Operating instructions

Vacuum Block VCBL

Note

The Operating instructions were originally written in German. Store in a safe place for future reference. Subject to technical changes without notice. No responsibility is taken for printing or other types of errors.

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Translation of the original operating instructions

Contents

1 Important Information

1.1 The technical documentation is part of the product

1. For problem-free and safe operation, follow the instructions in the documents.
2. Keep the technical documentation in close proximity to the product. The documentation must be accessible to personnel at all times.
3. Pass on the technical documentation to subsequent users.

⇨ Failure to follow the instructions in these Operating instructions may result in injuries!

⇨ Schmalz is not liable for damage or malfunctions that result from failure to heed these instructions.

If you still have questions after reading the technical documentation, contact Schmalz Service at:

www.schmalz.com/services

1.2 Note on Using this Document

J. Schmalz GmbH is generally referred to as Schmalz in this document.

The document contains important notes and information about the different operating phases of the product:

- Transport, storage, start of operations and decommissioning
- Safe operation, required maintenance, rectification of any faults

The document describes the product at the time of delivery by Schmalz and is intended for:

- Installers who are trained in handling the product and can operate and install it
- Technically trained service personnel performing the maintenance work
- Technically trained persons who work on electrical equipment

The displayed figures are only examples. Depending on the particular design, they can differ from the product.

1.3 Type Plate

The type plate is permanently attached to the product and must always be clearly legible.
It contains product identification data and important technical information.

The QR code enables access to the digital technical documentation for the product.

▸ For spare parts orders, warranty claims or other inquiries, have the information on the type plate to hand.

1.4 Symbols

This symbol indicates useful and important information.

✓ This symbol represents a prerequisite that must be met before an action is performed.

▸ This symbol represents an action to be performed.

⇨ This symbol represents the result of an action.

Actions that consist of more than one step are numbered:

1. First action to be performed.
2. Second action to be performed.

2 Fundamental Safety Instructions

2.1 Intended Use

The vacuum block is used to clamp plate-shaped, dry workpieces on CNC woodworking machines using a special vacuum clamping console as an interface.

The vacuum block is placed on machine tables with a specially designed vacuum clamping console.

The product is built in accordance with the latest standards of technology and is delivered in a safe operating condition; however, hazards may arise during use.

The product is intended for industrial and commercial applications.

Intended use includes observing the technical data and the installation and operating instructions in this manual.

2.2 Non-Intended Use

Schmalz accepts no liability for damages resulting from use other than the intended use. In particular, the following types of use are considered non-intended use:

- Operation of the suction cup with worn or damaged suction plate or sealing
- Suction of human or animal body parts
- Machining forces that lead to the vacuum block and/or workpiece being displaced or torn off are not permitted.
- Use of the vacuum block as a base, support or comparable aid
- Use with workpieces at risk of explosion
- Contact with liquids, media or surfaces that lead to a reduction in the static friction or vacuum force of the suction cup
- Evacuation of highly inflammable or explosive media
- Mechanical overload of the vacuum block
- Operation with a workpiece that does not cover the entire suction area
- Operation of the suction cup with a sealing surface soiled by dust or chips (leads to reduced vacuum force!)

2.3 Personnel Qualifications

Unqualified personnel cannot recognize dangers and are therefore exposed to higher risks!

The operating company must ensure the following points:

- The personnel must be commissioned for the activities described in these operating instructions.
- The staff must be at least 18 years of age and physically and mentally capable.
- The product must be operated only by persons who have undergone appropriate training.
- Personnel must receive regular safety briefings (frequency as per country-specific regulations).
- Installation, maintenance, and repairs must be carried out only by specialists from Schmalz or by persons who can prove that they have undergone appropriate training at Schmalz.

The following target groups are addressed in these operating instructions:

- Persons trained in operating and cleaning the product.

The operator of the system must comply with country-specific regulations regarding the age, ability and training of the personnel.

Applicable for Germany:

A qualified employee is defined as an employee who has received technical training and has the knowledge and experience – including knowledge of applicable regulations – necessary to enable him or her to recognize possible dangers and implement the appropriate safety measures while performing tasks. Qualified employees must observe the relevant industry-specific rules and regulations.

2.4 Workplace Requirements

The following requirements must be fulfilled to ensure a safe workplace:

- The components must not be used outdoors.
- The type plate and warning signs must be legible.
- The surroundings of the components must be dry.
- The operator must have a clear view of the whole working area, the workplace must be adequately lit and free of glare and the area around the workplace must be clean and clear.

2.5 Warnings in This Document

Warnings warn against hazards that may occur when handling the product. The signal word indicates the level of danger.

Signal word	Meaning
⚠ WARNING	Indicates a medium-risk hazard that could result in death or serious injury if not avoided.
⚠ CAUTION	Indicates a low-risk hazard that could result in minor or moderate injury if not avoided.
NOTE	Indicates a danger that leads to property damage.

2.6 Residual Risks

⚠ WARNING

Flying workpiece due to insufficient vacuum clamping force during machining, resulting from insufficient vacuum.

Risk of injury due to flying workpiece

- ▸ Monitor the vacuum value as close to the clamping location as possible
- ▸ Wear personal protective clothing

⚠ WARNING

Flying workpiece caused by damage to the sealing during machining and thus loss of holding force.

Risk of injury due to flying workpiece

- ▸ Do not damage the sealing surfaces during machining.
- ▸ Personal protective clothing must be worn.

⚠ CAUTION

Noise pollution from leakage

Hearing damage

- ▸ Correct position.
- ▸ Wear ear protectors.

⚠ CAUTION

Falling product

Risk of injury

- Fasten or store the product securely at the location of use.
- Wear protective work shoes (S1).

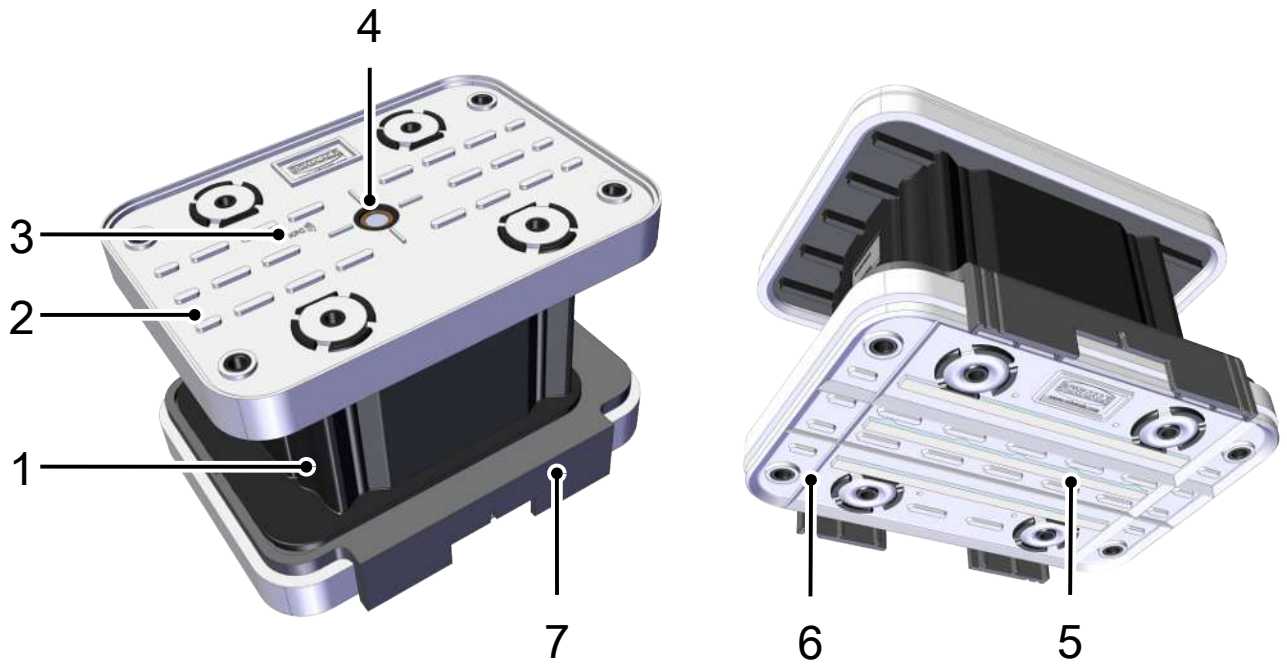
2.7 Modifications to the Product

Schmalz assumes no liability for consequences of modifications over which it has no control:

1. The product must be operated only in its original condition as delivered.
2. Use only original spare parts from Schmalz.
3. The product must be operated only in perfect condition.

3 Product description

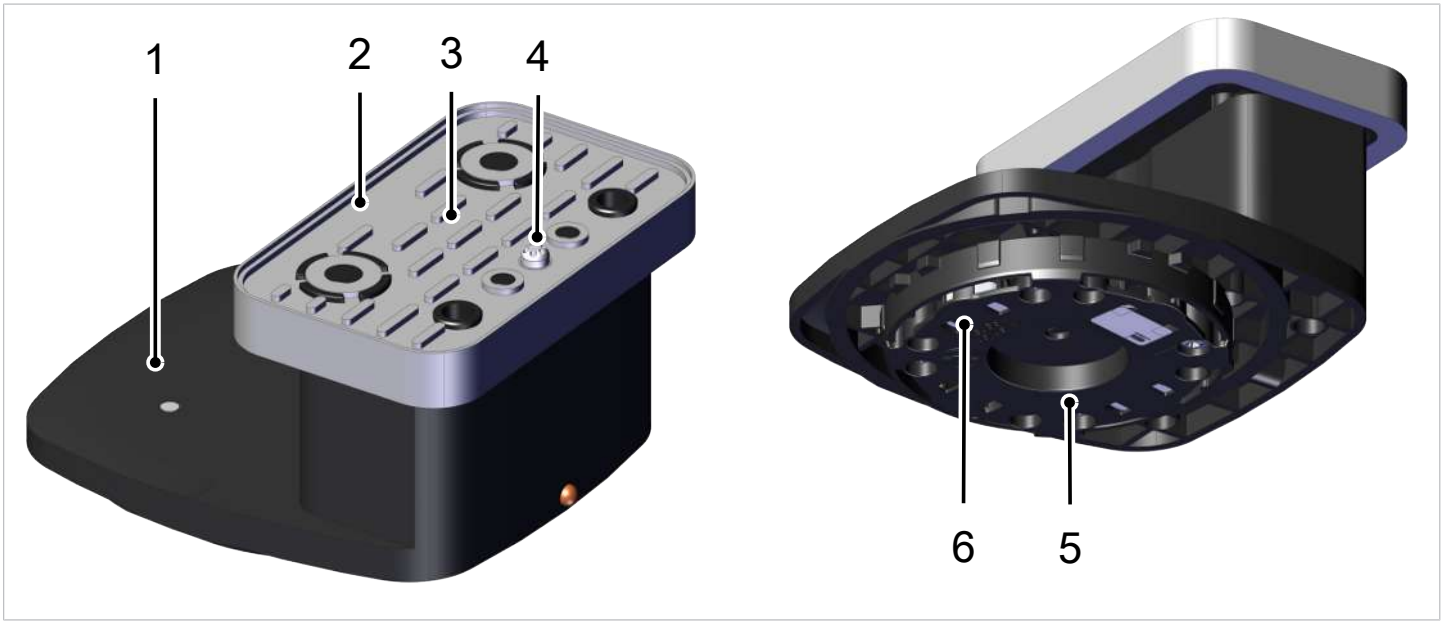
3.1 Vacuum Block K1/K2 Product Design



1	Housing	5	Metal strip
2	Top suction plate	6	Bottom suction plate
3	Position of NFC chip (depending on variant)	7	Guide strip
4	Screen or touch valve (depending on variant)		

3.2 Vacuum Block VCBL-B Product Design

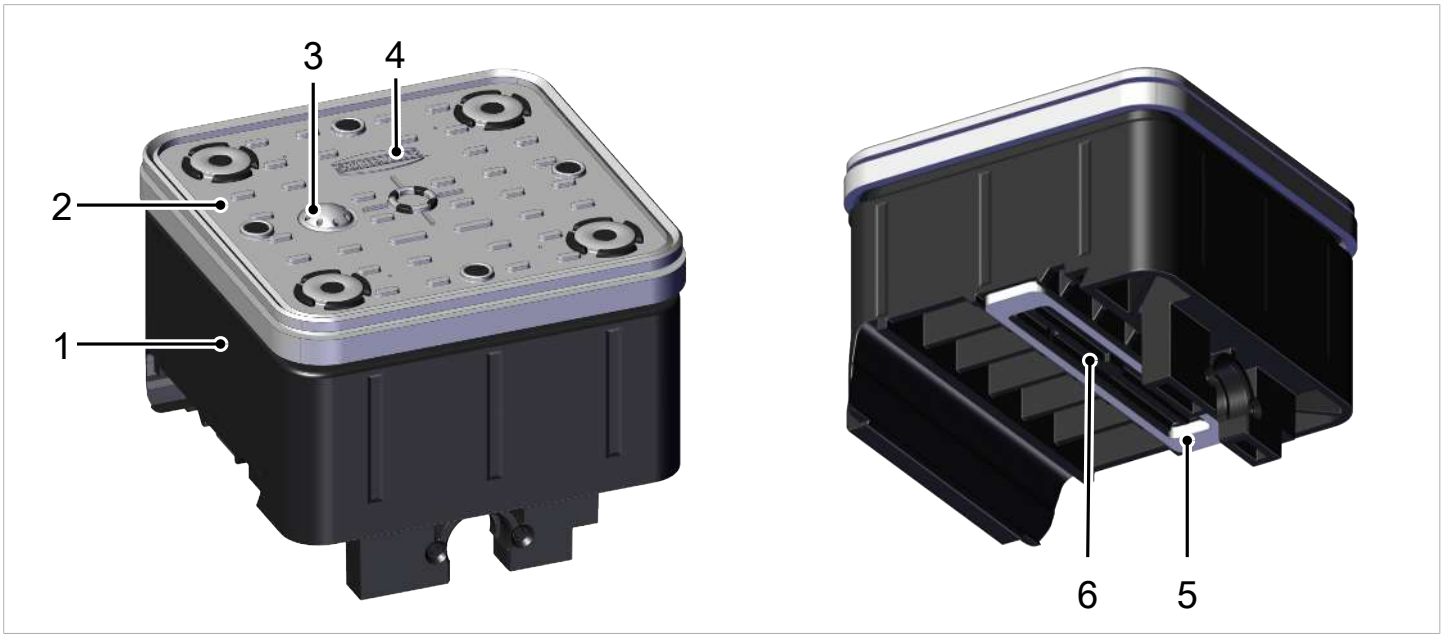
Biesse is a registered trademark of the Biesse Group.
The items listed here are products of J. Schmalz GmbH that have been designed to fit CNC milling machines from Biesse.



1	Main body	4	Touch valve
2	Top suction plate	5	Adapter ring
3	Position of NFC chip (depending on variant)	6	Magnets

3.3 Vacuum Block S6 Product Design

Scm Group S6 is a registered trademark of the Scm Group.
The items listed here are products of J. Schmalz GmbH that have been designed to fit CNC milling machines from the Scm Group.



1	Base plate with clamping profile	4	Position of NFC chip (depending on variant)
2	Top suction plate	5	Sealing
3	Touch valve	6	Vacuum feedthrough

3.4 Interface NFC

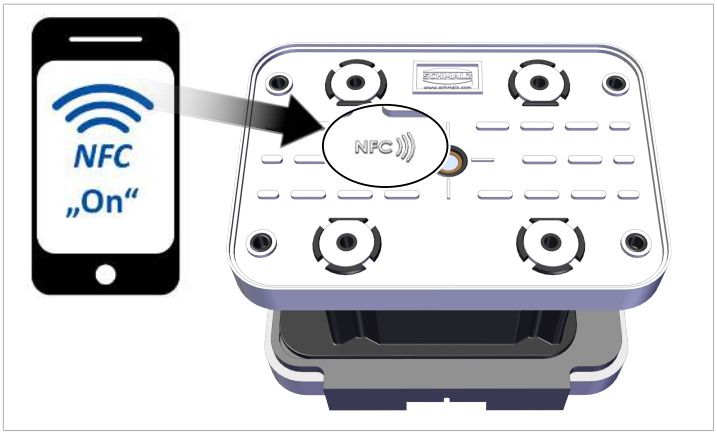
NFC (Near Field Communication) refers to a standard for wireless data transfer between different devices over short distances.

An NFC chip is installed on the product on the upper suction surface. It acts as a passive NFC tag, which can be read by a reader such as a smartphone or tablet with NFC enabled.

Read-only access is available through a website viewed in a browser.
This does not require an additional app.
The reading device requires only that NFC and the Internet connection are enabled.

Process control via NFC is not possible.

The NFC chip is installed on the upper suction plate, usually under the NFC symbol or the Schmalz logo.
For an optimal data connection, scan for the NFC connection with the reader close above the suction surface.



The reading distance is very short for NFC applications. If necessary, find the position of the NFC antenna in the reading device used.

4 General Parameters

Permissible ambient temperature	5 to 50 °C
Environment	Dry

5 Technical Data

The technical data (e.g. dimensions, weight, etc.) for the product can be found at www.schmalz.com.

6 Checking the Delivery

The scope of delivery can be found in the order confirmation. The weights and dimensions are listed in the delivery notes.

1. Compare the entire delivery with the supplied delivery notes to make sure nothing is missing.
2. Damage caused by defective packaging or occurring in transit must be reported immediately to the carrier and J. Schmalz GmbH.

7 Installation

7.1 Installation Instructions

⚠ CAUTION

Vacuum close to the eye

Severe eye injury!

- Wear eye protection.
- Do not look into vacuum openings, e.g. suction cups.

For safe installation, the following instructions must be observed:

- Dirt particles or foreign bodies in the suction plate connections, hoses or pipelines can lead to malfunctions or failure.
- Mounting and removal may be performed only when the device is unpressurized and disconnected from the mains.

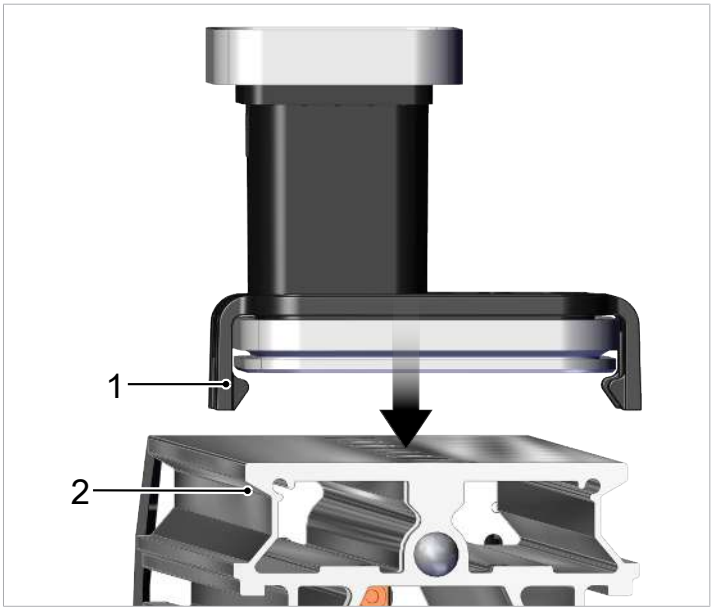
7.2 Placing the Vacuum Block on the Vacuum Clamping Console

7.2.1 Vacuum Block VCBL-K1 (1 Circuit)

The illustrations shown below may deviate from the customer's version because they serve as examples of different versions of the product.

Position the vacuum block in the machining area on the vacuum clamping console.

- Place the vacuum block (as shown) on the vacuum clamping console and position it over the vacuum openings.
  Make sure the clips of the guide rail (1) engage under the bevel on the vacuum clamping console (2).



⇨ The vacuum block rests flat on the vacuum clamping console and is pre-fixed to the vacuum clamping console by the clamping action of the guide strip.
The vacuum block can be displaced in the longitudinal direction.
The magnetic valves (vacuum supply) integrated in the vacuum clamping console are opened using the insert installed in the lower suction plate.

Vacuum blocks for single-circuit consoles are pre-fixed to the vacuum clamping console by the clamping action of the guide strip.
By activating the operating vacuum:

- the workpiece placed on the vacuum block is secured, and
- the area between the bottom suction plate and the vacuum clamping console is evacuated, creating a clamping force to fix the vacuum block.

Using the Vacuum Block

✓ All the vacuum blocks required for the workpiece are positioned on the machining table.

1. Use the machine to extend the stop cylinders.
2. Place the workpiece on top and place it against the stops.
3. Activate the vacuum using the machine controller.
   In variants with a touch valve, the vacuum channel is opened when the workpiece is placed on the table. This means that the vacuum blocks can remain on the vacuum clamping console without contacting the workpiece, as the vacuum circuit remains closed.
   ⇨ In versions with a lifting system, the support surface lowers (version AS only) and the workpiece is clamped.
4. Retract the stops.
5. Before starting the machining process, visually and manually check that the vacuum block(s) and workpiece are securely fastened.

⇨ The setup process is complete and machining of the workpiece can begin.

Releasing the Workpiece

⚠ CAUTION

Falling objects resulting from the workpiece being released (deactivation of the vacuum)

Risk of injury

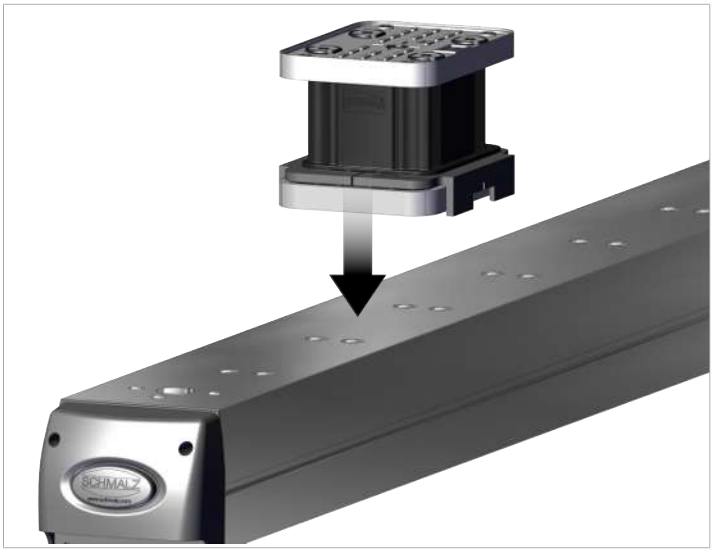
- Personal protective clothing must be worn.

By deactivating the vacuum and thus reducing the vacuum to atmospheric pressure, the workpiece is released and the fixing for the vacuum block on the vacuum clamping console is also released.
The pre-fixing (mechanical clamp) remains intact.

7.2.2 Vacuum Block VCBL-K2 (2 Circuit)

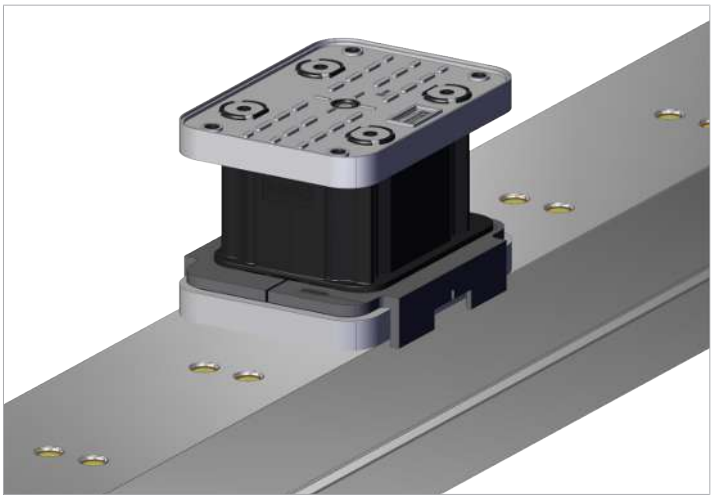
The illustrations shown below may deviate from the customer's version because they serve as examples of different versions of the product.

Position the vacuum block in the machining area on the vacuum clamping console.



- Place the vacuum block (as shown) on the vacuum clamping console and position it over the vacuum openings.

  ⇨ The vacuum block rests flat on the vacuum clamping console and is guided over the side edges.
  The vacuum block can be easily displaced in the longitudinal direction.
  The magnetic valves (vacuum supply) integrated in the vacuum clamping console are opened using the inserts installed in the lower suction plate.



The vacuum block is not secured.
In order to evacuate the area between the bottom suction plate and the vacuum clamping console and achieve a clamping force for fixing, the corresponding vacuum circuit of the vacuum clamping console must first be evacuated.

Using the Vacuum Block

Vacuum blocks for 2-circuit consoles are fixed to the vacuum clamping console by supplying an operating vacuum on the first vacuum circuit.
Activating the operating vacuum on the second vacuum circuit secures the workpiece placed on the vacuum block.

✓ All the vacuum blocks required for the workpiece are positioned on the machining table.

1. Use the machine to extend the stop cylinders.
2. By activating the first vacuum circuit, the vacuum blocks are fixed on the vacuum clamping console.
3. Place the workpiece on top and place it against the stops.

4. Activate the vacuum of the second vacuum circuit using the machine controller.
   In variants with a touch valve, the vacuum channel is opened when the workpiece is placed on the table. This means that the vacuum blocks can remain on the vacuum clamping console without contacting the workpiece, as the vacuum circuit remains closed.
   ⇨ In versions with a lifting system, the support surface lowers (version AS only) and the workpiece is clamped.
5. Retract the stops.
6. Before starting the machining process, visually and manually check that the vacuum block(s) and workpiece are securely fastened.

⇨ The setup process is complete and machining of the workpiece can begin.

Releasing the Workpiece

⚠ CAUTION

Falling objects resulting from the workpiece being released (deactivation of the vacuum)

Risk of injury

- Personal protective clothing must be worn.

By switching off the second vacuum circuit and thus reducing the vacuum to atmospheric pressure, the workpiece is released, while the vacuum block remains secure.

When the first vacuum circuit is switched off, the vacuum block is released from the vacuum clamping console.

7.2.3 Inserting Vacuum Block VCBL-B into the Base

The illustrations shown below may deviate from the customer's version because they serve as examples of different versions of the product.

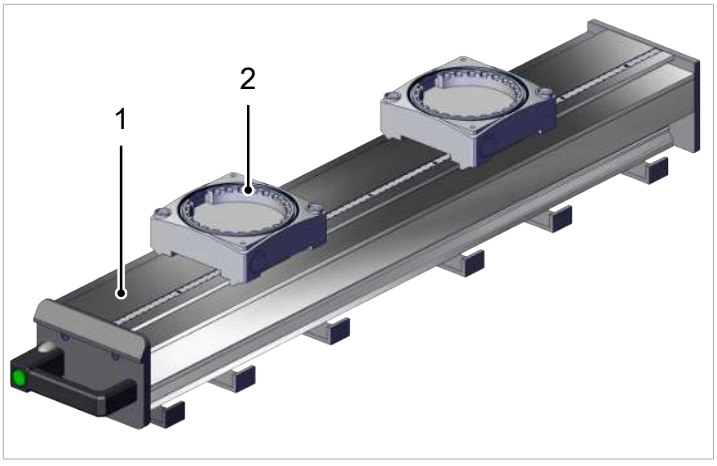
The vacuum block is used on Biesse machine tables.

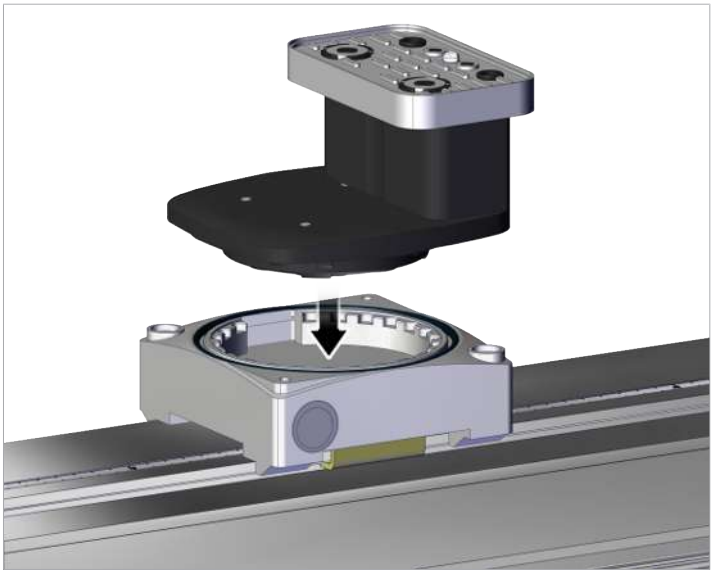
Bases (2) are mounted on the vacuum clamping consoles (1), into which the vacuum block is inserted and secured.

The vacuum block can be inserted into the base (2) in 15° increments.

Clamping straps on the vacuum block ring and magnets ensure the blocks are securely fixed in the base.

The integrated touch valve allows vacuum blocks that are not currently in use to remain on the machine table.





- Press the vacuum block into the base in the correct position (can be positioned in 15° increments).

Using the Vacuum Blocks

1. After pressing the vacuum block into the base, it must be moved to the specified position on the vacuum clamping console (depending on the workpiece).
2. Via the release from the machine, the vacuum blocks are fixed (activation of the compressed air circuit of the vacuum clamping console) and the stop cylinders move into the stop positions.
3. Place the workpiece on top and place it against the stops.
   ⇨ The vacuum blocks are equipped with a touch valve. When the workpiece is in contact, the vacuum channel is opened.
4. Activate the vacuum using the machine controller. The workpiece is clamped.
5. Retract the stops.
6. Before starting the machining process, visually and manually check that the vacuum block(s) and workpiece are securely fastened.

⇨ The setup process is complete and machining of the workpiece can begin.

Releasing the Workpiece

⚠ CAUTION

Falling objects resulting from the workpiece being released (deactivation of the vacuum)

Risk of injury

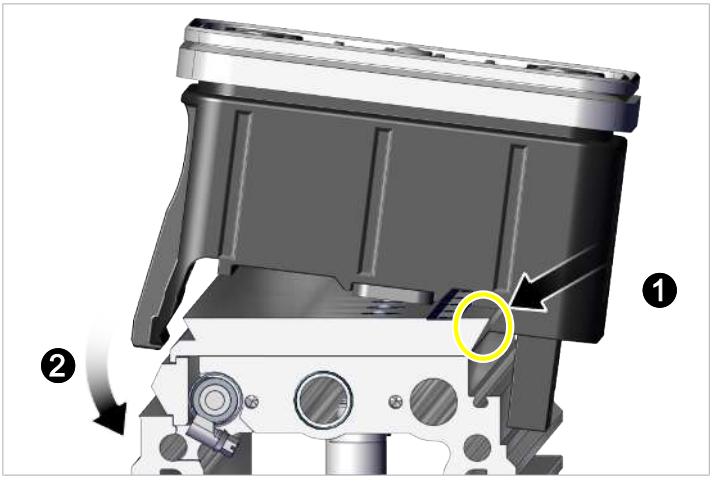
- Personal protective clothing must be worn.

By deactivating the vacuum and thus reducing the vacuum to atmospheric pressure, the workpiece is released, but the fixing for the vacuum block in the base is maintained.

7.2.4 Attaching Vacuum Block VCBL-S6

The illustrations shown below may deviate from the customer's version because they serve as examples of different versions of the product.

- Place the vacuum block (as shown) at an angle to the vacuum clamping console ❶.
  Ensure that the guide strip engages underneath the bevel of the vacuum clamping console.
  Lower the vacuum block onto the vacuum clamping console ❷.



The vacuum block VCBL-S6 is initially held on the vacuum clamping console by a low clamping force.

The vacuum block is not secured. It can be positioned by sliding it on the vacuum clamping console. The vacuum block is only secured when the compressed air circuit of the vacuum clamping console is activated.

When the operating vacuum is supplied, the workpiece is clamped. When the operating vacuum is switched off, the workpiece is released.

Using the Vacuum Blocks

1. After placing the vacuum block on the vacuum clamping console, it must be moved to the specified position on the vacuum clamping console (depending on the workpiece).
2. Via the release from the machine, the vacuum blocks are fixed (activation of the compressed air circuit of the vacuum clamping console) and the stop cylinders move into the stop positions.
3. Place the workpiece on top and place it against the stops.
   ⇨ The vacuum blocks are equipped with a touch valve. When the workpiece is in contact, the vacuum channel is opened.
4. Activate the vacuum using the machine controller. The workpiece is clamped.
5. Retract the stops.
6. Before starting the machining process, visually and manually check that the vacuum block(s) and workpiece are securely fastened.

⇨ The setup process is complete and machining of the workpiece can begin.

Releasing the Workpiece

⚠ CAUTION

Falling objects resulting from the workpiece being released (deactivation of the vacuum)

Risk of injury

- Personal protective clothing must be worn.

By deactivating the vacuum and thus reducing the vacuum to atmospheric pressure, the workpiece is released and the fixing for the vacuum block on the vacuum clamping console is also released.
The pre-fixing (mechanical clamp) remains intact.

8 Specifications for Use

⚠ CAUTION

During machining, dust is released into the environment and can enter the respiratory tract.

Danger to health

- Use suction equipment or cover the machining area to ensure that no dust is released into the environment.
- If necessary, wear a breathing mask in accordance with class FFP1 or higher.

1. Monitor the vacuum value that is reached as close as possible to the vacuum block (e.g. with a gauge).
2. Ensure that the operating vacuum is ≥ 600 mbar before machining the workpiece.
3. Check the sealing for wear and replace if necessary.
4. Before each machining process, clean chips and dust from the machining table and vacuum block to achieve the required accuracy and friction as well as to prevent leakage.

9 Machining Limitations

⚠ WARNING

The workpiece comes loose during machining and is flung away by the machine.

Risk of injury from flying parts.

- Ascertain the maximum machining parameters and observe them.

The holding force is limited, meaning that it can withstand machining forces only up to a certain point.

Accordingly, the operator of the vacuum block is obligated to establish for themselves (through testing, slowly and carefully increasing the machining forces) the optimal settings and number of vacuum blocks required to clamp the workpiece to ensure that the workpiece does not slip or even come loose during the machining process.

This procedure should be performed in particular for new workpieces that have never been machined before or for uncertain cases with regard to the holding force.

Schmalz assumes no liability for damages resulting from slippage or release of workpieces due to faulty adjustment of machining parameters.

10 Troubleshooting

Malfunction	Cause	Troubleshooting
No vacuum on the clamping equipment or vacuum is too low	Vacuum generator does not start	▸ Switching on the vacuum generator
	Vacuum for clamping system not released	▸ Release “Clamp workpiece” vacuum for clamping device
	Leakage	1. Check the clamping device for leakage. 2. Ensure that the clamping equipment is complete (sealing) 3. Remove dirt
	Closed vacuum system	▸ Remove dirt

11 Maintenance and Cleaning

11.1 Cleaning the Vacuum Blocks

⚠ CAUTION

Use of Cleaners Containing Solvents

Damage to the product (seals, insulation, coatings and other surfaces may be damaged by cleaners that contain solvents) and potentially damage to health

- Use a chemically and biologically neutral cleaning agent.
- Use cleaning agent that is rated as non-harmful to health.
- The use of the following cleaning agents is strictly prohibited:
  — Acetone
  — white spirit
  — cellulose thinner/turpentine oil (solvents)

NOTE

Incorrectly cleaning the product and its components

Damage to the product or individual components due to aggressive cleaning agents or excessive temperatures!

- For cleaning, use only cleaning agents that do not corrode or damage the materials used.
- Do not use sharp-edged objects (wire brushes, sandpaper, etc.).
- Do not exceed the specified max. temperature during cleaning.

Clean and check the suction cup/sealing ring at least once a week:

1. Use a soft cloth and soapy solution at 60° C or below to remove any external debris from the product, such as glue, adhesive, chips and dust.
2. Allow cleaned surfaces to dry at room temperature.
3. Check the cleaned sealing surfaces or sealing elements for damage such as cracks, holes, undulations and inhomogeneity of the sealing surface.
4. Replace damaged or worn suction plates/sealing immediately.

11.2 Replacing the Suction Plate and Touch Valve

The illustrations shown below may deviate from the customer's version because they serve as examples of different versions of the product.

NOTE

Sharp objects cause damage to rubber components.

Damage and malfunction

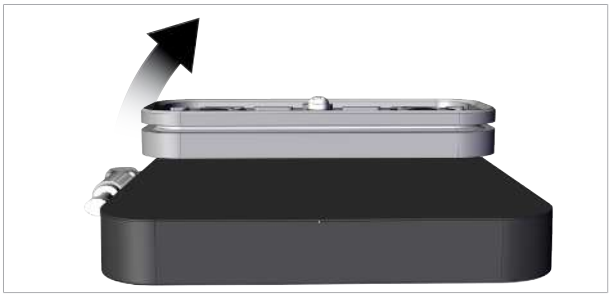
- Do not use sharp objects (e.g. screwdriver, etc.) to mount or disassemble rubber components.

The suction plate and touch valve become more or less worn depending on their application and are thus considered wearing parts.

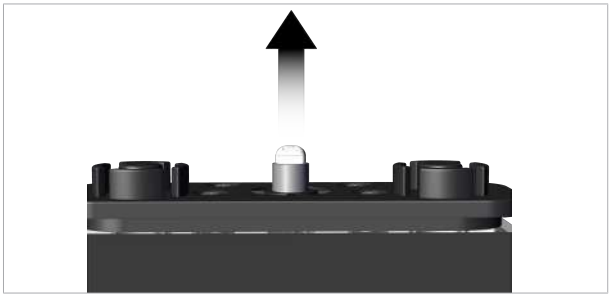
The following section describes how to replace these parts.

Removing the suction plate from the touch valve if necessary:

1. Pull a corner of the suction plate over the edge of the black suction cup connection plate and completely remove it.

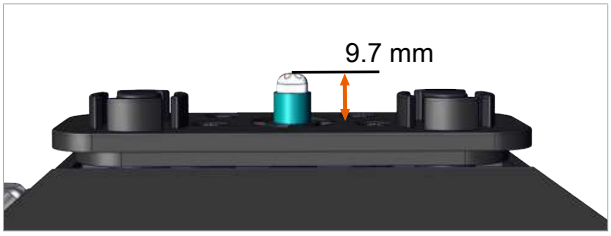


2. If the touch valve needs to be replaced, pull it out of the mounting hole with a gripper.



Mounting of the new touch valve (except for membrane variant):

- Place the new touch valve onto the hole provided in the suction cup connection plate and press it in.
  - ⇨ The touch valve must be approx. 9.7 mm above the suction cup connection plate.



Mounting of the new touch valve for membrane variant

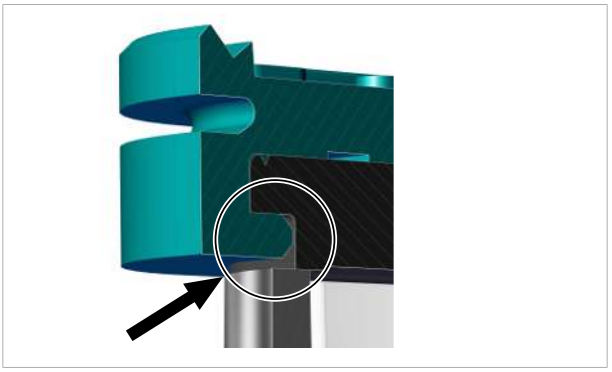
- Place the new touch valve onto the designated hole in the suction connection plate and press it in until it stops or blocks.

Mounting the suction plate

1. In the area of the groove shown, wet the suction plate all around with soapy water to help to join the components.

2. Place the new suction plate over the touch valve or lifting system.

3. Pull the suction plate edge by edge over the suction connection plate.
   The suction plate must be underneath the suction cup connection plate at all points.



4. Press the suction plate in the areas of the pads.

12 Spare and Wearing Parts

Maintenance work may only be carried out by qualified personnel.

The spare and wear parts for the product are listed on the homepage http://schmalz.com.

13 Disposing of the product

- Sort and dispose of all components according to the country-specific regulations.

For proper disposal, please contact a company specializing in the disposal of technical goods and instruct the company to observe the applicable disposal and environmental regulations. Schmalz is happy to assist you in finding a suitable company.