

TANDEM

Base plates

Assembly and operating manual



Imprint

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Technical changes:

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

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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,

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Table of Contents

1	General	5
1.1	About this manual	5
1.1.1	Presentation of Warning Labels.....	5
1.1.2	Applicable documents.....	6
1.1.3	Sizes.....	6
1.2	Warranty.....	6
1.3	Scope of Delivery.....	6
1.4	Accessories	7
2	Basic safety notes	8
2.1	Intended use.....	8
2.2	Not intended use.....	8
2.3	Constructional changes	8
2.4	Spare parts.....	9
2.5	Environmental and operating conditions.....	9
2.6	Personnel qualification.....	9
2.7	Personal protective equipment.....	10
2.8	Notes on safe operation.....	11
2.9	Transport	11
2.10	Malfunctions.....	11
2.11	Disposal.....	12
2.12	Fundamental dangers.....	12
2.12.1	Protection during handling and assembly	12
2.12.2	Protection during commissioning and operation	13
2.12.3	Protection against dangerous movements.....	13
2.12.4	Notes on particular risks	14
3	Technical data	16
4	Function	18
5	Assembly.....	20
5.1	Mounting the clamping block on the base plate	20
5.2	Connecting the clamping block	21
5.3	Connections for the base plate	22
5.3.1	Changing the sizes.....	23
5.3.2	Aligning the clamping force blocks	23
5.3.3	Bottom compressed air supply for the base plate	24
5.4	Screw tightening torques	25
5.5	Mounting the base plate	25

5.5.1	Mounting with VERO-S NSE plus 138 quick-change pallet module.....	25
5.5.2	Mounting with VERO-S NSE3 138 quick-change pallet module	26
5.5.3	Clamping pins SPA 40, SPB 40, SPC 40, SPG 40.....	26
5.6	Pneumatic circuit diagram.....	28
6	Troubleshooting	29
7	Maintenance and care	30
7.1	Leak test.....	30
8	Part lists	32
9	Drawings	39
10	Translation of the original declaration of incorporation.....	45

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 [\(☞ 1.1.2, Page 6\)](#) are applicable.

1.1.1 Presentation of Warning Labels

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

	<p>⚠ DANGER</p> <p>Danger for persons! Non-observance will inevitably cause irreversible injury or death.</p>
	<p>⚠ WARNING</p> <p>Dangers for persons! Non-observance can lead to irreversible injury and even death.</p>
	<p>⚠ CAUTION</p> <p>Dangers for persons! Non-observance can cause minor injuries.</p>
	<p>NOTICE</p> <p>Material damage! Information about avoiding material damage.</p>

1.1.2 Applicable documents

- General terms of business*
- Catalog data sheet of the purchased product *
- Operating manuals for the TANDEM clamping force blocks used *

The documents marked with an asterisk (*) can be downloaded on our homepage **schunk.com**

1.1.3 Sizes

This operating manual applies to the following sizes:

- Single plate
- Double plate
- Triple plate

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, Page 6](#))
- Observe the ambient conditions and operating conditions, ([👉 2.5, Page 9](#))
- Observance of the specified care and maintenance instructions ([👉 7, Page 30](#))

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

- **ABP-h plus TANDEM base plate**
- **Plug nipple**
- **Eye bolt** for transport
- **Sealing kit** for the pneumatic connections for the clamping force blocks
- **Handles for the series 100/160**

1.4 Accessories

(see catalog or data sheets when ordering separately)

- Sealing kit for the pneumatic connections for the clamping force blocks
- Clamping force block KSP plus 100 / 160 / 250
- Clamping pins type SPA 40, SPB 40, SPC 40, SPG 40
- Cylindrical clamp blanks type BRR
- 2.5 mm hexagonal socket screwdriver
- 4 mm hexagonal socket screwdriver
- 6 mm hexagonal socket screwdriver
- 22 mm combination wrench
- Hydrokomp media transfer
- T-nuts with screw M12
- Sealing kit for the base plates
- Indexing bolt IXB V1 for single plate with NSE plus 138-V1
- Mini pressure gauge with key
- NSL plus 150-V1-T
- NSL plus 200
- NSE plus 138
- NSE plus 138-V1
- NSE plus 138-P
- NSE-T plus 138
- NSE-T plus 138-V1
- NSL3 150-V1-T
- NSL3 200
- NSL3 200-V1-T
- NSE3 138
- NSE3 138-K
- NSE3 138-V1
- NSE3 138-V1-K
- NSE3-T3 138
- NSE-T3 138-K
- NSE-T3 138-V1
- NSE-T3 138-V1-K
- NSL3 400
- NSL3 600
- NSL3 800
- NSE3 138-P
- NSE3 138-P-K

2 Basic safety notes

2.1 Intended use

- This product is intended for assembling and controlling TAN-DEM clamping force blocks 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, Page 16](#)).
- 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:

- Clamping devices that have not been intended are attached.
- It is used in working environments that are not permissible.
- Workpieces are not properly clamped.
- The applicable safety regulations are disregarded and individuals not wearing additional protective equipment are working on this product, e.g. machining clamped workpieces.
- 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 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, Page 16](#)).
- Make sure that the contact surfaces of the interfaces are always clean.
- Always ensure that no chips of any kind enter the interface of the change components.
- Only use high-quality cooling emulsions with anti-corrosive additives during processing.
- Carry out regular visual/functional checks.
In the case of visible damage or signs of malfunctions on the base plate, the clamping systems or the quick-change pallet system installed, shut down the clamping systems immediately. The system may only be commissioned again once all the faults have been corrected.

2.6 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.

2.7 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.

2.8 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.

2.9 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.

2.10 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.

2.11 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.

2.12 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.

2.12.1 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.

2.12.2 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.

2.12.3 Protection against dangerous movements

Unexpected movements

The pressure maintenance valve integrated into the base plate temporarily prevents the pneumatic load from ventilating through the valve if the pressure in the supply line drops. For that reason, the assumption should always be made that residual energy is stored in the system.



- Before starting any assembly, conversion, maintenance or adjustment work, the base plate must first be ventilated. Before ventilating, a check is required to determine which clamping force block and function (opening or closing) it will trigger. It is necessary to ensure that no one can be harmed.
- When ventilating, do not reach within the clamping range of the clamping force blocks.
- A pressure maintenance unit ensures that the clamping device remains clamped until the machine stops if the pressure medium fails.
- If the base plate is disconnected from the medium supply line during machining, the actuating valve for controlling the clamping device may not be actuated while the device is disconnected. When the pressure medium is reconnected, the clamping device could immediately switch to the current function and the workpiece might fall out.
- To prevent cooling lubricant from entering the pneumatic system, the supplied protective cap must be placed on the coupling nipple while it is disconnected.

- Tightness can be checked using the pressure gauge. We recommend checking the pressure gauge before changing the workpiece
- Prevent any clamped workpieces from falling off.
- Prevent the base plate from unintentionally engaging during all work activities.

Any hazards that arise for downstream consumers must be identified separately and protected against by the operator.

- Only qualified personnel may disassemble the product
- Perform maintenance, modifications, and additions outside the danger zone.
- Perform maintenance, modifications, and additions outside the danger zone.
- 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.

2.12.4 Notes on particular risks

	 WARNING
	<p>Risk of injury from workpiece loss if compressed air fails or is reduced, or as a result of improper controlling (operator error)</p> <ul style="list-style-type: none">• Safeguards in user program.

**⚠ WARNING**

Risk of injury due to the base plate and the clamping force blocks falling during transportation, mounting or removal

- Make sure the base plate and the clamping force block do not fall during transport, installation or removal.
- Use a crane and/or a transport truck for transport.
- Only install the base plate 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	Any
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
Required level of cleanliness in accordance with DIN EN 60529	IP 30

Mass / Weight

TANDEM base plate with clamping force block					
ID no. Base plate	1323973	1323974	1323975	1323976	1323977
	ABP-h plus 100/160-1	ABP-h plus 100/160-2	ABP-h plus 100/160-3	ABP-h plus 250-1	ABP-h plus 250-2
KSP plus 100	15 kg	26 kg	37 kg		
KSP plus 160	22 kg	40 kg	58 kg		
KSP plus 250				52 kg	101 kg

Technical data for the clamping force blocks

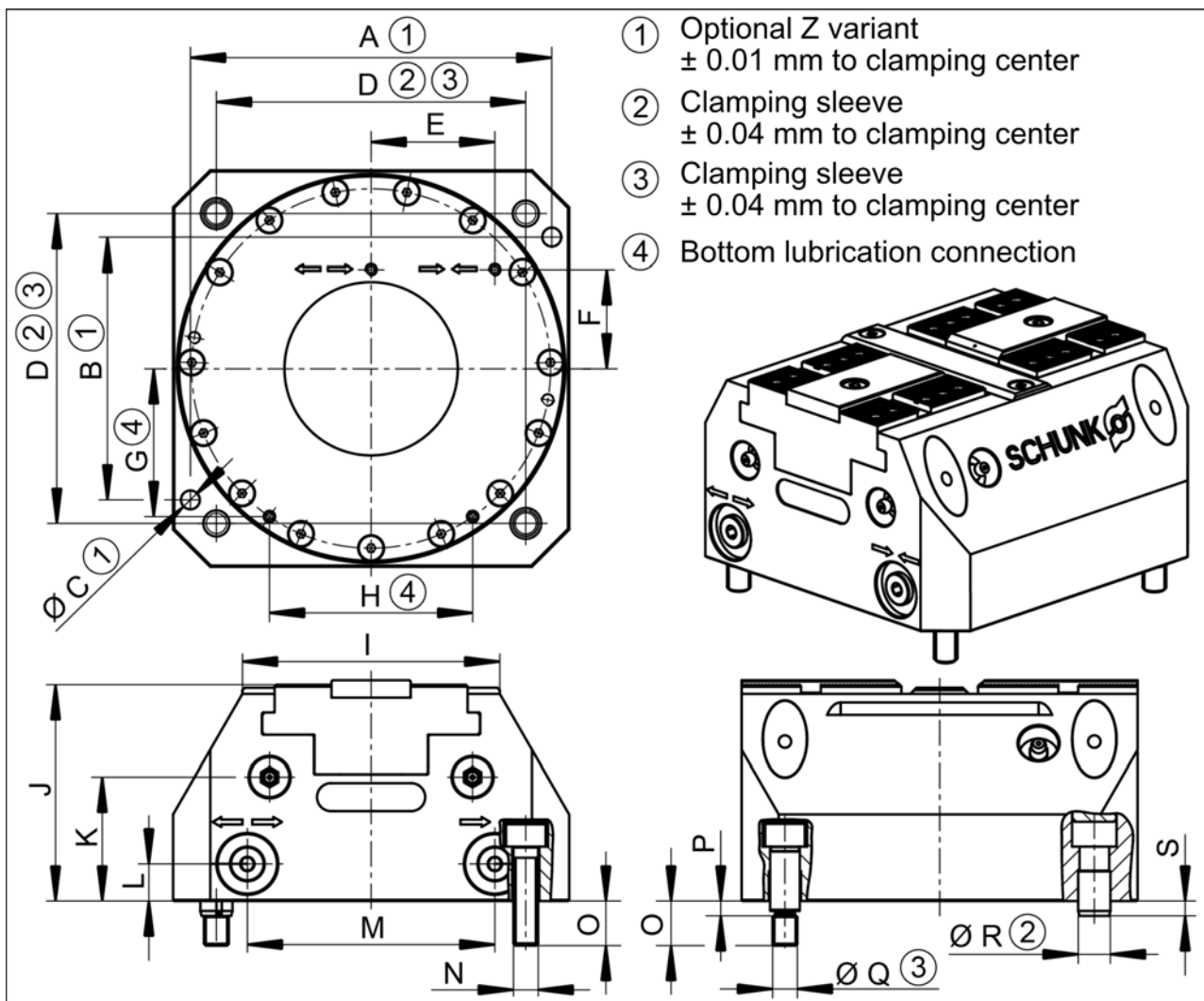
Designation	KSP plus 100	KSP plus 160	KSP plus 250
Stroke per jaw [mm]	2 mm	3 mm	5 mm
Clamping force* with max. pressure [kN]	18 kN	4.5 kN	55 kN
max. pressure [bar]	9 bar	9 bar	9 bar
min. pressure [bar]	2 bar	2 bar	2 bar
Repeat accuracy** [mm]	0.01 mm	0.02 mm	0.03 mm
max. jaw height [mm]	60 mm	60 mm	150 mm

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

** End position spread after 100 consecutive strokes.

Dimension	KSP plus / KSP-LH plus / KSP-F plus			
	64	100	160	250
A	36	90	146	230
B	56	64	106	154
∅ C	4H7 x 7.5	6H7 x 12	8H7 x 14	10H7 x 20
D	50	80	125	200
E	17	29.5	50	75

Dimension	KSP plus / KSP-LH plus / KSP-F plus			
	64	100	160	250
F	17	32	40	64
G	21	34.5	59.7	92.6
H	33.6	55	82	139.6
I	41	64	104	170
J	50.7	69.2	82.2	98.2
K	30.8	42	45	52
L	12	10	15	20
M	34	59	100	150
N	M6	M8	M10	M12
O	12	15	18	20
P	2.5	4	4	5
Ø Q	8f7	10f7	12f7	14f7
Ø R	8	11	13	16
S	4	4.5	6	6



Dimensions

Technical data for the quick-change pallet module

Designation	NSE plus 138	NSE plus 138-V1	NSE plus 138-P
Holding force* (M10 / M12 / M16 / M20)	35 kN / 50 kN / 75 kN / 75 kN	35 kN / 50 kN / 75 kN / 75 kN	35 kN / 50 kN / 75 kN / 75 kN
Pull-in force without turbo	7.5 kN	7.5 kN	7.5 kN
Pull-down force with Turbo	25 kN	25 kN	25 kN
Unlocking pressure	6 bar	6 bar	6 bar

* Holding force when fastening the clamping pin with cylindrical screw – DIN EN ISO 4762/12.9

4 Function

The base plate is suitable as a connection element between the clamping force blocks and different machining tables.

The base plate is available in the manually operated variant ABP-h.

Variants of the base plate

Size	Clamping force block	Clamping force block
Single plate	KSP plus 100/160	KSP plus 250
Double plate	KSP plus 100/160	KSP plus 250
Triple plate	KSP plus 100/160	--

Each clamping force block can be controlled individually using a toggle switch.

By engaging the MTV 4 toggle switch, each clamping force block can be opened or closed. For indicating the working pressure, each of the clamping force blocks has a pressure gauge in the base plate.

When switching from O.D. to I.D. clamping, the locking screw for each clamping force block must be replaced, otherwise the pressure gauge will not be able to indicate the working pressure.

Each clamping force block contains a pressure maintenance valve in the base plate. This consists of two check valves that are switched in parallel, and automatically open and ventilate the return flow direction on alternating sides. In the event of a pressure failure or removal of the power supply, the supply lines close the return flow valves and prevent a loss in pressure. This means that each clamping force block can be operated individually.

The size 100 or 160 clamping force blocks can be used on the base plate 100/160. When changing, the air feed-through (item 7) must be turned by 180° ([↩ 5.3, Page 22](#)).

Base plate 250 is for clamping force block size 250.

The clamping force blocks can be mounted rotated by 90° on all base plates. The valve bore holes in the base plate must be opened or closed with screw plugs.

The base plate can be controlled with compressed air using the three lateral locking couplings and a locking coupling ([↩ 5.3, Page 22](#)) located at the upper flat surface or on the bottom via transfer with an NSE plus 138-P module ([↩ 5.3.3, Page 24](#)).

Each clamping force block can also be controlled directly from the side.

Ventilation

Before ventilating, remove the compressed air supply.

Carefully unscrew the locking screws used to change from O.D. to I.D. clamping ([↩ 5.3.2, Page 24](#)), in order to ventilate the base plate. This will allow the stored compressed air to escape.



Fastening variants



Single plate	1 x NSE plus 138-V1	2 x NSE plus 138	1 x NSE plus 138-P 1 x NSE plus 138	directly on the machine table with screw-nut connections
	1 x NSE3 138-V1	2 x NSE3 138	1 x NSE3 138-P 1 x NSE3 138	
Double plate	1 x NSE plus 138-P 1 x NSE plus 138	2 x NSE plus 138		
	1 x NSE3 138-P 1 x NSE3 138	2 x NSE3 138		
Triple plate	1 x NSE plus 138-P 2 x NSE plus 138	3 x NSE plus 138		
	1 x NSE3 138-P 2 x NSE3 138	3 x NSE3 138		

All NSE3 variants are also available with conical closures (-K) and with tower modules (-T).

5 Assembly

The numbers shown for individual components refer to the assembly illustrations or clamping block connections and to the "Drawings" chapter. ([👉 9, Page 39](#))

	 WARNING
	<p>Risk of injury due to accidental actuation of the clamping force block during assembly and connection.</p> <ul style="list-style-type: none"> • 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
	<p>Risk of injury from clamping block or chuck jaws falling during transport, installation or removal!</p> <ul style="list-style-type: none"> • 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.

5.1 Mounting the clamping block on the base plate

(If the two parts are delivered separately)

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").

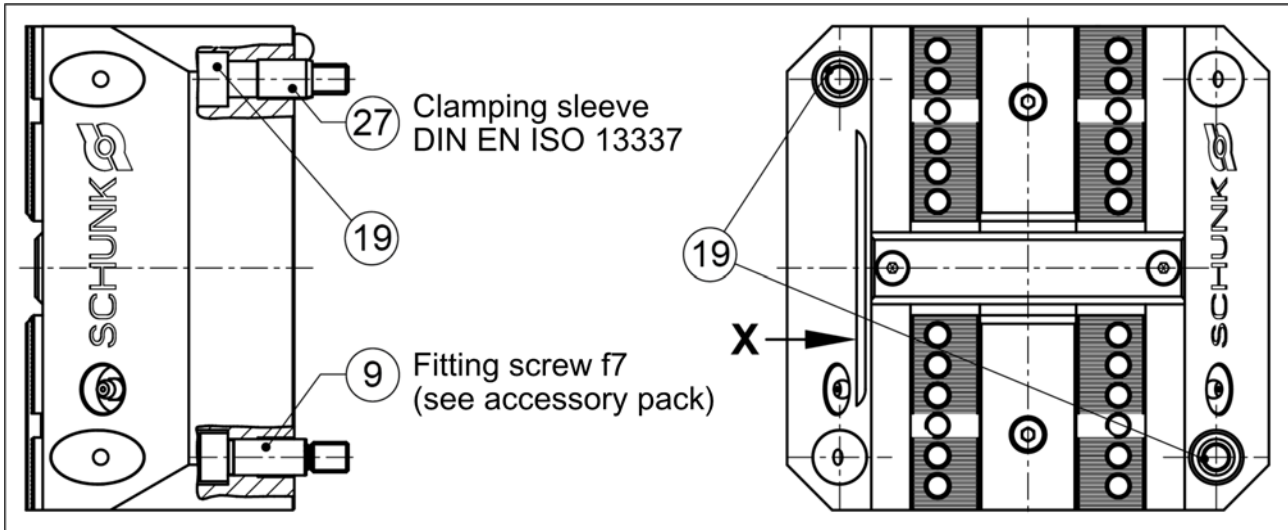
- Remove the seal plugs from the base plate (internal air feed-through III, IV) and insert the O-rings from the accessory pack into the recesses for the air feed-throughs.
- Mount the clamping force block onto the base plate.

NOTE

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

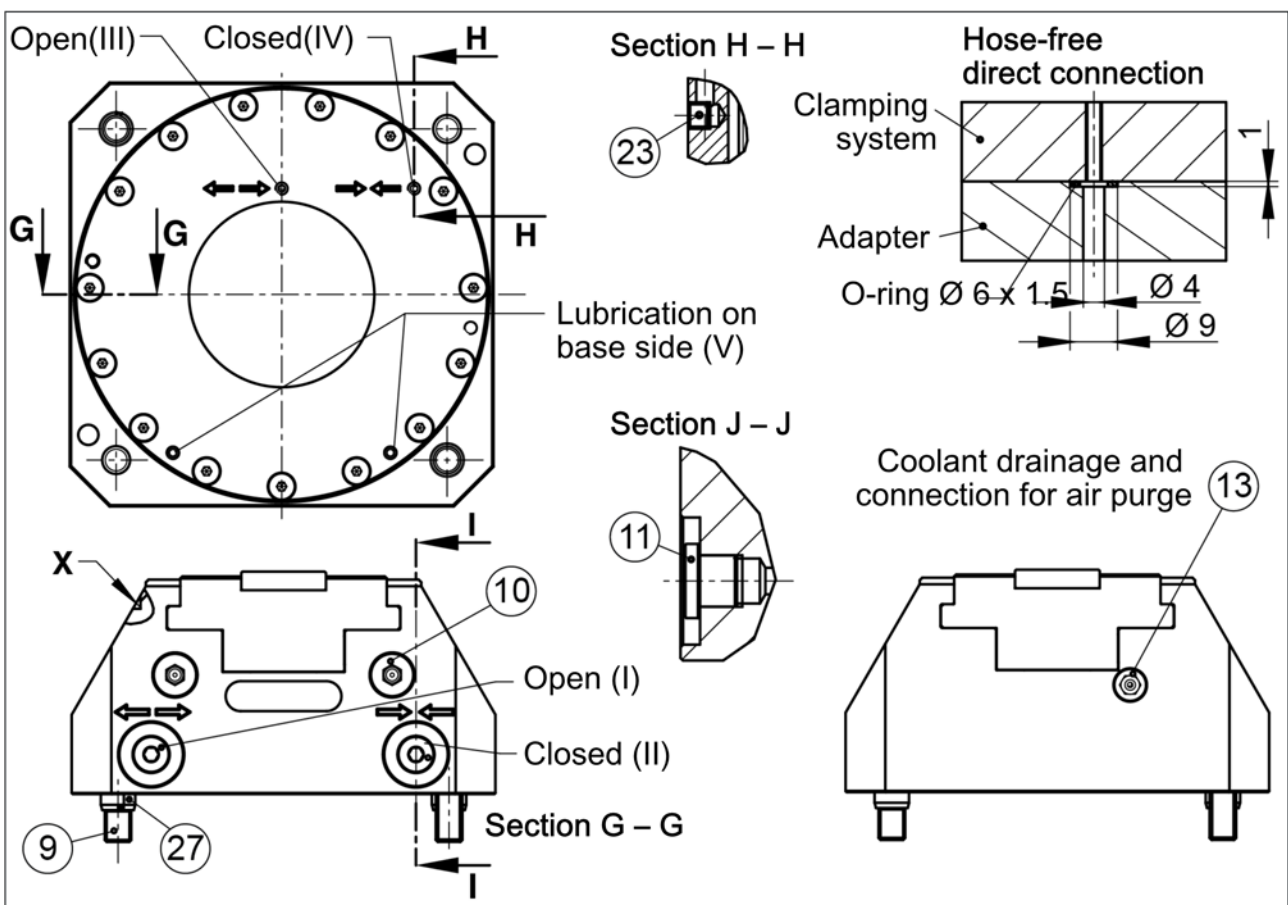
The function for monitoring the jaw position can only be connected externally. When joining, make sure the air feed-throughs for the clamping system and the base plate are precisely aligned.

- Remove the locking screws from the pneumatic connections on the base plate.




Assembling the clamping force block

5.2 Connecting the clamping block



Connecting the clamping force block

	NOTICE
<p>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.</p>	

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 100, KSP-LH plus 100, KSP-F plus 100	M5
KSP plus 160, KSP-LH plus 160, KSP-F plus 160	G1/8"
KSP plus 250, KSP-LH plus 250, KSP-F plus 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).

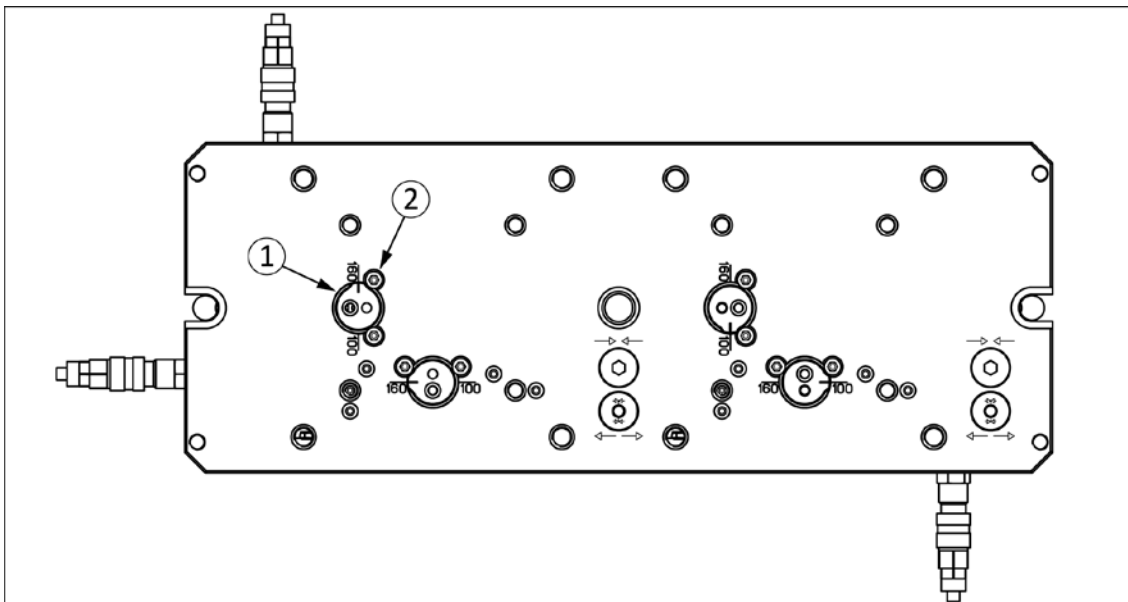
Compressed air supply requirements: Compressed air, compressed air quality according to ISO 8573-1:7 4 4

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. These connections come sealed on delivery with set-screws (item 24).

5.3 Connections for the base plate

On the base plate there are three lateral options and one option on the adaptation surface for the locking couplings. These locking couplings are used to drive the base plate.



The size 100 and 160 clamping force blocks can be mounted on the base plate 100/160. The air feed-throughs (1) must be adjusted to the appropriate size. When changing, e.g. from size 100 clamping force blocks to size 160, the air feed-throughs (1) must be rotated by 180°.

The entire system must be depressurized here.

5.3.1 Changing the sizes

- 1 Disassemble the clamping force blocks from the base plate.
- 2 Loosen the clamping screws (2) next to the air feed-throughs (1) (approx. two rotations).
- 3 Turn the air feed-throughs (1) 180° using a 4 mm hexagon socket wrench (marking the air feed-throughs at the appropriate size specification.)
- 4 Tighten the clamping screws (2) again with the specified torque ([↩ 5.4, Page 25](#)).

If the clamping force blocks are replaced or rotated, the seals for the hose-free air connections must always be checked. Always insert the seals in the required air feed-throughs.

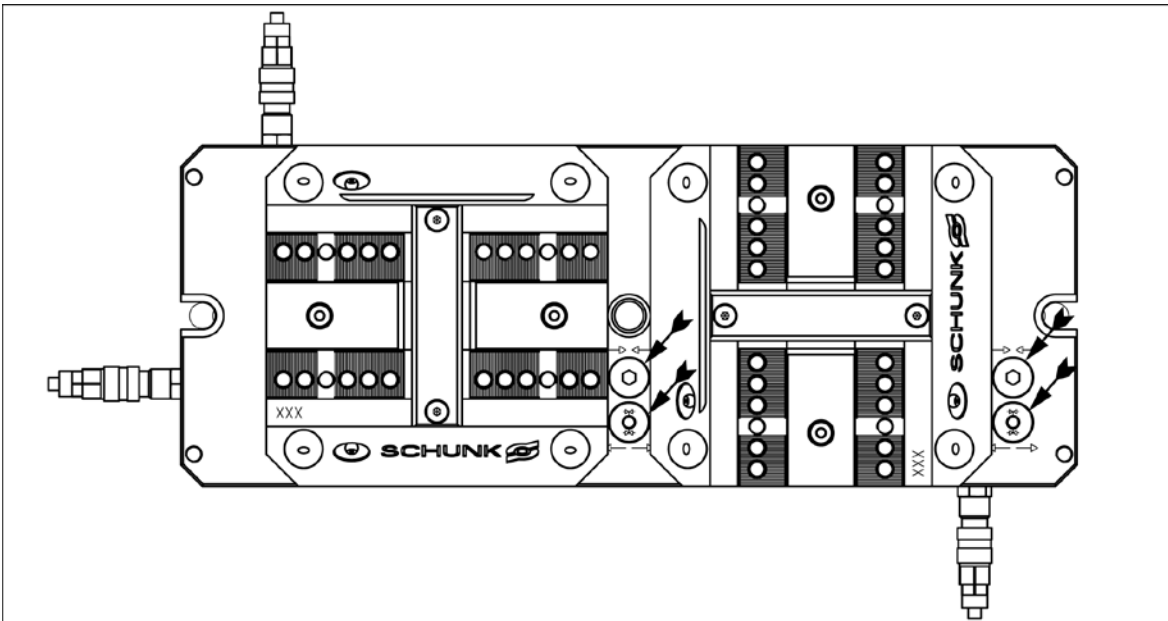
Open or close the required or unnecessary air transfer holes.

5.3.2 Aligning the clamping force blocks

Alignment of the clamping force blocks can be done at 0° and if rotated by 90°. The required hose-free air connections must be opened. The unnecessary hose-free air connections must be closed.

Changing from O.D. to I.D. clamping

When changing from O.D. to I.D. clamping, the locking screw for the corresponding clamping module must be changed. The installed pressure gauge indicates the working pressure of the clamping force block.

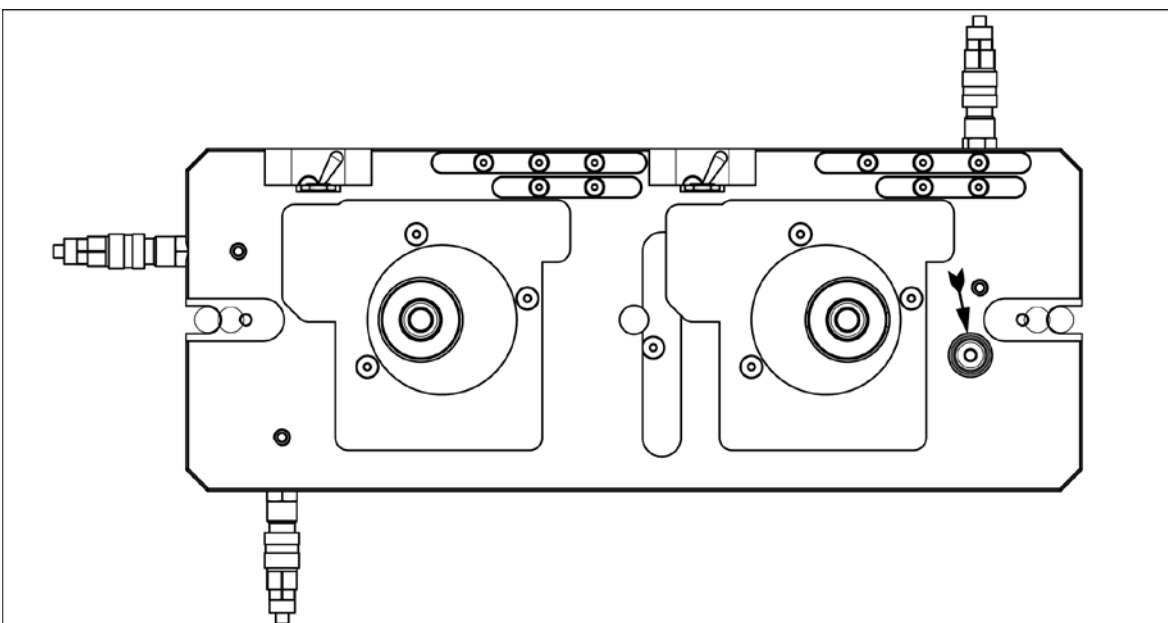


5.3.3 Bottom compressed air supply for the base plate

The base plate can be supplied with compressed air from the bottom via a VERO-S NSE plus 138-P module.

For this purpose, a **Hydrokomp coupling** (accessories, not included in the scope of delivery) must be screwed into the base plate.

Air transfer from the bottom is not possible with the TANDEM base plate 100/160-1 with a VERO-S single module and with the TANDEM base plate 250-1.



5.4 Screw tightening torques

Tightening torques for mounting the clamping force block onto the base plate, for mounting the base plate onto the machine table and for the clamping screws for the air feed-throughs (screw quality 10.9).

Screw size	M4	M5	M6	M8	M10	M12	M14	M16
Tightening torque M_A (Nm)	4.2	7.5	13	28	50	88	120	160

5.5 Mounting the base plate

The base plate can be mounted on the machine table in several variants.

Direct assembly

Direct assembly takes place using a screw-nut connection through the screw holes provided. Alignment can be done using the fitting slots at the bottom.

Adhesive attachment

The base plate can be mounted on the machine table with adhesive and screws.

5.5.1 Mounting with VERO-S NSE plus 138 quick-change pallet module

To quickly change different base plates, clamping pins can be mounted under the base plate. VERO-S NSE plus 138 quick-change pallet modules must be mounted on the machine table.

- For a single plate with SPA clamping pin, an NSE plus 138-V1 (with torque pin) should be mounted.
- For a single plate with two clamping pins, one SPA and one SPB clamping pin, two NSE plus 138 should be mounted, or one NSE plus 138 and one NSE plus 138-P with media transfer ([👉 5.3.3, Page 24](#)).
- For a double plate with two clamping pins, one SPA and one SPB clamping pin, two NSE plus 138 should be mounted, or one NSE plus 138 and one NSE plus 138-P with media transfer ([👉 5.3.3, Page 24](#)).
- For a triple plate with three clamping pins, one SPA, one SPB and one SPC clamping pin, three NSE plus 138 should be mounted, or two NSE plus 138 and one NSE plus 138-P with media transfer ([👉 5.3.3, Page 24](#)).

5.5.2 Mounting with VERO-S NSE3 138 quick-change pallet module

To quickly change different base plates, clamping pins can be mounted under the base plate. VERO-S NSE3 138 quick-change pallet modules must be mounted on the machine table.

- For a single plate with SPA clamping pin, an NSE3 138-V1 or NSE3 138-V1-K should be mounted.
- For a single plate with two clamping pins, one SPA and one SPB clamping pin, two NSE3 138 or NSE3 138-K should be mounted, or one NSE3 138 and one NSE3 138-P, or one NSE3 138-K and one NSE3 138-P-K.
- For a double plate with two clamping pins, one SPA and one SPB clamping pin, two NSE3 138 or NSE3 138-K should be mounted, or one NSE3 138 and one NSE3 138-P, or one NSE3 138-K and one NSE3 138-P-K.
- For a triple plate with three clamping pins, one SPA, one SPB and one SPC clamping pin, three NSE3 138 or NSE3 138-K should be mounted, or two NSE3 138 and one NSE3 138-P, or two NSE3 138-K and one NSE3 138-P-K.

(K = conical lock)

The entire system can also be equipped with T-modules (T = tower module).

5.5.3 Clamping pins SPA 40, SPB 40, SPC 40, SPG 40

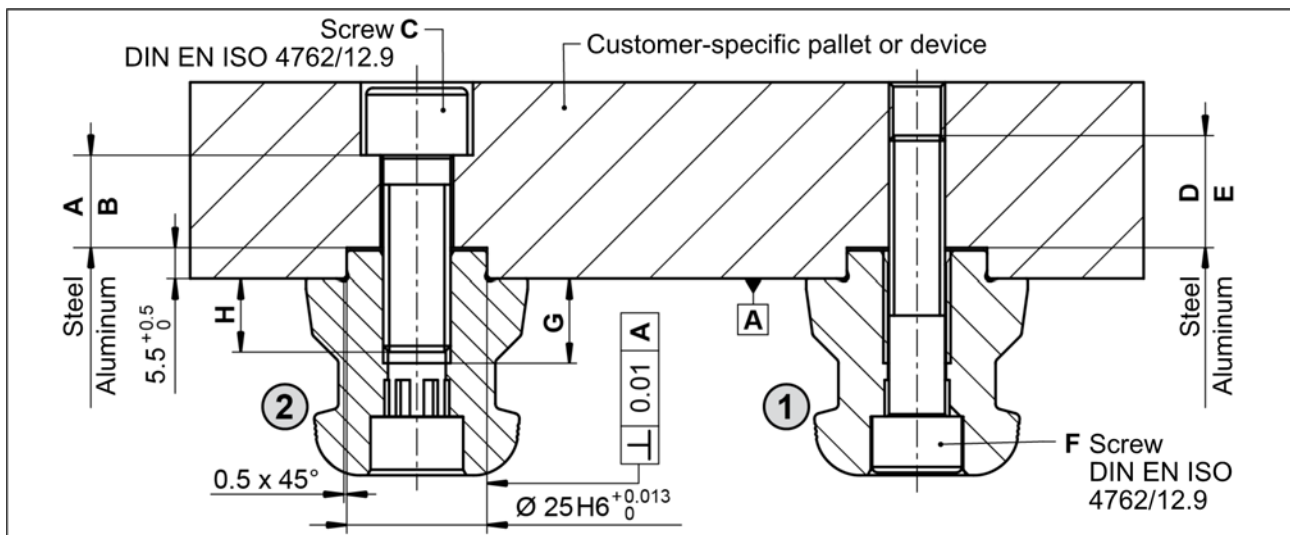


NOTICE

Notes on clamping pins and mounting screws

The holding force of the quick-change pallet system is limited essentially by the tightness of the screw connection which connects the clamping pin to the pallet or the device.

- This is why only screws of strength class 12.9 may be used.
- Only original SCHUNK clamping pins may be used.
- If the clamping pins are to be used in customer-owned devices, the customer must provide sufficiently dimensioned threaded holes or a sufficiently thick mounting material.

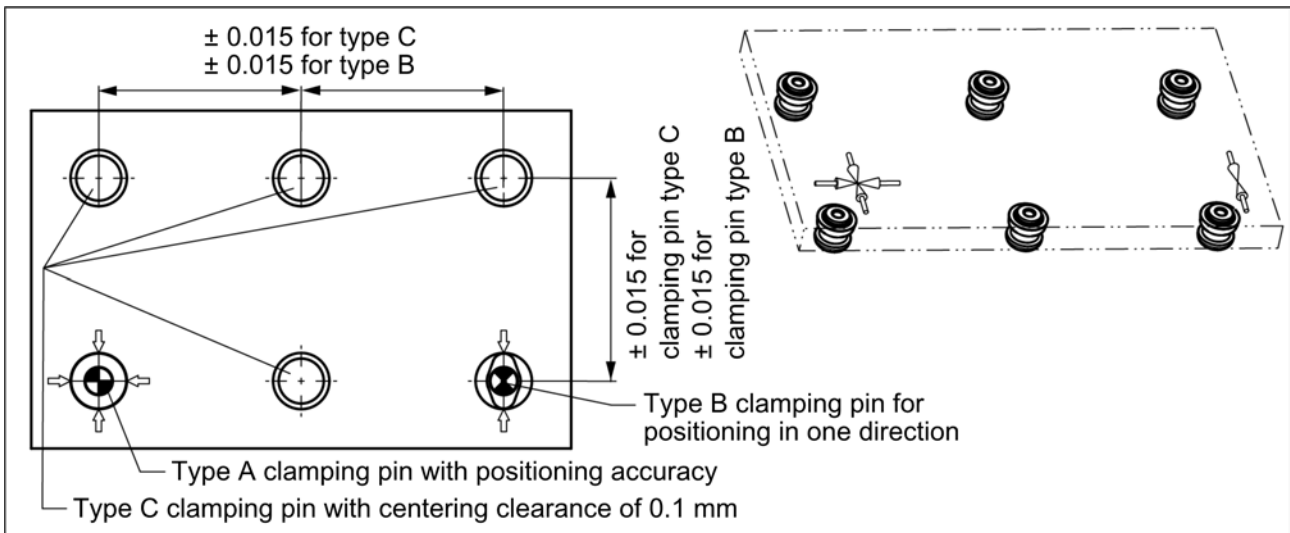


Tolerances and installation conditions

Type	ID no.	A	B	C	D	E	F	G*	H
SPA 40	0471151	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPB 40	0471152	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPC 40	0471153	> 12	> 17	M12	> 15	> 20	M10	15	>12
SPG 40	0471154	> 12	> 17	M12	> 15	> 20	M10	25	>22
SPA 40-16	0471064	> 13	> 18	M16	> 18	> 24	M12	20	>16
SPB 40-16	0471065	> 13	> 18	M16	> 18	> 24	M12	20	>16
SPC 40-16	0471066	> 13	> 18	M16	> 18	> 24	M12	20	>16

* The length of the screwed thread must not exceed the dimension "G" under any circumstances!

Usage/arrangement of the different types of clamping pins
 (Application: pallet with 6 clamping positions)

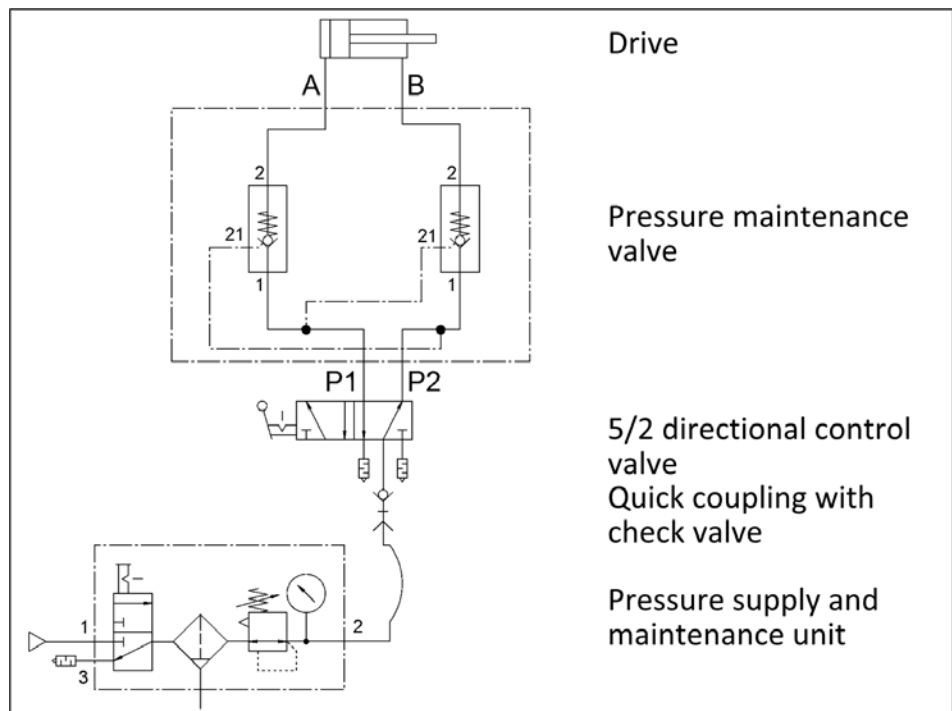


Tightening torques for mounting VERO-S clamping pins type SPA / SPB / SPC

(Screw quality 12.9)

Screw size	M10	M12	M14	M16
Tightening torque (Nm)	62	108	170	262

5.6 Pneumatic circuit diagram



6 Troubleshooting

Possible cause	Remedial measures
Air supply interrupted	Check air supply
System pressure too low	Increase system pressure according to clamping system technical specifications
Unused air connections not sealed	Close connections with accessories
Active air connections sealed	Remove set-screws/locking screws from sealed air connections
The base plate is leaking	Check connection and seal screws; reseal or replace
Seals damaged	Replace all seals
Loss of power/loss of clamping force	Check tightness of the base plate and accessories
Air feed-throughs are stuck or cannot turn	Switch the system to a depressurized state and loosen the clamping screws
No air transfer at the air feed-through	Air feed-through with threaded pin closed or not turned to end position
Pressure gauge indicates no pressure although the switching position is correct	Replace locking screws for the pressure display (pressure display for O.D and I.D. clamping)
Clamping force block opens or closes when the system pressure is connected	Check position of the toggle switch
Single plate rotates during processing	Check whether an NSE plus 138-V1 or NSE3 138-V1 is mounted as an interface
Transfer through the NSE plus 138-P module is not working	Check if the transfer coupling is mounted on the bottom
The base plate is not laying flat on the NSE plus 138 modules	Check whether the transfer coupling is mounted on the bottom or disassemble and close the supply bore hole
The base plate is not laying flat on the machine table	Check whether the transfer coupling is mounted on the bottom or disassemble and close the supply bore hole
Inaccuracy when changing the base plate with pre-assembled clamping pin	Check the arrangement of the clamping pins
The base plate is not pulled flat against the clamping modules when the clamping module is engaged	Check whether the clamping pin is correctly fastened or tightened with torque

7 Maintenance and care

The base plate is designed for low-maintenance operation. As such opening and disassembly of the base plate is only necessary in exceptional cases.

If a leak is detected, the location of the leak must be determined and then closed. All unused transfer holes must be closed with sealed threaded pins.

Sealing at the transfer points is done using sealing rings. The unused sealing rings on the transfer holes must be removed and protected from light (UV) and ambient influences.

When changing the clamping force blocks and mounting the base plate on the machine table, all surfaces must be cleaned. No chips are permitted on the locating surface, clamping surfaces and clamping points of the components.

7.1 Leak test

During the leak test, the air and plug connections as well as the pressure display and the pressure maintenance valve are checked for tightness.

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

No accessories should be connected during the leak test.

- 1 Connect the components to the air connection in the following order:
pressure gauge, shut-off valve, supply line with coupling nipple.
- 2 Pressurize the clamping system with compressed air.
- 3 Check the clamping system for tightness in both switch positions.
- 4 Check the tightness of the integrated pressure display.
- 5 The clamping system is sealed:
when the pressure gauge indicates a pressure drop of less than 0.1 bar per hour.
The clamping system is not sealed:
when the pressure gauge indicates a pressure drop of more than 0.1 bar per hour.

If the clamping system has leaks, the entire pneumatic system must be checked (e.g. using Metaflux leak detector spray).

If any leaks are identified, check the seals and replace them if necessary.

Leaks at the pressure display or in the plug-in connections of the air supply, for example, must be sealed and any defective components replaced.

8 Part lists

Single plate ABP-h plus 100/160-1 (ID No. 1323973)
sealing kit (ID No. 1336273)

Item	Designation	Quantity
1	Base plate	1
2	Rotary feed-through	1
3	Valve strip, large	1
4	Valve strip, small	1
5	Lance	1
6	Cover, large	1
7	Air feed-through	2
8	Locking screw	1
9	Aluminum plate	1
10	SPA 40	1
12	Sealing nipple	1
13	Sealing ring	1
14	MTV 4	1
15	Screw	4
16	Countersunk screw	3
17	Sound absorber	1
18	Locking screw *	1
19	Locking screw *	3
20	Set-screw *	4
21	O-ring */**	2
22	O-ring */**	1
23	O-ring */**	6
24	O-ring */**	2
25	Locking screw */**	1
26	Set-screw */**	4
27	Countersunk screw	4
28	Set-screw	2
29	Screw *	4
30	IXB	1
31	O-ring */**	1
32	O-ring */**	1

Item	Designation	Quantity
33	O-ring */**	1
34	O-ring */**	4
35	O-ring */**	1
36	Set-screw	2
37	Pressure gauge	1
38	Screw plug	4
39	Eye bolt	4
40	Handle	1
41	Countersunk screw	4
42	Screw	4

**Double plate ABP-h plus 100/160-2 (ID No. 1323974)
sealing kit (ID No. 1336288)**

Item	Designation	Quantity
1	Base plate	1
2	Rotary feed-through	2
3	Valve strip, large	2
4	Valve strip, small	2
5	Lance	1
6	Cover, large	2
7	Air feed-through	4
8	Locking screw	2
9	Cover, small	1
10	Aluminum plate	1
11	SPA 40	1
12	SPB 40	1
14	Sealing nipple	1
15	Sealing ring	3
16	MTV 4	2
17	Screw	8
18	Countersunk screw	7
19	Sound absorber	1
20	Locking screw *	1
21	Locking screw *	3
22	Set-screw	4

Item	Designation	Quantity
23	O-ring */**	2
24	O-ring */**	1
25	O-ring */**	12
26	O-ring */**	4
27	Locking screw */**	2
28	Set-screw */**	8
29	Countersunk screw	8
31	Elbow screw-in union	2
32	Set-screw *	4
33	Screw *	8
34	O-ring */**	2
35	O-ring */**	2
36	O-ring */**	2
37	O-ring */**	8
38	Elbow screw-in union	1
39	O-ring */**	2
40	Set-screw	4
41	Pressure gauge	2
42	Screw plug	8
43	Eye bolt	4
44	Handle	1
45	Countersunk screw	4
46	Screw	4

**Double plate ABP-h plus 100/160-3 (ID No. 1323975)
sealing kit (ID No. 1336293)**

Item	Designation	Quantity
1	Base plate	1
2	Rotary feed-through	3
3	Valve strip, large	2
4	Valve strip, small	2
5	Lance	1
6	Cover, large	3
7	Air feed-through	6
8	Locking screw	3

Item	Designation	Quantity
9	Cover, small	2
10	Aluminum plate	1
11	SPA 40	1
12	SPB 40	1
13	SPC 40	1
15	Sealing nipple	1
16	Sealing ring	1
17	MTV 4	3
18	Screw	12
19	Countersunk screw	11
20	Sound absorber	1
21	Locking screw *	1
22	Locking screw *	3
23	Set-screw	6
24	O-ring */**	2
25	O-ring */**	1
26	O-ring */**	18
27	O-ring */**	6
28	Locking screw */**	3
29	Set-screw */**	12
30	Countersunk screw	8
31	Elbow screw-in union	2
32	Set-screw	11
33	Screw *	12
34	O-ring */**	2
35	O-ring */**	2
36	O-ring */**	3
37	O-ring */**	8
38	Elbow screw-in union	2
39	O-ring */**	3
41	Pressure gauge	3
42	Screw plug	12
43	Eye bolt	4

Item	Designation	Quantity
44	Handle	1
45	Countersunk screw	4
46	Screw	4

**Single plate ABP plus 250-1 (ID No. 1323976)
sealing kit (ID No. 1336302)**

Item	Designation	Quantity
1	Base plate	1
2	Valve plate	1
3	Distance plate	1
4	Cover	1
5	Valve strip, large	2
6	Lance	1
7	Locking screw	1
8	Aluminum plate	1
9	SPA 40-16	1
10	SPB 40-16	1
11	Sealing nipple	1
12	Sealing ring	1
13	MTV 4	1
14	Sound absorber	1
15	Locking screw *	3
16	Straight screw-in union	7
17	Elbow screw-in union	1
18	SDV-P 04	1
19	Pressure gauge	1
20	Locking screw *	1
21	Set-screw */**	6
22	Set-screw	2
23	Screw	4
24	Screw	1
25	Screw	1
26	Countersunk screw	4
27	Countersunk screw	3
28	O-ring */**	2

Item	Designation	Quantity
29	O-ring */**	1
30	O-ring */**	8
31	O-ring */**	2
32	O-ring */**	1
33	O-ring */**	4
34	O-ring */**	5
35	Eye bolt	4
36	Screw	4

**Double plate ABP plus 250-2 (ID No. 1323977)
sealing kit (ID No. 1323977)**

Item	Designation	Quantity
1	Base plate	1
2	Valve plate	2
3	Distance plate	2
4	Cover	2
5	Valve strip, large	4
6	Lance	2
7	Locking screw	2
8	Aluminum plate	1
9	SPA 40-16	1
10	SPB 40-16	1
11	SPC 40-16	1
12	Sealing nipple	1
13	Sealing ring	1
14	MTV 4	2
15	Sound absorber	1
16	Locking screw *	3
17	Straight screw-in union	12
18	Elbow screw-in union	4
19	SDV-P 04	2
20	Pressure gauge	2
21	Locking screw *	2
22	Locking screw *	1
23	Set-screw */**	12

Item	Designation	Quantity
24	Set-screw	4
25	Screw	8
26	Screw	2
27	Screw	2
28	Countersunk screw	3
29	Countersunk screw	8
30	O-ring */**	4
31	O-ring */**	2
32	O-ring */**	16
33	O-ring */**	4
34	O-ring */**	2
35	O-ring */**	8
36	O-ring */**	10
38	Set-screw	3
39	Screw	1
40	Eye bolt	4
41	Screw	4

Rotary feed-through DDF ABP-h plus (ID No. 1154888)

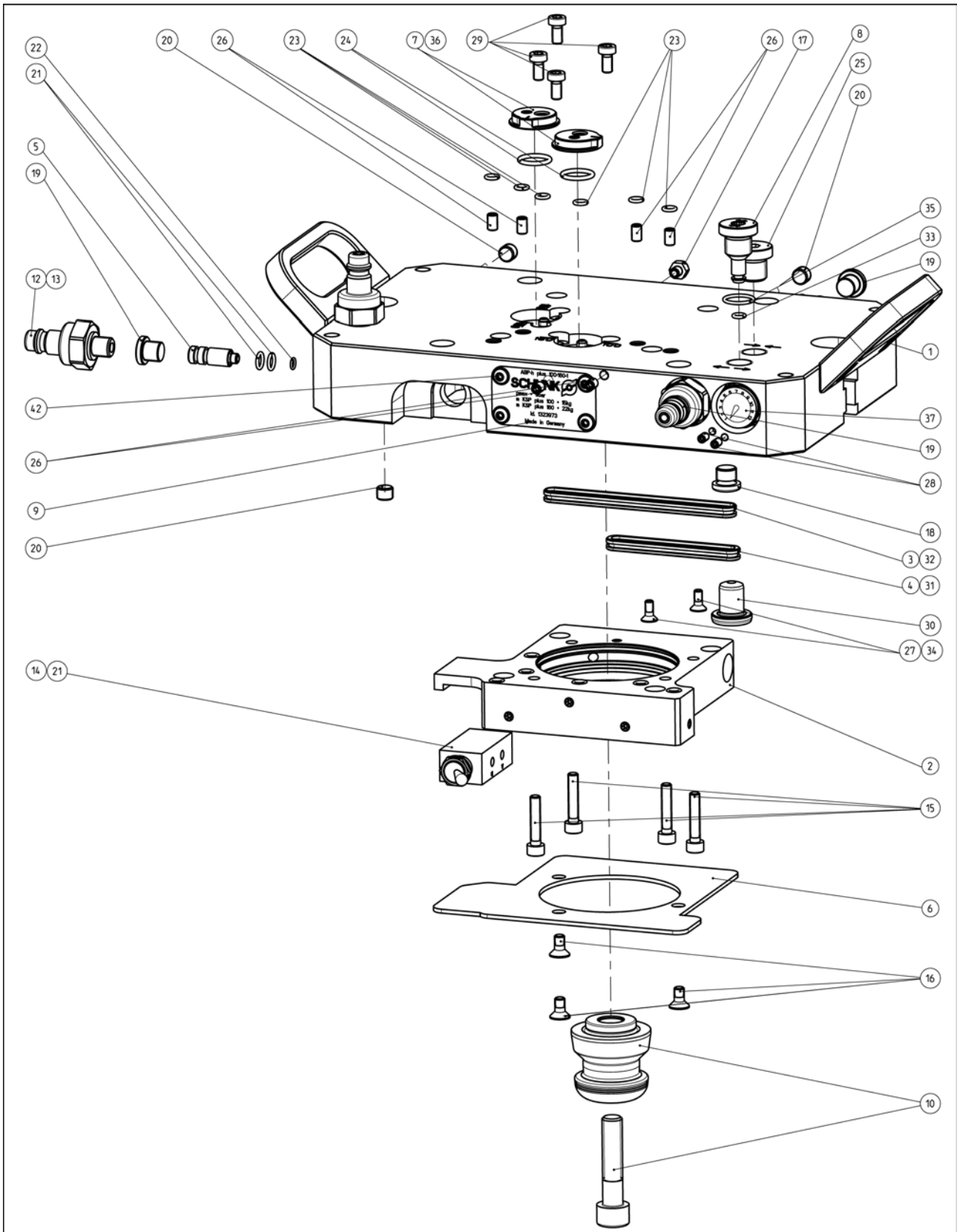
Item	Designation	Quantity
1	Rotary feed-through	1
2	O-ring	3
3	O-ring	6
4	Set-screw	16
5	Rod	1
6	Locking screw	2
7	Sealing groove	2
8	Spring plate	2
9	O-ring	1
10	O-ring	2
11	O-ring	2
12	O-ring	2

*** Wearing parts, recommend replacing when maintenance is performed**

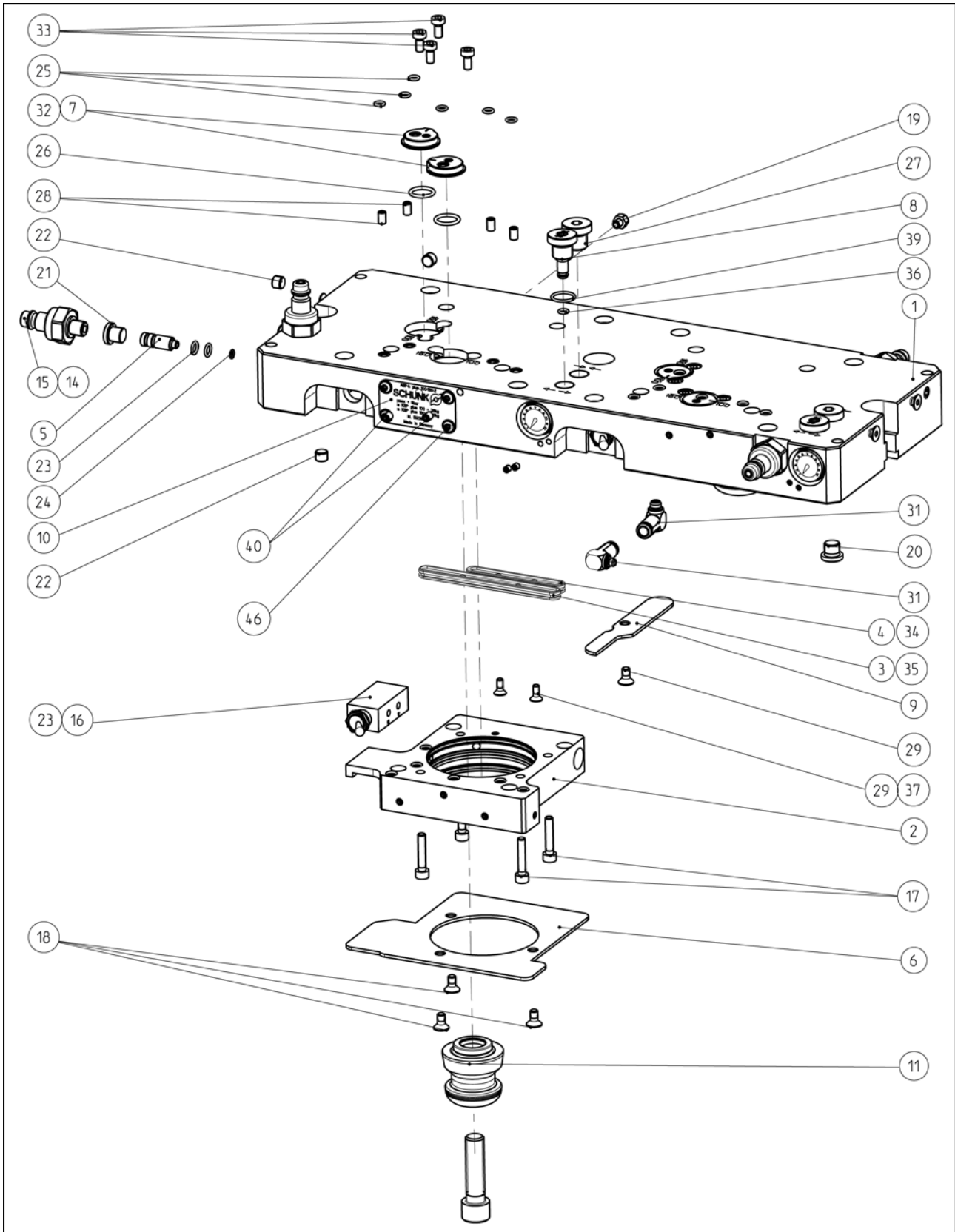
**** sealing kit**

9 Drawings

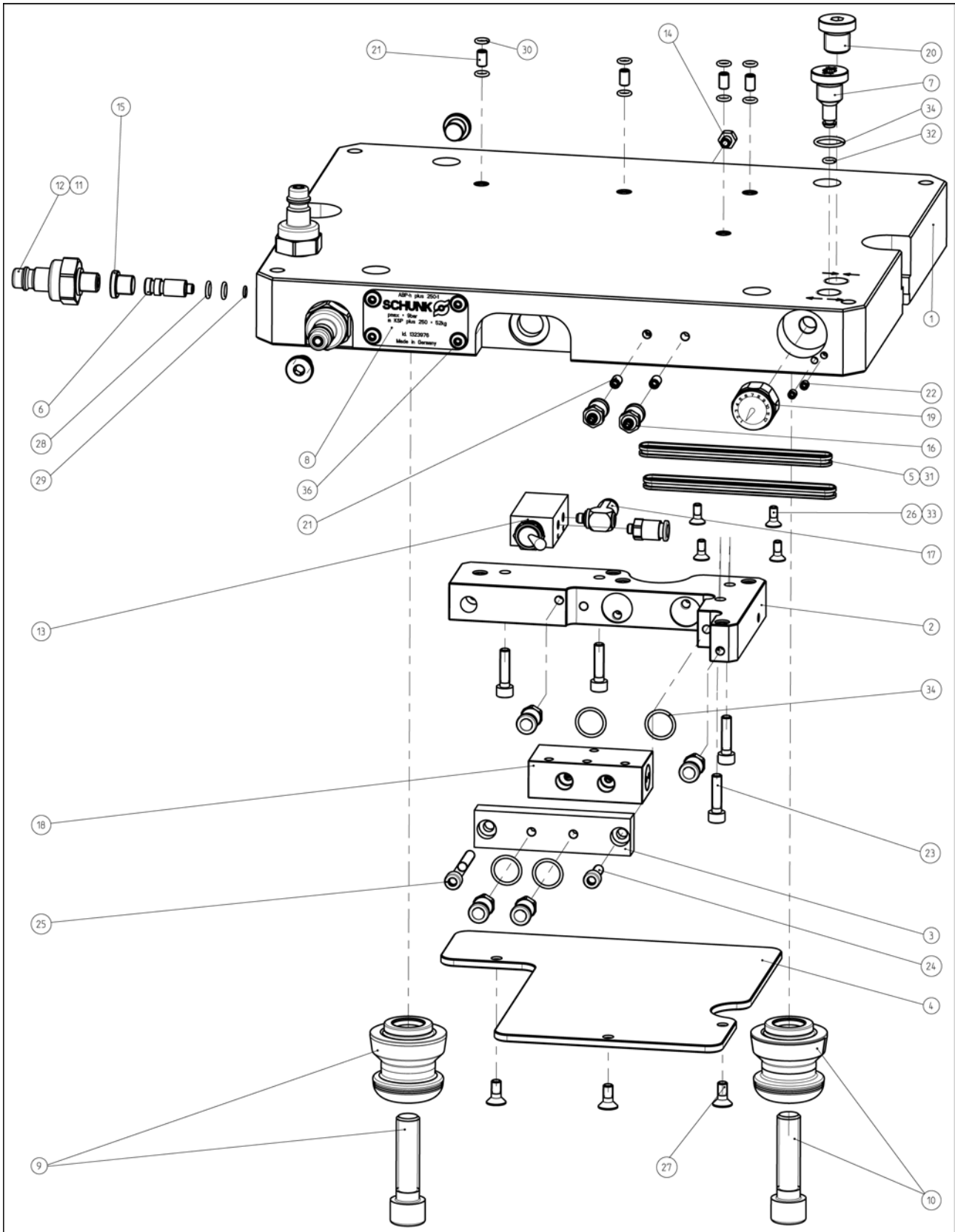
Single plate ABP-h plus 100/160-1



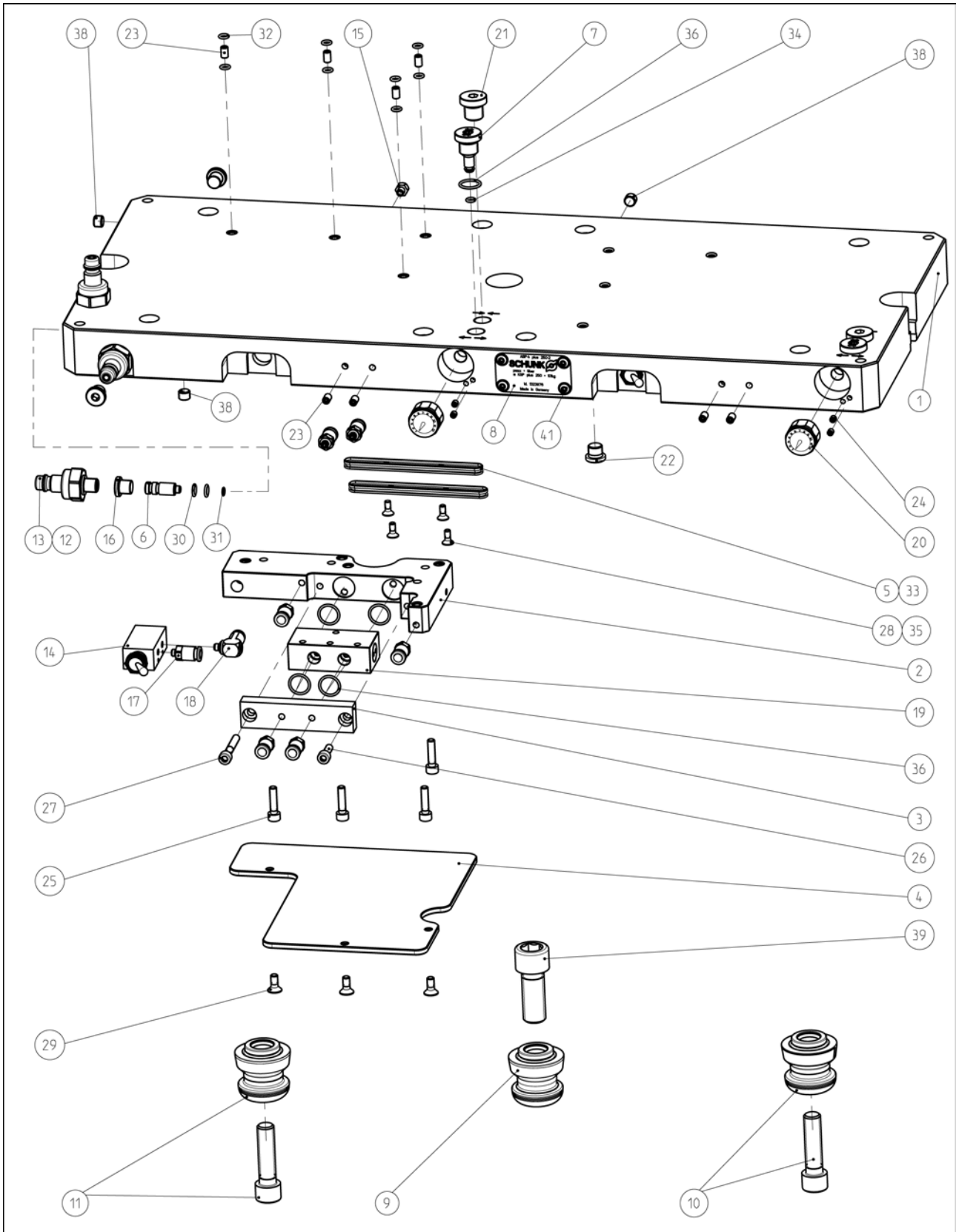
Double plate ABP-h plus 100/160-2



Single plate ABP plus 250-1



Double plate ABP plus 250-2



Rotary feed-through DDF ABP-h plus

