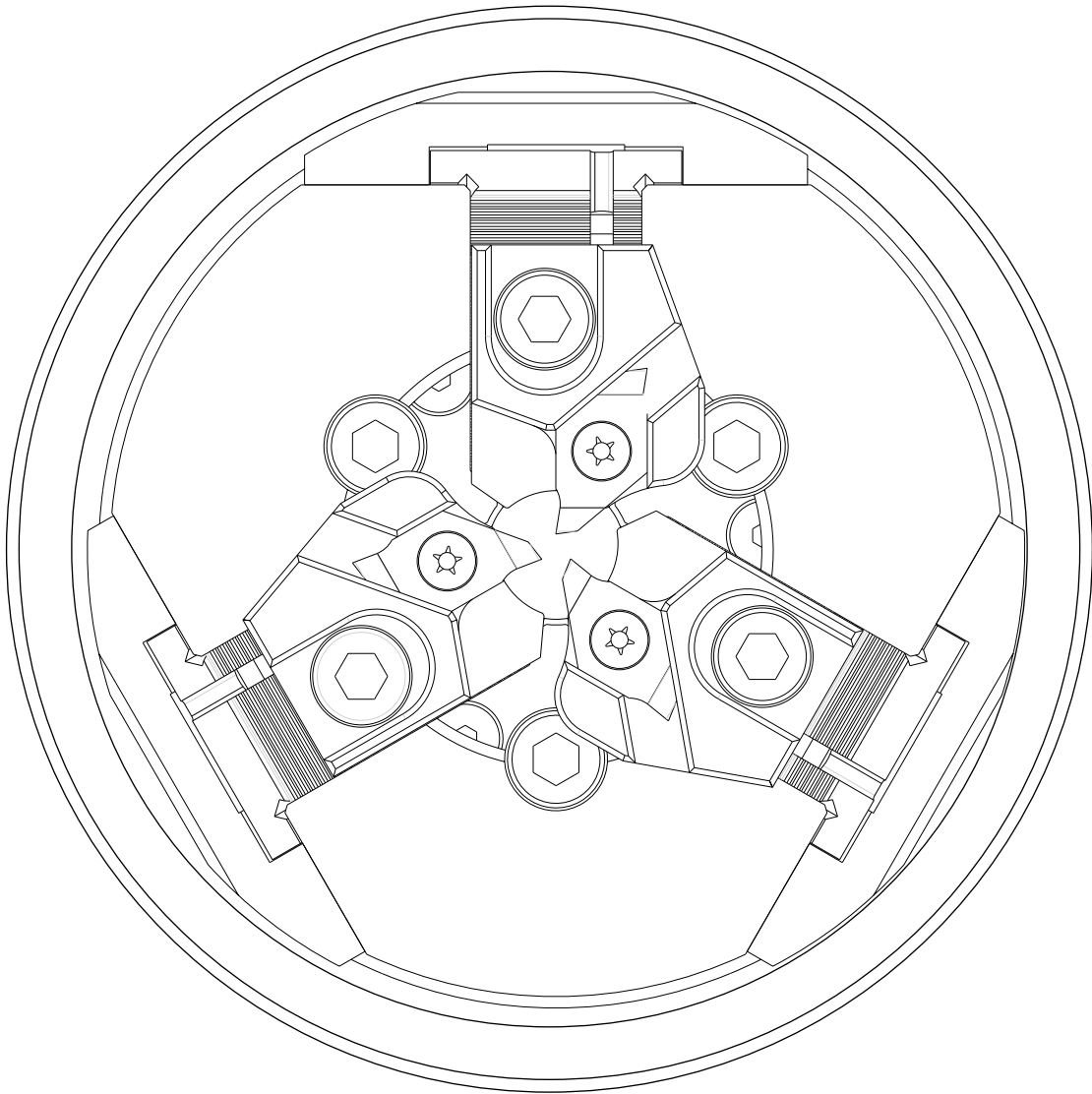


Operating Manual

Radial Cutting Head

REK-1
74406000



WAGNER[®]
WERKZEUGSYSTEME
MÜLLER GMBH

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1. Preface

Dear customer,

You have purchased a high-quality technical tool which guarantees you an efficient work performance.

The cutting heads of our company are widely known for their high quality and long-life cycle. We do hope that you are perfectly satisfied with our products, too.

Customer care even after purchase:

This operating manual helps you to make the first steps with the new WAGNER® product. It helps to understand its function and alludes to possible hazards.

However, should you be in need of further consulting service, training or some other advice do not hesitate to contact us.

Even if you are not happy with one of our WAGNER® products!
Our marketing staff is more than glad to help you at anytime.

This operating manual should be read, understood and paid attention to by every person in charge.

In particular this applies for safety- and hazard warnings which are specially indicated. (See chapter 2.0 safety warnings)

Following these advices helps to avoid accidents and faults.

This manual provides all information on operation and maintenance of your WAGNER® cutting head. The information laid down in this manual is state of the art according to the production date of the product.

Please use only this manual when working with the thread cutting head. The WAGNER® Werkzeugsysteme Müller GmbH reserves the right to technical amendments regarding the improvement of this product. However, the WAGNER® Werkzeugsysteme Müller GmbH cannot held liable for any faults, damages, failures and production loss resulting thereof caused by disregarding of some aspects mentioned in this manual.

Due to copyright reasons we would like to point out that this operating manual is for internal use only. Please refrain from distributing it to third parties.

In addition to the instructions mentioned before, national and international „safety instructions and rules for accident prevention“ apply when operating and maintaining the cutting head. The operating manual, in particular, the „safety instructions“ have to be read carefully. Through observing the safety instructions and legal regulations damage to persons, mechanical breakdown and damage to the cutting head should be avoided.

Warranty

We warrant perfect function of the thread cutting heads when purchasing and using original WAGNER® spare parts and equipment.

We cannot hold liable for any damage to persons, mechanical breakdown and damage to the thread cutting head in the event of:

- Improper installation and operation
- Usage of non original spare parts
- Removal of component parts and screws
- Unauthorised modifications of our products
- Usage of damaged cutting heads.

Please note:
Read this operating manual carefully before initial operation and take note of the hazard warnings!

Limitation of liability:

Please note: Use this product only for the purpose it is manufactured for! Please take notice of the safety instructions and hazard warnings! The thread cutting head should only be used by trained technical staff. Otherwise health hazard or danger of life and damage to property cannot be ruled out. In that case we cannot hold liable for any of these damages.

We cannot hold liable for any use of components which are not manufactured or not approved by WAGNER®.

We cannot hold liable for damages occurring through removing of safety devices of the machine. We imply the placing into operation of our products on efficient technical machines.

Normal use:

Don't use force when mounting, dismounting and operating the cutting head. Otherwise you will cause damages to the cutting head or the machine.

Initial operation

Check the function of the thread cutting head before initial operation.

2. Security advice

- Persons operating, maintaining or servicing the cutting head should always read and understand the operating manual in particular the safety instructions. Persons under the influence of alcohol and /or drugs may cause accidents!
- Take into account the weight of the thread cutting head upon installation. If necessary lift it with a lifting gear.
- Please take note that the interface between tool and machine is kept clean. Should it be fouled the accuracy of the workpiece is affected.
- When installing the tools switch off the machine at the line switch. When changing the inserts take note that the tool spindle isn't starting unexpectedly.
- Remove all tools and testing equipment from the workspace of the machine before activating it. Risk of injury arises through tools and testing equipment which are flung about!
- Close guard door or protection case before machining. Flying chipping and damaged tools or workpieces can cause damage to persons or mechanical breakdown.
- Make sure that the cutting head isn't loosening when machining.
- Don't touch the cutting head upon closing. Don't touch rotating tools: Risk of injury!
- Please ensure that the thread cutting head is properly secured and attached whilst transporting.

3. Product description

3.1. Application

The REK-1 cutting head can be used for cutting external recesses with widths up to approx. 5 mm and a maximum depth of 3.4 mm on circular parts with diameters up to 12 mm. The adaption is realised using a shank or connection flange fitted to the machine tool's spindle.

However, stationary use with rotating workpieces is also possible in principle.

The REK-1 cutting head covers the following working areas:

Working area (cutting insert holder in position):	Pos. 1	Pos. 2	Pos. 3
Largest diameter when open:	8.0 mm	10.0 mm	12.0 mm
Smallest diameter when closed:	1.0 mm	3.0 mm	5.0 mm
Maximum stroke (radial):	3.5 mm	3.5 mm	3.5 mm

3.2. Design and operation

The REK-1 cutting head's principle components consist of the base body, the guide ring with its ball bearing, base support and the cutting insert holders together with the cutting inserts (see *illustration on Page 7*).

The base body is attached to the machine's spindle.

The guide ring is seated on the base body. The guide ring's axial movement is transferred from the base support to the cutting insert holder via a radial advancement. The head will open if the guide ring is retracted, i.e. the cutting insert holders with the stinger inserts will move apart. If the guide ring is moved forwards then the cutting insert holders will move closer together.

The maximum possible axial movement of the guide ring is 11 mm and this corresponds to a radial cutting insert holder advancement of 3.5 mm.

The control force is transferred from the machine's own control mechanism to the rotating cutting head's guide ring via the ball bearing seated on the guide ring.

The base support sits in the guides of the base body and the guide ring. This converts the guide ring's axial movement into a radial movement.

Cylinder head bolts are used to affix the cutting insert holders to the base supports. Both parts are serrated in order to ensure that they can be positioned precisely. You must always ensure that all three cutting insert holders are fitted in the identical positions on their base supports, as the cutting insert holders can be installed in three different positions.

The stinger inserts fit compactly in the cutting insert holders and Torx screws are used to secure them in place.

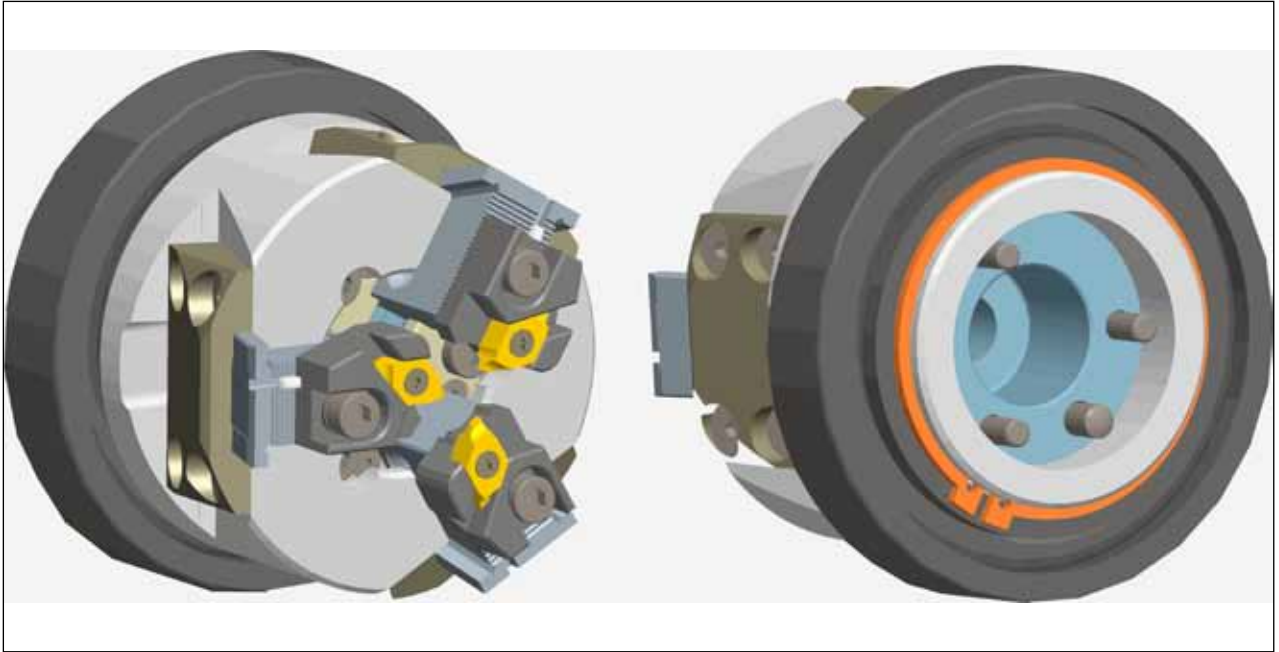


Illustration: Design and operation of the cutting head

4. Installation in the machine

After the cutting head has been assembled it can be fitted on the flange, the mounting shank or bolted directly onto the spindle. The installation dimensions can be found in Drawing 74406000 (1).

The Ø25 H6 hole is used for the centring process and the Ø6 threaded pin is used for the positioning process. Three M5 cylinder head bolts must be inserted in the base body and tightened up to affix it in place.

A control cylinder, which provides the axial movement force for the guide ring, is needed in the machine. A control yoke or control ring (not included in the package) is used to transfer the closing force to the ball bearing seated on the guide ring.

The approximate force needed to close the cutting head can be calculated using the following formula:

$$F_z = 0.4 \cdot R_m \cdot b \cdot f$$

F_z = closing force [N]
 R_m = ultimate tensile strength [N/mm²]
 b = cutting width [mm]
 f = feed rate [mm]

The force used to open the head must never exceed 100 N.

Feed rate

The stinger bit's radial feed rate »f« should normally lie between 0.1 to 0.3 mm. This rate corresponds to an axial clamping cylinder feed rate »fz« of approx. 0.3 to 0.9 mm per spindle revolution ($f_z = 3 \times f$).

The clamping cylinder's feed rate speed is calculated as follows:

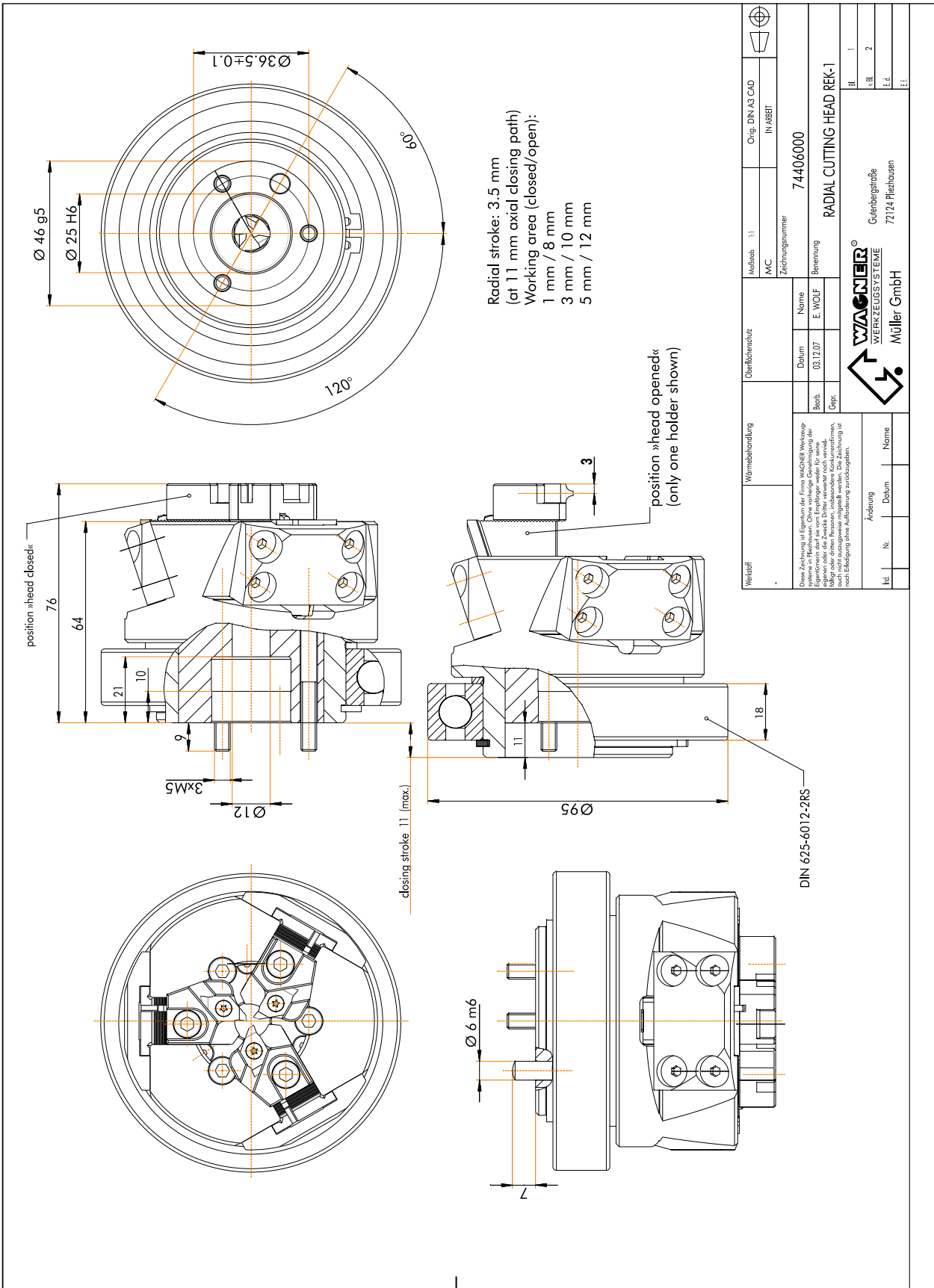
$$v_f = \frac{n}{60} \cdot f_z$$

v_f = feed rate speed [mm/s]
 n = revolutions [/min]

whereby: $f_z = 3 \cdot f$

f = feed rate [mm]
 f_z = clamping cylinder feed rate

Drawing 74406000 (1)



Weißblech		Wärmebehandlung		Oberflächenstruktur		Maßstab 1:1		Orig. DIN A3 CAD	
						MC		IN ARBEIT	
						Zeichnungsnummer		74406000	
						Datum		Benennung	
						03.12.07		E. WOLFE	
						Bohr:		Bl. 1	
						Gepr.:		L. Bl. 2	
								E. Bl.	
								F. Bl.	
Änderung		Datum		Name		 WAGNER WERKZEUGSYSTEME Gelenbergstraße 7124 Pflzerhausen			
Id.		Nr.		Datum					
Name		Datum		Name					

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5. Functional sequence

1. The cutting head is positioned in the axial direction above the clamped workpiece or else the workpiece is positioned inside the cutting head.
2. The control cylinder moves outwards at the feed rate speed and this process advances the rotating cutting head's guide ring. The cutting insert holders with the stinger inserts move closer together and machine the workpiece.
3. The control cylinder withdraws and retracts the guide ring back into its start position after the programmed cutting depth has been reached.
4. The workpiece will then be released or cycled onwards.

6. Cooling and lubrication

If coolant is being used with the cutting head then you must ensure that the machining area is sealed in order to prevent any excessive coolant from being thrown off.

Any approved commercial emulsion or cutting oil can be used.

Additional cutting head lubrication will not be needed in this case.

We recommend that air is used to cool the toolpiece if it is to be run dry or if minimum quantity lubrication is going to be used. Even then the cutting head's smooth surfaces should still be sprayed with an oil mist at regular intervals.

7. Maintenance and cleaning

The toolpiece should be maintained at regular intervals, which will depend on the cycle times and the loading rate.

This work can be undertaken in the machine if it is not very dirty and if the toolpiece can be accessed easily.

Proceed as follows to realise this:

7.1. Dismantling the die head

1. Traverse the cutting head into the »Head open« position and then switch the machine's main switch off.
2. Unscrew and remove the countersunk screws [50] in the guide ring [30] and then remove the thrust plates [40].
3. Remove the base support [120] from the guides in the radial direction.
4. If necessary you can also detach the control yoke or the control ring (depends on the machine model being used) from the control cylinder and then use the attached parts to pull the guide ring [30] away from the base body.
5. Now clean the parts and inspect them for signs of wear. If no signs of wear or damage are to be seen then re-assemble the cutting head in the reverse sequence.

7.2. Removing the die head from the machine

The die head can be removed from the machine if it is very dirty or if the machining area is difficult to access.

1. Switch the machine's main switch off and then disconnect the control yoke or control ring from the control cylinder.
2. Remove the die head together with the mounting shank or connection flange (this depends on the machine model being used) from the spindle.
3. Unscrew the three cylinder head bolts [110]. The cutting head can now be removed from the mounting shank or the connection flange.
4. Unscrew and remove the countersunk screws [50] in the guide ring [30] and then remove the thrust plates [40].
5. Remove the base support [120] from the guides (in the radial direction) when the head is open. Dismantle the base body [10] and the guide ring [30].
6. If necessary you can also unscrew the countersunk screws [70] from the base body and remove the guide plates [60] from the base body.

7. You must use special pliers to remove the locking ring [100] before you can remove the ball bearing [80] from the guide ring. The ball bearing [80] and the spacer [90] can now be pulled away from the guide ring.

The separate parts of the cutting head can now be thoroughly cleaned. Any part that shows signs of severe wear or damage must be replaced.

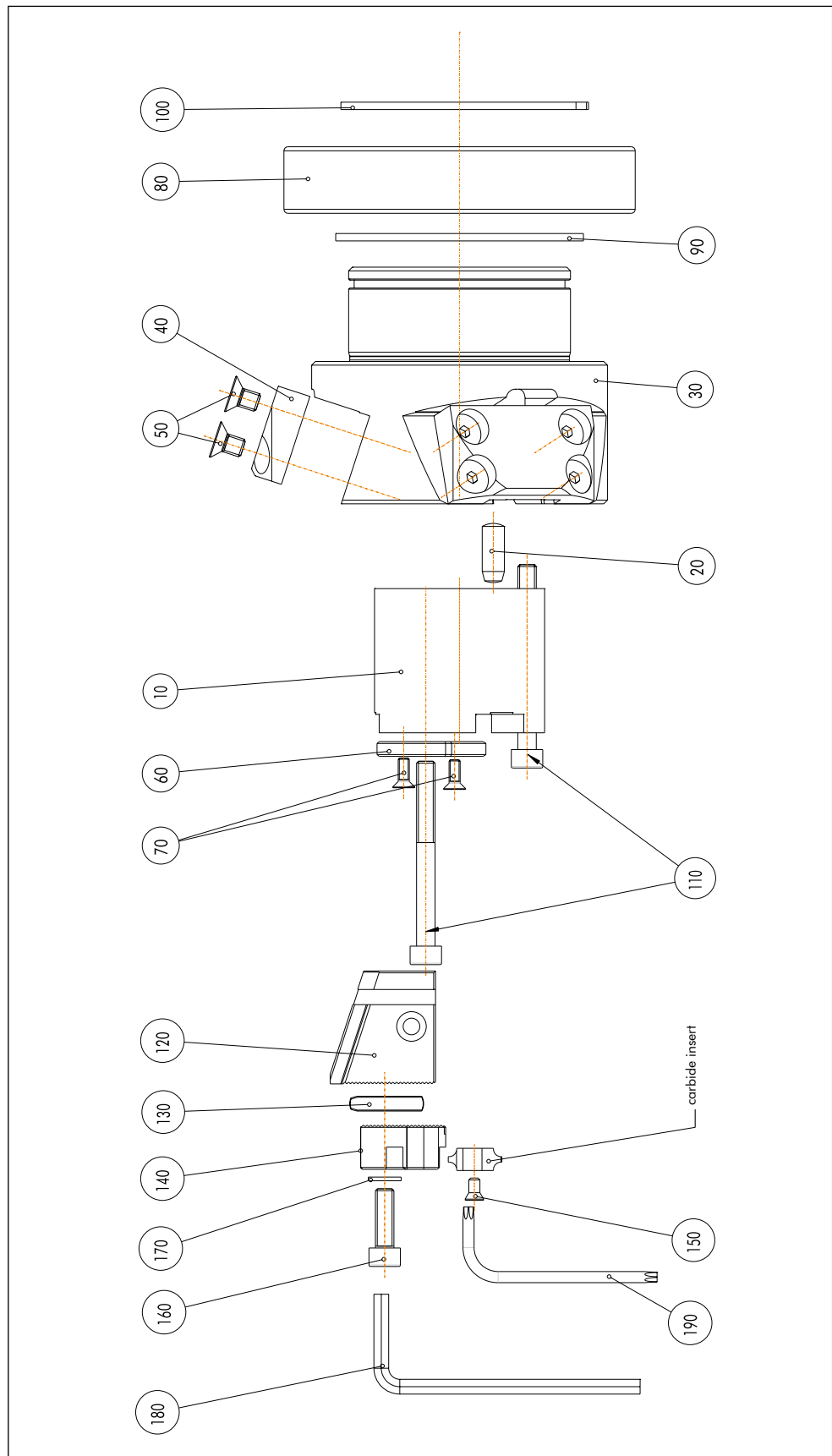
The separate parts should be lightly oiled before being reassembled. This applies in particular if the cutting head will not be used again for a long time.

7.3. Reassembling the die head

When you reassemble the cutting head you must always ensure that there is no dirt on any of the smooth surfaces. Proceed as follows:

1. Slide the spacer [90] onto the guide ring [30] first and then the ball bearing [80] and then refit the locking ring [100] in the groove in the guide ring [30].
2. Place the three guide plates [60] on the base body [10] and then use two countersunk screws [70] in each to fix them in place.
3. Slide the guide ring [30] onto the base body [10] and then turn the guide ring [30] so that the base support [120] can be seated in the guides in the base body [10].
4. Now place the three thrust plates [40] on the guide ring [30] and then use 4 countersunk screws [50] in each of them to affix them in place. The guide ring [30] should be able to move slightly on the base body [10].
5. Fit the inserts into their seats in the cutting insert holder and then use the Torx screws to lock them in position.
6. Mesh the cutting insert holder's serrations [140] in the relevant serrations in the base support [120] (see working area). You must ensure that all three of the cutting insert holders are seated in the identical positions. The feather key [130] will set up the side positioning.
7. Use the three cylinder screws [110] to affix the cutting head onto the connection flange, mounting shank or directly onto the spindle. Use the $\varnothing 25$ H6 hole in the base body for the centring and the $\varnothing 6$ M6 [20] threaded pin for the positioning.

7.4. Exploded assembly drawing 74406000 (2)



7.5. Spare parts list for WAGNER® REK-1 radial cutting head

Product No. 744 060 00

Item	Quantity	Product No.	Designation
10	1	74406200	REK-1 base body
20	1	02113410	Cyl.-pin (M 6 x 16 - DIN 6325)
30	1	74406100	REK-1 guide ring
40	3	74406500	REK-1 thrust plate
50	12	02018101	Countersunk screw (M 5 x 8 - DIN 7991-10.9)
60	3	74406300	REK-1 guide plate
70	6	02018006	Countersunk screw (M 3x 8 - DIN 7991-10.9)
80	1	02401112	Grooved ball bearing– DIN 625, 60 x 95 x 18
90	1	74147000	Spacer (67/60 x 2)
100	1	02084040	Locking ring (60 x 2– DIN 471)
110	3	02015064	Cylinder screw (M 5 x 50 – DIN 912-12.9)
120	3	74610800	Base support
130	3	71881900	Feather key

REK-FS10-600 carbide insert holder - Product No. 74610900

140	3	74611000	Cutting insert holder
150	3	73848500	Securing screw
160	3	02015055	Cylinder screw (M 5 x 16 - DIN 912)
170	3	72193200	Thrust washer
180	1	02677004	Offset screwdriver 4 - DIN 911
190	1	02677000	Offset screwdriver T8

REK-SCMT09T3 carbide insert holder - Product No. 74640500

140	3	74640600	Cutting insert holder
150	3	74162500	Securing screw
160	3	02015055	Cylinder screw (M 5 x 16 - DIN 912)
170	3	72193200	Thrust washer
180	1	02677004	Offset screwdriver 4 - DIN 911
190	1	02676915	Offset screwdriver T8

Efficient cylindrical machining – rolling and cutting threads, turning and paring using systems from WAGNER®-Werkzeugsysteme!

Tool systems from WAGNER® make a wide range of cylindrical machining processes available to you. Multi-cutter turning heads are used during the end machining for cutting the threads or the thread rolls.

Our specialised WAGNER®-toolpieces can also be used for other production stages such as beading, crimping, knurling or rolling-in, etc.

Imprint

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