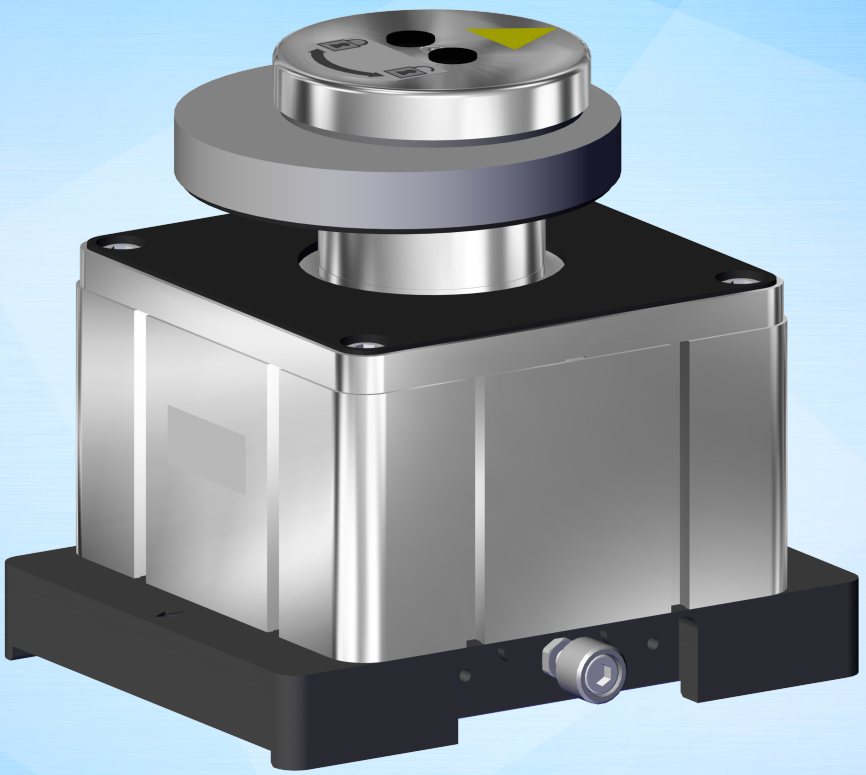

Operating Instructions

Mechanical Clamp VCMC AP/R

WWW.SCHMALZ.COM

EN-US · 30.30.01.01947 · 02 · 08/22

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 these Operating instructions.

These Operating instructions contain 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 Operating instructions describe the product at the time of delivery by Schmalz.

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 life-threatening 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 Warnings in This Document

Warnings warn against hazards that may occur when handling the product. This document contains three levels of danger that you can recognize by the signal word.

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.

1.4 Symbol

This symbol indicates useful and important information.

✓ This symbol represents a prerequisite that must be met prior to an operational step.

▸ 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 Mechanical clamp (VCMC) is built in accordance with the latest standards of technology and is shipped in safe condition. However, hazards can arise during use.

The purpose of the mechanical clamp is to clamp workpieces to CNC wood working machines when a clamping console AP is used (applies to VCMC-AP; a grid plate is needed for VCMC-R). The mechanical clamp is aligned on the slide and secured against horizontal slipping using pins (applies to VCMC-AP; for VCMC-R, the clamp is aligned and secured against horizontal slipping using inserts). Switching on the first vacuum circuit fixes the mechanical clamp to the slide. When the second vacuum circuit is switched on, the workpiece is clamped down via a vertical movement made by the clamping disc (applies to VCMC-AP; for VCMC-R, the clamping fixing and the workpiece clamping are performed using a vacuum channel).

The VCMC is used for clamping dry, rigid workpieces. It may be used only in combination with suitable grid tables (version R) and clamping consoles (version AP). The VCMC is to be installed by the customer.

The mechanical clamp may be operated only under compliance with the valid safety provisions and safety features.

Switching on the operating vacuum fixes the VCMC to the grid table or to the AP mount. The workpiece is then clamped via a vertical stroke performed by the clamping disc. The version AP is equipped with two separate vacuum circuits: one is for pre-fixing the VCMC to the mount, and another is for clamping the workpiece.

When the second vacuum circuit is turned off, the workpiece (clamping disc moves upwards vertically) and the mechanical clamp (when the first vacuum circuit is turned off) are released from the slide (applies to VCMC-AP; for VCMC-R, the clamp and the workpiece are released simultaneously when the operating vacuum is switched off).

To guarantee safe operation of the VCMC, ensure the following:

- During installation, the clearance between the workpiece surface and the clamping disc must be no more than 6 mm. Caution: crushing hazard!
- Do not allow anyone to reach between the workpiece and the clamping disc during the lowering process.

When the operating vacuum is switched off and the vacuum circuits are vented, the clamping pressure on the workpiece is released, and the VCMC is released from the mount or the grid table (for AP, the workpiece and the VCMC are released in two separate steps).

The product is intended for use in the areas of industry, trade, and handcraft.

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 as intended. In particular, the following are considered non-intended use:

- Use in potentially explosive atmospheres
- Use in medical applications

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 Emissions

The Mechanical clamp emits noise as a result of operating with vacuum.

⚠ CAUTION

Noise pollution from leakage

Hearing damage

- Correct position.
- Wear ear protectors.

2.5 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 Description of Mechanical Clamp VCMC

3.1.1 Use

The VCMC is used for clamping dry, rigid workpieces. It may be used only in combination with suitable clamping consoles or a grid table (cannot be used universally). The clamping force and stroke are powered by evacuation of the VCMC. Since the contact surface of the VCMC and the vacuum block are at the same height, you can clamp a workpiece in mixed operation as well.

3.1.2 The Adjustment Mechanism

The VCMC is equipped with a quick-adjustment mechanism. It allows adjusting the clamping range in steps of 5 mm to conform to the workpiece.

3.1.3 Clamping the Workpiece

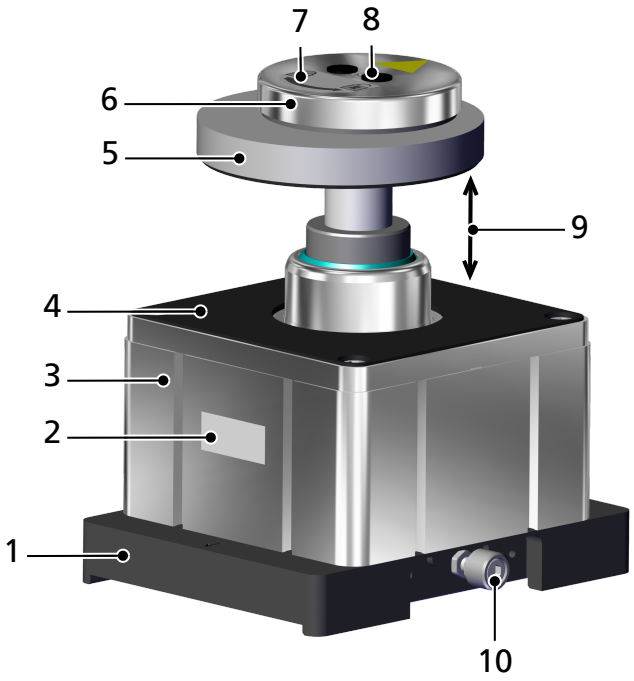
The clamping process takes place when the vacuum is activated (evacuation of the vacuum circuit of the clamping console or the grid table section) via the higher-level machine.

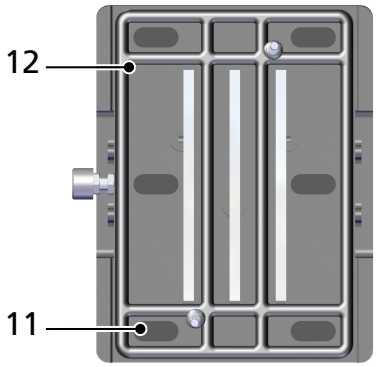
As a result, the following happens:

- The VCMC on the mount (version AP) or on the grid table (version R) is clamped, and
- The lifting cylinder is activated and clamps the workpiece.

3.2 Design of Mechanical Clamp VCMC

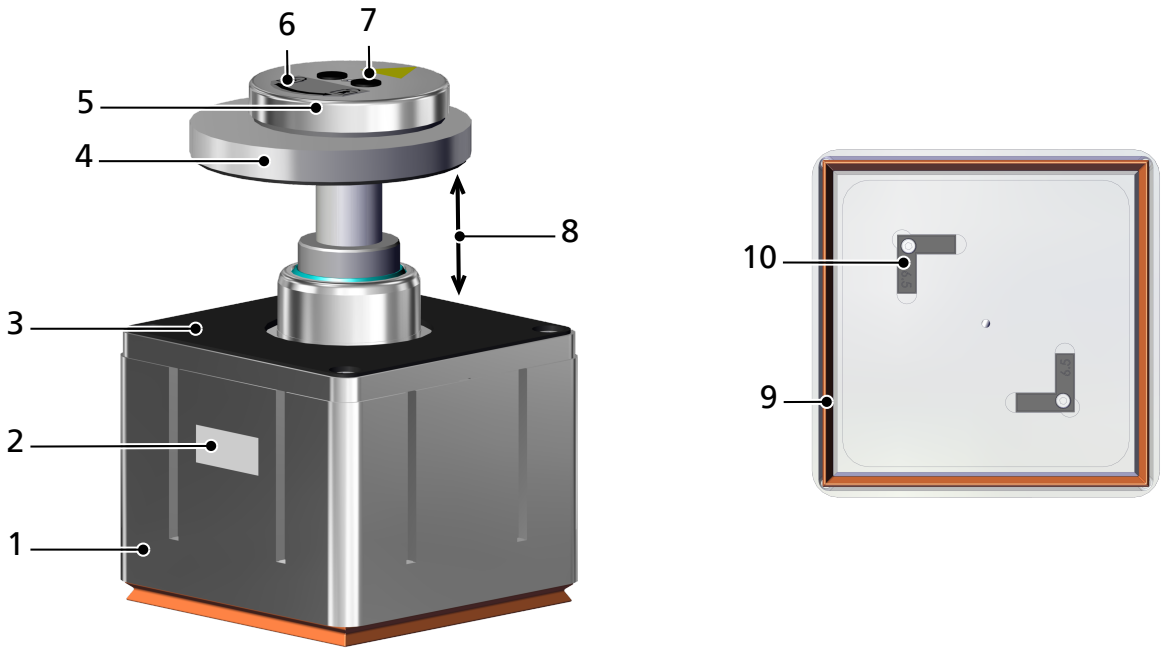
3.2.1 Design of the Version AP





1	Supporting plate	2	Type plate
3	Housing	4	Clamping surface
5	Clamping disc	6	Locking disk
7	Turning direction label	8	Plugs (2x)
9	Clamping range	10	Stop
11	Friction disc (6x)	12	Sealing frame

3.2.2 Design of the Version R



1	Housing	2	Type plate
3	Clamping surface	4	Clamping disc
5	Locking disk	6	Turning direction label
7	Plugs (2x)	8	Clamping range
9	Sealing frame	10	Positioning insert

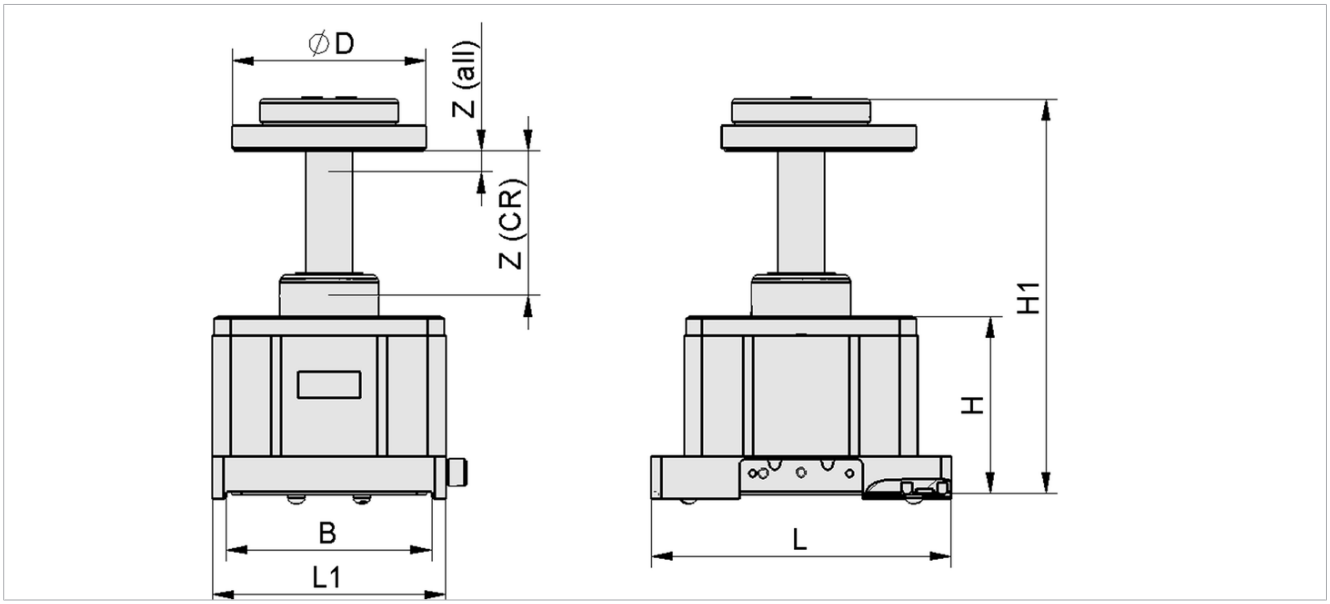
4 Technical Data

4.1 General Parameters

Parameter	Unit	Part no. 10.01.12.03947 (AP)	Part no. 10.01.12.04250 (R)
Mass	kg	5.04	4.66
Stroke length Z (all)	mm	10	
Detent spacing	mm	5	
Clamping range Z	mm	10–100	
Minimum operating vacuum	bar	0.6	
Clamping force at 0.6 bar operating vacuum	N	600	
Interface		AP console	Grid table

4.2 Dimensions

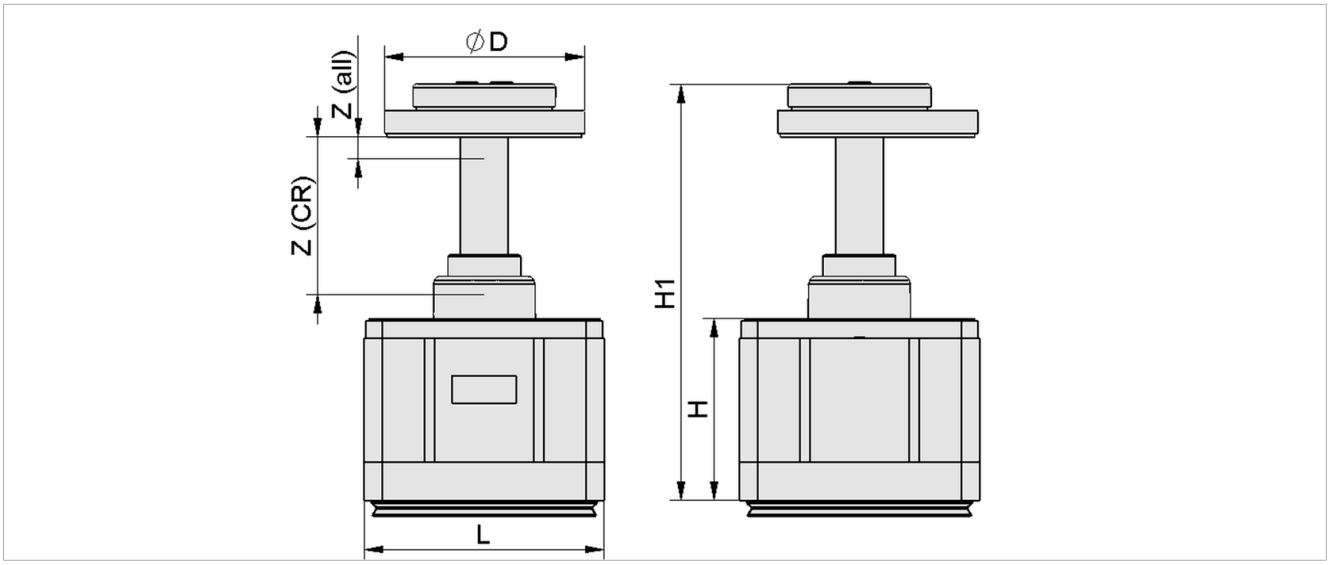
4.2.1 Version AP Dimensions



ØD	H	Z (CR)	Z (all)	B	L	L1	H1
110	100	90	10	116.5	170	132	233

All dimensions given in millimeters [mm].

4.2.2 Version R Dimensions



ØD	H	Z (CR)	Z (all)	L	H1
110	100	90	10	132	233

All dimensions given in millimeters [mm].

5 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.

6 Installation

6.1 Installation Instructions

The VCMC version AP is designed for use on special mounts with positive elements and solenoid valves on the mount interface. Version R is designed for grid tables with a grid of 30x30 mm.

For safe installation, the following instructions must be observed:

1. Use only the connections and attachment materials that have been provided.
2. Mounting and removal may be performed only when the device is unpressurized and disconnected from the mains.

6.2 Attaching the Mechanical Clamp to the Console

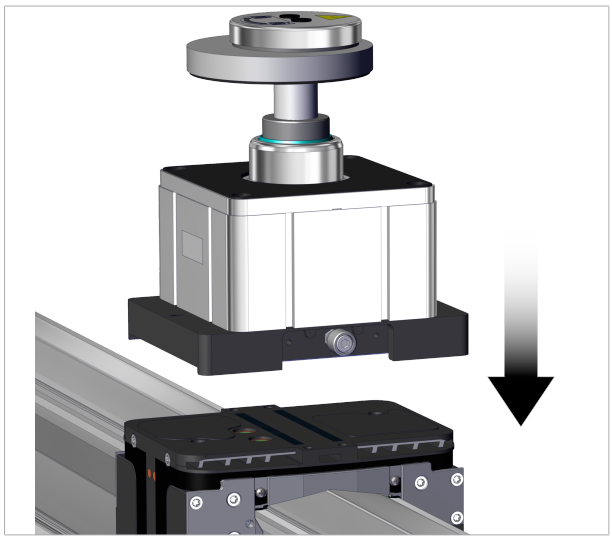
⚠ WARNING

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 mechanical clamp and the clamping surface before attaching the clamp.
- Use suction equipment during the work process.

6.2.1 Design of VCMC AP



- Place the VCMC AP on the slide mount of the vacuum console.

⇨ The VCMC should be in full contact with the slide mount and is fitted over the side edges.

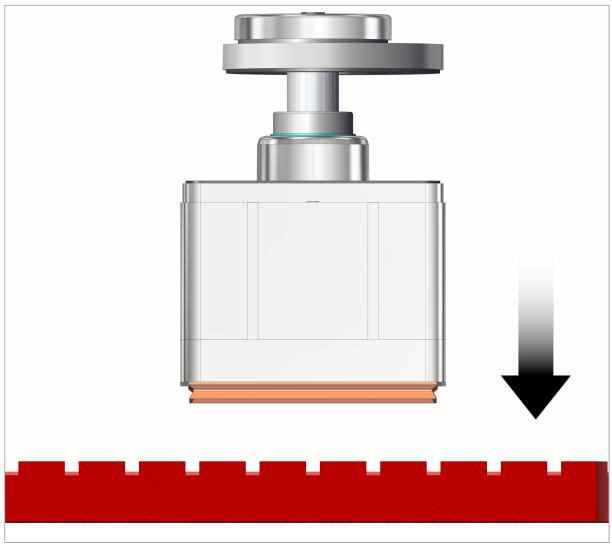
⇨ The VCMC is positively connected to the slide mount with two bolts that are integrated into the supporting plate.

⇨ The solenoid valve integrated into the slide mount (for the vacuum supply) is opened by the VCMC.

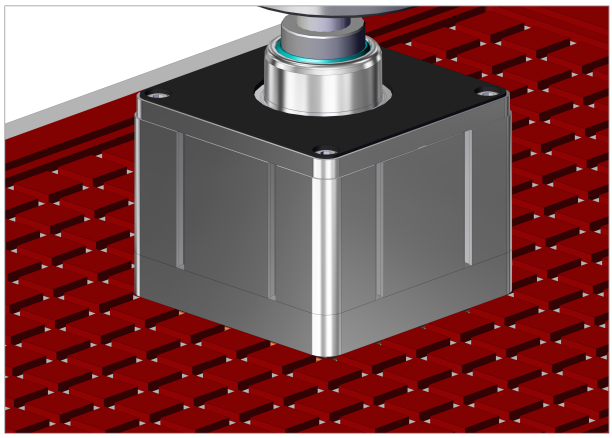
Only once the vacuum channel of the console, and thus the area between the VCMC and the slide mount, is evacuated is the force to clamp the VCMC in place produced.

6.2.2 Design of VCMC R

1. Place the mechanical clamp on the grid table. Make sure that there is a vacuum opening in the grid table within the sealing frame.



2. Check the position.



⇨ The positioning inserts lock positively into the slots.
⇨ The VCMC is in full contact with the table.
⇨ The sealing is on the bottom of the holding slot and seals off the vacuum area.

6.3 Setting the Clamping Height

⚠ CAUTION

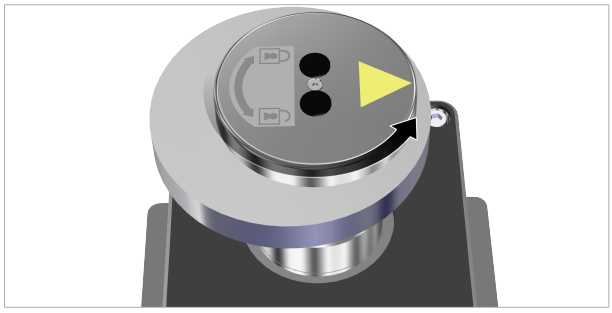
When the clamping disc is lowered, body parts may be present in the clamping range

Crushing of body parts

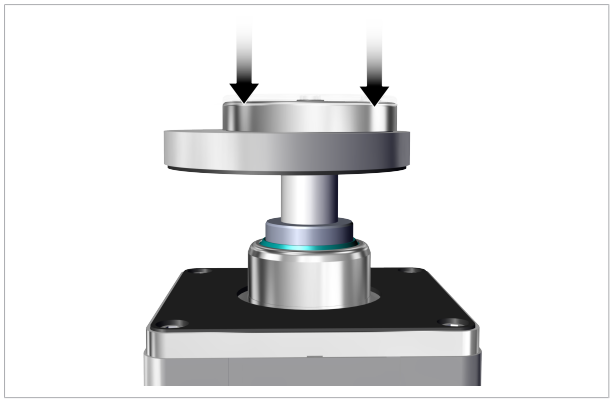
- Ensure that the clamping height is set so that the distance between the clamping disc and the workpiece is less than or equal to 6 mm.
- Do not reach into the clamping range while the clamping disc is being vacuum-lowered.

Adjust the VCMC to obtain the necessary clamping height:

1. **Opening the quick adjustment mechanism:** Turn the locking disc counterclockwise until the quick adjustment mechanism is completely opened.

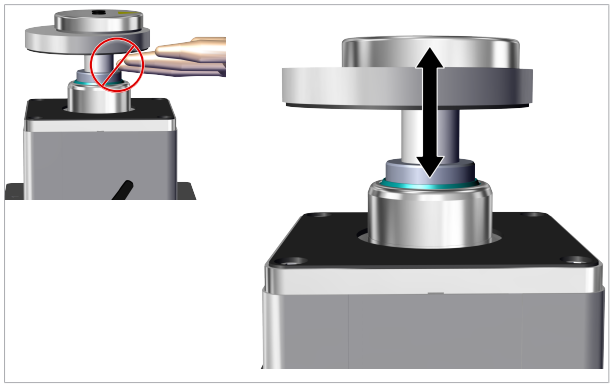


2. **Releasing the catch of the quick adjustment mechanism:** Clasp the clamping disc with both hands and press and hold the locking disc down by about 4 mm.



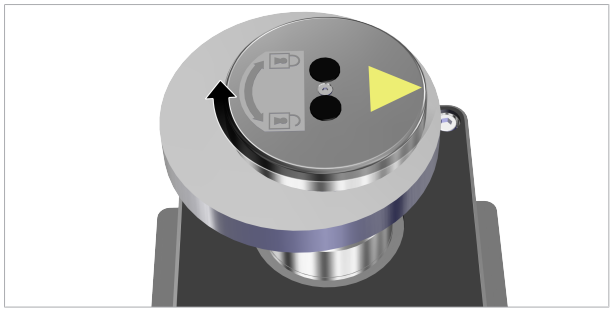
   ⇨ This releases the quick-locking mechanism.

3. **CAUTION! When the clamping disc is adjusted downward, there is the risk of crushing fingertips in the area shown.**
   Adjust the clamping height as necessary and then release the locking disc. Ensure that the distance between the clamping disc and the workpiece is less than or equal to 6 mm.
   The adjustments can be made in steps of 5 mm.



   ⇨ The clamping disc is adjusted to the necessary clamping height.
   ⇨ The quick adjustment mechanism is locked.

4. **Closing the quick adjustment mechanism:** Turn the locking disc clockwise as far as possible and tighten (hand-tight) to close the quick adjustment mechanism.



⇨ The system is free of play.
⇨ The clamping height is set.
⇨ The VCMC is ready for use.

7 Start of Operations

7.1 Pre-Fixing the Mechanical Clamp for the VCMC Version AP

When the VCMC AP is used with 2 vacuum circuits, the VCMC is pre-fixed to the slide mount by the evacuation of the first vacuum circuit. During this process, initially only a part of the clamping surface is evacuated.

7.2 Clamping the Workpiece

⚠ CAUTION

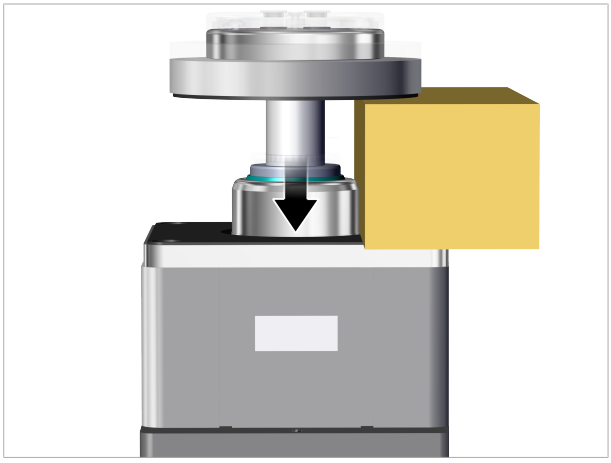
When the clamping disc is lowered, body parts may be present in the clamping range

Crushing of body parts

- Ensure that the clamping height is set so that the distance between the clamping disc and the workpiece is less than or equal to 6 mm.
- Do not reach into the clamping range while the clamping disc is being vacuum-lowered.

✓ The locking disc must be entirely closed.

✓ The workpiece is set.



1. Evacuate the appropriate vacuum circuit of the clamping system via the higher-level machine.

   ⇨ For the version AP with two vacuum circuits, the workpiece is clamped when the clamping disc is lowered.

   ⇨ For the version R, for grid tables with a single-circuit vacuum system, the VCMC is clamped to the grid table at the same time that the workpiece is clamped by lowering the clamping disc.

2. Check that the workpiece is securely clamped both visually and manually by pulling at it.

⇨ If the workpiece can be moved, then it is not sufficiently tightly clamped. Readjust the clamping height.

⇨ If the clamping is sufficient, then machining of the workpiece may commence.

7.3 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 clamping force is limited, meaning that it can withstand machining forces only up to a certain point. Accordingly, the operator of the mechanical clamp is obligated to establish for themselves (by experiment, slowly and carefully increasing the machining forces) the optimal settings and number of mechanical clamps necessary to ensure that the workpiece does not slip or even come loose during the machining process.

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

7.4 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.

Deactivating the vacuum, i.e. reducing it to atmospheric pressure, results in the workpiece being unclamped and the VCMC being released from the surface (for the version AP, unclamping the workpiece and releasing the VCMC from the vacuum console are two separate steps). The clamping disc is raised by spring force.

8 Warranty

Schmalz guarantees this system pursuant to our General Terms and Conditions of Sale and Delivery. The same applies to spare parts, provided that these are original parts supplied by us.

Wearing parts are not covered by the warranty.

9 Spare and wearing parts

Part no.	Type	Designation	Part type
10.01.12.04262	SPAN-TELL 110x31 EXZ VCMC	Clamping disc	Spare part
10.01.12.02191	VCDR 166x113x6.6 VCSP	K2 foam sealing frame	Wearing part
10.01.12.04010	SCHE 12-7x3.25 POM	Disc with collar	Spare part
10.01.12.02691	ERS-SET VCBL-R insert	Positioning insert and screws	Spare part
10.01.15.00353	ISDR 120x120x13.5 R 30/40	Grid table sealing frame	Spare part

10 Disposing of the Product

⚠ CAUTION

Flying parts resulting from opening the mechanical clamp and releasing the spring

Serious injury!

- Open the mechanical clamp and carefully allow the integrated spring to slacken slowly.

Recover the disassembled parts for recycling or reuse (provided no agreement on return or disposal has been made).

1. Dispose of the product properly after replacement or decommissioning.
2. Observe the country-specific guidelines and legal obligations for waste prevention and disposal.

11 Declarations of Conformity

11.1 EU Declaration of Conformity

The manufacturer Schmalz confirms that the product described in these instructions fulfills the following applicable EU directives:

2006/42/EC	Machinery Directive

The following harmonized standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 19085-1	Woodworking machines -- Safety requirements -- Part 1: Common requirements
EN ISO 19085-3	Woodworking machines -- Safety requirements -- Part 3: Numerically controlled (NC) boring and routing machines

The EU Declaration of Conformity valid at the time of product delivery is delivered with product or made available online. The standards and directives cited here reflect the status at the time of publication of the operating and assembly instructions.

11.2 UKCA Declaration of Conformity

The manufacturer Schmalz confirms that the product described in these operating instructions fulfills the following applicable UK regulations:

2008	Supply of Machinery (Safety) Regulations

The following designated standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 19085-1	Woodworking machines -- Safety requirements -- Part 1: Common requirements
EN ISO 19085-3	Woodworking machines -- Safety requirements -- Part 3: Numerically controlled (NC) boring and routing machines

The Declaration of Conformity (UKCA) valid at the time of product delivery is delivered with the product or made available online. The standards and directives cited here reflect the status at the time of publication of the operating and assembly instructions.

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