

***Precision meets Motion***



**Manual**

***EWS . Multiform***

**EWS**  
Tool Technologies

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## 1. System description

Multiform is a system tool for producing internal and external profiles on conventional machine tools, machining centers, milling machines, boring mills, CNC lathes and special purpose machines.

Multiform is a system tool for machining workpieces that have specific contours, e.g. squares, hexagons, octagons, etc.

Such profiles are needed for various applications and in a large number of geometries. The demands on such profiles are different. In most cases, such geometries are created using the production processes of broaching, pushing, milling or erosion machining.

When broaching or pushing shaped holes, also when broaching with floating tools, a more or less strongly serrated surface of the shaped hole is generally to be expected. High-strength materials will lead to an increased wear of the tools. In addition, the drilling of blind holes has the disadvantage of rolled up chipping occurring.

The erosion machining of shaped holes produces excellent results, even in hardened materials. However, this production method is very time-consuming so that this process is ruled out for reasons of economy in most cases.

The Multiform System Tool is a tool designed for producing different profiles having increased demands on the cleanliness of the surface and the dimensional accuracy of the contour without the disadvantages described. An essential requirement for this design was that this tool works extremely economically and can be completely integrated into the operating cycle of the machine tool.

The Multiform System Tool basically consists of a drive shaft and a cutter head, with the drive shaft being mounted in the housing and rotating during the operation. The housing stands firmly and the cutter head rotates driven by a positive control system integrated in the housing. An essential feature of the Multiform System Tool is its property to produce the deflection of the blade by means of purely rolling action elements, resulting in the Multiform System Tool being largely wear-free and maintenance-free.

In the practical application of the Multiform System Tool, initially a pilot hole is made by means of a conventional method. The shaped hole is made using the Multiform System Tool in one cycle with a rotation speed adapted to the profile and a feed corresponding to the material.

Internal machining: 0.5 mm smaller in diameter than the profile to be machined

External machining: 0.5 mm larger in diameter than the profile to be machined

The Multiform System Tool is a unique tool for producing the profiles described above offering the following benefits:

- Exact contour geometry
- Manufacturing tolerance (H1 1)
- Clean hole bottom when drilling blind holes (no chipping left over)
- Lower wear of the mechanical components
- Standard boring tools with replaceable cutting elements
- Automatic operation on all types of machines
- Wide variety of profile geometries

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#### **1. Diameter adjustment**

Please go by the attached drawing (Multiform cam change)

Permanent dimensional accuracy is ensured by adjustment of the blade wear

##### **1.1. Fine adjustment via the eccentric bushing**

Drilling range: 4.0 mm – 26 mm

Adjustment range: + / - 0.2 mm

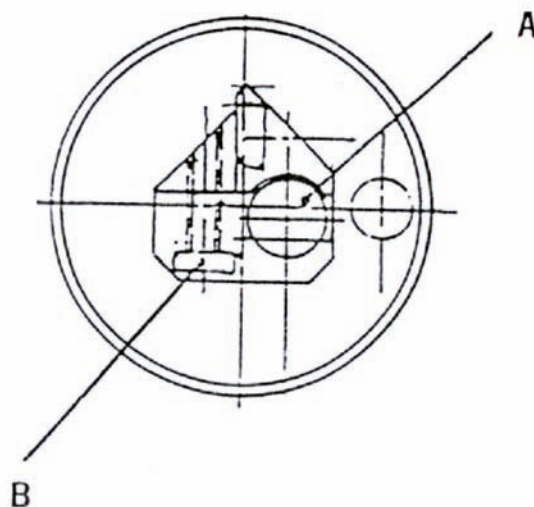
1. Loosen set screw No. 13.
2. Adjust eccentric bushing No. 04/08 by turning to the right (+) or to the left (-) (scale: 1 line corresponds to 0.02 mm radially).

**Mind the risk of injury posed by clamped Multiform boring tool!**

3. Tighten set screw No. 13.

##### **1.2. Rough and fine adjustment via the blade holder (drilling range from 26 mm)**

1. Loosen fastening screw No. A.
2. Turn adjusting screw No. B in + / - direction (adjustment of actual dimension).
3. Tighten fastening screw No. A.



**Mind the risk of injury posed by Multiform cutter holder and Multiform cutting element!**

## 2. Identification of the cam segments

All Multiform cam segments are marked with your order number. After mounting the Multiform cam segments to the Multiform head, the order number will be visible in a display window. Thus, the Multiform cam segments can be uniquely identified both unmounted and mounted.

### Identification key for Multiform cam segments



**FBK1 06 1200 /1**

/1	Variant 1 (tolerance zone/corner radius of the profile)
1200	Nominal dimension of the width across flat 12.00 mm
06	Geometry of the profile (hexagon)
FBK1	Size of the cam segment
	Size 1 = FBK1
	Size 2 = FBK2

### Encoding of Multiform cam segment geometries

- 01 = Space at the cylinder
- 02 = Width flat
- 04 = Square
- 06 = Hexagon
- 08 = Octagon
- 21 = Polygon

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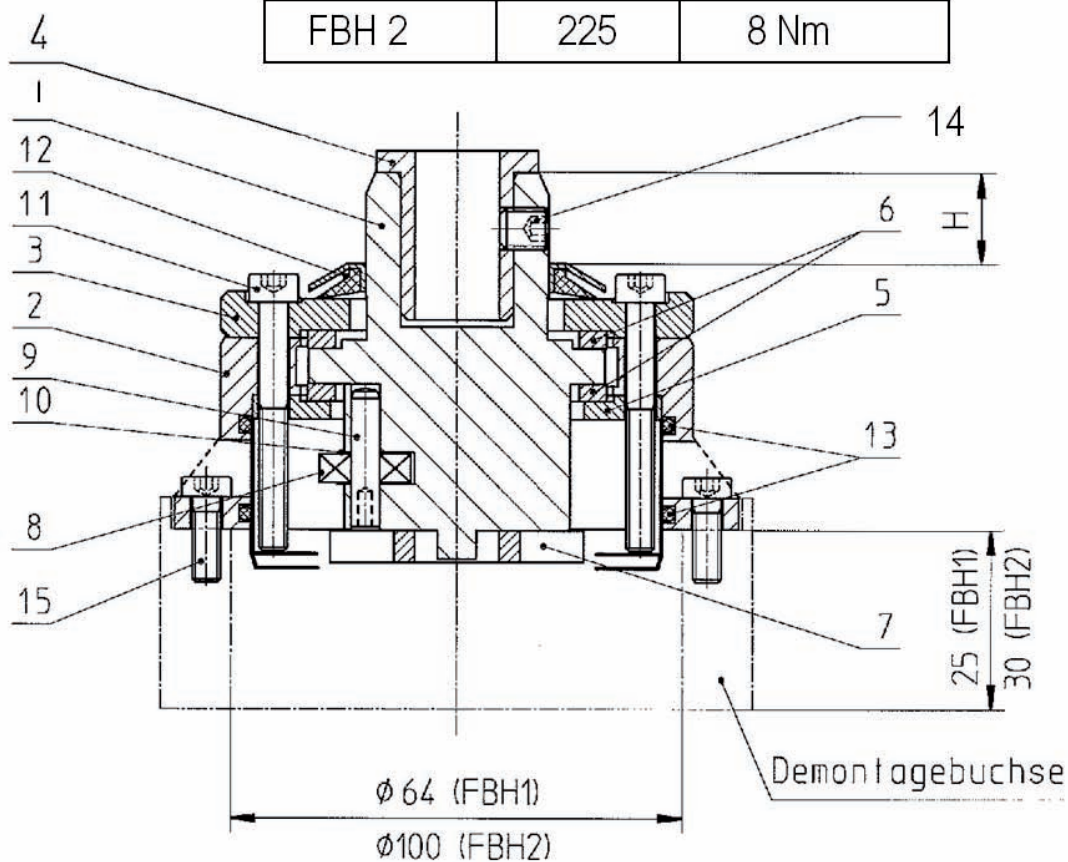
### **3. Multiform cam change**

Please go by the attached drawing:

1. Dismount boring tool (over-torque) by removing screw No. 14. Afterwards, remove eccentric bushing No. 4.
2. Loosen and remove screws No. 15. (6 times)
3. Remove the Multiform head from the drive.
4. Loosen and remove screws No. 11.
5. Put the Multiform head on a bushing as shown in the drawing and carefully press wobble head No. 1 out of housing No. 2, so that the gasket No. 12 is not damaged and can be removed.
6. Remove supporting ring No. 3.
7. Put housing No. 2 aside.
8. Remove cam segment from wobble head No. 1 and provide new cam segment.
9. Firstly push the smaller diameter of the cam segment onto wobble head No. 1.
10. Screw in 3 screws No. 11 into the back of the Multiform cam segment (approx. 2-3 movements)!
11. Turn thrust washer No. 5 so that the through-hole is located above the thread.
12. Place the Multiform cam segment (with wobble head) with the 3 screws No. 11 onto the work bench (three-point support).
13. Clean housing No. 2 and carefully push it from above onto the Multiform cam segment. The window in the housing should be located at the level of the lettering.
14. Check the wobble head for free movement (through rotary motion).
15. Apply floating bearing No. 6 (lubricant: kluber grease).
16. Apply supporting ring No. 3 and tighten screws No. 11 (6 times) with specified tightening torque.
17. Press on gasket No. 12, observing the dimension "H" (see drawing), so that the sealing lip is seated solidly on supporting ring No. 3. (TBP000260-4N04 gamma ring, TBP000450-4N04)
18. Attach the Multiform head onto the drive, observing the angular position. Turn the wobble head so that the tappets engage in clutch disk No. 7.
19. Tighten screws No. 15. (6 times)
20. Please test the functioning by manually turning the drive.



Overall size	H	Tightening torque Screw No. 11
FBH 1	13	4 Nm
FBH 2	225	8 Nm





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