

®

ALGRA

OPERATING INSTRUCTION DRIVEN TOOLHOLDERS

Version 1.4



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1. INTRODUCTION

This manual is an integral part of the supply of our driven toolholders and must be given to new users when they purchase the ALGRA product.

If further copies of this manual are required, they can be downloaded from the ALGRA.IT website.

It is advisable to read this manual before installation and use, and to observe all the directives and instructions given.

This document contains symbolic representations. The accessories shown are not necessarily included in the supply.

The information contained in this manual is based on knowledge available at the time of printing. We reserve the right to make changes even without prior notice.

1.1 General informations

Dear User,

The ALGRA driven toolholders are precision products with very high quality, and we thank you for your choice.

The purpose of this manual is to allow the User to understand the potential of the ALGRA product, and at the same time to provide guidelines for the correct use and operation of it.

1.1.1 Symbols legend

 Warning	This symbol indicates risk situations, related to the INCORRECT use of the driven toolholder or to the non-compliance with adequate safety criteria which can lead to dangers for the user's safety and/or to damage of the driven toolholder.
 Caution	This symbol indicates situations in which the NOT respect of the specifications presented in this manual leads to a significant shortening of the toolholder's life.
 Notice	This symbol gives instructions to be respected when using the product in order to use it correctly and efficiently.

1.2 Warranty

ALGRA has an internal department committed to repair and overhaul driven toolholders under warranty and not.

The faults that will be detected will be repaired under warranty only if due to non-compliance related to design, materials or workmanship and under the following conditions:

- 1) The warranty applies only to defects that occur within 12 months from delivery for new products and 90 days after delivery for repair service.
The Manufacturer will recognize as due to the causes mentioned above (non-compliance related to design, materials or processing).
- 2) Damages caused by: non-compliance with the instructions in the manual, incorrect operation in the use of the machine, failure to comply with the use of the motorized vehicle are excluded from the warranty.
- 3) The Customer must immediately stop using and submit a complaint at the moment of detection of the defect.
- 4) The written complaint must include a detailed description of the problem.

1.3 Possible Hazards During Use



Warning

This manual is written for use by Qualified Personnel.

The User is obliged to read and follow all the instruction reported in this manual.

This manual provides the knowledge necessary for the correct use of the driven toolholder and allows you to understand the risks deriving from non-compliance with the indications provided by ALGRA.



Notice

The use of Algra driven toolholders is subject to compliance with instructions provided by the machine manufacturer.

Any damage due to non-compliance with safety regulations and / or the lack of use of the appropriate protective devices are due to the incorrect use of the same.

Therefore, in order to avoid damage to the User's safety, is suggested to Users to always wear personal protective equipment (PPE), such as gloves, shoes and suitable clothing.



Warning

Any modification applied to the driven toolholder without ALGRA's prior written approval may compromise its correct functionality and reliability.

Any damage due to incorrect use, changes, or non-compliance with the requirements will result in the User being the only responsible and by consequence in the cancellation of the warranty.

The User must comply with the instructions provided using the driven toolholder correctly.



Caution

Check before each reuse that the part of the driven toolholder that is located in the appropriate seat in the turret remains in perfect condition with adequate cleaning and has not been damaged.



Notice

ALGRA obliges NOT TO USE damaged driven toolholders and if they are not carefully cleaned.

The use of products that are not intact can lead to their incorrect functioning.

If this happens, the user is invited to contact the Service Center for repair, replacement and disposal.

Maintenance must be carried out by ALGRA or Authorized Dealers, this is to avoid incorrect operations during disassembly and reassembly, and thus causing subsequent problems in the operation of the driven toolholder.



Notice

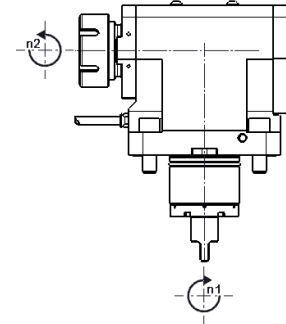
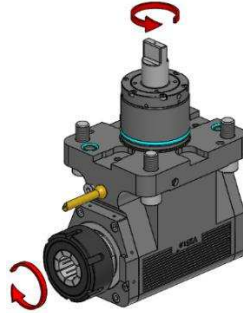
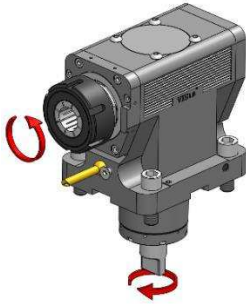
A correct planned and preventive maintenance plan for ALGRA products can avoid unwanted downtime, and favor greater production efficiency.

2.PRODUCT SPECIFICATION

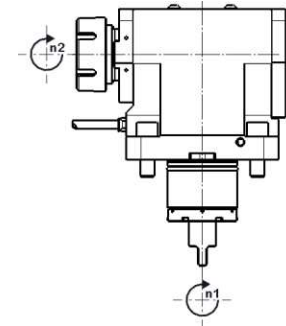
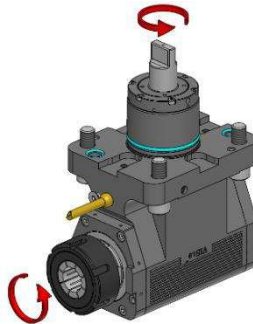
 ALGRA	
①	
② REV	③ S/N
④	⑤
⑥ Max.n2 = rpm	⑦ I = A (B)
⑧ W = kg	⑨ Max.T2 = Nm
⑩ Max.Press. = bar	⑪ Filtration = μm

1. Commercial code.
2. Alphanumeric identification code with respective revision.
3. Serial Number.
4. Reference standard/ Machine Interface.
5. Tool holder exit.
6. Maximum permissible torque.
7. Transmission ratio:
 - A. Rotation speed at output versus input
2:1 ,3:1 Demultiplied
1:2, 1:3 Multiplied
 - B. Direction of rotation of the spindle shaft with respect to the drive shaft

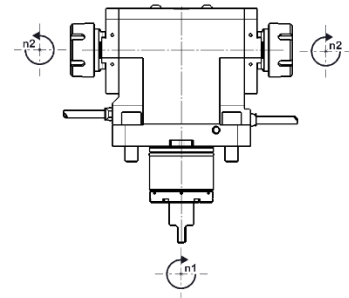
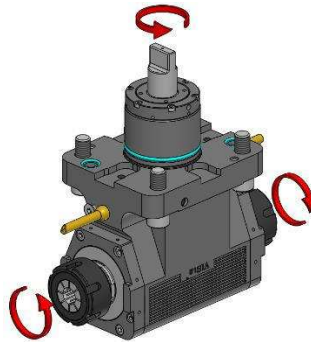
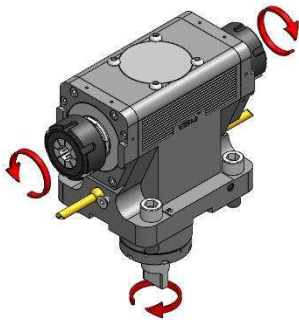
B_I: n1 : n2 ∩ ∩ (discord)



B_{II}: n1 : n2 ∩ ∩ (concord)



B_{III}: n1 n2 ∩ ∩ ∩ (double output)



8. Maximum speed.
9. Weight.
10. Maximum allowable pressure for driven toolholders with internal coolant supply; refer to the appropriate P-v graph.
11. Filtration required for proper operation.

N.B. points 10– 11 will be better analysed in the paragraph on internal coolant supply.

3. METHOD OF USE

3.1. Installation

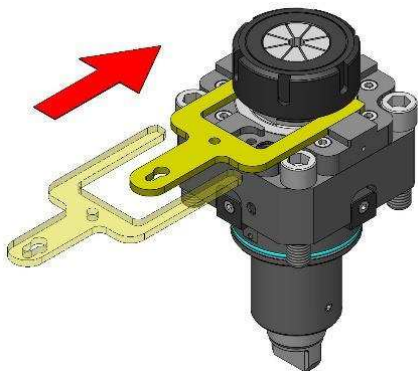


For correct assembly of the toolholder, the Operator must follow the instructions provided by the machine Manufacturers.

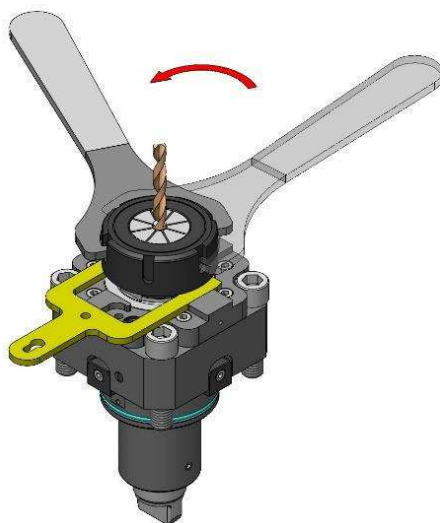
3.2. Replacement of Tools



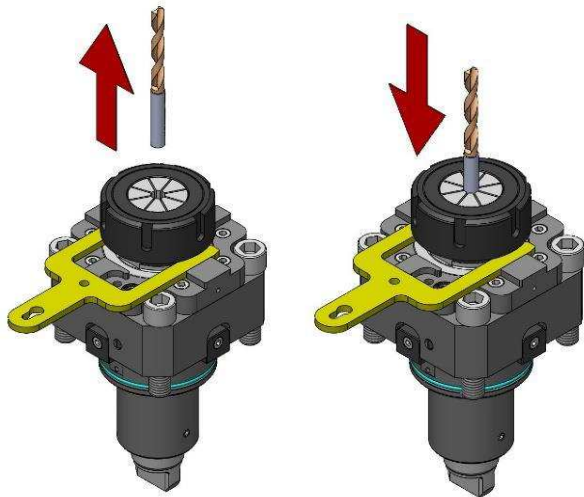
The following procedure defines the operations that the operator must comply with for the assembly and disassembly of collets.



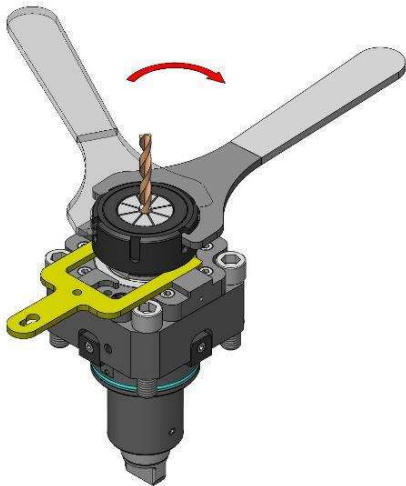
1. With the machine stopped, position the blocking wrench in the appropriate spaces between the flange and the shaft in order to block the rotation of the spindle.



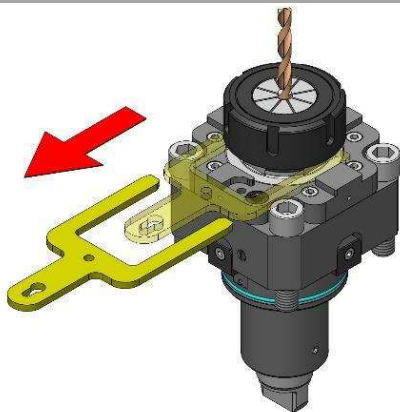
2. Once the blocking wrench has been positioned, it will be possible to unscrew the ring nut and release the tool.



3. Replace the tool.



4. Close the ring nut.



5. Remove the blocking wrench.



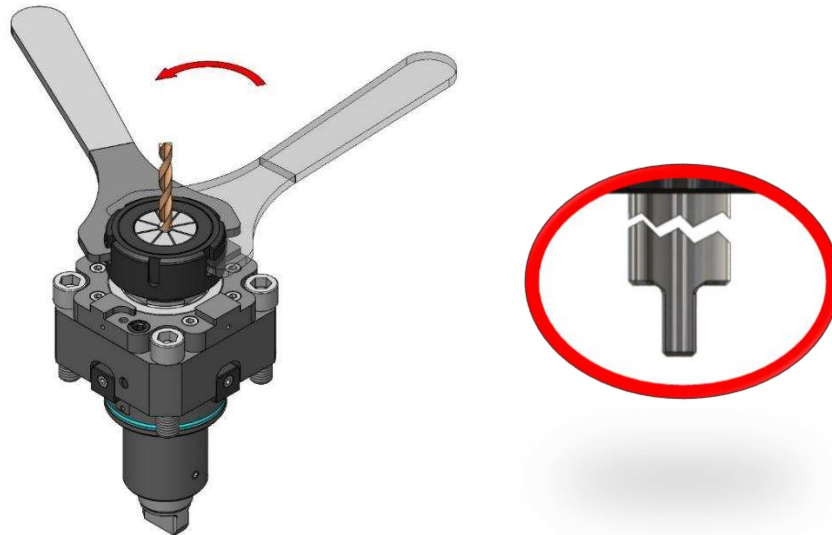
Warning

Forgotten removal of the wrench as indicated in point 5 can lead to serious damage to the driven toolholder and/or to the machine.



Open and close the ring nut only with the wrench in position! (As indicated in point 2)

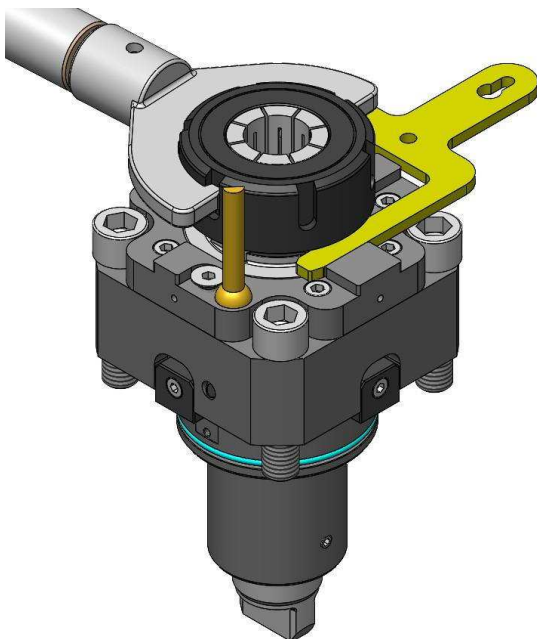
Operating without the wrench can lead to break of the tenon as indicated in the following figure.



3.3 Maximum closure of the rings

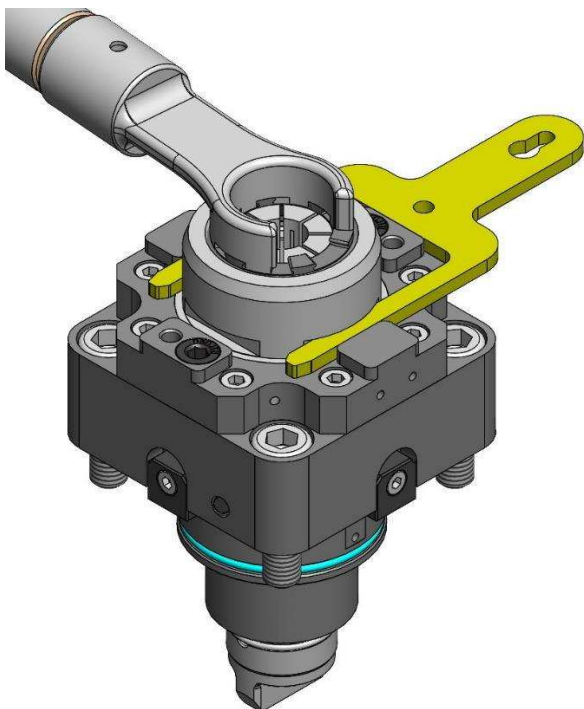
The maximum permissible values for the ALGRA nuts are shown in the tables below, divided according to the type of ring.

Internal thread ring (outside the spindle)



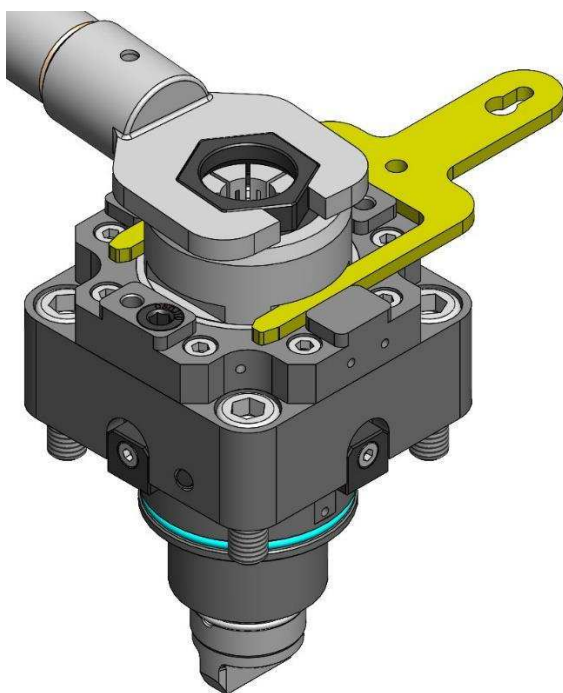
Reference cone	Max Torque Nm
ER11	30
ER16	60
ER20	70
ER25	100
ER32	130
ER40	160
ER50	230

External thread ring (inside the spindle)



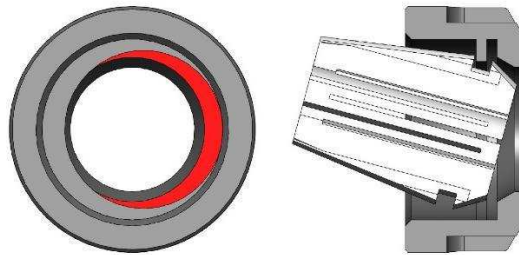
Reference cone	Max Torque Nm
ER11	24
ER16	30
ER20	40
ER25	60
ER32	80
ER40	95

Hexagonal external thread ring (inside the spindle)



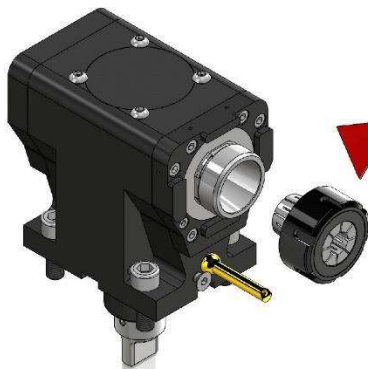
Reference cone	Max Torque Nm
ER11	24
ER16	40
ER20	50
ER25	80
ER32	100
ER40	110

3.4 Replacement of the collet



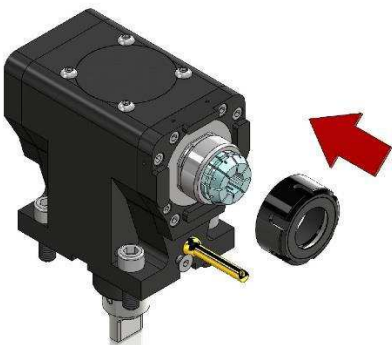
For correct Collet-Ring nut assembly:

- Place the collet diagonally with respect to the locking ring
- Set the collet laterally by pressing on the top
- Screw the ring nut on the spindle as shown in the figure below



Correct Assembly

Following the instructions



Uncorrect Assembly

It is absolutely wrong to insert the collet into the spindle before having mounted it in the ring nut



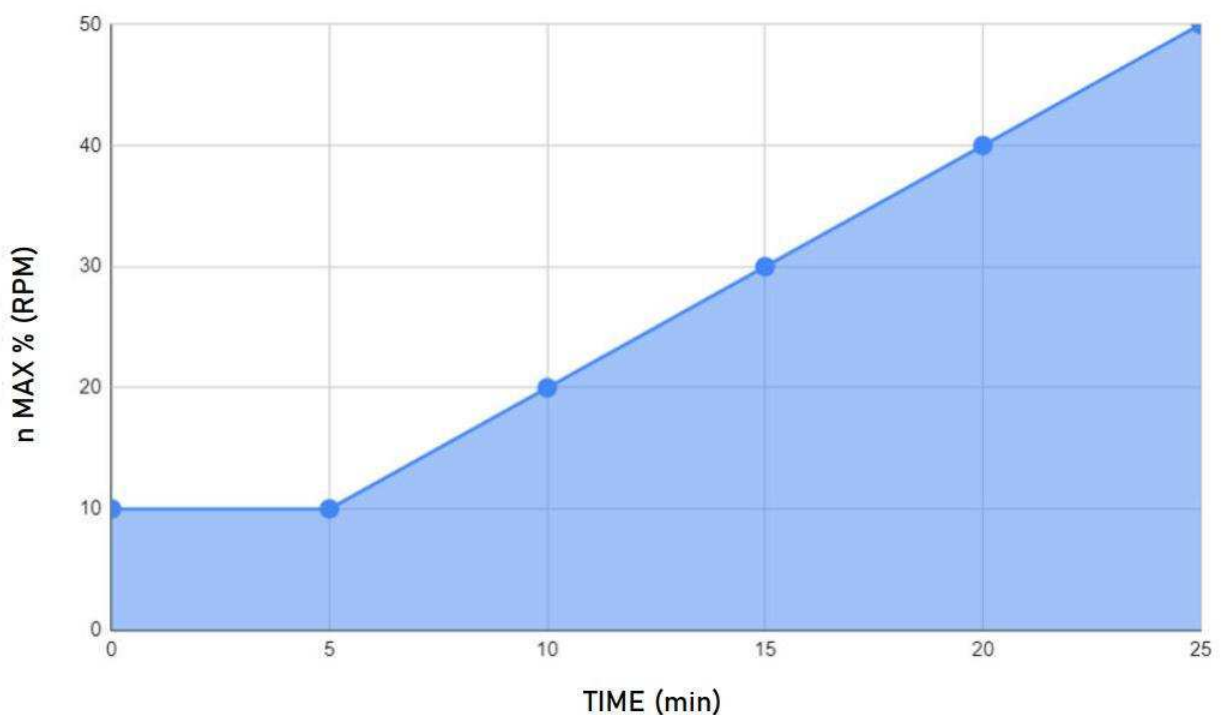
The instructions listed above are rules of common use, please always follow the instructions provided by the manufacturer for any specific indications.

3.5 First Installation

Before being packaged all ALGRA driven toolholders must do a running-in cycle until the maximum speed of use is reached.

Notice

The User is asked to carry out a second running-in cycle in the machine the first time the driven toolholder is put into operation, following the graph below.



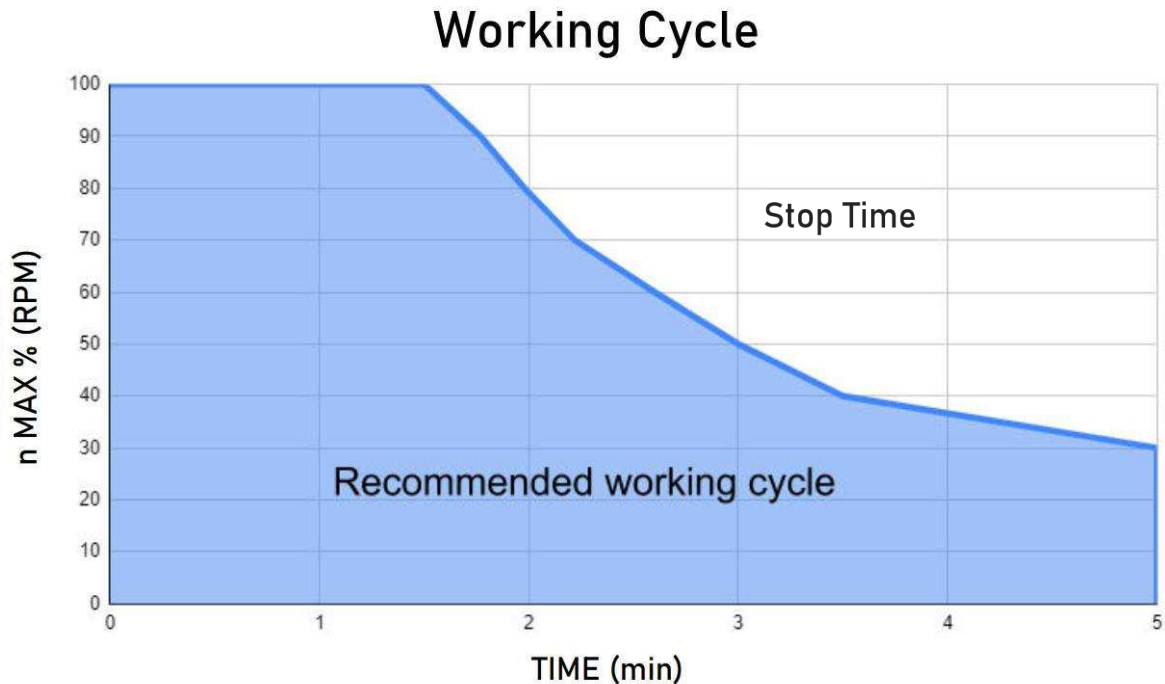
Notice



Warning

In the event that the driven toolholder is equipped with internal refrigeration, even during the running-in phase it is compulsory to always supply the toolholder with the internal coolant.

3.6 Load Cycle



The diagram indicates the ideal ratio between rotation speed and the maximum residence time at that speed during machining. Theoretically permissible (5 min duty cycle) for externally and internally cooled driven tools.

Example of using the diagram:

Maximum speed $\rightarrow n_{max} = 8.000 \text{ rpm}$

Rotation achieved during processing $\rightarrow n_{Used} = 4.000 \text{ rpm}$

Calculation $\rightarrow \%n = \frac{n_{Used}}{n_{max}} = 50 \%$

Now you should look at the diagram looking at the value calculated before on the y-axis and find the maximum duration at the working cycle in minutes on the x-axis.

So In this example the driven tool can work 3 min and must stop for the remaining 2 min cycle.



Using the driven toolholders beyond the recommended working times can cause damage to the bearings and sealing gaskets and consequently affect their correct functioning.

The temperature of the tool holder body must not exceed 80 °C (176 °F) during operation under normal conditions.

3.7 Permissible Torque

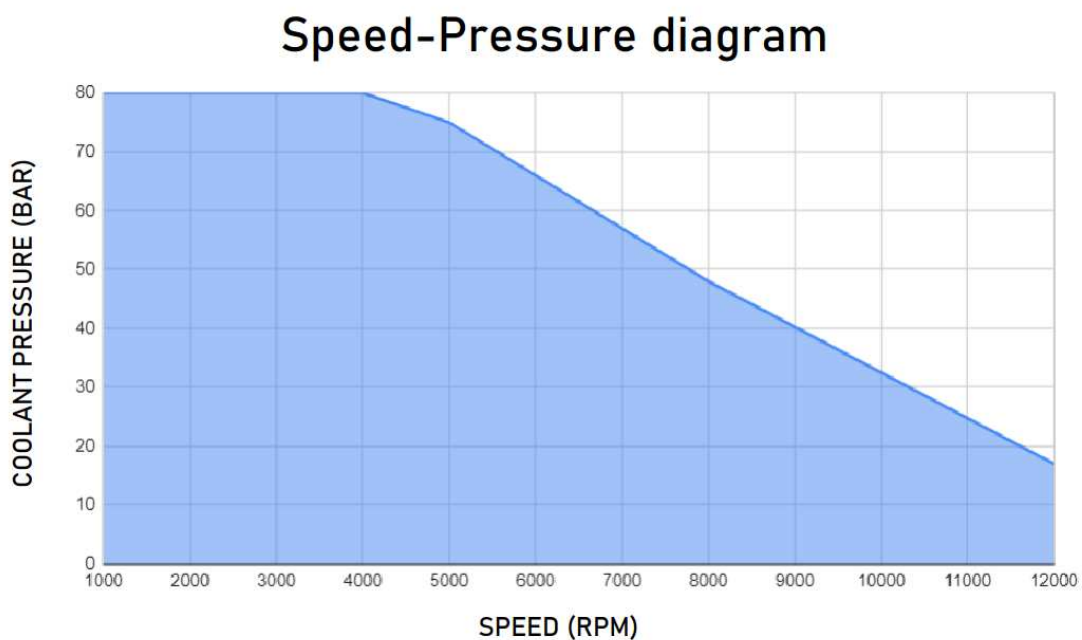
The max. torque values given in the data sheet apply to uniform loads with light impacts. The permissible torque is significantly reduced in the event of heavy impact loads. The cutting values of the machining tool must always be selected in such a way that overloading of the driven tool is ruled out.

Machining example	Impact load	Reduction of the max. torque
Drilling with twist drill	Low	0%
Milling with end mill	Medium	-20%
Groove milling with cutter head, Polygon turning	High	-40%

3.8 Internal coolant supply

This paragraph only concerns driven toolholders with internal coolant supply..

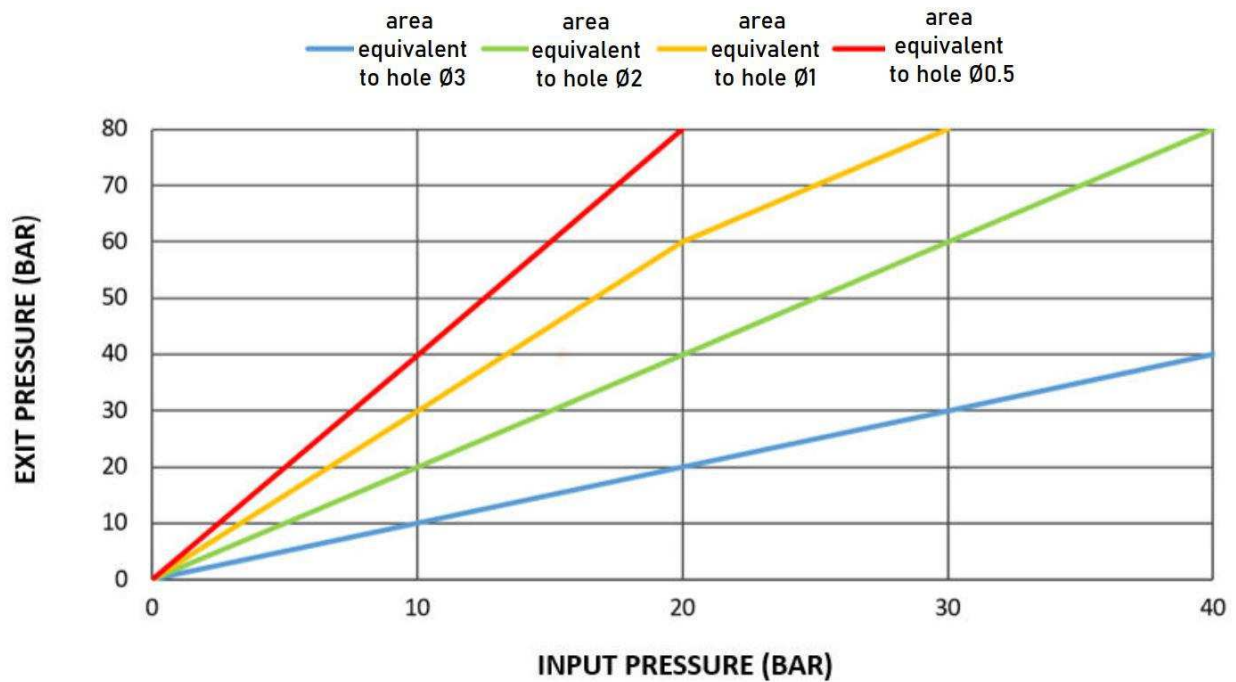
The maximum refrigerant pressure depends on the number of rpm at which we want to use the driven toolholder and is outlined in the following graph.



To ensure correct operation of the driven toolholder, it is necessary to filter the coolant entering the machine with a filtration of 30 µm.

Ensure that the coolant is present in the driven toolholder before it starts to rotate.

Pressure variation according to tool with coolant hole



Non-compliance with the instructions about pressure and/or filtration can cause significant damage to the service life of the driven tool and an increase in the risk of bearing blockage.



The above limitations are used to ensure the correct operation of the ALGRA seal, which allows operation at higher speeds than what traditional seals can offer today.

3.9 Maintenance

The life of ALGRA driven toolholders depends on:

- Processes for which driven toolholders are used
- Terms of use
- Working cycles practiced

Therefore, in order to ensure the maintenance of the optimal performance of the driven toolholder, a planned replacement of components that deteriorate because of their service time, such as bearings and gaskets, is necessary as referred to in chapter "1.3 Possible Hazards During Use".

The recommended service interval is

- 12 months under normal conditions in 2 shifts.
- 6 months when operating in 3 shifts or under heavy or high-speed conditions.
- 6 months with internal coolant supply



Maintenance or overhaul of ALGRA driven toolholders must be carried out only by ALGRA Personnel or by Certified Dealers.

Anyone who sends products to ALGRA for maintenance or repair must indicate the following information relating to the purchase of the product:

- Purchase date
- Product code
- Serial number
- Hours of use

A correct use and a regular preventive maintenance guarantee the good functioning of the product.

Any modification, tampering or improper use exempts and releases ALGRA from any responsibility for any accidents or damages.

3.10 Cleaning and Storage

Proper cleaning of the driven toolholder helps to maintain a high level of efficiency and helps to avoid the infiltration of micro-shavings derived from processing and condensates of coolant which have deposited on the surfaces and in the drainage holes during use.

Clean and check the tool holders once a week, rotate the spindle several times by hand.

Clean the spindle area thoroughly with a cloth when removing the cutting tool.



ABSOLUTELY AVOID the use of compressed air for cleaning the driven toolholder in this case, the use of it pushes inside the driven toolholder the micro-shavings and condensates which have deposited on it.



Driven toolholders with internal coolant supply have drainage holes necessary for the correct functioning of the sealing system, therefore, before mounting the driven toolholder in the machine, check that these are not obstructed: in that case, clean them before starting the production. Also during disassembly, check that the holes are not blocked, and if so, clean them.



In the case of internally cooled drives at the end of the operating cycle, before putting them into storage, ensure that all the refrigerant contained in the drive is drained out of the drains by rotating the drive by hand, in order to prevent oxide from forming during the storage period.

3.11 Warnings for environmental protection

Do not dispose of the product and its components in the environment.

The product and its components must not come into contact with sewage, water courses or soil.

Disposal of the product or its components must be carried out in accordance with legal requirements on environmental protection, waste disposal and the requirements of the relevant local authorities.

The user of the product is responsible for the characterisation of the waste, related to the product or its component, and for its proper disposal.

Proper and correct disposal helps to avoid possible negative effects on the environment and health and promotes the recycling of materials from which the product is made.

APPENDIX A – Disk mounting

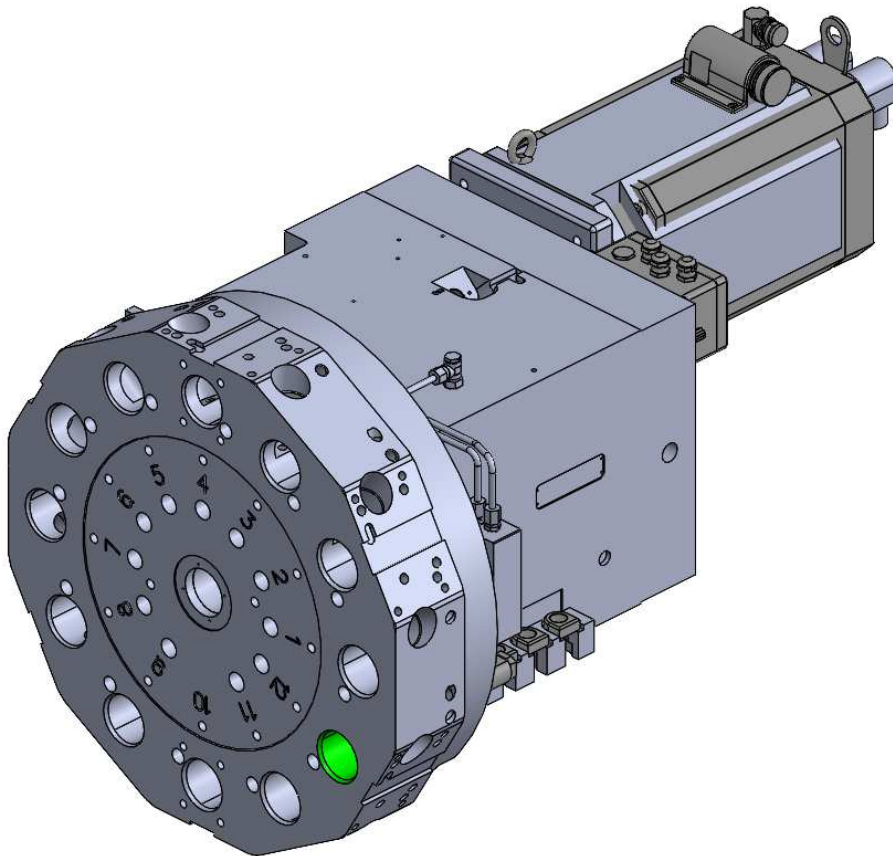
A.1) Driven tools installation on VDI disc with DIN5480



Notice

The following procedure is dedicated exclusively to driven tools with VDI DIN5480 (Sauter), in order to avoid coupling errors that can lead to damage to the turret or the driven tool itself.

1. Place the turret in the working position.



2. Unlock the driven tool ring.

Starting with the tooth of the grafted ring (figure 1), push it inwards until it can be inserted in its seat (figure 2) and at this point rotate it inside the seat in order to allow the free rotation of the shaft (figure 3).

Figure 1

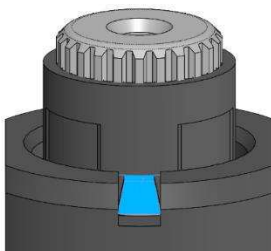


Figure 2

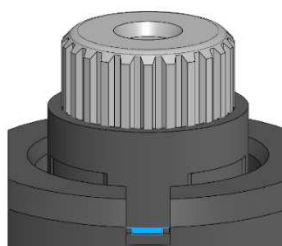
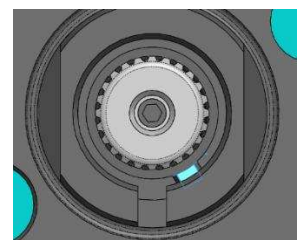
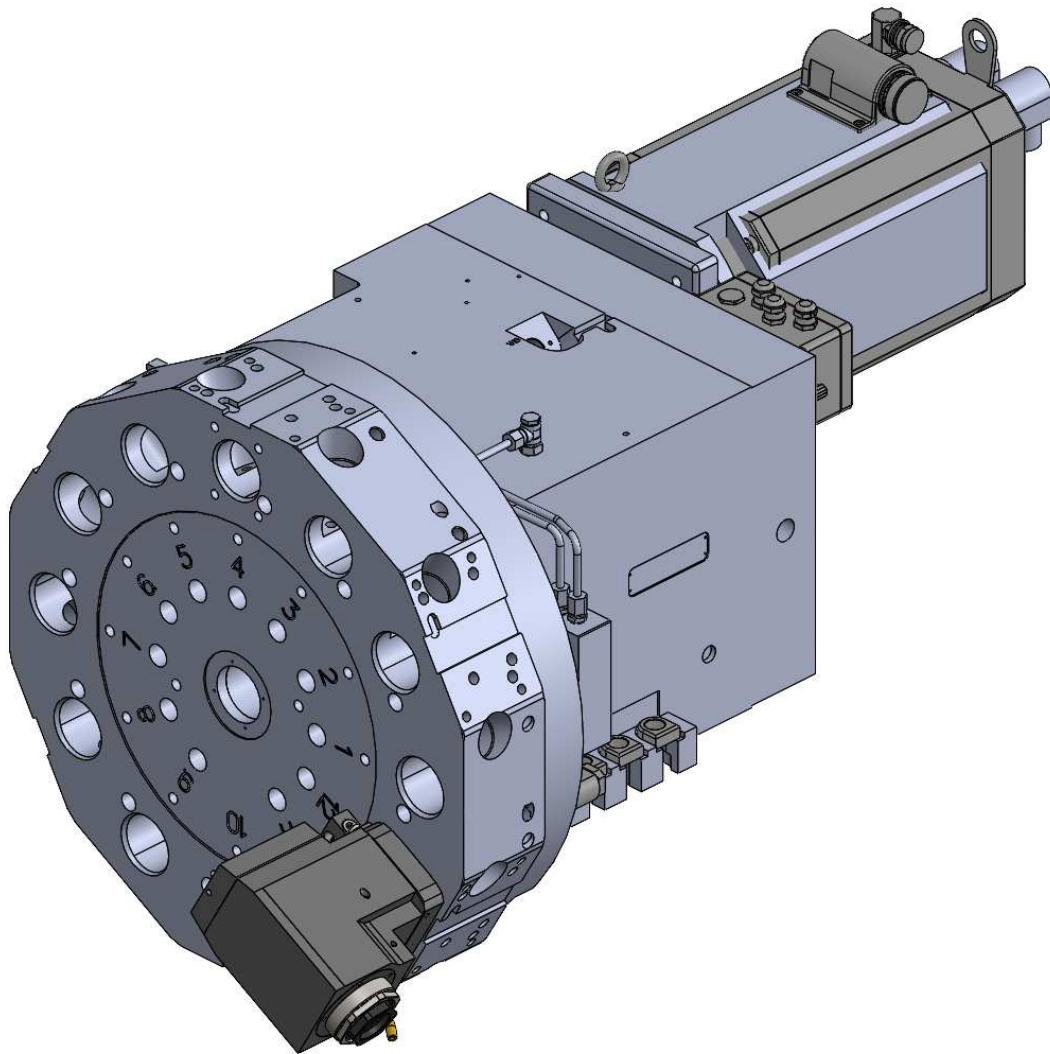


Figure 3



3. Mount the driven tool in the turret.

Mount the driven tool in turret, adjusting the spindle shaft slightly so as to allow the correct connection between the DIN5480 shaft and its seat in the turret.

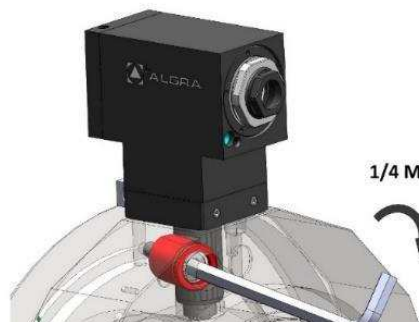


A.2) Toolholder installation on VDI disc

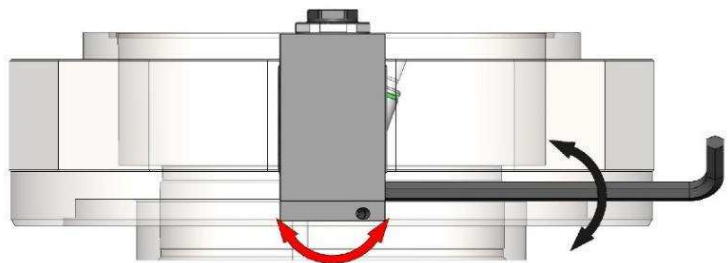
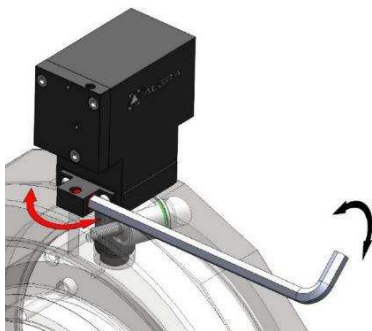
1. Clean the face of the disc on which you want to mount the toolholder, taking care NOT to use compressed air.



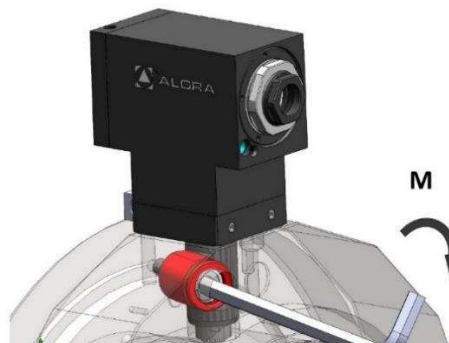
2. Insert the toolholder and close the VDI plug to $\frac{1}{4}$ of the value required for closing.



3. Check that the VDI closure does not block the rotation.
Adjust the position of the pin block to the desired position.

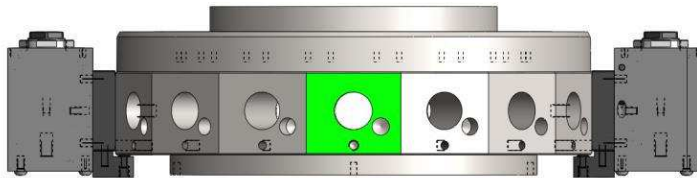


4. Close the VDI plug to the value required for closing.

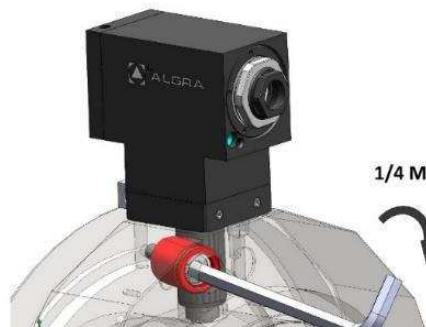


A.3) Toolholder installation on VDI disc with BRH

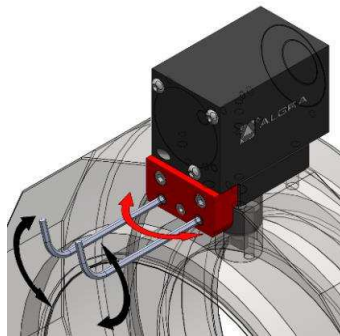
1. Clean the face of the disc on which you want to mount the tool holder, taking care NOT to use compressed air



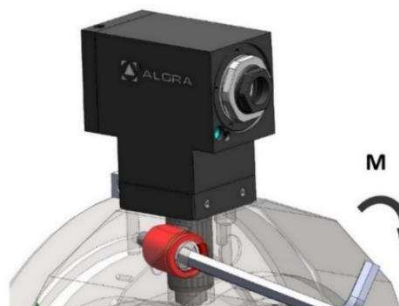
2. Insert the toolholder and close the VDI plug to $\frac{1}{4}$ of the value required for closing.



3. Check that the VDI closure does not block the rotation.
Adjust the block acting on the face of the disc until the desired position is obtained.

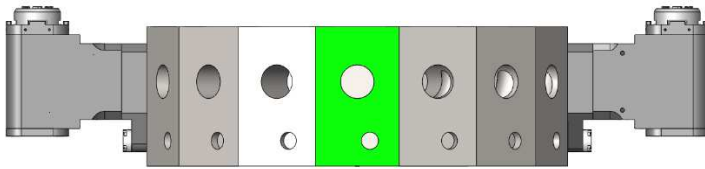


4. Close the VDI plug to the value required for closing.

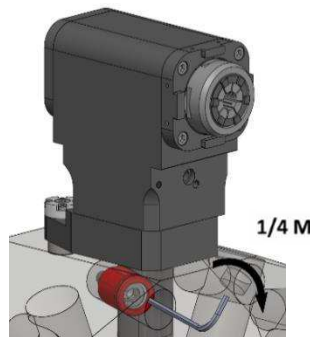


A.4) Tool holder installation on VDI disc with eccentric adjustment pin

4. Clean the face of the disc on which you want to mount the tool holder, taking care NOT to use compressed air



2. Insert the toolholder and close the VDI plug to $\frac{1}{4}$ of the value required for closing.

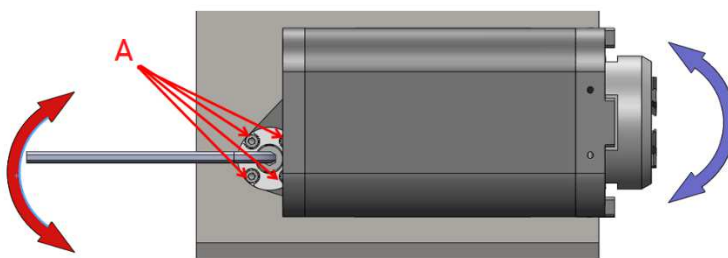


3. Loosen the screws (A).

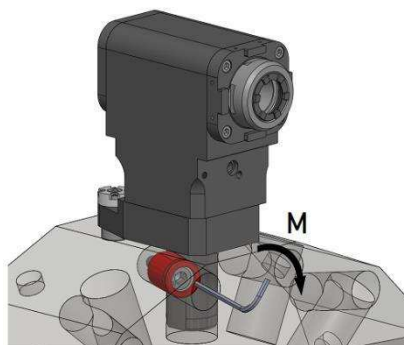
Check that the VDI closure does not block the rotation.

Adjust the eccentric pin by rotating it in the disc until the desired position is obtained.

Close the screws (A) to lock the rotation.



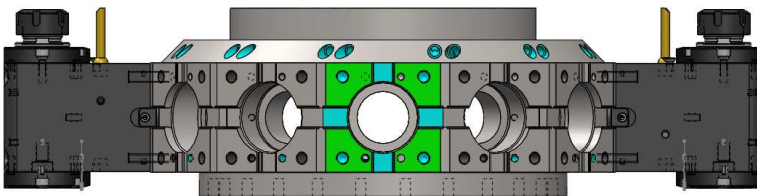
4. Close the VDI plug to the value required for closing.



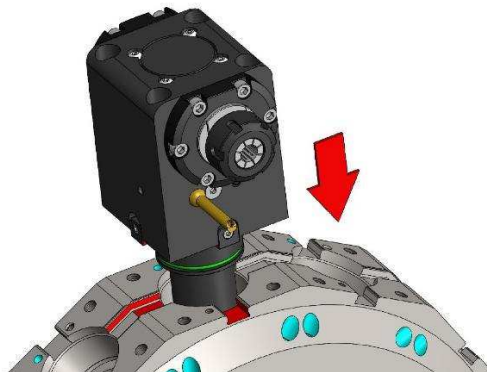
A.5) Tool holder installation on BMT disc with fixed centring

1. Clean the face of the disc on which the toolholder is to be mounted, the block seats and the thread seats of any swarf, coolant condensate or any other impurities in order to prevent damage to the disc or the drive itself and coupling and/or positioning errors.

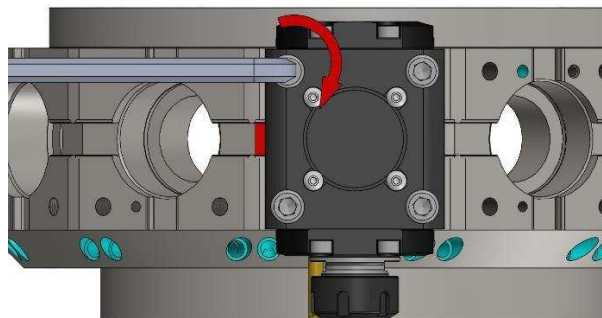
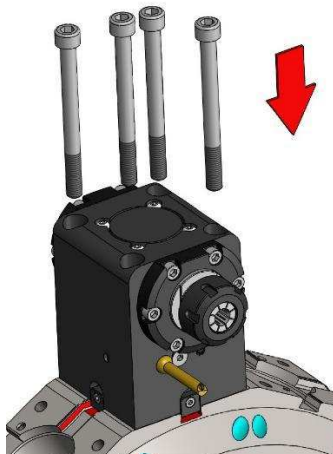
Take care NOT to use compressed air.



2. Mount the tool holder in the desired position by aligning the 4 blocks with their respective seats in the disc.

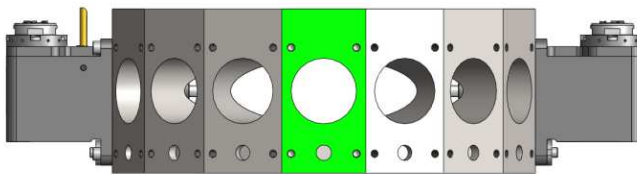


3. Once the tool holder is in place, insert the 4 fastening screws and close them

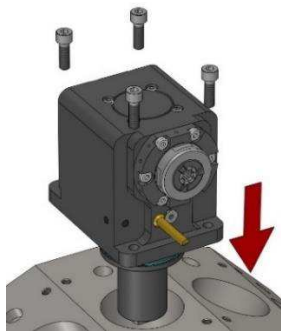


A.6) Tool holder installation on BMT disc with eccentric adjustment pin

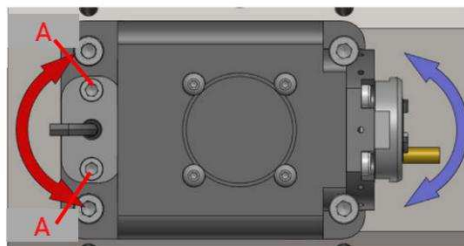
1. Clean the face of the disc on which the toolholder is to be mounted, the block seats and thread seats of any swarf, coolant condensate or any other impurities, in order to prevent damage to the disc or the drive itself and coupling and/or the drive itself and coupling and/or positioning errors.
Take care NOT to use compressed air.



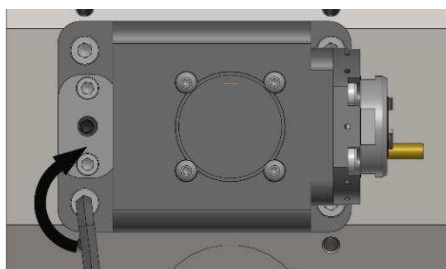
2. Mount the tool holder in the desired position, insert the 4 screws without locking them



3. Loosen the screws (A).
Adjust the eccentric pin by rotating it in the disc until the desired position is obtained.
Close the screws (A) to lock the rotation.



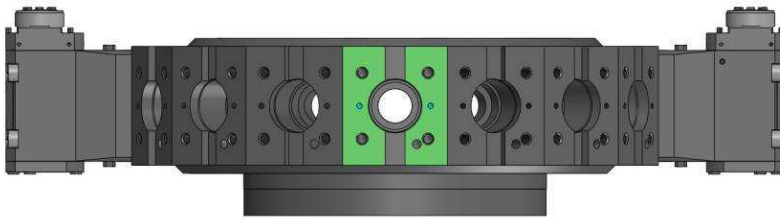
4. Tighten the 4 screws.



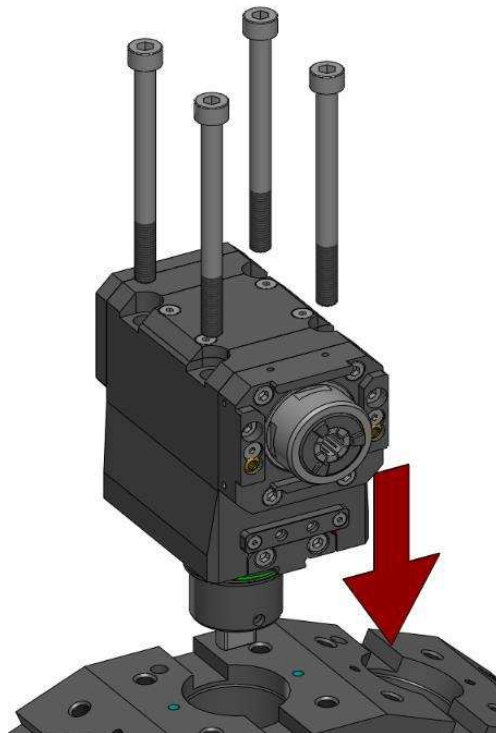
A.7) Tool holder installation on BMT disc with block/1

1. Clean the face of the disc on which the tool holder is to be mounted, the block seats and the thread seats of any swarf, coolant condensate or any other impurities, in order to prevent damage to the disc or the drive itself and coupling and/or positioning errors.

Take care NOT to use compressed air.



2. Mount the tool holder in the desired position by inserting the 4 screws.



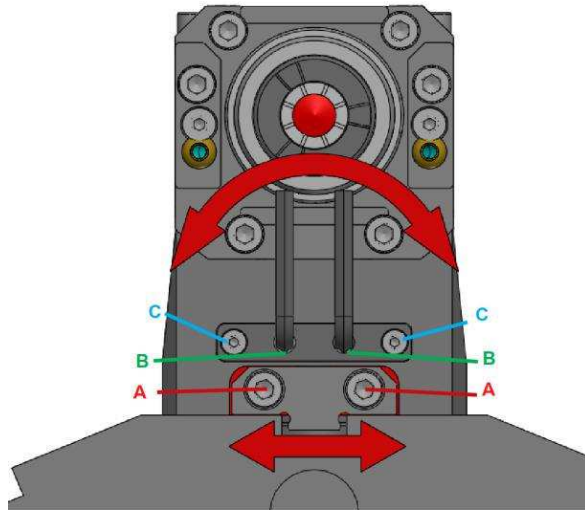
3. Driven tool angle alignment procedure:

3.1) Loosen screws [A] so that the block is mobile.

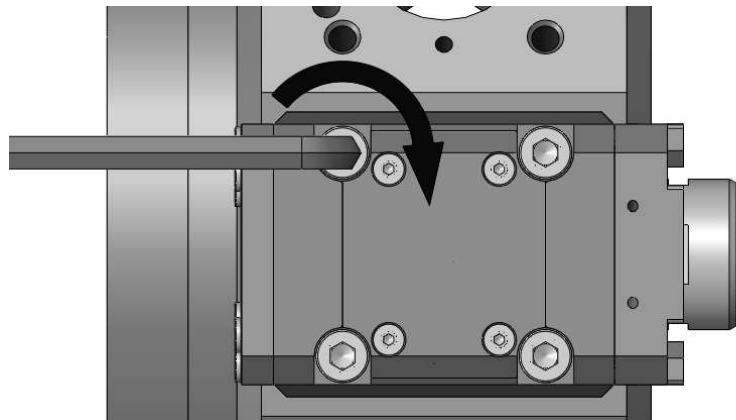
3.2) CAUTION! Absolutely avoid loosening screws [C].

3.3) CAUTION! Turn the components [B] simultaneously in the same direction in order to move the adjustment block to the right and left.

3.4) Once the desired position has been found, close the screws [A].



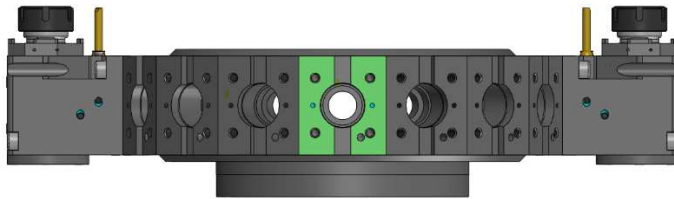
4. Tighten the 4 screws.



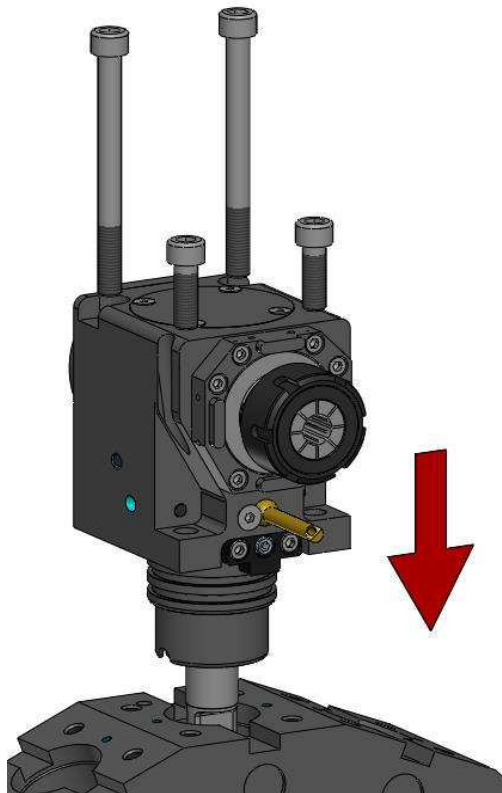
A.8) Tool holder installation on BMT disc with block/2

1. Clean the face of the disc on which the tool holder is to be mounted, the block seats and the thread seats of any swarf, coolant condensate or any other impurities, in order to prevent damage to the disc or the motor itself and coupling and/or positioning errors.

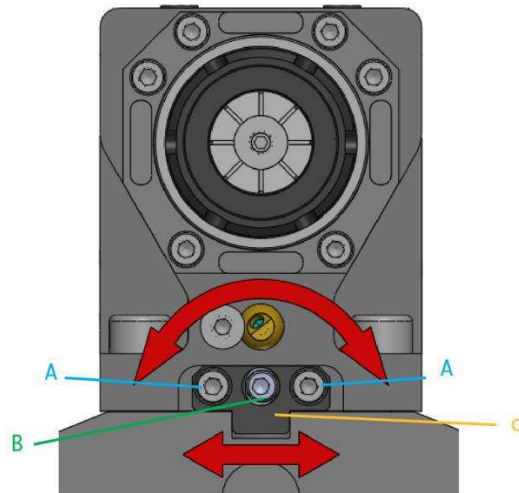
Take care NOT to use compressed air.



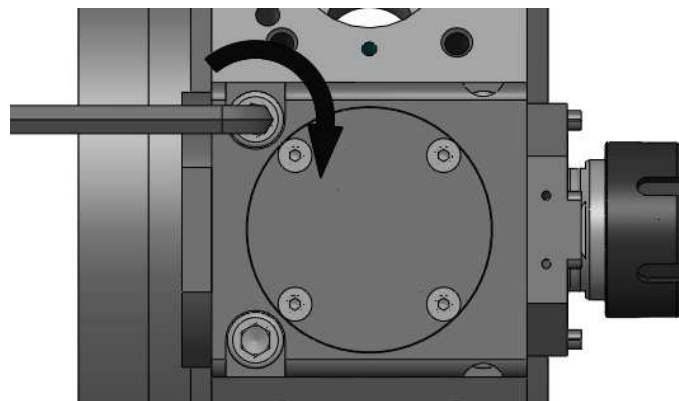
2. Mount the tool holder in the desired position insert the 4 screws.



3. Driven tool angle alignment procedure:
- 3.1) Loosen screws [A] so that the block [C] is mobile.
 - 3.2) Rotate the central pin [B] so as to move the adjustment block [C] to the right and left.
 - 3.3) Once the desired position has been found, close the screws [A].



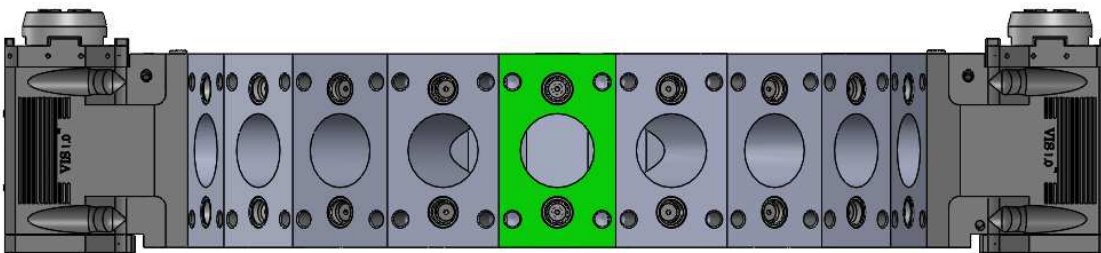
4. Tighten the 4 screws.



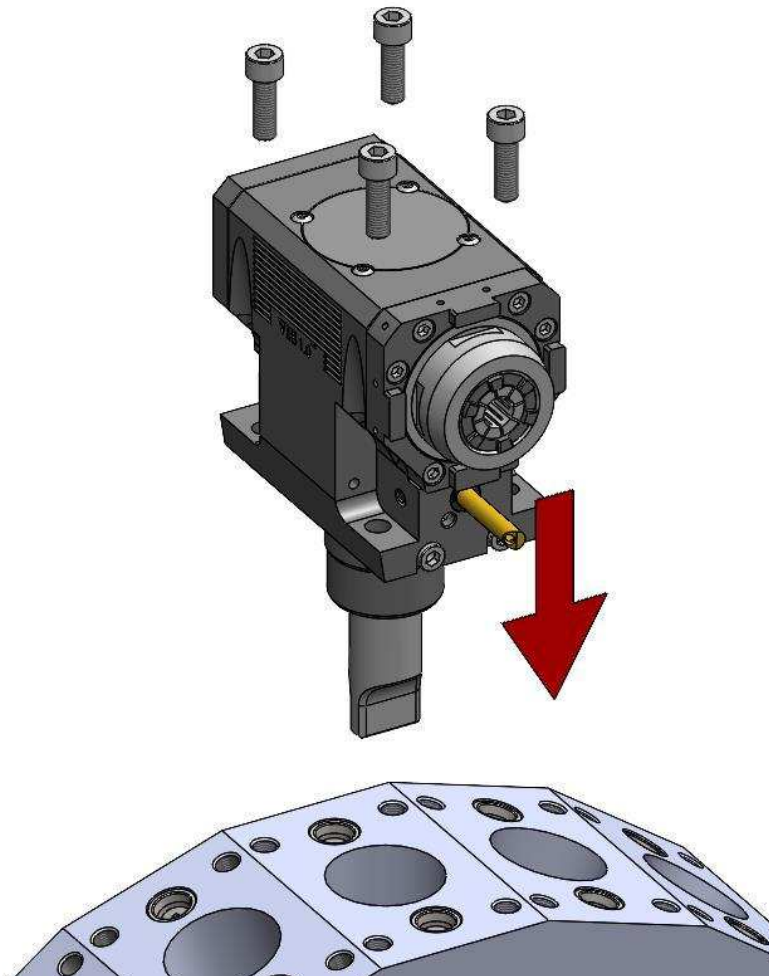
A.9) Tool holder installation on DMG MORI BMT42 disc with tapered pin

1. Clean the face of the disc on which the tool holder is to be mounted, the block seats and the thread seats of any swarf, coolant condensate or any other impurities, in order to prevent damage to the disc or the motor itself and coupling and/or positioning errors.

Take care NOT to use compressed air.

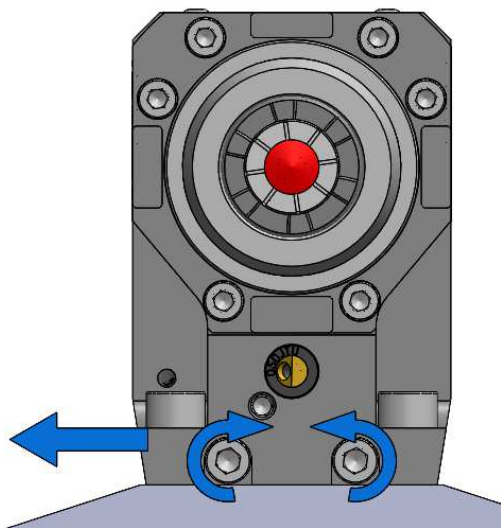


2. Mount the tool holder in the desired position insert the 4 screws.

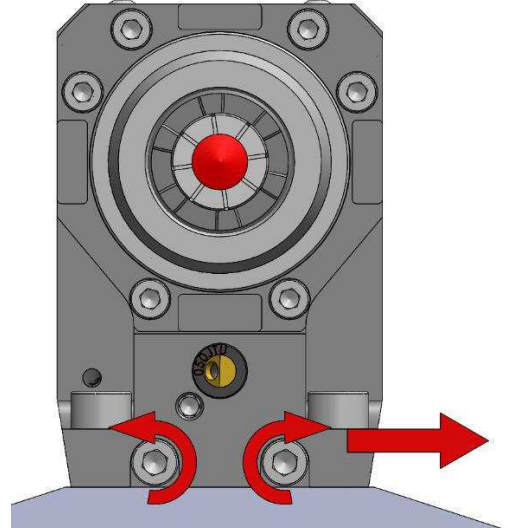


3. Adjust the tool holder tighten and loosen the frontal screws:

To adjust the tool holder on the desired direction (right/left) you have to tight the screw corresponding to that direction and you have to loose the opposite one.

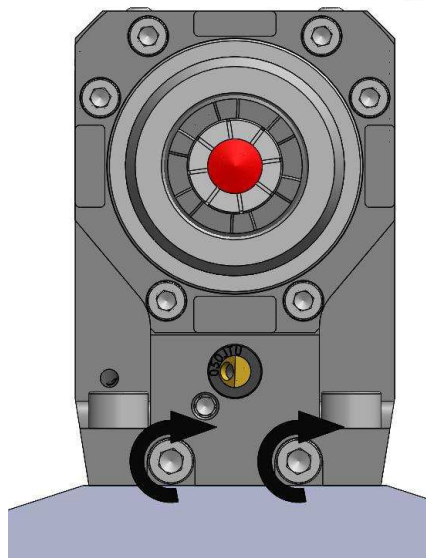


[to adjust the position on the LEFT you have to tight the Left screw and you have to loose the Right screw]

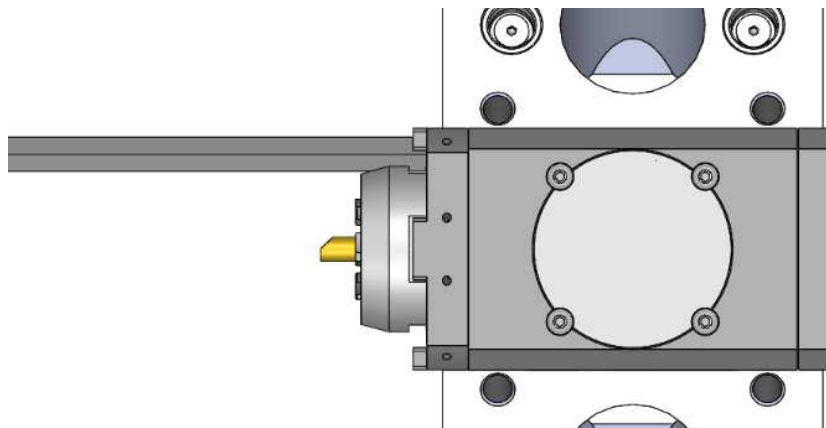


[to adjust the position on the RIGHT you have to tight the Right screw and you have to loose the Left screw]

4. Once the desired position has been found, close the screws.

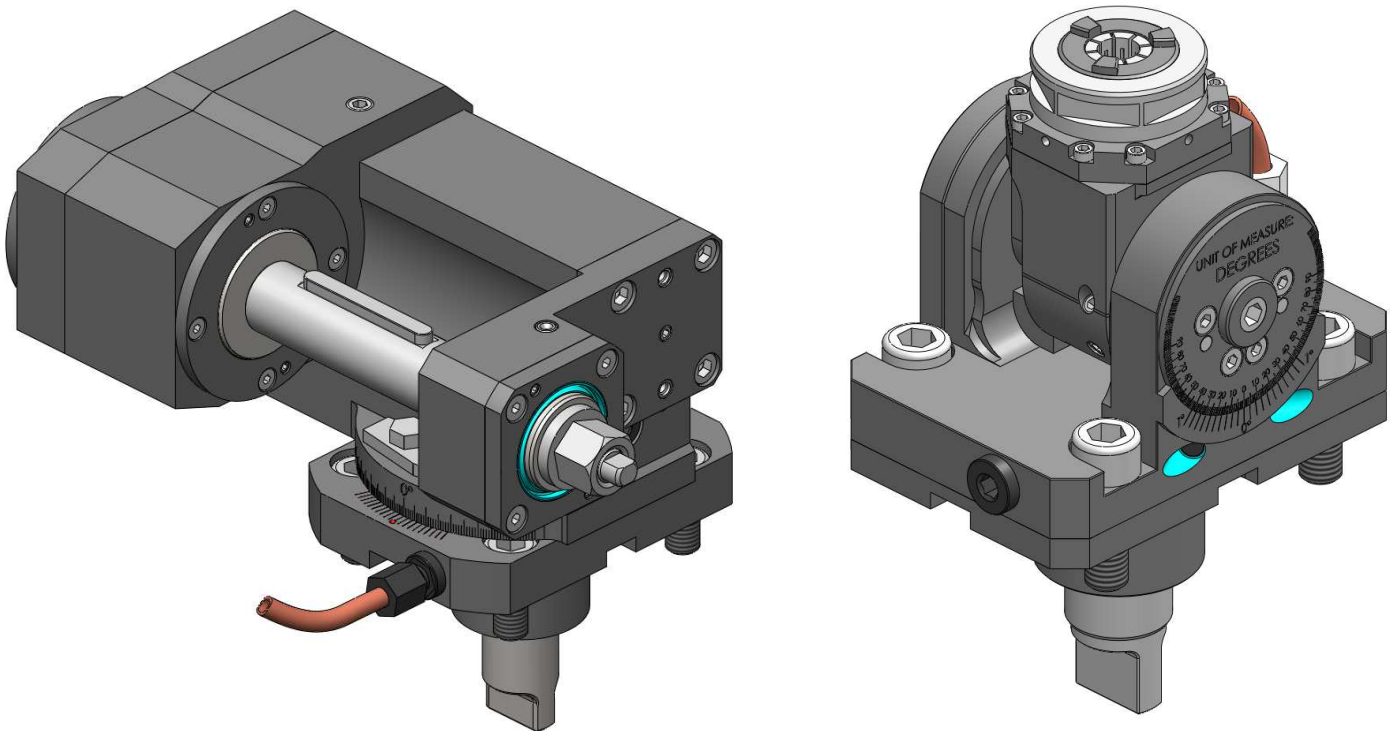


5. Tighten the 4 screws.



APPENDIX B – Driven tool holder adjustment

B.1) Driven tool holder adjustment with new angular orientation



Algra adjustable driven tool are designed to be tilted within an angle of 90° (Fig.1) or 180° (Fig.2) depending on the specific shape; with a reading accuracy of 0.1° .

This is done through the correct combination of the gradation of the rotating nonius and the adjustment notches on the body.

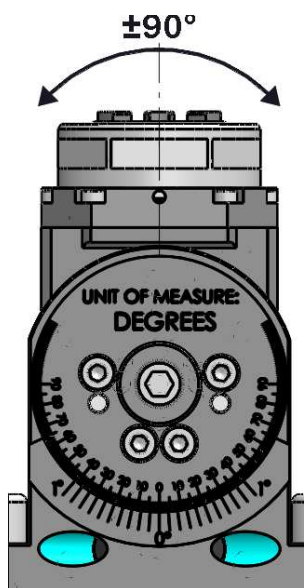


Fig. 1 Example Adjustable driven tool $\pm 90^\circ$

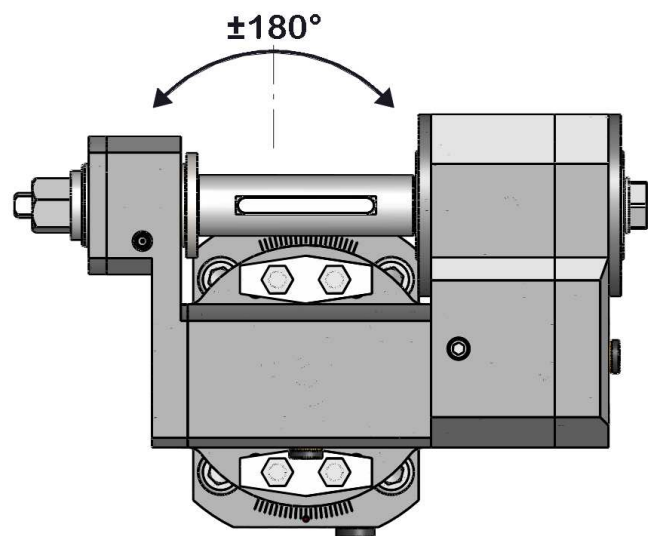
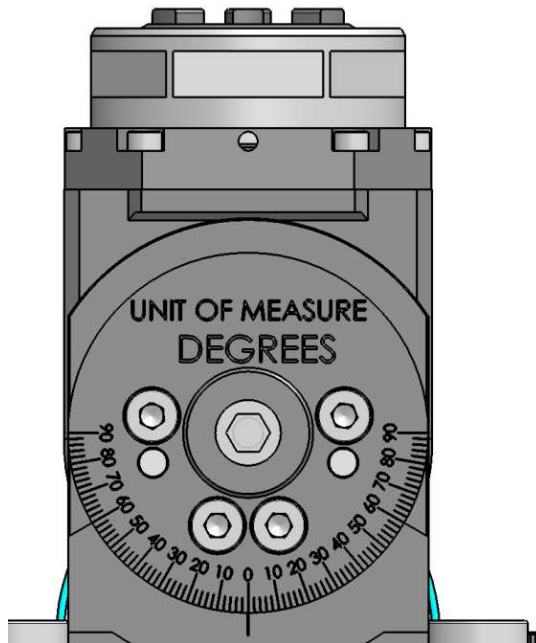


Fig. 2 Example Gear Hobber $\pm 180^\circ$

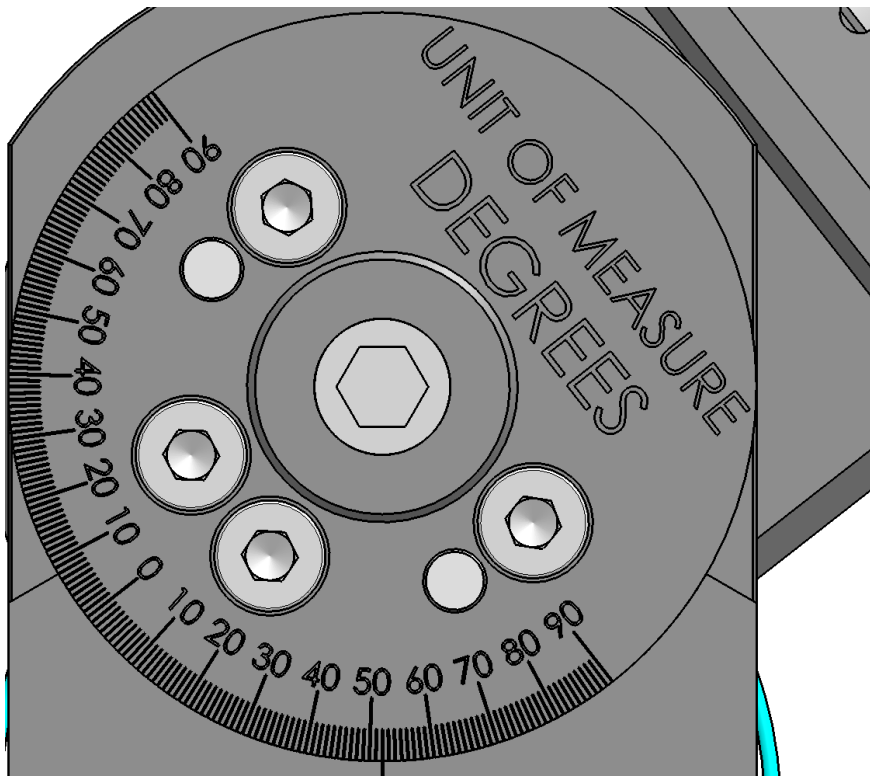
B.0) Adjustment without decimal reading.

The Algra adjustable driven tool without decimal reading, allows the reading of the whole angles between the values indicated on the vernier.

- 1) To adjust the tool holder from the angle 0



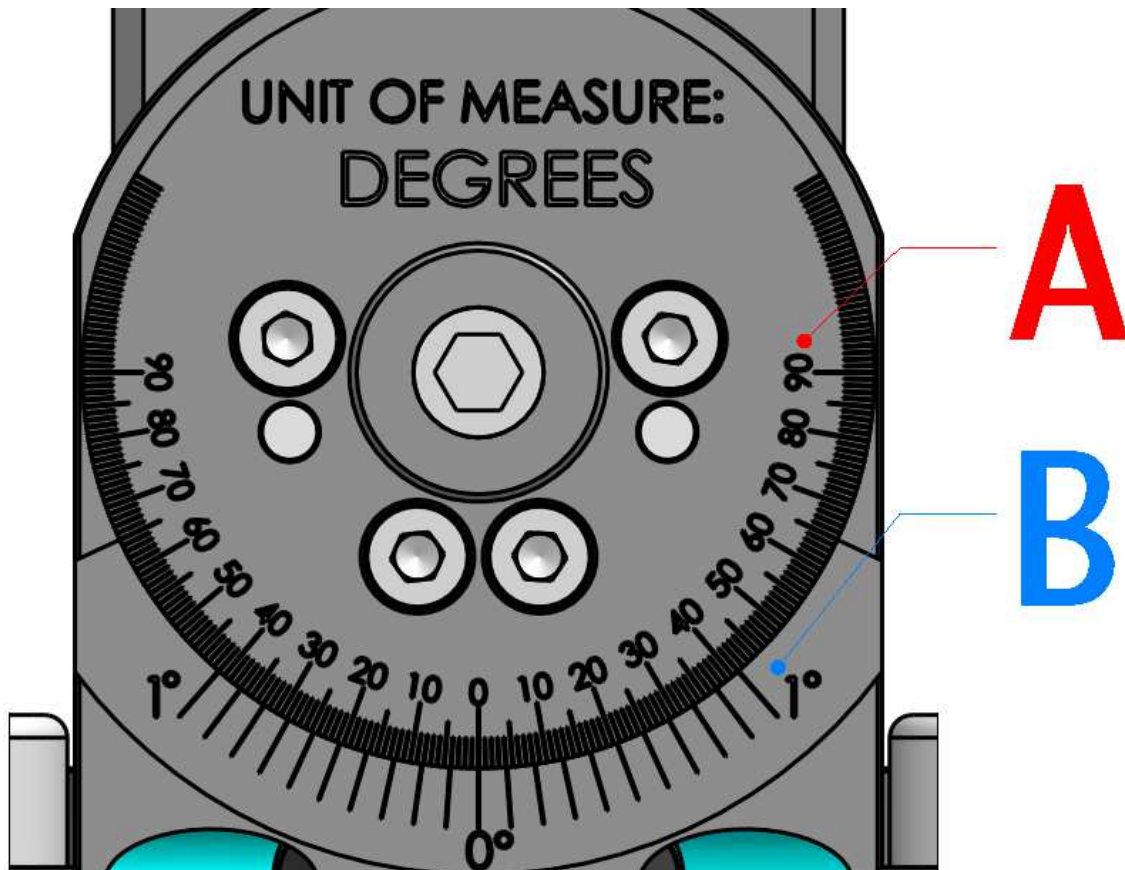
- 2) Adjust the spindle head to the desired angle (as reported as an example, below it is 52°)



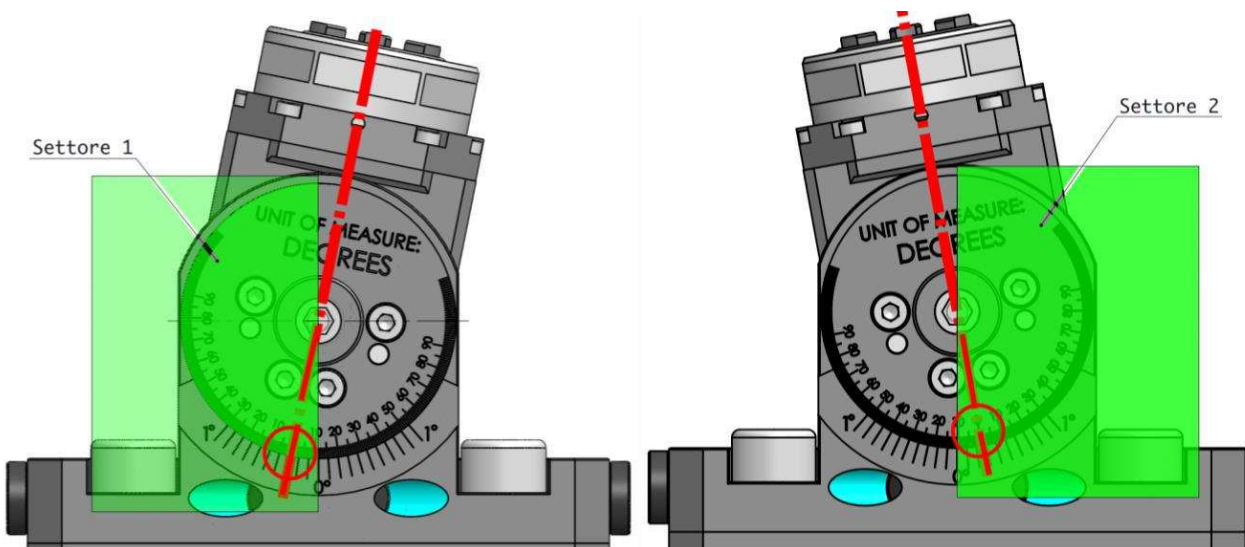
B.0.0) Adjustment with decimal reading.

The regulation explained in paragraph B.0 is bound to whole angles only, which is why in the new generations of Algra adjustable driven tools has introduced the possibility of a decimal reading.

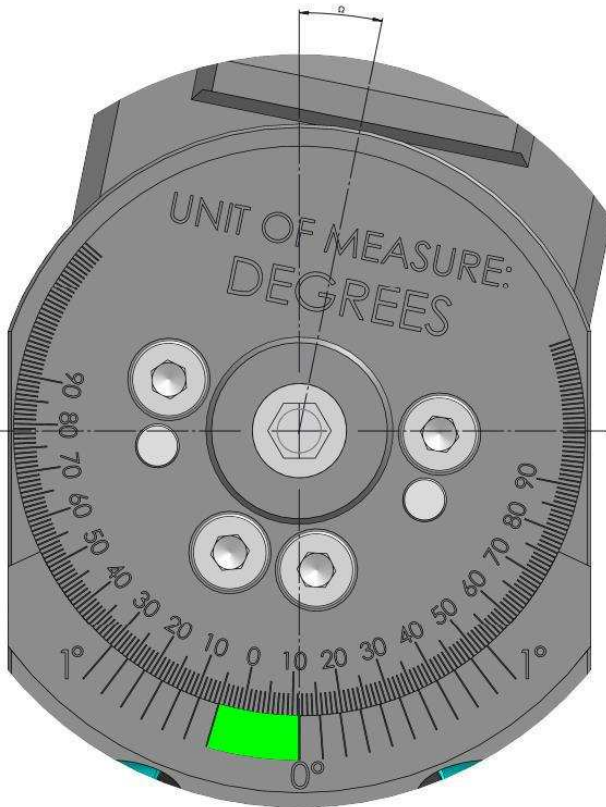
The decimal reading occurs through the correct association of the primary scale **A** (integer) and the secondary scale **B** (decimal).



The sector from which to detect the decimal reading is the one in which the tool axis intersects the graduated scales, as shown in the figure: sector 1 if clockwise, sector 2 if counterclockwise.

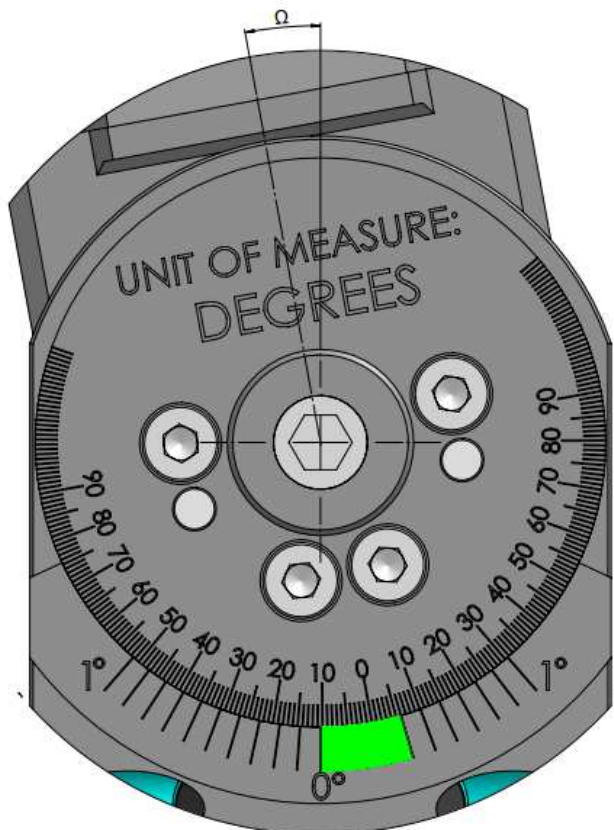


Application examples



Example 10,4°, direction CLOCKWISE

Turn the tool holder clockwise by 10 seconds and continue rotation clockwise al-linearly on the notch of primary scale A with the 4th notch of secondary scale B in sector 1 (start counting from 0, not included, to the left).

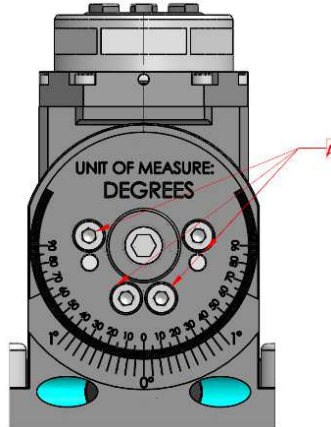


Example 10,4°, direction COUNTERCLOCKWISE

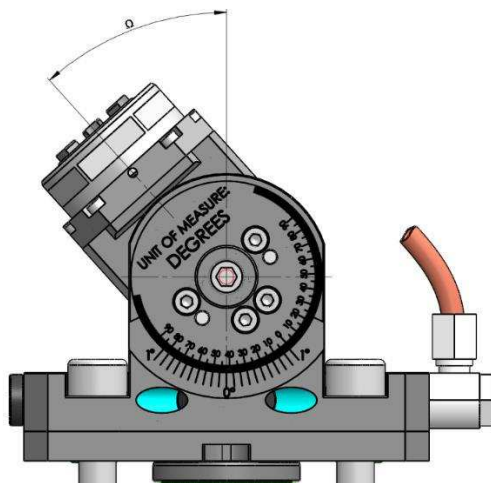
Turn the tool holder counterclockwise by 10 and continuing the rotation counterclockwise align the notch of the primary scale A with the 4th notch of the secondary scale B in sector 2 (start counting from the 0, not included, to the right).

B.1) Regulation of an adjustable $\pm 90^\circ$ driven tool

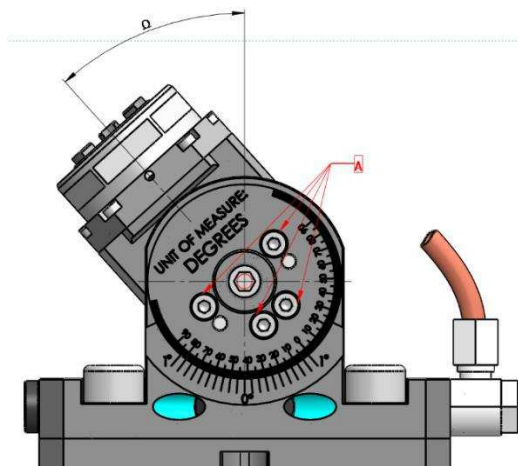
1. Loosen the A screws of the graded nonium, so that the head can rotate freely.



2. Follow the instructions to obtain the desired angle.

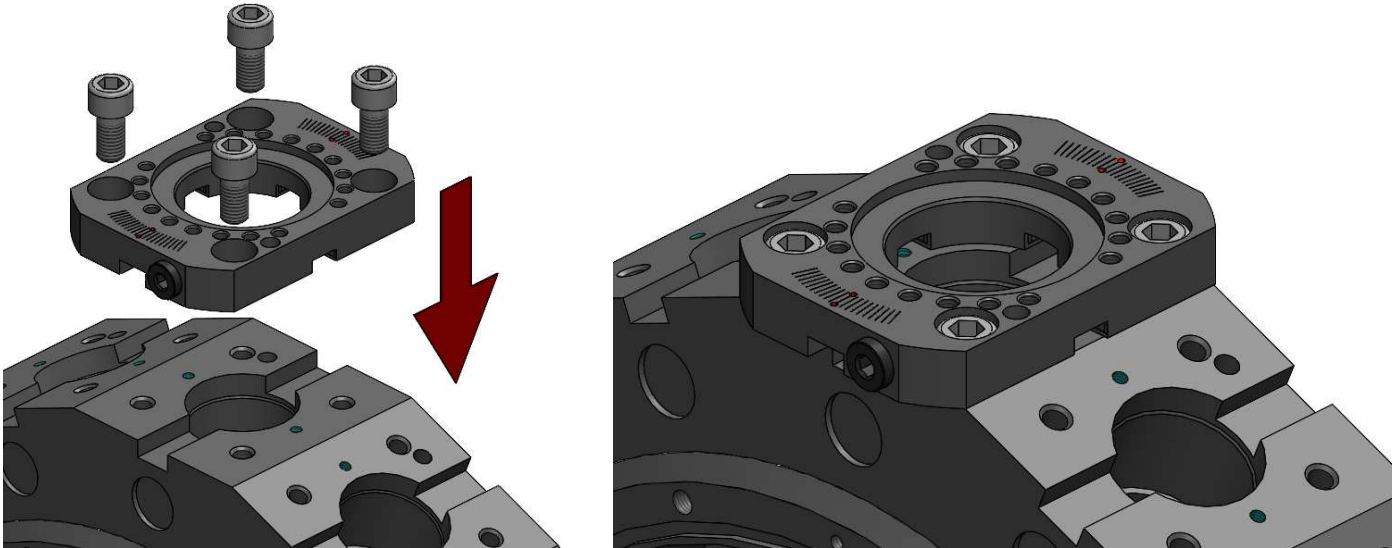


3. Tightening the A screws of the graded nonium, so that the head remains fixed in the angle just obtained.

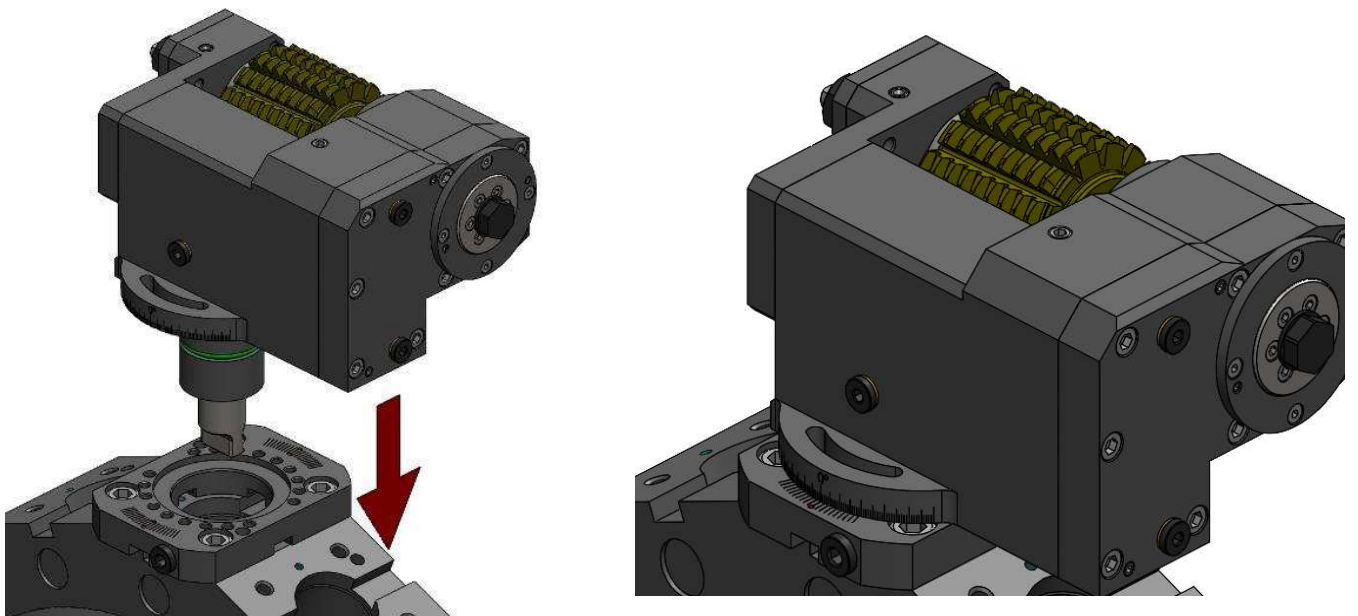


B.2) Regulation Gear Hobber $\pm 180^\circ$ with decimal reading.

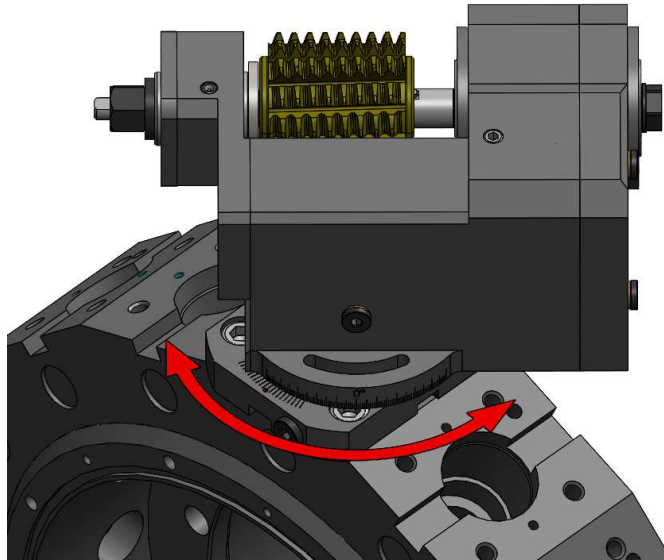
1. Mounting the flange in machine.



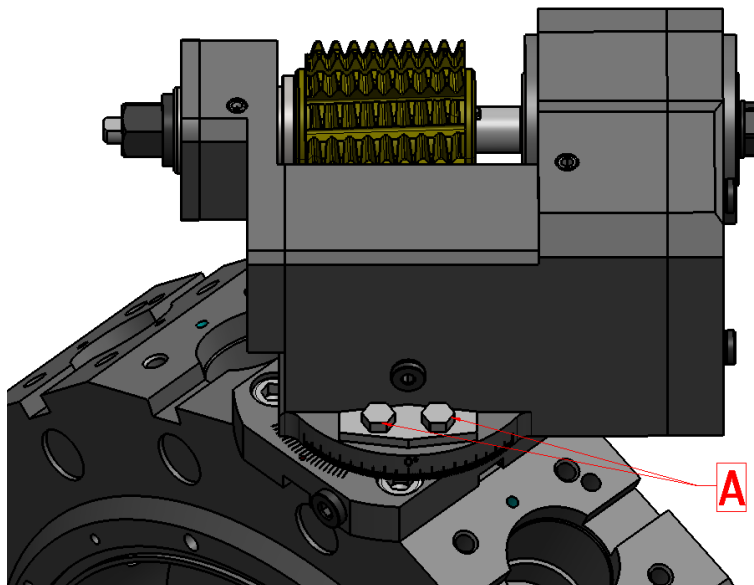
2. Mount the Gear hobber on the flange.



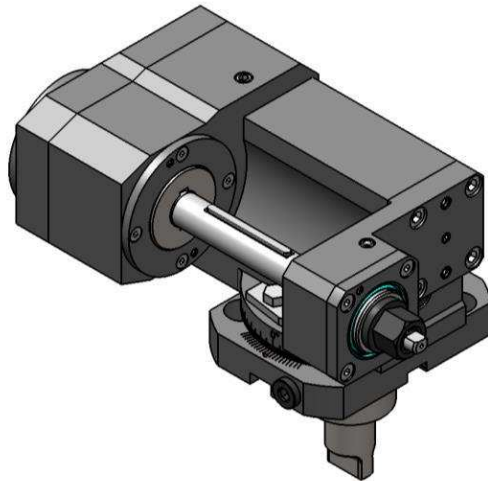
3. Adjust the angular position of the creator door according to procedure B.0 or B.0.0 respectively depending on the tool holder used.



4. Close the 4 A screws so as to bind the creator door in the desired angle.

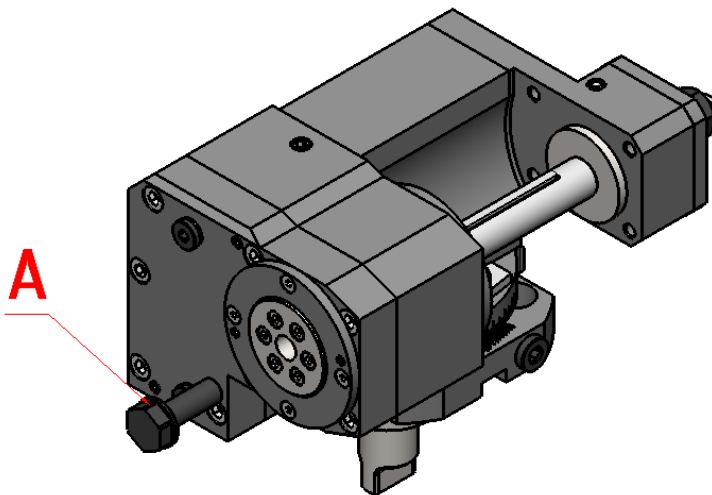


B.3) Tool assembly/Shaft change Gear Hobber

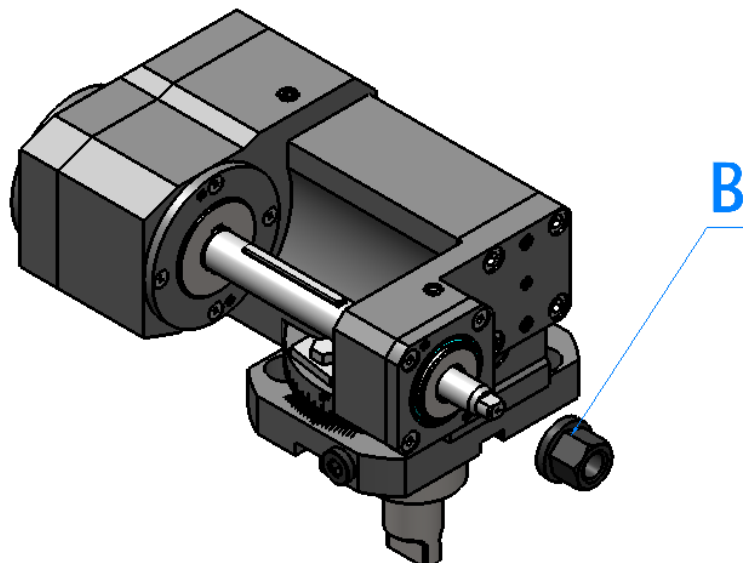


To properly mount and disassemble the shaft of a Algra Gear Hobber follow the instructions below

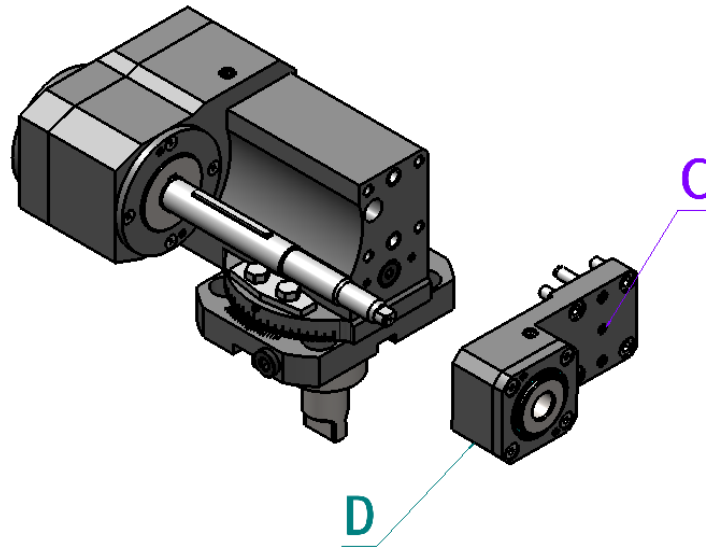
1. Remove screw A.



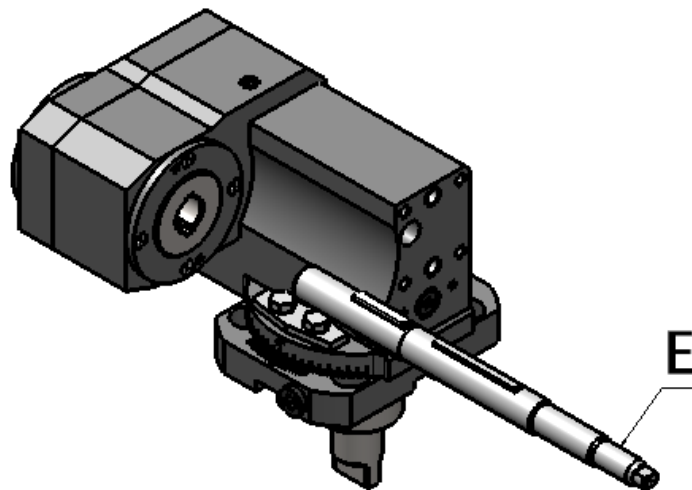
2. Remove the ring B.



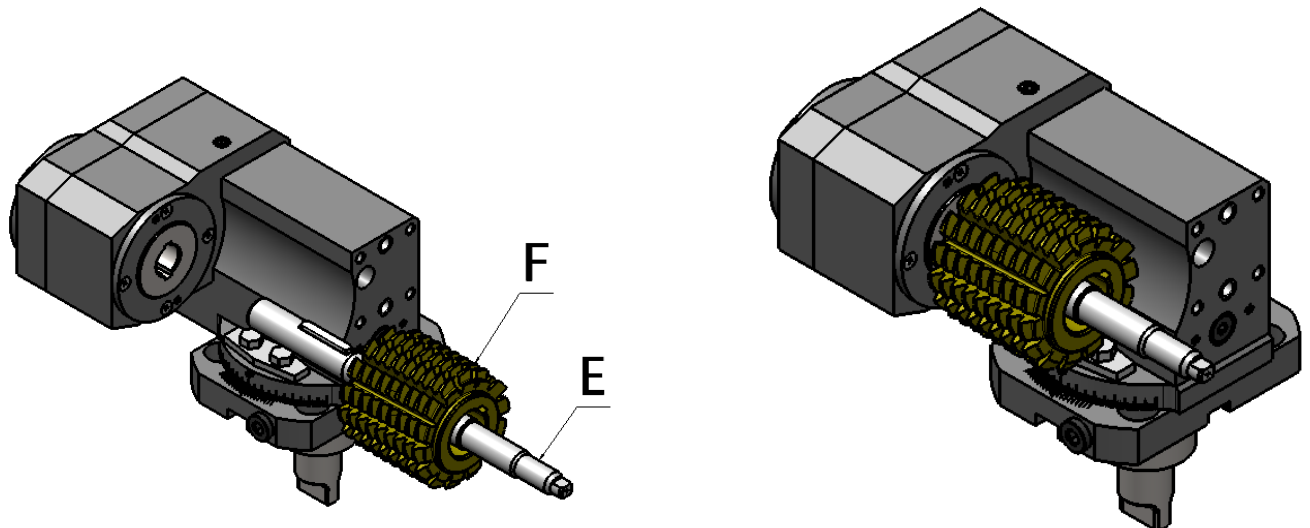
3. Through the extraction grain C separate the "Mobile Arm" D from the main body.



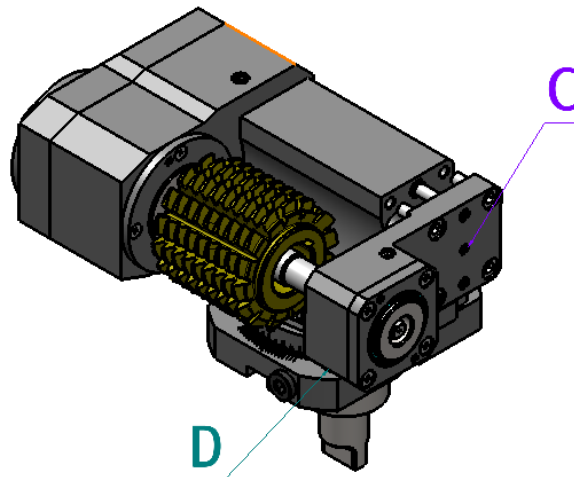
4. Disassemble Shaft E.



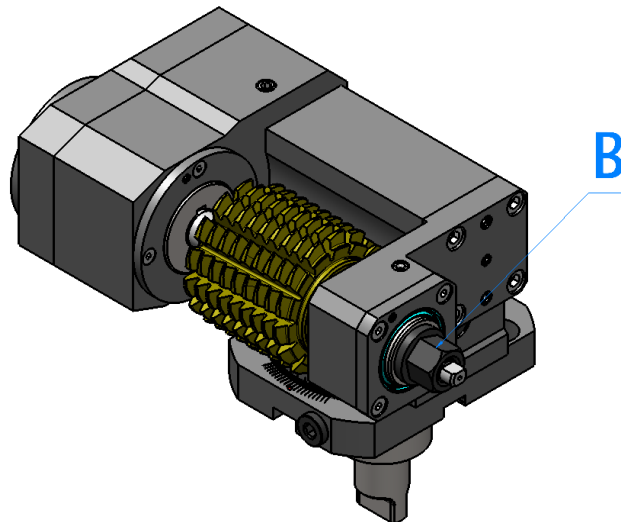
5. Mount the hobber F on the shaft E and reassemble the shaft in the body.



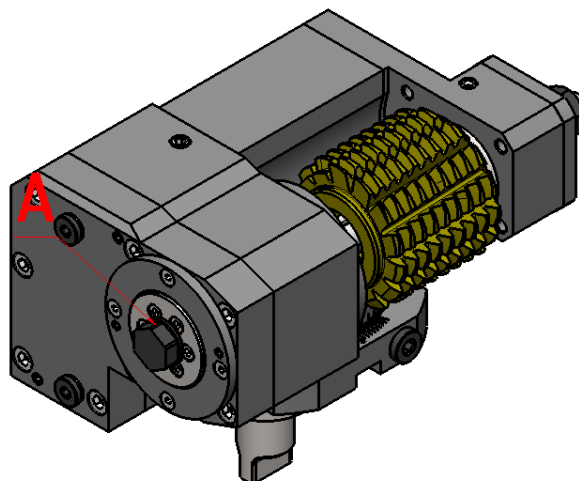
6. Mount the "Mobile Arm" D On the main body, making sure that the extraction grain does not protrude from the plane.



7. Close ring B.



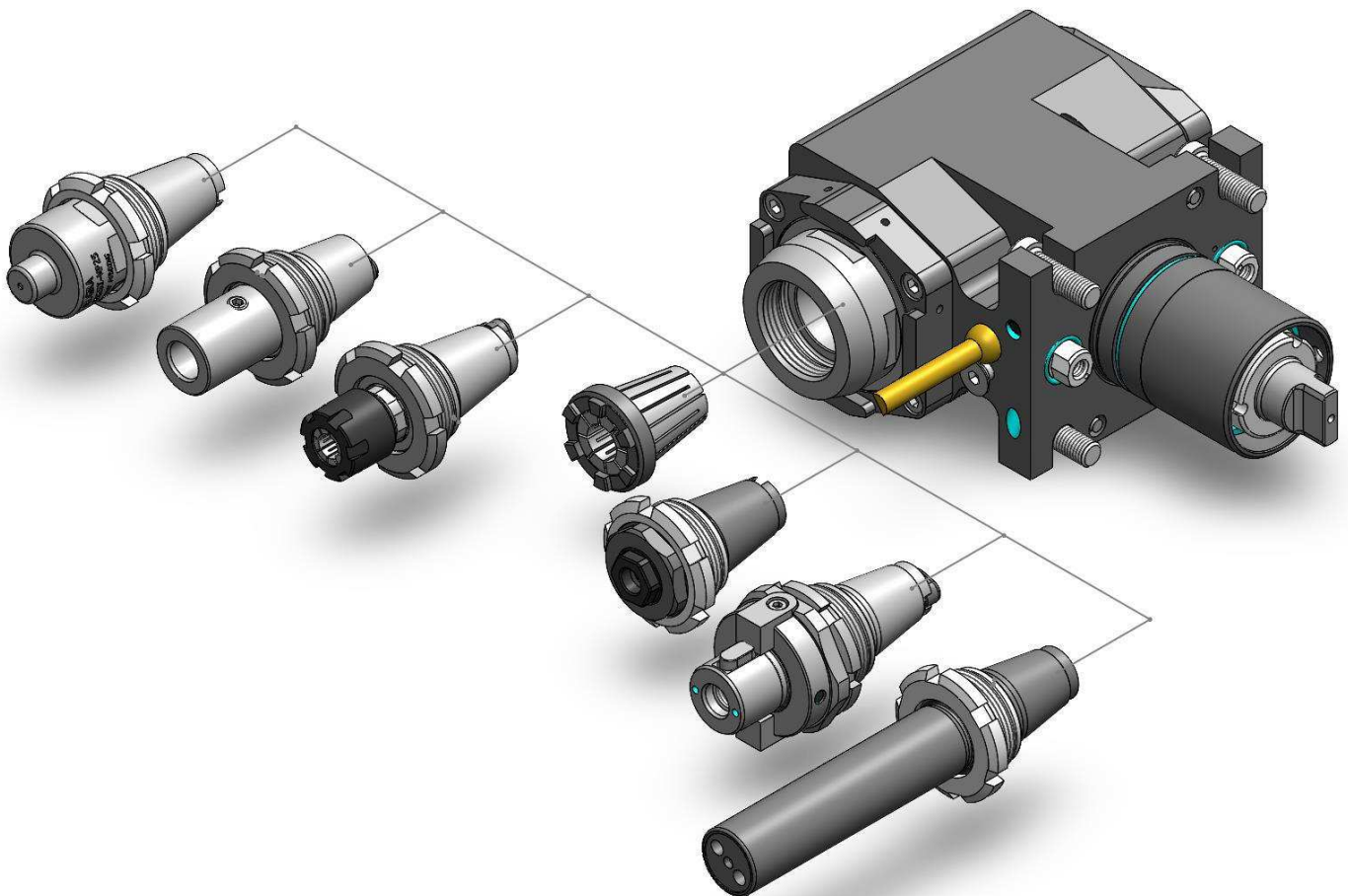
8. Close Screw A.



APPENDIX C – UNI-CHANGE

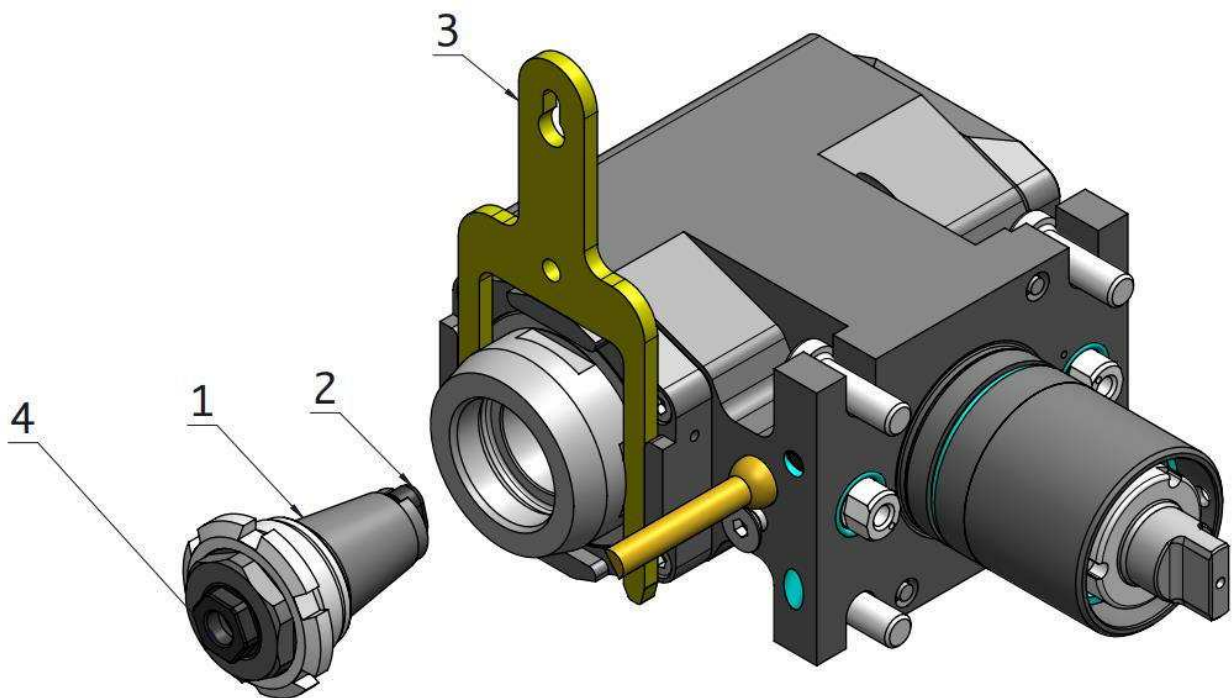


UNI-CHANGE is a modular system applicable in ER cones (DIN6499), which allows you to obtain various types of tool outlet.



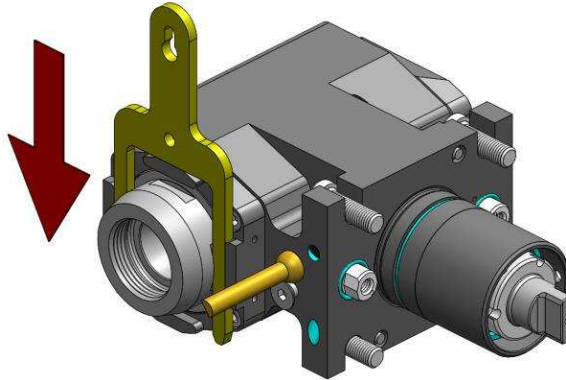
The advantages of the Algra UNI-CHANGE system are:

- 1) Universal, adaptable to all ER clamps, via cone coupling.
- 2) Greater rigidity, only in Algra tool holders, through an integrated drive system.
- 3) Easy removal by using the Y key (one-handed).
- 4) All UNI-CHANGE are applicable both in ER tool holders with external and internal refrigeration.
- 5) Pre-setting possible both inside and outside the machine.

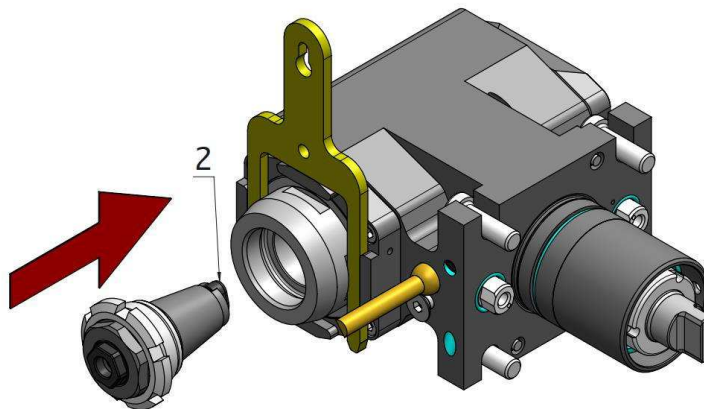


C.1) Assembly UNI-CHANGE

1) Apply the locking key to hold the spindle in place.



2) Mount the UNI-CHANGE in the ER spindle cone, taking care to correctly align component 2, if it is mounted, with its seat at the bottom of the cone.



3) Tighten the UNI-CHANGE with the appropriate locking key, taking care to observe the maximum specific locking torque indicated in the data sheet.

