

EN

Translation of the Original Operating Manual 5-axle-tensioner with quick change jaw RVM



Store for reference

Version 1.1 • 20.07.2023

ID: 1412990

Table of Contents

1	About this Operating Manual.....	6
1.1	Manufacturer Details.....	6
1.2	Copyright	6
1.3	Warranty and Liability	6
1.4	Conventions of Presentation	8
1.4.1	Text Display.....	8
1.4.2	Display of Safety and Warning Instructions	9
1.5	Definitions	10
1.5.1	Manufacturer of the machine	10
1.5.2	Manufacturer	10
1.5.3	Operator	10
1.5.4	Assembly information for holding screws	10
1.5.5	Important components on the 5-axle clamp	11
2	Safety	12
2.1	Intended Use	12
2.2	Improper Use.....	13
2.3	Obligations of the operator	14
2.4	Qualification of Operating and Specialist Personnel	14
2.5	Personal Protective Equipment and Personnel Qualification.....	15
2.6	General Dangers.....	15
2.6.1	Dangers due to hot surfaces	15
2.6.2	Risk of ejection, detachment and falling of components of the 5-axle clamp	16
2.6.3	Risk of ejection, detachment and falling of workpieces from the 5-axle clamp	16
2.6.4	Skin irritation due to operating materials.....	16
2.6.5	Risk of injury due to handling heavy loads	17
2.6.6	Eye Injuries due to Metal Chips.....	17
2.6.7	Danger of crushing	17
2.7	Miscellaneous.....	18
2.7.1	Procedure in the Event of Danger and Accidents	18
2.7.2	Modifying the 5-axle clamp.....	18
2.7.3	Dismantling the 5-axle clamp.....	18
2.7.4	Collision/falling	18
3	Product description	19
3.1	About this 5-axle clamp	19

3.2	Technical data	21
3.2.1	Overview of construction sizes	21
3.2.2	Clamping force-torque diagram	21
3.2.3	Clamping ranges.....	22
3.2.4	Name plate	23
3.2.5	Labelling.....	23
3.2.6	Environmental and operational conditions.....	23
3.2.7	Permissible operating materials	24
3.3	Structural operating conditions.....	24
3.4	Technical control requirements	25
3.4.1	General technical control requirements.....	25
3.4.2	Setup mode.....	25
3.4.3	Lubrication	25
4	Transport.....	26
4.1	Transporting the 5-axle clamp	27
4.2	Lowering the 5-axle clamp.....	28
5	Assembly.....	29
5.1	Mounting the 5-axle clamp on the mounting surface	29
5.1.1	Attachment with cylinder head screws and T-slot nuts.....	29
5.1.2	Attachment with clamping claws.....	30
5.1.3	Attachment with pins for zero point clamping system.....	31
6	Commissioning	32
7	Operation	32
7.1	Production mode	32
7.2	Replacing the clamping jaws	32
7.2.1	Removal of clamping jaws	33
7.2.2	Mounting of clamping jaws	34
7.3	Check the screw-in depth of the spindle.....	35
7.4	Slide the base jaws or clamping jaws on the body	36
7.5	Replacing the clamping sleeve.....	37
7.6	Information on safe clamping of workpieces	38
8	Cleaning	39
8.1	Cleaning the 5-axle clamp	39
9	Maintenance	40
9.1	Checking the 5-axle clamp	40

9.2	Lubricating the 5-axle clamp.....	40
10	Storage.....	42
11	Troubleshooting.....	42
12	Decommissioning and disassembly	42
13	Disposal	43

1 About this Operating Manual

This Operating manual describes in detail the use, installation, assembly and maintenance of a 5-axle clamp RVM.

The efficiency of the 5-axle clamp depends primarily on correct use and careful maintenance. This Operating manual serves as the leading document and is provided on delivery of the product. Personnel must have carefully read and understood the Operating manual before beginning any work. Observance of all safety instructions and instructions for use in these Operating manual are the basic prerequisites for working safely with the 5-axle clamp. In addition to the regulations listed here, local and user-related operating instructions and professional accident prevention regulations are to be observed.

1.1 Manufacturer Details

RÖHM GmbH
Heinrich-Röhm-Straße 50
89567 Sontheim/Brenz
Germany

Tel.: +49 7325 160
Fax: +49 7325 16492
Web: www.roehm.biz
E-mail: info@roehm.biz

1.2 Copyright

This Operating manual is protected by copyright and is intended for internal purposes only.

The forwarding of the Operating manual to third parties, reproduction by any means – even in part – as well as use and/or communication of the content without the permission of RÖHM are prohibited (except for internal purposes).

Infringements will lead to claims for compensation. We reserve the right to assert further claims.

1.3 Warranty and Liability

All information and instructions in this Operating manual are given in good faith on the basis of our experience and knowledge to date. The products of RÖHM are constantly developed. RÖHM therefore reserves the right to make any modifications and improvements deemed useful. However, there is no obligation to extend these modifications and extensions to any previously delivered 5-axle clamp. The 5-axle clamp is constructed exclusively for the purpose specified under “Intended Use”. Any use beyond this is

deemed to be inappropriate. RÖHM is not liable for damage resulting from such use. The risk is borne solely by the operator. Product liability for consequential damage of any type is excluded for damage and operational interruptions resulting from operating errors, failure to observe this Operating manual or incorrect maintenance by unauthorised personnel.

RÖHM expressly points out that replacement and wear parts not supplied by RÖHM must be authorised by RÖHM. RÖHM does not accept liability for unauthorised replacement and wear parts. This applies to both product liability for consequential damage of all types and to liability for damage to property.

All unauthorised conversions, modifications to the 5-axle clamp and/or changes in conditions are not permitted for safety reasons and exclude RÖHM from any liability for any damage which may result. If modifications to the 5-axle clamp are necessary or the area of use differs from the intended use, this must be agreed with the express permission of RÖHM.

The statutory and contractually agreed terms and conditions apply.

The following damage or defects are excluded from the warranty:

- caused by the operator due to non-compliance with the written instructions of RÖHM with regard to
 - commissioning (e.g. incorrect construction and assembly work),
 - operation and
 - maintenance of the equipment (insofar as this maintenance has not been contractually taken over by RÖHM).
- caused by technical operating conditions unknown to RÖHM (e.g. chemical or electrolytic influences) and/or machine specifications.
- caused by natural wear.
- caused by force majeure.
- caused by incorrect operation of all types or by incorrect use or operation of the 5-axle clamp. This also includes loading beyond the specified load limits (e.g. speed, pressure, force, etc.).

This also includes damage caused

- if the operator or third parties carry out modifications or repairs to the services / products without prior permission of RÖHM. Excepted from this are damage or defects which have occurred and which were demonstrably not due to these modifications or repairs.
- which occurs due to use of the 5-axle clamp under altered operating conditions (e.g. materials, tools, cutting parameters, programmes, etc.), in particular without consulting and obtaining written authorisation from the seller or RÖHM.
- which is due to altered environmental conditions.

1.4 Conventions of Presentation

1.4.1 Text Display

To improve legibility and comprehension of the text, the following conventions were agreed:

Text type	Marking	Function
Operating instruction	1. 2., etc.	Marks a sequence of actions
	•	Marks an individual operating instruction
	➤	Marks an intermediate result of an operating instruction
	✓	End result of an operating instruction
List	▪	Marks elements of a list
	○	Marks comments within a list










Contains useful information or further information.

1.4.2 Display of Safety and Warning Instructions

Safety and warning instructions are marked by pictograms. The signal word and the colouring show the level of danger.

Observe the safety instructions to prevent personal injury and damage to property.

 DANGER	
	<p>Indicates an imminently dangerous situation which may lead to death or permanent personal injury if not avoided.</p> <ul style="list-style-type: none"> ➤ List of all measures which must be taken to prevent consequences.
 WARNING	
	<p>Indicates a possible danger which may lead to permanent personal injury or death if not avoided.</p> <ul style="list-style-type: none"> ➤ List of all measures which must be taken to prevent consequences.
 CAUTION	
	<p>Indicates a possible danger which may lead to minor reversible injuries if not prevented.</p> <ul style="list-style-type: none"> ➤ List of all measures which must be taken to prevent consequences.
NOTICE	
	<p>Indicates a possible danger which may lead to damage to property if not avoided.</p> <ul style="list-style-type: none"> ➤ List of all measures which must be taken to prevent consequences.

1.5 Definitions

1.5.1 Manufacturer of the machine

In this Operating manual, the manufacturer of the machine is defined as the company which buys the 5-axle clamp and integrates it into a machine.

1.5.2 Manufacturer

In this operating manual, the manufacturer is defined as the manufacturer of other parts, assemblies or products which are contained in or attached to the 5-axle clamp such as rotary feed-throughs, o-rings, operating materials, etc. and the manufacturer of which is not RÖHM.

1.5.3 Operator

In this operating manual, the operator is defined as the company which uses the machine with the 5-axle clamp to process workpieces.

1.5.4 Assembly information for holding screws

For the correct assembly it is essential to assemble the holding screws according to the information. This information is listed as standard in the following way:

Example:

6x	←	Number of holding screws
M10x90	←	Screw size
12.9	←	Strength class
83 Nm	←	Tightening torque

NOTE:

If there is no information for an item, this item is marked by “-”.

NOTE:

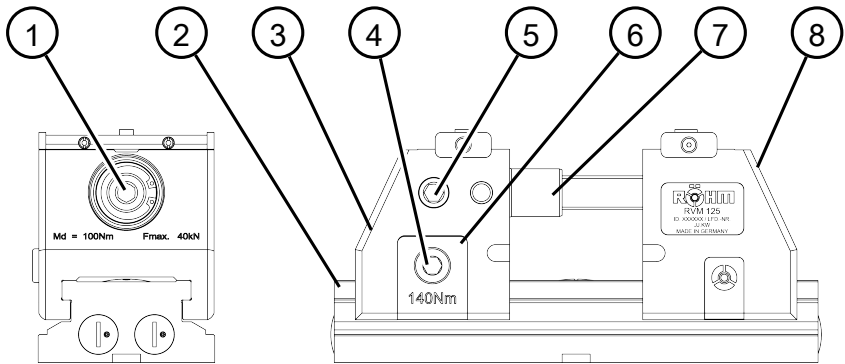
Holding screws are not listed in the figure keys. However, special screws such as screw plugs or venting screws are also listed in the keys.

NOTE:

The tightening torques stated must be adhered to with a tolerance of $\pm 10\%$.

1.5.5 Important components on the 5-axe clamp

Definition of most important components



1	Spindle	5	Turning bolt (2x)
2	Body	6	Clamping plate right
3	Base jaw, clampable	7	Threaded sleeve
4	Clamping screw	8	Base jaw, movable

2 Safety

Safety instructions and safety equipment serve to prevent accidents and damage when working on the 5-axle clamp. The safety information contains warnings and basic safety instructions. In addition to the safety instructions in this chapter, the following chapters contain action-related warnings. Maximum protection of personnel and the environment from dangers and trouble-free operation is only possible when all safety instructions and warnings in this operating manual are observed.

2.1 Intended Use

The 5-axle clamp is used to clamp regularly and irregularly shaped workpieces.

- The 5-axle clamp may be installed in all machining centres and processing machines for cutting and non-cutting processes.
- The 5-axle clamp can be operated stationary or at a low speed of up to 20 rpm. A clocking or swivelling movement is permissible.
- The 5-axle clamp can be installed horizontally on the side as well as vertically.
- The clamping force may only be generated manually (clockwise rotation).
- In the case of special workpiece geometries, corresponding jaws must be used.
- The workpieces to be clamped must have a sufficient strength for the clamping force and minimum compressibility.
- Other materials may only be used with the agreement of RÖHM.
- The 5-axle clamp is only suitable for external clamping of workpieces.
- The 5-axle clamp is intended for commercial use only.

2.2 Improper Use

If the 5-axle clamp is operated for a purpose other than the intended use as specified in this Operating manual, this is deemed to be improper use.

Any utilisation beyond the scope of the “intended use” poses risks and is not approved by RÖHM.

Improper use refers to the following:

- Clamping or release while the machine spindle is running or during machining.
- Use of the 5-axle clamp with missing or damaged components.
- Clamping of workpieces with an incorrect clamping jaw set.
- Use of defective jaws (e.g. cracks in the jaws).
- Operation without a workpiece, or with the workpiece insufficiently clamped.
- Clamping of elastic workpieces and insufficient clamping force.
- One-sided clamping of the workpiece.
- Internal clamping of workpieces.
- Clamping with external drives or applying an actuating force exceeding the max. torque.
- Use of the 5-axle clamp in potentially explosive atmospheres.
- Cleaning with compressed air.
- Direct pointing of compressed air or coolant spray at guide gap or lubricating nipple;
- Operation with insufficient maintenance.
- Using non-OEM parts as replacement parts.
- Use of the 5-axle clamp for suspending loads.
- Operation outside of the defined operating parameters.
- Operation at a speed of more than 20 rpm.
- Operation with modifications not approved by the manufacturer.
- Mobile use, e.g. in vehicles.
- Private use.
- Assembly of the 5-axle clamp and individual parts with incorrect tightening torque.

2.3 Obligations of the operator

Before all work on and with the 5-axle clamp, the operator is to ensure:

- that the operating instructions are available to the responsible personnel.
- that the responsible personnel are sufficiently qualified for their work.
 - This applies in particular to assembly, maintenance, servicing and repair.
- that the responsible personnel have read and understood the operating instructions.
 - RÖHM recommends that this be documented in a suitable form.
- that the 5-axle clamp is in perfect technical working order.
- that any damaged and defective parts are replaced immediately.

Before initial machining is carried out, the operator must check (e.g. by calculation or testing) whether the generated clamping force is sufficient with the existing friction to safely hold the workpiece with the forces possibly occurring. See also chapter 3.2.2 Clamping force-torque diagram.

2.4 Qualification of Operating and Specialist Personnel

Definition of “skilled worker”

A person is designated as a skilled worker when they can assess the work assigned to them and identify possible dangers based on their specialist training, knowledge and experience. They also have knowledge of the relevant provisions. This refers only to trained specialist personnel or such personnel that the operator has found to be capable.

Definition of “trained/instructed person”

A trained/instructed person is someone who has been taught about, and if necessary trained in, the tasks assigned to them and about the possible dangers of improper conduct. They have also been taught about the necessary safety equipment and protective measures. Personnel to be taught, trained, instructed or personnel undergoing general training may only work under the constant supervision of an experienced person.

2.5 Personal Protective Equipment and Personnel Qualification

When working on and with the 5-axle clamp, personal protective equipment must be worn. The owner is responsible for providing personal protective equipment.

- Personal protective equipment must be in perfect condition when carrying out work. Defective protective equipment is to be replaced immediately.
- Observe information on personal protective equipment posted in the working area.



Wear protective gloves



Wear safety goggles



Wear safety shoes



Wear protective clothing

Work on and with the 5-axle clamp may only be carried out by qualified operating and specialist personnel (see Qualification of Operating and Specialist Personnel).

2.6 General Dangers

When using the device there is a special potential of residual risks

- during assembly and set-up work,
- during operation and
- during maintenance and service work.

This potential risk cannot be completely eliminated considering the functional availability of the operating manual. Therefore, all individual regulations of this Operating manual are to be observed.

2.6.1 Dangers due to hot surfaces

Description of the hazard:

The 5-axle clamp may heat up during operation. There is a risk of burning in case of contact with the 5-axle clamp.

Avoiding the hazard:

Keep away from the 5-axle clamp immediately after it was in operation and let it cool down before carrying out any work.

2.6.2 Risk of ejection, detachment and falling of components of the 5-axle clamp

Description of the hazard:

In case of failure of components of the 5-axle clamp or non-compliance with specifications of the 5-axle clamp (e.g. incorrect assembly, excessive speed, excessive processing force, incorrect actuating force, insufficient maintenance, wear, exceeding the service life), parts of the 5-axle clamp can be ejected.

Avoiding the hazard:

- All information in the operating manual on the 5-axle clamp must be observed.
- Carry out a risk assessment for the machine with the integrated 5-axle clamp and implement the derived safety measures.

2.6.3 Risk of ejection, detachment and falling of workpieces from the 5-axle clamp

Description of the hazard:

If the operating limits of the 5-axle clamp are not complied with (e.g. excessive speed, excessive processing force, incorrect selection of clamping jaws, insufficient residual clamping stroke, incorrect actuating force, insufficient maintenance, wear, exceeding the service life), failure of device components, in the case of insufficient clamping force, workpieces held by the 5-axle clamp can be ejected or fall.

Avoiding the hazard:

- All information in the operating manual on the 5-axle clamp must be observed.
- Carry out a risk assessment for the machine with the integrated 5-axle clamp and implement the derived safety measures.

2.6.4 Skin irritation due to operating materials

Description of the hazard:

Operating materials such as hydraulic oil, compressed air, lubricants etc. can contain substances which can lead to skin irritation when touched.

Avoiding the hazard:

- Avoid contact with the operating materials
- Wear personal protective equipment when handling the operating materials
- Observe the safety data sheets of the operating materials

2.6.5 Risk of injury due to handling heavy loads

Description of the hazard:

If the 5-axle clamp is handled manually, this can lead to the person handling it becoming overloaded or injured due to the weight of the 5-axle clamp.

Avoiding the hazard:

Do not handle the 5-axle clamp manually. Instead, lift it, put it down, transport it, assemble or disassemble it using suitable lifting gear.

2.6.6 Eye Injuries due to Metal Chips

Dangerous metal chips may be produced during machining of metal. During operation or when cleaning the 5-axle clamp RVM, sharp metal chips may be stirred up and cause eye injuries and cuts.

To prevent eye injuries and cuts, wear personal protective equipment during operation and cleaning work. Cleaning with compressed air or a high-pressure cleaner is not permitted.

2.6.7 Danger of crushing

The machine manufacturer and/or operator must ensure that all danger to persons due to unavoidable travel movements is excluded. This also includes hazards from **manually operated clamping devices** if **several operators** are working on them at the same time.

If there is a gap of **less than 25 mm** after the distance is travelled, there is generally a risk of crushing extremities. For this reason,

- the total clamping stroke must be below 4 mm before the start of the clamping movement
- **or** the workpiece loading in normal mode must be carried out either mechanically or with a ramrod.
- **or** the object to be clamped must be fixed with a permanently or temporarily attached workpiece holder (e.g. prism) before the clamping movement is started.
- **or** the clamping movement must be carried out with special care
- and eye contact must be maintained between the persons involved until the clamping process is completed.

2.7 Miscellaneous

2.7.1 Procedure in the Event of Danger and Accidents

In the event of danger and accidents, it must be ensured that first aid measures can be taken immediately.

1. Shut the machine down immediately via the Emergency-Stop button.
2. Remove the person involved from the danger zone and sit or lay the person down.
3. Call a doctor.
 - Do not make any changes to the accident site.
4. Administer first aid.
 - Stop any bleeding.
 - Cool burns.
5. Report all accidents to a superior.

2.7.2 Modifying the 5-axle clamp

NOTICE:

The 5-axle clamp may only be modified after written approval by RÖHM.

2.7.3 Dismantling the 5-axle clamp

NOTICE:

The 5-axle clamp must not be disassembled other than as described in this Operating manual. Exception: After its final decommissioning, the 5-axle clamp must be disassembled properly for disposal.

2.7.4 Collision/falling

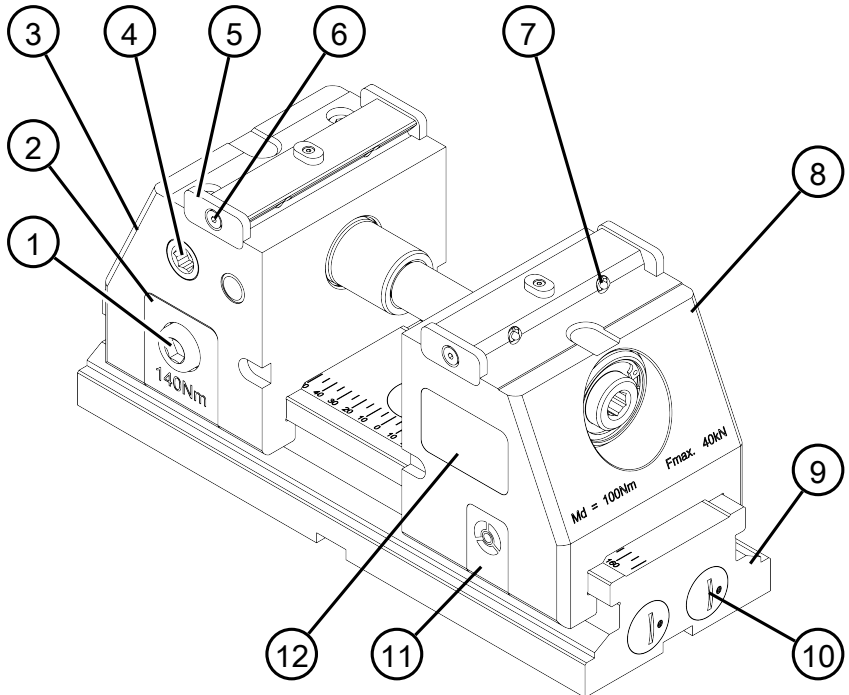
NOTICE:

After a collision between the 5-axle clamp and other components of the machine, or after it has fallen, the 5-axle clamp must be inspected for damage such as cracks by specialist personnel from RÖHM.

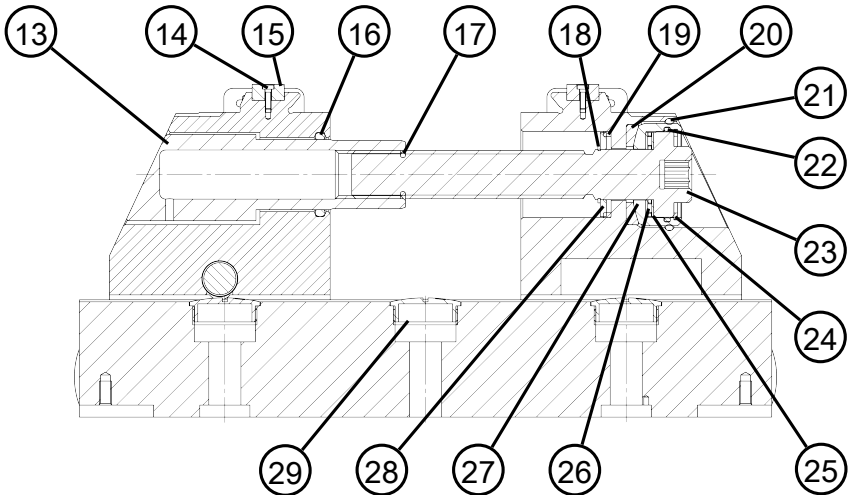
3 Product description

3.1 About this 5-axe clamp

Overview:



1	Clamping screw	7	Spring-loaded pressure piece (4x)
2	Clamping plate right	8	Base jaw, movable
3	Base jaw, clampable	9	Body
4	Turning bolt (2x)	10	Dummy plug (4x)
5	Cover plate (4x)	11	Insert (2x)
6	Countersunk screw (4x)	12	Name plate (2x)

Sectional view:


13	Threaded sleeve	22	O-ring 42.00x2.50
14	Cylinder screw M3x10	23	Spindle
15	Key	24	Retaining ring 43x1.75
16	O-ring 35.00x4.00	25	Axial disc
17	O-ring 16.00x2.00	26	Axial needle roller
18	Retaining ring 25x1.2	27	Swing bushing
19	O-ring 37.00x3.00	28	Disc
20	Ball socket	29	Dummy plug
21	O-ring 50.00x3.00	-	-

Functional description:

The 5-axle clamp is used to clamp regularly and irregularly shaped workpieces in machine tools. Using a mounting wrench (consisting of reversible ratchet and socket wrench insert SW12), the movable base jaw (8) with the actual clamping jaw is brought up to the workpiece by turning the spindle (23) clockwise. The clamping force is generated with a max. torque of 100 Nm.

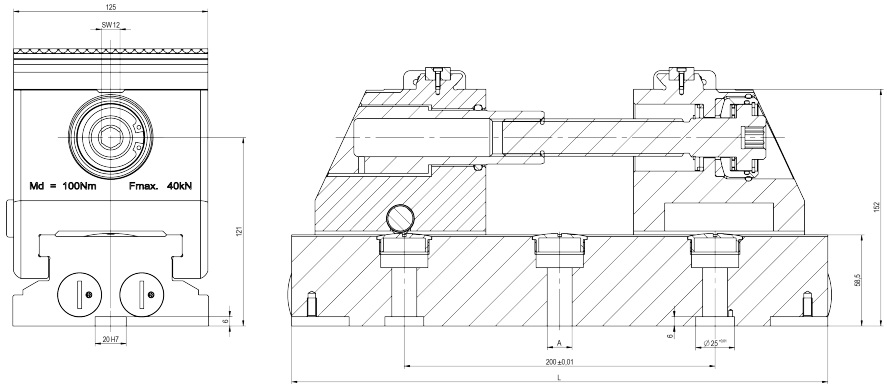
The clamping force per jaw is 40 KN.

The clamping range can be changed by changing the body (9) and the threaded sleeve (13).

For interfaces to the mounting surface, see chapter 3.2.1 Overview of construction sizes.

3.2 Technical data

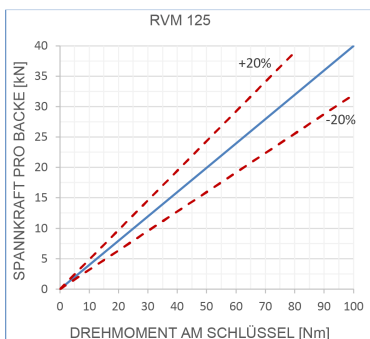
3.2.1 Overview of construction sizes



NC-Kompakt-Spanner RVM ohne Backen

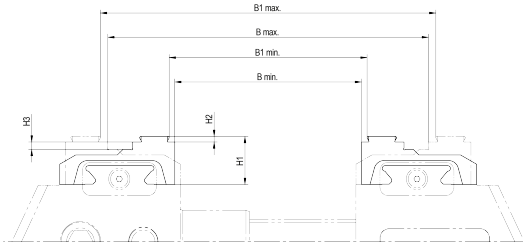
Id.-Nr.	184666	184717		
Backenbreite [mm]	125	125		
Länge Körper L [mm]	345	345		
Höhe bis Backenauflage [mm]	152	152		
Bohrung Befestigung A [mm]	16	13,5		
Höhe Spindel [mm]	121	121		
Max. Drehmoment [Nm]	100	100		
dabei Spannkraft [kN]	40	40		
Gewicht [kg]	31,9	31,9		

3.2.2 Clamping force-torque diagram



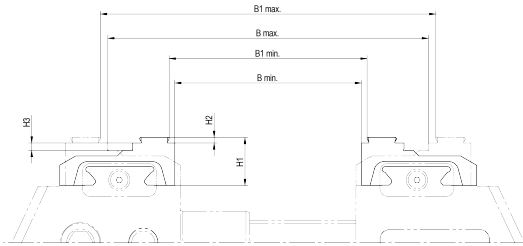
3.2.3 Clamping ranges

RVM, Maße mit Stufenbacken, Stufenhöhe 3 mm



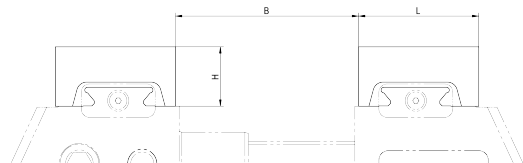
Backenbreite mm	125
B min. mm	7
B max. mm	172
B1 min. mm	13
B1 max. mm	180
H1 mm	28
H2 mm	5
H3 mm	4

RVM, Maße mit Stufenbacken, Stufenhöhe 5 mm



Backenbreite mm	125
B min. mm	7
B max. mm	172
B1 min. mm	13
B1 max. mm	180
H1 mm	28
H2 mm	5
H3 mm	4

RVM, Maße mit Blockbacken



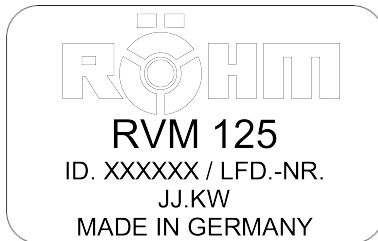
Backenbreite mm	125
B min. mm	0
B max. mm	99
H mm	32
L mm	65

3.2.4 Name plate

The name plate can be found on the moving base jaw of the 5-axle clamp, and it contains the following information:

RÖHM

- Type designation (RVM 125)
- RÖHM art. no. (ID. no.)
- Serial no. (ser. no.)
- Date of manufacture, year and week (YY.CW)
- MADE IN GERMANY



NOTICE:

The information on the name plate must be adhered to.

3.2.5 Labelling

The labelling is affixed on the individual components.

NOTICE:

See chapter "Important components on the 5-axle clamp".

3.2.6 Environmental and operational conditions

The 5-axle clamp is designed for the following environmental and operating conditions:

Environmental and operating conditions	Quality requirement(s)
Ambient medium	Air or inert gases
Place of use	Interior
Vibration speeds	< 5 mm/s as per DIN ISO 10816-3

Environmental and operating conditions	Quality requirement(s)
Relative humidity (at 40 °C)	<ul style="list-style-type: none"> ▪ max. 70 % outside of the working area ▪ max. 100 % within the working area NOTICE: Use in very humid conditions leads to faster corrosion and may reduce the useful life.
Potentially explosive environment	No
Ambient temperature at place of use	+5 °C to +60 °C
Ambient temperature for transport and storage	-15 °C to +55 °C (for 24 h also up to +70 °C)
Dry and wet machining	Wet machining permitted with cooling lubricants

Pollution of the machine's surroundings caused by the machine itself is permitted. However, perfect operation of the 5-axle clamp must be checked regularly.

3.2.7 Permissible operating materials

The following operating materials are permitted:

- Lubricant
 - which corresponds to the following quality requirements:
 - RöhM F80 grease (recommended)
 - or a comparable lubricant
- NOTICE:
See data sheet RöhM F80 grease (the data sheet is available on request).

Other operating materials may only be used with prior written approval from RÖHM.

3.3 Structural operating conditions

The following conditions must be adhered to for the proper operation of the 5-axle clamp in a machine:

- Before using the 5-axle clamp in a machine, it must be checked whether the machine allows the use of the 5-axle clamp.
See also:
 - Chapter "Obligations of the operator"

- chapter "Risk of ejection, detachment and falling of components at the 5-axle clamp", as well as
- chapter "Risk of ejection, detachment and falling of workpieces from the 5-axle clamp".
- The 5-axle clamp must be clamped directly over the body on the machine table. Attachment via another adapter is not permitted.
- The maximum installation dimensions of the 5-axle clamp can be found in the operating manual (see chapter 3.2 "Technical data").
- The base jaws must not protrude beyond the body.
- The collision circle of the 5-axle clamp must be kept clear.
- The movement range of the clamping jaw sets on the 5-axle clamp must be observed (danger of collision with other components, hoses, cables etc. in the machine).
- The compressed air and coolant jets must not be directed immediately onto jaw guides, guide gaps, vulcanisation gaps or lubricating nipples.

3.4 Technical control requirements

3.4.1 General technical control requirements

- You may only begin machining the workpiece once the workpiece has been clamped into place.
- The spindle must be screwed into the threaded sleeve until the red O-ring is **no** longer visible.
- If the clamping force drops, workpiece machining must be stopped immediately.

3.4.2 Setup mode

In the "Setup mode" machine operation type

- it may not be possible to machine a workpiece.
- the 5-axle clamp may also be rotated without clamped workpiece.
- the 5-axle clamp may also be rotated without clamping jaws.

3.4.3 Lubrication

- For the lubricant, see chapter "Permissible operating materials"

4 Transport

After delivery of the 5-axle clamp it must be checked immediately for transport damage. If any transport damage has occurred, it must be reported immediately to the transport company and to the manufacturer **RÖHMManufacturer Details** [▶ 6]). The further course of action in the event of transport damage is decided individually depending on the severity of the transport damage.





Check the scope of delivery

After receiving the delivery, check it for completeness.

Scope of delivery:

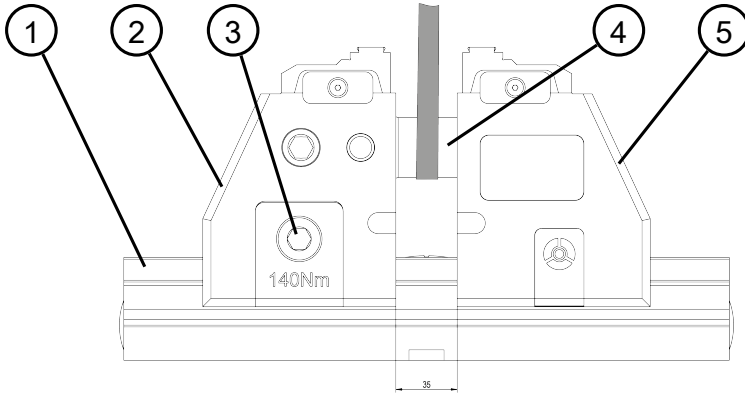
- 5-axle clamp
- ½-inch socket wrench insert, metric
- Operating manual

 WARNING	
	<p>Crushing injuries in the event of unsecured transport of the 5-axle clamp.</p> <p>Falling of the 5-axle clamp.</p> <ul style="list-style-type: none"> ➤ Use suitable hoisting gear and slings. ➤ Wear personal protective equipment. ➤ Do not remain under suspended loads.

Pre-conditions:

- Personnel qualification: Trained/instructed person
- Wear personal protective equipment

4.1 Transporting the 5-axe clamp



1	Body	4	Spindle
2	Base jaw, clampable	5	Base jaw, movable
3	Clamping screw	-	-

Procedure:

NOTICE



The 5-axe clamp must **not** be transported if the clamping screw is released.

1. Position the two base jaws in the middle of the body and with a distance of approx. 35 mm.
2. The clamping screw SW12 must be tightened to the specified tightening torque of 140 Nm.
3. Place a suitable lifting strap around the spindle.
4. Lift the 5-axe clamp and transport it in a manually-driven manner. The 5-axe clamp must not wobble.

NOTICE:

When lifting, transporting and putting down the 5-axe clamp, ensure that no collisions occur with other parts of the machine etc.

4.2 Lowering the 5-axle clamp

Procedure:

- Place the 5-axle clamp on a workbench or other surface in such a way that the 5-axle clamp cannot rest on projecting parts. Provide a support if required.

5 Assembly

5.1 Mounting the 5-axle clamp on the mounting surface

Pre-conditions:

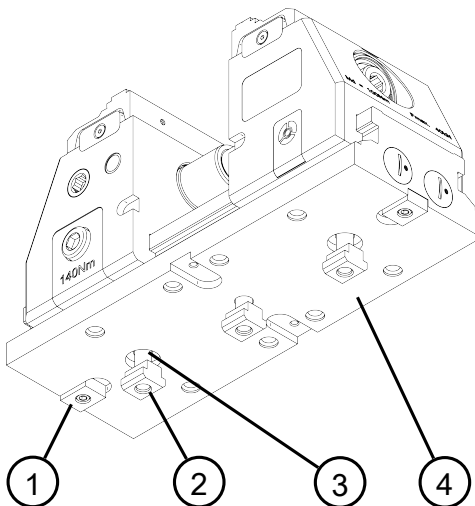
- Personnel qualification: Skilled worker
- Wear personal protective equipment
- The machine is switched off and protected against being switched on again
- Mounting surface is cleaned.

5.1.1 Attachment with cylinder head screws and T-slot nuts

Pre-conditions:

- The support surface, slots, T-slot nut, fitting slot nuts, bores and threaded holes on the 5-axle clamp are clean

Procedure:



1	Fitting slot nut	3	Cylinder screw
2	T-slot nut	4	Body

1. Align the 5-axle clamp with the fitting slot nuts and place it on the mounting surface.

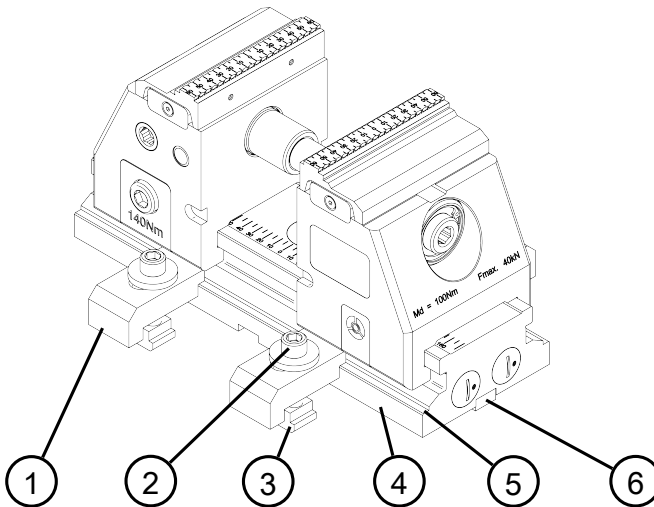
2. Attach the 5-axle clamp to the mounting surface with cylinder screws and T-slot nuts.
 NOTICE:
 The cylinder screws must be inserted and tightened with the respective tightening torque.
 NOTICE:
 The 5-axle clamp must be flat over the entire support surface.

5.1.2 Attachment with clamping claws

Pre-conditions:

- The support surface, slots, T-slot nut, fitting slot nuts, clamping claws, bar at body, bores and threaded holes on the 5-axle clamp are clean

Procedure:



1	Clamping claw	4	Body
2	Cylinder screw	5	Bar at body
3	T-slot nut	6	Fitting slot nut

1. Align the 5-axle clamp with the fitting slot nuts and place it on the mounting surface.
2. Attach the 5-axle clamp to the mounting surface with the clamping claws, cylinder screws and T-slot nuts.
 NOTICE:
 The cylinder screws must be inserted and tightened with the respective tightening torque.

NOTICE:

The 5-axle clamp must be flat over the entire support surface.

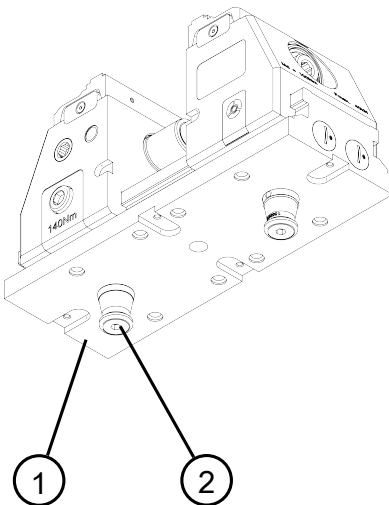
NOTICE:

The clamping claws (2 on each side) must be attached to the bar at the body at the height of the clamping area.

5.1.3 Attachment with pins for zero point clamping system

Pre-conditions:

- The support surface, slots, pins for zero point clamping system, bores and threaded holes on the 5-axle clamp are cleaned

Procedure:


1	Body (L=345 mm)	2	Pins for zero point clamping system
---	-----------------	---	-------------------------------------

1. Fasten the pins for the zero point clamping system to the body with cylinder screws.

NOTICE:

For bodies with L=345 mm in grid 200

NOTICE:

The cylinder screws must be inserted and tightened with the respective tightening torque.

2. Align the 5-axle clamp with the pins for the zero point clamping system and place it on the mounting surface.

NOTICE:



The 5-axle clamp must be flat over the entire support surface.

6 Commissioning

Initial commissioning is carried out by the manufacturer of the machine.

7 Operation

7.1 Production mode

 DANGER	
	<p>Danger to life by the ejection or falling of tools, workpieces or parts thereof during operation of the 5-axle clamp.</p> <ul style="list-style-type: none"> ➤ Before operating the 5-axle clamp, carry out a risk assessment/hazard assessment and implement measures derived from this for risk minimisation.

- The 5-axle clamp must not be operated until a risk assessment of the entire machine with the 5-axle clamp has been carried out by the manufacturer of the machine and the use of the 5-axle clamp has been approved.

In accordance with the standard sheet VDMA 34192 (section 4.1.1), the following must be considered in particular:

- protection against interference in hazardous areas of rotating clamping devices and moving clamping elements.

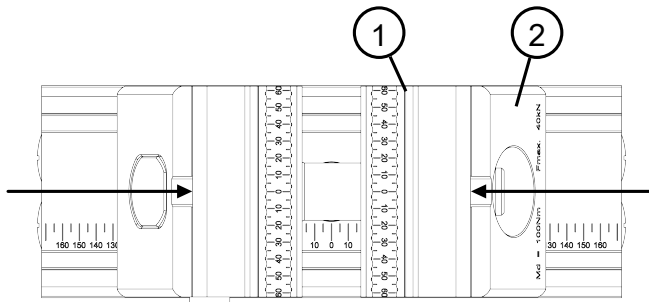
7.2 Replacing the clamping jaws

Pre-conditions:

- Personnel qualification: Skilled worker
- Wear personal protective equipment
- The machine is switched off and protected against being switched on again
- The machine and 5-axle clamp have cooled down
- Machine and 5-axle clamp are cleaned

7.2.1 Removal of clamping jaws

Procedure:



1 Clamping jaw	2 Base jaw
----------------	------------

1. According to the recess in the base jaw, insert the extraction tool between the base jaw and the clamping jaw in the direction of the arrow.

NOTICE:

A screwdriver or similar tool can be used as an extraction tool.

2. Lever the clamping jaws out of the base jaws.

NOTICE:

Hold the clamping jaws with your hand while levering them out.

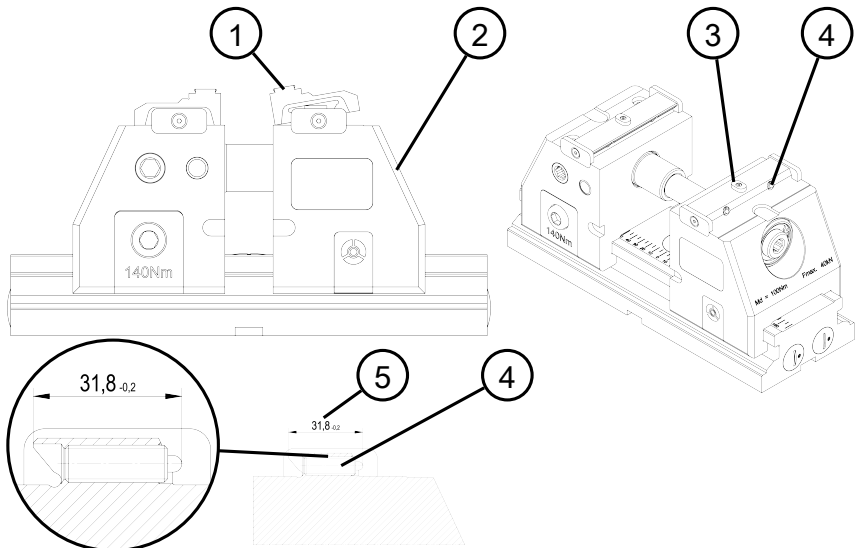
- The clamping jaws are removed.

7.2.2 Mounting of clamping jaws

Pre-conditions:

- The contact surfaces on the clamping jaw are clean

Procedure:



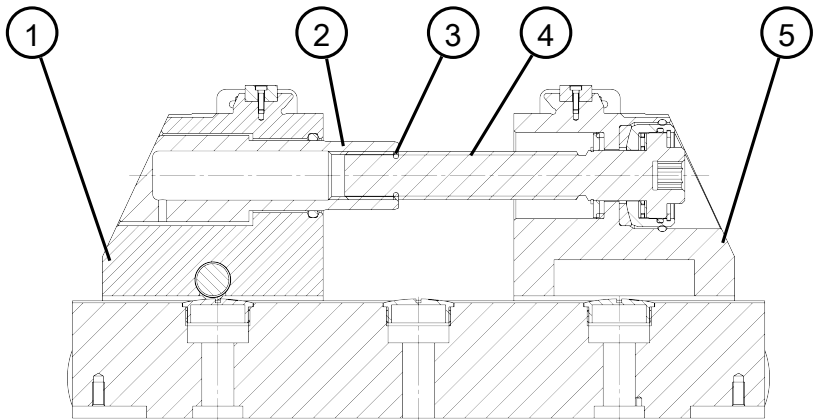
1	Clamping jaw	4	Spring-loaded pressure piece
2	Base jaw	5	Adjustment dimension
3	Key	-	-

The adjustment dimension on the spring-loaded pressure pieces must **not** be changed.

1. Check the adjustment dimension.
NOTICE:
If necessary, correct the adjustment dimension via the spring-loaded pressure pieces.
2. Place the clamping jaws diagonally on the base jaws using the slot for the key and press firmly until they engage.
NOTICE:
Depending on the type of clamping jaws, they can be mounted rotated by 180°. This way, the clamping range can be extended.
➤ The clamping jaws are mounted.

7.3 Check the screw-in depth of the spindle

Procedure:



1	Base jaw, clampable	4	Spindle
2	Threaded sleeve	5	Base jaw, movable
3	O-ring	-	-

NOTICE



- Check the screw-in depth of the spindle before each clamping.
- The O-ring must **no** longer be visible.

1. Place the movable base jaw with spindle against the clampable base jaw with threaded sleeve.
2. Using a mounting wrench (consisting of reversible ratchet and socket wrench insert SW12), screw the spindle into the threaded sleeve until the O-ring is **no** longer visible.

NOTICE:

The O-ring must be inserted at the spindle.

NOTICE:

The movable base jaw is pulled against the clampable base jaw.

7.4 Slide the base jaws or clamping jaws on the body

Procedure:

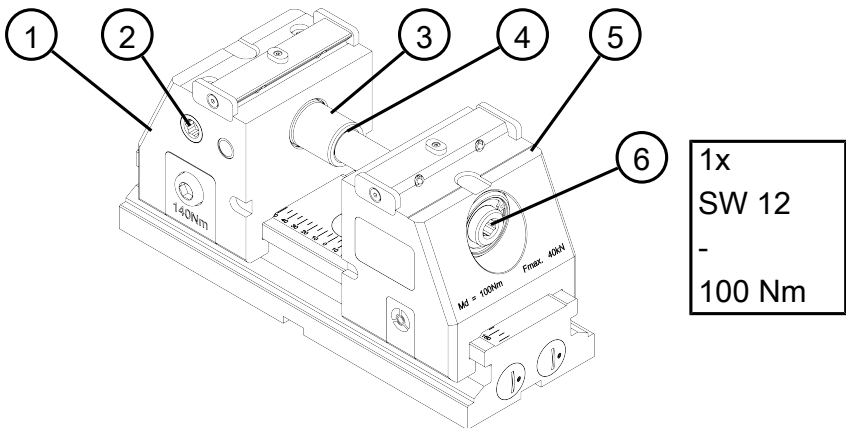
1. Loosen the clamping screw in the clampable base jaw by two to three turns.
2. Slide the clampable base jaw on the body into the desired position.
NOTICE:
The clampable base jaw can be moved steplessly.
3. Screw the clamping screw back in.
NOTICE:
The clamping screw must be tightened to the specified tightening torque of 140 Nm.

7.5 Replacing the clamping sleeve

Pre-conditions:

- Personnel qualification: Skilled worker
- Wear personal protective equipment
- The machine is switched off and protected against being switched on again
- The machine and 5-axle clamp have cooled down
- Machine and 5-axle clamp are cleaned

Procedure:

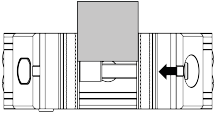
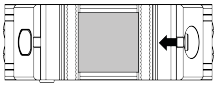
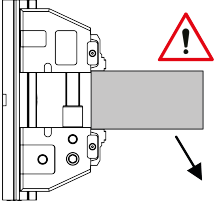


1	Base jaw, clampable	4	O-ring
2	Turning bolt (2x)	5	Base jaw, movable
3	Threaded sleeve	6	Spindle

1. Unscrew the spindle from the threaded sleeve.
2. Unscrew the two turning bolts from the clampable base jaw as far as they will go.
NOTICE:
Threaded sleeve is unlocked.
3. Pull the threaded sleeve out of the clampable base jaw.
 - The threaded sleeve is removed from the clampable base jaw.
4. Insert the new threaded sleeve flush into the clampable base jaw in the correct position.

5. Screw the two turning bolts flush into the clampable base jaw.
 NOTICE:
 Threaded sleeve is locked.
6. Screw the spindle into the threaded sleeve until the O-ring is no longer visible.
 NOTICE:
 The O-ring must be inserted at the spindle.
 ➤ The threaded sleeve is mounted.

7.6 Information on safe clamping of workpieces

Incorrect		Correct	
	<p>One-sided clamping</p>		<p>Central clamping</p>
	<p>Caution in the case of vertical use: Risk of injury due to the workpiece falling out when loosening. Hold or support workpieces.</p>		

8 Cleaning

Information for cleaning:

- It is preferable to use rags, cloths, fine brushes or brooms for cleaning.
- Do not use high-pressure cleaners, solvents, cleaning agents or chemicals for cleaning.
- Do not use creeping lubricants and preservatives for cleaning.

Activity	Interval (hours of operation or after incident)
Cleaning the 5-axle clamp	120 h or 1x weekly, more often if necessary

- The machine is switched off and protected against being switched on again

8.1 Cleaning the 5-axle clamp

Pre-conditions:

- Personnel qualification: Trained/instructed person
- Wear personal protective equipment
- The machine is switched off and protected against being switched on again
- The machine and 5-axle clamp have cooled down

Procedure:

- Clean the 5-axle clamp.

9 Maintenance

Maintenance task	Interval (hours of operation or after incident)
Check the 5-axle clamp for deformations, fractures, cracks, signs of wear, corrosion and loose parts (screws, components) (visual inspection)	120 h or at least 1x weekly
Lubricating the 5-axle clamp	120 h or at least 1x weekly

9.1 Checking the 5-axle clamp

Pre-conditions:

- Personnel qualification: Trained/instructed person
- Wear personal protective equipment
- The machine is switched off and protected against being switched on again
- The machine and 5-axle clamp have cooled down
- Machine and 5-axle clamp are cleaned

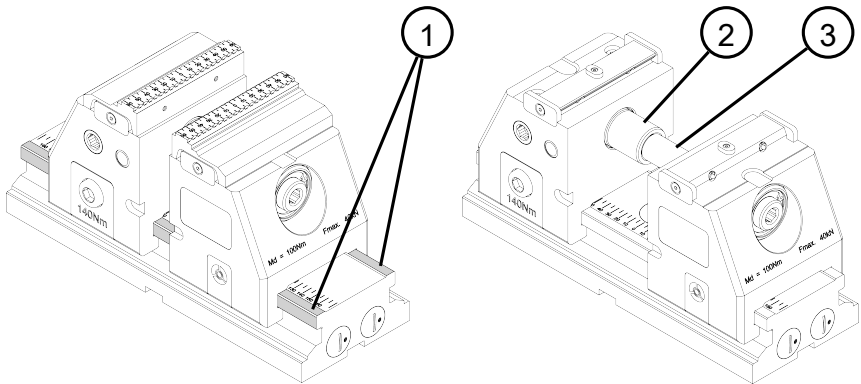
Procedure:

- Check the 5-axle clamp for deformations, fractures, cracks, signs of wear, corrosion and loose parts.

9.2 Lubricating the 5-axle clamp

Pre-conditions:

- Personnel qualification: Trained/instructed person
- Wear personal protective equipment
- The machine is switched off and protected against being switched on again
- The machine and 5-axle clamp have cooled down
- Machine and 5-axle clamp are cleaned

Overview of lubrication points:


1	Guideway	3	Spindle
2	Threaded sleeve	-	-

Procedure:

1. Unscrew the spindle from the threaded sleeve and lubricate it.
2. Lubricate the 5-axle clamp on all sides of the guideways.

NOTICE:

For the lubricant, see chapter "Permissible operating materials"

10 Storage

Pre-conditions:

- Personnel qualification: Trained/instructed person
- Wear personal protective equipment
- 5-axle clamp has been removed from the machine
- 5-axle clamp is clean

Procedure:

- The 5-axle clamp must be stored in a dry and protected place in accordance with the storage temperature (see Environmental and Operating Conditions).

NOTICE:

- Do not place the 5-axle clamp on protruding parts. Provide a support if required.

11 Troubleshooting

NOTICE:

- Troubleshooting must be carried out by a skilled worker or specialist personnel of RÖHM.

12 Decommissioning and disassembly

Pre-conditions:

- Personnel qualification: Skilled worker
- Wear personal protective equipment
- The machine is switched off and protected against being switched on again
- The machine and 5-axle clamp have cooled down
- Machine and 5-axle clamp are cleaned

13 Disposal

Pre-conditions:

- Personnel qualification: Skilled worker
- Wear personal protective equipment
- 5-axle clamp has been removed from the machine
- 5-axle clamp is clean

Procedure:

- Dismantle the 5-axle clamp into its respective individual parts properly and completely for disposal.
- Improper dismantling, e.g. by sawing or separation with saws, abrasive cutters, plasma cutters, welding torches or similar tools is prohibited.
- During dismantling, any leaking operating materials must be collected.
- Metals, plastics, rubber and operating materials etc. must be disposed of according to the applicable local regulations.

