or release pressure applied.
3. Clamping force block with spring force:
Clamped without energy without workpiece.
Special feature: Due to the built-in spring, an opened clamping force block clamps without release pressure. Unexpected clamping movements could result if the release pressure fails. Take suitable measures, e.g. a pilot-controlled check valve with manual venting.

Unexpected movements

If the system still retains residual energy, serious injuries can be caused while working on the product.

- Establish a safe state, switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.

2.17 Notes on particular risks



⚠ WARNING

Risk of injury in the event of workpiece loss due to component failure on the product as a result of exceeding the technical data.

- The product is only allowed to be used within the scope of its technical data.



⚠ WARNING

Risk of injury due to immediate closing of the product with high spring force in the event of pneumatic pressure failure (AS variant).

- Wait for the system to come to a complete standstill in the safe state.
- Do not reach into the clamping force block.



⚠ WARNING

Danger of crushing due to the chuck jaws moving to the workpiece during the clamping procedure when loading and unloading manually.

- Do not reach between the workpiece and the chuck jaw during the clamping procedure.
- Implement the safety functions according to the integrator's risk assessment.



⚠ WARNING

Risk of injury in the event of workpiece loss due to failure or pressure reduction.

- Implementing safety functions according to the integrator's risk assessment.
- Ensure stable pressure supply.
- Use pressure maintenance valves.



⚠ WARNING

Risk of injury from falling parts during transport, assembly and disassembly of the product and its accessories.

- Use suitable load handling equipment for transport.
- Do not linger in the danger zone.
- Wear protective equipment (protective shoes).

**⚠ CAUTION**

Ergonomic risk to the musculoskeletal system when lifting and transporting the product using manual force.

- Use load handling equipment for lifting and transporting.

**⚠ CAUTION**

Allergic reactions or irritation due to skin or eye contact with lubricants on the product.

- In case of foreseeable contact with lubricants on the product (e.g. when lubricating or cleaning),
- wear protective equipment (protective gloves, protective goggles).

**⚠ CAUTION**

Danger for the operating personnel in case of insufficient clamping force due to ejection or falling of the workpiece!

Due to settling behavior, the clamping force may decrease over time.

- Ensure that the clamping pressure is applied to the clamping force block while the workpiece is being machined.
- Re-clamping of the workpiece with manual or pneumatic clamping force blocks.

3 Technical data

Installation position	any
Operating temperature [°C]	5 to 60
Noise emission [dB(A)]	≤ 70
Pressure medium	Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]

KSP plus	64	100	140	160	250
Stroke per jaw [mm]	2	2	3	3	5
Clamping force* at max. pressure [kN]	4.5	18	30	45	55
Max. pressure [bar]	9	9***	9	9***	6
Repeat accuracy** [mm]	0.01	0.01	0.015	0.02	0.03
Max. jaw height [mm]	60	60	60	60	150
Weight [kg]	1.5	4	7.5	11	32

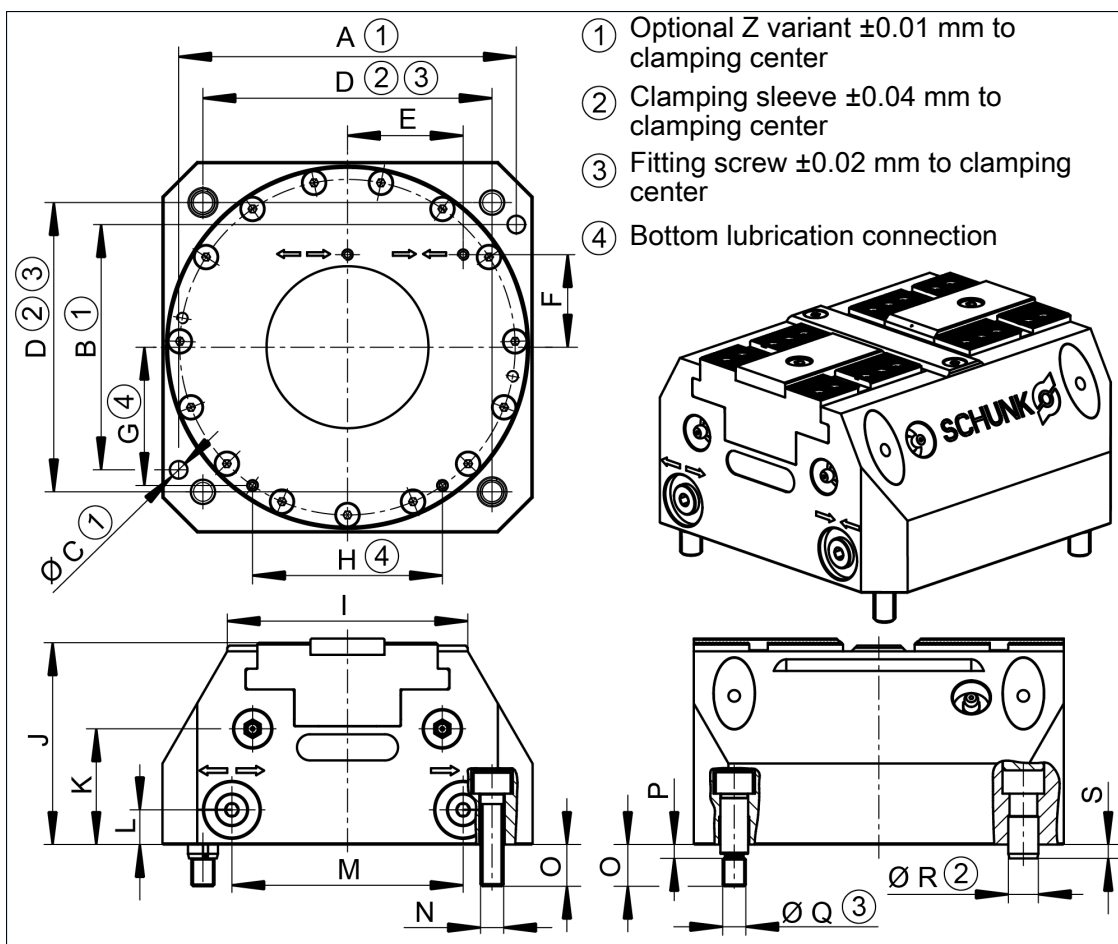
KSP-LH plus	64	100	140	160	250
Stroke per jaw [mm]	4	6	7	8	15
Clamping force* at max. pressure [kN]	2.3	8	15	20	20
Max. pressure [bar]	9	9***	9	9***	6
Repeat accuracy** [mm]	0.01	0.01	0.015	0.02	0.03
Max. jaw height [mm]	100	150	120	200	500
Weight [kg]	1.5	4	7.5	11	32

KSP-F plus	64	100	140	160	250
Stroke per jaw [mm]	2	4	6	6	10
Clamping force* at max. pressure [kN]	4.5	18	30	45	55
Max. pressure [bar]	9	9***	9	9***	6
Repeat accuracy** [mm]	0.01	0.01	0.015	0.02	0.03
Max. jaw height [mm]	60	60	60	60	150
Weight [kg]	1.5	4	7.5	11	32

* Clamping force is the arithmetic sum of the individual forces occurring at the chuck jaws at distance "H" (see also catalog).

** End position spread after 100 consecutive strokes.

*** When using an ABP-A base plate, the maximum pressure must be limited to **7 bar** .



KSP plus / KSP-LH plus / KSP-F plus					
Dimension	64	100	140	160	250
A [mm]	36	90	126	146	230
B [mm]	56	64	92	106	154
$\varnothing C$	4 H7 x 7.5	6 H7 x 12	8 H7 x 14	8 H7 x 14	10 H7 x 20
D [mm]	50	80	110	125	200
E [mm]	17	29.5	44	50	75
F [mm]	17	32	45.5	40	64
G [mm]	21	34.5	51.8	59.7	92.6
H [mm]	33.6	55	74	82	139.6
I [mm]	41	64	91	104	170
J [mm]	50.7	69.2	72.7	82.2	98.2
K [mm]	30.8	42	41	45	52
L [mm]	12	10	13.5	15	20
M [mm]	34	59	88	100	150
N	M6	M8	M8	M10	M12
O [mm]	12	15	15.5	18	20
P [mm]	2.5	4	3.5	4	5
$\varnothing Q$	8 f7	10 f7	10 f7	12 f7	14 f7
$\varnothing R$ [mm]	8	11	11	13	16
S [mm]	4	4.5	5.5	6	6

4 Assembly

The numbers shown for individual components refer to the assembly illustrations or clamping block connections and to the "Drawings" chapter, ▶ 9 [28].



⚠ WARNING

Risk of injury due to accidental actuation of the clamping force block during assembly and connection.

- Make sure the power supply for the clamping block is off during assembly and connection.
- Perform maintenance, modifications, or installations outside of the danger zone.



⚠ WARNING

Risk of injury from clamping block or chuck jaws falling during transport, installation or removal!

- Make sure the clamping block and chuck jaws do not fall during transport, installation or removal.
- Use a crane and/or a transport truck for transportation.
- Only install the clamping block on machines with the appropriate connection dimensions.

4.1 Tightening torques for screws

Tightening torques to mount the clamping system on the machine table (screw quality 10.9)

Screw size	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Tightening torque M_A (Nm)	4	4	13	28	50	88	120	160	200	290	400	500

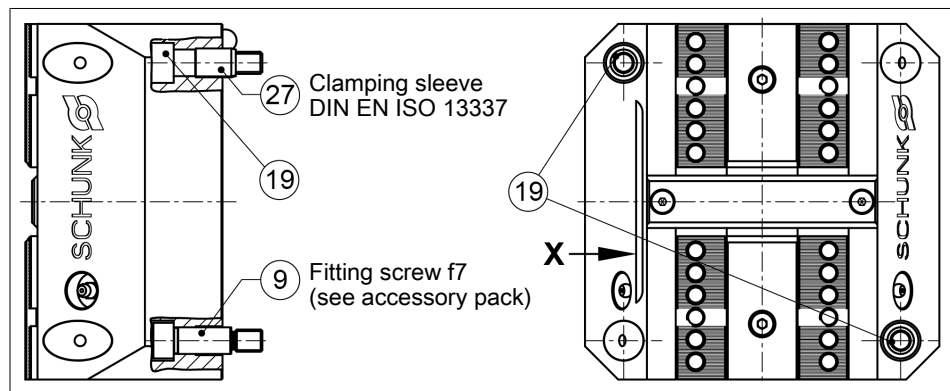
Tightening torques for mounting top jaws on the TANDEM clamping block (screw quality 12.9)

Screw size	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24
Tightening torque M_A (Nm)	5	9	15	32	62	108	170	262	510	880

Tightening torques to mount the chuck piston onto the cylinder piston (screw quality 12.9)

Screw size	M5	M8	M10	M12
Tightening torques M_A (Nm)	9	32	62	108

4.2 Assembly of the Clamping Block on the machine table



Assembly of the Clamping Block

NOTE

- For vertical installation, the opening of the coolant drain (item 13) must always face downwards
- Surface "X" is parallel to the guideway of the base jaws (item 2) so the clamping block can be aligned on the machine table.

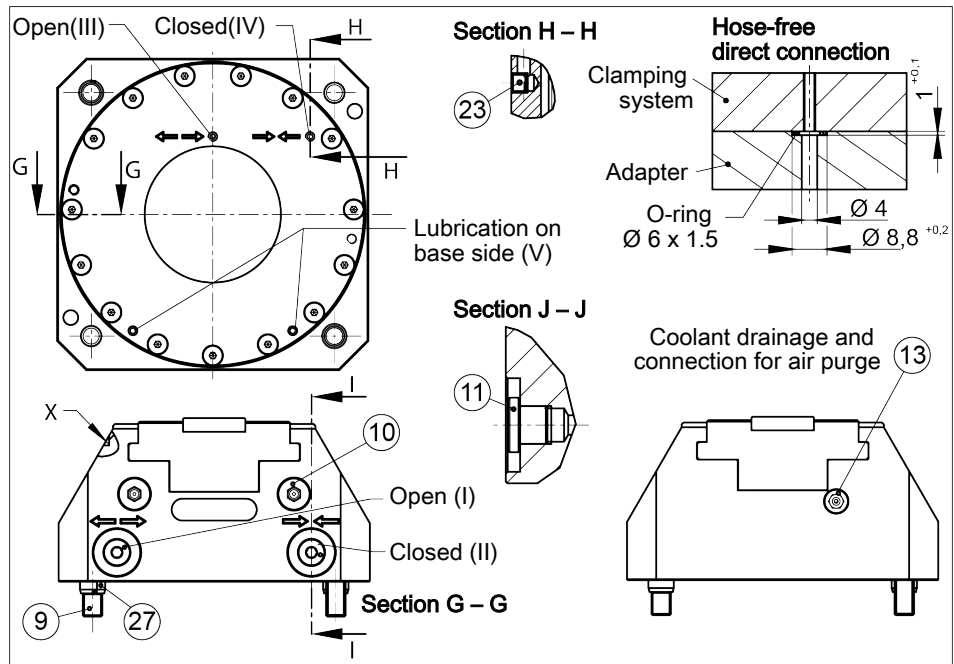
Assembly with clamping sleeves:

Mount the clamping block on the machine table together with clamping sleeves (item 27) and screws (item 19).

Assembly with fitting screws:

There are two fittings in the housing (item 1) that, along with the optional fitting screws (item 9), are used to center the clamping block on the machine table with repeat accuracy. Do not realign the clamping block after removing it from the machine table (e.g., after replacing the seals). When using fitting screws (item 9), use them instead of the clamping sleeves (item 27) and the two corresponding screws (item 19).

4.3 Connecting the clamping block



Connecting the clamping force block

NOTICE

Risk of workpiece loss and damage to system due to loss of air pressure caused by damaged pneumatic lines.

Always make sure the connections are tight, and use appropriate protection covers to protect the pneumatic hoses and lines from hot chips and falling parts.

The clamping force block has four air connections: **I, II, III, IV**. Two connections for OPEN (**I** and **III**) and two connections for CLOSE (**II** and **IV**).

Which of the two air connections has to be opened for actuation depends on the application:

- Connections **I** and **II** for operation without a base plate.
- Connections **III** and **IV** in the base for hose-free, direct connection to the machine table or on the base plate.

The threads for hose-free, direct connection are not designed for pneumatic fittings.

Thread for pneumatic fitting (frontal):

KSP plus, KSP-LH plus, KSP-F plus 64 and 100	M5
KSP plus, KSP-LH plus, KSP-F plus 140, 160 and 250	G1/8"

NOTE:

All four air connections come sealed on delivery of the clamping force block. On base side with set-screws (item 23) and on front with locking screws (item 11).

Compressed air supply requirements: Compressed air, compressed air quality according to ISO 8573-1:2010 [7:4:4]

Unconditioned compressed air contains dust and oil particles and moisture, all of which can lead to malfunctions or premature wear in the clamping force block. The oiler should be no more than 2 meters from the coupling point.

The clamping force block has two more base connections (V) for direct lubrication through the machine table. On delivery, these connections are sealed with set-screws (item 23 and item 24).

4.4 Mounting the clamping block on the base plate (If the two parts are delivered separately)

When mounting PLUS series TANDEM clamping blocks on **ABP-h plus** TANDEM base plates, use the shorter mounting screws included in the base plate accessory pack instead of the standard mounting screws (item 19) that come with the clamping block.

For KSP plus 100, KSP-LH plus 100 und KSP-F plus 100:

Use the **M8 x 30** screws from the base plate accessory pack instead of the M8 x 35 screws (item 19).

For KSP plus 160, KSP-LH plus 160 und KSP-F plus 160:

Use the **M10 x 40** screws from the base plate accessory pack instead of the M10 x 35 screws (item 19).

For KSP plus 250, KSP-LH plus 250 und KSP-F plus 250:

Use the **M12 x 45** screws from the base plate accessory pack instead of the M12 x 40 screws (item 19).

NOTE:

If the clamping block and base plate are ordered separately, the screws, O-rings and clamping sleeves for assembling the parts are included in the accessory pack that comes with the clamping block.

- Do not open the connections on the front of the clamping force block (I, II), or seal them with suitable dummy plugs (M5 or G1/8").
- Insert the clamping sleeves from the accessory pack into the centering holes on the base plate.
- Remove the seal plugs from the base plate (internal air feed-through III, IV) and insert the O-rings from the accessory pack into the recesses for the air feed-throughs.
- Mount the clamping block onto the base plate.

NOTE:

The TANDEM base plates do not have a connection possibility for the inductive proximity switches on the TANDEM clamping blocks.

The function for monitoring the jaw position can only be connected externally. When joining, make sure the air feed-throughs for the clamping system and the base plate are precisely aligned.

- Screw the two parts together using the four screws (item 19) from the accessory pack. In doing so, observe tightening torques, ▶ 4.1 [16].
- Remove the locking screws from the pneumatic connections on the base plate.
- Connect the diaphragm pressure switch and set the switch to the required minimum pressure.

5 Maintenance and care

To ensure the clamping force block operates perfectly, the following instructions are to be observed:

- Make sure the bore hole for coolant drainage remains unblocked!
- Depending on the load, but at least once a month or after every 10,000 clampings, grease the guides on the two frontal or the two lateral lubrication nipples with LINOMAX plus or an equivalent lubricant. Make sure the chuck jaws are in the open position.
- Disassemble the base jaw and chuck piston at least once every three months (or more often, if necessary). Clean the housing, base jaw and chuck piston and lubricate all the guides (housing, base jaw, chuck piston) with LINOMAX plus or an equivalent lubricant. Reassemble everything and relubricate the two frontal or the two lateral lubricating nipples with LINOMAX plus or an equivalent lubricant.

(product information about LINOMAX plus can be requested from SCHUNK).



⚠ CAUTION

Allergic reactions if lubricating grease comes into contact with the skin.

Wear protective gloves.

IMPORTANT!

Please regularly check the clamping device for tightness by applying a clamping force tester over a longer period of time (>10 min.). The clamping force should not drop during this period. Please adjust the inspection interval to the operating conditions of the clamping device, however, we do recommend conducting a check every 5,000 clamping cycles at the latest.

5.1 Disassembly and assembly the clamping block

When replacing wearing parts (e.g. seals – for seal kit lists see ▶ 8.1 [□ 25]) adhere to the following order:

NOTE:

The base jaws (items 2, 31), chuck piston (item 3) and housing (item 1) are specially tuned to one another. These parts cannot be replaced individually. To replace these parts, ship the entire clamping force block to SCHUNK along with a repair order.

1. Apply 6 bar of air pressure to the clamping system until the jaws are in the OPEN position.
2. Remove the covering strip (item 7) and the guide strips (item 6).
3. Remove the cylindrical screw (item 14) from the chuck piston.
4. Remove the pressure line.
5. Pull the plugs (item 8) out of the housing (item 1).

6. Loosen the screws (items 9, 19) and remove the clamping system from the base plate or machine table. Air may escape at this point.
7. To remove the chuck piston (item 3)
 - for size 64 screw in one M6 x > 25 screw in the center bore,
 - for size 100, screw in one M10 x > 25 screw in the center bore,
 - for size 140 and 160, screw one M12 x 25 screw in the center bore,
 - for size 250, screw in two M6 x 25 screws in the lateral threaded holes.

In addition, for variant KSP-F plus:

 - Remove the screw (item 32) between the base jaw (item 31) and housing (item 1).
 - Remove the positioning bolt (item 29) between base jaw (item 31) and housing (item 1). Also, screw an M3 screw for size 64, a M5 screw for sizes 100, 140 and 160 or an M6 screw for size 250 in the thread of the positioning bolt (item 29).
 - Pull the base jaw (item 31) out of the housing (item 1).
8. Pull the base jaws (item 2) out of the housing (item 1).
9. Before pulling off the cover (item 5), all the screws (item 21) need to be removed. To pull off the cover (item 5), screw two screws into the outer threaded holes:
 - for size 64, two M3 x > 25 screws,
 - for size 100, two M3 x > 25 screws,
 - for size 140, two M4 x > 25 screws,
 - for size 160 and 250, two M5 x > 25 screws,
10. Remove the seals (items 20, 22).
11. Underlay the clamping force block so the cylinder piston (item 4) can be pushed out.
12. Remove the seals (items 12, 15, 17).
13. Clean all the parts thoroughly and check for damage and wear. **Replace damaged and worn parts with original SCHUNK spare parts.**
14. Lubricate the new seals (items 12, 15, 17, 20, 22) with Renolit HLT 2 or equivalent grease.
15. Mount the new seals carefully. The seals must not be damaged in the process.
16. Grease the sliding surfaces of the cylinder and piston with Renolit HLT 2 or equivalent grease.
17. Place the cylinder piston (item 4) loosely into the cylinder. Make sure the cylinder piston (item 4) is level and not tilted.
18. Gently press the quad ring (item 12) inwards from all sides so that it slides more easily over the edge of the housing (item 1).
19. Press the cylinder piston (item 4) into the cylinder of the housing (item 1). Do not tilt the cylinder piston (item 4).
20. Place the O-rings (items 20, 22) in the housing (item 1) and the O-ring (item 17) around the cover (item 5).
21. Insert the cover (item 5) into the housing (item 1), making sure the openings for the air feed-throughs are aligned.

22. Screw the cover (item 5) onto the housing (item 1). Use a torque wrench ▶ 4.1 [16].
23. If using clamping sleeves (item 27) for centering, insert these into the housing (item 1) now.
24. Grease the sliding surfaces of the housing (item 1), base jaws (item 2) and chuck piston (item 3) with LINOMAX plus.
25. Assemble the base jaws (item 2) and the chuck piston (item 3). Be sure to observe the installation position for the base jaws and the chuck piston.
In addition, for variant KSP-F plus:
 - Mount base jaw (item 31) in the housing (item 1).
 - Mount the positioning bolt (item 29) between base jaw (item 31) and housing (item 1).
 - Screw in the screw (item 32) between the base jaw (item 31) and the housing (item 1).
26. Connect the clamping system to the air supply and move the jaws to the CLOSED position.
27. Screw down the chuck piston (item 3) and cylinder piston (item 4). Tighten the screw (item 14) with a torque wrench ▶ 4.1 [16].
28. Fasten the guide strips (item 6) and the covering strip (item 7).
29. Check for leaks.

5.2 Leak test

The following components are required to check for leaks: pressure gauge, shut-off valve, supply line and quick coupler.

- Check for leaks in the clamping system in the OPEN and CLOSED positions.
1. Connect the components to the open CLOSED connection in the following order:
pressure gauge – shut-off valve – quick coupler – supply line.
 2. Pressurize the clamping force block.
 3. Close the shut-off valve and remove the supply line.
 4. Leave the clamping force block force clamped for 24 hours.
 5. After 24 hours, the clamping force block is:
 - sealed if the pressure gauge indicates a drop in pressure of less than 0.5 bar.
 - leaking if the pressure gauge indicates a drop in pressure of more than 0.5 bar.

If the clamping system is leaking, check the screws first (e.g. with Metaflux leak detection spray). Seal any leaking screws.

Once the screws are sealed, check for leaks and replace if necessary (see Disassembling and assembling the clamping block ▶ 5.1 [20]).

6 Troubleshooting

Clamping block chuck jaws will not move

Possible cause	Solution(s)
Air supply interrupted	Check air supply
System pressure too low	Increase system pressure according to clamping system technical specifications
Connections mixed up	Check connections and functions and connect properly
Unused air connections not sealed	Seal front or base connections using accessories (included in scope of delivery)
Active air connections sealed	Remove set-screws from sealed air connections

Piston will not move

Possible cause	Solution(s)
Air is not oiled	Check maintenance unit, perform maintenance Place oiler closer to clamping system Set required oil level
Chuck piston screw broken (overload)	Send clamping system to SCHUNK for repairs or Disassemble clamping system and repair with original SCHUNK replacement parts ▶ 5.1 [20]
Piston rod or piston rod screw connection broken (overload)	Send clamping system to SCHUNK for repairs or disassemble clamping system and repair using original SCHUNK spare parts ▶ 5.1 [20]
Active air connections sealed	Remove set-screws from sealed air connections

Clamping block does not complete stroke

Possible cause	Solution(s)
Chips or dirt between covering strip and base jaws	Unscrew the covering strip (item 7) and remove chips and dirt

Clamping force getting weaker

Possible cause	Solution(s)
Clamping block not sealed tightly	Check connection and seal screws; reseal or replace
Seals damaged	Disassemble the clamping block ▶ 5.1 [20] and replace all the seals (see sealing kit lists, ▶ 8.1 [25])
Inadequate lubrication	Lubricate the lubrication nipples with LINOMAX plus ▶ 5 [20]

Clamping block movement jerky

Possible cause	Solution(s)
Steel guide rollers on sliding surfaces not greased	See chapter "Maintenance and Care" ▶ 5 [20]

7 Storage

When storing the product for a longer period of time, observe the following points:

- Clean the product and lubricate it lightly.
- Store the product in a suitable transport container.
- Only store the product in dry rooms.
- Protect the product from major temperature fluctuations.

NOTE: Before recommissioning, clean the product and all attachments, check for damage, functionality and leaks.

8 Sealing kits, accessory packs and parts lists

When ordering spare parts, the type, size and, if possible, the serial number of the clamping force block must always be stated to avoid delivery mistakes.

Seals, sealing elements, fittings, springs, bearings, screws, wiper bars and parts that come into contact with the workpiece are not covered by the warranty.

8.1 Sealing kit lists

Sealing kit *	ID
Size 64	0405119
Size 100	0405219
Size 140	1352791
Size 160	0405319
Size 250	0405319

* For included items, see note **X** in the following Parts List chapter. Seals are wearing parts and are recommended to be replaced during maintenance. The sealing kit can only be ordered as a complete set.

8.2 Accessory packs

Accessory kit *	ID
Size 64	8507912
Size 100	8507911
Size 140	1344305
Size 160	8507913
Size 250	8507914

* For included items, see note **Z** in the Parts List chapter below.

8.3 Parts lists

Item	Designation	Quantity	Note
1	Body	1	*
2	Base jaw	1	F *
	Base jaw	2	*
3	Chuck piston	1	*
4	Cylinder piston	1	
5	Cover	1	
6	Guide strip	2	
7	Covering strip	1	
8	Plug	4	Z
9	Fitting screw	2	Z
10	Lubrication nipple	4	
11	Locking screw	2	
12	X-ring	1	X
13	Sound absorber	1	
14	Screw	1	
15	Combined sealing ring	1	X
16	Screw	1	F
	Screw	2	
17	O-ring	1	X
18	O-ring	4	Z
19	Screw	4	Z
20	Flat gasket	12	64
	Flat gasket	13	100
	Flat gasket	15	160
	Flat gasket	18	140
	Flat gasket	19	250
21	Countersunk screw	9	64
	Countersunk screw	11	100
	Countersunk screw	15	140 / 160
	Countersunk screw	19	250
22	Flat gasket	1	100 / 160 / 250
	Flat gasket	2	100-F
23	Set-screw	2	100 / 250
	Set-screw	4	140 / 160
	Set-screw	5	64

Item	Designation	Quantity	Note
24	Set-screw	2	100 / 250
25	Countersunk screw	2	
26	Set-screw	1	160 / 250
27	Clamping sleeve	2	Z
28	Spherical washer	1	F
29	Socket pin	1	F
30	Screw	1	F
31	Base jaw	1	F*
32	Screw	1	F
33	Guide strip	1	64-F
43	Screw	3	140 / 160 / 250
45	O-ring	2	250

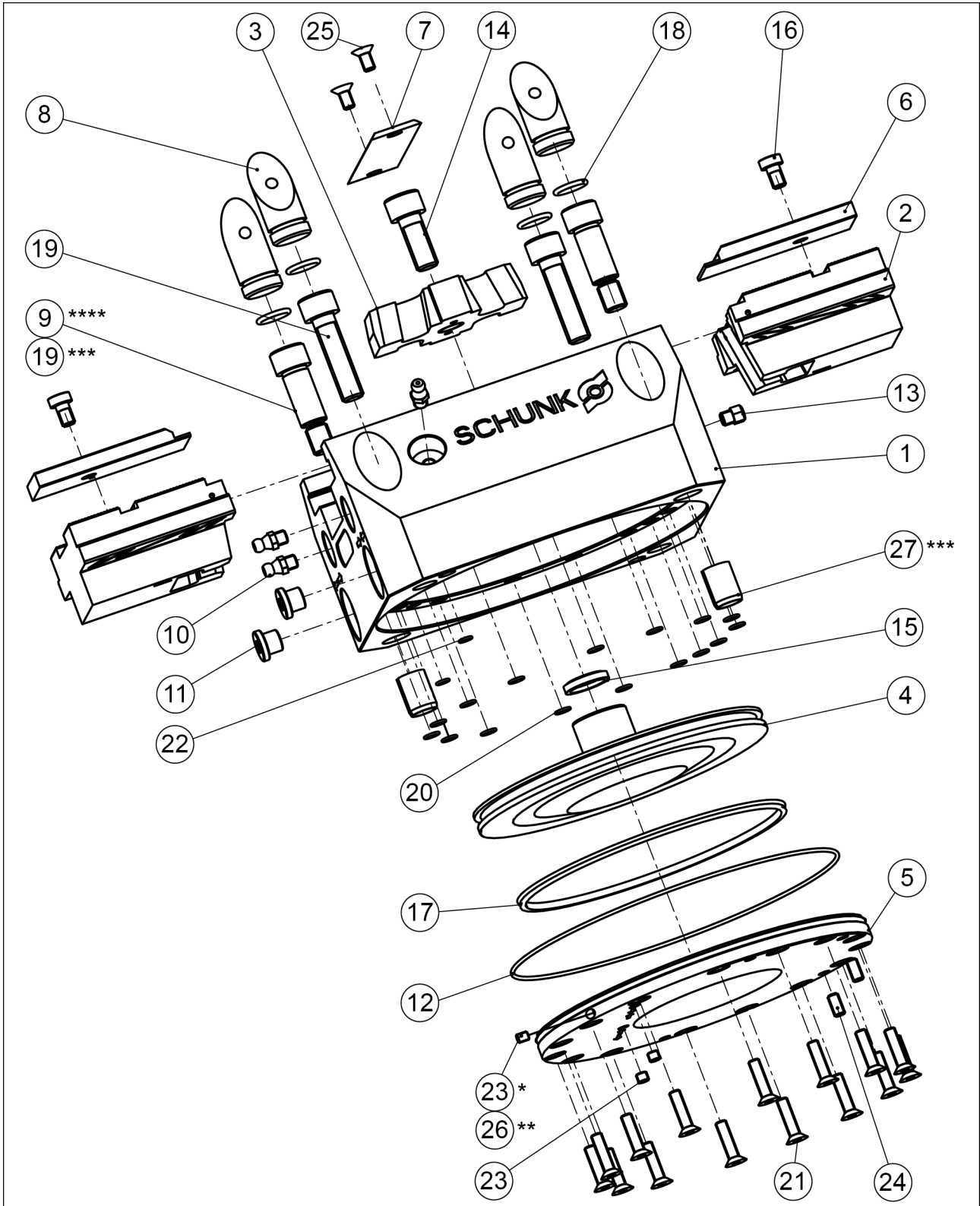
Parts list key

64	for size 64	F	with "fixed jaw" variants
100	for size 100	LH	with "LH" variants
140	for size 140	X	included in the sealing kit
160	for size 160	Z	included in accessory kit
250	for size 250		

* Individual components are specially tuned to one another and cannot be replaced by the customer.

9 Assembly drawings

9.1 KSP plus, KSP-LH plus



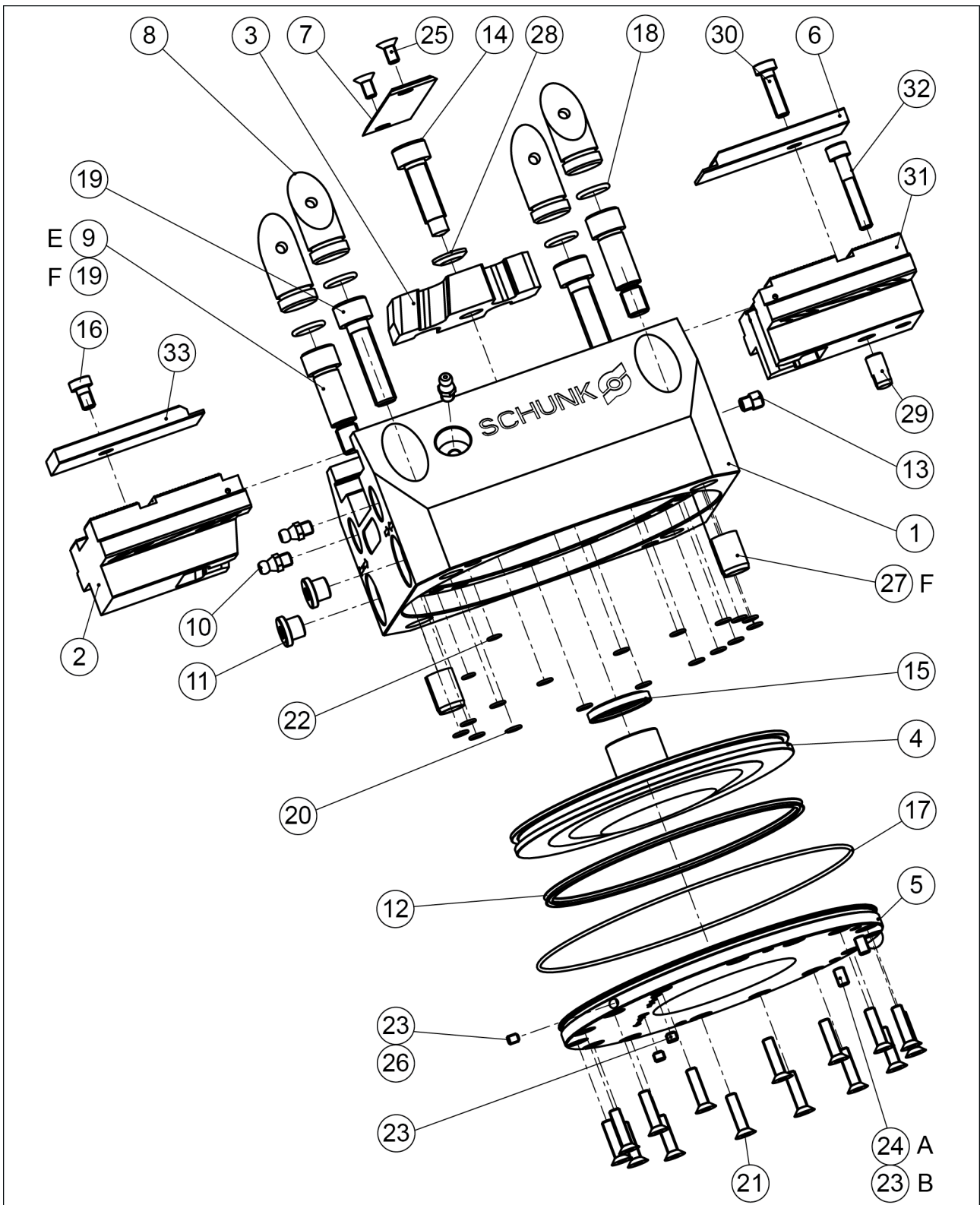
* for size 100

** for sizes 160/250

*** Centering with clamping sleeves

**** Centering with fitting screws

9.2 KSP-F plus



A for sizes 100/250

B for sizes 64/140/160

E Centering with fitting screws

F Centering with clamping sleeves

10 Manufacturer certificate

Manufacturer /
Distributor: H.-D. SCHUNK GmbH & Co. Spanntechnik KG
Lothringer Str. 23
D-88512 Mengen

Product: Clamping force block
Designation: TANDEM
Type designation: KSP, KRP, PZS, PZS-D, PGS

Heinz-Dieter SCHUNK GmbH & Co. Spanntechnik KG certifies that the above-mentioned products, when used as intended and in compliance with the operating manual and the warnings on the product, are safe according to the national regulations and:

- a **risk assessment** has been carried out in accordance with ISO 12100:2010.
- an **operating manual** for the assembly instructions has been created in accordance with the contents of the Machinery Directive 2006/42/EC Annex I No. 1.7.4.2. and the contents of the provisions of Annex VI of the Machinery Directive 2006/42/EC.
- **Markings** have been made in accordance with EN 1550:1997+A1:2008 Section 6.3.1, VDMA 34192:2019 Section 6.3 or ISO 16156:2004 Section 6.3. The requirements of Annex I No. 1.7.3. of the Machinery Directive 2006/42/EC have been complied with.
- the relevant basic and proven safety principles of the Annexes of **ISO 13849-2:2012**, taking into account the requirements of the documentation have been observed for the component. The parameters, limitations, ambient conditions, characteristic values, etc. for proper operation are defined in the operating manual.
- an $MTTF_D$ value of 150 years can be estimated for mechanical components using the informative procedure in Table C.1 of ISO 13849-1:2015.
- **fault exclusion** against the fault "Unexpected release without pending release signal".
- the **fault exclusion** against the fault "Breakage during operation" in compliance with the parameters, limitations, ambient conditions, characteristic values and maintenance intervals, etc., specified in the operating manual.
- that internal bore diameters in the **pipe or control lines** are at least 2 mm for pneumatic clamping systems and at least 3 mm for hydraulic clamping systems

Harmonized Standards applied:

- **ISO 12100:2010** Safety of machinery – General principles for design – Risk assessment and risk reduction

Other related technical Standards and specifications:

- **VDMA 34192:2019** Safety requirements for clamping devices for use on machines

Mengen, 25th of April 2023

Signature: see original declaration

Signature: see original declaration

p.p. Philipp Schröder
Head of Development standard products

p.p. Alexander Koch
Head of Engineering Design special products





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