Operating instructions

Vacuum block VCBL-R/N

WWW.SCHMALZ.COM

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Translation of the original operating instructions

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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1 Important Information

1.1 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 aimed at:

- 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

1.2 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

1.3 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 VCBL-R is used for clamping workpieces on processing machines and is placed on the machine tables with specially designed grids and/or nesting.

For grid table applications, a 30x30 or 40x40 mm grid, a groove depth of 6 to 7.2 mm and a groove width of ≥6 mm are required for the suction cups. This makes the vacuum block design suitable for grid tables from the manufacturers HOMAG, SCM and Biesse.

In addition, the VCBL-R can be converted into a suction cup by mounting a friction clip, which can be used on a nesting table. This friction clip can be attached or removed as required in order to equip the respective machine table variants.

For nesting applications, it is generally recommended to use an additional vacuum connection (a customer-supplied mounting is available on the vacuum block). Otherwise, the vacuum value is highly dependent on the system machine, MDF sheet and vacuum pump. A direct vacuum supply increases the vacuum value and enables a safe clamping process.

Use on a flat table is possible only by using an external vacuum (> See ch. 4.2 Installing the Connection for the External Vacuum, p. 10).

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

2.3 Personnel Qualifications

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

1. Task only qualified personnel to perform the tasks described in these Operating instructions.
2. The product must be operated only by persons who have undergone appropriate training.

These Operating instructions are intended for fitters who are trained in handling the product and who can operate and install it.

2.4 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.

2.5 Residual Risks

⚠ CAUTION

Noise pollution from leakage

Hearing damage

- Correct position.
- Wear ear protectors.

⚠ CAUTION

Falling product

Risk of injury

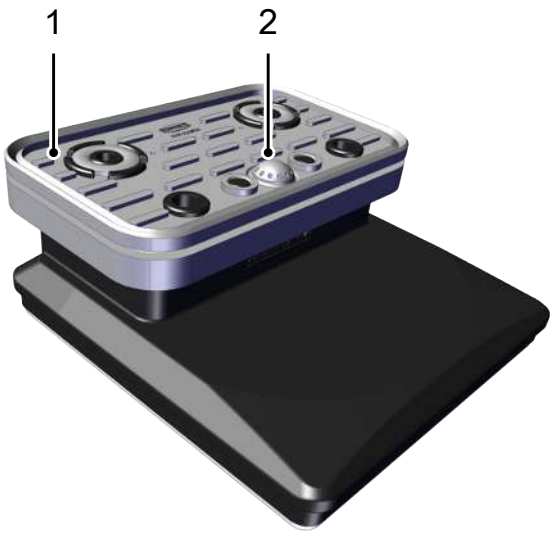
- Fasten or store the product securely at the location of use.
- Wear protective work shoes (S1).

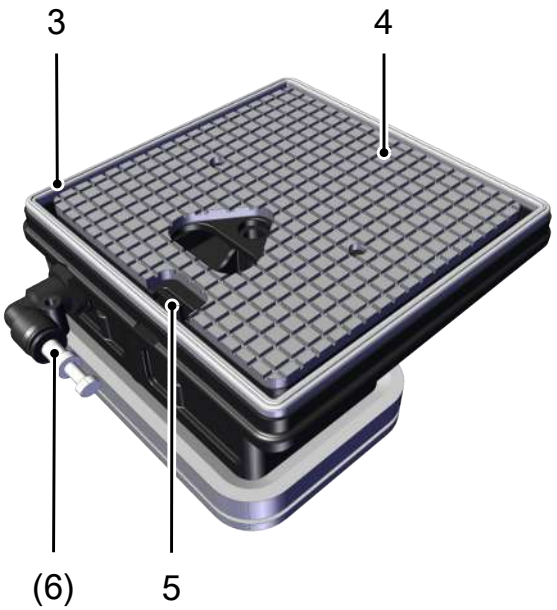
2.6 Modifications to the Product

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 Design of the Vacuum Block





1	Suction plate	4	Friction clip (for nesting application)
2	Touch valve	5	Friction clip latch
3	Sealing frame	(6)	Vacuum connection (retrofittable)

4 One Vacuum Block for Various Applications

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

Following a short, tool-less setup process, the vacuum block can be used for two applications:

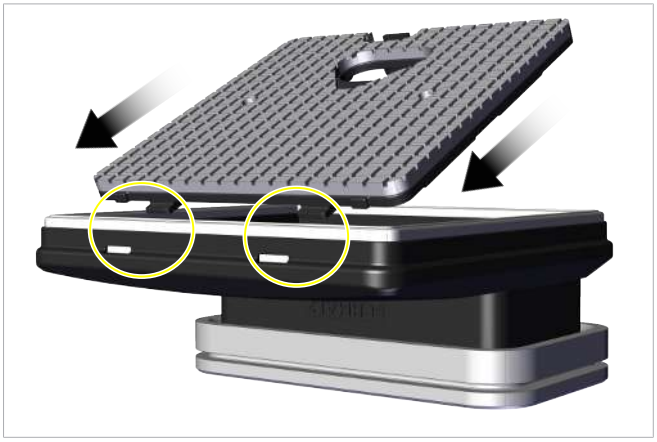
- Without a friction clip, for use on a grid table
- With a fitted friction clip, for use on a nesting table

When used in a nesting application, Schmalz recommends retrofitting the vacuum connection for the external vacuum supply.

4.1 Using the Vacuum Block on a Nesting Table

Installing the friction clip

1. Insert the friction clip into the housing in the correct position on the side with the two recesses.

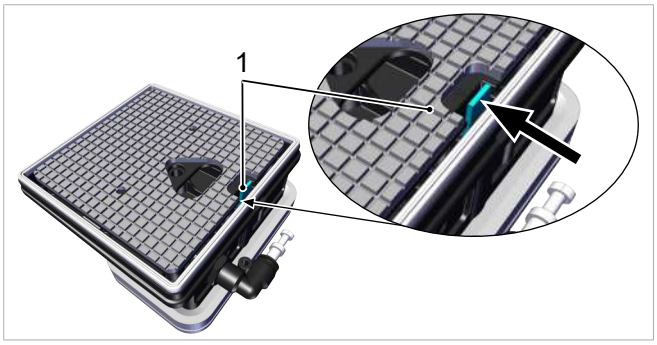


2. On the latch side, push the friction clip toward the housing until the latch audibly clicks into the recess on the housing.

⇨ The friction clip is installed.

Removing the friction clip

1. Push in the friction clip latch (1).



2. Remove the friction clip.

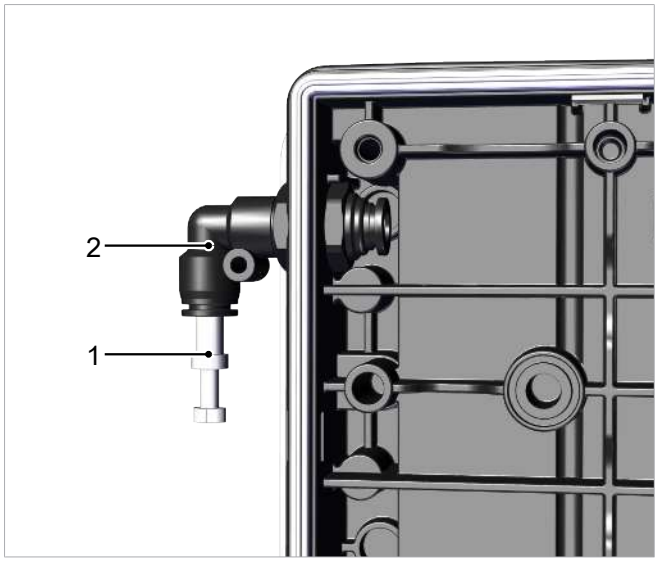
4.2 Installing the Connection for the External Vacuum

When using the vacuum block on a nesting table, we recommend connecting an external vacuum supply to increase the holding force.

1. Remove the friction clip (> See ch. 4.1 Using the Vacuum Block on a Nesting Table, p. 9).

2. Drill through the housing at the designated point using a drill (Ø14.5 mm) (use the recess to center the drill) and deburr the hole.

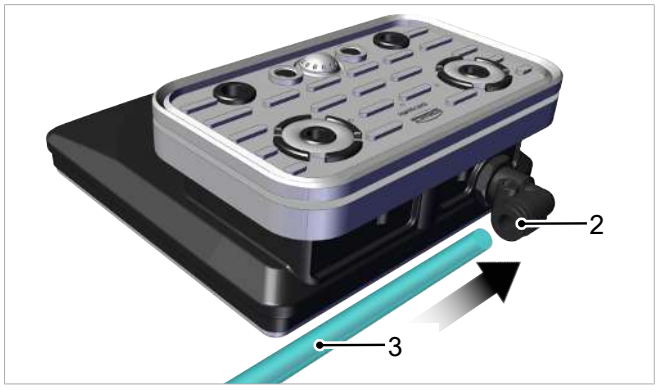
3. Install the hose connection (2) (shown here with plug (1)) as shown in the figure.



4. Install the friction clip (> See ch. 4.1 Using the Vacuum Block on a Nesting Table, p. 9).

5. To install a vacuum hose, remove the plug (1) from the hose connection (2).

6. Insert the vacuum hose (3) with an outside diameter of 6 mm to the hose connection (2) as far as it will go.

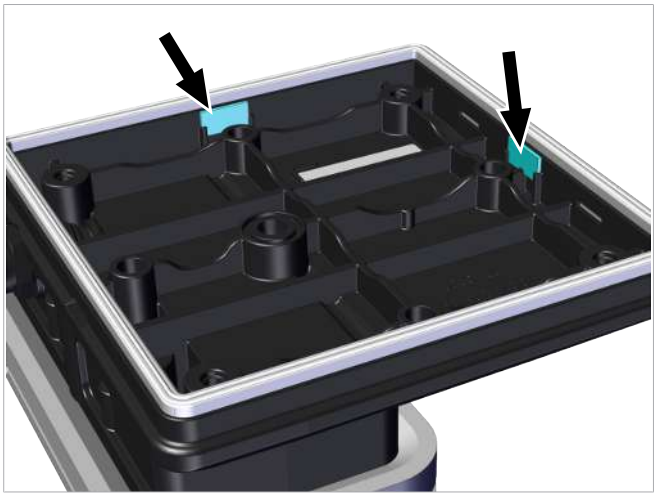


5 Adapting the Vacuum Block to a Wide Grid Table Slot

When used on a grid table, the vacuum block is designed for slot widths of ≥6 mm.

When using a wide slot (≥7 mm), the positioning accuracy and seat of the vacuum block in the slot can be improved using two inserts.

✓ The appropriate inserts are available under part no. 10.01.12.05574 (> See ch. 15 Spare and wearing parts, p. 25).



▸ To adapt it to a wide slot, insert the two inserts into the prepared positions.

6 Vacuum Block Variant with Lifting System

The lifting system (AS) makes it easier to position the workpiece accurately.

Function:

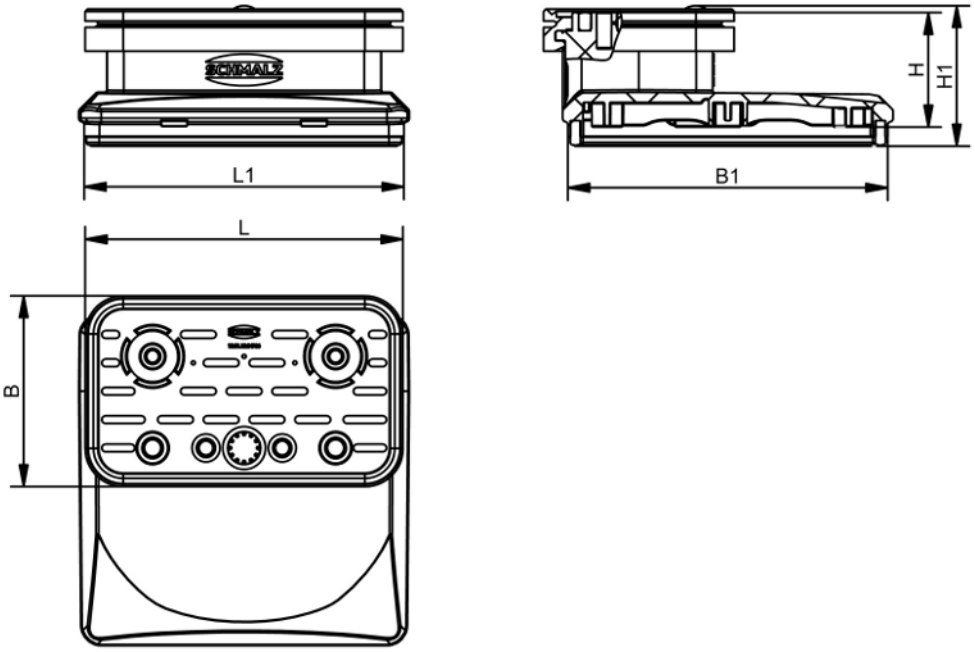
The lifting system protrudes over the vacuum block seal. If the workpiece is on the lifting system, it is easy to move to the position specified for machining.

When the vacuum is activated, the lifting system is moved downward so that the workpiece is deposited on the vacuum block. As a result, the seal lies flat against the workpiece and the touch valve is actuated.

7 Technical Data

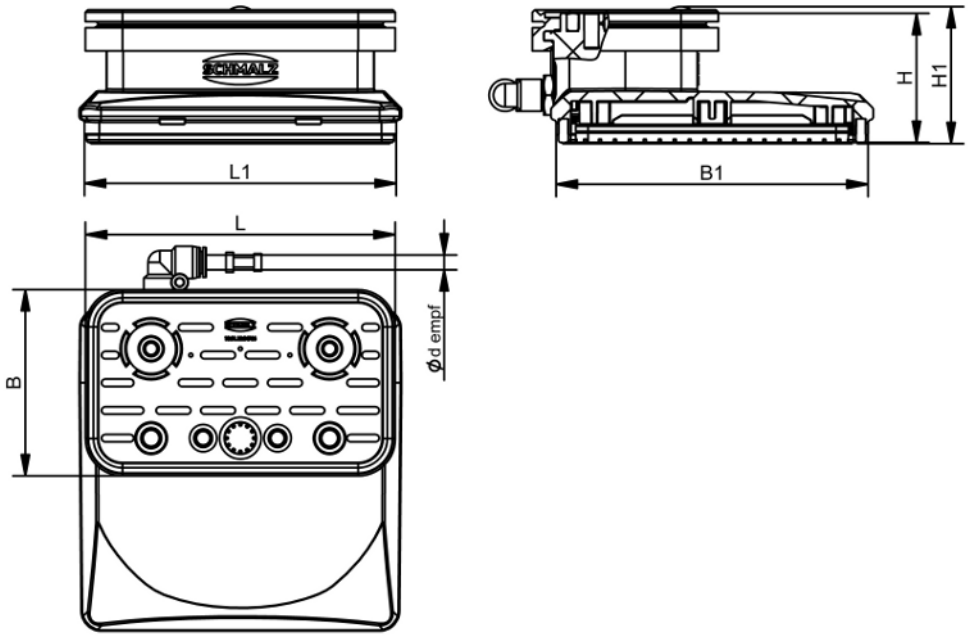
7.1 Dimensions

"Grid" variant



Part no. 10.01.12	L	L1	B	B1	H	H1
0.05430	145	130	145	130	45	53.7
0.05431	145	130	145	130	45	56.5
0.05432	145	130	145	130	25	34
0.05433	125	137	75	141	25	34.2
0.05434	120	137	50	141	25	34
0.05435	130	137	30	141.4	25	34.5
0.05436	125	130	75	130	45	53.7
0.05437	120	130	50	137.5	45	53.7
0.05438	130	130	30	137.7	45	55.3
0.05440	125	130	75	137.5	90	98.75
0.05441	120	130	50	137.5	90	98.7
0.05442	130	130	30	137.5	90	100.3
0.05469	145	130	145	130	90	98.7
0.05470	145	130	145	130	90	98.7
0.05444	145	130	145	130	125	133.7
0.05446	125	130	75	137.5	125	133.9
0.05448	120	130	50	137.5	125	135.9
0.05449	130	130	30	137.8	125	135
0.05451	145	130	145	130	125	136.5

"Nesting" variant



Part no. 10.01.12	L	L1	B	d empf. (rec.)	B1	H	H1
0.05590	145	130	145	4	130	32	33.7
0.05591	125		75			32	33.7
0.05592	120		50			32	33.7
0.05593	130		30			32	33.7
0.05553	145		145			52	55.15
0.05554	145		145			52	55.15
0.05555	125		75			52	55.15
0.05556	120		50			52	55.15
0.05557	130		30			52	55.15
0.05558	125		75			97	99.6
0.05559	120		50			97	99.6
0.05560	130		30			97	99.6
0.05561	145		145			97	99.6
0.05562	145		145			97	99.6
0.05563	145		145			132	135.15
0.05564	125		75			132	135.15
0.05565	120		50			132	135.15
0.05566	130		30			132	135.15
0.05567	145		145			132	135.15

7.2 Weight

Part no. 10.01.12	Description	Weight
0.05590	VCBL-N 145x145x32 30/40 TV	490 g
0.05591	VCBL-N 125x75x32 30/40 TV	475 g
0.05592	VCBL-N 120x50x32 30/40 TV	430 g
0.05593	VCBL-N 130x30x32 30/40 TV	445 g
0.05553	VCBL-N 145x145x52 30/40 TV	640 g
0.05554	VCBL-N 145x145x52 30/40 AS+TV	710 g
0.05555	VCBL-N 125x75x52 30/40 TV	480 g
0.05556	VCBL-N 120x50x52 30/40 TV	435 g
0.05557	VCBL-N 130x30x52 30/40 TV	450 g
0.05558	VCBL-N 125x75x97 30/40 TV	710 g
0.05559	VCBL-N 120x50x97 30/40 TV	640 g
0.05560	VCBL-N 130x30x97 30/40 TV	610 g
0.05561	VCBL-N 145x145x97 30/40 TV	890 g
0.05562	VCBL-N 145x145x97 30/40 AS+TV	960 g
0.05563	VCBL-N 145x145x132 30/40 TV	1,840 g
0.05564	VCBL-N 125x75x132 30/40 TV	1,680 g
0.05565	VCBL-N 120x50x132 30/40 TV	1,635 g
0.05566	VCBL-N 130x30x132 30/40 TV	1,650 g
0.05567	VCBL-N 145x145x132 30/40 AS+TV	1,910 g
0.05430	VCBL-R 145x145x45 30/40 TV	530 g
0.05431	VCBL-R 145x145x45 30/40 AS+TV	600 g
0.05432	VCBL-R 145x145x25 30/40 TV	380 g
0.05433	VCBL-R 125x75x25 30/40 TV	365 g
0.05434	VCBL-R 120x50x25 30/40 TV	320 g
0.05435	VCBL-R 130x30x25 30/40 TV	335 g
0.05436	VCBL-R 125x75x45 30/40 TV	370 g
0.05437	VCBL-R 120x50x45 30/40 TV	325 g
0.05438	VCBL-R 130x30x45 30/40 TV	340 g
0.05440	VCBL-R 125x75x90 30/40 TV	600 g
0.05441	VCBL-R 120x50x90 30/40 TV	530 g
0.05442	VCBL-R 130x30x90 30/40 TV	500 g
0.05469	VCBL-R 145x145x90 30/40 TV	780 g
0.05470	VCBL-R 145x145x90 30/40 AS+TV	850 g
0.05444	VCBL-R 145x145x125 30/40 TV	1,730 g
0.05446	VCBL-R 125x75x125 30/40 TV	1,570 g
0.05448	VCBL-R 120x50x125 30/40 TV	1,525 g
0.05449	VCBL-R 130x30x125 30/40 TV	1,540 g
0.05451	VCBL-R 145x145x125 30/40 AS+TV	1,800 g

7.3 General Parameters

Permissible ambient temperature	5 to 45 °C

8 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.

9 Installation

9.1 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.

9.2 Placing the Vacuum Block on the Machining Table

⚠ WARNING

The holding force is reduced by the presence of dirt or moisture, resulting in the workpiece being released.

Risk of injury from flying parts.

- Remove all dirt and moisture from the and the suction cup mounting before attaching the clamp.
- Use suction equipment during the work process.

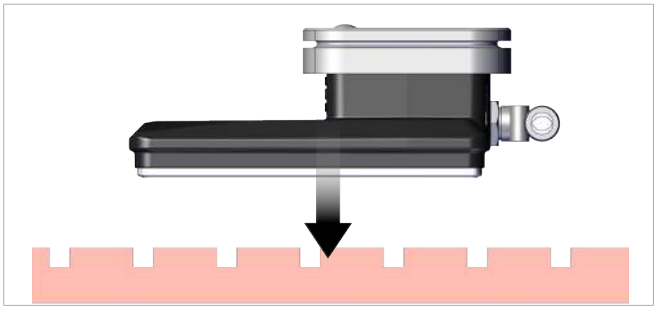
Grid table application

✓ 30x30 or 40x40 grid. Groove width ≥6 mm and groove depth 6 to 7.2 mm.

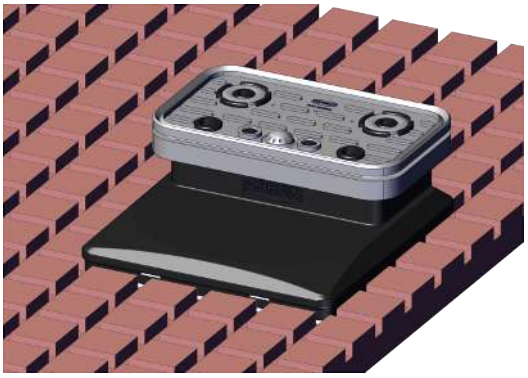
✓ The friction clip has been removed (> See ch. 4.1 Using the Vacuum Block on a Nesting Table, p. 9).

1. With a groove width ≥7 mm, fit the two inserts for greater positioning accuracy (> See ch. 5 Adapting the Vacuum Block to a Wide Grid Table Slot, p. 12).

2. Place the vacuum block on the grid table. Make sure that there is an opened vacuum feed in the grid table within the sealing frame.



3. Check the position.



⇨ The sealing frame is on the bottom of the grid groove and seals off the vacuum area.

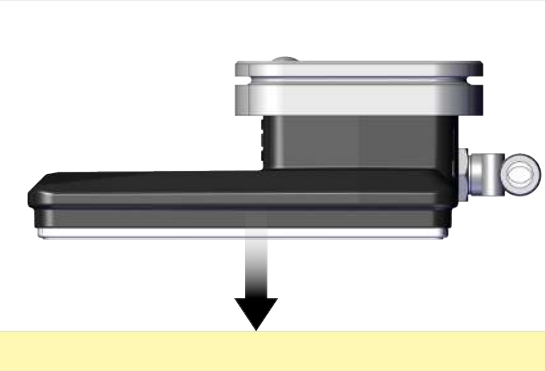
⇨ The vacuum block is in full contact with the machining table.

Nesting table application

✓ The friction clip is installed (> See ch. 4.1 Using the Vacuum Block on a Nesting Table, p. 9).

✓ Schmalz recommends the connection of an external vacuum supply to ensure the highest possible holding force (> See ch. 4.2 Installing the Connection for the External Vacuum, p. 10).

1. Place the vacuum block on the nesting table.



2. Recommendation: connect the external vacuum supply.
3. Check the position.

⇨ The vacuum block is in full contact with the machining table.

10 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. Before each machining process, clean chips and dust from the machining table and vacuum block to achieve the required accuracy and adhesion as well as to prevent leakage.
4. Check the seals for wear and replace if necessary.

11 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 (by experiment, slowly and carefully increasing the machining forces) the optimal settings and number of vacuum blocks necessary 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.

12 Using the Vacuum Blocks

✓ 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.
   ⇨ The vacuum blocks are equipped with a touch valve. When the workpiece is applied, the vacuum channel is opened.
3. Activate the vacuum using the machine control unit.
   ⇨ The lifting system is lowered (variant AS only) and the workpiece is tensioned.
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.

13 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

14 Cleaning the Vacuum Blocks

1. For cleaning, do not use aggressive cleaning agents such as industrial alcohol, white spirit or thinners.
2. Remove dirt on the exterior of the device with a soft cloth and soap suds.

15 Spare and wearing parts

Part no.	Type	Description	Type
10.01.12.05422	Sealing frame	VCDR 124x124x10 VCBL-R	Wearing part
10.01.12.02514	Touch valve (with plastic spring plunger)	TV D9 4.3	Spare part
10.01.12.04445	Top suction plate	VCSP-O 145x145x16.5	Wearing part
10.01.12.05471	Top suction plate	VCSP-O 145x145x16.5, VCBL-R suction plate for AS	Wearing part
10.01.12.04766	Top suction plate	VCSP-O 125x75x16.5	Wearing part
10.01.01.01341	Top suction plate	VCSP-O 120x50x15.5 TPE	Wearing part
10.01.12.01643	Top suction plate	VCSP-O 130x30x15 PA	Wearing part
10.01.12.01543	Suction plate 130x30+TV for VCBL-B / -S	ERS VCSP	Spare part set
10.01.12.05574	Cut plate (straight)	ZU-BLEC 13.5x7x1 A-G	Spare part
10.08.06.00064	Sealing screw with collar and sealing ring	VRS-SB M5-AG ISKT	Spare part

16 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.

At Your Service Worldwide

Vacuum automation

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Handling systems

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