

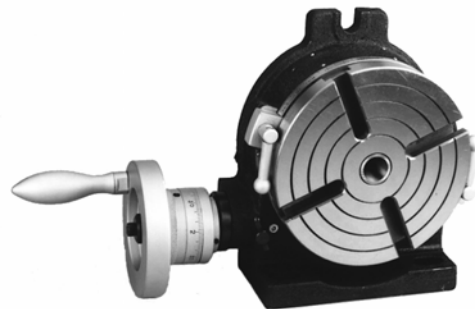


Operating instructions

Dividing attachment



No. 11501



No. 11510

**Walter Blombach GmbH
Tool and Machine Factory**

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1. Area of application

Dividing attachments vertical/horizontal

for machining on several sides – for work pieces are to be spot faced or counter sunk around the circumference, which can also be circular, e.g. milling polygons, hole patterns on a circle, splined shafts, helical grooves and toothed wheels

2. Construction features

2.1 Dividing attachment No. 11501

- enclosed construction prevents the ingress of dirt and swarf
- hardened and ground adjustable worm
- clamping table swivels on a scraped flat bed
- quick clamping device
- holding jig: vertical and horizontal
- 3 radial clamping T-slots
- width of T-slots 10 mm
- construction height 70 mm
- trough spindle bore MT2
- table diameter 110 mm
- weight: 7 kg

2. Construction features

2.2 Dividing attachment No. 11510

- enclosed construction prevents the ingress of dirt and swarf
- hardened and ground adjustable worm
- clamping table swivels on a scraped flat bed
- quick clamping device
- holding jig: vertical and horizontal
- 4 radial clamping T-slots
- width of T-slots 10 mm
- construction height 80 mm
- trough spindle bore MT2
- table diameter 150 mm
- weight: 12 kg

3. Technical data

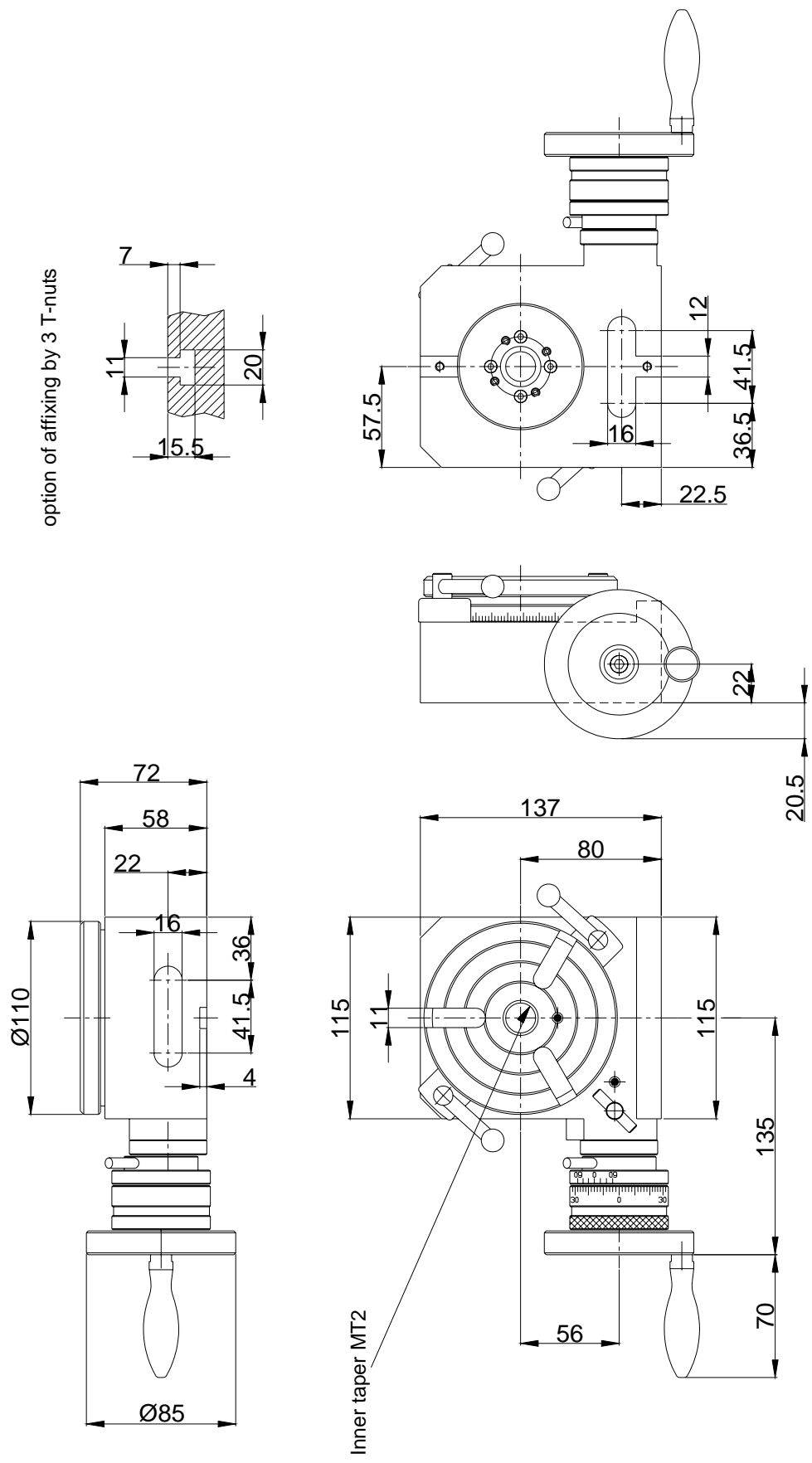
Accuracy (max. deviations):

- | | |
|--|---------|
| • truth of rotation of the work bench | 0.02 mm |
| • parallelism of the clamping surface of the clamping table to the base surface | 0.02 mm |
| • parallelism of the drilling axis with respect to the vertical clamping surface | 0.03 mm |
| • parallelism of the drilling axis with respect to the slots of the vertical clamping surface | 0.02 mm |
| • parallelism between the vertical clamping surface and the axis of connection taper center - point of tailstock | 0.02 mm |
| • dividing precision | 45" |
| • clamping table with scale | 360° |
| • worm drive ratio | 90:1 |
| • rotations handwheel per 1 turn clamping table | 90 |
| • one turn of the handle turns the table | 4° |
| • the graduation ring is stepped in increments of | 2 min. |

- Technical details are subject to change -

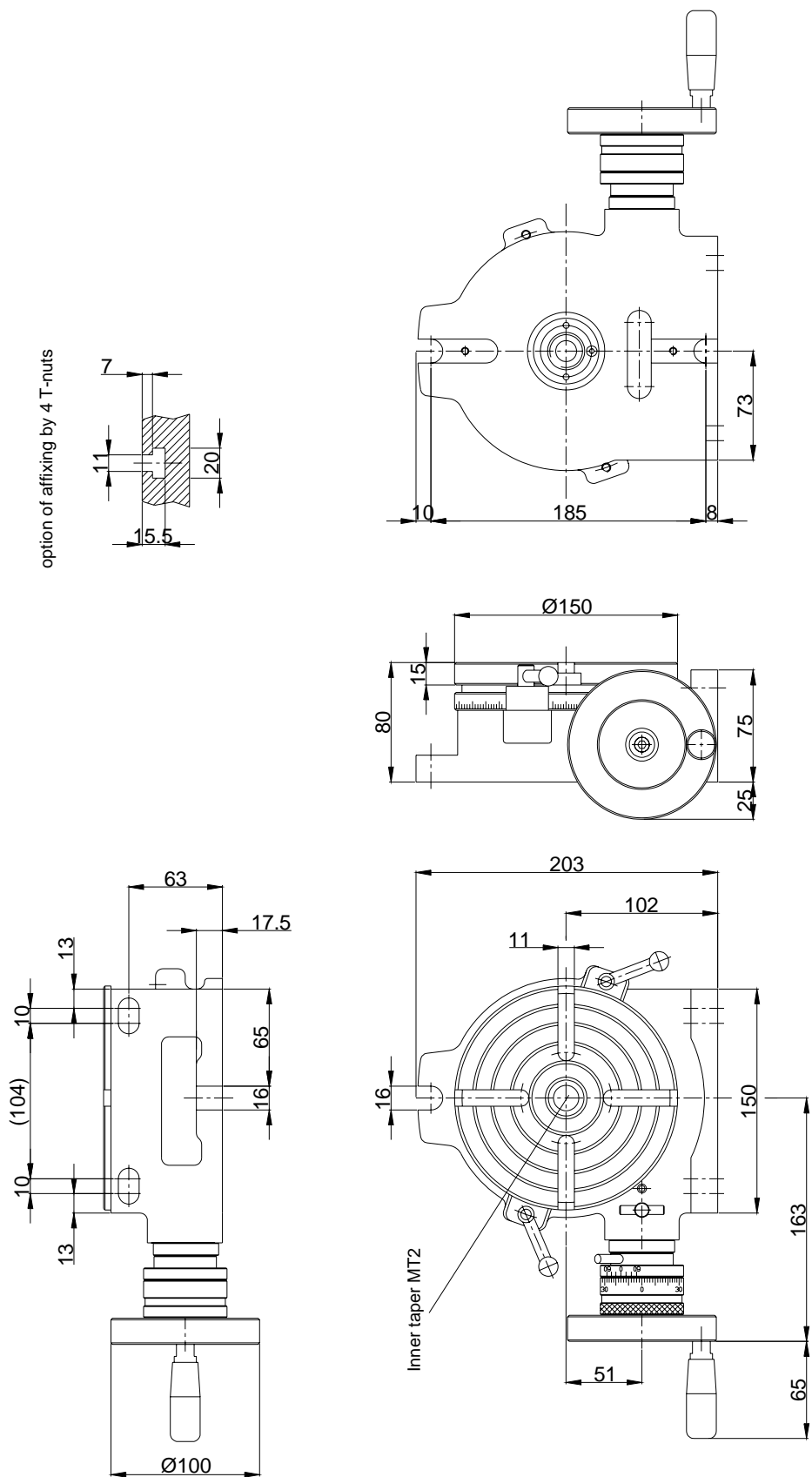
4. General construction and operation

4.1 General construction No. 11501



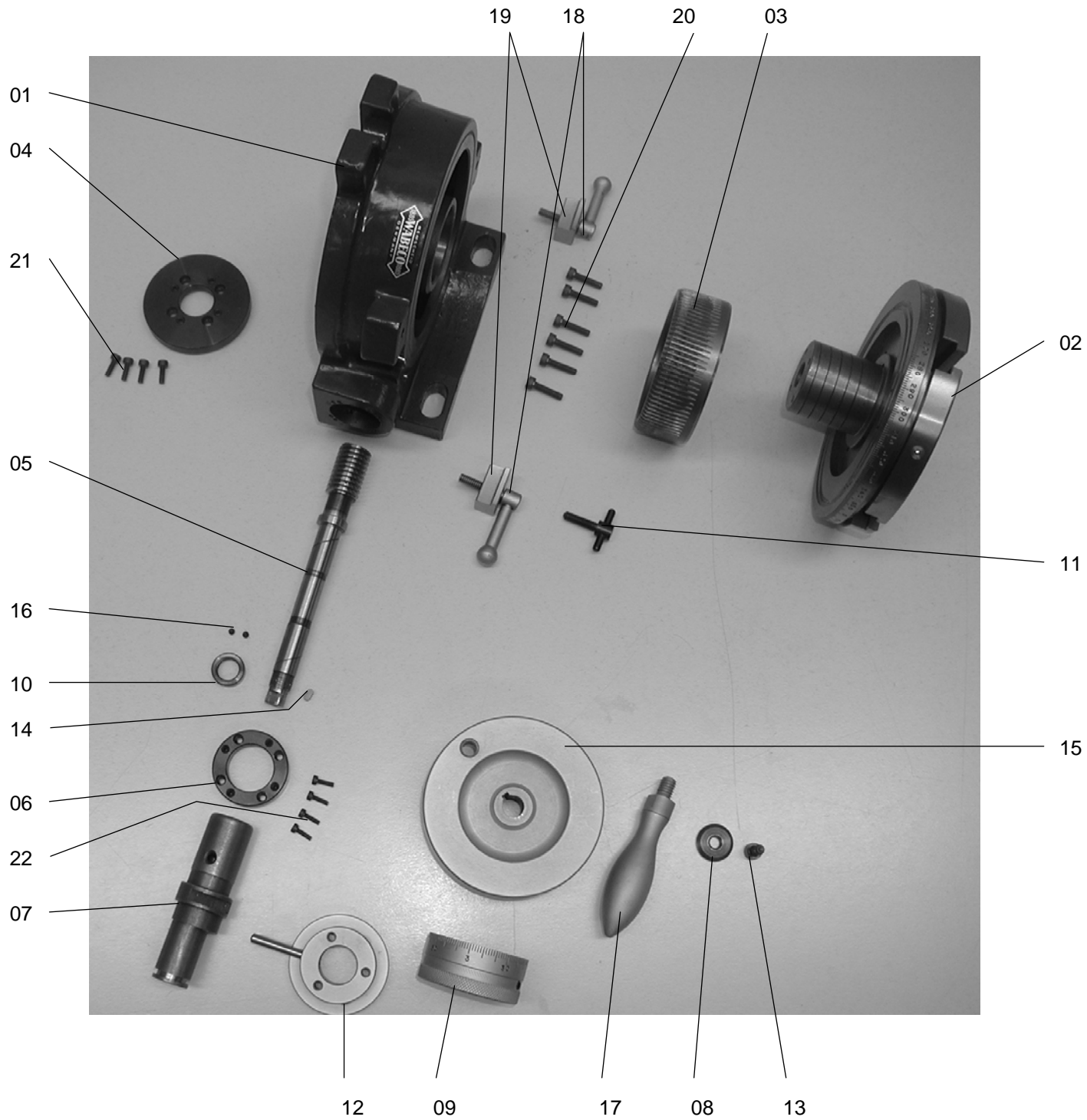
4. General construction and operation

4.1 General construction No. 11510



4. General construction and operation

4.2 Illustration No. 11510



4. General construction and operation

4.2.1 Legend

| Part-No. | Pieces | Designation |
|----------|--------|---------------------------|
| 01 | 1 | Case |
| 02 | 1 | Rotary table |
| 03 | 1 | Worm wheel |
| 04 | 1 | Limiting ring |
| 05 | 1 | Worm shaft |
| 06 | 1 | Retainer ring |
| 07 | 1 | Excentric |
| 08 | 1 | Holding disk |
| 09 | 1 | Graduated collar |
| 10 | 1 | Rating nut |
| 11 | 1 | Set screw |
| 12 | 1 | Indicator ring |
| 13 | 1 | Attachment bolt |
| 14 | 1 | Fit-in key |
| 15 | 1 | Handwheel |
| 16 | 2 | Set screw |
| 17 | 1 | Hand gripp |
| 18 | 2 | Clamping lever |
| 19 | 2 | Clamping piece |
| 20 | 6 | Fixing bolt worm wheel |
| 21 | 4 | Fixing bolt limiting ring |
| 22 | 4 | Fixing bolt retainer ring |

4. General construction and operation

4.3 Operation

The workpiece to be machined is clamped in place by means of T-slots or hexagonal head cap screws into the appropriate slots.

For the easiest possible operation and quick setup, release the clamping lever of the eccentric mechanism (11) and two clamp levers (18+19). By swiveling the indicator ring (12) by hand to the left so that the worm (05) on the worm wheel (03) is disengaged. In this way it is possible to move the rotary table (02) manually.

Subsequently, rotate the indicator ring (12) in the opposite direction in order to engage the worm (05) and the worm wheel (03) and clamp the clamping lever of the eccentric mechanism (11). The correct position can now be set by rotating the table via handwheel (15).

After adjusting workpiece onto rotary table, set scale ring (09) and indicator ring (12) to zero degree position. For this you have to release pin screws onto it's circumference, set rings to zero degree position and fix screws again.

After the correct division has been set, the rotary table (02) must be fixed in place using the clamping lever (18+19).

When using the rotary table in a vertical position in connection with the tailstock, make sure that the guideway is exactly aligned and coincides with the T-slots on the table.

5. Maintenance and lubrication

When using and transporting the dividing attachment, extreme care must be taken of all machined surfaces on the table.

In order to maintain the high precision of the dividing attachment over an extended service-life period, do not expose the rotary table or the clamped workpieces to severe impact or blows.

After operation, remove all chips and residual cooling mediums and oil the table surface to prevent it from rusting.

Grease the worm before placing into operation (two grease fittings).

6. Indexing unit (Optional equipment) No. 11514

6.1 Indirect division

The dividing attachment can be equipped with an indexing unit (optional).

When working with an indexing device, the following parts on the rotary table must be removed and then be replaced by the indexing unit: attachment bolt (13) and handwheel (15).

The indexing unit is consisting of the following parts:

Sector arm (1) with pin (2) , three-pieces indexing disk (3), spring steel sheet (4), shear (5) and three screws M4x16 (6).

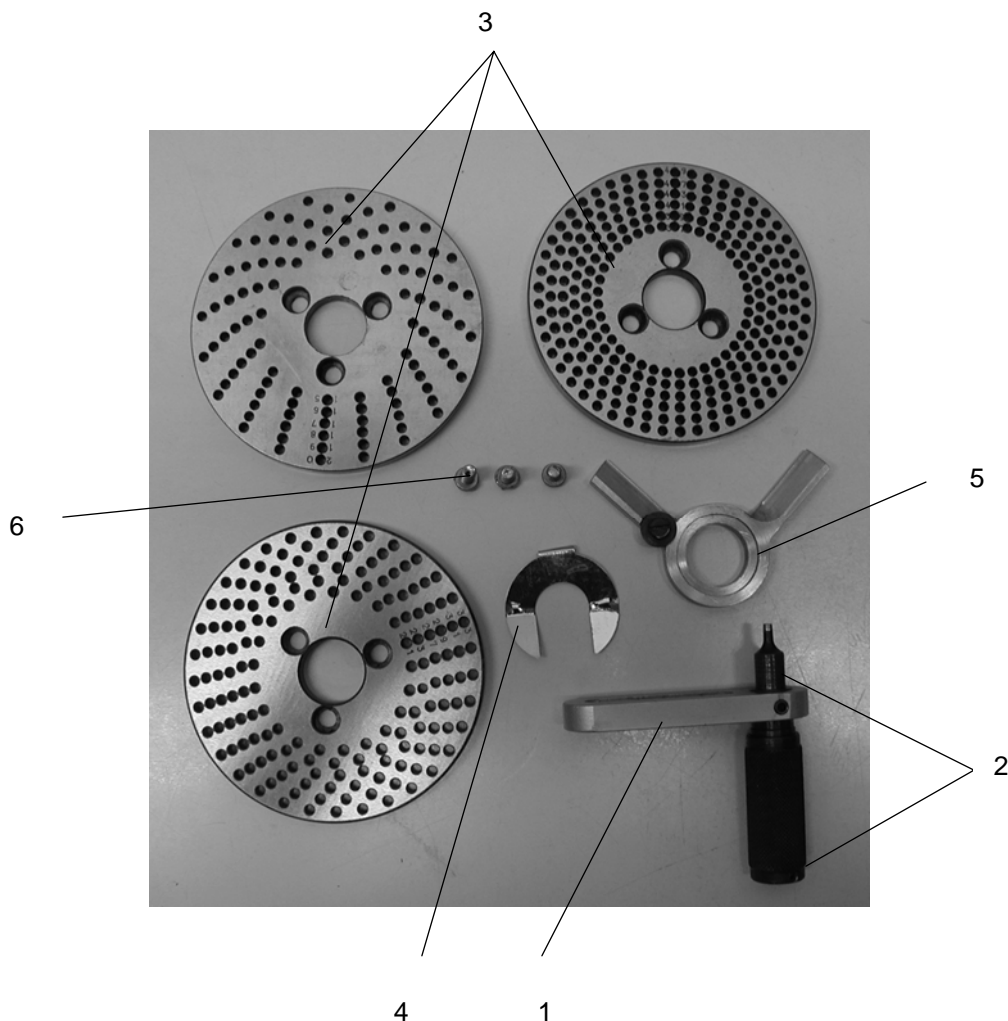
Attach the indexing disk (3) using the three screws M4x16 (6) at the indicator ring (12).

After this move on the shear (5) over. It is to be fixed with spring steel plate (4) and index washer onto surface. Fix sector arm (1) with attachment screw (13) onto spiral lever (05).

After selecting the hole-circle diameter and the corresponding angle of the shear (5) from the table, remove the pin (2) and rotate the sector arm (1) for divisions.

The graduation of 2 to 100 can be carried out quickly and easily.

Engagement equation: Since the ratio of the worm drive is 1:90, the supporting table is rotated by $1/90$ when the crank handle is rotated 360° . The ratio between crank handle rotation "N" and the number of divisions "T" to be equated is shown in the following equation: $N = 90/T$.



6. Indexing unit (Optional equipment) No. 11514

6.1 Indirect division

The rotary table is driven by a worm and worm wheel. Make sure that the clamping lever (18+19) on the table is not tightened.

T Division number/number of divisions

< Angular division in degrees (°)

i = 90° transmission ratio in indexing unit
= Number of crank revolutions for a complete revolution of the workpiece

n_k Number of crank revolutions for a dividing step (can be a fraction, a mixed number or a whole number)

Number of holes on the hole circle of the hole disk

| | |
|---|---------------------------|
| A | 15, 16, 17, 18, 19, 20 |
| B | 21, 23, 27, 29, 31, 33 |
| C | 37, 39, 41, 43, 47, 49 |

$$n_k = \frac{i}{T}$$

$$n_k = \frac{\angle \times i}{360^\circ}$$

6. Indexing unit (Optional equipment) No. 11514

6.2 Example 1

$$i = 90$$

$$T = 30$$

$$n_k = ?$$

$$n_k = \frac{i}{T} = \frac{90}{30} = \frac{9}{3} = 3$$

This means: The dividing crank must be turned by 3 complete revolutions.

6.3 Example 2

$$i = 90$$

$$T = 63$$

$$n_k = ?$$

$$n_k = \frac{i}{T} = \frac{90}{63} = 1 \frac{27}{63} = 1 \frac{9}{21}$$

This means: The dividing crank must be turned one complete revolution and 9 hole distances on the 21-hole circle.

6.4 Example 3

$$i = 90$$

$$\alpha = 23 \text{ Grad}$$

$$n_k = ?$$

$$n_k = \frac{\alpha \times i}{360} = \frac{23^\circ \times 90}{360} = 5,75 = 20 \times 0,75 = 15$$

This means: 5 complete revolutions made with the crank and 15 hole distances on the 20-hole circle.

6. Indexing unit (Optional equipment) No. 11514

6.5 Tables

| Number of divisions / division number | Indirect division | | |
|--|----------------------------------|----------------|---|
| | Revolutions of the hand wheel | Hole circle | Hole of distance of the indexing pin |
| 2 | 45 | | 0 |
| 3 | 30 | | 0 |
| 4 | 22 | 20 | 10 |
| 5 | 18 | | 0 |
| 6 | 15 | | 0 |
| 7 | 12 | 21 | 18 |
| 8 | 11 | 20 | 5 |
| 9 | 10 | | 0 |
| 10 | 9 | | 0 |
| 11 | 8 | 33 | 6 |
| 12 | 7 | 20 | 10 |
| 13 | 6 | 39 | 36 |
| 14 | 6 | 21 | 9 |
| 15 | 6 | | 0 |
| 16 | 5 | 16 | 10 |
| 17 | 5 | 17 | 5 |
| 18 | 5 | | 0 |
| 19 | 4 | 19 | 14 |
| 20 | 4 | 20 | 10 |
| 21 | 4 | 21 | 6 |
| 22 | 4 | 33 | 3 |
| 23 | 3 | 23 | 21 |
| 24 | 3 | 20 | 15 |
| 25 | 3 | 20 | 12 |
| 26 | 3 | 39 | 18 |
| 27 | 3 | 18 | 6 |
| 29 | 3 | 29 | 3 |
| 30 | 3 | | 0 |
| 31 | 2 | 31 | 28 |
| 32 | 2 | 16 | 13 |
| 33 | 2 | 33 | 24 |
| 34 | 2 | 17 | 11 |
| 35 | 2 | 21 | 12 |
| 36 | 2 | 20 | 10 |
| 37 | 2 | 37 | 16 |
| 38 | 2 | 19 | 7 |
| 39 | 2 | 39 | 12 |
| 40 | 2 | 20 | 5 |
| 41 | 2 | 41 | 8 |
| 42 | 2 | 21 | 3 |
| 43 | 2 | 43 | 4 |
| 45 | 2 | | 0 |
| 46 | 1 | 23 | 22 |
| 47 | 1 | 47 | 43 |
| 48 | 1 | 16 | 14 |
| 49 | 1 | 49 | 41 |
| 50 | 1 | 20 | 16 |
| 51 | 1 | 17 | 13 |
| 54 | 1 | 18 | 12 |

6. Indexing unit (Optional equipment) No. 11514

6.5 Tables

| Number of divisions / division number | Indirect division | | |
|--|----------------------------------|----------------|---|
| | Revolutions of the hand wheel | Hole circle | Hole of distance of the indexing pin |
| 55 | 1 | 33 | 21 |
| 57 | 1 | 19 | 11 |
| 58 | 1 | 29 | 16 |
| 60 | 1 | 20 | 10 |
| 62 | 1 | 31 | 14 |
| 63 | 1 | 21 | 9 |
| 65 | 1 | 39 | 15 |
| 66 | 1 | 33 | 12 |
| 69 | 1 | 23 | 7 |
| 70 | 1 | 21 | 1 |
| 72 | 1 | 20 | 5 |
| 74 | 1 | 37 | 8 |
| 75 | 1 | 20 | 4 |
| 76 | 1 | 38 | 7 |
| 78 | 1 | 39 | 6 |
| 80 | 1 | 16 | 2 |
| 81 | | 18 | 2 |
| 82 | 1 | 41 | 4 |
| 85 | 1 | 17 | 1 |
| 86 | 1 | 43 | 2 |
| 87 | 1 | 29 | 1 |
| 90 | 1 | | 0 |
| 93 | | 31 | 30 |
| 94 | | 47 | 45 |
| 95 | | 19 | 18 |
| 96 | | 16 | 15 |
| 98 | | 49 | 45 |
| 99 | | 33 | 30 |
| 100 | | 20 | 18 |
| 102 | | 17 | 15 |
| 105 | | 21 | 18 |
| 108 | | 18 | 15 |
| 110 | | 33 | 27 |
| 111 | | 37 | 30 |
| 114 | | 19 | 15 |
| 115 | | 23 | 18 |
| 117 | | 39 | 30 |
| 120 | | 20 | 15 |
| 123 | | 41 | 30 |
| 126 | | 21 | 15 |
| 129 | | 43 | 30 |
| 130 | | 39 | 27 |
| 135 | | 27 | 18 |
| 138 | | 23 | 15 |
| 141 | | 47 | 30 |
| 144 | | 16 | 10 |
| 145 | | 29 | 18 |
| 147 | | 49 | 30 |
| 150 | | 15 | 9 |
| 153 | | 17 | 10 |

6. Indexing unit (Optional equipment) No. 11514

6.5 Tables

| | Indirect division | | |
|--|----------------------------------|----------------|---|
| Number of divisions / division number | Revolutions of the hand wheel | Hole circle | Hole of distance of the indexing pin |
| 155 | | 31 | 18 |
| 160 | | 16 | 9 |
| 162 | | 18 | 10 |
| 165 | | 33 | 18 |
| 170 | | 17 | 9 |
| 171 | | 19 | 10 |
| 174 | | 29 | 15 |
| 180 | | 18 | 9 |
| 185 | | 37 | 18 |
| 186 | | 31 | 15 |
| 189 | | 21 | 10 |
| 190 | | 19 | 9 |
| 195 | | 39 | 18 |
| 198 | | 33 | 15 |
| 200 | | 20 | 9 |
| 205 | | 41 | 18 |
| 207 | | 23 | 10 |
| 210 | | 21 | 9 |
| 215 | | 43 | 18 |
| 222 | | 37 | 15 |
| 225 | | 20 | 8 |
| 230 | | 23 | 9 |
| 234 | | 39 | 15 |
| 235 | | 47 | 18 |
| 240 | | 16 | 6 |
| 243 | | 27 | 10 |
| 245 | | 49 | 18 |
| 246 | | 41 | 15 |
| 255 | | 17 | 6 |
| 258 | | 43 | 15 |
| 261 | | 29 | 10 |
| 270 | | 15 | 5 |
| 279 | | 31 | 10 |
| 282 | | 47 | 15 |
| 285 | | 19 | 6 |
| 288 | | 16 | 5 |
| 290 | | 29 | 9 |
| 294 | | 49 | 15 |
| 297 | | 33 | 10 |
| 300 | | 20 | 6 |
| 306 | | 17 | 5 |
| 310 | | 31 | 9 |
| 315 | | 21 | 6 |
| 324 | | 18 | 5 |
| 330 | | 33 | 9 |

6. Indexing unit (Optional equipment) No. 11514

6.5 Tables

| Number of divisions / division number | Indirect division | | |
|--|----------------------------------|----------------|---|
| | Revolutions of the hand wheel | Hole circle | Hole of distance of the indexing pin |
| 333 | | 37 | 10 |
| 342 | | 19 | 5 |
| 345 | | 23 | 6 |
| 351 | | 39 | 10 |
| 360 | | 20 | 5 |
| 369 | | 41 | 10 |
| 370 | | 37 | 9 |
| 378 | | 21 | 5 |
| 387 | | 43 | 10 |
| 390 | | 39 | 9 |
| 405 | | 18 | 4 |
| 410 | | 41 | 9 |
| 414 | | 23 | 5 |
| 423 | | 47 | 10 |
| 430 | | 43 | 9 |
| 435 | | 29 | 6 |
| 441 | | 49 | 10 |
| 450 | | 20 | 4 |
| 465 | | 31 | 6 |
| 470 | | 47 | 9 |
| 480 | | 16 | 3 |
| 486 | | 27 | 5 |
| 510 | | 17 | 3 |
| 522 | | 29 | 5 |
| 540 | | 18 | 3 |
| 555 | | 37 | 6 |
| 558 | | 31 | 5 |
| 570 | | 19 | 3 |
| 594 | | 33 | 5 |
| 600 | | 20 | 3 |
| 615 | | 41 | 6 |
| 630 | | 21 | 3 |
| 645 | | 43 | 6 |
| 666 | | 37 | 5 |
| 675 | | 15 | 2 |
| 690 | | 23 | 3 |
| 702 | | 39 | 5 |
| 705 | | 47 | 6 |
| 720 | | 16 | 2 |
| 735 | | 49 | 6 |
| 738 | | 41 | 5 |
| 765 | | 17 | 2 |
| 774 | | 43 | 5 |
| 810 | | 18 | 2 |
| 846 | | 47 | 5 |

6. Indexing unit (Optional equipment) No. 11514

6.5 Tables

| Number of divisions / division number | Indirect division | | |
|--|----------------------------------|----------------|---|
| | Revolutions of the hand wheel | Hole circle | Hole of distance of the indexing pin |
| 855 | | 19 | 2 |
| 870 | | 29 | 3 |
| 882 | | 49 | 5 |
| 900 | | 20 | 2 |
| 930 | | 31 | 3 |
| 945 | | 21 | 2 |
| 990 | | 33 | 3 |
| 1035 | | 23 | 2 |
| 1110 | | 37 | 3 |
| 1170 | | 39 | 3 |
| 1215 | | 27 | 2 |
| 1230 | | 41 | 3 |
| 1290 | | 43 | 3 |
| 1305 | | 29 | 2 |
| 1350 | | 15 | 1 |
| 1395 | | 31 | 2 |
| 1410 | | 47 | 3 |
| 1440 | | 16 | 1 |
| 1470 | | 49 | 3 |
| 1485 | | 33 | 2 |
| 1530 | | 17 | 1 |
| 1620 | | 18 | 1 |
| 1665 | | 37 | 2 |
| 1710 | | 19 | 1 |
| 1755 | | 39 | 2 |
| 1800 | | 20 | 1 |
| 1845 | | 41 | 2 |
| 1890 | | 21 | 1 |
| 1935 | | 43 | 2 |
| 2070 | | 23 | 1 |
| 2115 | | 47 | 2 |
| 2205 | | 49 | 2 |
| 2430 | | 27 | 1 |
| 2610 | | 29 | 1 |
| 2790 | | 31 | 1 |
| 2970 | | 33 | 1 |
| 3330 | | 37 | 1 |
| 3510 | | 39 | 1 |
| 3690 | | 41 | 1 |
| 3870 | | 43 | 1 |
| 4230 | | 47 | 1 |
| 4410 | | 49 | 1 |