



Clamping technology
■ ■ ■ Made in Germany



Operating and assembly instructions



Mechanical centering vise

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Original, Version 1.5

Also-applicable documents

Table 1: Also-applicable documents

Manufacturer	Also-applicable documents
EMUGE GmbH & Co. KG	EvoPoint zero-point system assembly instructions
	EvoBlock spacer assembly instructions
Manufacturers of compatible systems	Operating instructions for the installed zero-point system and/or the attachment elements

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Changes

The products of EMUGE GmbH & Co. KG are constantly being enhanced and improved.
All illustrations are purely illustrative and slightly may differ from the product.

The latest version of these operating and assembly instructions can be found on the website .

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1 Safety

1.1 Explanation of symbols

1.1.1 Danger classes

Safety notices in this document are marked with standardized illustrations and symbols. Observe the respective notices. The following danger classes are used depending on the probability of occurrence and severity of the consequence:

DANGER



Indicates a dangerous situation that may cause severe injury or death.

- Measures to avoid danger

WARNING



Indicates a dangerous situation that may cause severe injury or death.

- Measures to avoid danger

CAUTION



Indicates a dangerous situation that may cause light to medium injury.

- Measures to avoid danger

NOTE



Indicates a dangerous situation that may cause property damage.

- Measures to avoid property damage.

1.1.2 Application advice and information

Application advice and useful information are presented as follows:

INFORMATION

Application advice and useful information.

1.1.3 Warning symbols



Warning of a danger point.



Warning of injury to the limbs.



Warning of visible or pointed objects.



Warning against uncontrolled start-up.

1.2 Intended use

Application area

- Manual clamping of raw or partially machined workpieces in industrial applications.
- The clamping fixture must either be installed directly on a machine table or installed on a suitable quick-change unit or spacer.
 - Max. speed of the rotating machine table:
100 rpm permissible.
- The clamping process can take place inside and outside the machine.
- The machine and clamping fixture must be in perfect condition.
- Safety and protective devices must be in perfect condition.
- The workpiece can be clamped using different designs of clamping jaws and top jaws.

Designed service life

- 50,000 clamping cycles
- With proper use, maintenance and general overhaul, a longer service life is possible.

Information in documents

- Observe all information in these operating and assembly instructions.
- Comply with all specifications in the also-applicable documents.

1.3 Foreseeable misuse

Misuse	Any use beyond the intended use or any other use is considered misuse: ■ Never operate the clamping fixture outside the stated specifications, see chapter 3, Technical data. ■ Components outside the specification are not permitted. ■ Never operate the clamping fixture beyond the designed service life without a general overhaul. ■ The machine and attachment elements must be suitable for the clamping fixture described in these operating and assembly instructions. ■ Prevent contact with acids and oxidants. ■ Not suitable for potentially explosive atmospheres. ■ Not suitable for rotating spindles. EMUGE GmbH & Co. KG is not liable for any damage caused by misuse.
Structural changes	Any unauthorized modifications and changes to the clamping fixture will render any liability and warranty of EMUGE GmbH & Co. KG void.

1.4 Requirements for the operator

Operator's obligations	The operator must ensure that persons working on the clamping fixture observe the rules, regulations and the following instructions: ■ Observe national and regional regulations for safety, accident prevention and environmental protection. ■ Provide the necessary protective equipment. ■ Instruct personnel in handling the clamping fixture. ■ Train all personnel regularly. ■ Do not have any damaged clamping fixtures installed or commissioned.
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1.5 Requirements to the personnel

User groups	These operating and assembly instructions are intended for the following user groups: Specialist ■ Completed vocational training as a mechanic or comparable qualification. ■ Can recognize possible dangers within the scope of the work assigned and react correctly. All user groups must have read and understood these operating and assembly instructions before starting work.
Unqualified personnel	Persons who do not meet the minimum requirements of a user group are considered unqualified personnel. Unqualified personnel are not authorized to carry out the activities described in these operating and assembly instructions.
Impairments	The assignment of persons with physical and/or mental disabilities must be approved by the operator. The operator can define activities for these persons that ensure safe operation. Persons under the influence of alcohol or drugs are not permitted.
Instruction	The operator must instruct all personnel regularly. The instruction must at least include the regulations on occupational health and safety, general safety and the handling of the clamping fixture. An instruction log must be prepared for better tracking.
Personal protective equipment	■ Observe country-specific accident prevention regulations and general safety instructions. ■ Observe the respective country-specific legal requirements for occupational health and safety and wear the required personal protective equipment when working on and with the clamping fixture.

1.6 Residual risks

Correct workpiece clamping

Correct workpiece clamping is the personnel's responsibility. New fixtures must be assessed and carefully checked by qualified personnel with regard to the required clamping force, available clamping surfaces and the machining forces that occur.

The risk of a workpiece slipping or being torn out must be considered even with a correctly functioning clamping fixture due to the different geometries to be clamped, support surfaces, friction values of the clamping, machining forces, incorrect manipulation of the processing machine, etc.

Machine hazards

DANGER



Risk of injury due to uncontrolled start-up of the machine!

Uncontrolled start-up of the machine may cause severe injuries or even death when working on the clamping fixture and on connection components.

- ▶ Stop the machine before working on the clamping fixture.
- ▶ In case of emergency, operate the EMERGENCY STOP of the machine.
- ▶ Secure the stopped machine against unauthorized restarting.

Dangers from sharp edges

CAUTION



Cuts from sharp edges!

Workpieces and damaged components may have sharp edges. Sharp edges can cause cuts.

- ▶ Rectify any damage before using the clamping fixture.
- ▶ Use protective gloves.

Dangers from falling components

WARNING



Risk of injury due to falling components!

If clamping fixtures or connection components are transported or installed, components may come loose and fall down. Falling components can result in injuries.

- ▶ Place the clamping fixture and component flat on a flat and stable surface.
- ▶ Install as intended before use.
- ▶ Wear suitable protective equipment, in particular protective gloves and safety shoes.

Dangers from components heavier than 15 kg**⚠ WARNING****Risk of injury due to improper movement of heavy components!**

The clamping fixture and connection components of the larger widths and lengths can weigh more than 15 kg. Uncontrolled movements can result in injuries.

- ▶ Observe the weight and the maximal dimensions of the clamping fixture, see chapter 3.3, Dimensions and weights.
- ▶ Use suitable eyebolts or lifting straps to move the clamping fixture and connection components, see chapter 4.3, Install eyebolts.
- ▶ Secure the clamping fixture to the means of transport.
- ▶ Wear personal protective equipment, in particular a hard hat, protective gloves and safety shoes.
- ▶ Do not move below suspended loads.
- ▶ Move heavy weights with at least two people or a suitable lifting device.
- ▶ Use suitable means of transport for longer distances.

Dangers from moving components**⚠ WARNING****Risk of crushing due to moving components!**

The machine, clamping fixture and connection components have moving components. Crushing may occur if limbs are located between moving parts.

- ▶ Never reach between any moving components.

Danger from ejected parts

WARNING



Risk of injury due to ejected parts!

If the clamping fixture is overloaded or workpieces are clamped incorrectly, components or parts may be damaged or ejected. Contact with ejected parts can result in irreversible injuries.

- ▶ Remove transport locks before use.
- ▶ Ensure that the clamping fixture has been installed as described in these operating and assembly instructions, see chapter 5, Assembly.
- ▶ Observe the load limits of the clamping fixture, see chapter 3, Technical data.
- ▶ If the load limits of the clamping fixture are exceeded, stop using the clamping fixture and contact EMUGE GmbH & Co. KG.
- ▶ Wear personal protective equipment, in particular safety goggles.
- ▶ Clamp the workpiece correctly, see chapter 7, Operation.

1.7 Emergency procedures

Stop in dangerous situations

If there is a risk of injury or situations in which the machine and/or clamping fixture could be damaged, the machine must be stopped immediately.

1. Operate the EMERGENCY STOP of the machine.
2. Wait for the machine to come to a standstill.
3. Observe further information in the operating instructions for the machine.

1.8 Environmental protection

NOTE**Environmental hazard due to incorrect handling of environmentally hazardous substances!**

Incorrect handling and disposal of environmentally hazardous substances can result in serious environmental damage.

- ▶ Observe production information, instructions and safety data sheets for all substances used on site.
- ▶ If in doubt, ask the competent authority about the appropriate handling of environmentally hazardous substances on site.
- ▶ Observe the instructions for handling and disposing of environmentally hazardous substances given in this manual.
- ▶ If environmentally hazardous substances are accidentally released into the environment, take appropriate measures immediately. If in doubt, inform the responsible authority about the damage.

Lubricants and cleaning fluids

Lubricants and solvent-based cleaning agents may contain toxic substances. They must not be released into the environment. Disposal must be carried out by a specialist disposal company.

2 Product description

The workpiece is clamped with an introduction torque on the hexagon of the screw shaft. The workpiece can be clamped from the inside and outside.

The clamping force depends on the introduction torque and is linear, see chapter 3.4, Introduction torque clamping force diagrams.

2.1 Base unit

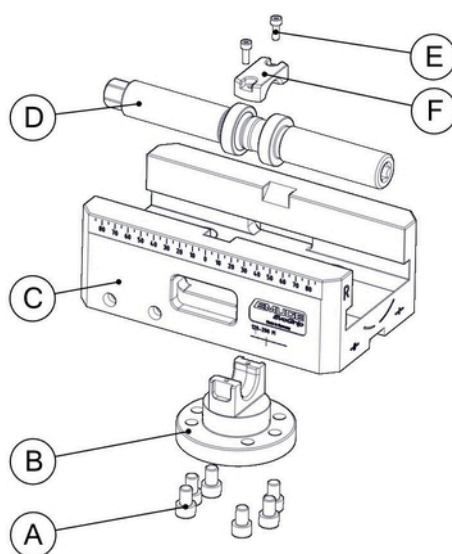


Figure 1: Schematic illustration: Base unit

- A** Cylinder bolts
- B** Spindle holder
- C** Base body
- D** Screw shaft
- E** Cylinder bolts
- F** Lid

The base unit is available in various widths and lengths. The different dimensions lead to different performance limits, see chapter 3.6, Clamping range and max. clamping force .

2.2 Equipment variants

All components that clamp or position a workpiece, as well as attachment components, count as equipment.

The base unit and equipment make up the clamping fixture.

2.2.1 Multi-piece clamping jaws

NOTE



Material damage due to incorrect or incorrectly used cylinder bolts!

- ▶ Only use cylinder bolts with strength class 14.9.
- ▶ Only tighten cylinder bolts to the correct tightening torque, see chapter 3.5, Tightening torques.
- ▶ Replace the cylinder bolts of the reversible jaws after 10,000 clamping cycles.

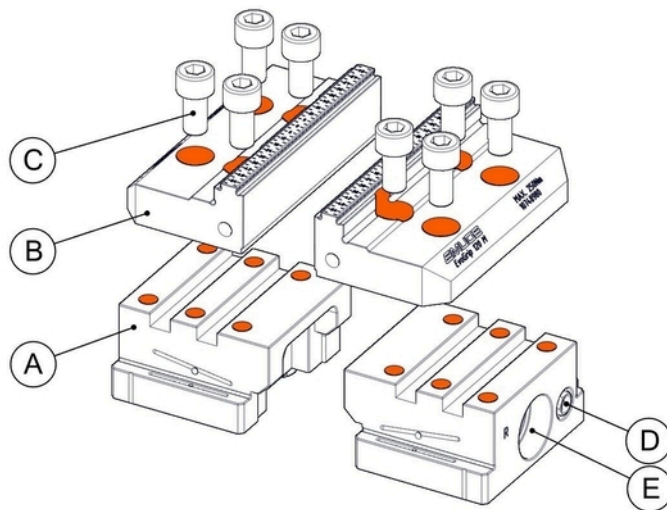


Figure 2: Schematic illustration: multi-piece clamping jaws

- A** Base jaw
- B** Reversible jaw
- C** Cylinder bolt
- D** Grease nipple
- E** Internal thread for screw shaft

The base jaws are installed in the base unit. The installation direction of the base jaws is predetermined.

The reversible jaws are screwed to the base jaws. The reversible jaws can be installed in two directions and in several positions. Reversible jaws are available with different clamping surfaces and in different shapes.

2.2.1.1 Vario reversible jaws

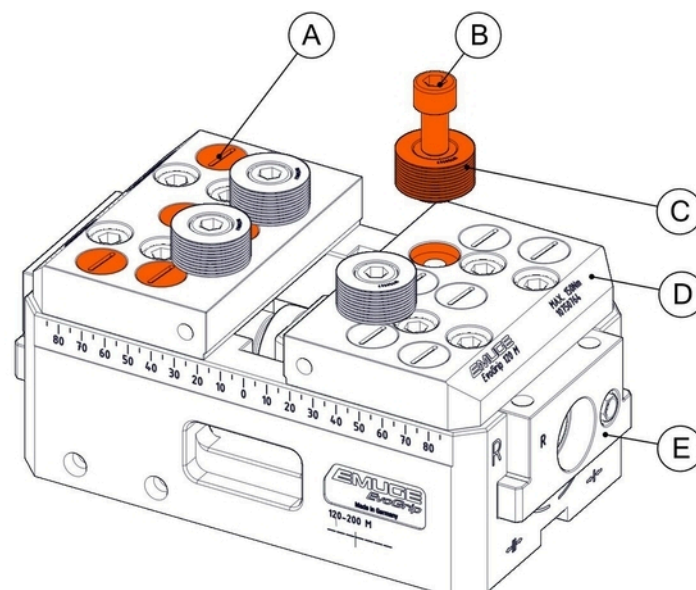


Figure 3: Schematic illustration: Vario reversible jaw

- A** Cover bolt
- B** Cylinder bolt
- C** Grip insert
- D** Vario reversible jaw
- E** Base unit

The Vario reversible jaw has several screw holes for positioning the grip inserts. The grip inserts allow for the adjustment to the respective workpiece outline. Grip inserts are available with different clamping surfaces and in different shapes.

Cover bolts protect the screw holes from contamination.

2.2.1.2 Top jaws

INFORMATION

The top jaw can only be used with the flat reversible jaw with thread!

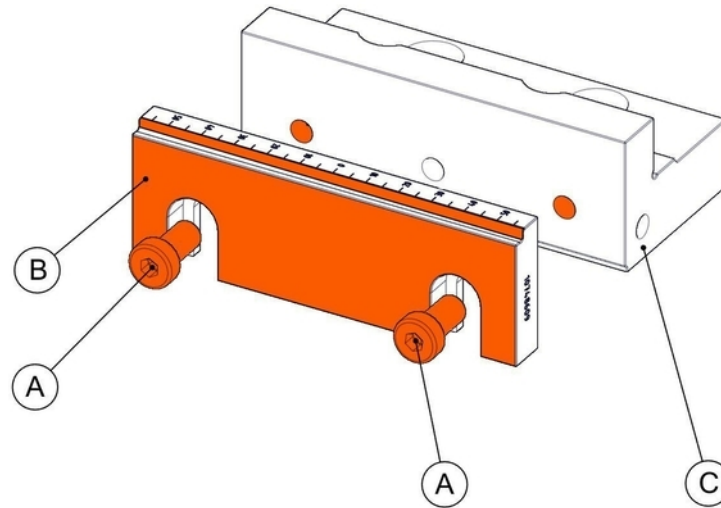


Figure 4: Schematic illustration: Top jaw

- A** Cylinder bolt
- B** Clamping surface of the top jaw
- C** Reversible jaw

The top jaws are available with different clamping surfaces.

2.3 Optional components

2.3.1 Stop

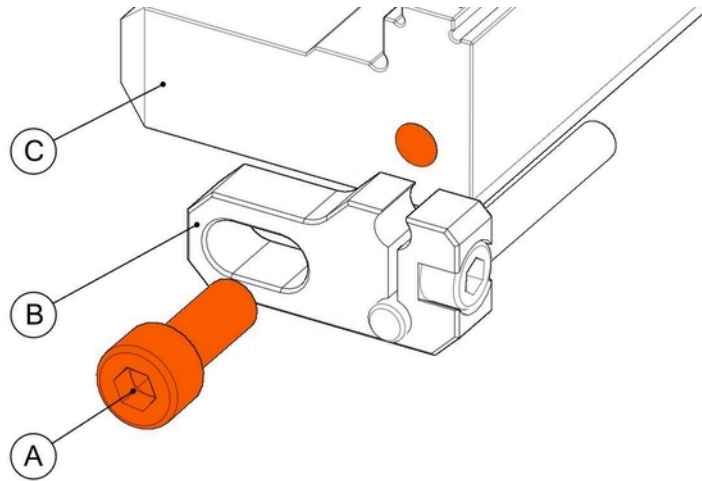


Figure 5: Schematic illustration: Stop

- A** Cylinder bolt
- B** Stop (example)
- C** Reversible jaw

The stop is used to position a workpiece transverse to the axis direction of the clamping fixture. The stop is installed on the threaded hole on the side of a reversible jaw.

2.3.2 Support bracket

INFORMATION

Only half the introduction torque may be applied for one-sided clamping! As a result, only half the clamping force is applied.

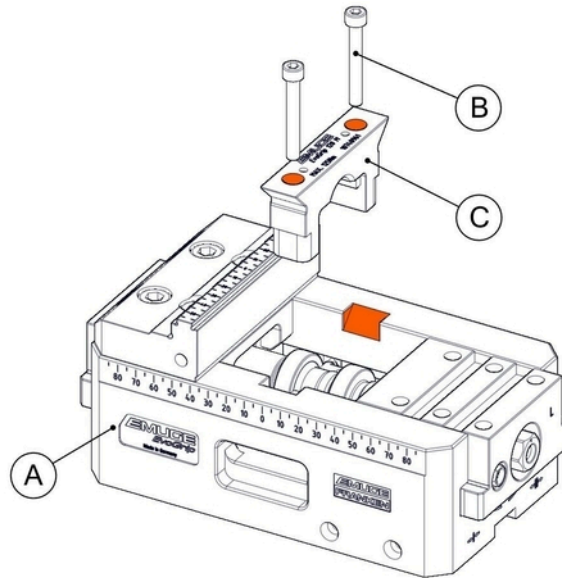


Figure 6: Schematic illustration: one-sided clamping with support bracket

- A** Clamping fixture
- B** Cylinder bolt
- C** Support bracket

The support bracket is required for one-sided clamping.
The screw shaft is additionally supported by the support bracket.

2.3.3 Middle jaw

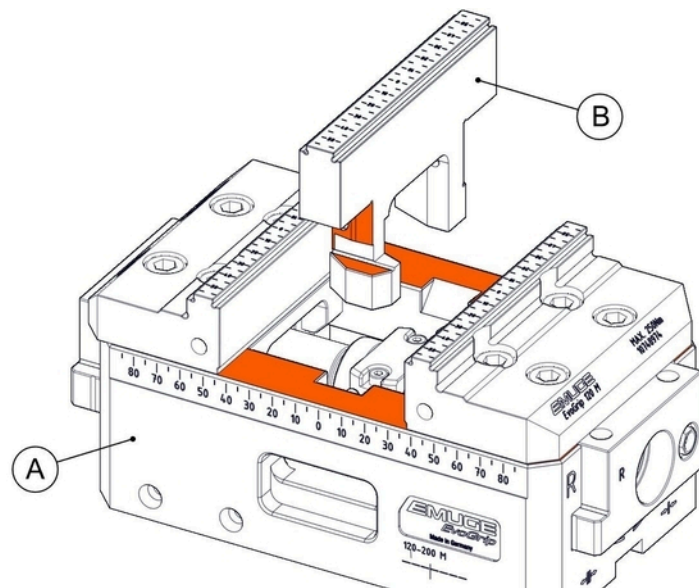


Figure 7: Schematic illustration: Clamping of 2 workpieces with middle jaw

- A** Clamping fixture
- B** Middle jaw

The middle jaw is used for clamping two workpieces.

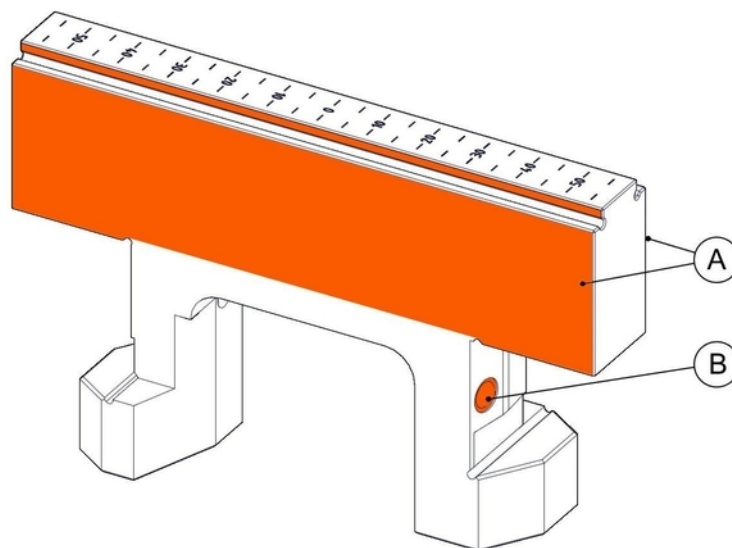


Figure 8: Schematic illustration: Middle jaw

- A** Clamping surface of the middle jaw
- B** Spring locking

The middle jaw is floating and compensates for tolerances between two workpieces.

2.4 Optional clamping variants

2.4.1 One-sided clamping

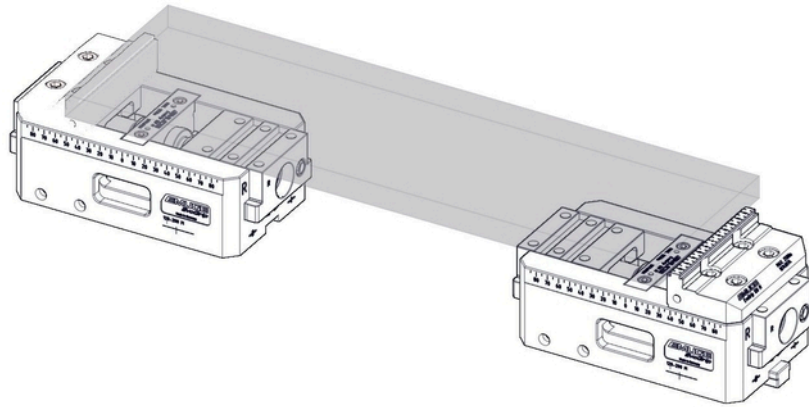


Figure 9: Schematic illustration: one-sided clamping variant

INFORMATION

Only half the introduction torque may be applied for one-sided clamping! As a result, only half the clamping force is applied.

One-sided clamping allows for very large workpieces to be clamped with two or more centering vises installed opposite each other.

For one-sided clamping, a support bracket must be installed on each clamping fixture used, see chapter 2.3.2, Support bracket.

In addition, both base jaws must always be installed for one-sided clamping.

2.4.1.1 Coupling

Synchronous
movement
of 2
clamping
fixtures

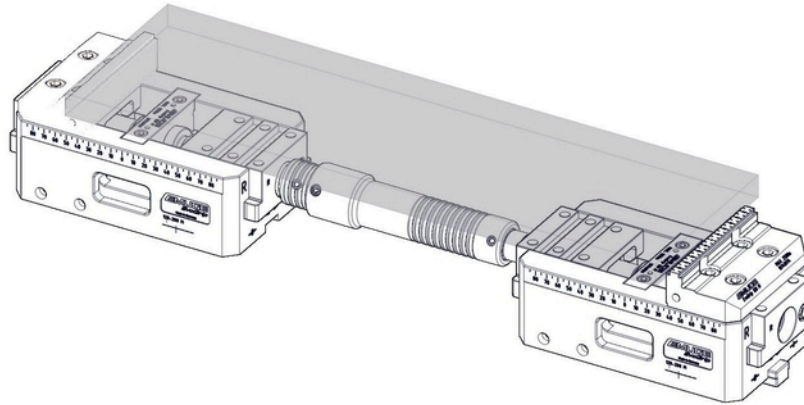


Figure 10: Schematic illustration: one-sided clamping with coupling

Optionally, a coupling can be installed.

If a coupling is used, the interconnected clamping fixtures are moved synchronously.

2.4.2 Clamping of 2 workpieces

If a middle jaw is inserted into the clamping fixture, two workpieces can be clamped at the same time.

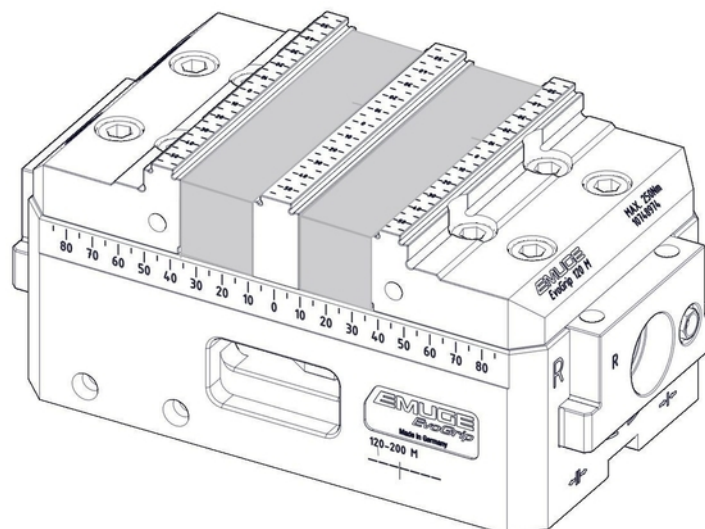


Figure 11: Schematic illustration: Clamping of 2 workpieces

2.5 Interfaces

2.5.1 Mechanical interfaces

There are various cut-outs, threads, screw holes and positioning holes in the base body for installing the clamping fixture.

The required bores or cut-outs are shown for the installation of the respective connection, see chapter 5, Assembly.

Fastening options with dimensions

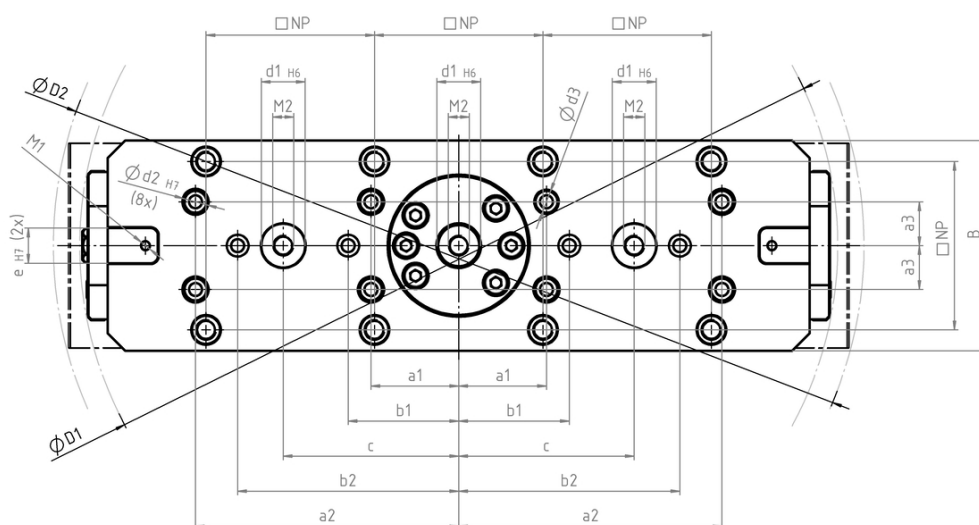


Figure 12: Schematic illustration: Dimensional drawing from below

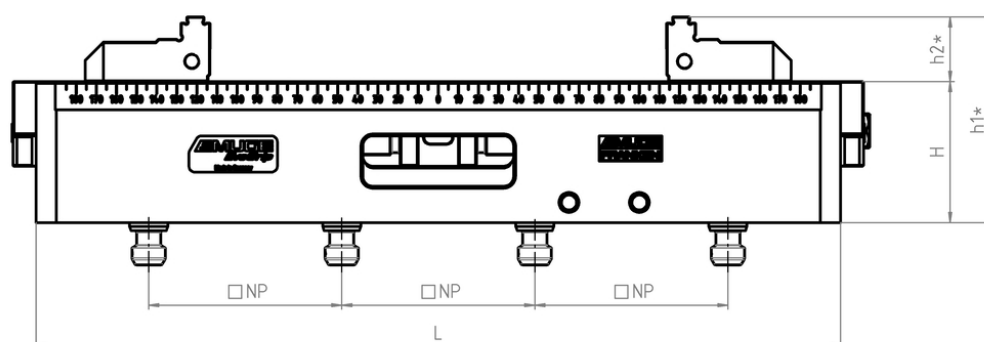


Figure 13: Schematic illustration: Dimensional drawing from the side

Table

* Dimensions vary depending on the type of clamping jaw used

Table 2: Dimensions of the mechanical interfaces

Installation width [mm]	70			100			120		
Installation length [mm]	130	180	230	150	225	300	200	325	400
a1 [mm]	31.5			40			50		
a2 [mm]	-	72.5	94.5	-	92	120	-	150	150
a3 [mm]	14			20			25		
b1 [mm]	40	50	40	40	63	63	63		
b2 [mm]	-	-	80	-	-	126	-	126	126
W [mm]	70			100			120		
c [mm]	-			-	-	100	-	100	100
d1 [mm]	Ø25			Ø25			Ø25		
d2 [mm]	Ø12			Ø12			Ø14		
d3 [mm]	Ø8.5			Ø10.5			Ø12.5		
e [mm]	20			20			20		
D1 [mm]	156	206	256	184	254	328	238	358	432
D2 [mm]	177	224	272	214	283	354	272	390	462
h1* [mm]	72			85			102		
h2* [mm]	24			27			32		
H [mm]	48			58			70		

Product description

Installation width [mm]	70			100			120		
Installation length [mm]	130	180	230	150	225	300	200	325	400
L [mm]	130	180	230	150	225	300	200	325	400
M1 [mm]	M6			M6			M6		
M2 [mm]	M12			M12			M12		
NP [mm]	52			52			96		

3 Technical data

3.1 Identification data

Manufacturer:	EMUGE-Werk Richard Glimpel GmbH & Co. KG Fabrik für Präzisionswerkzeuge Nürnberger Straße 96 – 100 91207 Lauf
Meets the requirements of the directives:	EC machinery directive 2006/42/EC
Meets the harmonized standards:	DIN EN ISO 12100:2011-03 Safety of machinery - General principles for design - Risk assessment and risk reduction

3.1.1 Labeling on the base unit

Type
designation

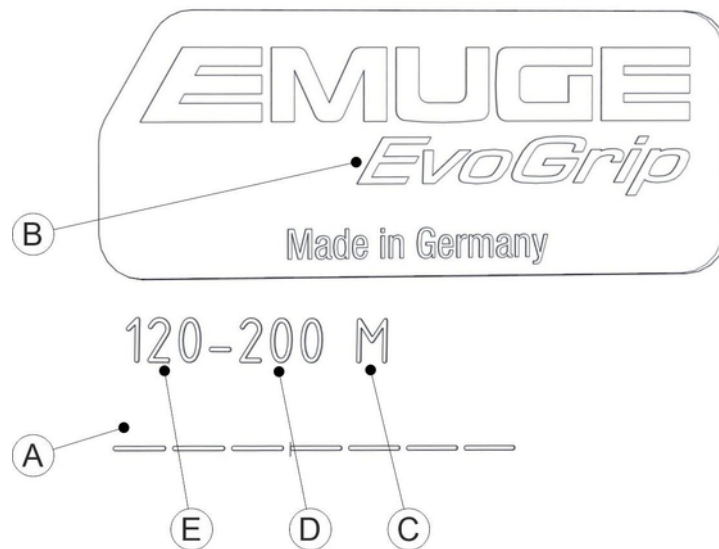


Figure 14: Schematic illustration: Type designation

- A** Batch number
- B** Name of the product line
- C** Version
M = Mechanical
- D** Installation length [mm]
- E** Installation width [mm]

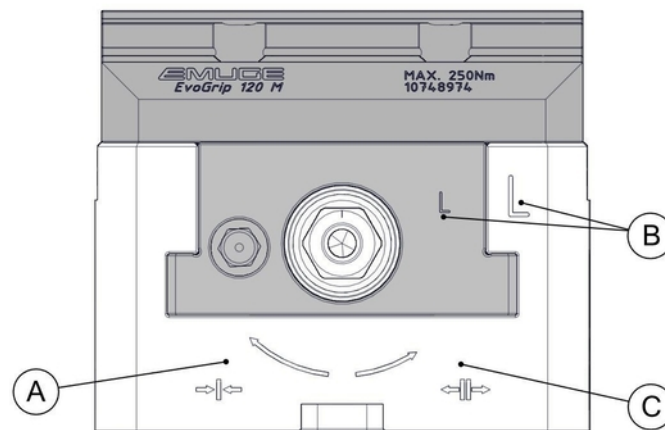
**Labeling
base unit**

Figure 15: Schematic illustration: Labeling base unit

- A** Clockwise thread rotation:
clamping jaws move inwards
- B** Installation side
R = right
L = left
- C** Counterclockwise thread rotation:
clamping jaws move outwards

3.1.2 Labeling on the equipment

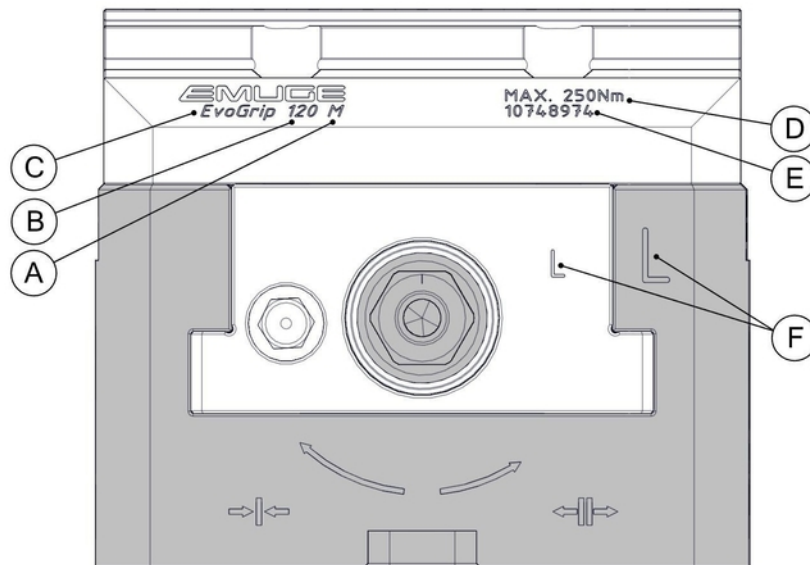


Figure 16: Schematic illustration: Designation on the equipment

- A** Version
M= Mechanical
- B** Installation width [mm]
- C** Name of the product line
- D** Maximum introduction torque [Nm]
- E** Material number
- F** Installation side
R = right
L = left

3.2 Operating conditions

Table 3: Operating conditions

Operating condition	Value
Ambient temperature	15 ... 65 °C
Ambient humidity	< 80%
Magnetic fields	< 5 Gauß

3.3 Dimensions and weights

Table 4: Dimensions and weights

Installation width in mm	Installation length in mm	Min. weight in kg (incl. equipment)	Max. weight in kg (incl. equipment)
70	130	3.2	4.3
	180	4.3	5.3
	230	5.0	6.1
100	150	6.9	9.2
	225	9.3	11.7
	300	11.5	13.9
120	200	12.8	16.4
	325	18.5	22.2
	400	21.8	25.5

3.4 Introduction torque clamping force diagrams

The introduction torques can be read in the diagrams sorted by width, depending on the clamping force.

Overall width
70 mm

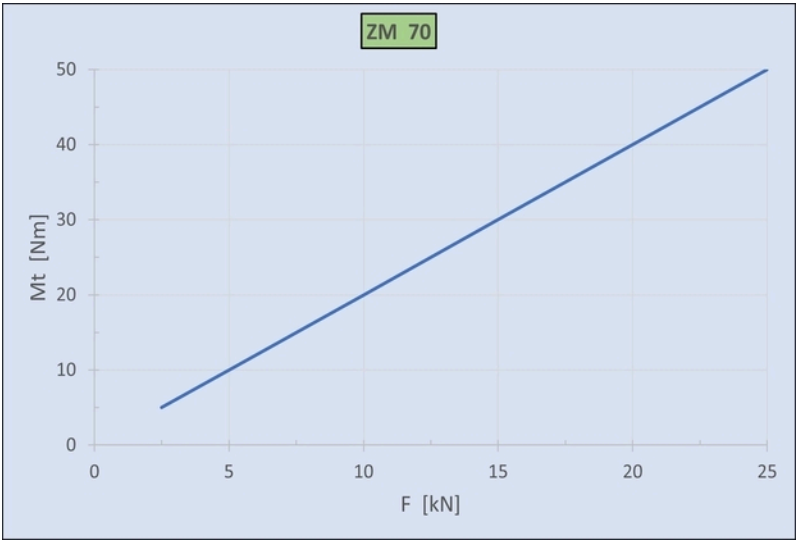


Figure 17: Introduction torque clamping force diagram, width 70 mm

ZM Mechanical centering vise
Mt Introduction torque [Nm]
F Resulting clamping force [kN]

Overall width
100 mm

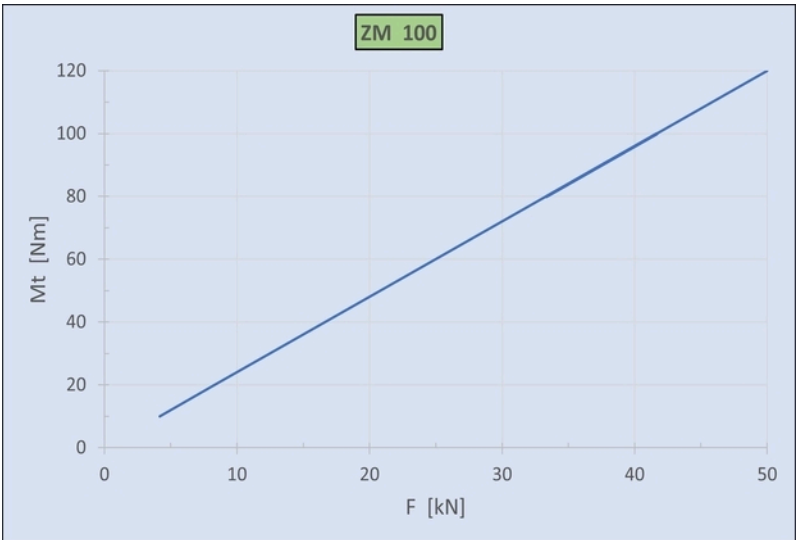


Figure 18: Introduction torque clamping force diagram, width 100 mm

ZM Mechanical centering vise
Mt Introduction torque [Nm]
F Resulting clamping force [kN]

Overall width
120 mm

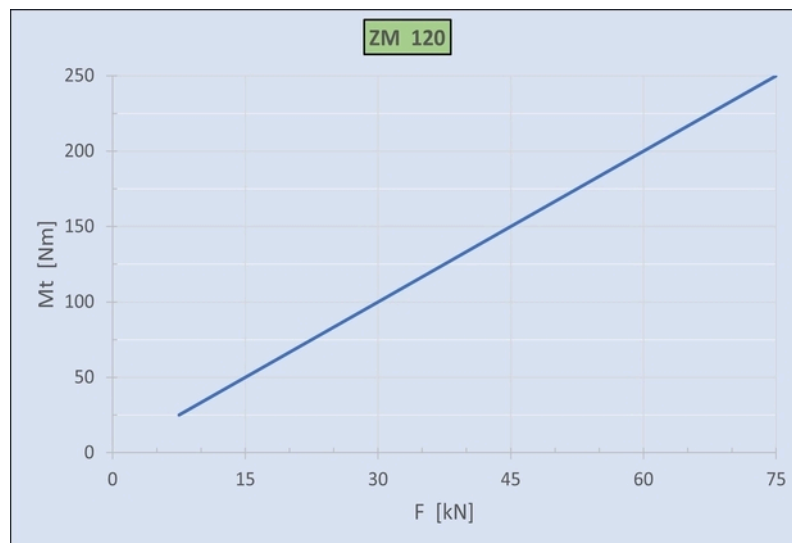


Figure 19: Introduction torque clamping force diagram, width 120 mm

ZM Mechanical centering vise
Mt Introduction torque [Nm]
F Resulting clamping force [kN]

3.5 Tightening torques

Table 5: Tightening torques for screws [Nm]

Reference values of the tightening torques for shaft screws [Nm] Friction figure $\mu=0.1$			
Thread size	Strength class		
	8.8	12.9	14.9
M3	1.0	1.7	-
M4	2.4	4.2	-
M5	4.8	8.3	-
M6	8.3	14	22
M8	20	35	48
M10	40	69	96
M12	69	120	-

3.6 Clamping range and max. clamping force

Clamping inwards

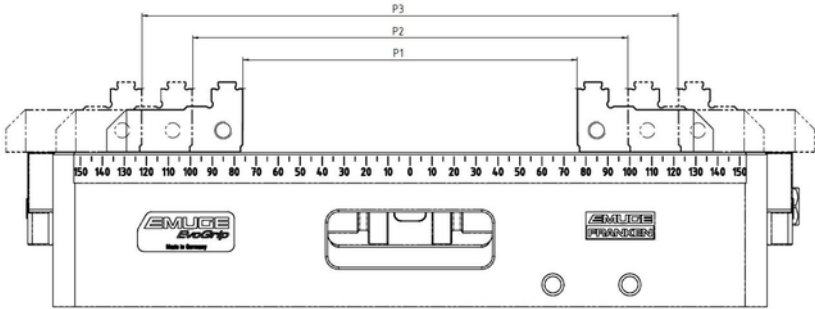


Figure 20: Schematic illustration: Clamping position of the clamping jaws inwards

Table 6: Clamping range, clamping position of the clamping jaws inwards

Installation width [mm]	Installation length [mm]	Max. clamping range		
		P1 [mm]	P2 [mm]	P3 [mm]
70	130	0 – 49	27 – 77	-
	180	0 – 71	27 – 99	55 – 127
	230	0 – 121	27 – 149	55 – 177
100	150	0 – 50	33 – 84	-
	225	0 – 91	33 – 125	67 – 159
	300	0 – 166	33 – 200	67 – 234
120	200	0 – 73	45 – 119	-
	325	0 – 152	45 – 198	91 – 244
	400	0 – 227	45 – 273	91 – 319

Clamping outwards

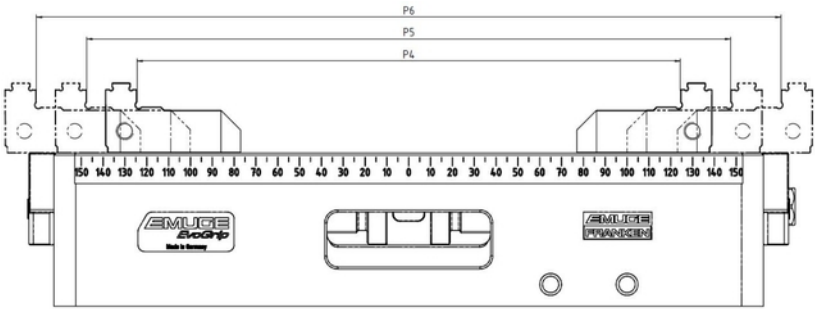


Figure 21: Schematic illustration: Clamping position of the clamping jaws outwards

Table 7: Clamping range, clamping position of the clamping jaws outwards

Installation width [mm]	Installation length [mm]	Max. clamping range		
		P4 [mm]	P5 [mm]	P6 [mm]
70	130	61 – 111	89 – 139	-
	180	61 – 133	89 – 161	117 – 189
	230	61 – 183	89 – 211	117 – 239
100	150	78 – 129	112 – 163	-
	225	78 – 170	112 – 204	146 – 238
	300	78 – 245	112 – 279	146 – 323
120	200	96 – 170	142 – 216	-
	325	96 – 249	142 – 295	188 – 341
	400	96 – 324	142 – 370	188 – 416

Clamping outwards

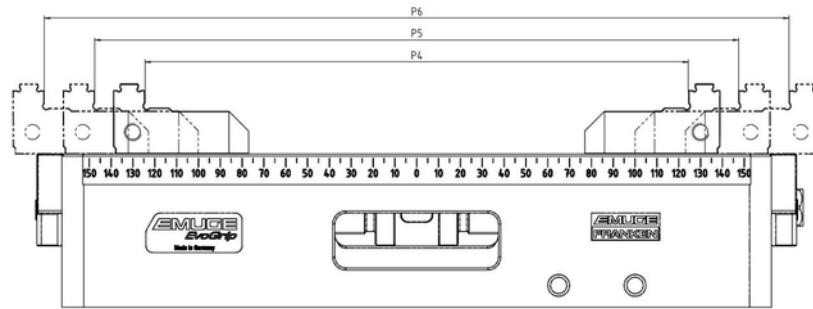


Figure 22: Schematic illustration: Clamping position of the clamping jaws outwards

Table 8: Clamping range, clamping position of the clamping jaws outwards

Installation width [mm]	Installation length [mm]	Max. clamping range		
		P4 [mm]	P5 [mm]	P6 [mm]
70	130	61 – 111	89 – 139	-
	180	61 – 133	89 – 161	117 – 189
	230	61 – 183	89 – 211	117 – 239
100	150	78 – 129	112 – 163	-
	225	78 – 170	112 – 204	146 – 238
	300	78 – 245	112 – 279	146 – 323
120	200	96 – 170	142 – 216	-
	325	96 – 249	142 – 295	188 – 341
	400	96 – 324	142 – 370	188 – 416

3.7 Cleaning agents and lubricants

Table 9: Cleaning agents, lubricants and tools

Work process	Cleaning agent or lubricant	Specification	Tool
Clean	-	-	Brush, Lint-free rags
Damp clean	Machine cleaner	Brand "Profi" by Heinol	Brush, Lint-free rags
Replace corrosion protection, oil	Hydraulic oil HLP 46	DIN 51524-2 (HLP); DIN EN ISO 6743-4 (H)	Brush, Lint-free rags
Grease	Multi-purpose grease	KP2K-30 as per DIN 51502; ISO-L-XCCEB2 as per ISO 6743-9	Brush, Push-type gun

4 Transport and packaging

4.1 Unpacking and checking the delivery

To protect the clamping fixture during transport, the packaging consists of several layers.

Delivery notice The individual order is the basis for the scope of delivery. The scope of delivery is listed in the delivery notice.

Inner packaging The clamping fixture and all other configured components are shipped in precisely fitting inner packaging. The inner packaging protects the contents during transport.

EMUGE GmbH & Co. KG recommends keeping the inner packaging.

If a component is oiled with corrosion protection, it is wrapped in oiled paper before being packaged further.

NOTE



Material damage due to defective inner packaging!

Defective inner packaging indicates improper transport. Improper transport can result in damage to the clamping fixture.

- ▶ If the inner packaging is defective, contact EMUGE GmbH & Co. KG.
- ▶ If the inner packaging is defective, do not use the clamping fixture without consulting us.

Unpacking components

1. Compare the order with the delivery notice.
2. Compare the delivery notice with the delivered components.
3. Unpack the components, check for damage and make a complaint if necessary.

✓ The clamping fixture can be installed and equipped.

4.2 Transporting the clamping fixture

Transport or shipping

1. Clean the outside of the clamping fixture.
 2. Renew the corrosion protection of the metal surfaces.
 3. Grease the thread and guide surfaces.
 4. Pack components in suitable, closed containers.
 - EMUGE GmbH & Co. KG recommends using the original inner packaging.
 5. When the components are shipped, package the components with a second layer.
- ✓ The clamping fixture is ready for transport or shipping.

4.3 Install eyebolts

To move clamping fixtures heavier than 15 kg, suitable eyebolts must be installed to the provided positioning holes.

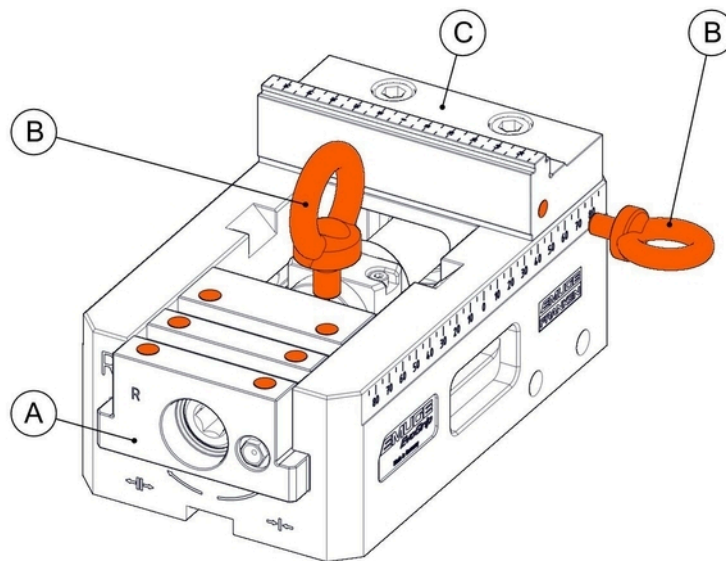


Figure 23: Schematic illustration: Install eyebolts

- A** Base jaw
- B** Eyebolt
- C** Reversible jaw

5 Assembly

NOTE



Material damage due to incorrect tightening torque!

If a screw is tightened to an incorrect tightening torque, the clamping fixture may be damaged.

- ▶ Tighten the screws to the specified tightening torques, see chapter 3.5, Tightening torques.

5.1 Preparing the machine and clamping fixture

⚠ WARNING



Risk of injury due to improper movement of heavy components!

The clamping fixture and connection components of the larger widths and lengths can weigh more than 15 kg. Uncontrolled movements can result in injuries.

- ▶ Observe the weight and the maximal dimensions of the clamping fixture, see chapter 3.3, Dimensions and weights.
- ▶ Use suitable eyebolts or lifting straps to move the clamping fixture and connection components, see chapter 4.3, Install eyebolts.
- ▶ Secure the clamping fixture to the means of transport.
- ▶ Wear personal protective equipment, in particular a hard hat, protective gloves and safety shoes.
- ▶ Do not move below suspended loads.
- ▶ Move heavy weights with at least two people or a suitable lifting device.
- ▶ Use suitable means of transport for longer distances.

Machine interface

- Free of objects
- Clean and dry or oiled
- Easily accessible
- Choose the position so that the clamping fixture is easy to install.

Clamping device

- Clean
- Screw shaft and guides greased
- Metal surfaces oiled with corrosion protection

Installing an interface If an interface is used, this interface must be properly installed in the machine.
Observe the operating and assembly instructions for the interface used.

5.2 Installing the clamping fixture

NOTE



Material damage due to damage to the screw shaft!

Pressure or impacts can damage the fine thread. If the fine thread is damaged, the function of the clamping fixture cannot be guaranteed.

- ▶ Do not touch the screw shaft with the tool.
- ▶ Only use screw shafts in perfect condition.

INFORMATION

Centering bores and screw holes vary with the overall lengths!

The number and position of the centering bores and screw holes depend on the overall length used, see chapter 2.5.1, Mechanical interfaces.

The illustrations in these operating and assembly instructions correspond to width 120 and length 200.

INFORMATION

The screw shaft is aligned in the clamping fixture before delivery.

As soon as the spindle holder is released, the screw shaft must be realigned, see chapter 10.3, Replacing the screw shaft.

Variants

Depending on the application, choose from the positioning and mounting variants described below.

All variants must be combined correctly and sensibly.

5.2.1 Using positioning variants

5.2.1.1 Positioning the clamping fixture with loose slot nuts

Overview

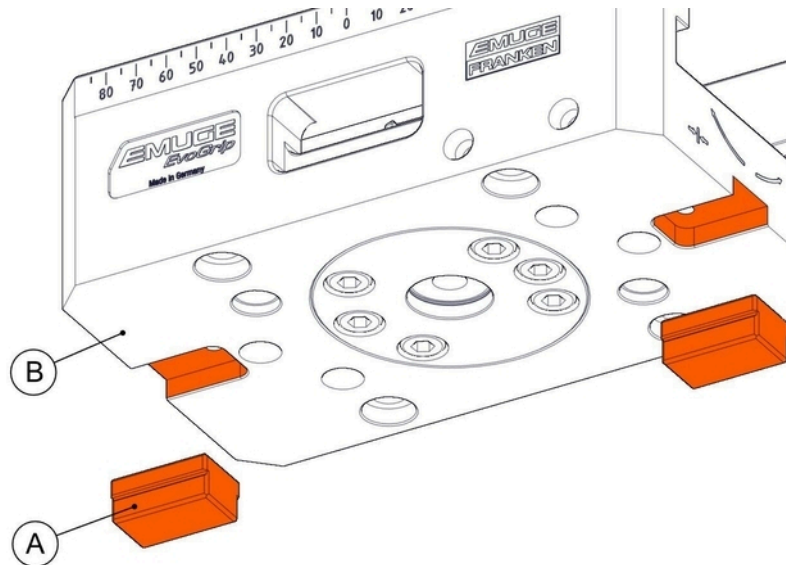


Figure 24: Schematic illustration: Positioning via loose slot nuts

- A** Loose slot nut
- B** Clamping fixture

Assembly

1. Insert the slot nuts (pos. A) into the slot of the machine interface.
 2. Position the clamping fixture (pos. B) with the integrated slots over the loose slot nuts (pos. A) in the machine interface.
 - The clamping fixture (pos. B) must lie flat and level.
- ✓ The clamping fixture is positioned and ready for fastening.

5.2.1.2 Positioning the clamping fixture with screwed slot nuts

Overview

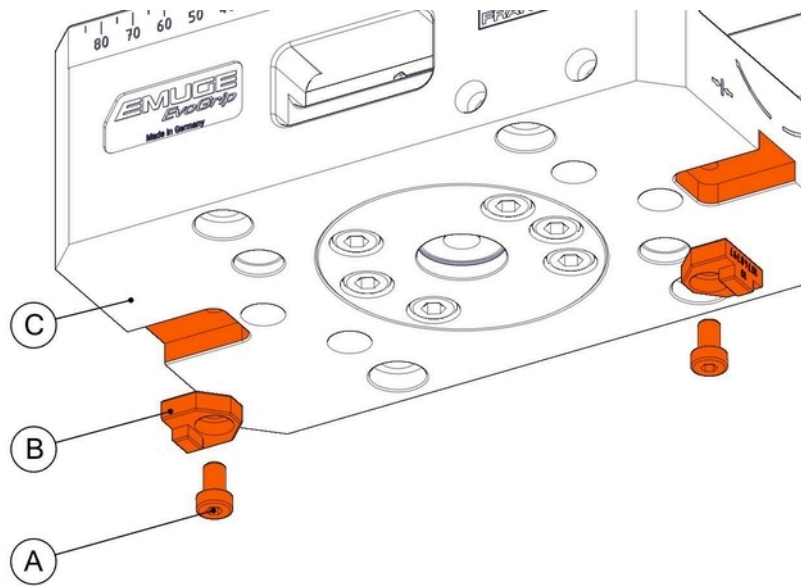


Figure 25: Schematic illustration: Positioning with screwed slot nuts

- A** Cylinder bolt
- B** Slot nut
- C** Clamping fixture

Assembly

1. Insert the slot nuts (pos. B) from below into the clamping fixture (pos. C).
 2. Screw the cylinder bolts (pos. A) of the slot nuts into the clamping fixture and tighten.
 3. Position the clamping fixture (pos. C) in the slot of the machine interface using slot nuts (pos. B).
 - The clamping fixture must lie flat and level.
- ✓ The clamping fixture is positioned and ready for fastening.

5.2.1.3 Positioning the clamping fixture with centering bushes

Overview

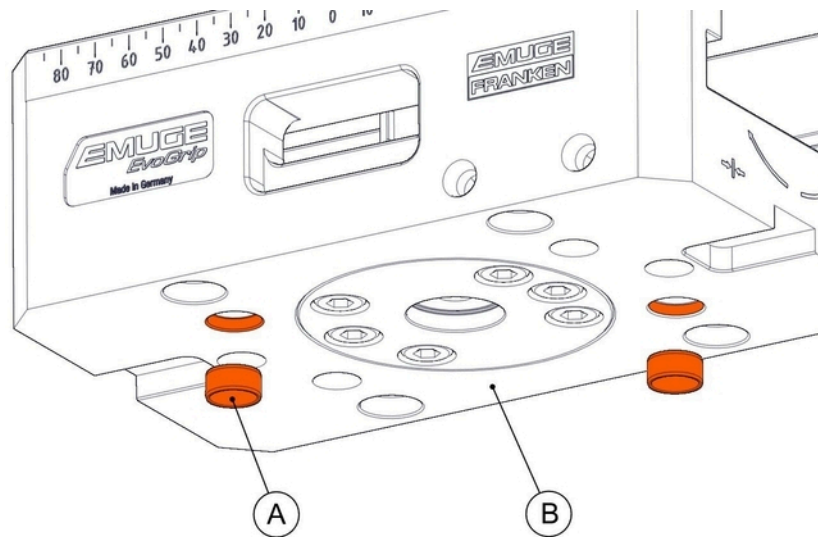


Figure 26: Schematic illustration: Positioning with centering bushes

- A** Centering bush
- B** Clamping fixture

Assembly

1. Install at least 2 centering bushes (pos. A) diagonally into the intended positioning holes of the clamping fixture (pos. B) or the machine interface.
 2. Position the clamping fixture (pos. B) on the machine interface using centering bushes (pos. A).
- ✓ The clamping fixture is positioned and ready for fastening.

5.2.2 Using mounting variants

Select a sufficient number of threaded holes with a suitable thread for fastening.

The matching nuts for T-slots can be used.

5.2.2.1 Fastening the clamping fixture with screw connection

Overview

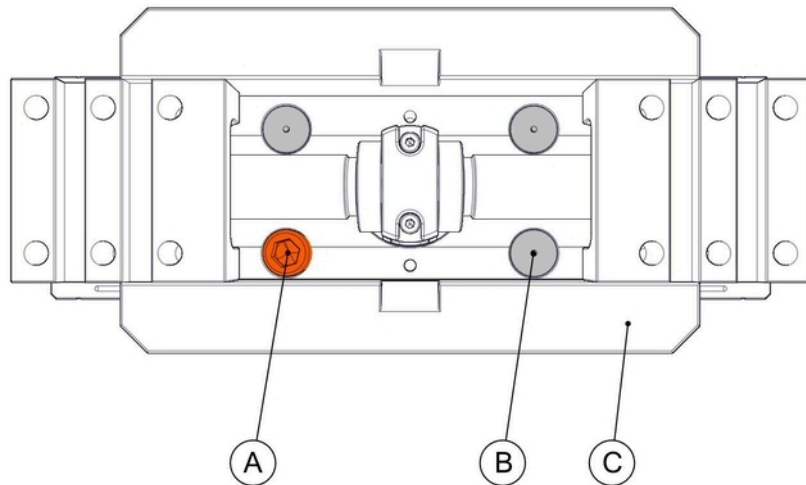


Figure 27: Schematic illustration: Screw connection

- A** Cylinder bolt
- B** Covering cap
- C** Clamping fixture

Pre-requisite ■ The clamping jaws are positioned so that the screw connection is accessible.

- Assembly**
1. Install and tighten the cylinder bolts (pos. A).
 - ⇒ The clamping fixture is fastened to the machine interface.
 2. Insert the cover caps (pos. B) into the screw holes of the clamping fixture (pos. C).
 - Use a suitable auxiliary tool, e.g. cylinder bolt with matching thread.
 - Use the central auxiliary thread for installing and removing the cover caps.
 - The cover caps must be flush with the plane surface of the base body.
- ✓ The clamping fixture is ready for operation.

5.2.2.2 Fastening the clamping fixture to the center axis with a screw connection

INFORMATION

For stable clamping, additional securing with clamping claws is recommended.

Overview

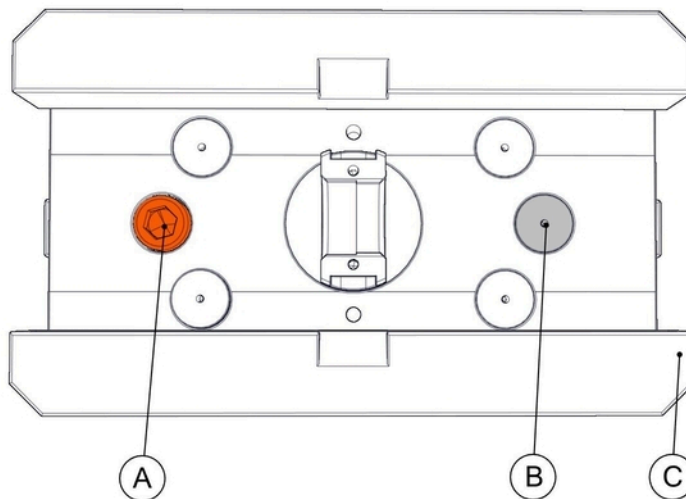


Figure 28: Schematic illustration: Screw connection on the center axis

- A** Cylinder bolt
- B** Covering cap
- C** Clamping fixture

Pre-requisites

- Multi-piece clamping jaws are removed, see chapter 6, Changing the equipment variants.
- The lid and screw shaft are removed, see chapter 10.3, Replacing the screw shaft.
- The spindle holder remains installed.

Assembly

1. Install and tighten the cylinder bolts (pos. A).
⇒ The clamping fixture is fastened to the machine interface.
2. Insert the cover caps (pos. B) into the screw holes of the clamping fixture (pos. C).
 - Use a suitable auxiliary tool, e.g. cylinder bolt with matching thread.
 - Use the central auxiliary thread for installing and removing the cover caps.
 - The cover caps must be flush with the plane surface of the base body.
3. Install the screw shaft, see chapter 10.3, Replacing the screw shaft.

4. Equip the base unit, see chapter 6, Changing the equipment variants.
 - ✓ The clamping fixture is ready for operation.

5.2.2.3 Fastening the clamping fixture with clamping claws

INFORMATION

For stable clamping, additional securing by screwing is recommended.

Overview

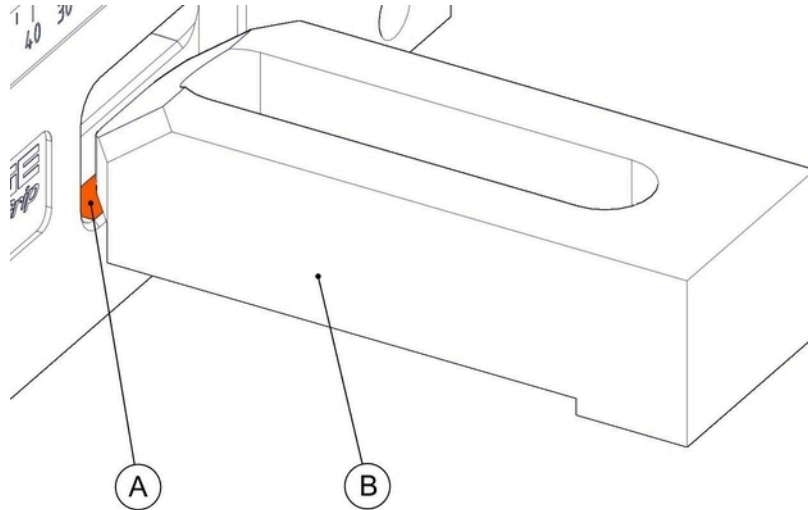


Figure 29: Schematic illustration: Fastening with clamping claw

- A** Support surface on the clamping fixture
- B** Clamping claw (provided by customer)

Assembly

1. Position the clamping fixture.
 - Select the distance to match the length of the clamping claw.
 2. Place the customer-side clamping claws (pos. B) on the support surface of the clamping fixture (pos. A).
 3. Attach the customer-side clamping claws (pos. B).
 - ⇒ The clamping fixture is fastened to the machine interface.
 4. If not already done, equip the base unit, see chapter 6, Changing the equipment variants.
- ✓ The clamping fixture is ready for operation.

5.2.3 Using zero-point systems

5.2.3.1 Using EvoPoint zero-point system

Overview

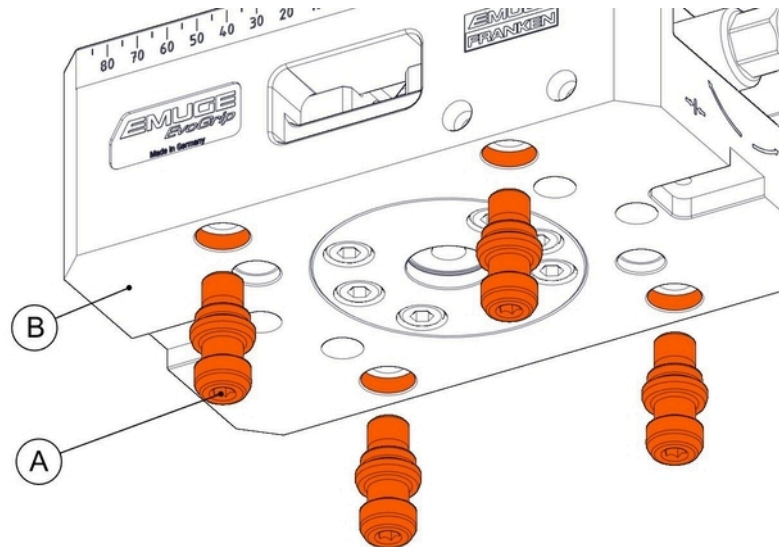


Figure 30: Schematic illustration: Assembly / disassembly of the locating bolts for EvoPoint zero-point system

- A** Locating bolt
- B** Clamping fixture

Assembly

1. Insert the locating bolt (pos. A) from below into the locating holes of the clamping fixture (pos. B) and tighten to 30 Nm.
- ✓ The clamping fixture is ready for fastening on the EvoPoint zero-point system.

5.2.3.2 Using compatible zero-point systems

Overview of locatingbolts

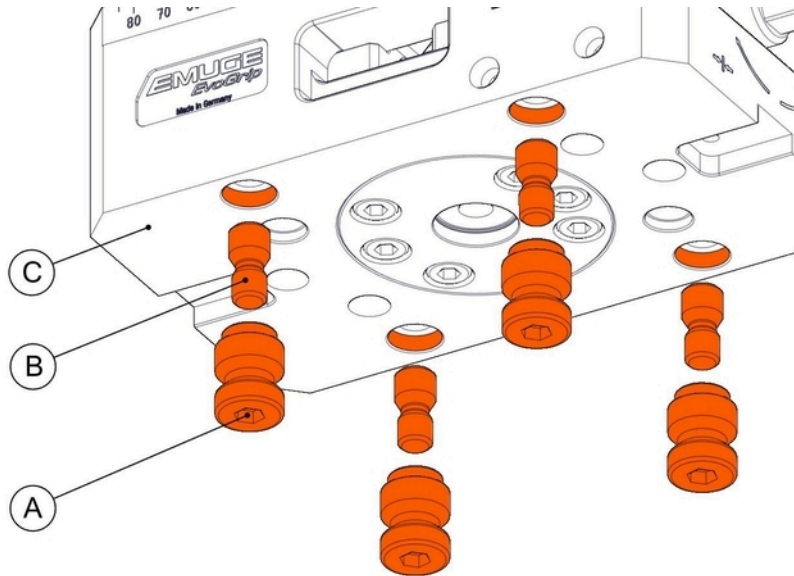


Figure 31: Schematic illustration: Assembly / disassembly of the locating bolts for compatible zero-point systems

- A** Locating bolt (customer-side)
- B** Threaded adapter
- C** Clamping fixture

Installing locatingbolts

1. Screw the threaded adapter (pos. B) from below into the locating holes of the clamping fixture (pos. C).
 2. Screw the customer-side locating bolt (pos. A) from below onto the threaded adapter (pos. B) and tighten to 30 Nm.
- ✓ The clamping fixture is ready to be fastened to the compatible zero-point system.

Overview of central clamping bolt

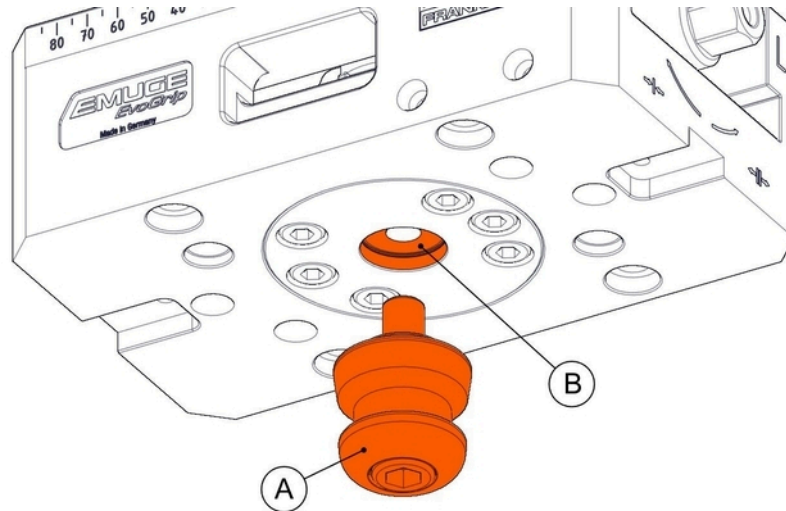


Figure 32: Schematic illustration: Assembly / disassembly of the clamping bolt for compatible zero-point systems

- A** Clamping bolt (customer-side)
B Clamping fixture

Installing central clamping bolts

1. Insert the customer-side clamping bolt (pos. A) from below into the central locating hole of the clamping fixture (pos. B) and tighten to 120 Nm.
 - The bore for the customer-side clamping bolt has a diameter of 25 mm.
 - It is attached using an M12 thread.
- ✓ The clamping fixture is ready to be fastened to the compatible zero-point system.

5.3 Installing optional clamping variants

5.3.1 Installing the one-sided clamping variant

Overview

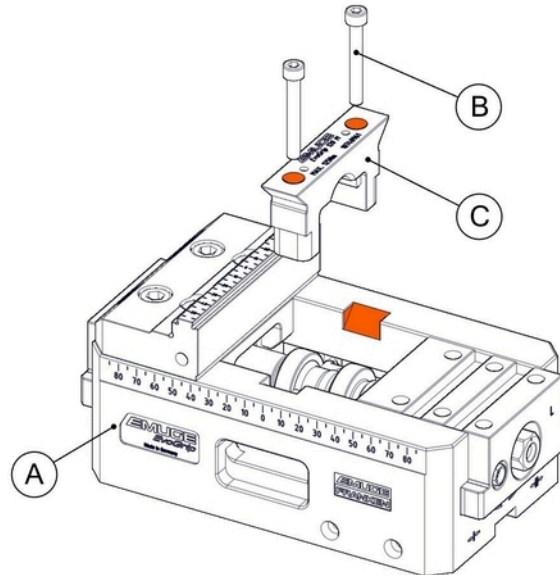


Figure 33: Schematic illustration: Overview of one-sided clamping variant

- A** Clamping fixture
- B** Cylinder bolt
- C** Support bracket

INFORMATION

Only half the introduction torque may be applied for one-sided clamping! As a result, only half the clamping force is applied.

- Prerequisites**
- The desired reversible jaw is installed on one side of the clamping fixture.
 - Both base jaws of the multi-piece clamping jaws are installed.

Assembly

1. Install the clamping fixture (pos. A) to the machine interface, see chapter 5.2, Installing the clamping fixture.
 2. If present, remove the lid of the spindle holder, see chapter 10.3, Replacing the screw shaft.
 3. Install the support bracket (pos. C), see chapter 6.2.2, Changing the support bracket.
 4. If required, install the coupling.
- ✓ The clamping fixture is ready for one-sided clamping.

5.3.1.1 Installing the coupling

Prerequisites

- The clamping fixtures have been installed.
- The clamping fixtures have the same clamping position:
 - The base jaws lie flat against the respective support bracket.
- The clamping fixtures are aligned with each other.
- The clamping fixtures are aligned in the same direction.

Overview

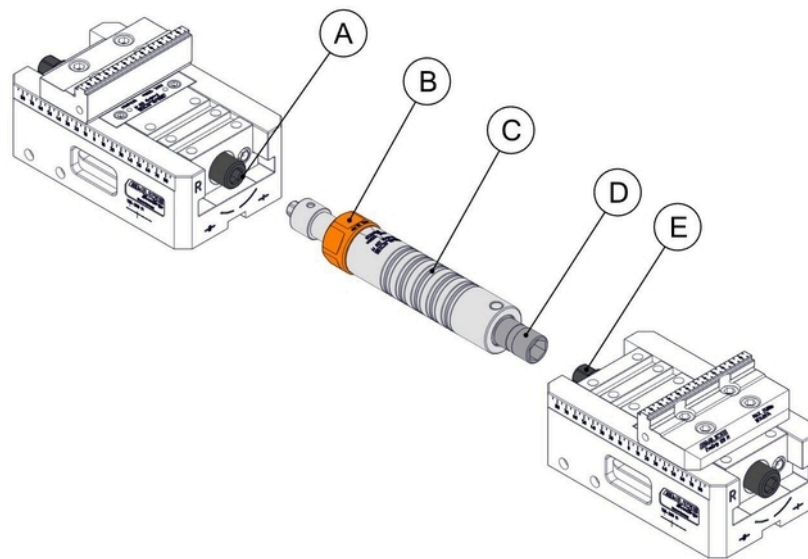


Figure 34: Schematic illustration: Installing the coupling

- A** Interface of the screw shaft (hexagon socket)
- B** Nut
- C** Coupling
- D** Wrench socket
- E** Interface of the screw shaft (hexagon head)

Assembly

1. Place the wrench socket (pos. D) on the square of the coupling (pos. C).
2. Loosen the nut (pos. B) of the coupling (pos. C) by 1-2 turns.
3. Pull both ends of the coupling (pos. C) to roughly adjust the length.

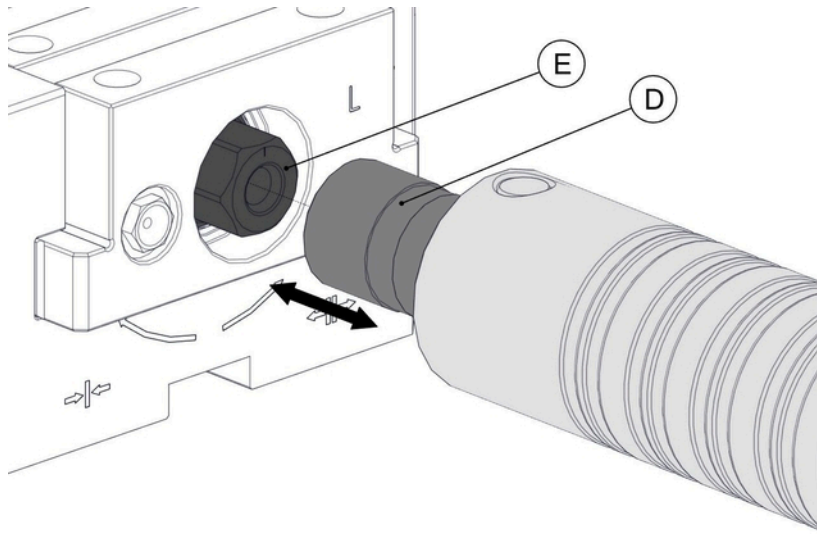


Figure 35: Schematic illustration: Interface of the screw shaft (hexagon head)

- D** Wrench socket
- E** Interface of the screw shaft (hexagon head)

4. Install the hexagon socket of the wrench socket (pos. D) on the block on the hexagon head of the screw shaft (pos. E).
5. Pull the free end of the coupling (pos. C).

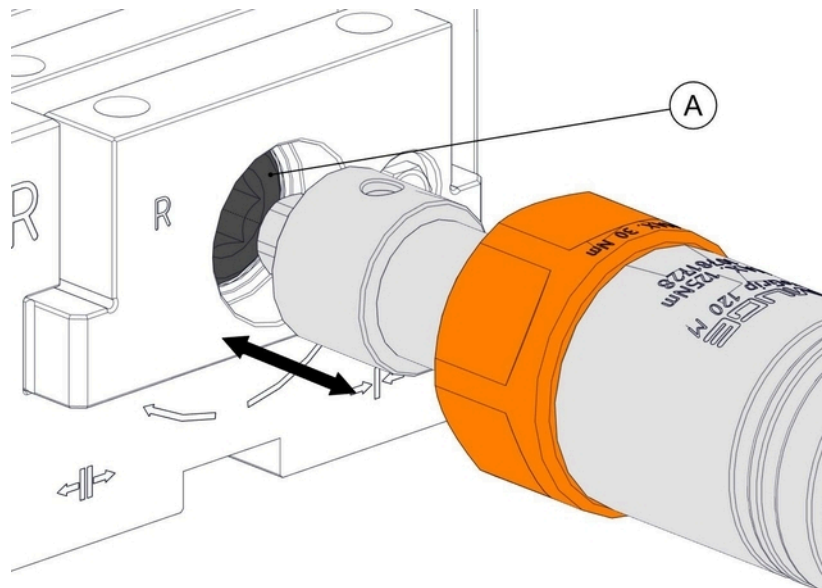


Figure 36: Schematic illustration: Interface of the screw shaft (hexagon socket)

A Interface of the screw shaft (hexagon socket)

6. Check whether the hexagon head of the coupling (pos. C) is positioned correctly in relation to the hexagon socket of the screw shaft (pos. A).

7. Align the coupling as required:

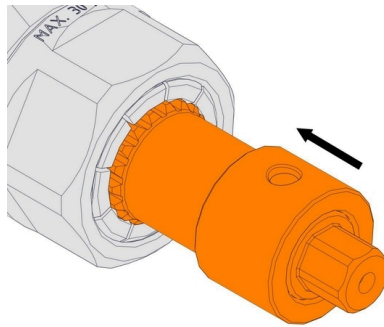


Figure 37: Schematic illustration: Aligning the coupling

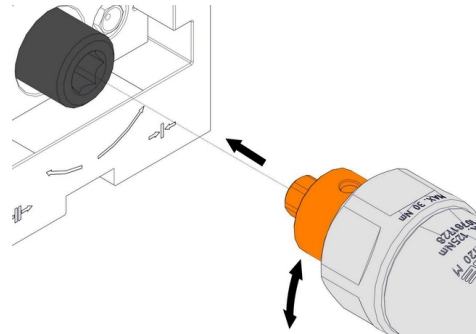


Figure 38: Schematic illustration: Aligning the coupling

INFORMATION

Due to the division of the toothing in the coupling (pos. C), the hexagon head of the coupling and the hexagon socket of the wrench socket can be rotated in a certain position in relation to each other.

- a) Push the free end of the coupling (pos. C) up to the block into the coupling.
 - b) Turn the free end of the coupling (pos. C) in the desired direction.
 - The hexagon head of the coupling (pos. C) should be aligned with the hexagon socket of the screw shaft (pos. A).
8. Install the hexagon head of the coupling (pos. C) on the block in the hexagon socket of the screw shaft (pos. A).
 9. Tighten the nut (pos. B).
 - The maximum tightening torque labeled on the nut must be observed.
 - To ensure that the screw shafts (pos. A, pos. E) do not turn during this process, they must be held against the clamping fixture during clamping.
- ✓ The clamping fixtures are ready for synchronized movement.

5.3.2 Installing the clamping variant for clamping 2 workpieces

Prerequisite ■ Clamping jaws matching the middle jaw are installed.

Overview

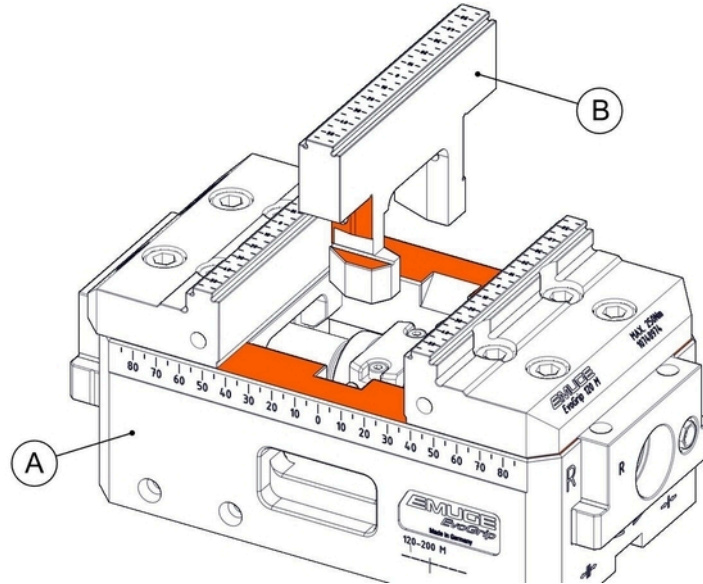


Figure 39: Schematic illustration: Clamping variant for clamping 2 workpieces

- A** Clamping fixture
- B** Middle jaw

Assembly

1. Install the clamping fixture (pos. A) to the machine interface, see chapter 5.2, Installing the clamping fixture.
 2. Install the middle jaw (pos. B), see chapter 6.2.3, Changing the middle jaw.
- ⇒ The clamping fixture is ready for clamping 2 workpieces.

6 Changing the equipment variants

NOTE



Property damage due to asynchronous or asymmetrical clamping jaws!

If the clamping jaws are not installed symmetrically, the workpiece cannot be clamped centrically. An off-center workpiece position can result in damage to the machine and workpiece.

- ▶ Ensure that the clamping jaws are centered. The imprinted scale helps with positioning.
- ▶ Always swap the reversible jaws in pairs.
- ▶ Verify the use of individual clamping jaws with EMUGE GmbH & Co. KG.

NOTE



Material damage due to incorrect tightening torque!

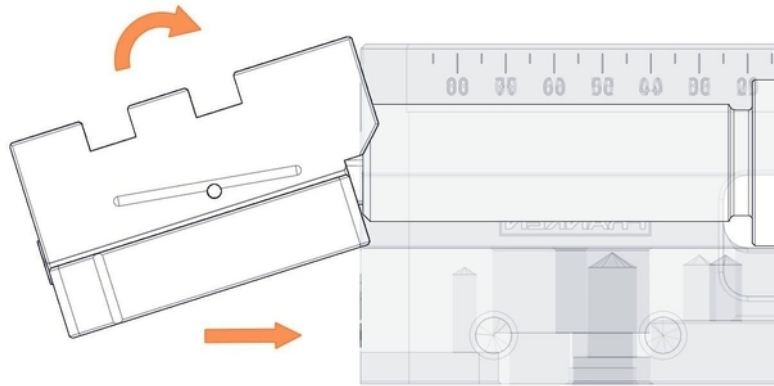
If a screw is tightened to an incorrect tightening torque, the clamping fixture may be damaged.

- ▶ Tighten the screws to the specified tightening torques, see chapter 3.5, Tightening torques.

Prevent tilting**INFORMATION**

The process described below is referred to as “tipping in”.
Tipping in can prevent the base jaws from tilting.

1. Guide the base jaw slightly tipped to the guide surface of the base unit and position it.



2. Once contact has been made with the guide rails of the base unit, tip the upper edge of the base jaw towards the screw shaft and push it in.
- ⇒ The base jaw lies flat in the guide surfaces of the base unit.

6.1 Changing the multi-piece clamping jaws

Overview

Replacing reversible jaws

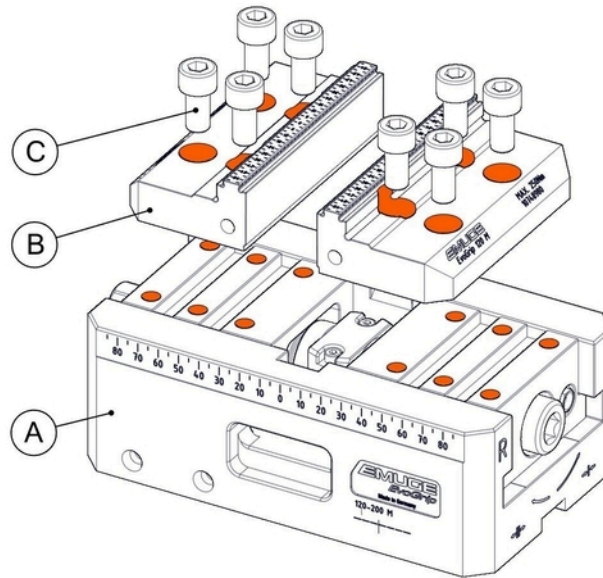


Figure 40: Schematic illustration: Changing the reversible jaws

- A** Base unit
- B** Reversible jaw
- C** Cylinder bolt

NOTE



Material damage due to incorrect or incorrectly used cylinder bolts!

- ▶ Only use cylinder bolts with strength class 14.9.
- ▶ Only tighten cylinder bolts to the correct tightening torque, see chapter 3.5, Tightening torques.
- ▶ Replace the cylinder bolts of the reversible jaws after 10,000 clamping cycles.

Removing reversible jaws

1. Loosen and remove the cylinder bolts (pos. C).
 2. Remove the reversible jaws (pos. B).
 - Clean and oil reversible jaws (pos. B) for reuse.
- ⇒ The base jaws are ready for new reversible jaws.

Installing reversible jaws

1. Position the reversible jaws (pos. B) in the correct position on the base jaw (pos. D) using the clamping situation.
2. Install and tighten the cylinder bolts (pos. C).
 - ✓ The reversible jaws are installed on the base jaws.
 - ✓ The clamping fixture is ready for operation.

Overview Replacing base jaws

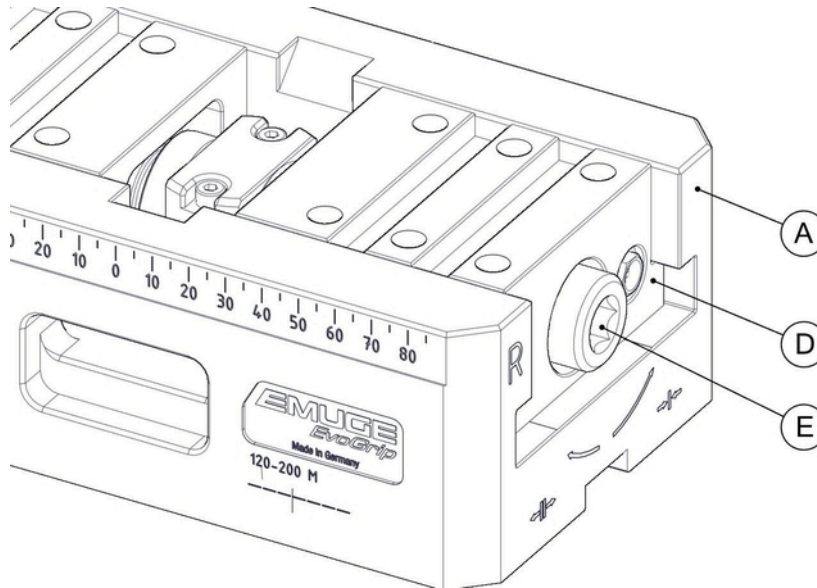


Figure 41: Schematic illustration: Changing base jaws

- A** Base unit
- D** Base jaw
- E** Screw shaft

Removing base jaws

1. Turn the screw shaft (pos. E) to move the base jaws (pos. D) outwards.
 2. Stop movement when the threads of screw shaft (pos. E) and base jaws (pos. D) are no longer engaged.
 - For the direction of rotation, observe the labeling of the base unit (pos. A), see chapter 3.1.1, Labeling on the base unit.
 3. Pull the base jaws (pos. D) out of the guide and remove them.
 4. If the sealing rings in the base jaws (pos. D) are damaged, replace the sealing rings, see chapter 10.4, Replacing the sealing rings of the base jaw.
- ⇒ The base jaws are removed from the base unit.

Base jaws maintenance

Before installing new base jaws (pos. D), the thread for the screw shaft (pos. E) in the respective base jaw must be cleaned and greased, see chapter 9.1, Service plan.

Thread spindle maintenance

Before installing new base jaws (pos. D), the screw shaft (pos. E) must be cleaned and greased, see chapter 9.1, Service plan.

Base unit maintenance

1. Clean the base body of the base unit (pos. A) and oil with corrosion protection.
 2. Clean and grease the guides and sliding surface on the base unit (pos. A) and base jaws (pos. D).
- ⇒ The base jaws can be installed.

**Installing
base
jaws**

1. Install the base jaws (pos. D) in the guides according to the installation direction and at the same time apply light pressure to the screw shaft (pos. E).
 - Prevent tilting by tipping in.
 2. Screw the thread of the screw shaft (pos. E) into the base jaws (pos. D). Ensure symmetrical movement of the base jaws (pos. D).
 - The preload of the sealing rings in the base jaws (pos. D) must be overpressed.
 - The imprinted scale helps with checking.
- ✓ The base jaws are installed symmetrically.
 - ✓ The base jaws are ready to receive new reversible jaws.

6.1.1 Equipping Vario reversible jaws

Overview

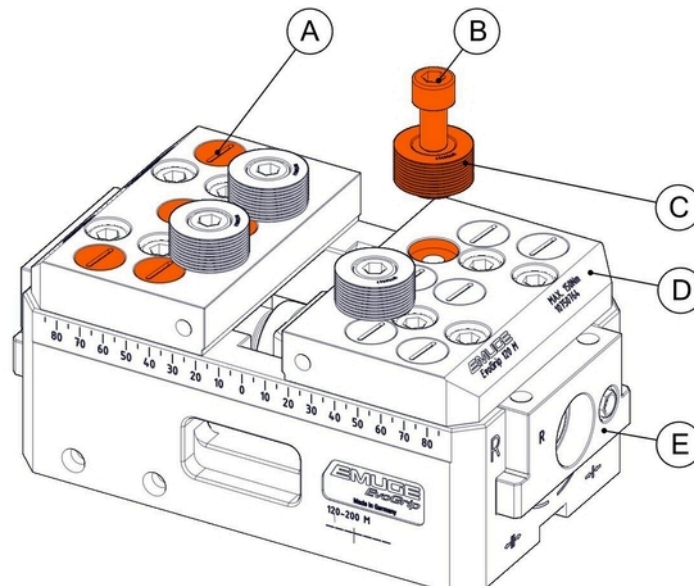


Figure 42: Schematic illustration: Changing the equipment of the Vario reversible jaw

- A** Cover bolt
- B** Cylinder bolt
- C** Grip insert
- D** Vario reversible jaw
- E** Base unit

NOTE



Material damage due to incorrect or incorrectly used cylinder bolts!

- ▶ Only use cylinder bolts with strength class 14.9.
- ▶ Only tighten cylinder bolts to the correct tightening torque, see chapter 3.5, Tightening torques.
- ▶ After 10,000 clamping cycles, replace the cylinder bolts of the grip inserts and reversible jaws.

Prerequisite

- The Vario reversible jaws are installed.

Removing Grip inserts

1. Loosen and remove the cylinder bolts (pos. B).
 2. Remove the grip inserts (pos. C).
 3. If the position is not reused, screw cover bolts (pos. A) into the positioning holes.
- ⇒ The grip inserts are removed from the Vario reversible jaws.

INFORMATION

The grip inserts can be positioned based on the workpiece contour.

**Installing
Grip
inserts**

1. Remove the cover bolt (pos. A) of the required positioning holes.
 2. Position the grip inserts (pos. C) in the Vario reversible jaws (pos. D).
 3. Install and tighten the cylinder bolts (pos. B).
- ✓ The grip inserts are installed on the reversible jaws.

6.1.2 Changing the top jaws

Prerequisite ■ The reversible jaws, flat with thread, are installed.

**Overview
variant 1**

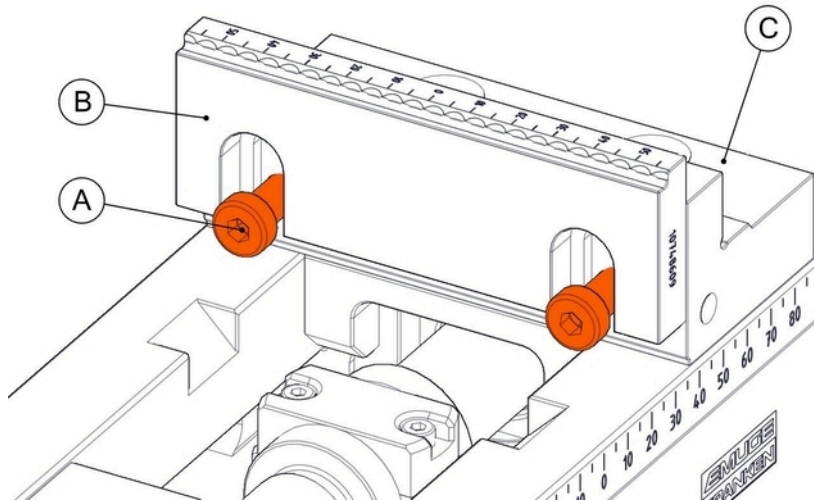


Figure 43: Schematic illustration: Changing the top jaw, variant 1

- A** Cylinder bolt
- B** Top jaw
- C** Reversible jaw, flat with thread

Removing the top jaw

1. Loosen the cylinder bolts (pos. A) by 2-3 thread turns.
 2. Pull the top jaws (pos. B) upwards to remove them.
- ⇒ The top jaws are removed from the reversible jaws.

Installing the top jaw

1. Position the top jaws (pos. B) in the correct position on the reversible jaws.
 - The top jaw (pos. B) must lie flush on the base unit.
2. Tighten the cylinder bolts (pos. A).
 - ✓ The top jaws are installed on the reversible jaws.
 - ✓ The clamping fixture is ready for operation.

Overview variant 2

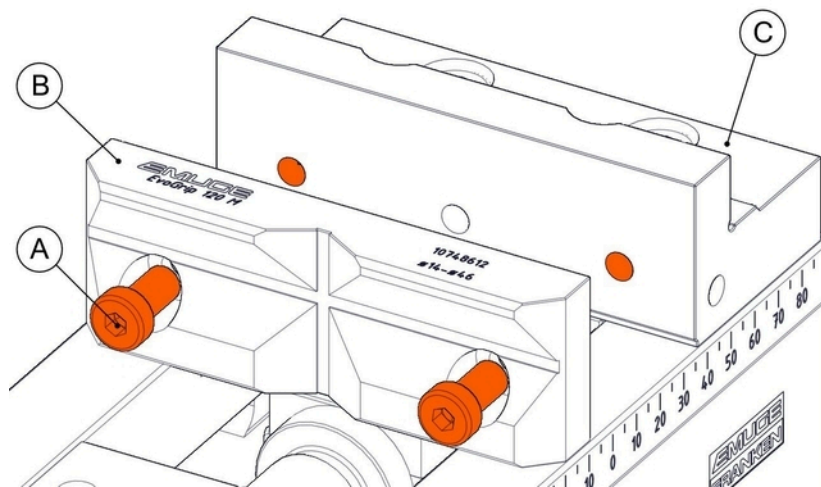


Figure 44: Schematic illustration: Changing the top jaw, variant 2

- A** Cylinder bolt
- B** Top jaw
- C** Reversible jaw, flat with thread

Removing the top jaw

1. Loosen and remove the cylinder bolts (pos. A).
 2. Remove the top jaws (pos. B).
- ⇒ The top jaws are removed from the reversible jaws.

Installing the top jaw

1. Position the top jaws (pos. B) in the correct position on the reversible jaws.
 - The top jaw (pos. B) must lie flush on the base unit.
 2. Tighten the cylinder bolts (pos. A).
- ✓ The top jaws are installed on the reversible jaws.
 - ✓ The clamping fixture is ready for operation.

6.2 Changing the optional equipment

6.2.1 Changing the stop

Overview

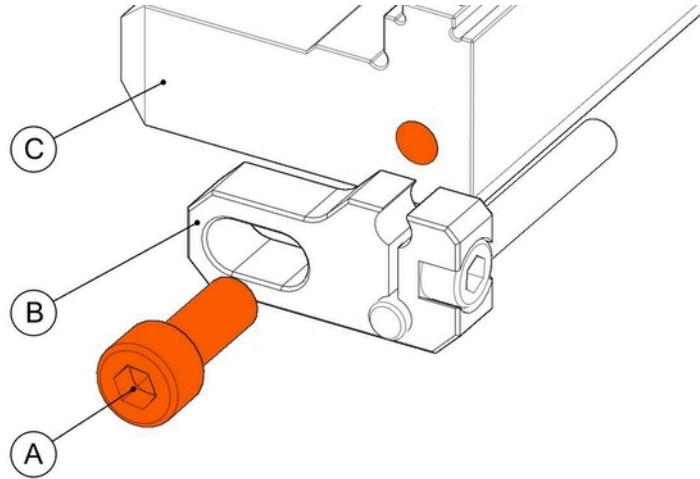


Figure 45: Schematic illustration: Stop

- A** Cylinder bolt
- B** Stop (example)
- C** Reversible jaw

Prerequisite ■ The reversible jaws are installed.

Removing the stop

1. Loosen and remove the cylinder bolt (pos. A).
2. Remove the stop (pos. B).

⇒ The stop has been disassembled.

✓ The clamping fixture is ready for operation.

Installing the stop

1. Position the stop (pos. B) laterally on the reversible jaw (pos. C) .
2. Tighten the cylinder bolt (pos. A).

⇒ The stop has been installed.

✓ The clamping fixture is ready for operation.

6.2.2 Changing the support bracket

Overview

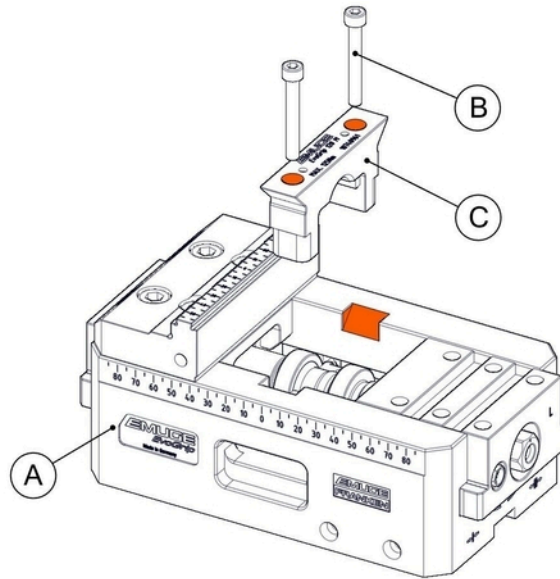


Figure 46: Schematic illustration: one-sided clamping with support bracket

- A** Clamping fixture
- B** Cylinder bolt
- C** Support bracket

- | | |
|---------------------------------------|--|
| Prerequisites | <ul style="list-style-type: none"> ■ The multi-piece clamping jaws are positioned sufficiently far apart. ■ The lid of the spindle holder has been removed, see chapter 10.3, Replacing the screw shaft. |
| Thread spindle maintenance | <ol style="list-style-type: none"> 1. Clean the connection area from the screw shaft to the spindle holder. 2. Turn the screw shaft slowly and grease the connection area between the screw shaft and the spindle holder. <p>⇒ The support bracket can be installed.</p> |
| Installing the support bracket | <ol style="list-style-type: none"> 1. Install the support bracket (pos. C) in the correct position. 2. Tighten the cylinder bolts (pos. B). <ul style="list-style-type: none"> ✓ The support bracket has been installed. ✓ The clamping fixture is ready for one-sided clamping. |
| Removing the support bracket | <ol style="list-style-type: none"> 1. Loosen and remove the cylinder bolts (pos. B). 2. Remove the support bracket (pos. C) vertically upwards, use the disassembly thread if necessary. <p>⇒ The support bracket has been removed.</p> |

6.2.3 Changing the middle jaw

INFORMATION

The middle jaw has a floating bearing and compensates for tolerance differences of the workpieces.

Overview

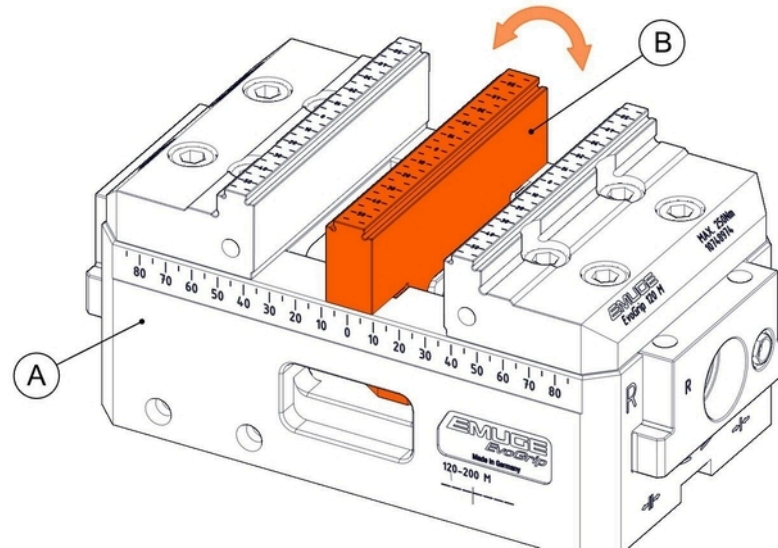


Figure 47: Schematic illustration: Changing the middle jaw

- A** Clamping fixture
B Middle jaw

Prerequisite

- The reversible jaws are positioned sufficiently far apart.

Installing the middle jaw

1. Install the middle jaw (pos. B) in the middle of the clamping fixture at an angle of approx. 30° counterclockwise.
 2. Turn the middle jaw clockwise until the clamping surfaces of the middle jaw (pos. B) are parallel to the reversible jaws.
- ⇒ The integrated spring locking secures the middle jaw.
- ✓ The middle jaw has been installed.
 - ✓ The clamping fixture is ready for operation.

Removing the middle jaw

1. Position the middle jaw (pos. B) centrally (scale value 0).
 2. Turn the middle jaw (pos. B) counterclockwise by approx. 30°.
 3. Pull the middle jaw (pos. B) upwards to remove it.
- ✓ The middle jaw has been removed.

7 Operation

Correct workpiece clamping

Correct workpiece clamping is the personnel's responsibility.

New fixtures must be assessed and carefully checked by qualified personnel with regard to the required clamping force, available clamping surfaces and the machining forces that occur.

The risk of a workpiece slipping or being torn out must be considered even with a correctly functioning clamping fixture due to the different geometries to be clamped, support surfaces, friction values of the clamping, machining forces, incorrect manipulation of the processing machine, etc.

7.1 Determining the required clamping force

INFORMATION

The required clamping force depends on the shape, material and surface of the workpiece.

The respective machining forces must be taken into account.

INFORMATION

Only half the introduction torque may be applied for one-sided clamping! As a result, only half the clamping force is applied.

When is it required?

- The workpiece/component is used for the first time.
- The type/shape of the workpiece/component is used for the first time.
- The material of the workpiece/component changes.
- The surface of the workpiece/component changes.
- The machining forces change.

When is it not required?

- The component is replaced with an equivalent component (e.g. during maintenance, repair).

Prerequisite

- The clamping fixture is ready for operation.

Testing

INFORMATION

The design of the clamping surfaces must be chosen to suit the respective clamping surface on the workpiece.

The clamping force must be considered based on the clamping surface.

For smooth clamping surfaces, a maximum parallelism of 0.1 mm per 100 mm of clamping surface width is permissible.

For grip clamping surfaces, a maximum parallelism of 0.2 mm per 100 mm of clamping surface width is permissible.

1. Place the workpiece, see chapter 7.2, Clamping the clamping fixture.
2. Introduce the introduction torque in a controlled and uniform manner.
 - Use a suitable torque wrench.
 - Observe the permissible introduction torque, see chapter 3.4, Introduction torque clamping force diagrams.

NOTE



Property damage in case of power intervals!

Uneven and intermittent force during the introduction of the introduction torque will damage the screw shaft.

- ▶ Do not use impact wrenches.

3. In case of deformation and impressions on the workpiece, repeat the process with a lower introduction torque.
 - Exception: Marks are to be expected on grooved and grip clamping surfaces.
- ✓ The required clamping force for the respective clamping situation has been determined.

7.2 Clamping the clamping fixture

The clamping process can take place inside and outside the machine.

Pre-requisite

- The clamping fixture is ready for operation.

Clamping process

1. Position the clamping jaws at the correct distance from the workpiece.
2. Place the workpiece in the correct position on the desired support surfaces.
3. Position the workpiece in the center of the clamping jaw.
4. If a stop is used, place the workpiece against the stop.
5. Introduce the determined introduction torque, see chapter 3.4, Introduction torque clamping force diagrams.
 - Use a suitable torque wrench.
- ✓ The workpiece is clamped in the clamping fixture.
- ✓ The workpiece can be machined.
6. Release the clamping fixture.
7. Remove the workpiece.
- ✓ The clamping fixture can be loaded again.

7.2.1 Clamping workpieces with optional clamping variants

Positive and negative clamping examples are shown below.

Correct clamping

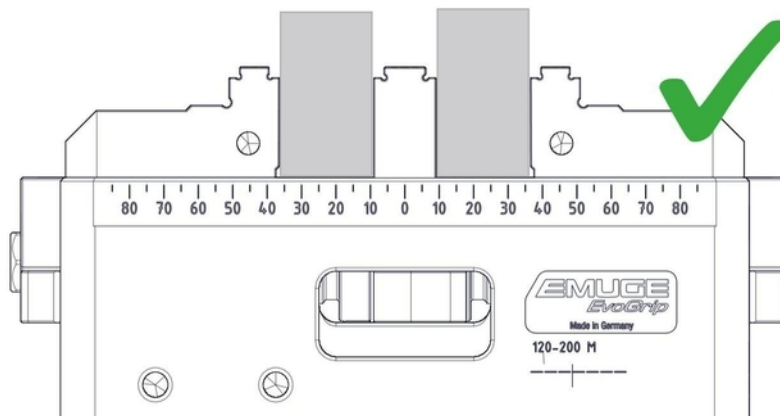


Figure 48: Schematic illustration: Correct clamping of 2 workpieces

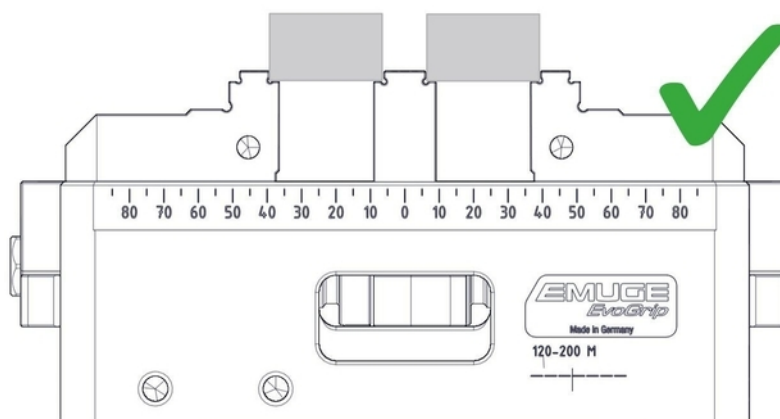


Figure 49: Schematic illustration: Correct clamping of 2 workpieces

Incorrect clamping

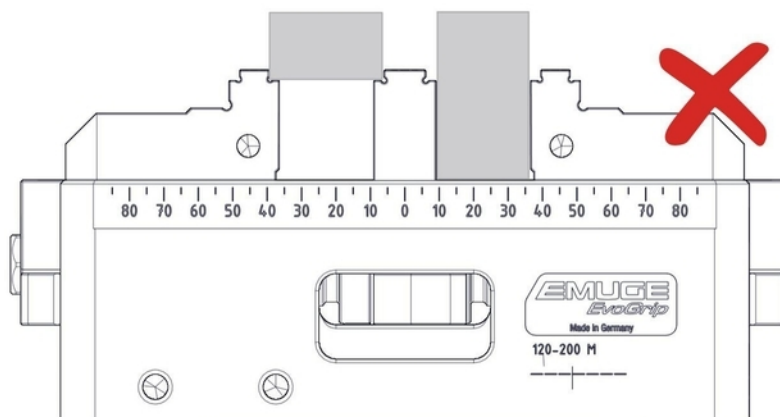


Figure 50: Schematic illustration: Incorrect clamping of 2 workpieces

7.2.2 Ratio of clamping force to clamping width used

Reduction of introduction torque The maximum permissible introduction torque of the clamping fixture is reduced under the following conditions:

Position of the workpiece in relation to the clamping width	Maximum permissible clamping force
The workpiece lies <u>centered</u> on the clamping surface and uses at least <u>half</u> of the desired clamping width.	Full maximum introduction torque permissible!
The workpiece lies <u>centered</u> on the clamping surface and uses <u>a quarter</u> of the desired clamping width.	Only 50% of the maximum introduction torque permitted!
The workpiece is <u>not centered</u> on the clamping surface.	The maximum permissible introduction torque must be reduced depending on the range and application.

Examples of reducing the clamping force for workpiece clamping are shown below.

50% jaw width

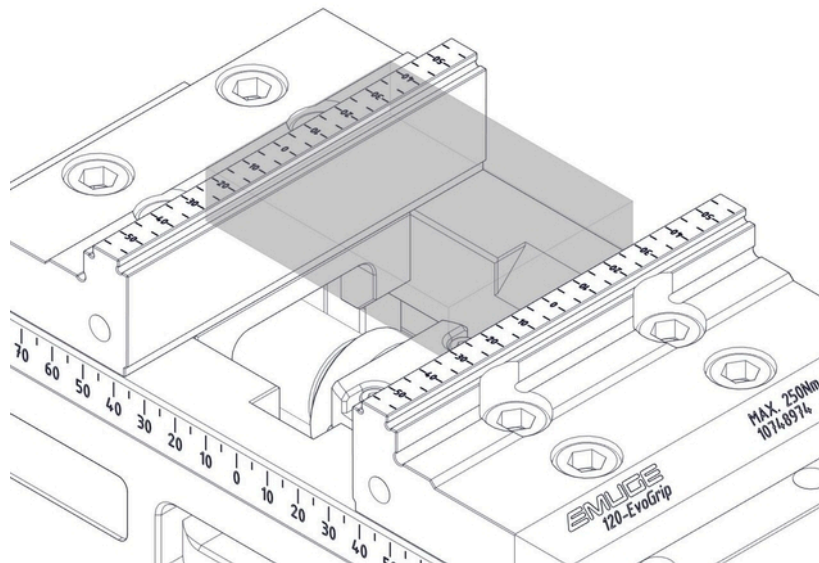


Figure 51: Schematic illustration: 50% jaw width

INFORMATION

If the workpiece is centered on the clamping surface and at least half of the desired clamping width is used:

- Full maximum introduction torque permissible!

10% jaw width

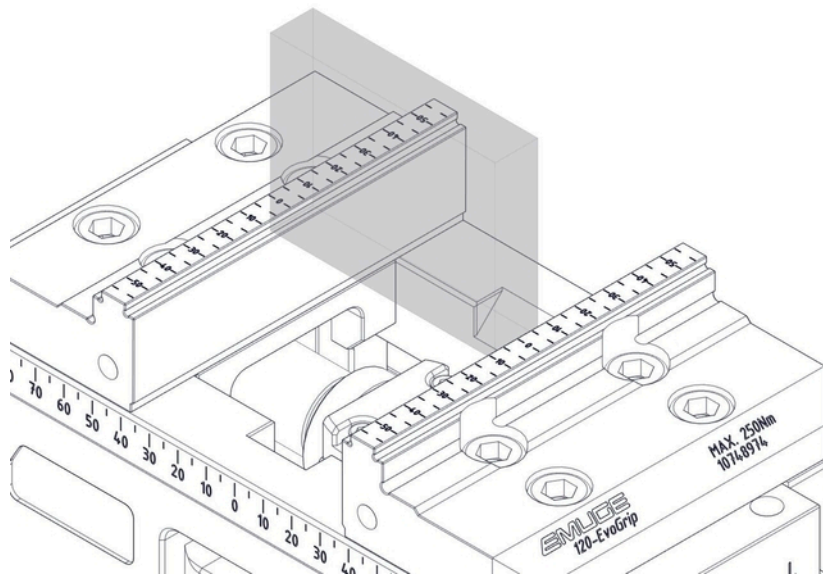


Figure 52: Schematic illustration: 10% jaw width

INFORMATION

If the workpiece is centered on the clamping surface and only 10% of the desired clamping width is used:

- Only 20% of the maximum introduction torque permitted!

8 Disassembly

Pre-preparations

- Ensure that the machine interface is free of objects.
- Choose the position so that the clamping fixture is easy to remove.
- If an interface is used, dismantle this interface properly.

8.1 Disassemble the clamping fixtures

NOTE



Material damage due to damage to the screw shaft!

Pressure or impacts can damage the fine thread. If the fine thread is damaged, the function of the clamping fixture cannot be guaranteed.

- ▶ Do not touch the screw shaft with the tool.
- ▶ Only use screw shafts in perfect condition.

INFORMATION

Centering bores and screw holes vary with the overall lengths!

The number and position of the centering bores and screw holes depend on the overall length used, see chapter 2.5.1, Mechanical interfaces.

The illustrations in these operating and assembly instructions correspond to width 120 and length 200.

8.1.1 Disassembling mounting variants

8.1.1.1 Disassembling the clamping fixture with screw connection

Overview

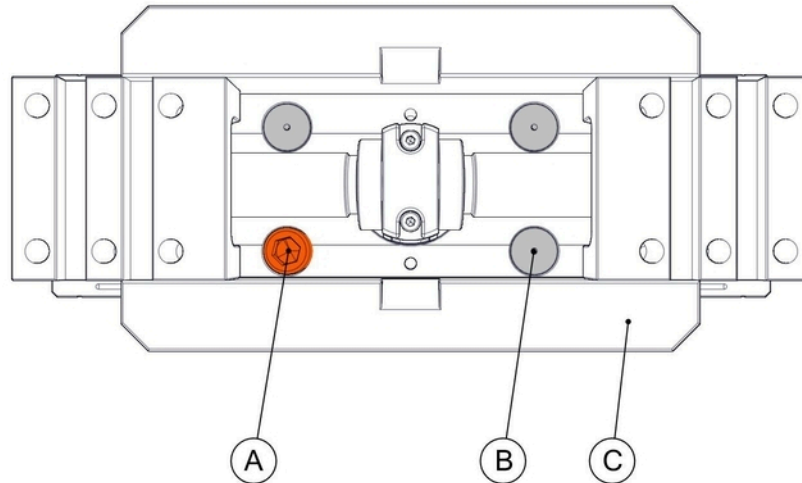


Figure 53: Schematic illustration: Screw connection

- A** Cylinder bolt
- B** Covering cap
- C** Clamping fixture

- Disassembly**
1. Remove the cover caps (pos. B) from the screw holes of the clamping fixture (pos. C).
 - Use a suitable auxiliary tool, e.g. cylinder bolt with matching thread.
 - Use the central auxiliary thread for installing and removing the cover caps.
 2. Loosen and remove the cylinder bolts (pos. A).
 3. Remove the clamping fixture (pos. C) from the machine interface.
- ✓ The clamping fixture has been removed from the machine interface.

8.1.1.2 Disassembling the clamping fixture on the center axis with a screw connection

Overview

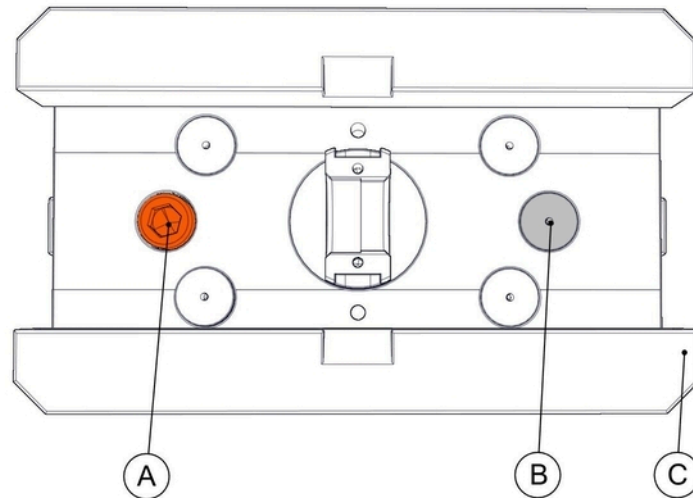


Figure 54: Schematic illustration: Screw connection on the center axis

- A** Cylinder bolt
- B** Covering cap
- C** Clamping fixture

Pre-requisites

- One- or multi-piece clamping jaws are disassembled, see chapter 6, Changing the equipment variants.
- The screw shaft has been removed, see chapter 10.3, Replacing the screw shaft.

Disassembly

1. Remove the cover caps (pos. B) from the screw holes of the clamping fixture (pos. C).
 - Use a suitable auxiliary tool, e.g. cylinder bolt with matching thread.
 - Use the central auxiliary thread for installing and removing the cover caps.
 2. Loosen and remove the cylinder bolts (pos. A).
 3. Remove the clamping fixture (pos. C) from the machine interface.
- ✓ The clamping fixture has been removed from the machine interface.

8.1.1.3 Disassembling the clamping fixture with clamping claws

Overview

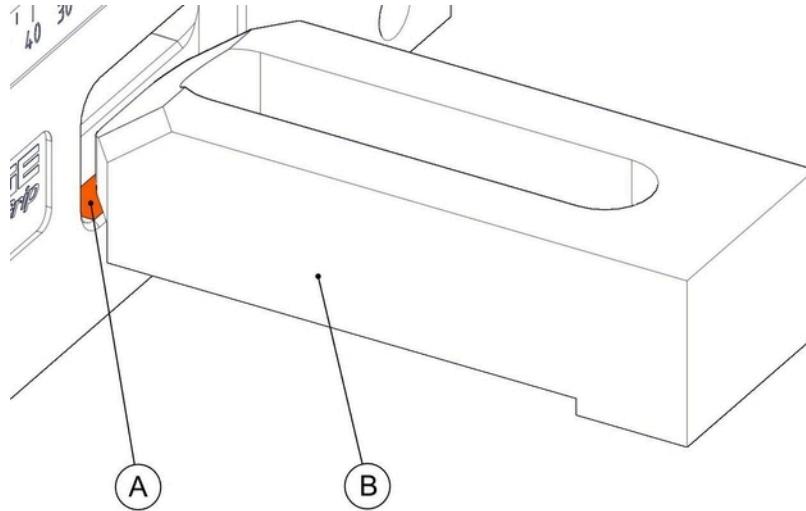


Figure 55: Schematic illustration: Fastening with clamping claw

- A** Support surface on the clamping fixture
- B** Clamping claw (provided by customer)

Disassembly

1. Dismantle and remove the customer-side clamping claws (pos. B).
 2. Remove the clamping fixture from the machine interface.
- ✓ The clamping fixture has been removed from the machine interface.

8.1.2 Disassembling positioning variants

8.1.2.1 Disassembling the clamping fixture with loose slot nuts

Overview

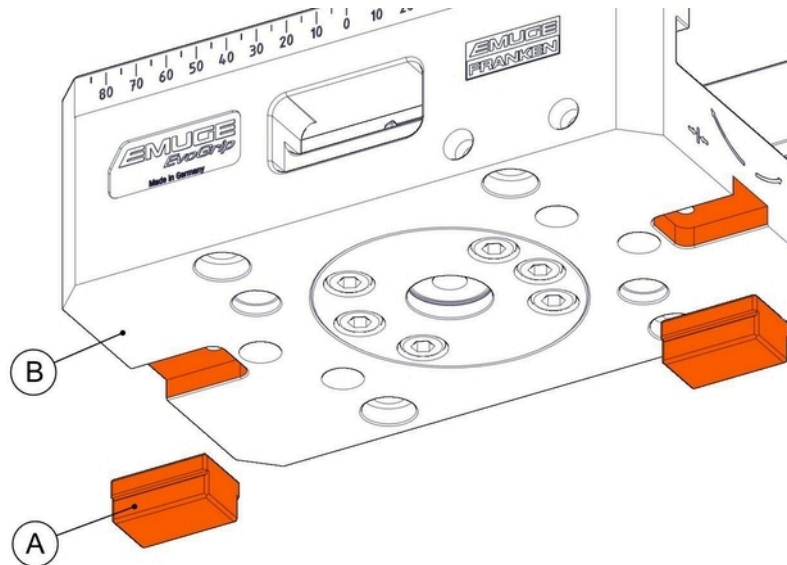


Figure 56: Schematic illustration: Positioning via loose slot nuts

- A** Loose slot nut
B Clamping fixture

Disassembly

1. Remove the clamping fixture (pos. B) from the machine interface.
 2. Remove the slot nuts (pos. A) from the slot of the machine interface.
- ✓ The clamping fixture has been removed from the machine interface.

8.1.2.2 Disassembling the clamping fixture with screwed slot nuts

Overview

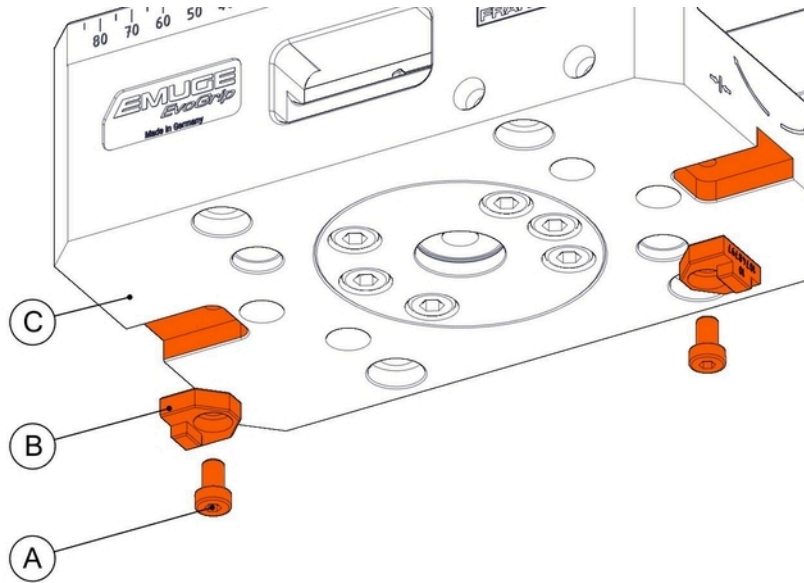


Figure 57: Schematic illustration: Positioning with screwed slot nuts

- A** Cylinder bolt
- B** Slot nut
- C** Clamping fixture

- Disassembly**
1. Remove the clamping fixture (pos. C) with slot nuts (pos. B) from the machine interface.
 2. Loosen and remove the cylinder bolts (pos. A) of the slot nuts.
 3. Remove the slot nuts (pos. B).
- ✓ The clamping fixture has been removed from the machine interface.

8.1.2.3 Disassembling the clamping fixture with centering bushes

Overview

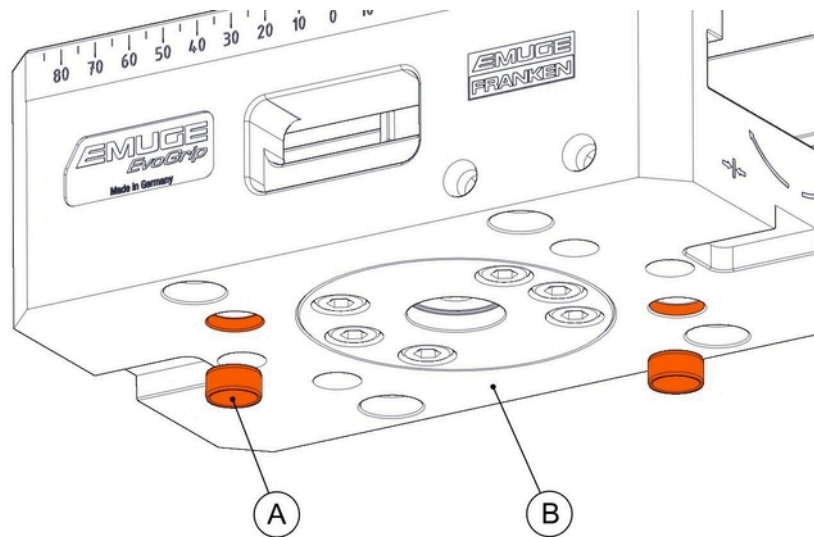


Figure 58: Schematic illustration: Positioning with centering bushes

- A** Centering bush
- B** Clamping fixture

Disassembly

1. Remove the clamping fixture (pos. B) from the machine interface.
 2. Remove all centering bushes (pos. A) .
- ✓ The clamping fixture has been removed from the machine interface.

8.1.3 Disassembling the connections for the zero-point systems

8.1.3.1 Use locating pin for EvoPoint zero-point system

Overview

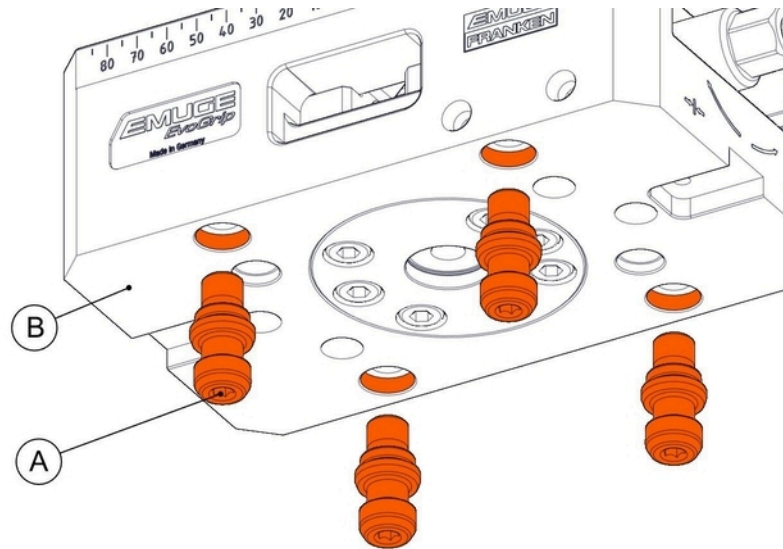


Figure 59: Schematic illustration: Assembly / disassembly of the locating bolts for EvoPoint zero-point system

- A** Locating bolt
- B** Clamping fixture

Disassembly

1. Remove the clamping fixture from the EvoPoint zero-point system.
 - Observe the assembly instructions for the product.
 2. Loosen the locating bolt (pos. A) and remove from below from the locating holes of the clamping fixture (pos. B).
- ✓ The interface for the EvoPoint zero-point system has been removed.

8.1.3.2 Removing the interfaces of the compatible zero-point systems

Overview of locatingbolts

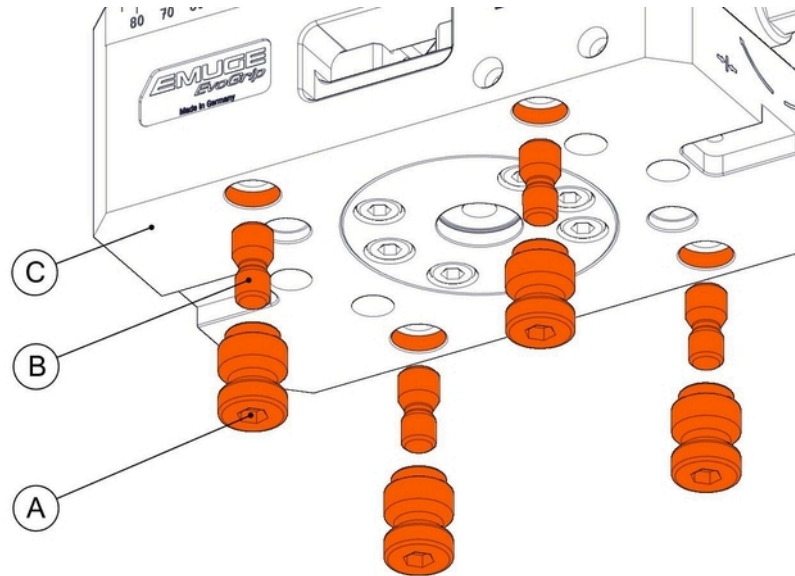


Figure 60: Schematic illustration: Assembly / disassembly of the locating bolts for compatible zero-point systems

- A** Locating bolt (customer-side)
- B** Threaded adapter
- C** Clamping fixture

Removing locatingbolts

1. Remove the clamping fixture from the compatible zero-point system.
 - Observe the assembly instructions for the product.
 2. Unscrew the customer-side locating bolt (pos. A) from the threaded adapters (pos. B).
 3. Screw the threaded adapter (pos. B) out of the locating holes of the clamping fixture (pos. C).
- ✓ The interface for the compatible zero-point system has been removed.

**Overview
of central
clamping bolt**

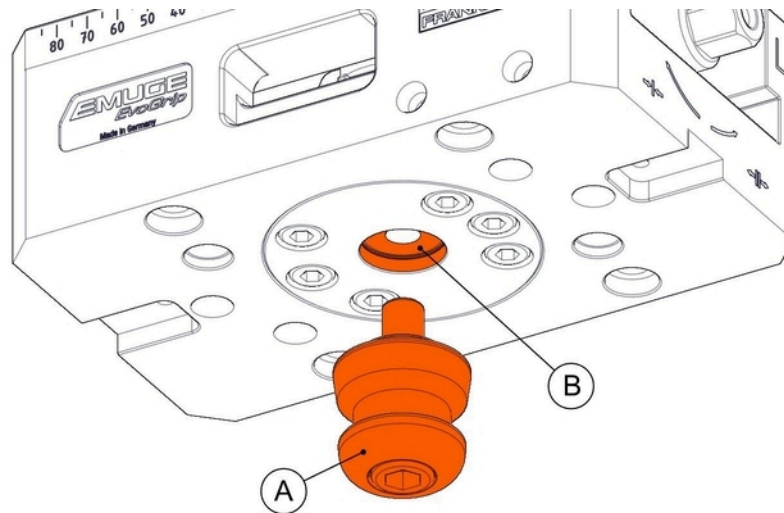


Figure 61: Schematic illustration: Assembly / disassembly of the clamping bolt for compatible zero-point systems

- A** Clamping bolt (customer-side)
- B** Clamping fixture

**Removing
central
clamping bolts**

1. Remove the clamping fixture from the compatible zero-point system.
 - Observe the assembly instructions for the product.
 2. Unscrew the customer-side clamping bolt (pos. A) from the central locating hole of the clamping fixture (pos. B).
- ✓ The interface for the compatible zero-point system has been removed.

8.2 Removing optional clamping variants

8.2.1 Removing the one-sided clamping variant

Overview

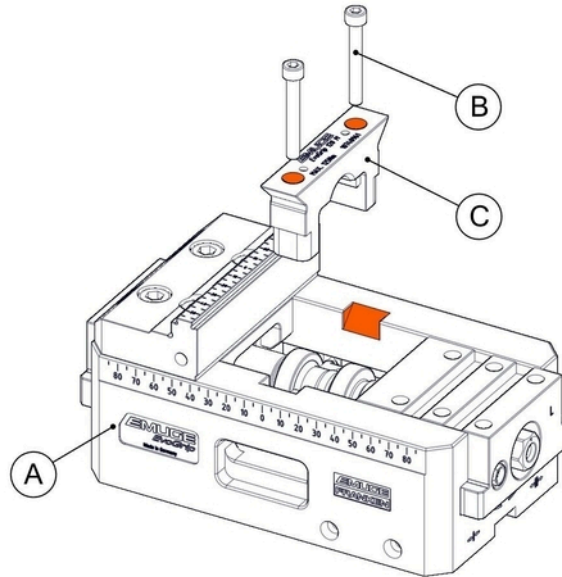


Figure 62: Schematic illustration: Overview of one-sided clamping variant

- A** Clamping fixture
- B** Cylinder bolt
- C** Support bracket

Disassembly

1. If used, remove the coupling, see chapter 8.2.1.1, Removing the coupling.
 2. Remove the support bracket (pos. C), see chapter 6.2.2, Changing the support bracket.
 3. Clean and grease the screw shaft, see chapter 9.1, Service plan.
 4. Remove the clamping fixture (pos. A) from the machine interface, see chapter 8.1, Disassemble the clamping fixtures.
- ✓ The support bracket has been removed from the clamping fixture.

8.2.1.1 Removing the coupling

Overview

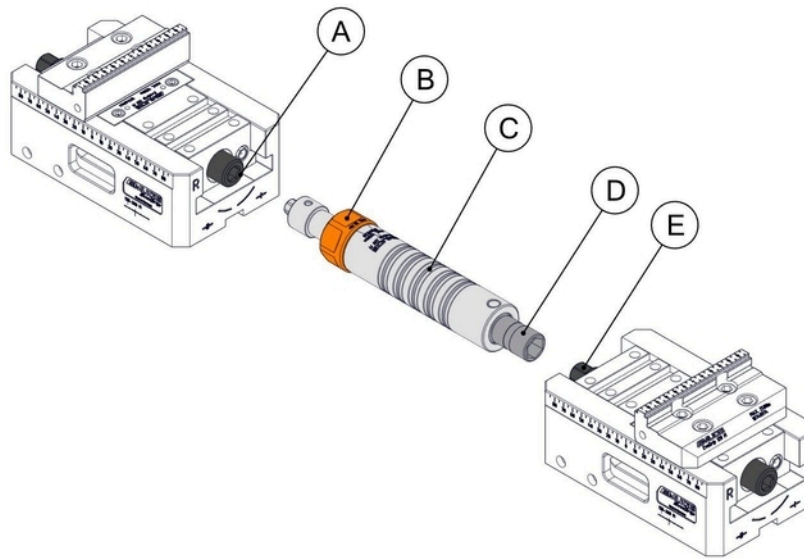


Figure 63: Schematic illustration: Installing the coupling

- A** Interface of the screw shaft (hexagon socket)
- B** Nut
- C** Coupling
- D** Wrench socket
- E** Interface of the screw shaft (hexagon head)

Disassembly

1. Loosen the nut (pos. B) of the coupling (pos. C) by 1-2 turns.
 - To ensure that the screw shafts (pos. A, pos. E) do not turn during this process, they must be held against the clamping fixture during clamping.
2. Pull the hexagon head of the coupling (pos. C) out of the hexagon socket of the screw shaft (pos. A).
3. Push the free end of the coupling (pos. C) to reduce the length.
4. Remove the hexagon socket of the wrench socket (pos. D) from the hexagon head of the screw shaft (pos. E).
5. Tighten the nut (pos. B) of the coupling (pos. C) slightly.
 - ✓ The coupling has been removed from the clamping fixtures.

8.2.2 Dismantling the clamping variant for clamping 2 workpieces

Overview

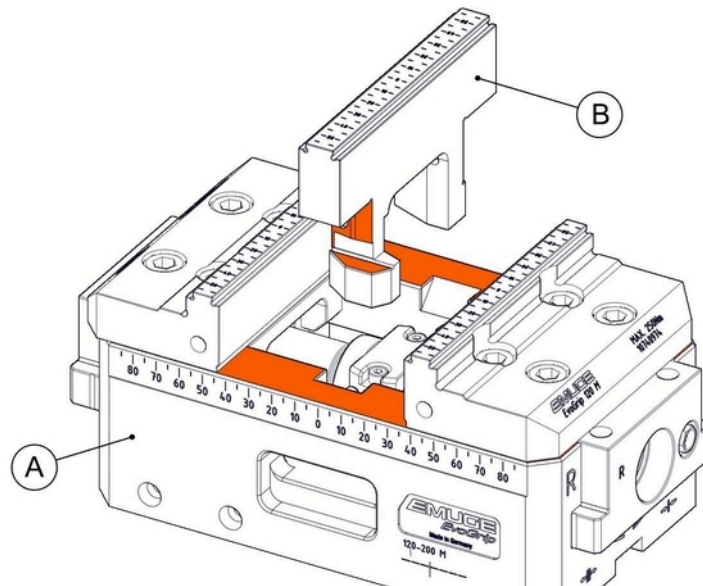


Figure 64: Overview, two-sided setup

- A** Clamping fixture
- B** Middle jaw

Disassembly

1. Remove the middle jaw (pos. B), see chapter 6.2.3, Changing the middle jaw.
 2. Remove the clamping fixture (pos. A) from the machine interface, see chapter 8.1, Disassemble the clamping fixtures.
- ✓ The middle jaw has been removed from the clamping fixture.

9 Servicing

NOTE



Property damage due to compressed air!

Compressed air can cause metal chips to enter the grooves and the area of the screw shaft. The metal chips can result in blockages or damage the thread.

- ▶ Do not clean with compressed air.
- ▶ Do not point compressed air directly at the clamping fixture.

9.1 Service plan

Entire clamping fixture

Table 10: Maintenance plan, entire clamping fixture

Interval	Task
Before the start of the shift	Check for damage and wear Rectify defects if necessary, see chapter 10.2, Detecting and rectifying faults
500 clamping cycles, At the latest weekly	■ Check for ease of movement over the entire clamping range Renew the corrosion protection of the metal surfaces Clean and grease guides and sliding surfaces
2,500 clamping cycles, At the latest monthly	■ Check the assembly of the clamping fixture and retighten the screws if necessary For zero-point systems: ■ Check change function
End of the intended service life	
50,000 clamping cycles	If reuse is desired, submit the device to EMUGE GmbH & Co. KG for general overhaul, see chapter 10.5, Contact address

All screw connections

Table 11: Maintenance plan, all screw connections

Interval	Task
First 100 clamping cycles	Check screw connection and retighten if necessary
2,500 clamping cycles, At the latest monthly	Check screw connection and retighten if necessary
10,000 clamping cycles	Replace the screws of the reversible jaws Replacing the screws of the grip inserts Check screw connections for damage and wear and replace if necessary, see chapter 10.2, Detecting and rectifying faults

Equipment

Table 12: Maintenance plan, equipment

Interval	Task
1,000 clamping cycles, At the latest weekly	Removal and cleaning Check for damage and wear Renew the corrosion protection of the metal surfaces Grease thread and guide surfaces Press grease into the grease nipples of the base jaws using a grease gun until the grease emerges slightly from the guide surfaces

Screw shaft

Table 13: Maintenance plan, screw shaft

Interval	Task
500 clamping cycles, At the latest weekly	Cleaning and greasing 1. Removing the equipment, see chapter 6, Changing the equipment variants. 2. Gently press a suitable cloth against the screw shaft. 3. Move the screw shaft by several revolutions. 4. Gently press the greased brush against the screw shaft. 5. Move the screw shaft by several revolutions. 6. Install clamping jaws, see chapter 6, Changing the equipment variants.

Interval	Task
2,500 clamping cycles, At the latest monthly	■ Clean and grease as described for 1,000 clamping cycles ■ Check for damage and wear ■ Replace if necessary, see chapter 10.2, Detecting and rectifying faults

Optional components

Table 14: Maintenance plan, optional components

Interval	Task
2,500 clamping cycles, At the latest monthly	Removal and cleaning Check for damage and wear Renew the corrosion protection of the metal surfaces

9.2 Spare parts

⚠ WARNING**Risk of injury due to the use of incorrect or defective spare parts!**

Incorrect or defective spare parts can damage the clamping fixture or attachment components. Damaged components can behave unexpectedly and result in injuries.

- ▶ Do not use components that are not guaranteed to function correctly.
- ▶ Only use original spare parts by EMUGE GmbH & Co. KG.

10 Faults and repairs

10.1 Procedures in case of faults

As soon as a fault occurs:

1. Stop the machine.
2. Take the clamping fixture out of operation.
3. Find and rectify the fault using these operating and assembly instructions, see chapter 10.2, Detecting and rectifying faults.
 - If it is not possible to rectify the fault using these operating and assembly instructions, contact EMUGE GmbH & Co. KG if necessary, see chapter 10.5, Contact address.

✓ The clamping fixture can be put back into operation.

10.2 Detecting and rectifying faults

Entire clamping fixture

Table 15: Faults, entire clamping fixture

Fault	Possible cause	Solution step
Sluggish rotational movement in the clamping range	Contamination Defective component	Disassemble the clamping fixtures Clean and check all components, replace and grease if necessary If the fault cannot be rectified this way: see chapter 10.5, Contact address

All screw connections

Table 16: Faults, all screw connections

Fault	Possible cause	Solution step
Damage to the screw connection	Tightened with too high a tightening torque Wear	Replace screws and/or damaged components
Unusual wear	■ Using beyond the technical limits ■ Incorrect assembly ■ Tightened with too high a tightening torque ■ Maintenance intervals not adhered to ■ Machining forces too high	■ Replace screws and/or damaged components ■ Find and rectify the cause, see chapter 3, Technical data, see chapter 5.2, Installing the clamping fixture ■ Check maintenance intervals and adjust if necessary

Flat and screw surfaces

Table 17: Faults, flat and screw surfaces

Fault	Possible cause	Solution step
Minor damage	Slight application of force by other components, workpieces or tools	Strip surface with oil stone If necessary, establish measures to avoid cause in the future
Severe damage	■ Uncontrolled application of force by other components, workpieces or tools	■ Replace ■ If necessary, establish measures to avoid cause in the future

Base jaws (multi-piece clamping jaws)

Table 18: Faults, base jaws

Fault	Possible cause	Solution step
Damage	Uncontrolled application of force by other components, workpieces or tools Clamping process with excessive introduction torque Machining forces too high	Replace If necessary, establish measures to avoid cause in the future If necessary, check the required clamping force, see chapter 7.1, Determining the required clamping force
Ordinary wear	Intended use	Replace
Unusual wear	Using beyond the technical limits Using unsuitable workpieces Incorrect assembly Maintenance intervals not adhered to Contamination Defective component Machining forces too high Clamping process with excessive introduction torque	Replace Find and rectify the cause, see chapter 1.3, Foreseeable misuse, see chapter 3, Technical data, see chapter 6, Changing the equipment variants Check maintenance intervals and adjust if necessary If the fault cannot be rectified this way: see chapter 10.5, Contact address
Greasing via grease nipple does not work	- Blocked grease nipple or lubrication channel - Defective component	- Clean the grease nipple and replace if necessary - Clean lubrication channel (when removed) - If the fault cannot be rectified this way, see chapter 10.5, Contact address
Sealing rings of the base jaw defective	Contamination Mechanical effects Defective screw shaft	Replace Find and rectify the cause Check maintenance intervals and adjust if necessary

Reversible jaws

Table 19: Faults, reversible jaws

Fault	Possible cause	Solution step
Damage	Uncontrolled application of force by other components, workpieces or tools Workpiece was not clamped in the center of the clamping jaw Screws tightened to the wrong tightening torque Clamping process with excessive introduction torque	Replace If necessary, establish measures to avoid cause in the future If necessary, redetermine the required clamping force, see chapter 7.1, Determining the required clamping force
Ordinary wear	■ Intended use	■ Replace
Unusual wear	Using beyond the technical limits Workpiece was not clamped in the center of the clamping jaw Using unsuitable workpieces Incorrect assembly Maintenance intervals not adhered to Contamination Defective component Machining forces too high Clamping process with excessive introduction torque	Replace Find and rectify the cause , see chapter 1.3, Foreseeable misuse, see chapter 3, Technical data, see chapter 6, Changing the equipment variants Check maintenance intervals and adjust if necessary If the fault cannot be rectified this way: see chapter 10.5, Contact address

Screw shaft

Table 20: Faults, screw shaft

Fault	Possible cause	Solution step
Damage	Uncontrolled application of force by other components, workpieces or tools Damage during installation Particles in the thread Too high introduction torque Machining forces too high Clamping process with excessive introduction torque	Replace If necessary, establish measures to avoid cause in the future If necessary, redetermine the required clamping force, see chapter 7.1, Determining the required clamping force
Ordinary wear	■ Using without special features	■ Replace
Unusual wear	Using beyond the technical limits Using unsuitable workpieces Incorrect assembly Maintenance intervals not adhered to Contamination Defective component Machining forces too high	Replace Find and rectify the cause, see chapter 1.3, Foreseeable misuse, see chapter 3, Technical data, see chapter 6, Changing the equipment variants Check maintenance intervals and adjust if necessary If the fault cannot be rectified this way: see chapter 10.5, Contact address
Sluggish rotational movement in the clamping range	■ Contamination ■ Defective screw shaft	■ Remove the clamping fixture; Clean, check and grease all components; Install the clamping fixture ■ If the fault cannot be rectified this way: see chapter 10.5, Contact address

10.3 Replacing the screw shaft

NOTE



Material damage due to damage to the screw shaft!

Pressure or impacts can damage the fine thread. If the fine thread is damaged, the function of the clamping fixture cannot be guaranteed.

- ▶ Do not touch the screw shaft with the tool.
- ▶ Only use screw shafts in perfect condition.

Overview

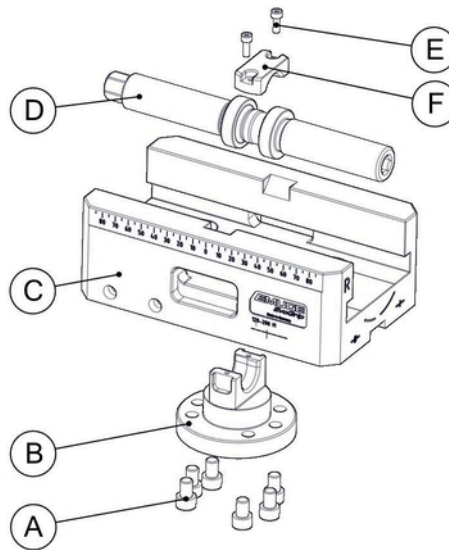


Figure 65: Schematic illustration: Base unit

- A** Cylinder bolts
- B** Spindle holder
- C** Base body
- D** Screw shaft
- E** Cylinder bolts
- F** Lid

Pre-requisite

- The base jaws are removed, see chapter 6, Changing the equipment variants.

What to dis-assemble?

- Disassemble the screw shaft and spindle holder when replacing the screw shaft.
- Disassemble the screw shaft without the spindle holder if the screw shaft is only removed for a short time.

**Removing
the screw
shaft**

1. Loosen and remove the cylinder bolts (pos. E).
2. Remove the lid (pos. F).
3. Clean the lid (pos. F) and oil with corrosion protection.
⇒ The lid has been removed.
4. Remove the screw shaft (pos. D) upwards.
⇒ The screw shaft has been removed.

**Installing
the screw
shaft**

1. Grease the screw shaft (pos. D) and spindle holder (pos. B).
2. Insert the screw shaft (pos. D) into the spindle holder (pos. B) in the correct position.
 - Observe the insertion protection.
3. Install the lid (pos. F) onto the spindle holder (pos. B).
4. Tighten the cylinder bolts (pos. E).
⇒ The lid (pos. F) has been installed.
✓ The screw shaft has been installed.

**Optional:
Overview
Changing
the spindle
holder**

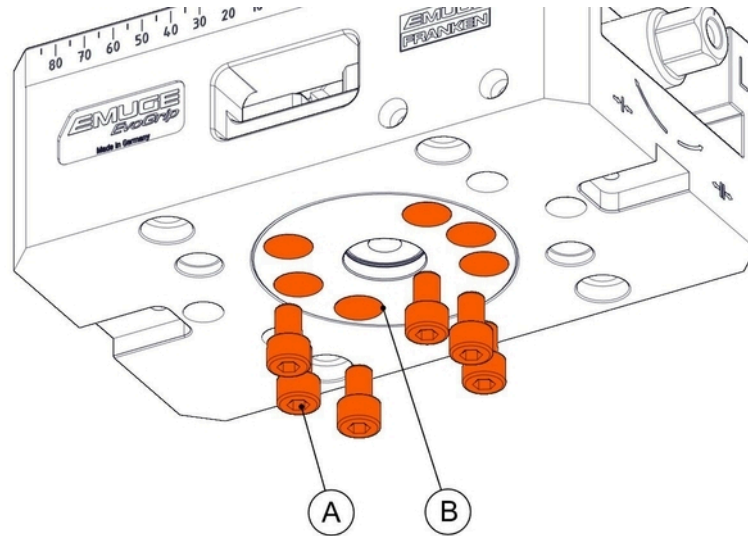


Figure 66: Schematic illustration: Pre-fastening the screw shaft

- A** Cylinder bolt
- B** Spindle holder

**Optional:
Removing
the spindle
holder**

1. Remove the screw shaft (pos. D).
 2. Remove the clamping fixture (pos. C) from the machine interface, see chapter 8.1, Disassemble the clamping fixtures.
 3. Loosen and remove all cylinder bolts (pos. A).
 4. Remove the spindle holder (pos. B) downwards.
 5. Clean the spindle holder (pos. B) and oil with corrosion protection.
- ⇒ The spindle holder has been removed.
- ⇒ The clamping fixture is ready for the installation of a new screw shaft.

**Optional:
Assembly and
pre-fastening**

1. Grease the screw shaft (pos. D) and spindle holder (pos. B).
2. Position the spindle holder (pos. B) in the correct position in the base body.
3. Screw in the cylinder bolts (pos. A) lightly.
 - Do not tighten the cylinder bolts.
4. Insert the screw shaft (pos. D) into the spindle holder in the correct position.
 - Observe the insertion protection.
5. Install the lid (pos. F) onto the spindle holder (pos. B).
6. Tighten the cylinder bolts (pos. E).
 - ⇒ The lid has been installed.
 - ⇒ The screw shaft is pre-fastened.
 - ✓ The screw shaft is ready for alignment.

**Optional:
aligning
the screw
shaft**

1. Grease the thread and guide surfaces of the screw shaft (pos. D).
2. Grease the thread of the respective base jaw.
3. Install the base jaws, see chapter 6, Changing the equipment variants.
4. Tighten all cylinder bolts (pos. A) of the spindle holder (pos. B) crosswise.
 - ⇒ The screw shaft and spindle holder are installed and aligned.
 - ✓ The clamping fixture is ready for assembly.

10.4 Replacing the sealing rings of the base jaw

NOTE



Material damage due to metal tools!

Metal tools may cause scratches or damage.

Overview

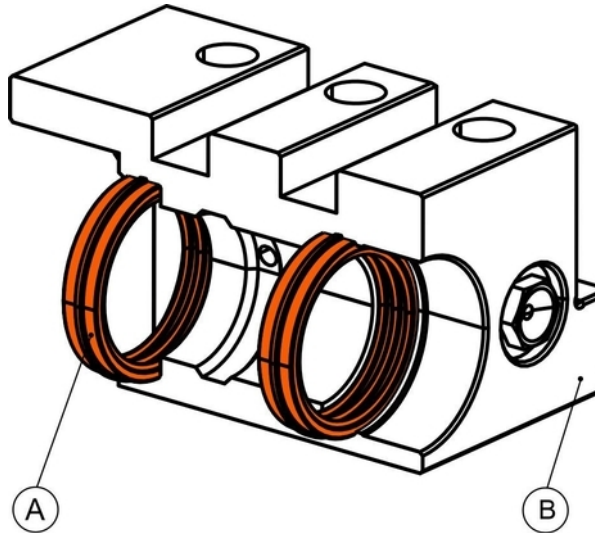


Figure 67: Schematic illustration: Sealing rings of the base jaw

- A** Sealing ring
- B** Base jaw

The sealing rings are designed to be maintenance-free over 50,000 clamping cycles.

If the sealing rings are damaged, replace them in the base jaws.

Replacing the sealing rings

1. Pry the sealing rings (pos. A) out of the base jaw (pos. B) using a suitable tool.
 2. Gently press the new sealing rings (pos. A) together.
 3. Insert the sealing rings (pos. A) into the hole and push into position.
 4. Expand the sealing rings (pos. A) until they rest in the groove.
- ✓ The sealing rings in the base jaw have been replaced.

10.5 Contact address



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11 Storage

NOTE



Material damage due to incorrect storage!

If the clamping fixture is not stored properly, bearing damage may develop. Damage to the bearings may impair operation.

- ▶ Clean all components of the clamping fixture.
- ▶ Grease or oil the components, see chapter 3.7, Cleaning agents and lubricants.
- ▶ Store the clamping fixture on a suitable surface, see chapter 11.1, Storage conditions.
- ▶ Protect the clamping fixture from deposits and contamination.

11.1 Storage conditions

Storage area The storage area must meet the following criteria:

- Flat
- Non-slip
- Clean
- Dry or oiled
- Designed for the weight of the clamping fixture, see chapter 3.3, Dimensions and weights

Storage environment

Condition	Value
Ambient temperature	15 ... 40 °C
Humidity	< 60 %

11.2 Preparing the clamping fixture for storage

1. Disassemble the clamping fixture, see chapter 8, Disassembly.
 2. Clean components.
 3. Renew the corrosion protection of the metal surfaces.
 4. Grease the threads and guide surfaces of the screw shaft.
 5. Grease the guides and threads of the respective base jaw.
 6. Store the clamping fixture in a suitable, closed container.
- ✓ The clamping fixture is ready for storage.

Storing the components individually

The components can be stored individually. If the components are stored individually, it is recommended to use the original packaging.

11.3 Repairing the clamping fixture after storage

1. Depending on the type of storage, disassemble the clamping fixture or unpack the components.
 2. Check the entire clamping fixture for damage.
 - In case of damage, first consult EMUGE GmbH & Co. KG for any possibilities for use.
 3. Clean components.
 4. Renew the corrosion protection of the metal surfaces.
 5. Grease the threads and guide surfaces of the screw shaft.
 6. Grease the guides and threads of the respective base jaw.
- ✓ The clamping fixture is ready for assembly.

12 Waste disposal

Dispose of all components in accordance with local regulations, see chapter 1.8, Environmental protection.

Materials used

Table 21: Materials used

Component	Material used
All metal components of the clamping fixture	Alloy steel
Seals in the base jaws	HPU-95
Covering caps	PETG
Cover bolt	PA

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EMUGE Mechanical centering vise
Operating and assembly instructions

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