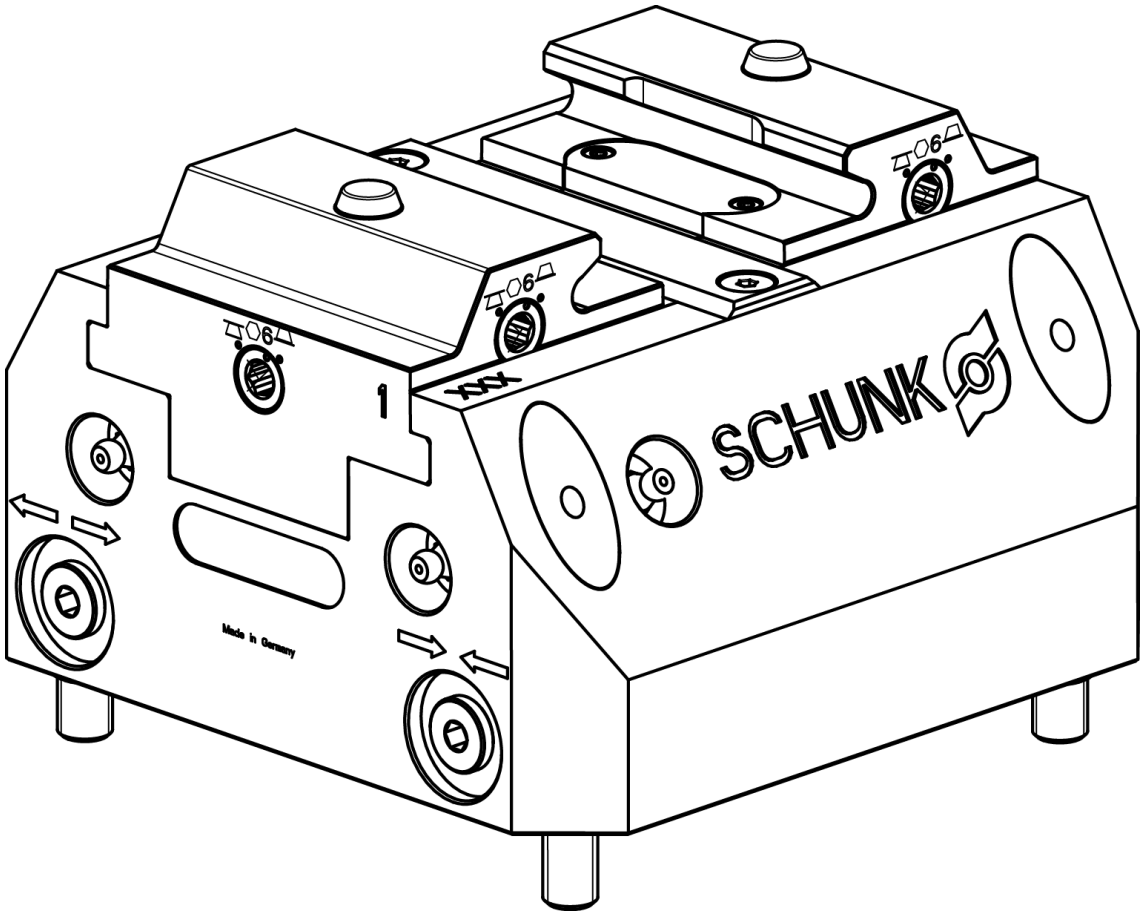
TANDEM Clamping Block
KSP plus-BWM, KSP-LH plus-BWM
Assembly and Operating Manual



Superior Clamping and Gripping

SCHUNK®

Imprint

Technical changes:

We reserve the right to make alterations for the purpose of technical improvement.

Document number: 1151449

Version: 05.00 | 25/03/2022 | en

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

Customer Management

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

Table of Contents

1 General

1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

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

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

Illustrations in this manual are provided for basic understanding and may differ from the actual product design.

In addition to these instructions, the documents listed under ▸ 1.1.2 [🗋 5] are applicable.

1.1.1 Presentation of Warning Labels

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

⚠ DANGER

Danger for persons!

Non-observance will inevitably cause irreversible injury or death.

⚠ WARNING

Dangers for persons!

Non-observance can lead to irreversible injury and even death.

⚠ CAUTION

Dangers for persons!

Non-observance can cause minor injuries.

CAUTION

Material damage!

Information about avoiding material damage.

1.1.2 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *

The documents labeled with an asterisk (*) can be downloaded from **schunk.com**.

1.1.3 Sizes

This operating manual applies to the following sizes:

- KSP plus-BWM 100, 160, 250
- KSP-LH plus-BWM 100, 160, 250

1.2 Warranty

The warranty period is 24 months after delivery date from factory or 500 000 cycles*, if it is used as intended, under the following conditions:

- Observe the applicable documents, ▸ 1.1.2 [🗋 5]
- Observe the ambient conditions and operating conditions, ▸ 2.6 [🗋 8]
- Observance of the specified care and maintenance instructions ▸ 8 [🗋 35]

Parts touching the workpiece and wear parts are not included in the warranty.

* A cycle consists of a complete clamping process ("Open" and "Close").

1.3 Scope of delivery

KSP plus-BWM or KSP-LH plus-BWM clamping block

(without changing jaws, reversible gripping inserts and clamping bars)

ACCESSORY PACK:
(for contents, see chapter accessory packs ▸ 9.2 [🗋 42])

1.4 Accessories

(see catalog or data sheets when ordering separately)

Changing jaw type: WTR, WTG (see chapter "WTR, WTG changing jaws" ▸ 5.2 [🗋 18])

Reversible gripping inserts for WTR, WTG

Clamping bars for WTR, WTG

TANDEM base plates

Valves, pneumatic screws

Hexagonal socket screwdriver

2 Basic safety notes

2.1 Intended use

- This product is intended for clamping and holding workpieces on machine tools and other suitable technical devices.
- It is designed to be set up on a machine table or machine pallets.
- The product may only be used within the scope of its technical data, ▶ 3 [🗋 14].
- The product is intended for industrial and industry-oriented use.
- Appropriate use of the product includes compliance with all instructions in this manual.

2.2 Not intended use

- The product is not being used as intended if, for example:
- It is used as lifting equipment, as a press, as a punching tool, as a lathe chuck, as a drill or as a cutting tool.
- It is used in working environments that are not permissible.
- Workpieces are not properly clamped.
- Safety regulations are disregarded and persons are working at this product (for example, to machine clamped workpieces) without additional protective equipment.
- The technical data specified by the manufacturer are exceeded during usage.
- It is used with machines/systems or workpieces that are not designed to be used with it.

2.3 Constructional changes

Implementation of structural changes

By conversions, changes, and reworking, e.g. additional threads, holes, or safety devices can impair the functioning or safety of the product or damage it.

- 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.

- Use only original spare parts or spares authorized by SCHUNK.

2.5 Use of special chuck jaws

Requirements of the chuck jaws

When using special chuck jaws, please observe the following rules:

- The chuck jaws should be designed to be as low as possible. The clamping point must be as close as possible to the housing (clamping points further away cause higher surface pressures in the jaw guides and can significantly reduce clamping force).
- Do not use welded jaws.
- Reduce operating pressure for higher clamping points.
- Mount accessories such as clamping bars or reversible gripping jaws to the changing jaws with the proper torque ▸ 4 [🗋 16].

2.6 Environmental 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 to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, ▸ 3 [🗋 14].
- Make sure that the product is a sufficient size for the application.
- Ensure that maintenance and lubrication intervals are observed, ▸ 8 [🗋 35].
- Ensure that the environment is free from ferromagnetic particles or chips.

2.7 Personnel qualification

Inadequate qualifications of the personnel

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

The following personal qualifications are necessary for the various activities related to the product:

Trained electrician

Due to their technical training, knowledge and experience, trained electricians are able to work on electrical systems, recognize and avoid possible dangers and know the relevant standards and regulations.

Qualified personnel Due to its technical training, knowledge and experience, qualified personnel is able to perform the delegated tasks, recognize and avoid possible dangers and knows the relevant standards and regulations.

Instructed person Instructed persons were instructed by the operator about the delegated tasks and possible dangers due to improper behaviour.

Service personnel of the manufacturer Due to its technical training, knowledge and experience, service personnel of the manufacturer is able to perform the delegated tasks and to recognize and avoid possible dangers.

2.8 Personal protective equipment

Use of personal protective equipment

Personal protective equipment serves to protect staff against danger which may interfere with their health or safety at work.

- When working on and with the product, observe the occupational health and safety regulations and wear the required personal protective equipment.
- Observe the valid safety and accident prevention regulations.
- Wear protective gloves to guard against sharp edges and corners or rough surfaces.
- Wear heat-resistant protective gloves when handling hot surfaces.
- Wear protective gloves and safety goggles when handling hazardous substances.
- Wear close-fitting protective clothing and also wear long hair in a hairnet when dealing with moving components.

2.9 Notes on safe operation

Incorrect handling of the personnel

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Avoid any manner of working that may interfere with the function and operational safety of the product.
- Use the product as intended.
- Observe the safety notes and assembly instructions.
- Do not expose the product to any corrosive media. This does not apply to products that are designed for special environments.
- Eliminate any malfunction immediately.
- Observe the care and maintenance instructions.
- Observe the current safety, accident prevention and environmental protection regulations regarding the product's application field.

IMPORTANT!

Following a longer shutdown period (more than approx. 6 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.

2.10 Transport

Handling during transport

Incorrect handling during transport may impair the product's safety and cause serious injuries and considerable material damage.

- When handling heavy weights, use lifting equipment to lift the product and transport it by appropriate means.
- Secure the product against falling during transportation and handling.
- Stand clear of suspended loads.

2.11 Malfunctions

Behavior in case of malfunctions

- Immediately remove the product from operation and report the malfunction to the responsible departments/persons.
- Order appropriately trained personnel to rectify the malfunction.
- Do not recommission the product until the malfunction has been rectified.
- Test the product after a malfunction to establish whether it still functions properly and no increased risks have arisen.

2.12 Disposal

Handling of disposal

The incorrect handling of disposal may impair the product's safety and cause serious injuries as well as considerable material and environmental harm.

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

2.13 Fundamental dangers

General

- Observe safety distances.
- Never deactivate safety devices.
- Before commissioning the product, take appropriate protective measures to secure the danger zone.

- Disconnect power sources before installation, modification, maintenance, or calibration. Ensure that no residual energy remains in the system.
- If the energy supply is connected, do not move any parts by hand.
- Do not reach into the open mechanism or movement area of the product during operation.

2.13.1 Protection during handling and assembly

Incorrect handling and assembly

Incorrect handling and assembly may impair the product's safety and cause serious injuries and considerable material damage.

- Have all work carried out by appropriately qualified personnel.
- For all work, secure the product against accidental operation.
- Observe the relevant accident prevention rules.
- Use suitable assembly and transport equipment and take precautions to prevent jamming and crushing.

Incorrect lifting of loads

Falling loads may cause serious injuries and even death.

- Stand clear of suspended loads and do not step into their swiveling range.
- Never move loads without supervision.
- Do not leave suspended loads unattended.

2.13.2 Protection during commissioning and operation

Falling or violently ejected components

Falling and violently ejected components can cause serious injuries and even death.

- Take appropriate protective measures to secure the danger zone.
- Never step into the danger zone during operation.

2.13.3 Protection against dangerous movements

Unexpected movements

Residual energy in the system may cause serious injuries while working with the product.

- Switch off the energy supply, ensure that no residual energy remains and secure against inadvertent reactivation.
- Never rely solely on the response of the monitoring function to avert danger. Until the installed monitors become effective, it must be assumed that the drive movement is faulty, with its action being dependent on the control unit and the current

operating condition of the drive. Perform maintenance work, modifications, and attachments outside the danger zone defined by the movement range.

- To avoid accidents and/or material damage, human access to the movement range of the machine must be restricted. Limit/ prevent accidental access for people in this area due through technical safety measures. The protective cover and protective fence must be rigid enough to withstand the maximum possible movement energy. EMERGENCY STOP switches must be easily and quickly accessible. Before starting up the machine or automated system, check that the EMERGENCY STOP system is working. Prevent operation of the machine if this protective equipment does not function correctly.

2.13.4 Notes on particular risks

⚠ WARNING

Risk of injury to operating personnel if the clamping block fails because the technical data have been exceeded and a workpiece is released or parts fly off!

- The technical data specified by the manufacturer for using the clamping block must never be exceeded.
- The clamping block may only be used on machines and facilities that fulfill the minimum requirements of the EC Machinery Directive 2006/42/EC; specifically, they must have effective technical measures to protect against possible mechanical hazards.

⚠ WARNING

Risk of injury from workpiece loss if compressed air or oil pressure fails or is reduced and from improper controlling (operator error)!

- Use pressure maintenance valves.
- Safeguards in user program.

⚠ 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.

⚠ CAUTION

Risk of crushing from chuck jaws opening and closing when manually loading and unloading!

- Do not reach between the chuck jaws.
- Wear personal protective equipment.
- Prevent the clamping block from being actuated unintentionally.
- Use automated loading.

⚠ CAUTION

Risk of slipping or falling if the operational environment of the clamping block is not clean (e.g. contaminated with cooling lubricants or oil).

- Ensure that the working environment is clean before starting assembly and installation work.
- Wear suitable safety boots.
- Follow the safety and accident-prevention regulations when operating the clamping block, especially when working with machine tools and other technical equipment.

⚠ CAUTION

Risk of burns due to workpieces with high temperatures.

- Wear protective gloves when removing the workpieces.
- Automatic loading is preferred.

3 Technical data

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

Designation	KSP plus-BWM, KSP-LH plus-BWM					
	100	160	250	LH 100	LH 160	LH 250
Stroke per jaw [mm]	2	3	5	6	8	15
Clamping force* at max. pressure [kN]	18	45	55	8	20	20
max. pressure**	9	9	9	9	9	9
Repeatability [mm]***	0.01	0.02	0.03	0.01	0.02	0.03
Repeat accuracy [mm]	0.02	0.02	0.02	0.02	0.02	0.02
max. jaw height [mm]	35	55	70	35	55	70
Weight [kg]	4	11.6	34.5	4	11.7	34.6

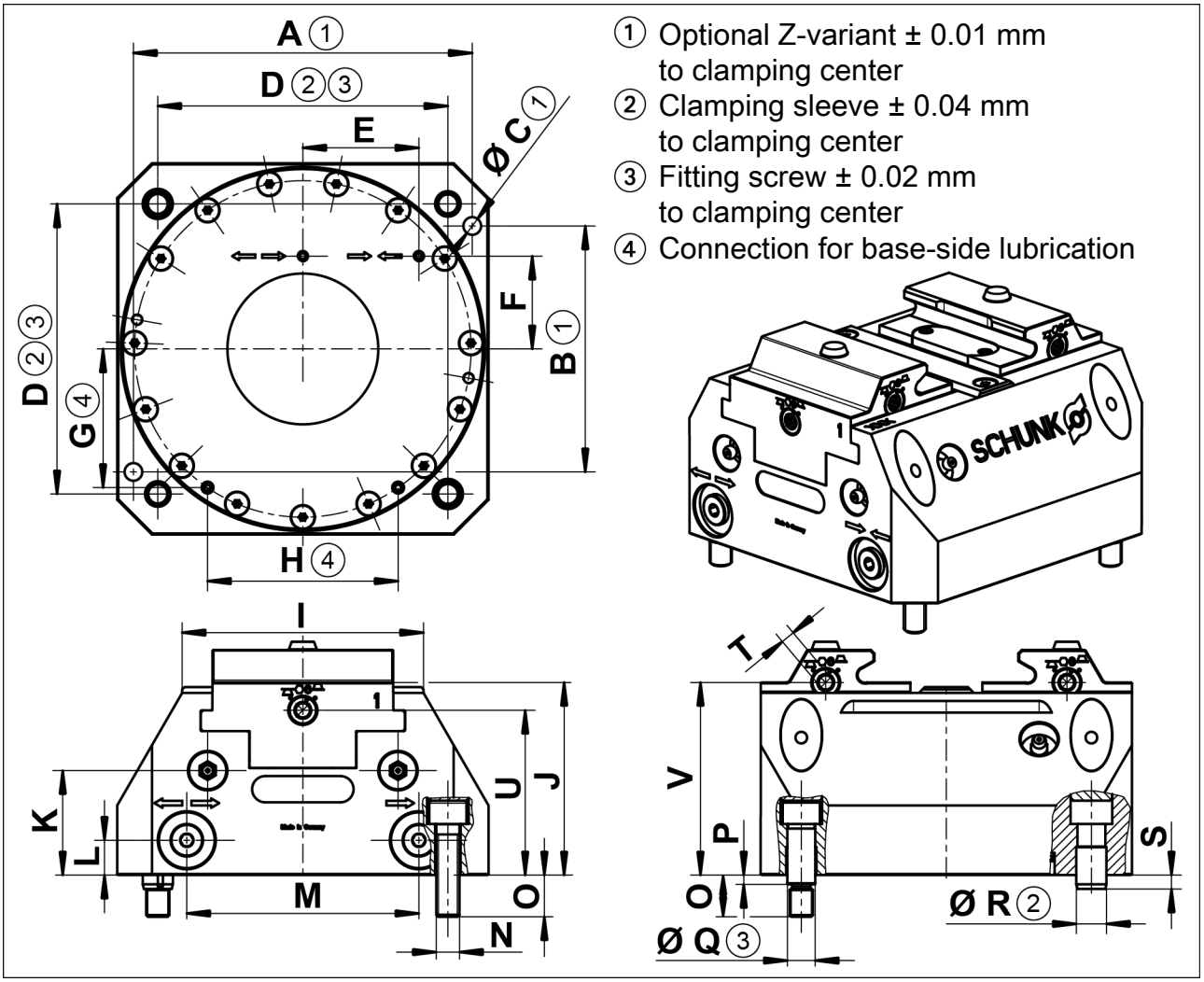
* Clamping force is the arithmetic sum of the individual forces occuring at the jaw, distance “H” (see catalog ▶ 1.1.2 [🗋 5]).

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

*** After 100 consecutive strokes to end positions.

Dimension	KSP plus-BWM, KSP-LH plus-BWM		
	100	160	250
A	90	146	230
B	64	106	154
Ø C	6H7 x 12	8H7 x 14	10H7 x 20
D	80	125	200
E	29.5	50	75
F	32	40	64
G	34.5	59.7	92.6
H	55	82	139.6
I	64	104	170
J	70	83	98
K	42	45	52
L	10	15	20
M	59	100	150
N	M8	M10	M12
O	15	18	20
P	4	4	5
Ø Q	10 f7	12 f7	14f7

Dimension	KSP plus-BWM, KSP-LH plus-BWM		
	100	160	250
Ø R	11	13	16
S	4.5	6	6
T	5	6	8
U	59.8	71	83
V	69.3	83	99



Dimensions

4 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
Admissible torque M_A (Nm)	4.2	7.5	13	28	50	88	120	160	200	290	400	500

Tightening torques to mount top jaws on the TANDEM clamping block (screw quality 12.9)

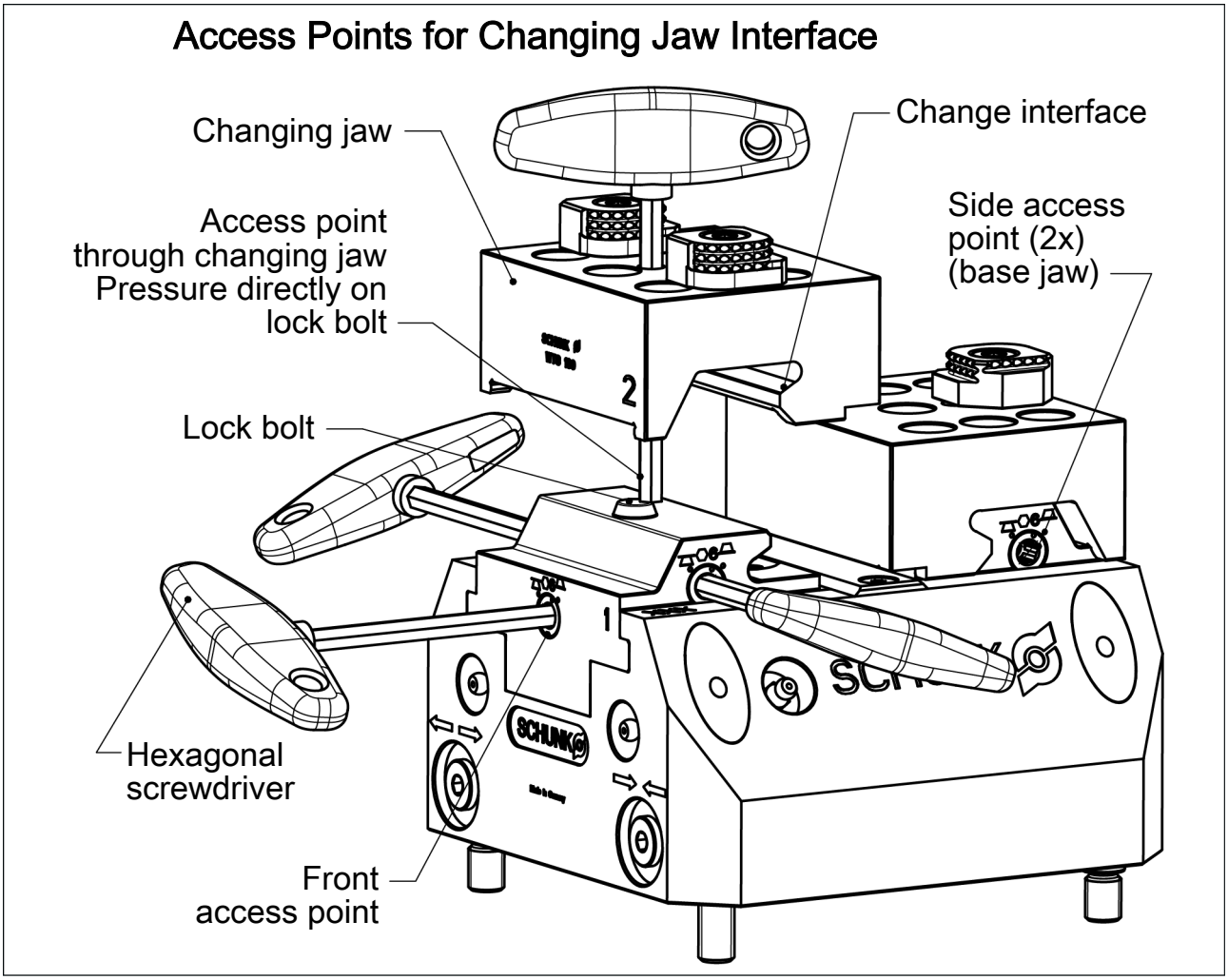
Screw size	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24
Tightening torques M_A (Nm)	5	9	15	32	62	108	170	262	510	880

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

5 Function

5.1 Functional description of quick-change jaw system



Access Points for Changing Jaw Interface

The TANDEM KSP plus-BWM/KSP-LH plus-BWM clamping force blocks come with a semi-automatic jaw quick-change system for external workpiece clamping. Changing jaws can be locked in place with a form-fitting diagonal pull without additional mounting screws on the base jaw. The changing jaw is locked in place by a spring-actuated failsafe mechanism. The retentive function of the conical lock bolt ensures the jaw is always locked in place firmly and at the same location. Each base jaw has four access points for unlocking the changing jaws (see Fig. "Access points for changing jaw interface"). A hexagonal screwdriver is used to unlock the jaw when the clamping force block is in the "OPEN" position.

The changing jaw is unlocked with a one-quarter counter-clockwise turn at one of the three access points on the side, or from the top through a through hole in the changing jaw itself. The changing jaw can then be lifted off inwards and removed.

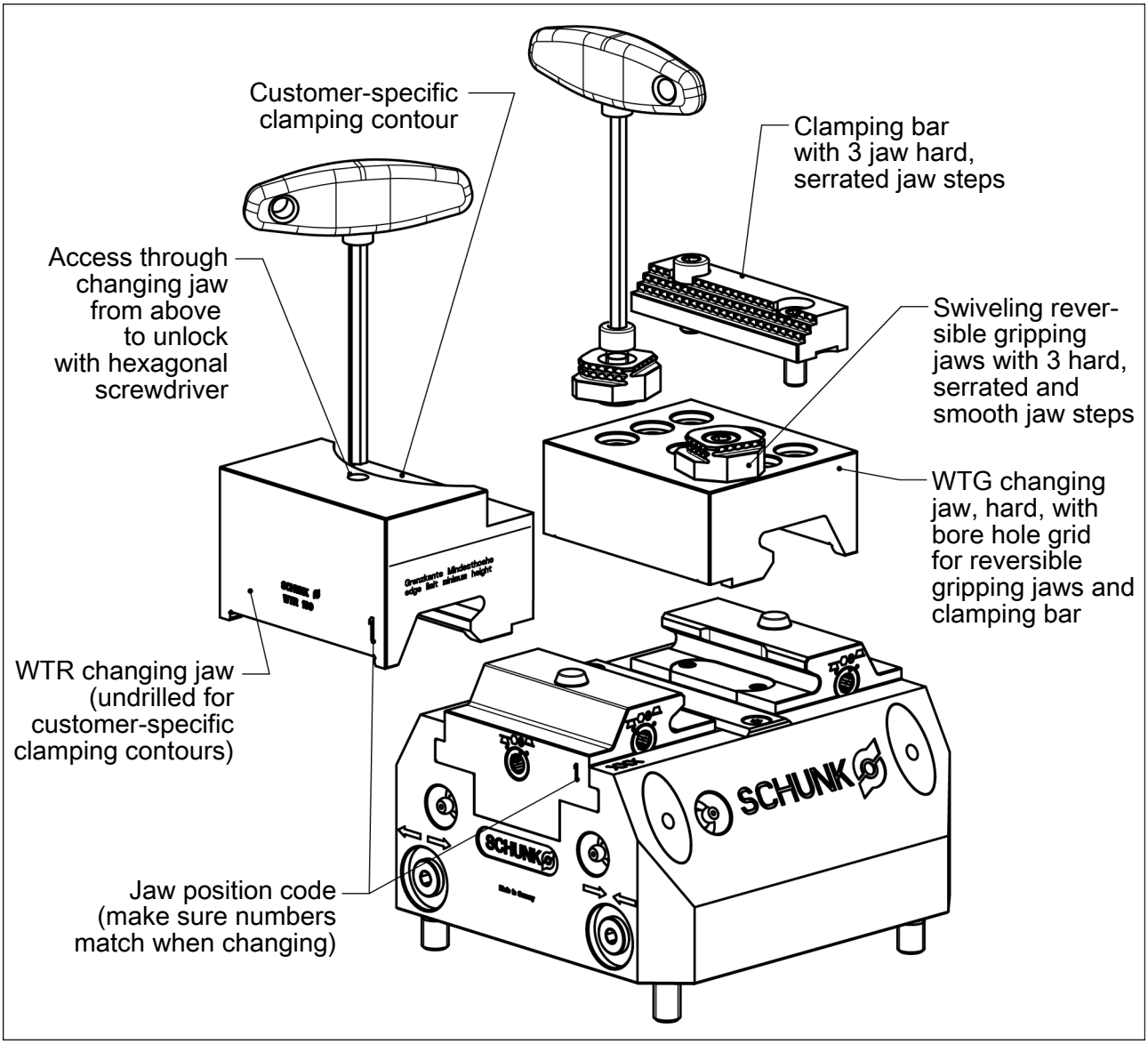
The kinematics are automatically moved back into locking position by a spring mechanism. The lock bolt also moves back out.

NOTE

: Be sure to only apply moderate force when turning the hexagonal screwdriver. Do not strengthen the spring-actuated jaw locks with additional force from the screwdriver.

5.2 Construction concept and dimensions of BWM system-compatible changing jaws

The TANDEM clamping force block with BWM system can be equipped with various changing jaws. The system is only designed for O.D. workpiece clamping.



Compatible changing jaws

Changing jaw type: WTR

The WTR changing jaw is essentially a top jaw blank. The clamping contour can be individually adjusted. The jaw steps can be milled to a limited extent.

The clamping contour must be placed under clamping pressure. Additionally, a spacer with sufficient clamping stroke reserve must be clamped between the changing jaws.

Changing jaw type: WTG

The WTG changing jaw can be used with clamping bars and reversible gripping jaws to clamp raw parts. The reversible gripping jaws and clamping bars are suited for three or four-point clamping of cylindrical and rectangular workpieces (see chuck jaw interface design, ▸ 10 [🗋 49]).

The interface can be individually adjusted to the workpiece dimensions with the WTG grid holes. The various jaw steps combined with the grid hole distances allow virtually all workpiece dimensions to be clamped within the limited clamping range.

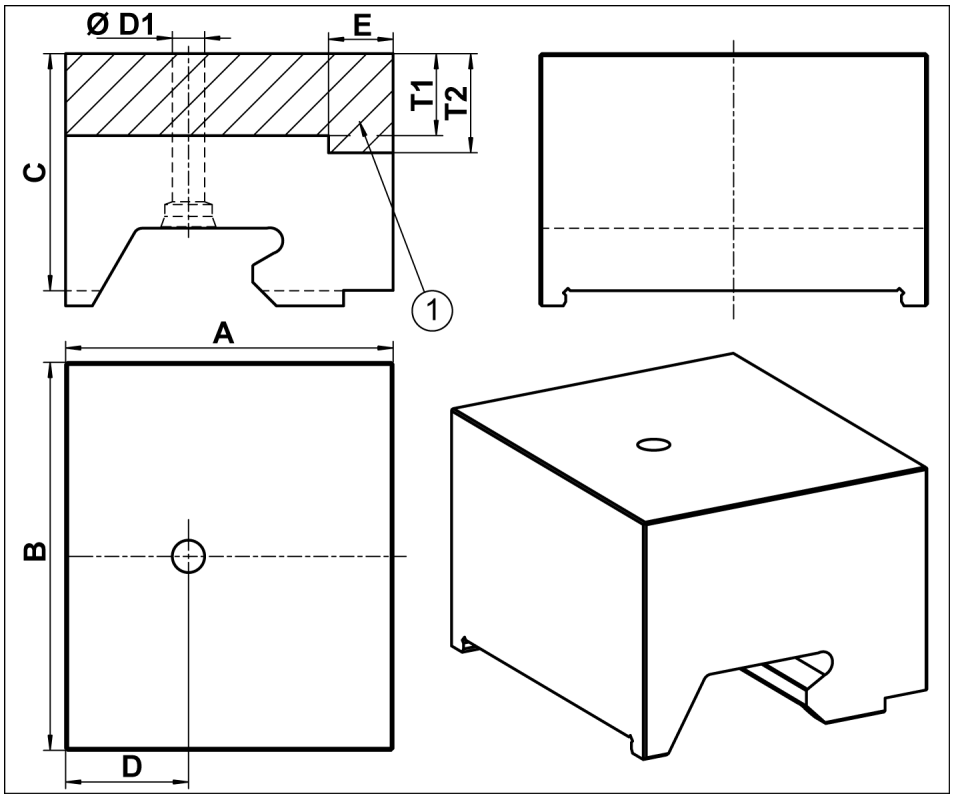
5.2.1 WTR changing jaws

Soft and undrilled.

Mounted to TANDEM KSP plus-BWM standard stroke and long stroke with quick-change interlocking.

Made out of hardenable 16MnCr5. Workpiece-specific adjusting possible by machining under clamping pressure.

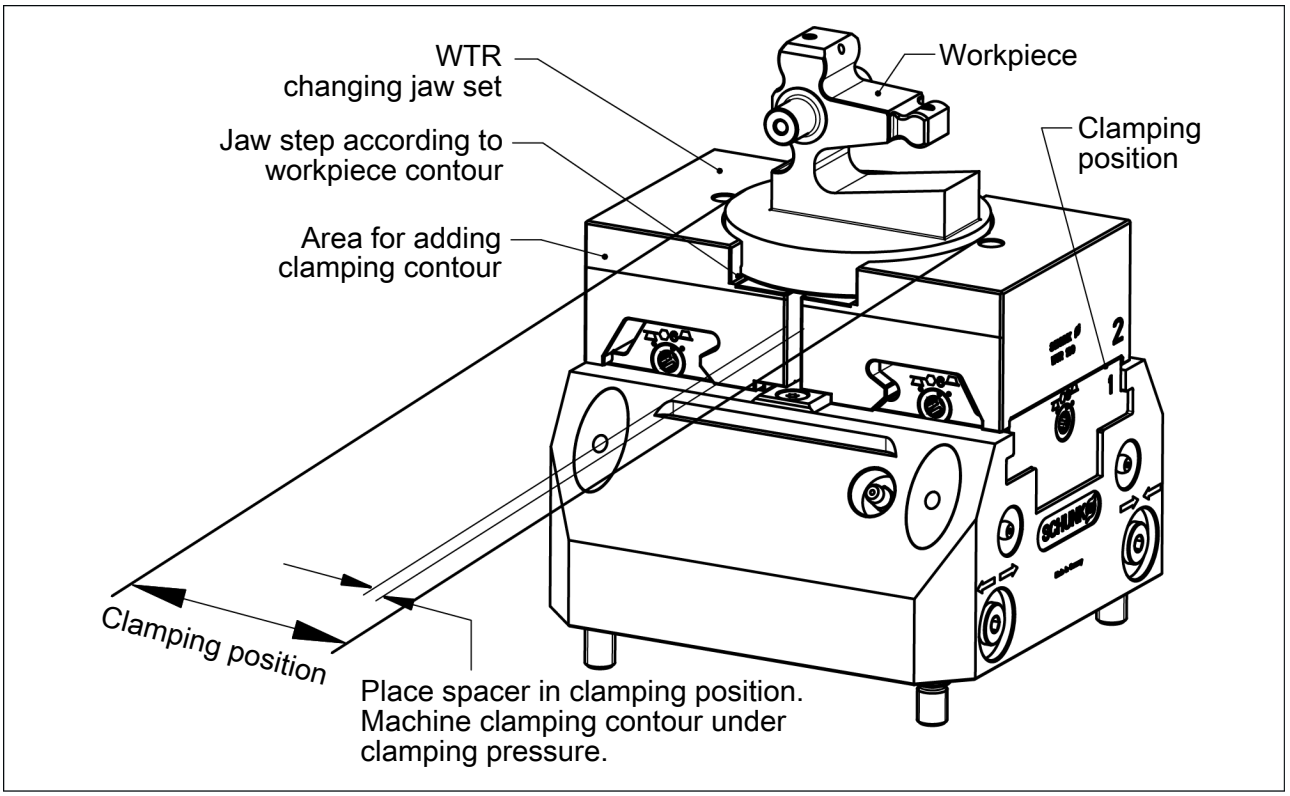
Bore holes and clamping contours can be made to order.



WTR changing jaw

Designation	WTR 100	WTR 160	WTR 250
ID no.	0.402.301	0.402.302	0.402.303

Designation	WTR 100	WTR 160	WTR 250
compatible for sizes	KSP/(-LH) plus 100-BWM	KSP/(-LH) plus 160-BWM	KSP/(-LH) plus 250-BWM
A	47	76	118
B	55	90	140
C	35	55	46
D	18	28.5	46
D1	6	7.5	9.5
E	12	15	20
T1	10	19	28
T2	14	23	32
Weight/set	1.2 kg	5.2 kg	15.9 kg



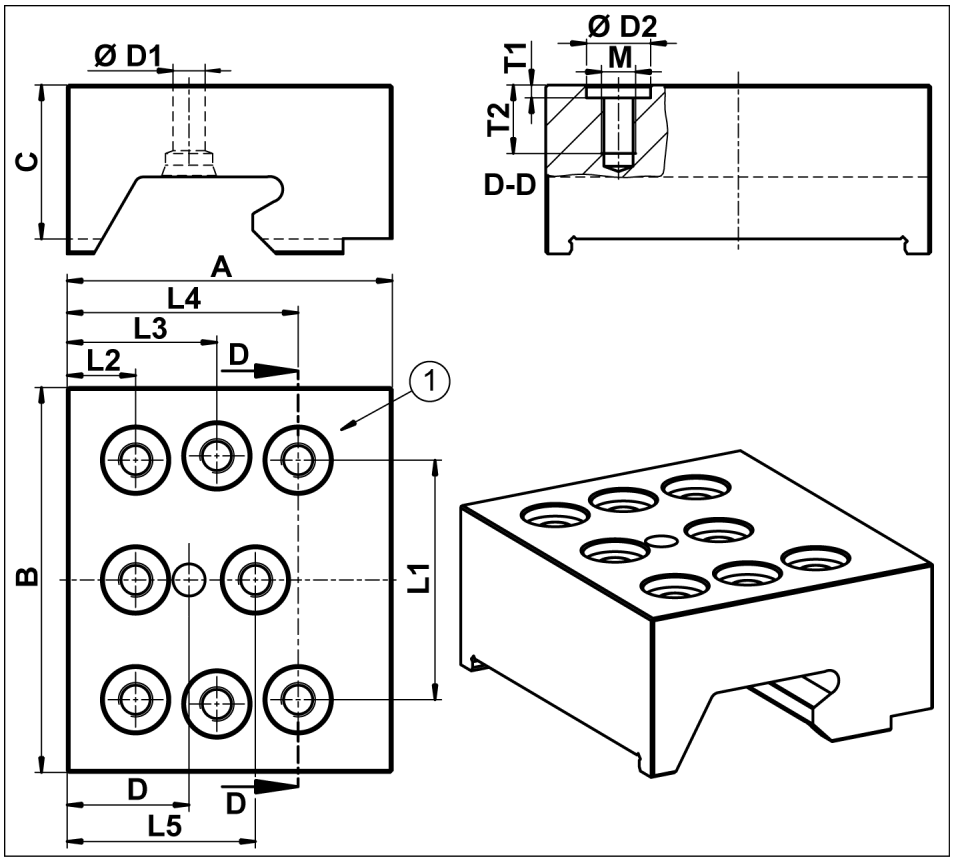
Sample workpiece clamping with WTR changing jaw

5.2.2 WTG changing jaws

Hard and drilled with bore hole grid, as supporting jaw for SEI 6x reversible clamping inserts and STG clamping bars.

Mounted to TANDEM KSP-BWM standard stroke and long stroke with quick-change interlocking.

Made out of 16 MnCr 5. Bore hole grid can be made to order.



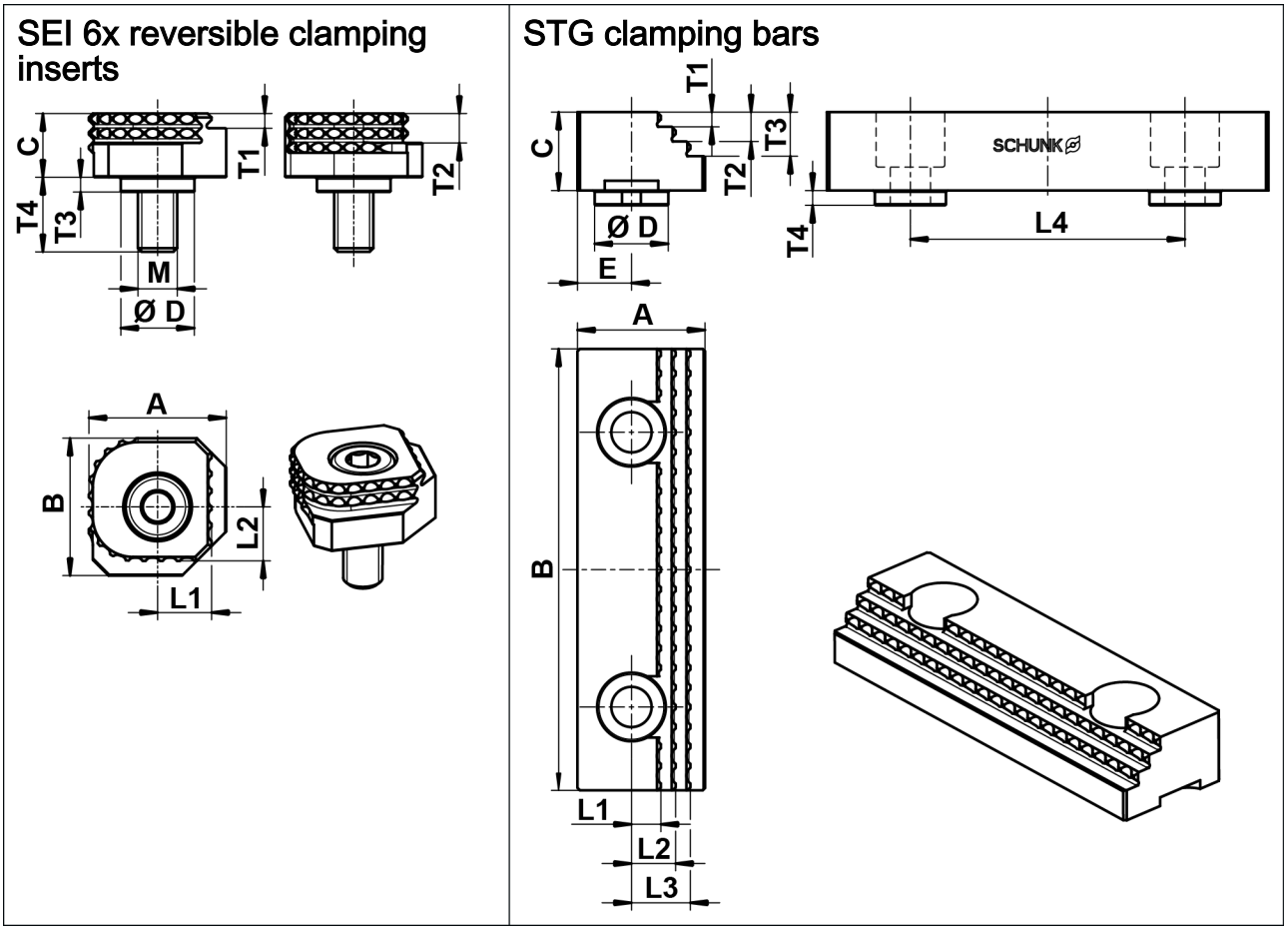
WTG changing jaw

Designation	WTR 100	WTR 160	WTR 250
ID	0402311	0402312	0402313
suitable for sizes	KSP/(-LH) plus 100-BWM	KSP/(-LH) plus 160-BWM	KSP/(-LH) plus 250-BWM
A	47	76	118
B	55	90	140
C	25	36	46
D	18	28.5	46
d D1	6	7.5	9.5
d D2	10	15	20
L1	30	56	96
L2	9	16	21
L3	22	35	51
L4	35	54	81
L5	29	44	73
M	M6	M8	M10
T1	1	3	4
T2	11	16	21
Weight/set	0.8 kg	3.0 kg	9.2 kg

WTG changing jaw accessories:

- **SEI 6x reversible clamping inserts**
- **STG clamping bars**

NOTE:
6x reversible clamping inserts and clamping bars come with mounting screws. Only use the mounting screws included at the specified torque when assembling ▶ 4 [🗋 16].



WTG changing jaw accessories:

Designation	SEI 100-M6	SEI 160-M8	SEI 250-M10
ID	0402317	0402318	0402319
suitable for sizes	WTG 100	WTG 160	WTG 250
A	18	28	34
B	18	28	34
C	8	13	16
Ø D	10	15	20
M	M6	M8	M10
L1	7.5	11	13
L2	7.5	11	13
T1	2.8	3	3
T2	5	6	9

Designation	SEI 100-M6	SEI 160-M8	SEI 250-M10
T3	2	3	4
T4	10	15	19

Designation	STG 100	STG 160	STG 250
ID	0402314	0402315	0402316
suitable for sizes	WTG 100	WTG 160	WTG 250
A	20	26	36
B	55	90	140
C	11.4	16	19
Ø D	10	15	20
E	8	11	16
L1	4.5	6	8
L2	7	9	12
L3	9.5	12	16
L4	30	56	96
T1	2.8	3	3
T2	5.6	6	6
T3	8.4	9	12
T4	2	3	4

5.3 Functional testing

- Test to make sure the TANDEM clamping block is functioning properly before putting it into operation. Make sure there are no leaks in the line system.
- Regularly check the motion kinematics of the jaw change interface locking mechanism to make sure they can be easily moved and return to their original position automatically.
- If the clamping system is involved in a collision, it must be tested to see if it is still functioning properly before using it again. Only use original SCHUNK spare parts when replacing damaged items.
- Visually inspect the clamping block at least once per shift for visible damage and defects.
- Replace the chuck jaw mounting screws if there are signs of wear or damage. Only use screws with a quality of 12.9.

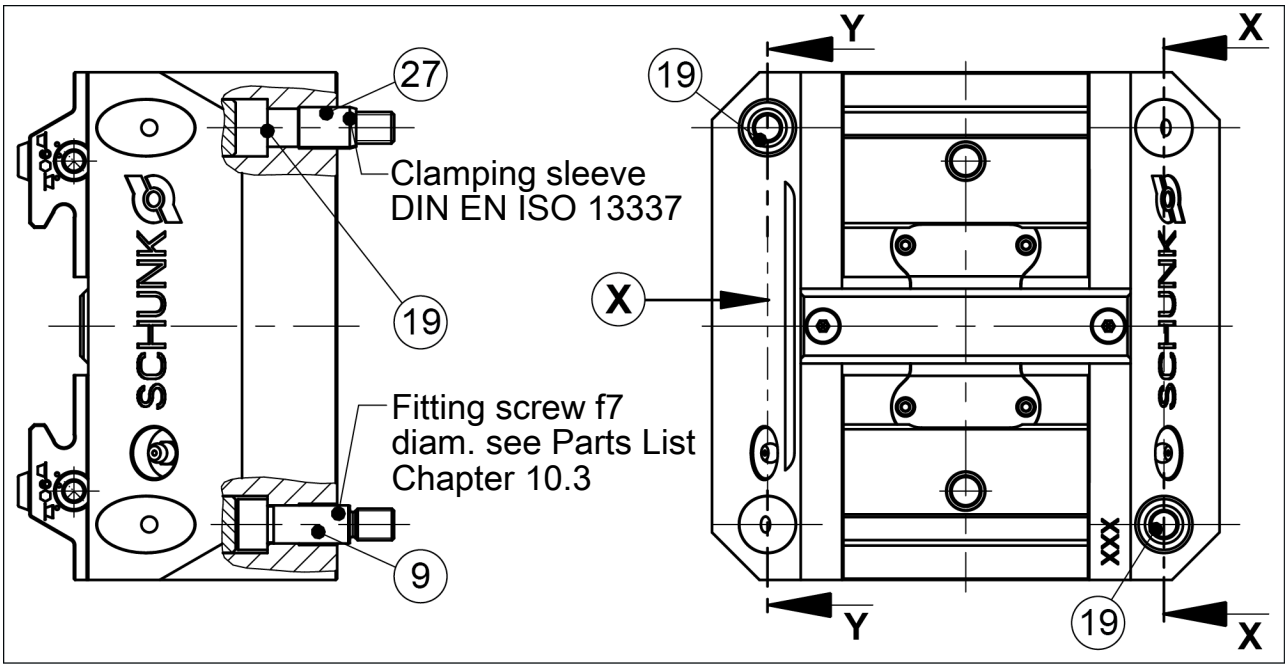
6 Assembly

The item numbers specified for the corresponding individual components relate to chapter drawings ▶ 10 [🗋 49] and the figures "Assembling the clamping block" and "Connecting the clamping block".

Make sure the power supply for the clamping block is off during assembly and connection. See Chapter "Basic Safety Notes". ▶ 2 [🗋 7]

6.1 Assembling the clamping block on the machine table

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



Assembling the clamping block

Assembly with clamping sleeves:
Assemble the clamping block on the machine table together with clamping sleeves (27) and screws (19).

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

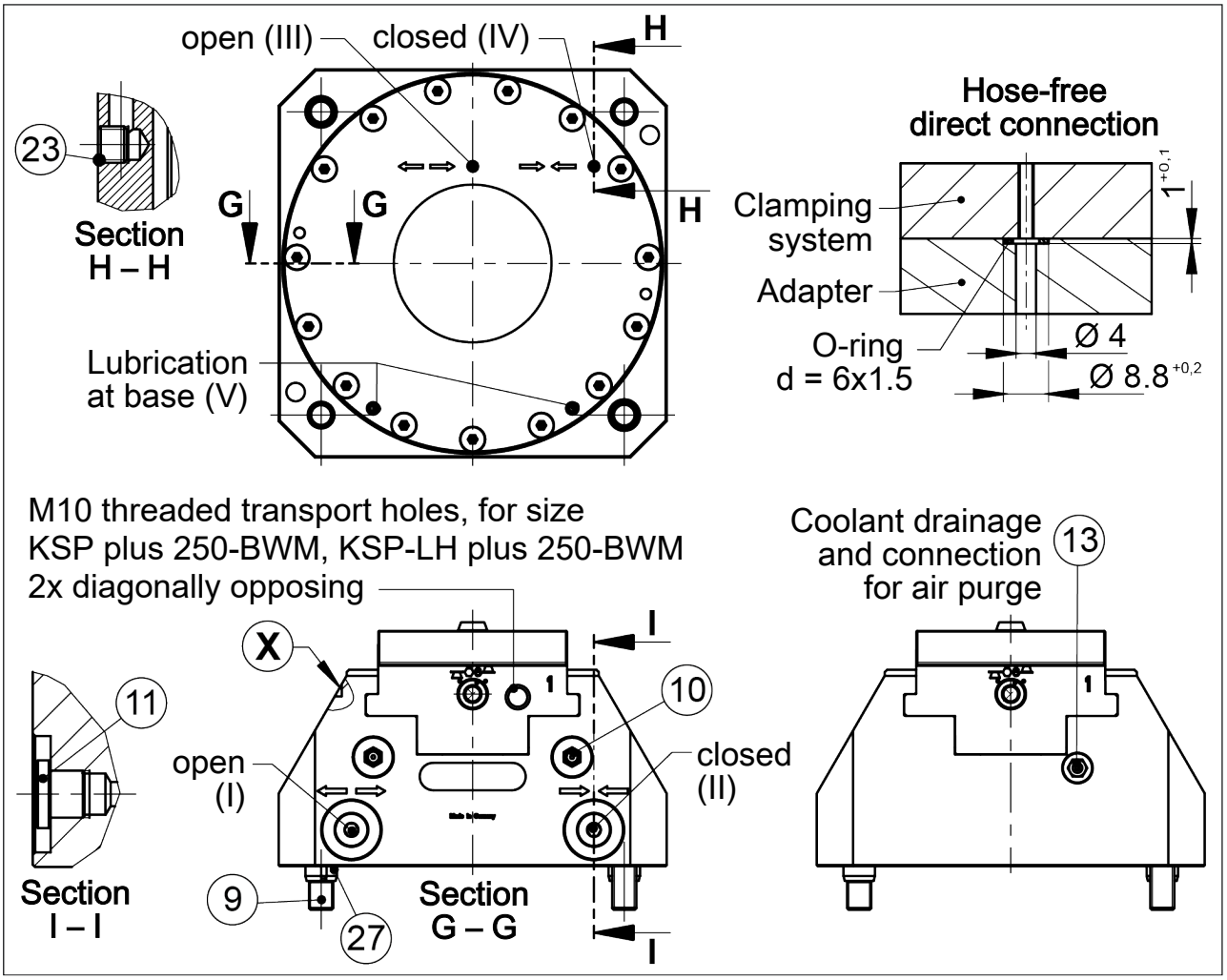
6.2 Connecting the clamping block

Make sure the power supply is off when connecting the clamping force block. See the "Basic Safety Notes" ▶ 2 [🗋 7] chapter.

CAUTION

Risk of workpiece loss and damage to automated 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.



Connecting the clamping force block

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 screwed connection (on the front):
KSPplus 100-BWM, KSP-LH plus 100-BWM: M5
KSPplus 100-BWM, KSP-LH plus 160-BWM: G1/8"
KSPplus 250-BWM, KSP-LH plus 250-BWM: G1/8"

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

Requirements for compressed air supply: compressed air, compressed air quality according to ISO 8573-1:6 4 4

Unconditioned compressed air contains moisture as well as dust and oil particles, 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. These connections come sealed on delivery with set-screws (item 24).

6.3 Assembling the clamping block on the base plate

(If the two parts are delivered separately)

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

For **KSPplus 100-BWM:** Use the **M8 x 30** screws from the base plate accessory kit instead of the M8 x 35 screws (item 19).

For **KSPplus 160-BWM:** Use the **M10 x 35** screws from the base plate accessory kit instead of the M10 x 40 screws (item 19).

For **KSPplus 250-BWM:** Use the **M12 x 40** screws from the base plate accessory kit instead of the M12 x 45 screws (item 19).

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

- Do not open the connections on the front of the clamping force block (**I, II**) or alternatively seal them with suitable dummy plugs (M5 or G1/8").
- Insert the clamping sleeves from the accessory kit 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 kit into the recesses for the air feed-throughs.
- Mount the clamping force block onto the base plate.

NOTE:
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 kit. In doing so, observe tightening torques.▸ 4 [🗋 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.

6.4 Inserting the changing jaws

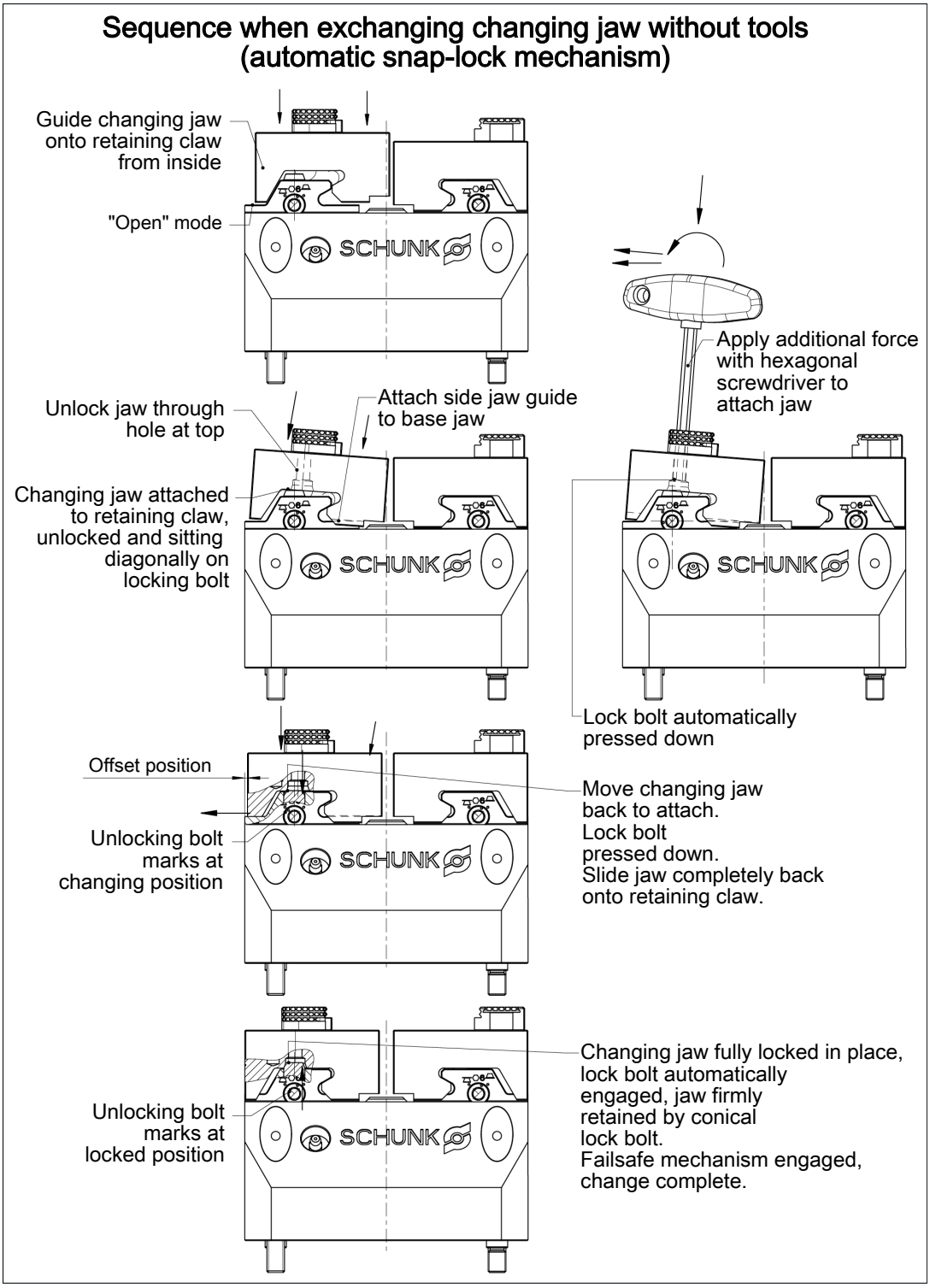
A set of changing jaws consists of two individual jaws designed to fit together. The jaws are marked with numbers "1" and "2". Always insert the changing jaws on the TANDEM clamping block's change interface with the same number in order to ensure maximum repeat clamping accuracy.

NOTE:
Only trigger the actuating mechanism with an appropriate tool. Only change the jaws with manual force. Do not use a hammer to assist in changing the jaws.

The changing jaws can be changed in two ways:

First, hang the changing jaw on the hook attachment. This connects the lateral centering bars to the base jaw.

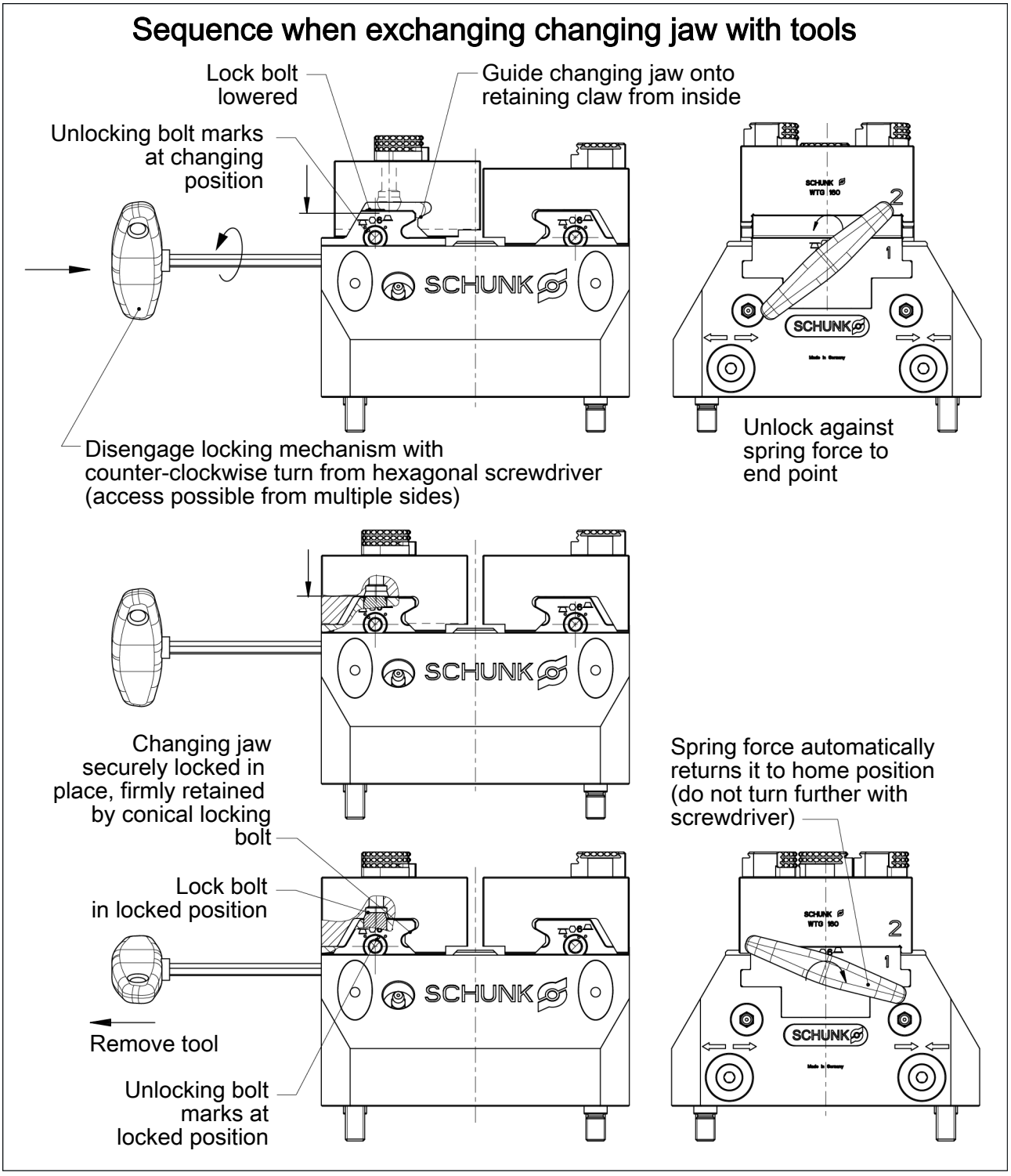
1. Locking in place without tools:
Pull the changing jaw back and press it down to lock it into place without tools. The spring-actuated snap-lock mechanism is automatically triggered, locking the changing jaw to the TANDEM clamping block.



Locking in place without tools

2. Semi-automatic locking:

With semi-automatic locking, the lock bolt is driven down with a hexagonal screwdriver. This is done by applying a one-quarter counter-clockwise turn at one of the side access points. Once the jaw is inserted into the interface and positioned, the locking kinematics return to their original position. This locks the jaw firmly and securely onto the changing interface.

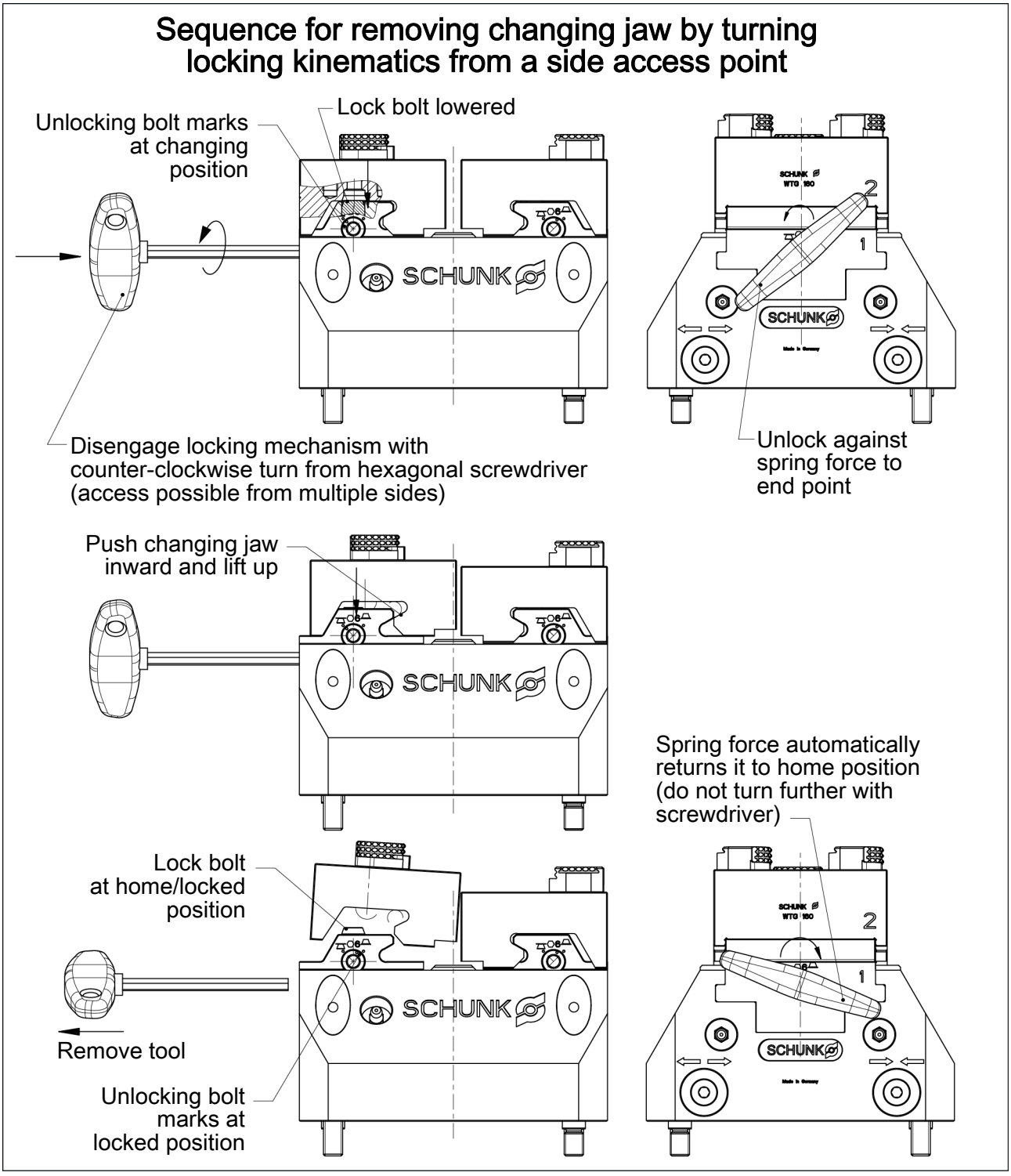


Semi-automatic locking

6.5 Removing the changing jaws from the quick-change interface

The jaws can be removed in two ways:

1. Two-handed:
Unlock the jaws with a one-quarter counter-clockwise turn from the hexagonal screwdriver at one of the side access points. At the same time, lift the jaw diagonally from the center upward and out of the change interface.



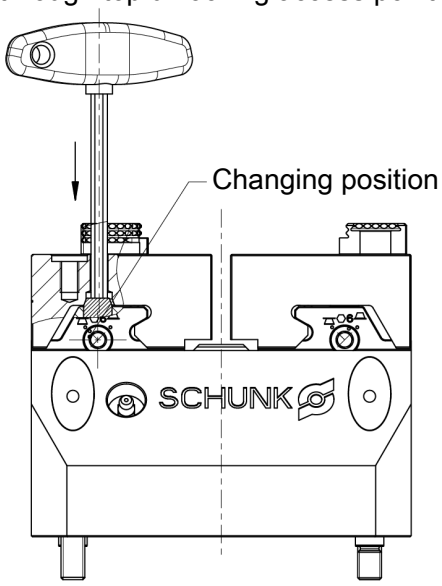
Two-handed

2. One-handed:

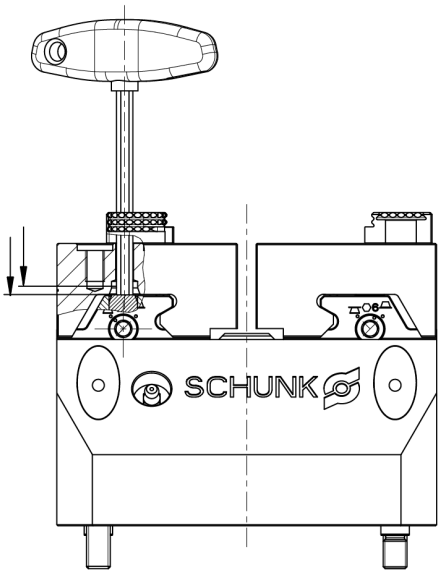
Feed the hexagonal screwdriver through the hole in the changing jaw and unlock it directly from above. The tool drives the lock bolt down and simultaneously can be used to tip the jaw out of the change interface.

Sequence for removing changing jaw by pressing on lock bolt directly from above

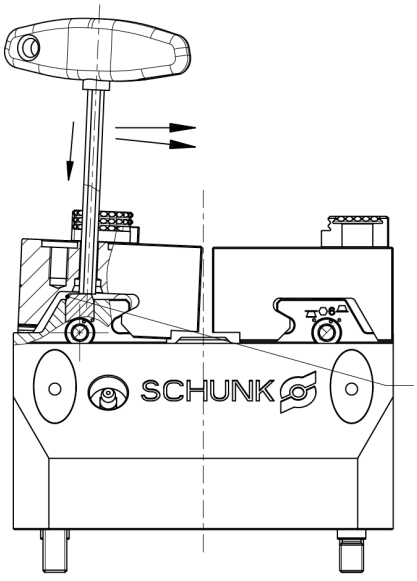
1 Insert hexagonal screwdriver through top unlocking access point.



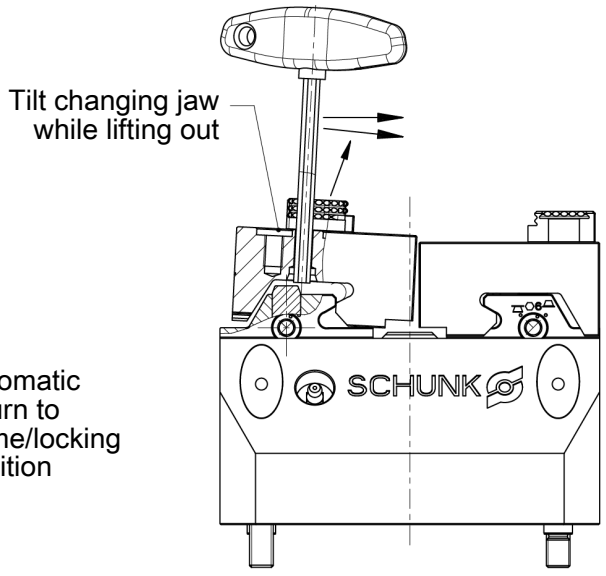
2 Press lock bolt down with manual force.



3 While pressing the tool down, tilt it toward the middle of the clamping system. The locking kinematics automatically move to the home position.



4 Tilt the tool until the changing jaw can be removed from the retaining claw. The lock bolt is at the home position. Changing complete.



One-handed

7 Trouble shooting

Clamping force 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 using original SCHUNK spare parts ▶ 8.1 [🗋 36]
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
Active air connections sealed	Remove set-screws from sealed air connections

Jaw changing function does not operate properly

Possible cause	Solution(s)
Lock bolt at changing interface not resetting and remains depressed	Check if motion kinematics can be easily moved and if they are damaged. To improve movement, apply a few drops of machine oil to the rotating joints until the kinematics automatically reset.
Lock bolt on changing interface not recessing	Check if motion kinematics can be easily moved and if they are damaged. To improve movement, apply a few drops of machine oil to the rotating joints.
Repeat accuracy not achieved during jaw change	Clean change interfaces and check for damage. Replace damaged parts, if necessary. The changing jaws have been switched. Changing and base jaw numbers must match.
Increased changing jaw "rear-up"	Clean interfaces between base and changing jaws. Set changing jaw firmly into change interface by pulling backward.

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 clamping block ▶ 8.1 [🗋 36] and replace all the seals (see sealing kit lists ▶ 9 [🗋 41])
Inadequate lubrication	Lubricate the lubrication nipples with LINO MAX 200 ▶ 8 [🗋 35]

Clamping block movement jerky

Possible cause	Solution(s)
Steel guide rollers on sliding surfaces not greased	▶ 8 [🗋 35]

8 Maintenance and care

The item numbers specified for the corresponding individual components relate to chapter drawings. ▶ 10 [🗋 49]

Regularly check to see if the motion kinematics of the jaw locking mechanism are working properly. Make sure the turning mechanics are easy to move and automatically reset. The conical lock bolt must smoothly and completely rise up.

The base jaws (item 2), chuck piston (item 3) and housing (item 1) are made to go together. To replace these parts, ship the entire clamping system to SCHUNK along with a repair order.

In order to keep the clamping block in proper working order, observe the following notes:

- Make sure that the bore for the coolant drainage is always kept clear!
- Depending on the load but at least once a month or every 10,000 clampings, lubricate the guides on the two frontal or the two lateral lubricating nipples with LINOMAX 200 or equivalent lubricant. For this purpose the chuck jaws should be in opened position.
- Replace the base jaws and chuck piston at least every three months or more often, if necessary (see ▶ 8.1 [🗋 36]). Clean the housing, base jaws and chuck piston, and lubricate all the guides (housing, base jaws, chuck piston) with LINOMAX 200. Reassemble everything and relubricate the two front or two side lubricating nipples with LINOMAX 200.

(Product information about LINOMAX 200 can be requested by SCHUNK).

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.

⚠ CAUTION

Allergic reactions due to grease in contact with skin!

Wear gloves.

8.1 Disassembling and assembling the clamping force block

NOTE:
The base jaws (item 2), the chuck piston (item 3) and the housing (item 1) are matched to each other. These parts cannot be replaced individually. To replace these parts, ship the entire clamping force block to SCHUNK along with a repair order.

Always transport the clamping force block without the changing jaws. The KSP plus 250-BWM and KSP-LH plus 250-BWM have an M10 threaded transport hole on the front of each base jaw for mounting the T-handles with the set-screws included in the accessory kit. Remove the T-handles before operating.

When replacing wearing parts (e.g. seals – for sealing kit lists, see ▶ 9 [🗋 41]) adhere to the following order:

1. Pressurize the clamping force block at 6 bar until the jaws are in the OPEN position.
2. Actuate the disengaging mechanics on the quick-change jaw system and remove both changing jaws (WTR or WTG).
3. Remove the covering strip (7).
4. Remove the cylindrical screw (item 14) from the chuck piston.
5. Remove the pressure line.
6. Pull the plugs (item 8) out of the housing (item 1).
7. Loosen the screws (items 9, 19) and remove the clamping system from the base plate or machine table. Air may escape at this point.
8. To remove the chuck piston (item 3)
   for size 100-BWM, screw in one M10 x > 25 screw in the center bore,
   for size 160-BWM, screw one M12 x > 25 screw in the center bore,
   for size 250-BWM, screw two M6 x > 25 screws in the lateral threaded holes.

9. Pull the base jaws (item 2) out of the housing (item 1).
   The base jaws are multi-part assemblies that can be further disassembled as needed (see drawing ▶ 10 [🗋 49]). *Attention:* Components may fall out.
   - To disassemble a base jaw unit, remove the screws (item 16) and covering strip (item 6).
   - Pull the cylindrical pin (item 35) out of the base jaw (item 2). Screw a suitable pulling tool into the internal thread of the cylindrical pin and carefully pull it out.
   - Remove the unlocking bolts (item 32 and item 33) from the base jaw.
     Gently press on the lock bolt (item 31) and hold the base jaw to each side so the three front unlocking bolts fall out.
   - Remove the lock bolt (item 31) and compression spring (item 34).
   - When assembling the base jaw unit, apply LINOMAX 200 (black) special grease to all sliding surfaces of moving components.

10. Before pulling off the cover (item 5), all the screws (item 21) need to be removed. To take off the cover (item 5), screw two screws into the outer threaded holes:
    for size 100-BWM, two M3 x > 25 screws,
    for size 160-BWM, two M5 x > 25 screws,
    for size 250-BWM, two M5 x > 25 screws.

11. Remove the seals (items 20, 22).

12. Shim the clamping force block so the cylinder piston (item 4) can be pushed out.

13. Remove the seals (items 12, 15, 17).

14. Clean all the parts thoroughly and check for damage and wear. **Replace damaged and worn parts with original SCHUNK spare parts.**

15. Lubricate the new seals (items 12, 15, 17, 20, 22) with Renolit HLT 2 or equivalent grease.

16. Mount the new seals carefully. The seals must not be damaged in the process.

17. Grease the sliding surfaces of the cylinder and piston with Renolit HLT 2 or equivalent grease.

18. Place the cylinder piston (item 4) loosely into the cylinder. Make sure the cylinder piston (item 4) is level and not tilted.

19. 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).
20. Press the cylinder piston (item 4) into the cylinder of the housing (item 1). Do not tilt the cylinder piston (item 4).
21. Place the O-rings (items 20, 22) in the housing (item 1) and the O-ring (item 17) around the cover (item 5).
22. Insert the cover (item 5) into the housing (item 1), making sure the openings for the air feed-throughs are aligned.
23. Screw the cover (item 5) onto the housing (item 1). Use a torque wrench at the values specified in the table ▶ 4 [🗋 16].
24. If using clamping sleeves (item 27) for centering, insert these into the housing (item 1) now.
25. Grease the sliding surfaces of the housing (item 1), base jaws (item 2) and chuck piston (item 3) with LINOMAX 200.
26. Assemble the complete base jaws (2) and the chuck piston (3). Be sure to observe the installation position for the base jaws and the chuck piston. Make sure no parts fall out when installing the base jaw units.
27. Connect the clamping system to the air supply and move the jaws to the OPEN position.
28. Screw down the chuck piston (item 3) and cylinder piston (item 4). Tighten the screw (item 14) with a torque wrench ▶ 4 [🗋 16].
29. Attach the covering strip (7).
30. Check for leaks.
31. Check to see that the clamping force block is functioning properly. The changing jaws are required for this (with WTR or WTG accessories).

8.2 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 ▶ 8.1 [🗋 36]).

8.3 Testing quick-change jaw function

A function check consists of checking to see if the motion kinematics are easy to move and if the lock bolt (31) automatically resets.

1. Insert the hexagonal socket screwdriver into the hexagonal socket of one of the three access points on each base jaw.
2. With moderate manual force, turn the screwdriver counterclockwise until it stops in order to lower the lock bolt.
3. Release the torque on the screwdriver and see if the kinematics reset automatically and the lock bolt rises completely up. Check the motion kinematics multiple times in alternating fashion.
4. Check the actuating mechanism by pressing on the front of the lock bolt. To do this, insert the changing jaw (accessory, ▶ 1.4 [🗋 6]) into the hook attachment on the change interface and press it down and back. This briefly presses the lock bolt down, and it automatical-ly snaps into the changing jaw's locking bore.
5. Check to see if the changing jaw can be unlocked by pressing on the front of the lock bolt with a hexagonal screwdriver.
   To do this, position the hexagonal screwdriver on the lock bolt through the access hole on the change jaw. Press the lock bolt down while tilting the tool toward clamping center. The changing jaw should disengage and can now be lifted off the change interface with two hands or tilted toward the middle of the clamping system. Attention: Never press on the lock bolt with the hexagonal screwdriver without a changing jaw in place. Injury may occur if the tool slips while pressing without a lateral guide.

⚠ CAUTION

Risk of injury from screwdriver slipping!

Pressing on the lock bolt with the hexagonal screwdriver without a changing jaw in place can result in injury from the screwdriver slipping.

- **Never press on the lock bolt with the hexagonal screwdriver without a changing jaw in place.**

9 Seal Kit and Parts List

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, screw connections, springs, bearings, screws, wiper bars and parts that come into contact with the workpiece are not covered by the warranty.

9.1 Seal kit lists

KSPplus 100-BWM, KSP-LH plus 100-BWM (ID no. 0405219)

Item	Designation	Quantity
12	Quad ring, 72.62 x 3.53	1
15	Combined sealing element	1
17	O-ring, DIN 3771 93 x 2.00	1
18	O-ring, DIN 3771 9 x 2.00	4
20	Flat gasket	13
22	Flat gasket	2
50	O-ring, DIN 3771 6 x 1.50	2

KSPplus 160-BWM, KSP-LH plus 160-BWM (ID 0405319)

Item	Designation	Quantity
12	Quad ring, 126.59 x 3.53	1
15	Combined sealing ring	1
17	O-ring, DIN 3771 150 x 2.00	1
18	O-ring, DIN 3771 12 x 2.00	4
20	Flat gasket	17
22	Flat gasket	2
50	O-ring, DIN 3771 6 x 1.50	2

KSPplus 250-BWM, KSP-LH plus 250-BWM (ID 0405519)

Item	Designation	Quantity
12	Quad ring, 209.14 x 3.53	1
15	Combined sealing ring	1
17	O-ring, DIN 3771 238 x 2.00	1
18	O-ring, DIN 3771 15 x 1.78	4
20	Flat gasket	21
22	Flat gasket	2
50	O-ring, DIN 3771 6 x 1.50	2

Wear parts – replacement recommended during maintenance

The sealing kit can only be ordered as a compete kit.

9.2 Accessory packs

KSPplus 100-BWM, KSP-LH plus 100-BWM

Item	Designation	Quantity
8	Plug	4
9	Fitting screw, 10f7/M8	2
18	O-ring, DIN 3771 9 x 2.00	4
19	Screw, DEI 4762/10.9 M8 x 30 mm	4
27	Clamping sleeve, DIN EN ISO 13337 DRM. 11 x 16	2
54	O-ring, DIN 3771 6 x 1.50	2

KSPplus 160-BWM, KSP-LH plus 160-BWM

Item	Designation	Quantity
8	Plug	4
9	Fitting screw, 12f7/M10	2
18	O-ring, DIN 3771 12 x 2.00	4
19	Screw, DEI 4762/10.9 M10 x 35 mm	4
27	Clamping sleeve, DIN EN ISO 13337 DRM. 13 x 18	2
54	O-ring, DIN 3771 6 x 1.50	2

KSPplus 250-BWM, KSP-LH plus 250-BWM

Item	Designation	Quantity
8	Plug	4
9	Fitting screw, 114f7/M12	2
18	O-ring, DIN 3771 15 x 1.78	4
19	Screw, DEI 4762/10.9 M12 x 45 mm	4
27	Clamping sleeve, DIN EN ISO 13337 DRM. 16 x 22	2
52	T-handle for KSP M10	2
53	Set-screw, DIN EN ISO 4026 M10 x 30 mm	2
54	O-ring, DIN 3771 6 x 1.50	2

9.3 Stücklisten

KSP plus 100-BWM

Item	Designation	Quantity
1*	Body	1
2*	Base jaw	2
3*	Chuck piston	1
4	Cylinder piston	1
5	Cover	1
6	Covering strip	2
7	Covering strip	1
8***	Plug	4

9***	Fitting screw, 10f7/M8	2
10	Funnel lubrication nipple	4
11	Locking screw	2
12**	Quad ring, 72.62 x 3.53	1
13	Sound absorber	1
14	Screw, DEI 4762/10.9 M8 x 20 mm	1
15**	Combined sealing element	1
16	Countersink screw, DIN EN ISO 4026 M3x6 mm	4
17**	O-ring, DIN 3771 93 x 2.00	1
18***	O-ring, DIN 3771 9 x 2.00	4
19***	Screw, DEI 4762/10.9 M8 x 35 mm	4
20**	Flat gasket	13
21	Countersunk screw, DIN EN ISO 10642/10.9 M4 x 12 mm	11
22**	Flat gasket	2
23	Set-screw, similar to DIN EN ISO 4026/45H M3 x 3 mm	2
24	Set-screw, similar to DIN EN ISO 4026/45H M4 x 4 mm IN6RD/VZ/PA	2
25	Countersunk screw, DIN EN ISO 10642/10.9 M4 x 8 mm	2
27***	Clamping sleeve, DIN EN ISO 13337 DRM. 11 x 16	2
31	Lock bolt	2
32	Unlocking bolt	4
33	Unlocking bolt 2	2
34	Compression spring	2
35	Cylindrical pin, DEI 7979 - 5 M6x24 mm	2

KSP-LH plus 100-BWM

Item	Designation	Quantity
1*	Body	1
2*	Base jaw	2
3*	Chuck piston	1
4	Cylinder piston	1
5	Cover	1
6	Covering strip	2
7	Covering strip	1
8***	Plug	4
9***	Fitting screw, 10f7/M8	2
10	Funnel lubrication nipple	4
11	Locking screw	2
12**	Quad ring, 72.62 x 3.53	1
13	Sound absorber	1

14	Screw, DEI 4762/10.9 M8 x 20 mm	1
15**	Combined sealing element	1
16	Countersink screw, DIN EN ISO 4026 M3x6 mm	4
17**	O-ring, DIN 3771 93 x 2.00	1
18***	O-ring, DIN 3771 9 x 2.00	4
19***	Screw, DEI 4762/10.9 M8 x 35 mm	4
20**	Flat gasket	13
21	Countersunk screw, DIN EN ISO 10642/10.9 M4 x 12 mm	11
22**	Flat gasket	2
23	Set-screw, similar to DIN EN ISO 4026/45H M3 x 3 mm	2
24	Set-screw, similar to DIN EN ISO 4026/45H M4 x 4 mm IN6RD/VZ/PA	2
25	Countersunk screw, DIN EN ISO 10642/10.9 M4 x 8 mm	2
27***	Clamping sleeve, DIN EN ISO 13337 DRM. 11 x 16	2
31	Lock bolt	2
32	Unlocking bolt	4
33	Unlocking bolt 2	2
34	Compression spring	2
35	Cylindrical pin, DEI 7979 - 5 M6x28 mm	2

KSP plus 160-BWM

Item	Designation	Quantity
1*	Body	1
2*	Base jaw	2
3*	Chuck piston	1
4	Cylinder piston	1
5	Cover	1
6	Covering strip	2
7	Covering strip	1
8***	Plug	4
9***	Fitting screw, 12f7/M10	2
10	Funnel lubrication nipple	4
11	Locking screw	2
12**	Quad ring, 126.59 x 3.53	1
13	Sound absorber	1
14	Screw, DEI 4762/10.9 M10x25 mm	1
15**	Combined sealing ring	1
16	Countersink screw, DIN EN ISO 4026 M3x6 mm	4
17**	O-ring, DIN 3771 150 x 2.00	1
18***	O-ring, DIN 3771 12 x 2.00	4

19***	Screw, DEI 4762/10.9 M10 x 40 mm	4
20**	Flat gasket	17
21	Countersunk screw, DIN EN ISO 10642/10.9 M5 x 20 mm	15
22**	Flat gasket	2
23	Set-screw, similar to DIN EN ISO 4026/45H M5 x 4 mm	4
25	Countersunk screw, DIN EN ISO 10642/10.9 M5 x 10 mm	2
26	Set-screw, DIN EN ISO 4026/45H M4 x 4 mm IN6RD/VZ/PA	1
27***	Clamping sleeve, DIN EN ISO 13337 DRM. 13 x 18	2
31	Lock bolt	2
32	Unlocking bolt	4
33	Unlocking bolt 2	2
34	Compression spring	2
35	Cylindrical pin, DEI 7979 - 5 M6x24 mm	1
45	O-ring, DIN 3771 5.5 x 1.50	2

KSP-LH plus 160-BWM

Item	Designation	Quantity
1*	Body	1
2*	Base jaw	2
3*	Chuck piston	1
4	Cylinder piston	1
5	Cover	1
6	Covering strip	2
7	Covering strip	1
8***	Plug	4
9***	Fitting screw, 12f7/M10	2
10	Funnel lubrication nipple	4
11	Locking screw	2
12**	Quad ring, 126.59 x 3.53	1
13	Sound absorber	1
14	Screw, DEI 4762/10.9 M10x25 mm	1
15**	Combined sealing ring	1
16	Countersink screw, DIN EN ISO 4026 M3x6 mm	4
17**	O-ring, DIN 3771 150 x 2.00	1
18***	O-ring, DIN 3771 12 x 2.00	4
19***	Screw, DEI 4762/10.9 M10 x 40 mm	4
20**	Flat gasket	17
21	Countersunk screw, DIN EN ISO 10642/10.9 M5 x 20 mm	15
22**	Flat gasket	2
23	Set-screw, similar to DIN EN ISO 4026/45H M5 x 4 mm	4

25	Countersunk screw, DIN EN ISO 10642/10.9 M5 x 10 mm	2
26	Set-screw, DIN EN ISO 4026/45H M4 x 4 mm IN6RD/VZ/PA	1
27***	Clamping sleeve, DIN EN ISO 13337 DRM. 13 x 18	2
31	Lock bolt	2
32	Unlocking bolt	4
33	Unlocking bolt 2	2
34	Compression spring	2
35	Cylindrical pin, DEI 7979 - 5 M6x28 mm	1
45	O-ring, DIN 3771 5.5 x 1.50	2

KSP plus 250-BWM

Item	Designation	Quantity
1*	Body	1
2*	Base jaw	2
3*	Chuck piston	1
4	Cylinder piston	1
5	Cover	1
6	Covering strip	2
7	Covering strip	1
8***	Plug	4
9***	Fitting screw, 14f7/M12	2
10	Funnel lubrication nipple	4
11	Locking screw	2
12**	Quad ring, 209.14 x 3.53	1
13	Sound absorber	1
14	Screw, DEI 4762/10.9 M12 x 30 mm	1
15**	Combined sealing ring	1
16	Countersink screw, DIN EN ISO 7984 M4x8 mm	4
17**	O-ring, DIN 3771 238 x 2.00	1
18***	O-ring, DIN 3771 15 x 1.78	4
19***	Screw, DEI 4762/10.9 M12 x 45 mm	4
20**	Flat gasket	21
21	Countersunk screw, DIN EN ISO 10642/10.9 M5 x 20 mm	19
22**	Flat gasket	2
23	Set-screw, similar to DIN EN ISO 4026/45H M5 x 4 mm	2
24	Set-screw, similar to DIN EN ISO 4026/45H M6 x 6 mm IN6RD/VZ/PA	2
25	Countersunk screw, DIN EN ISO 10642/10.9 M6 x 12 mm	2
26	Set-screw, similar to DIN EN ISO 4026/45H M5 x 5 mm IN6RD/VZ/PA	1

27***	Clamping sleeve, DIN EN ISO 13337 DRM. 16 x 22	2
31	Lock bolt	2
32	Unlocking bolt	4
33	Unlocking bolt 2	2
34	Compression spring	2
35	Cylindrical pin, DEI 7979 - 6 M6x32 mm	1

KSP-LH plus 250-BWM

Item	Designation	Quantity
1*	Body	1
2*	Base jaw	2
3*	Chuck piston	1
4	Cylinder piston	1
5	Cover	1
6	Covering strip	2
7	Covering strip	1
8***	Plug	4
9***	Fitting screw, 14f7/M12	2
10	Funnel lubrication nipple	4
11	Locking screw	2
12**	Quad ring, 209.14 x 3.53	1
13	Sound absorber	1
14	Screw, DEI 4762/10.9 M12 x 30 mm	1
15**	Combined sealing ring	1
16	Countersink screw, DIN EN ISO 7984 M4x8 mm	4
17**	O-ring, DIN 3771 238 x 2.00	1
18***	O-ring, DIN 3771 15 x 1.78	4
19***	Screw, DEI 4762/10.9 M12 x 45 mm	4
20**	Flat gasket	21
21	Countersunk screw, DIN EN ISO 10642/10.9 M5 x 20 mm	19
22**	Flat gasket	2
23	Set-screw, similar to DIN EN ISO 4026/45H M5 x 4 mm	2
24	Set-screw, similar to DIN EN ISO 4026/45H M6 x 6 mm IN6RD/VZ/PA	2
25	Countersunk screw, DIN EN ISO 10642/10.9 M6 x 12 mm	2
26	Set-screw, similar to DIN EN ISO 4026/45H M5 x 5 mm IN6RD/VZ/PA	1
27***	Clamping sleeve, DIN EN ISO 13337 DRM. 16 x 22	2
31	Lock bolt	2
32	Unlocking bolt	4

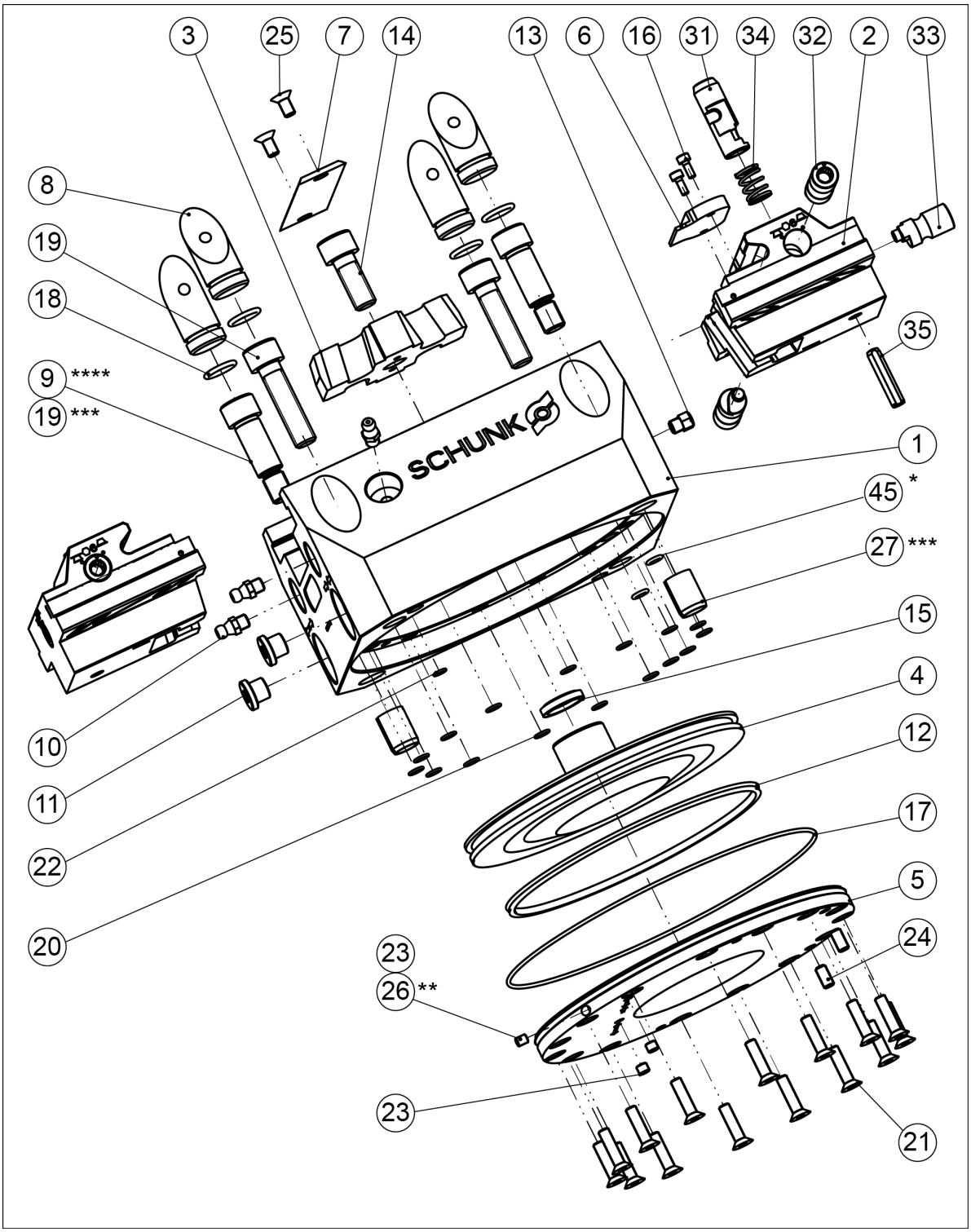
33	Unlocking bolt 2	2
34	Compression spring	2
35	Cylindrical pin, DEI 7979 - 6 M6x32 mm	1

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

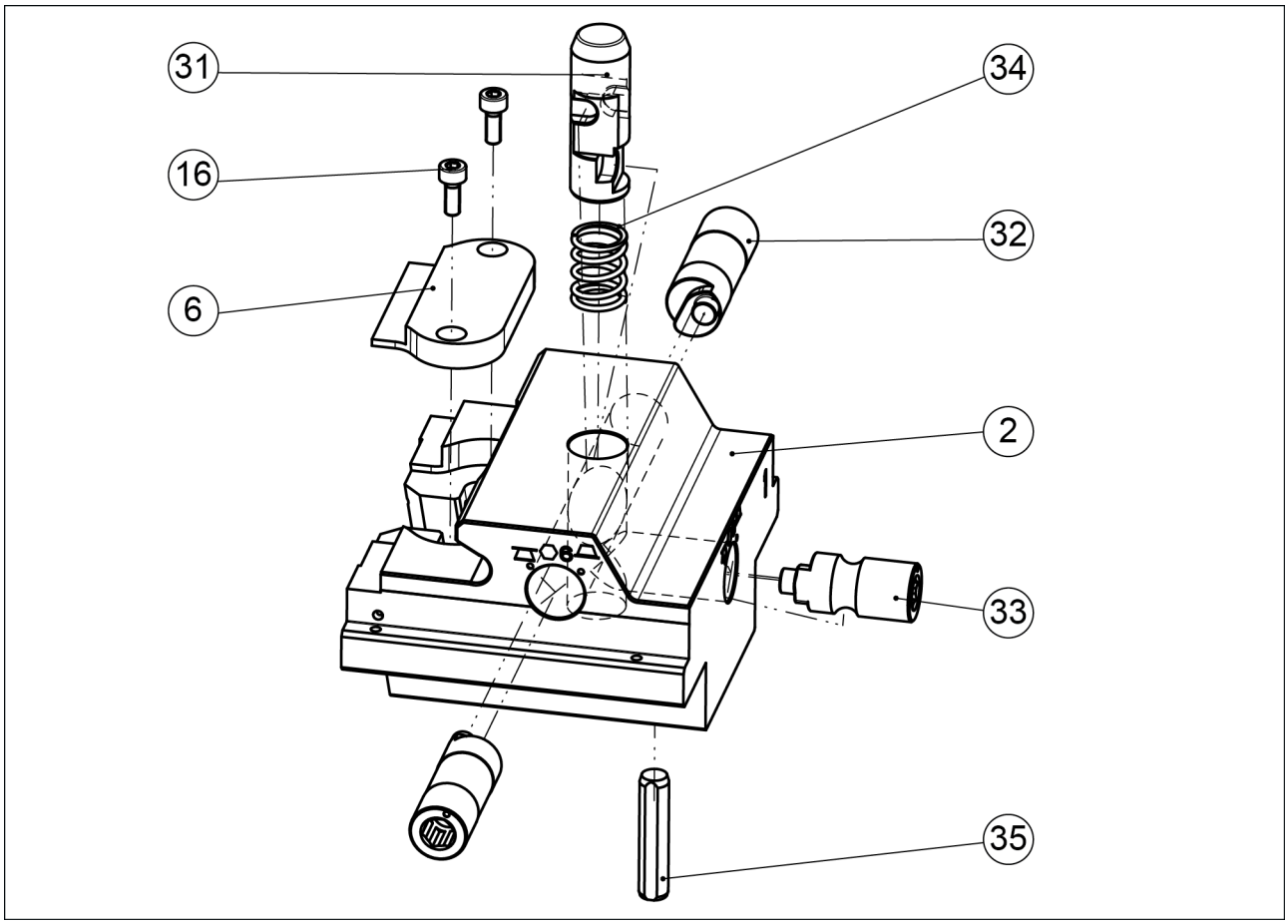
** See sealing kit list – parts cannot be ordered individually

*** Included in accessory pack

10 Drawings



*	for size 160	**	for sizes 160/250
***	Centering with clamping sleeves	****	Centering with fitting screws



Clamping jaw interface design

11 Translation of the original declaration of incorporation

in terms of the Directive 2006/42/EG, Annex II, Part 1.B of the European Parliament and of the Council on machinery.

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

We hereby declare that on the date of the declaration the following partly completed machine complied with all basic safety and health regulations found in the directive 2006/42/EC of the European Parliament and of the Council on machinery. The declaration is rendered invalid if modifications are made to the product.

Product designation:	TANDEM clamping force block, pneumatic (manual jaw change)
Type designation	KSP plus 100-BWM; KSP-LH plus 100-BWM; KSP-Z plus 100-BWM; KSP-LH-Z plus 100-BWM; KSP plus 160-BWM; KSP-LH plus 160-BWM; KSP-Z plus 160-BWM; KSP-LH-Z plus 160-BWM; KSP plus 250-BWM; KSP-LH plus 250-BWM; KSP-Z plus 250-BWM; KSP-LH-Z plus 250-BWM
ID number	0405203; 0405223; 0405205; 0405225; 0405303; 0405323; 0405305; 0405325; 0405503; 0405523; 0405505; 0405525

The partly completed machine may not be put into operation until conformity of the machine into which the partly completed machine is to be installed with the provisions of the Machinery Directive (2006/42/EC) is confirmed.

Applied harmonized standards, especially:

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 4414:2010	Pneumatic fluid power – General rules and safety requirements for systems and their components

Other related technical standards and specifications:

VDI 3035:2008-05	Design of machine tools, production lines and peripheral equipment for the use of metalworking fluids

The manufacturer agrees to forward on demand the relevant technical documentation for the partly completed machinery in electronic form to national authorities.

The relevant technical documentation according to Annex VII, Part B, belonging to the partly completed machinery, has been created.

Person authorized to compile the technical documentation:
Philipp Schräder, Address: see manufacturer's address

Signature: see original declaration

Mengen, November 2017 p.p. Philipp Schräder; Head of Engineering Design

12 Appendix on Declaration of Incorporation, as per 2006/42/EC, annex II, No. 1 B

1. Description of the basic safety and health protection requirements, as per 2006/42/EC, annex I, that apply to and are fulfilled for the scope of the incomplete machine:

Product designation	TANDEM clamping force block, pneumatic (manual jaw change)
Type designation	KSP plus 100-BWM; KSP-LH plus 100-BWM; KSP-Z plus 100-BWM; KSP-LH-Z plus 100-BWM; KSP plus 160-BWM; KSP-LH plus 160-BWM; KSP-Z plus 160-BWM; KSP-LH-Z plus 160-BWM; KSP plus 250-BWM; KSP-LH plus 250-BWM; KSP-Z plus 250-BWM; KSP-LH-Z plus 250-BWM
ID number	0405203; 0405223; 0405205; 0405225; 0405303; 0405323; 0405305; 0405325; 0405503; 0405523; 0405505; 0405525$CompanyName$

To be provided by the System Integrator for the overall machine			⇓
Fulfilled for the scope of the partly completed machine		⇓	
Not relevant	⇓		

1.1	**Essential Requirements**			
1.1.1	Definitions		X	
1.1.2	Principles of safety integration		X	
1.1.3	Materials and products		X	
1.1.4	Lighting			X
1.1.5	Design of machinery to facilitate its handling		X	
1.1.6	Ergonomics			X
1.1.7	Operating positions			X
1.1.8	Seating			X

1.2	**Control Systems**			
1.2.1	Safety and reliability of control systems			X
1.2.2	Control devices			X
1.2.3	Starting			X
1.2.4	Stopping			X
1.2.4.1	Normal stop			X
1.2.4.2	Operational stop			X
1.2.4.3	Emergency stop			X
1.2.4.4	Assembly of machinery			X
1.2.5	Selection of control or operating modes			X
1.2.6	Failure of the power supply			X

1.3	**Protection against mechanical hazards**			
1.3.1	Risk of loss of stability		X	

1.3	Protection against mechanical hazards			
1.3.2	Risk of break-up during operation		X	
1.3.3	Risks due to falling or ejected objects		X	
1.3.4	Risks due to surfaces, edges or angles		X	
1.3.5	Risks related to combined machinery			X
1.3.6	Risks related to variations in operating conditions		X	
1.3.7	Risks related to moving parts		X	
1.3.8	Choice of protection against risks arising from moving parts			X
1.3.8.1	Moving transmission parts		X	
1.3.8.2	Moving parts involved in the process			X
1.3.9	Risks of uncontrolled movements		X	

1.4	Required characteristics of guards and protective devices			
1.4.1	General requirements			X
1.4.2	Special requirements for guards			X
1.4.2.1	Fixed guards			X
1.4.2.2	Interlocking movable guards			X
1.4.2.3	Adjustable guards restricting access			X
1.4.3	Special requirements for protective devices			X

1.5	Risks due to other hazards			
1.5.1	Electricity supply			X
1.5.2	Static electricity			X
1.5.3	Energy supply other than electricity			X
1.5.4	Errors of fitting		X	
1.5.5	Extreme temperatures		X	
1.45.6	Fire			X
1.5.7	Explosion			X
1.5.8	Noise		X	
1.5.9	Vibrations		X	
1.5.10	Radiation	X		
1.5.11	External radiation	X		
1.5.12	Laser radiation	X		
1.5.13	Emissions of hazardous materials and substances			X
1.5.14	Risk of being trapped in a machine			X
1.5.15	Risk of slipping, tripping or falling			X
1.5.16	Lightning			X

1.6	Maintenance			
1.6.1	Machinery maintenance		X	
1.6.2	Access to operating positions and servicing points		X	

1.6	Maintenance			
1.6.3	Isolation of energy sources			X
1.6.4	Operator intervention			X
1.6.5	Cleaning of internal parts	X		

1.7	Information			
1.7.1	Information and warnings on the machinery		X	
1.7.1.1	Information and information devices			X
1.7.1.2	Warning devices			X
1.7.2	Warning of residual risks		X	
1.7.3	Marking of machinery			X
1.7.4	Instructions			X
1.7.4.1	General principles for the drafting of instructions		X	
1.7.4.2	Contents of the instructions			X
1.7.4.3	Sales literature		X	

	The classification from Annex 1 is to be supplemented from here forward.			
2	Supplementary essential health and safety requirements for certain categories of machinery			X
2.1	Foodstuffs machinery and machinery for cosmetics or pharmaceutical products			X
2.2	Portable hand-held and/or guided machinery			X
2.2.1	Portable fixing and other impact machinery			X
2.3	Machinery for working wood and material with similar physical characteristics			X
3	Supplementary essential health and safety requirements to offset hazards due to the mobility of machinery			X
4	Supplementary essential health and safety requirements to offset hazards due to lifting operations			X
5	Supplementary essential health and safety requirements for machinery intended for underground work			X
6	Supplementary essential health and safety requirements for machinery presenting particular hazards due to the lifting of persons			X

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Folgen Sie uns I *Follow us*

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