

Assembly and Setting Instructions Face-Milling Cutter PF3000

Original version of the instructions

Version: 01/2016



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1 Information About these Instructions

1.1 Read the Operating Instructions

Use and handling of the tool described below do not come naturally and are not self-explanatory. They are therefore explained by the accompanying technical documentation.

The instructions help you to use the tool as intended, properly, effectively and safely. You should therefore read the chapters below attentively and thoroughly. If necessary, keep looking up facts that are essential for your operations.

Request new operating instructions if parts of them are lost or damaged. Always keep the operating instructions at an accessible place in the vicinity of the tool.



Important information in the enclosed "General Safety Instructions" document

The safety instructions that are necessary for handling the tool can be found in the brief version of the "General Safety Instructions" that are enclosed with the tool.

Ensure that you read and observe this document.

Residual risks

The documents inform and warn you of residual risks for which the risk mitigation by design and protective measures takes no or no complete effect.

1.2 Explanation of the General Icons

Icon	Explanation
	Important information This icon indicates important additional information.
	Information about the machine documentation This icon refers to other parts of the documentation that must particularly or additionally be observed (for example in supplier instructions, etc.).

Tab. 1: General icons



1.3 Representation of Requirements and Work Instructions

1.3.1 Requirements

Requirements that are obligatory for the execution of an activity on the tool have a checkbox next to them in the text.

Typical requirement

...

The thread is coated with mounting lubricant

1.3.2 Work Instructions with Fixed Sequence

Many activities on the tool require the steps to be taken in a fixed sequence.

These steps have work instructions with consecutive numbering assigned. Work instructions also contain intermediate results and final results. Intermediate results show sequences that are not carried out by the user. They are identified by an arrowhead ▶. End results show the end of the action. They are identified by a tick ✓.

The sequence of the work operations is compulsory. Observing the work instructions is obligatory.

Typical work instructions with fixed sequence

1. Switch on the machine at the main switch
 - ▶ The machine controller starts up
2. Start the software
 - ▶ The software starts and the following menu appears:
 - ✓ Machine and software are ready for operation

2 Identification of the Tool

2.1 Tool Identification

Tool designation: Face-milling cutter PF3000

Part number / SAP no.: See Chapter 3.3 Specifications

Year of manufacture: 2017

2.2 Manufacturer Specifications

Headquarters:

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72458 Albstadt
Germany

Phone +49 7431 17-0
Fax +49 7431 17-21279
E-mail info@guehring.de
Internet www.guehring.de



3 Tool Description, Specifications

3.1 Intended Use

The tool is intended to be used in a CNC milling machine or in a machining centre with HSK or SK tool holder. Use the tool only on machines that are in a proper technical state.

A coolant lubricant emulsion or compressed air are provided for as coolant for internal cooling.

The PF3000 is suited for machining non-ferrous metals, such as aluminium, aluminium alloys, copper, brass and bronze. Further materials or tool holders on request. Since only optical measurement is allowed for tools with CBN tips, you must ensure that an optical measuring / adjusting unit is available.

3.2 Improper Use

The tool is not suited for machining ferrous metals (steel and cast iron). Besides, the tool is not suited for MQL (minimum quantity lubrication).

It is not possible to guarantee the proper functioning of the tool if it is used in a machine or with a material for which it is not suited. We cannot be held liable for any consequential damage to the machine or the workpiece.

3.3 Specifications

PF3000 item no. 4201 63,000	Value	Unit
Tool diameter	63	mm
Maximum speed	31,000	rpm
Weight	0.34	kg

PF3000 item no. 4201 80,000	Value	Unit
Tool diameter	80	mm
Maximum speed	28,000	rpm
Weight	0.61	kg

PF3000 item no. 4201 100,000	Value	Unit
Tool diameter	100	mm
Maximum speed	24,000	rpm
Weight	0.95	kg

PF3000 item no. 4201 125,000	Value	Unit
Tool diameter	125	mm
Maximum speed	20,000	rpm
Weight	1.78	kg

PF3000 item no. 4201 160,000	Value	Unit
Tool diameter	160	mm
Maximum speed	15,000	rpm
Weight	3.15	kg



PF3000 item no. 4201 200,000	Value	Unit
Tool diameter	200	mm
Maximum speed	12,000	rpm
Weight	4.89	kg

PF3000 item no. 4201 250,000	Value	Unit
Tool diameter	250	mm
Maximum speed	8,000	rpm
Weight	7.84	kg

Tab. 2: Specifications

Emission values



Important information

While the tool does not cause any emission, the machine in which the tool is used does. Always observe the operating instructions of the machine!

4

Basic Safety Instructions



Important information in the document "General Safety Instructions"

The safety instructions necessary for handling the tool can be found in the document "General Safety Instructions". Use the QR code or the link in the brief instructions that are enclosed with the tool to retrieve and download the General Safety Instructions.

Please get in touch with your contact at Gühring if you do not have access to the Internet or require an additional hard copy of the General Safety Instructions.

Gühring KG will send you a hard copy of the document.

Please ensure that you read and heed the document "General Safety Instructions" and its brief version.

5

Installing and Setting the Tool

5.1

Initial Safety Notes



Important information for your safety

You are responsible!

Always take note and observe the safety instructions in the document "General Safety Instructions" and the locally valid safety instructions.



5.2 Important Information on the Hexagon Wrenches

CAUTION



Risk of injury due to hexagon wrenches of inferior quality

Hexagon wrenches of inferior quality can break or bend during assembly of the PF3000 due to the high tightening torques applied. You can get injured by this.

- Only use high-quality hexagon wrenches for assembly.
- Use the adapter (accessories) for assembly.

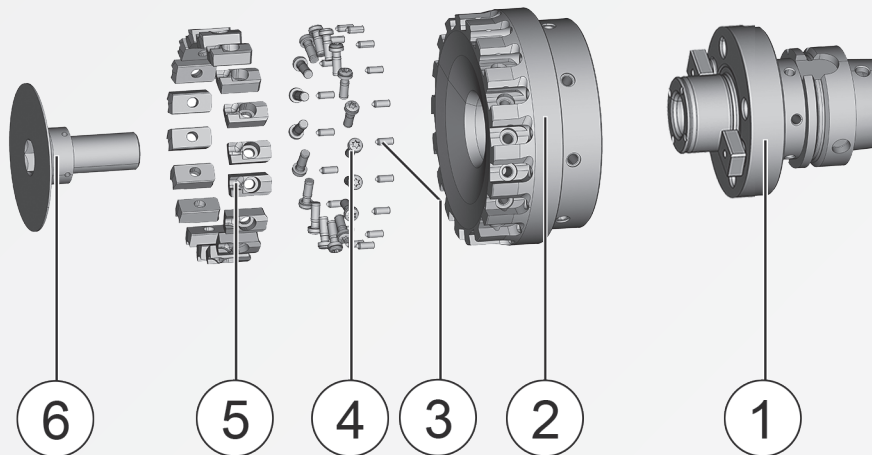
We recommend the use of the adapter (accessories) for assembly of the PF3000.



5.3 Designation of individual parts

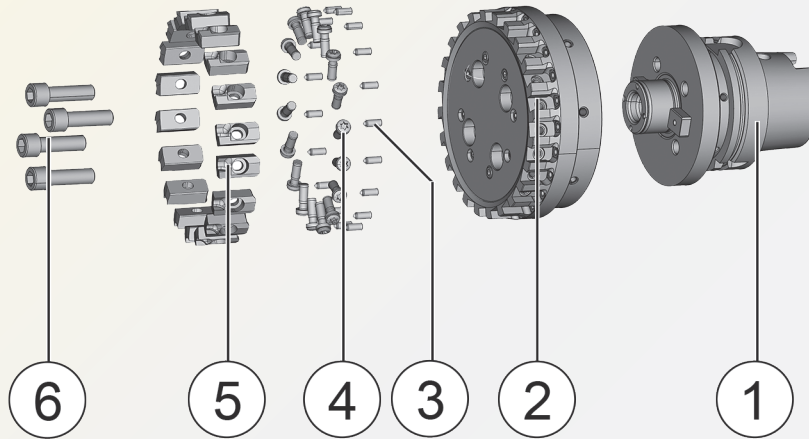
To have a clear definition of the individual parts, we use the following exploded views to designate them:

Ø 63 - 125 mm





Ø 160 - 250 mm



1	GÜHROJET milling head holder	3	Ball-ended thrust screw	5	PCD cartridges
2	Base body (from Ø 160 mm with pre-assembled coolant distribution plate)	4	Clamping screw	6	Coolant distribution screw Ø 125 mm / cheese head screws from Ø 160 mm



5.4 Assembly of the ball-ended thrust screws

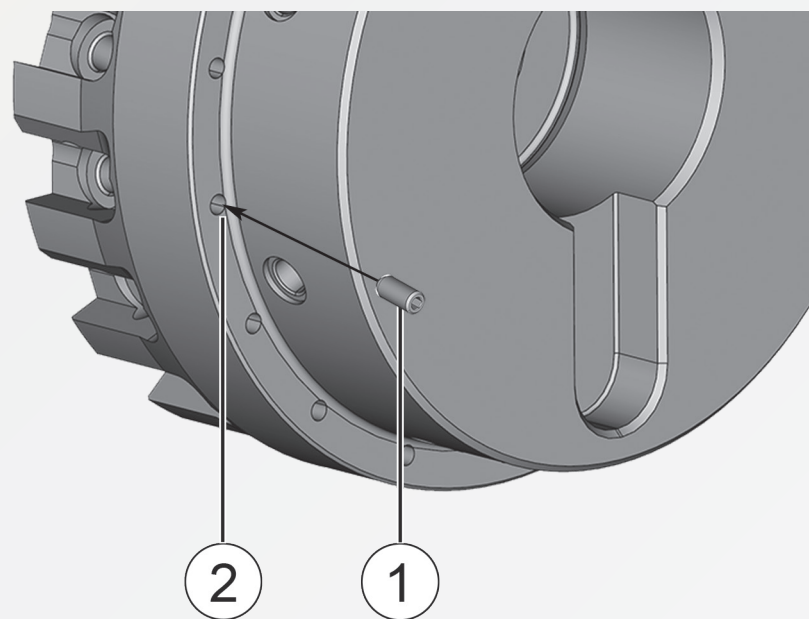
The ball-ended thrust screws are already assembled on delivery. When you have checked that the ball-ended thrust screws are not protruding into the cartridge seat, you can proceed with Chapter 5.5. "Assembly of cartridges".

Proceed as described below if you want to replace the ball-ended thrust screws.

Requirements:

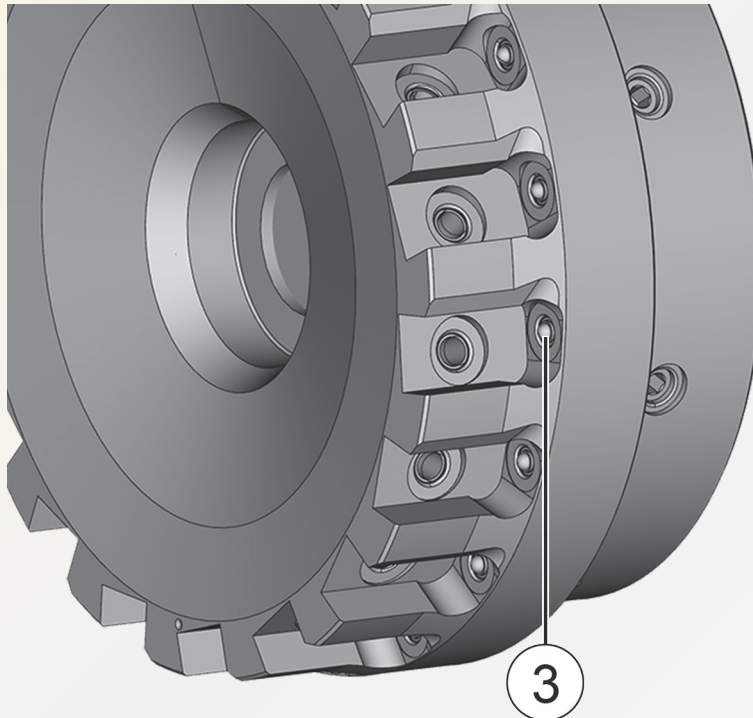
- Assembly paste Weicon, anti-seize
- Base body PF 3000
- Ball-ended thrust screws
- Hexagon socket wrench (AF 2)

1. Grease the ball-ended thrust screw with the assembly paste. This ensures that the adjustment can be made smoothly.
2. Screw the ball-ended thrust screw (1) with the hexagon socket wrench into the base body (2).





- ▶ The ball-ended thrust screw may not protrude into the cartridge seat (3) so that the cartridge can be mounted in the bottommost position.



3. Assemble the remaining ball-ended thrust screws in the same manner.
 - ✓ The ball-ended thrust screws are assembled.



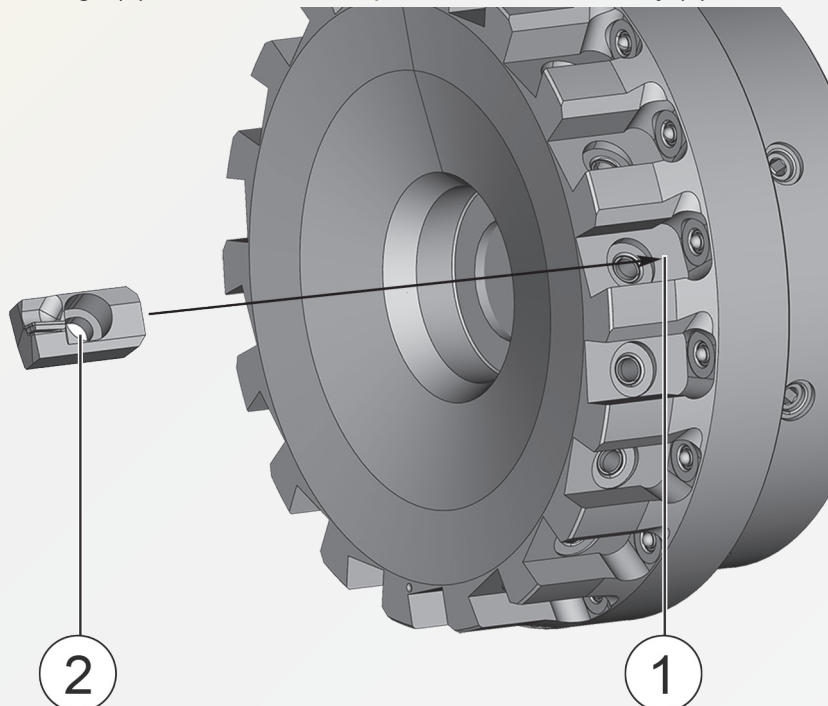
5.5 Assembly of the Cartridges

Use the following procedure to install the cartridges

Requirements:

- ☑ Assembly paste Molykote, G-N Plus
- ☑ Base body PF 3000
- ☑ Cutting cartridges
- ☑ Washer
- ☑ Clamping screws
- ☑ Torx wrench T20

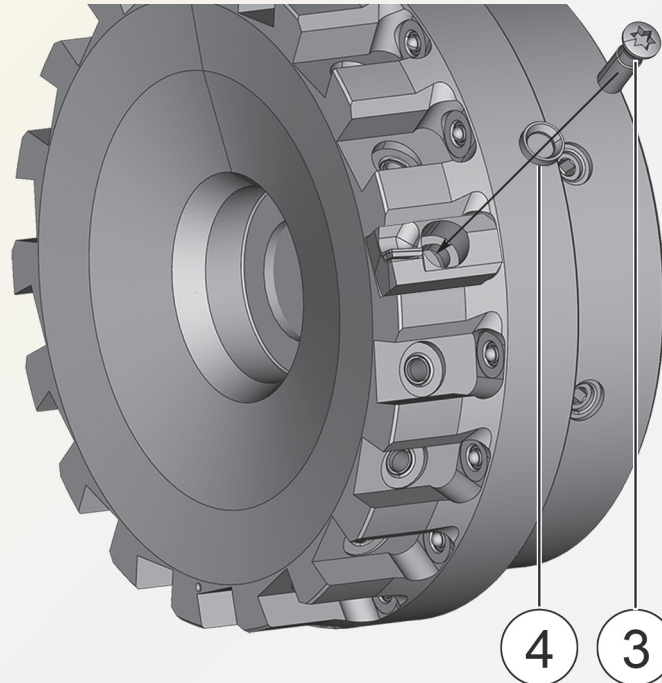
1. Insert the cartridge (2) in the bottommost position in the base body (1).



2. Grease the thread of the ball-ended thrust screw with the assembly paste.



3. Secure the cartridge with the washer (4) and the clamping screw (3). Use a Torx wrench T20 for this.



- ▶ The cartridge is secured.
4. Repeat these steps for all other cartridges.
- ✓ The cartridges are assembled.
 - ✓ From here, the completely assembled base body is called a shell type milling cutter.

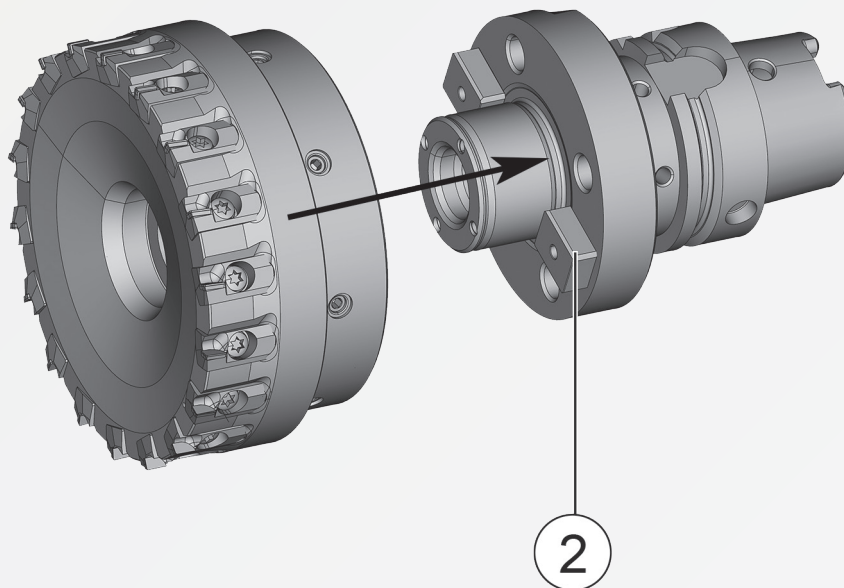


5.6 Installing the Shell Type Milling Cutters on a GÜHROJET Milling Head Holder

Use the following procedure to install the shell type milling cutters on the GÜHROJET milling head holder:

Requirements:

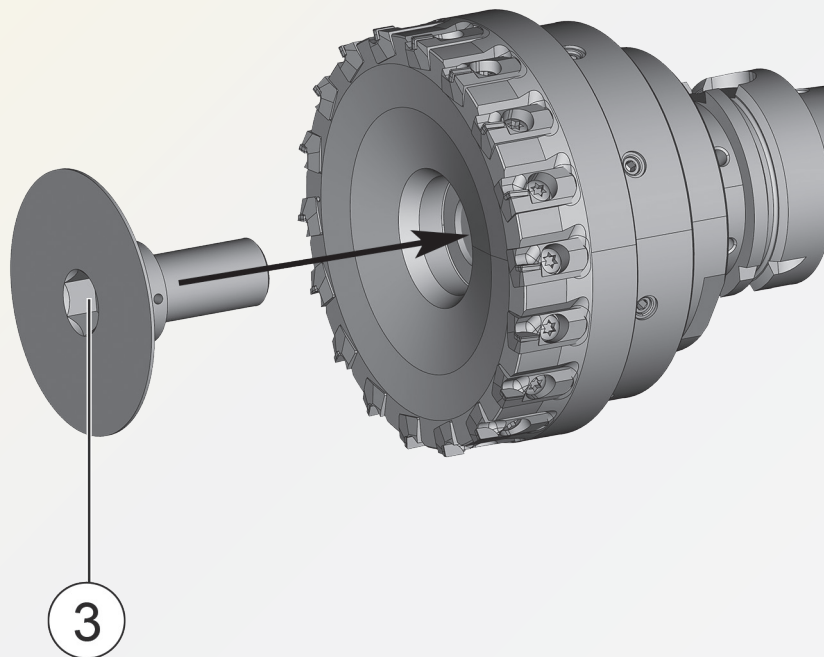
- ☑ GÜHROJET milling head holder
 - ☑ Shell type milling cutter (chapter 5.4 and 5.5 must have been completed)
 - ☑ Coolant distribution screw up to \varnothing 125 mm / 4x cheese head screws from \varnothing 160 mm
 - ☑ Torque wrench, for example part no. 4915 with matching internal hexagon socket wrench
1. On delivery, the GÜHROJET milling head holder has a balance quality of G6.3 / 15,000 rpm (static). When using a different milling head holder, please make sure that it also has a balance quality of G6.3 / 15,000 rpm. Where necessary, the shell type milling cutter has to be balanced before it is installed.
 2. Secure the GÜHROJET milling head holder in a tool mounting block (e.g. part no. 4946). The next assembly steps may not be performed in the spindle of setting or measuring machines.



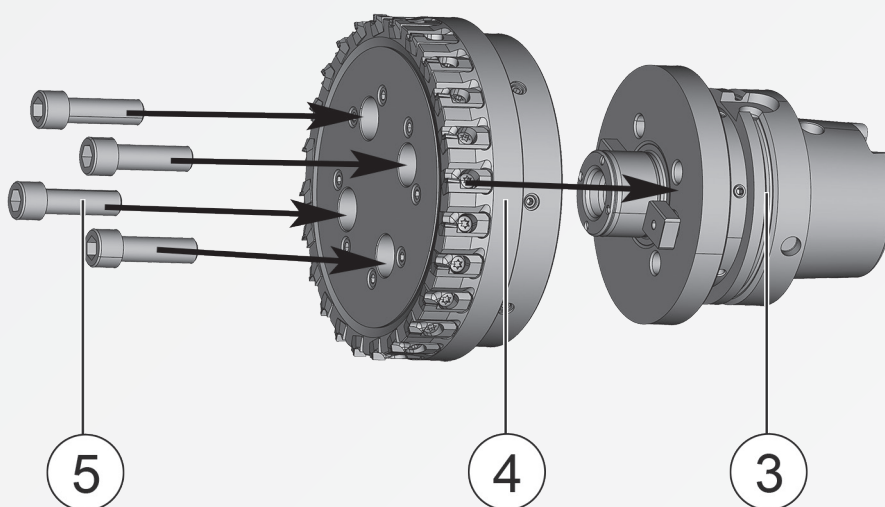
3. Push the shell type milling cutter onto the GÜHROJET milling head holder. Pay attention to the position of grooves and driving keys (2).



4. **With a tool diameter up to Ø 125 mm:** Screw the two parts together with the coolant distribution screw (3). Use a torque wrench with matching internal hexagon socket wrench. Observe the tightening torques in table 3 "Torque specifications" on the following page.



- With a tool diameter from Ø 160 mm:** The coolant distribution plate is already installed in the shell type milling cutter. Push the shell type milling cutter (4) onto the GÜHROJET milling head holder (3). Screw the two parts together with the 4 coolant distribution screws (5). Use a torque wrench with matching internal hexagon socket wrench. Observe the tightening torques in table 3 "Torque specifications" on the following page.





Tool diameter		Nominal size	Torque Ma
Ø 63	Coolant distribution screw 4203 63,000	AF 8	60 Nm
Ø 80	Coolant distribution screw 4203 80,000	AF 10	80 Nm
Ø 100	Coolant distribution screw 4203 100,000	AF 14	95 Nm
Ø 125	Coolant distribution screw 4203 125,000	AF 17	100 Nm
Ø 160	4 x cheese head screw M12	AF 10	85 Nm
Ø 200	4 x cheese head screw M16	AF 14	200 Nm
Ø 250	4 x cheese head screw M16	AF 14	200 Nm

Tab. 3: Torque specifications

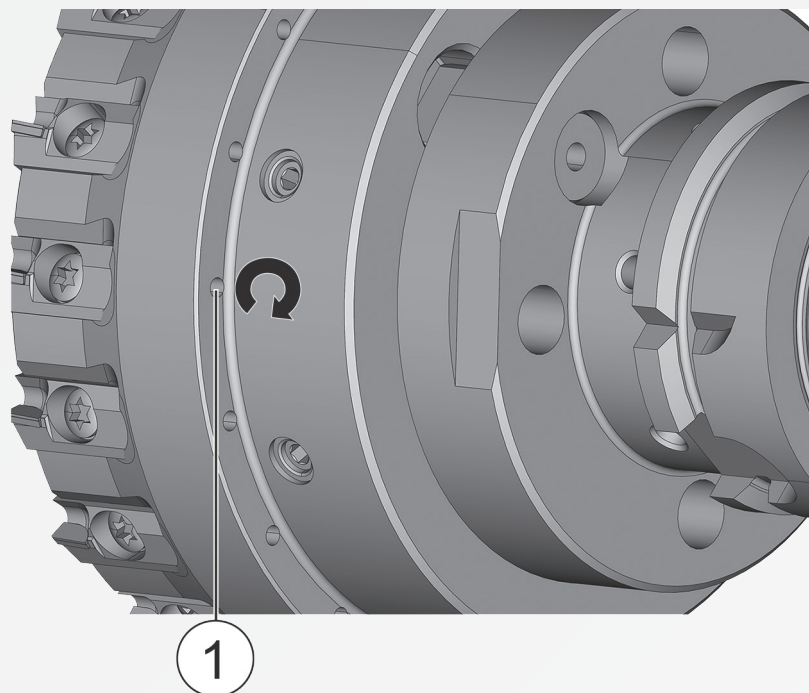
- ✓ The shell type milling cutter is installed.

5.7 Setting the Cartridges

Use the following procedure to set the cartridges:

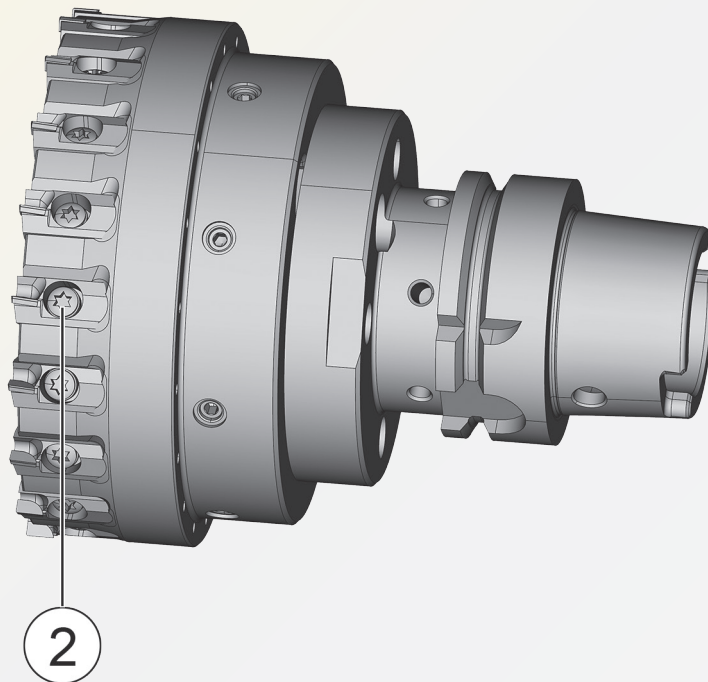
Requirements:

- ✓ Ball-ended thrust screws installed (chapter 5.4)
 - ✓ Hexagon socket wrench AF2
 - ✓ Cutting cartridges installed (chapter 5.5)
 - ✓ Shell type milling cutter installed on milling head holder (chapter 5.6)
 - ✓ Torque wrench, for example part no. 4915 with Torx T20 socket wrench
1. For all cartridges in their lowest axial position: Apply the clamping screw with approx. 1 Nm with the torque wrench
 2. Set all cartridges to 0.02 to 0.03 mm short of the setting dimension with the hexagon socket wrench
To do this, turn the ball-ended thrust screw (1) clockwise. Details of the setting dimension can be referenced in the enclosed tool drawing.





3. Tighten all clamping screws (2) to 7 Nm with the torque wrench.



4. Set all cartridges to the setting dimension. Axial run-out may not exceed 0.002 mm.
5. Record your settings.
- ✓ The cartridges are set.

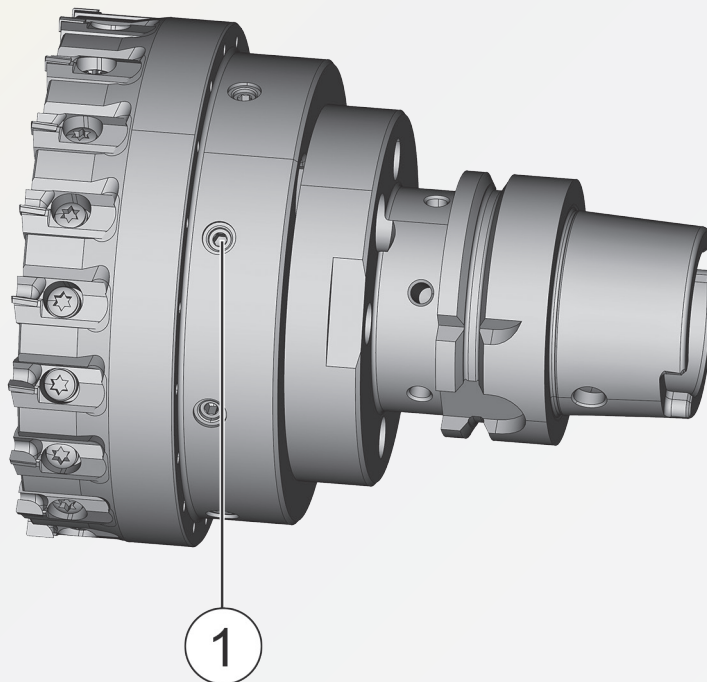


5.8 Balancing the Fully Assembled Tool

Once the settings have been completed, the entire milling system has to be balanced by means of the balancing screws provided.

Requirement

- ☑ The work described in chapters 5.1 - 5.7 has been carried out
- 1. Balance the tool to a balance quality of G6.3 / 15,000 rpm (static). Use the balancing screws (1) to do so. Other balance quality are available on request.



- ✓ The tool is ready for use and can now be installed in the machine tool.



6 Overview Part Numbers

Tools	Part number
PKD Face-Milling Cutter Ø63	4201 063,000
PKD Face-Milling Cutter Ø80	4201 080,000
PKD Face-Milling Cutter Ø100	4201 100,000
PKD Face-Milling Cutter Ø125	4201 125,000
PKD Face-Milling Cutter Ø160	4201 160,000
PKD Face-Milling Cutter Ø200	4201 200,000
PKD Face-Milling Cutter Ø250	4201 250,000

Cutting	Part number
PCD cartridges - blade geometry 1 PCD good surface quality	4204 030,000
PCD cartridges - blade geometry 2 PCD defined surface roughness	4204 030,200
PCD cartridges - blade geometry 3 PCD broad cut finishing	4204 030,300

Coolant screws	Part number
Coolant distribution screw for Ø63	4203 063,000
Coolant distribution screw for Ø80	4203 080,000
Coolant distribution screw for Ø100	4203 100,000
Coolant distribution screw for Ø125	4203 125,000
Coolant distribution plate for Ø160	4203 160,000
Coolant distribution plate for Ø200	4203 200,000
Coolant distribution plate for Ø250	4203 250,000

Miscellaneous	Part number
Washer	4207 030,000
Clamping screw M5x17	6128 5,000
Ball-ended thrust screw	20081 4,000
Balance screw M6x0.5	302307624
Cheese head screw M12 x 40	400168294
Cheese head screw M16 x 55	400168295
Assembly paste Molykote, G-N Plus	400118571
Assembly paste Weicon, anti-seize	20053 1,000
Torque wrench type A (for 1 - 5 Nm torque)	4915 5,001
Torque wrench type B (for 5 - 50 Nm torque)	4915 50,000
Torque wrench type C (for 40 - 200 Nm torque)	4915 200,000
Adapter	303254095
Hexagon socket wrench (AF 2)	4921 2,000

