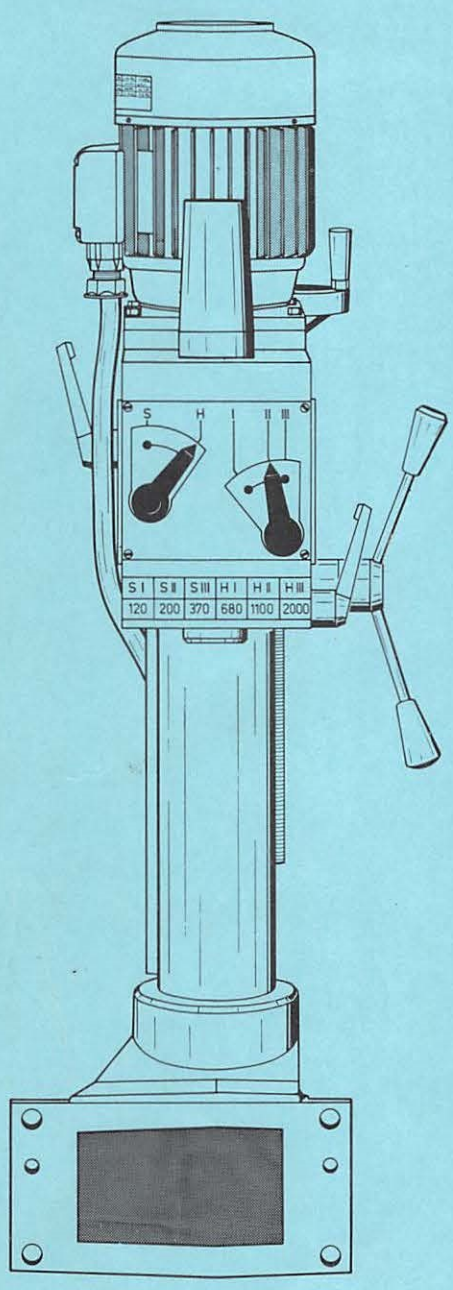
Vertical Drilling and Milling Unit



for:

- **Emcomat 8.4**
- **Emcomat 8.6**
- **Maximat V 10 P**
- **Maximat Mentor 10**
- **Compact 10**
- **Maximat Super 11**

Englisch Order No. EN 2445

Auflage: 10. 9. 8. 7. 6. 5. 4. 3.
92 91 90 89 88 87 86

Maier + Co.
A-5400 Hallein/Austria

Foreword

The Vertical Drilling and Milling Unit with the Order Nos. 524 1.. (Single-phase version) and 524 3.. (Three-phase version) can be fitted to the following machines: Emcomat 8.4/8.6, Maximat V10-P, Maximat Mentor 10 and Maximat Super 11.

The Vertical Drilling and Milling Unit with the Order Nos. 525 1.. (Single-phase version) and 525 3.. (Three-phase version) can be fitted to the Emcomat 8.4/8.6, Maximat V10-P and Maximat Mentor 10 but not to the Maximat Super 11.

Differences:

524 1.. Switch on the drive motor
524 3..

525 1.. Connection box on the drive motor
525 3.. Switch for switching on is integrated into the lathe

In addition, the clamping of the vertical slide has been improved and the column guide has been provided with a device for adjusting play.

Accident Prevention

1. **Electrical connections must only be carried out by a qualified electrician. The machine must only be connected to power outlet sockets with earthing conductors.**
2. **Spanners (chuck keys etc.) must not be affixed to the machine by chains, strings, wires or similar.**
3. **Adjustments to the machine, measurements and clamping work must only be carried out when the machine is at a standstill.**
4. **Clamp all workpieces and tools tightly and safely.**
5. **Never go away from a machine that is still running.**
6. **Never remove drillings, millings etc. from a machine while it is running; always use chip hooks.**
7. **Wear hair protection, do not wear loose clothing, wear eye protection.**
8. **Keep the working area clean at all times.**
9. **In the case of use in industrial workshops: Observe the General Accident Prevention Regulations.**

Important Tips

* work only with sharpened tools

* check oil level regularly

* after working eith coolant, clean wet surfaces thoroughly and oil these surfaces

* clamp all workpieces and tools firmly

* to prevent unnecessary wear of the slides and to assure optimum working results, all movements other than the feed must be blocked
  example: if cross slide feed for milling is used, then longitudinal slide, pinion and vertical slide must be clamped.

* **Only switch over spindle speeds when the machine is at a standstill**

* **Never clean the machine with compressed air.**

Basic Equipment

* Vertical milling and drilling unit complete with drive motor
* one set of service tools:
  - 1 rod
  - 1 key
  - 1 single-head wrench
  - 1 screwdriver 3 DIN 911
  - 1 screwdriver 8 DIN 911

* Supplementary Set for electrical connection of the vertical unit to the Emcomat 8.4/8.6, Maximat V10-P and Maximat Mentor 10.

Accessories

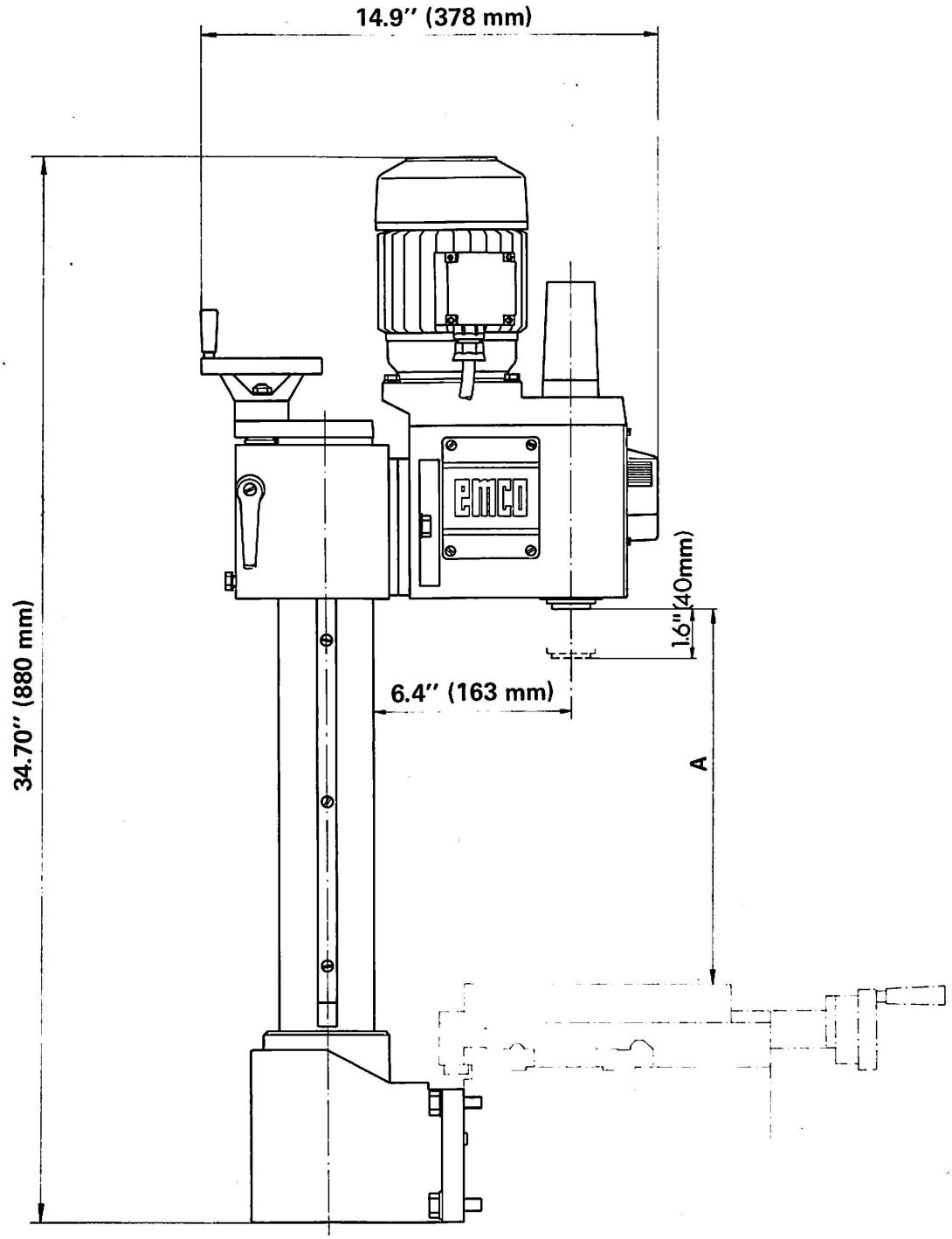
* drilling and milling guard
* tools, clamping devices for tools and workpieces, see pages 12 - 18
* gearbox oil
* cover for vertical unit
* coolant attachment

Technical Data

Throat:	6.4" (163 mm)
Diameter of column:	3.08" 78 mm)
Spindle taper:	MT2
Spindle stroke:	1.60" (40 mm)
Spindle speeds:	120,200,370,680,1100,2000 rpm. (with 50 cycle motor) 145, 240, 445, 815, 1320, 2400 rpm with 60 cycle motor.
Gearbox:	sliding toothed gear drive, gear surfaces shaved, gear wheels running in an oil bath and totally enclosed
Weight:	43 kg
Electrical Equipment:	IEC standardized motor with terminal housing; dust - and splashproof according to IP 54; model constructed accorded to VDE 0530; connecting cable with steel jacket

Motor Output: Single phase version: Output P2 = 0.22 kW (S3 – 60%)
Three phase version: Output P2 = 0.30 kW (S3 – 60%)

Dimensions

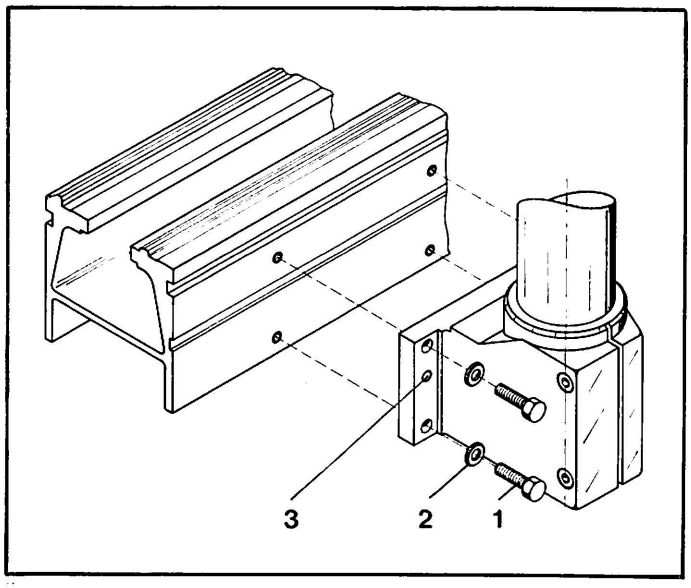


Emcomat 8.4
Emcomat 8.6
A = 323 mm (12,7")

Maximat V10-P
Maximat Mentor 10
A = 307 mm (12,1")

Maximat Super 11
A = 304 mm (12")

Mounting the Vertical Milling and Drilling Unit



The vertical unit is mounted on the rear of the machine bed with 4 hexagon screws M10x35 (1) and four washers (2). The two bolts (3) must fit into the groove in the machine bed.

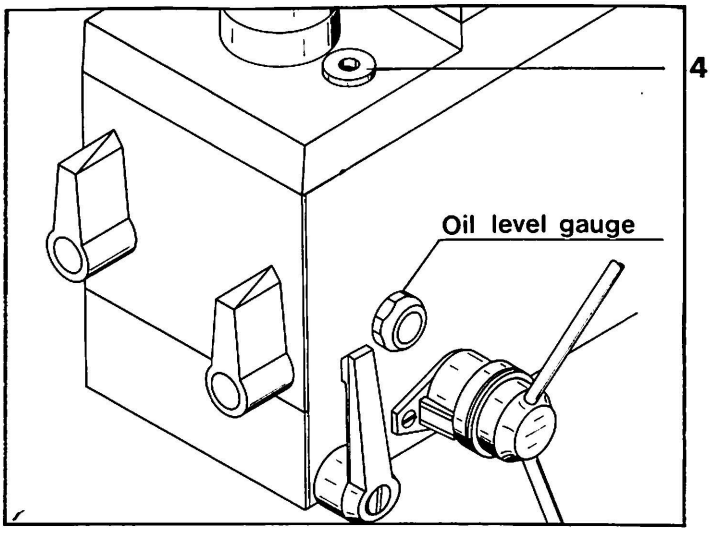
ATTENTION!

the contact surfaces and the threads must be dust - free !

Electrical Connections

Circuit diagrams for single-phase and three-phase models and wiring instructions on page **24–27**

Filling in the Gearbox Oil



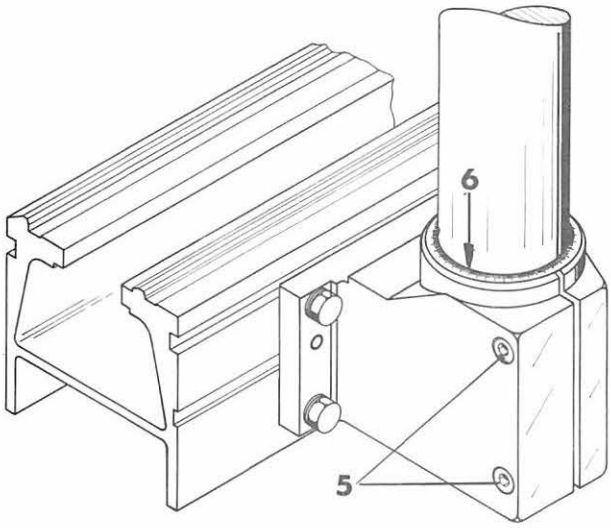
Quantity of oil: 0.5 l (2 bottles)
Oil quality: Emco Special Oil
(Order No. 751 000)

Unscrew the threaded filler plug (4) and pour in 0.5 l gearbox oil.

The correct oil level is in the centre of the oil level gauge (when the vertical head is standing upright).

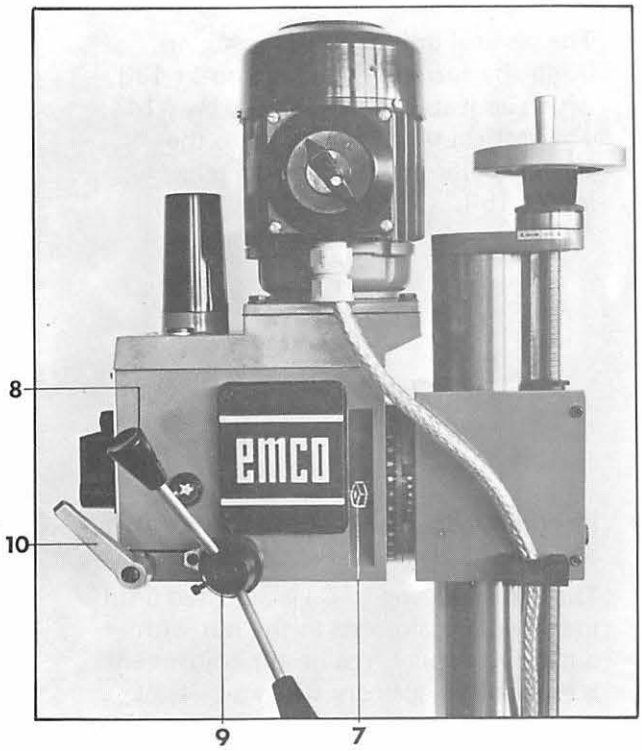
Change the oil after every 300 hours of operation.

Operating Elements – Play Re-adjustments



Turning the Vertical Unit:

After loosening both Allen head screws (5), the vertical column and with it the whole unit can be turned. The graduated scale (6) enables accurate positioning.

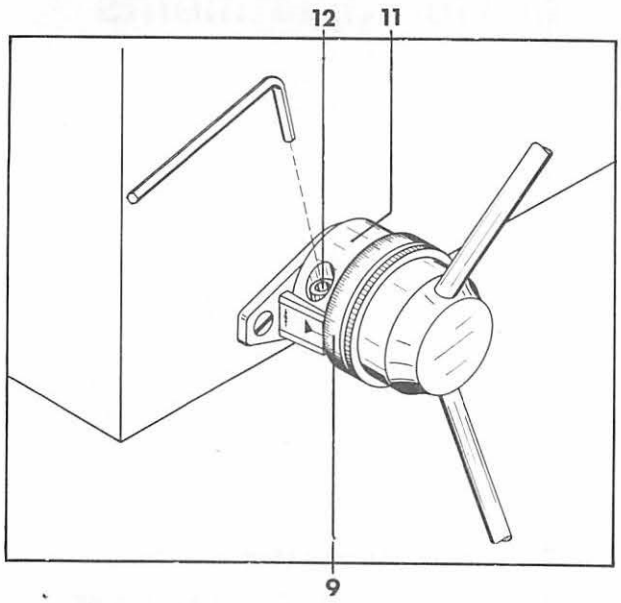


Swivelling the Vertical Head:

After loosening the two hexagon nuts (7) the vertical head can be swivelled by 360°.
Degree of accuracy 0,16° can be attained with aid of the graduated scale and vernier.

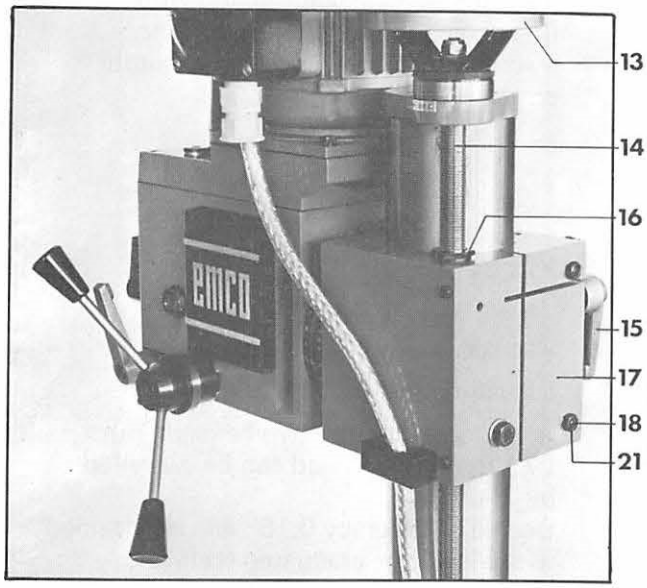
Stroke of spindle: 1.60'' maximum (40 mm)
By swivelling the toggle (8) counter-clockwise the spindle is lowered.
The distance of downward spindle motion can be accurately seen on the graduated scale (9).

Clamping the spindle: the spindle can be clamped with the convertible clamping lever (10).



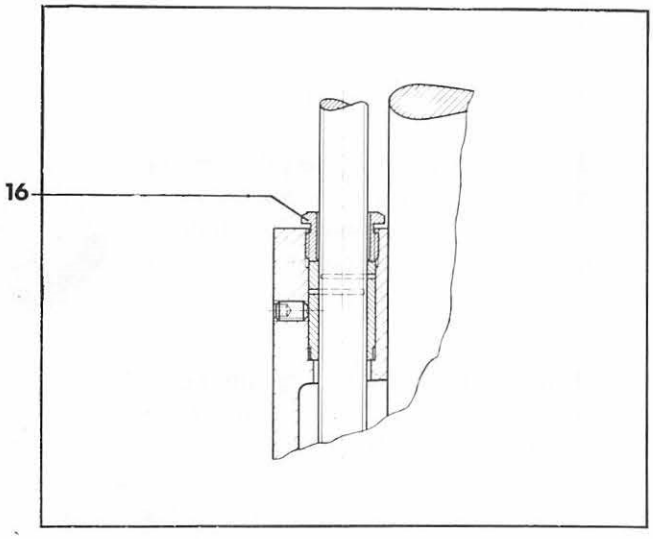
The Depth Stop:

If several holes of identical depth are to be drilled, it is possible to set the spindle stroke to the required dimension.
In practical use: when the spindle is in the lowered position, the stop ring (11) is fixed with the Allen head screw (12). In this way the stroke of spindle is limited.



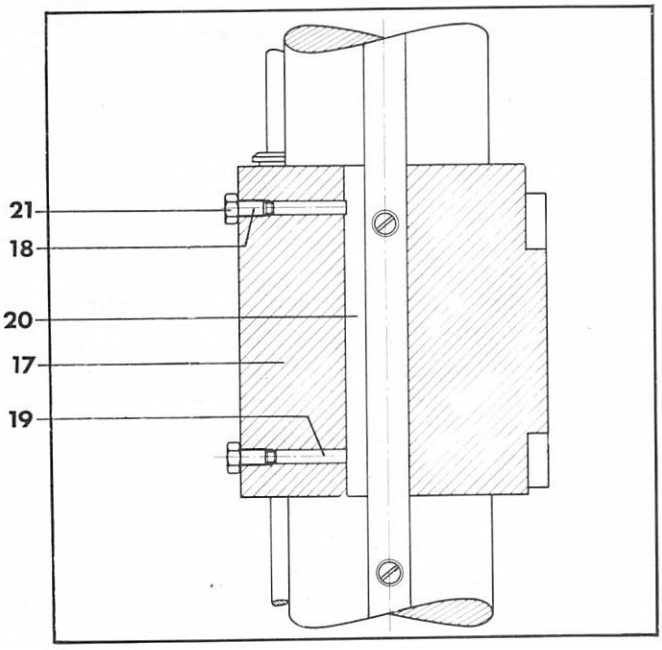
Adjusting the Height of the Vertical Unit:

The vertical unit can be adjusted in height by turning the handwheel (13), which activates the vertical screw (14). The vertical slide is clamped to the vertical column with the clamping lever (15).



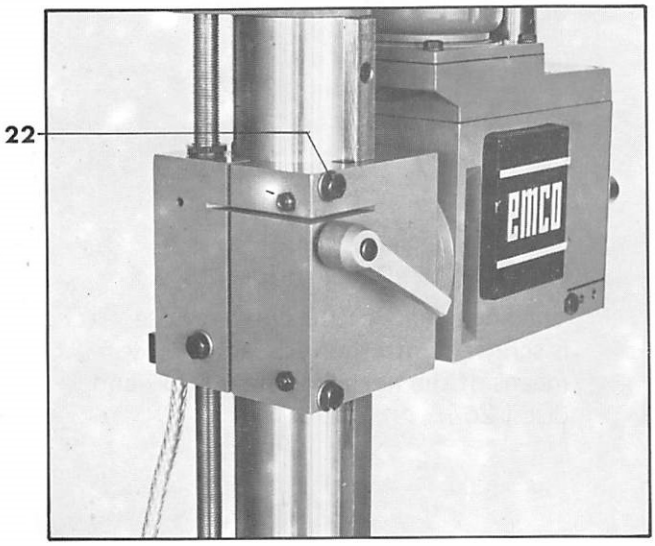
Re-adjustment of Play of the Vertical Slide in the Nut:

The threaded ring (16) is adjusted until the spindle again rests in the nut without play. A play-free height adjustment is especially necessary when a vertical feed movement takes place (for example, gear milling - see Instruction Manual - Lathe).



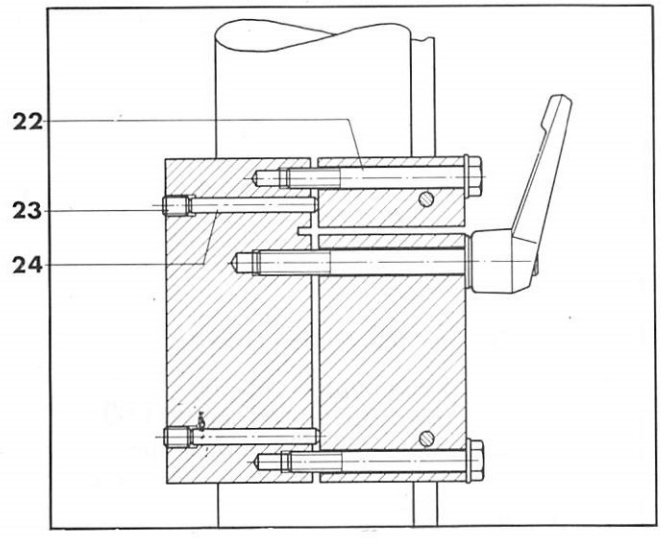
Readjustment of Play on the Guide Bar

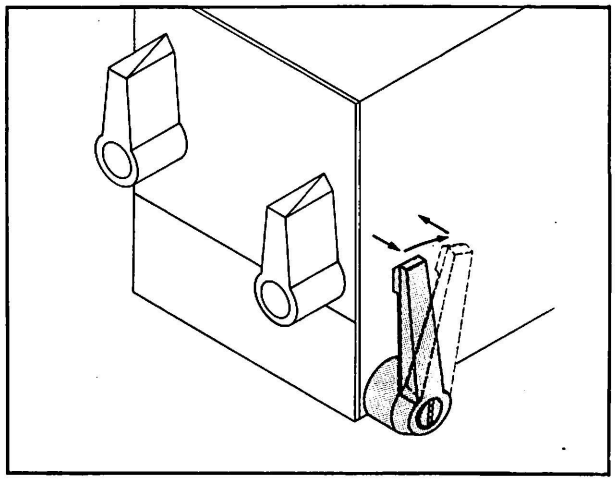
The vertical slide (17) is set in the factory to be play-free.
If necessary, the radial clearance can be compensated via both Allen head screws (18) over the pins (19) and the gib (20).The hexagon nuts (21) prevent loosening.



Readjustment of Play between the Vertical Slide and the Vertical Column

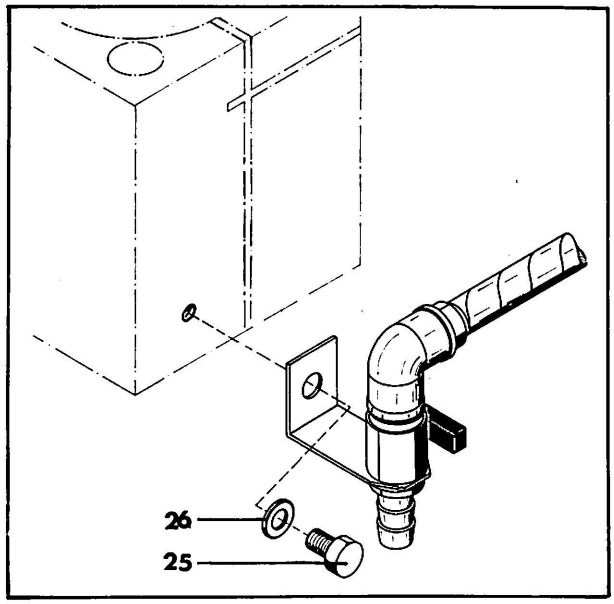
Loosen the set screws (23), tighten the hexagon head screws (22) until the vertical slide runs with no play and then re-tighten the set screws (23).





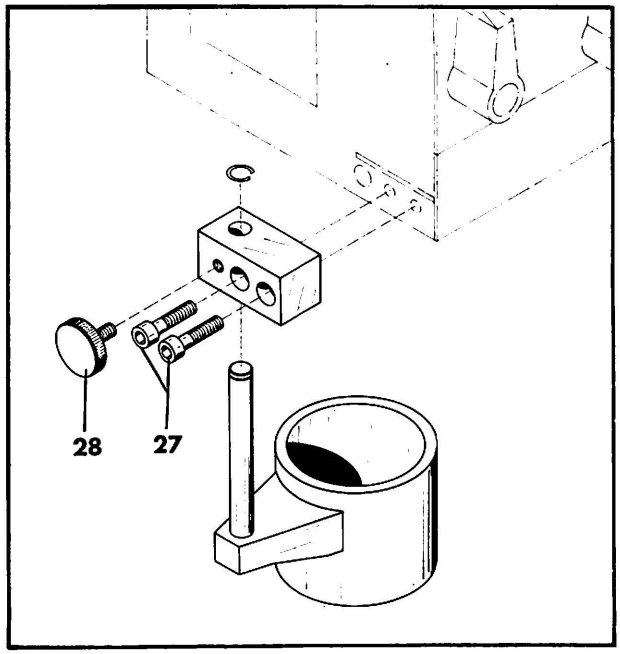
Re-setting the Convertible Clamping Lever:

(clamping lever for clamping of spindle and vertical slide).
Depending on working angle and height, the clamping lever is re-set to the most convenient position. The relative clamping lever is pulled out until it can be turned to the left or right. Possible angle turns of 30°.



Mounting the Coolant Hose:

The angle plate of the coolant hose is screwed onto the vertical head by means of the hexagon screw (25) and disc (26).



The Drilling and Milling Guard

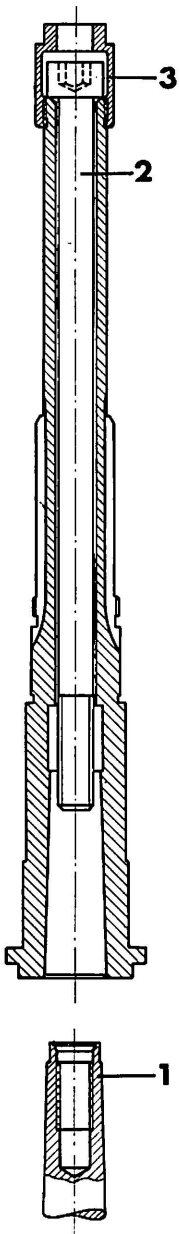
The guard is clamped onto the vertical head with two Allen head screws (27). It is adjustable in height and can be fixed with the knurled screw(28) in the required position.

Mounting and Dismounting of Tools and Arbors

ATTENTION

* **Spindle taper and tool taper must be dirt and dust-free.**
* **Never work without top cover.**
* **Never hammer the spindle - this could damage the precision bearings.**

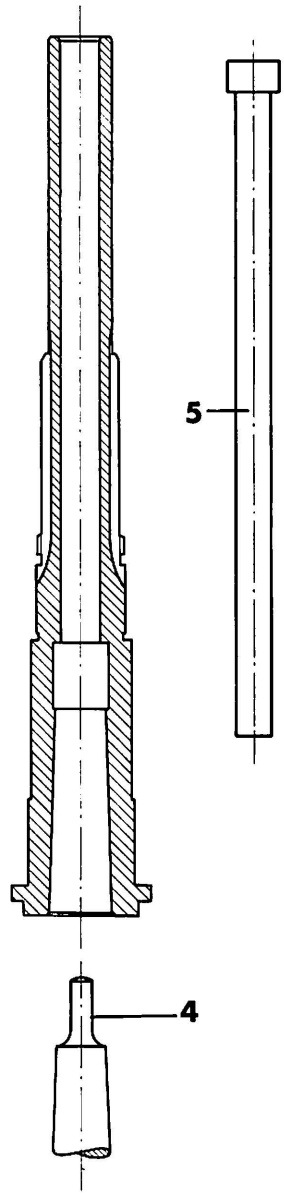
Tools with Morse taper shaft MT2 can be mounted directly.
Tools with a cylindrical shaft or receiving bore are clamped with the corresponding clamping device (3 jaw drill chuck, collet holder, shell end mill arbor).



Clamping Method A,
for tools or arbors with internal draw-in screw thread **(1).**

Clamping:
The tool is inserted into the spindle and fixed with the Allen head screw **(2).**

Dismounting:
The Allen head screw **(2)** is turned counterclockwise, the head of the screw presses against the nut **(3)** and the tool or arbor is released.



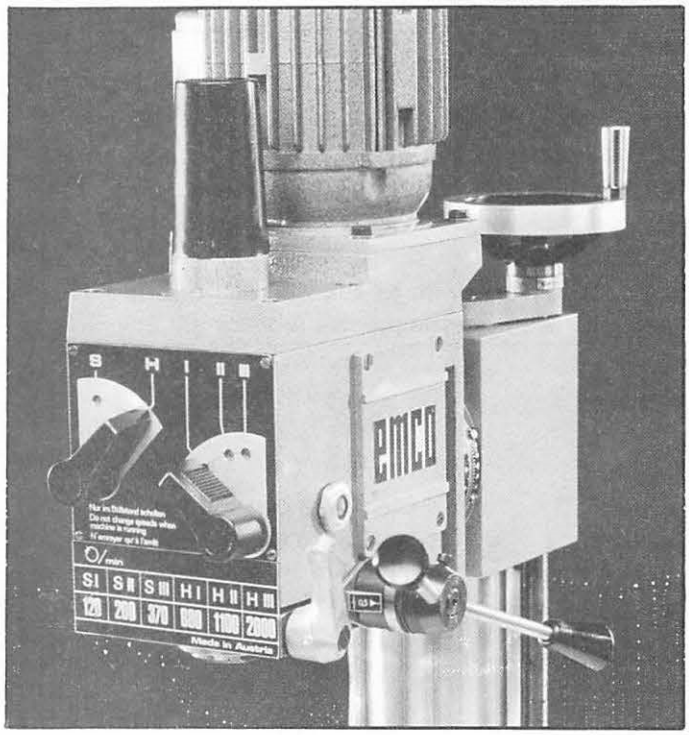
Clamping Method B,
for tools or arbors with flat tang **(4).**

Clamping:
The Allen head screw **(2)** and the nut **(3)** are dismounted. The tool is inserted into the spindle.

Dismounting:
The rod **(5)** is inserted into the spindle. The nut **(3)** is screwed on until the tool is ejected by the pressure of the rod **(5).**

The Spindle Speeds

Switching spindle speeds is facilitated by the sloped sliding gears. If, however, the teeth are above one another, the spindle must be turned with the hand during switching.



ATTENTION:

* **Never change spindle speeds while machine is running!**
* **Never switch with force, turn spindle during switching!**
* **The switch must rest in the bore of the speed plate !**

Guidelines for Spindle Speeds Depending on the Workpiece Material and Diameter of Milling/Drilling Tool.

The correct spindle speed is mainly dependent on two factors:

1. Strength of the workpiece material:

Generally applicable: the stronger the material (the harder the workpiece), the lower the speed.

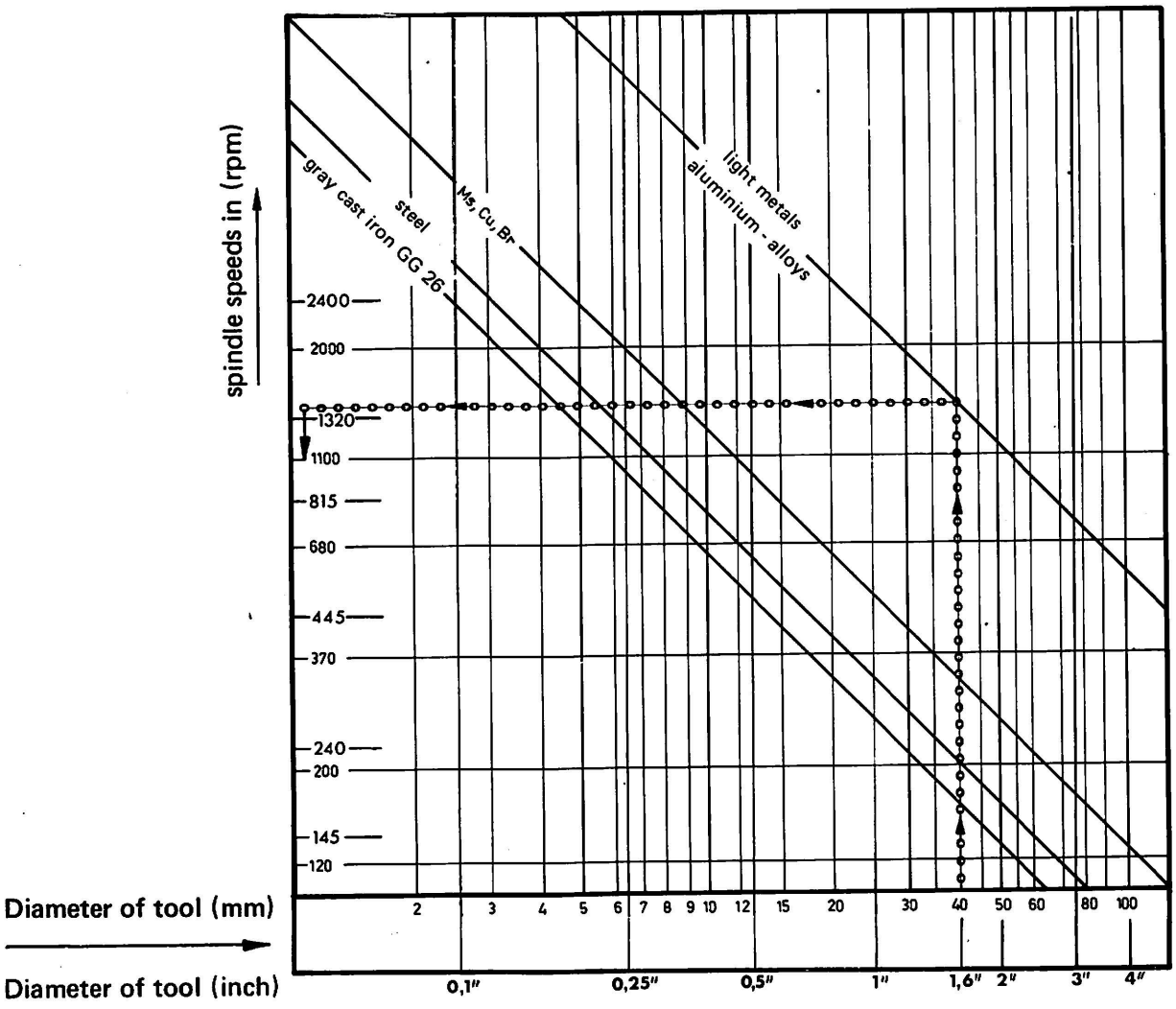
2. Diameter of the tool:

The larger the diameter of the milling tool (or drill), the lower the speed.

The guidelines as on the diagram are applicable:

1. when using optimally sharpened tools
2. when using the correct lubricating and coolant materials.

If cutting conditions are not the best (result: tool rattles, etc.) it is recommendable to work with a lower speed.

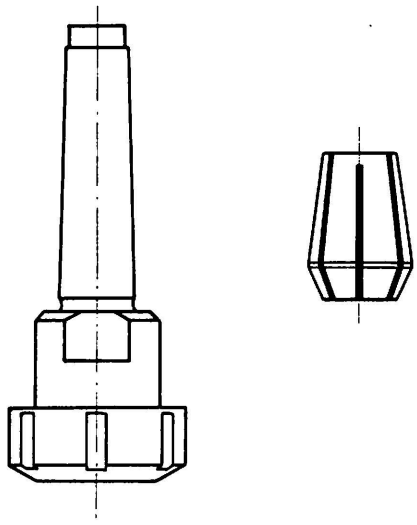


Example: Workpiece material: Aluminum alloy

Diameter of milling tool: **1,6 inch**

One follows the broken line and comes to a speed of approx. 1400 rpm.
The selected speed must always be under the theoretical speed.
In this case **1100 rpm.**

Clamping Devices for Tools



CLAMPING WITH THE COLLET HOLDER AND COLLETS

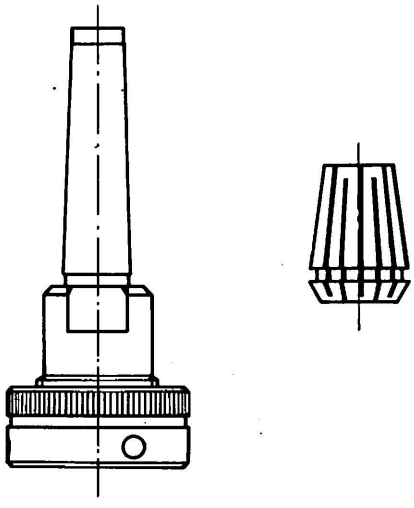
Clamping Method A

The collet holder enables clamping of milling tools with round shanks and of drills.

1. Collet Holder (Order No. 721 000) for Type E 25 Collets

For clamping with collets of Type E 25, you need the appropriate collet for each shank diameter. Clamping range: h 13. The clamping diameter is engraved on the collet. – For the Order Nos. of the E 25 collets, see the brochure.

The clamping nut is tightened with a hook spanner while counterforce is exerted with the key wrench.



2. Collet Holder (Order No. 520 020) for Type ESX 25 Collets

(available from mid-1981)

The collets of Type ESX 25 enable you to bridge greater clamping ranges (see table).
When the clamping nut is unscrewed, the collets are drawn off the cone of the collet holder by the annular ring round the collet waist.

The collets are available either as a set of 14 (Order No. 225 000) or separately.

Individual collets ESX-25

Nominal diameter in mm	Chucking capacity in mm	Chucking capacity in inches	Order No.
2,0	1,5-2,0	1/16-5/64	**225 020**
2,5	2,0-2,5	3/32	**225 025**
3,0	2,5-3,0	7/64	**225 030**
4,0	3,0-4,0	1/8-9/64-5/32	**225 040**
5,0	4,0-5,0	11/64-3/16	**225 050**
6,0	5,0-6,0	13/64-7/32-15/64	**225 060**
7,0	6,0-7,0	1/4-17/64	**225 070**
8,0	7,0-8,0	9/32-19/64-5/16	**225 080**
9,0	8,0-9,0	21/64-11/32	**225 090**
10,0	9,0-10,0	23/64-3/8-25/64	**225 100**
11,0	10,0-11,0	13/32-27/64	**225 110**
12,0	11,0-12,0	7/16-29/64-15/32	**225 120**
13,0	12,0-13,0	31/64-1/2	**225 130**
14,0	13,0-14,0	33/64-17/32-35/64	**225 140**

Important Note:

Collets of Type ESX 25 can be used in collet holder 721 000. However, collets of Type E 25 do not fit into collet holder 520 020.

CLAMPING IN THE DRILL CHUCK

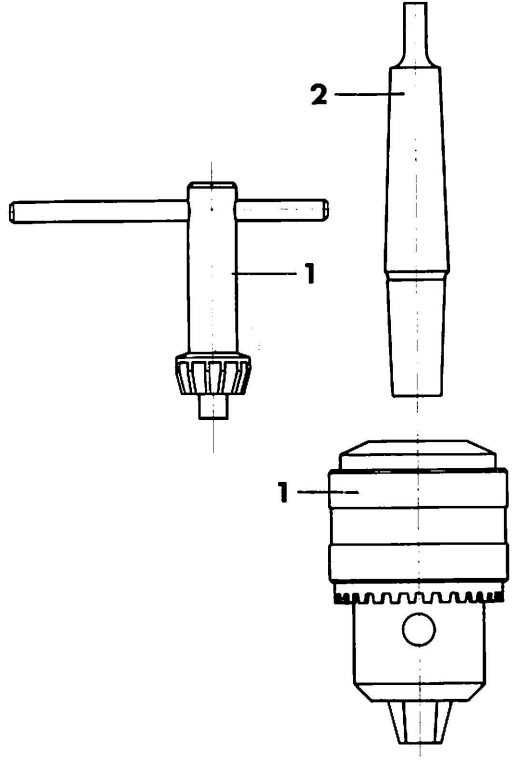
Clamping Method for Drill Chuck: B

Necessary accessories:

* 3 jaw drill chuck with key (1)

* Morse taper arbor MT2 (2)

Drills with cylindrical diameter of up to 0.63" (16 mm) can be clamped in the 3 jaw drill chuck.



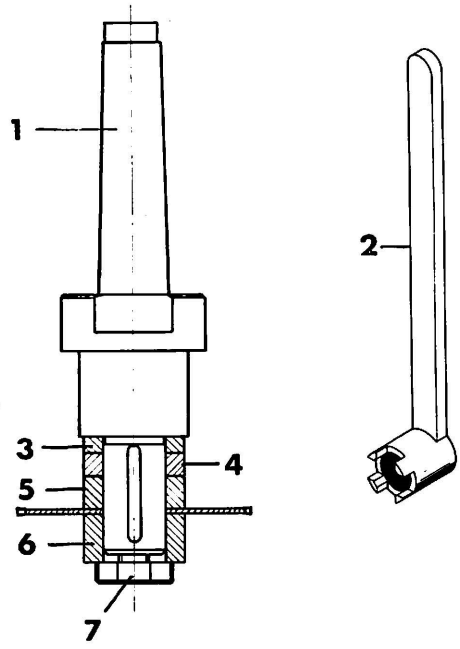
CLAMPING IN THE SHELL END MILL ARBOR

Clamping Method A (for shell end mill arbor)

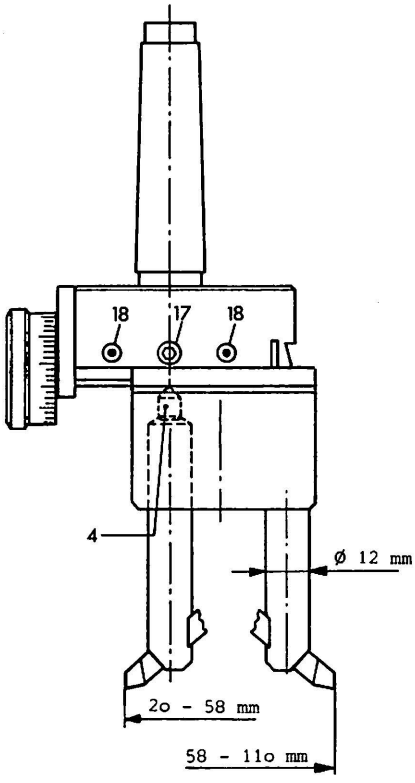
Necessary accessories:

* shell end mill arbor (1)
* special key (2)
* **Set of 4 collars**
  spacing collar 4 mm (3)
  spacing collar 6 mm (4)
  spacing collar 8 mm (5)
  spacing collar 12 mm (6)

Tools with a receiving bore of 16 mm diameter (milling cutters, staggered tooth side milling cutters, circular saw blades) are clamped against the collar of the shell end mill arbor over the spacing collars (3,4,5,6) with the clamping screw (7).
The special key (2) is used for tightening.



BORING AND FACING HEAD (FLY CUTTER)



Technical Data:

On the slide two bores of 12 mm (0.5″) dia. are machined.

Toolholder in left bore:
Smallest diameter: 20 mm (0.8″)
Largest diameter: 58 mm (2.3″)

Toolholder in right bore:
Smallest diameter: 58 mm (2.3″)
Largest diameter: 110 mm (4.4″)

Dimensions of turning tools: 6 x 6 mm (1/4″ x 1/4″)
Scale divisions: 0.025 mm

Working tip:

Before machining, clamp the cross slide with the set screw (17).

Adjusting tips:

— Adjustment of playfree guidance is done with the set screws (18).

— By adjusting the set screw (4) the backlash of leadscrew is eliminated.

Tools

All Tools of HSS Quality

Heavy-duty taper shank end mill, 8 mm dia. for roughing cut, cylindrical shaft;

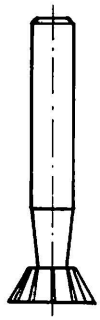
Clamping: with collet chuck attachment

Heavy-duty taper shank end mill, 15 mm dia., for roughing cut, Morse taper MT2;

Clamping: direct clamping according to Method A

Dovetail milling cutter, 16 mm dia. x 60° with cylindrical shaft 12 mm dia.

Clamping: with collet chuck attachment



Two flute slot drill with cylindrical shaft, 3,4,5,6 mm dia.

Clamping: with collet chuck attachment

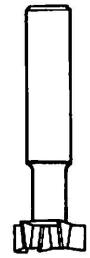
Twist drills, HSS, DIN 338
1 - 13 mm in steps of 1/2 mm,
1 set consists of 25 pieces

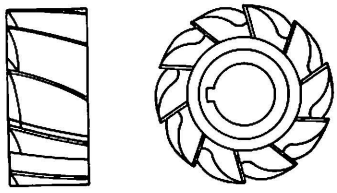
Clamping: with drill chuck or collet chuck attachment

T–slot cutter, 12,5 mm dia. x 6 mm cylindrical shank, 10 mm

T–slot cutter 16 mm dia. x 8 mm cylindrical shank, 10 mm

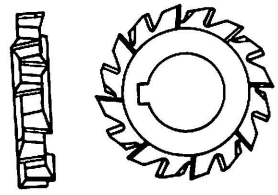
Clamping: with collet chuck attachment





Heavy-duty shell end mill, with spiral for roughing/finishing, outside dia. 40 mm, width 20 mm, dia. of bore 16 mm.

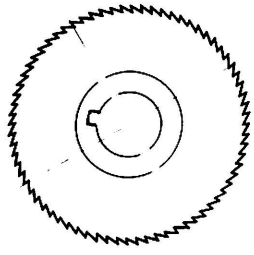
Clamping: with shell end mill arbor



Staggered tooth side milling cutter, dia. of cutter 35 mm, width 5 mm, bore 16 mm

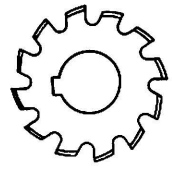
Staggered tooth side milling cutter, outside dia. 50 mm, width 6 mm, bore 16 mm

Clamping: with shell end mill arbor



Circular saw blade, fine tooth, dia. of blade 60 mm, width 0,8 mm, bore 16 mm.

Clamping: with shell end mill arbor

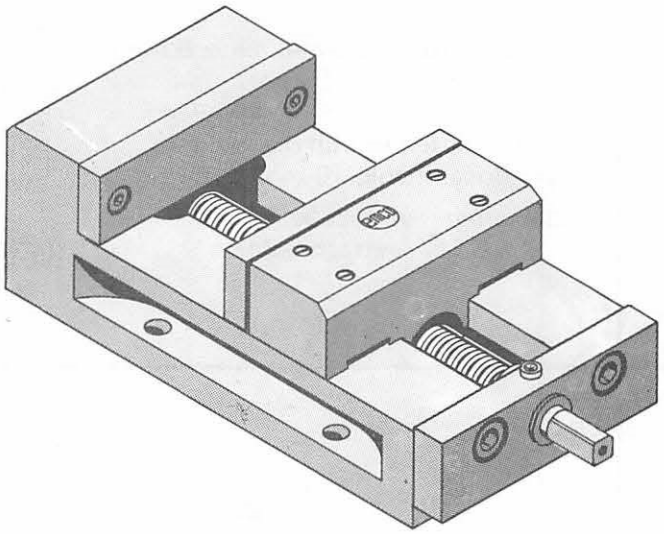


Gear milling cutters, relieved for 20° pressure, bore 16 mm

module 0,5
module 1
module 1,25

available in set of 8 pieces or individually

Clamping Devices for Workpieces

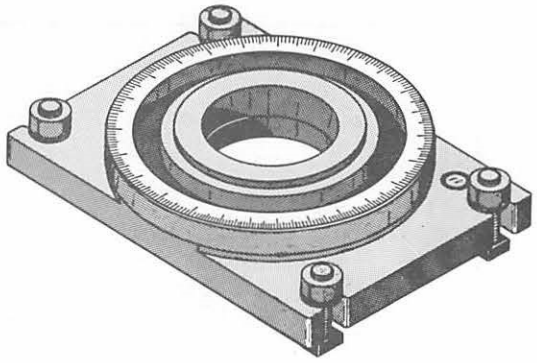


CLAMPING WITH THE MACHINE VICE

The machine vice is fitted onto the cross slide using the T-slot screws. On the Maximat Super 11, it can also be clamped onto the angled plate and milling table. For the screw dimensions see the Spare Parts List.

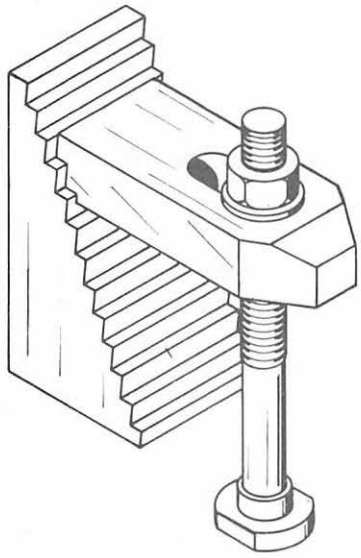
Order Nos., Technical Data:

Emcomat 8.4/8.6:	**Maximat V10-P, Maximat Mentor 10:**	**Maximat Super 11:**
Order No. 746 000 Width of jaws: 60 mm (2,36") Clamping capacity: 60 mm (2,36")	Order No. 761 310 Width of jaws: 110 mm (4,33") Clamping capacity: 110 mm (4,33")	Order No. 761 310 Width of jaws: 110 mm (4,33") Clamping capacity: 110 mm (4,33")



SWIVEL BASE FOR THE MACHINE VICE

Emcomat 8.4/8.6:	**Maximat V10-P, Maximat Mentor 10:**	**Maximat Super 11:**
No swivel base	Order No. 761 320	Order No. 761 320



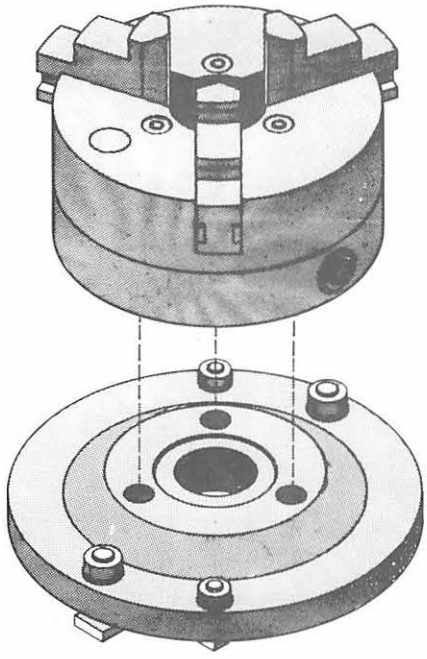
THE STEPPED CLAMPING SHOES

Max. clamping height: 60 mm (2,36'')

Using the stepped clamping shoes, large-surface workpieces can be clamped directly onto the cross slide, the milling table or the angled clamping plate. Depending on the shape of the workpiece, two or more stepped clamping shoes are required to clamp the workpiece firmly and safely.

Order Nos., Technical Data:

Emcomat 8.4/8.6:	**Maximat V10-P, Maximat Mentor 10:**	**Maximat Super 11:**
Order No. 765 000 Clamping height up to 20 mm (0,8'')	Order No. 465 100 Clamping height up to 60 mm (2,36'')	Order No. 465 100 Clamping height up to 60 mm (2,36'')



CLAMPING WITH THE LATHE CHUCKS AND THE INDEPENDENT CHUCK

Fitting the lathe chucks or independent chuck to the cross slide (milling table, angled clamping plate) necessitates the use of the support backplate.

Assembly:

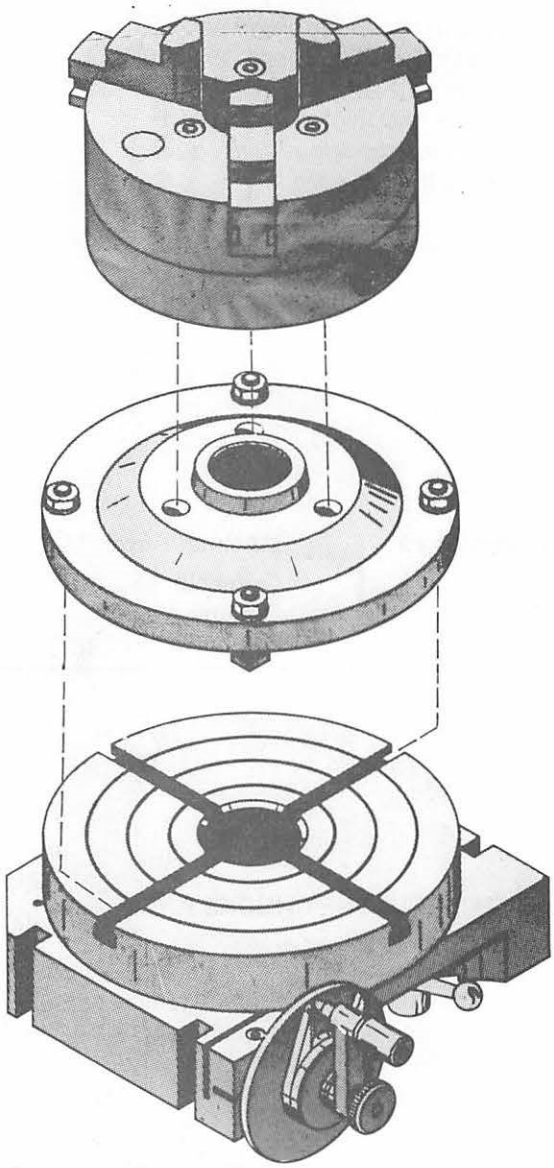
Clamp the chuck onto the support backplate. Attach the support backplate using the T-slot screws.

Note:

The lathe chucks and independent chucks are identical with those of the lathe itself.

For chucks see the brochure

Emcomat 8.4/8.6:	**Maximat V10-P, Maximat Mentor 10:**	**Maximat Super 11:**
Support flange Order No. 364 510	Support flange Order No. 364 510	Support flange Order No. 564 250



CLAMPING THE WORKPIECES ON THE DIVIDING ATTACHMENT

The workpieces are clamped on the dividing attachment using the lathe chucks or the independent chuck.
It is necessary to use the adaptor plate to fit the lathe chucks or independent chuck to the dividing attachment.

Assembly:

Bolt the lathe chucks or independent chuck onto the adaptor plate. Clamp the adaptor plate onto the cross slide (milling table, angled clamping plate).

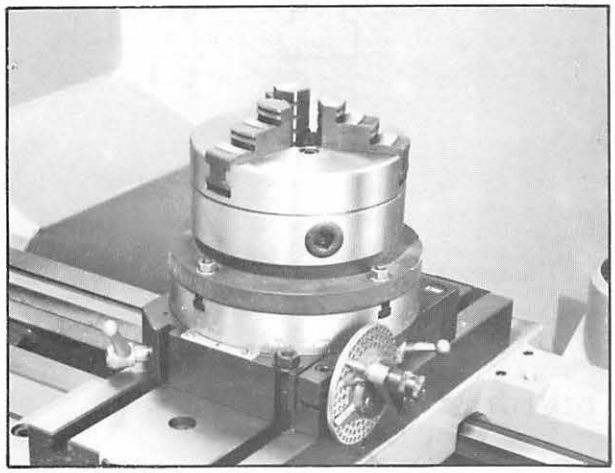
Note:

The lathe chucks and independent chuck are identical with those of the lathe itself.

For chucks see the brochure

Emcomat 8.4/8.6:	Maximat V10-P, Maximat Mentor 10:	Maximat Super 11:
Adaptor plate Order No. 745 510	Adaptor plate Order No. 745 510	Adaptor plate Order No. 584 170

The Dividing Attachment



TECHNICAL DATA

Diameter of rotary table: 6" (150 mm)
Worm reduction 1 : 40

T-slots according to factory standard
Number of holes in dividing plates: 27,33,34,36, 38,39,40,42

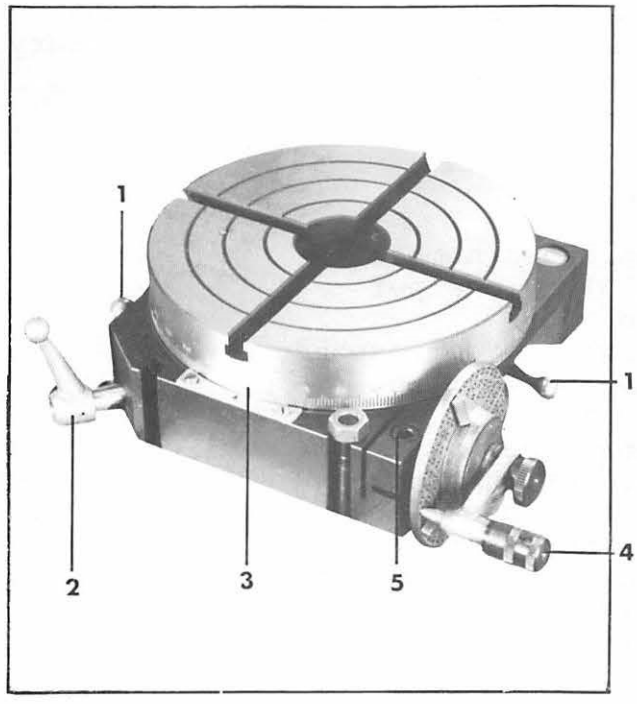
Necessary accessories for clamping the workpieces in the lathe chuck on the dividing attachment:

+ Dividing attachment
+ Adaptor plate
+ Lathe chuck 125 mm dia.

OPERATING ELEMENTS

Clamping levers for rotary table (1):
Clamping levers are loosened during the dividing operation itself, but must be clamped before every machining operation.

Indexing pin with handle (2):
During direct dividing from 15° to 15°, the pin rests into the parameter notches of the rotary table. During indirect dividing (worm dividing) or free dividing by means of the graduated scale, the indexing pin must be pulled out and swivelled to the left.



The graduated scale (3) for controlling the divisions.

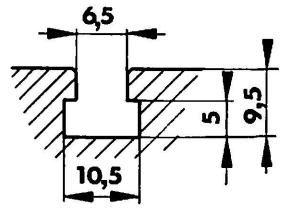
Crank handle with index plunger (4) moves the worm which is engaged with the worm-wheel of the rotary table during indirect dividing.

The shears serve to facilitate adding the number of holes when a fraction of a turn is to be added.

Disengaging and Engaging the Worm:

The allen head screw (5) is loosened. When the dividing plate is turned counterclockwise, the worm and wormwheel are disengaged. The rotary table can be turned by hand for direct indexing.
By turning the dividing plate clockwise, worm and wormwheel are engaged. To facilitate engagement of worm and wormwheel, the rotary table should be moved slightly by hand.
The allen head screw (5) must again be tightened after this operation.

T-slots of the Dividing Attachment



TYPES OF DIVIDING

Indirect Dividing:

Indirect dividing offers many more dividing possibilities and is more accurate because of the worm reduction of 1:40.
Indirect dividing method:
If the crank handle is turned 40 times, the rotary table makes 1 revolution (360°).
With help of the dividing plates, exact fractions of turns can be executed.

Direct Dividing:

Worm and wormwheel are disengaged.
Possibility 1:
dividing by means of the indexing pin (2). Dividing possibility from 15° to 15° (i.e., maximum of 24 divisions within 360°).

Possibility 2:
The dividing can be done freely with the aid of the graduated scale on the rotary table.

The Indexing Table:

1st column: indicates number of divisions per 360°
2nd column: shows the corresponding angle of the division
3rd column: shows the number of 360° crank handle revolutions which are necessary
4th column: shows the number of holes to be added for each index plate

INDEX TABLE for MAXIMAT

Formula for the Calculation of the Hole Numbers Required

z = No. of divisions required for one revolution of the workpiece.

K = No. of revolutions of handle for a complete revolution of the workpiece.

n = No. of revolutions of handle for one dividing move: $n = \frac{K}{z}$

Worm reduction of dividing head 1:40; i. e. K = 40.

Division Desired	Degrees	No. of crank turns req'd	Amount of holes to be added for each index plate							
			27	33	34	36	38	39	40	42
2	180°	20								
	175°	19	12							
	170°	18	24							
	160°	17	21							
	150°	16	18							
	140°	15	15							
	130°	14	12							
	125°	13	24							
3	120°	13	9	11		12		13		14
	110°	12	6							
	100°	11	3							
4	90°	10								
	80°	8	24							
	75°	8	9	11		12		13		14
5	72°	8								
	70°	7	21							
	65°	7	6							
6	60°	6	18	22		24		26		28
	55°	6	3							
7		5								30
	50°	5	15							
8	45°	5								
9	40°	4	12			16				
10	36°	4								
11		3		21						
12	30°	3	9	11		12		13		14
13		3						3		
14		2								36
	25°	2	21							
15	24°	2	18	22		24		26		28
16		2			17	18	19		20	21
17		2			12					
18	20°	2	6			8				
19		2					4			
20	18°	2								
	16°	1	21							
21		1								38
22		1		27						
24	15°	1	18	22		24		26		28
25		1							24	
26		1						21		
27		1	13							
28		1								18
30	12°	1	9	11		12		13		14

Division Desired	Degrees	No. of crank turns req'd	Amount of holes to be added for each index plate							
			27	33	34	36	38	39	40	42
32		1				9			10	
33		1		7						
34		1			6					
35		1								6
36	10°	1	3			4				
38		1					2			
39		1						1		
40	9°	1								
42										40
44				30						
45	8°		24			32				
48						30				35
50									32	
	7°		21			28				
52								30		
54			20							
55				24						
56										30
60	6°		18							
64									25	
65								24		
66				20						
68					20					
70										24
72	5°		15			20				
76							20			
78								20		
80					17	18	19		20	21
84										20
85					16					
88				15						
90	4°		12			16				
95							16			
96						15				
100									16	
120	3°		9	11		12		13		14
180	2°		6			8				
200									8	
240						6				7
270			4							
360	1°		3							
	40′		2							
	30′					2				
	20′		1							

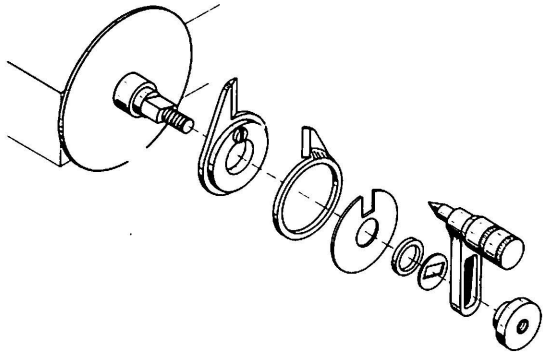
EXAMPLE OF AN INDIRECT DIVIDING OPERATION:

Desired division: 13 divisions in 360°

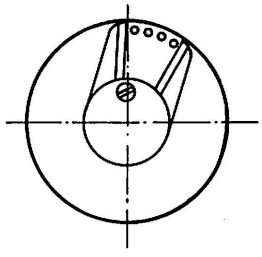
From the Indexing Table it can be seen that at the desired division 13, 3 full crank turns must be made plus a fraction turn of 3 additional holes on the indexing plate 39.

Practical Execution:

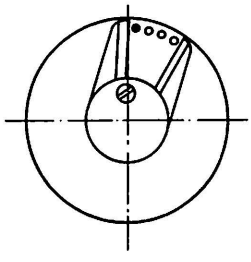
1. The indexing plate with 39 holes is mounted.



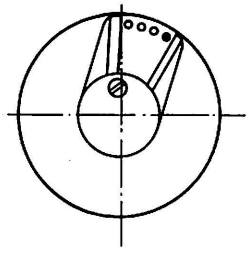
2. In the Indexing Table one sees that at the division 13, 3 full turns plus 3 holes on the 39 plate have to be added. Therefore, the shears are fixed so that they include 4 holes.



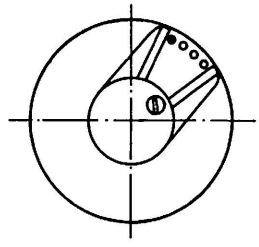
3. The indexing plunger is placed in a hole of the 39 plate (marked black on the drawing) and the left shear arm moved until it touches the pin of the plunger.



4. Execution of the Dividing Operation:
   3 full turns plus the fractional turn of the 3 added holes are made; that means that the plunger is placed in the black hole.
   One dividing operation is completed.

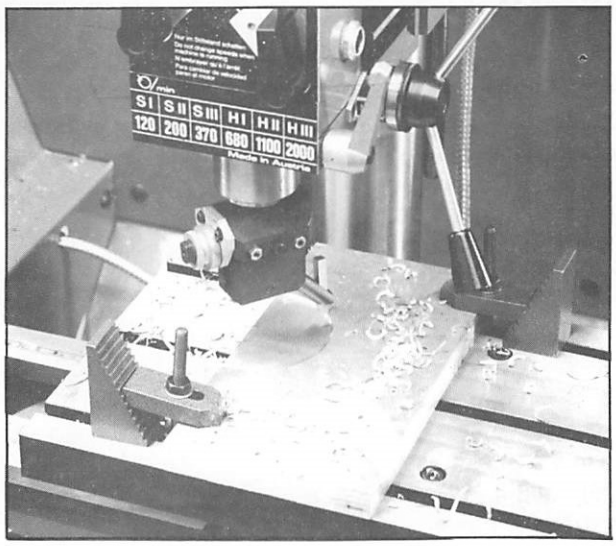


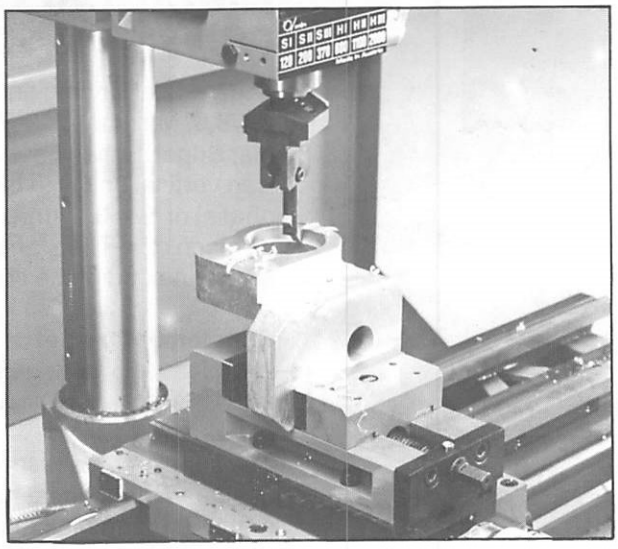
5. Next Dividing Operation:
   The shears are turned until the left arm touches the pin again; the next dividing operation follows as described in 4. above.



NOTE:
The shears may not be moved during the dividing operation, otherwise they do not serve their purpose as an orientation aid.

Examples


S I | S II | S III | H I | H II | H III
120 | 200 | 370 | 680 | 1100 | 2000
Made in Austria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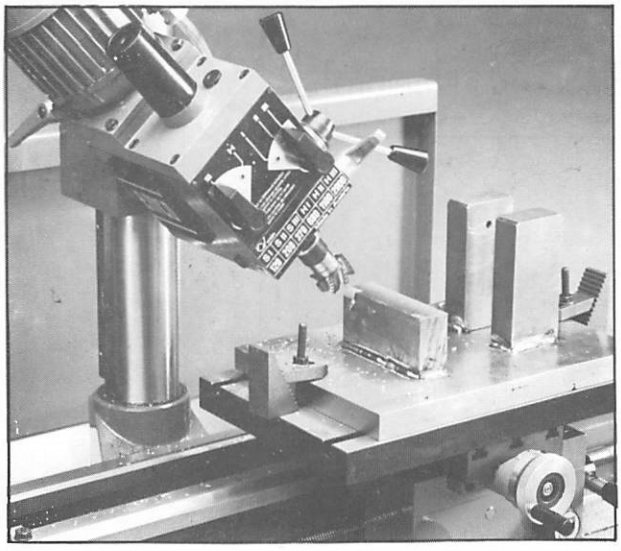
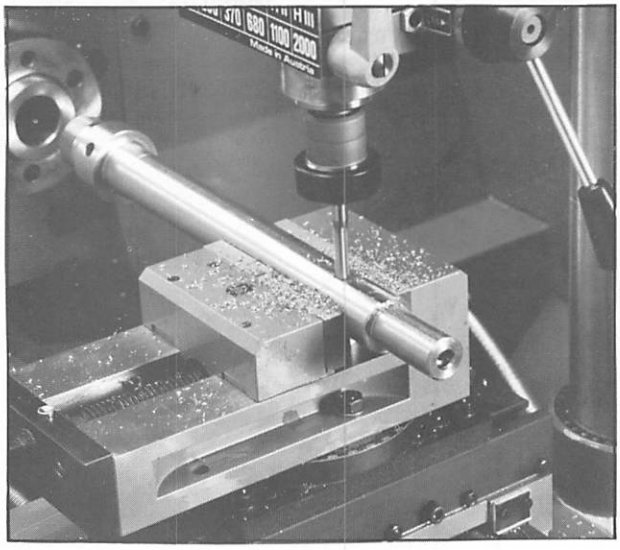
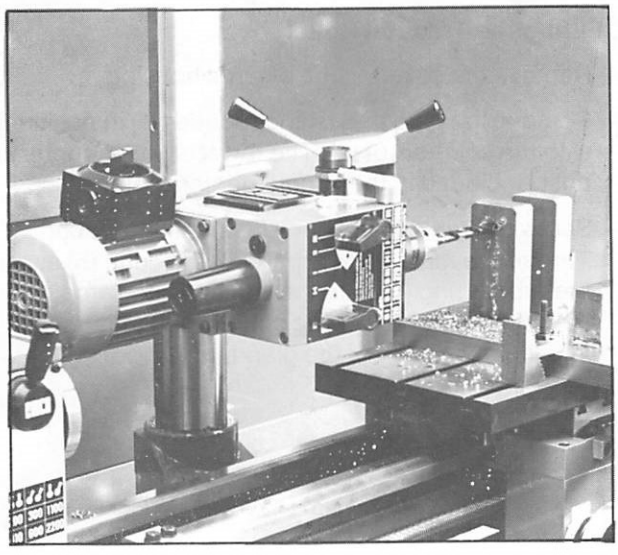
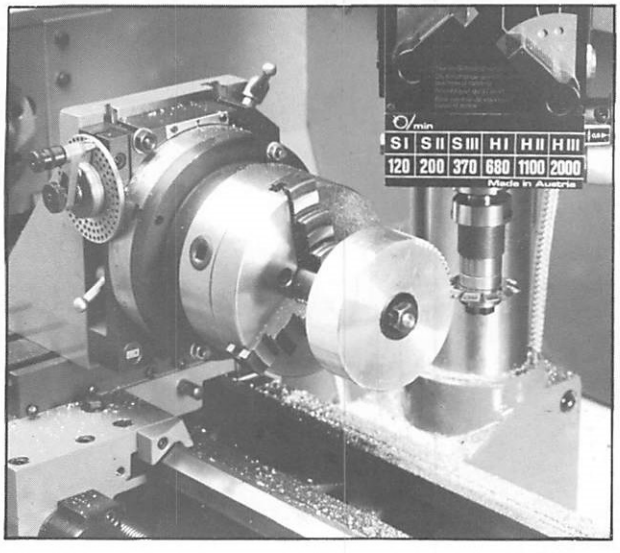



370 | 680 | 1100 | 2000
Made in Austria




S I | S II | S III | H I | H II | H III
120 | 200 | 370 | 680 | 1100 | 2000
Made in Austria

Electrical Connections

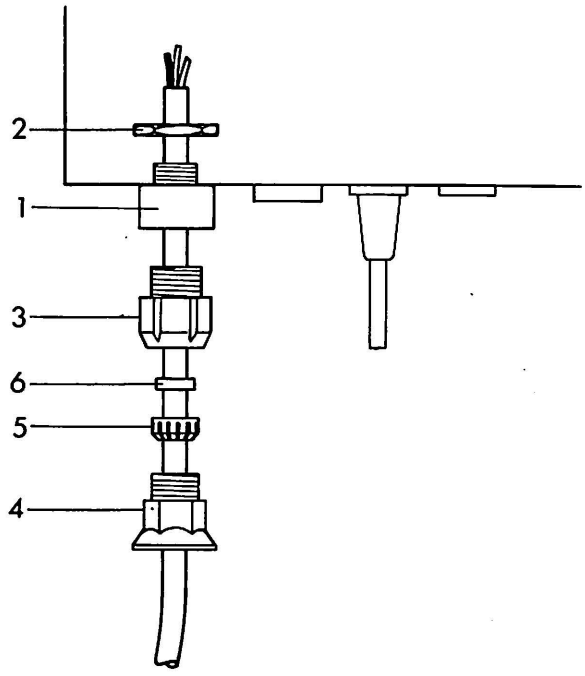
The Vertical Drilling and Milling Unit for the Emcomat 8.4/8.6, Maximat V10-P, Maximat Mentor 10 and Maximat Super 11 has been standardised. This standardised vertical unit with the Order No. 524 1. . (single-phase) or 524 3. . (three-phase) can be connected to all machines. The standardised vertical unit has a switch instead of the connection box on the motor.

Supplementary Set

Ref. Nr. 525 301 – single-phase
Ref. Nr. 525 303 – three-phase

The supplementary set enclosed in the packing is designed for connecting the Emcomat 8.4/8.6, Maximat V10-P and Maximat Mentor 10 to the power source. It is not required for connecting the Maximat Super 11.

DISCONNECT THE PLUG FROM THE MAINS PRIOR TO OPENING THE COVER!!



WIRING INSTRUCTIONS

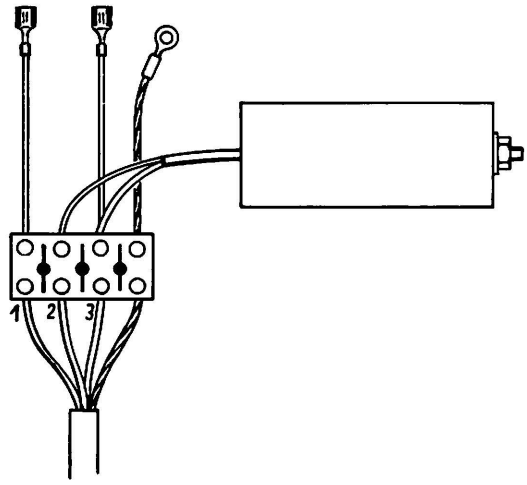
Emcomat 8.4/8.6, Maximat V10-P, Maximat Mentor 10.

1. Fitting the Traction Relief

— Remove the cover on the electric housing

— Remove the plug and fix the reducer (1) in position with the counternut (2). The reducer with counternut is included in the supplementary set.

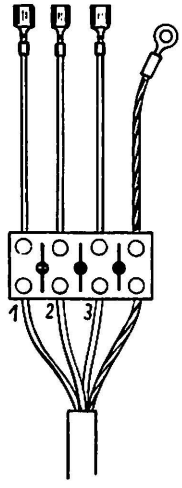
— Screw the main gland body (3) into the reducer. Thread the male counterpart (4), the cone (5) and the rubber ring (6) onto the cable. After clamping the cable ends, screw the counterpart (4) tightly into the main body of the gland.



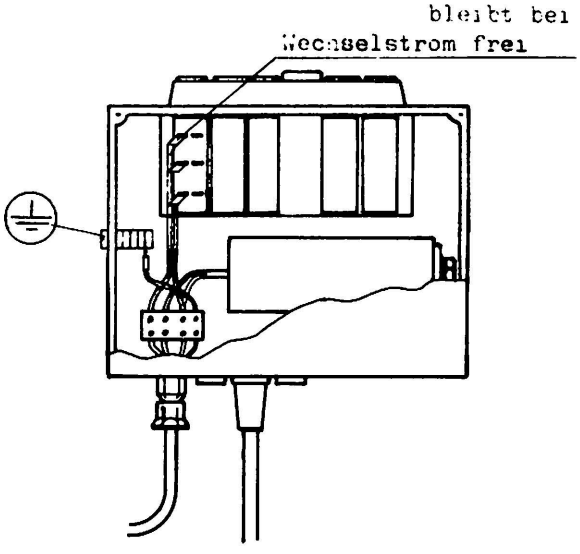
2. Assembly of the Clamp Contacts and the Capacitor

a) Single-phase current

— Clamp cables 1, 2 and 3; clamp the earthing conductor; remove the centre contact and connect the capacitor to 2 + 3.



b) Three-phase current
Clamp cables 1, 2, 3 and the earthing conductor.



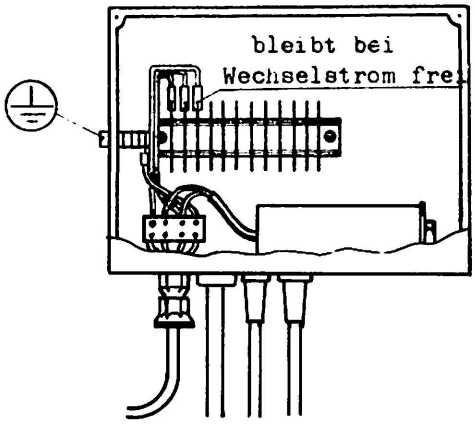
3. Connection to the Push-Button Switch or the Contact Terminal Strip

Emcomat 8.4/8.6
Maximat V10-P

— Firmly attach the earthing conductor (yellow and green) to the earthing contact screw using a toothed disc and brass nut.

— Connect the cable ends to the push-button switch. With Single-phase current, the top plug-in contact remains unoccupied.

— Fix the capacitor (only on Single-phase current) onto the trim tab of the cover.



Maximat Mentor 10

— Firmly attach the earthing conductor (yellow and green) to the earthing contact screw using a toothed disc and brass nut.

— Slip the cable ends onto the contacts of the contact strip. In the case of Single-phase current, the third contact remains unoccupied.

— Fix the capacitor onto the timb tab of the cover. Tighten the cable gland and close the cover.

Please Note:

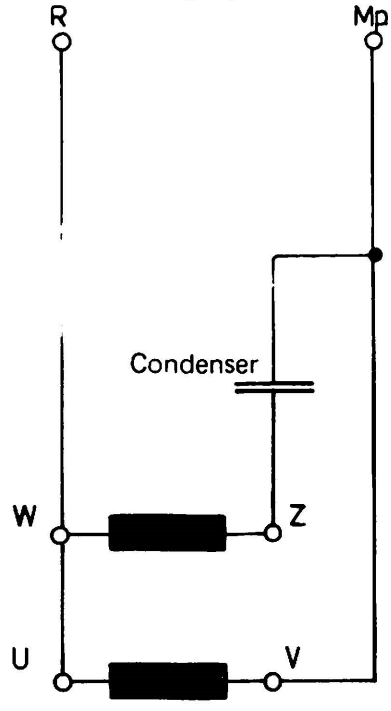
In the case of Single-phase motors, you may find that the motors rotates in the wrong direction (see direction of rotation arrow on the spindle). In this case, two wires (e.g. 1 and 2) must have been connected the wrong way round.

ELECTRICAL CONNECTION OF THE VERTICAL DRILLING AND MILLING MACHINE TO THE MAXIMAT SUPER 11

For the wiring instructions and circuit diagrams see the Operating Instructions of the Maximat Super 11 lathe.

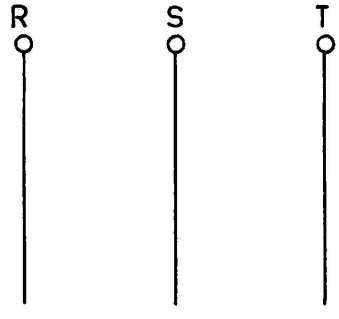
Circuit Diagram

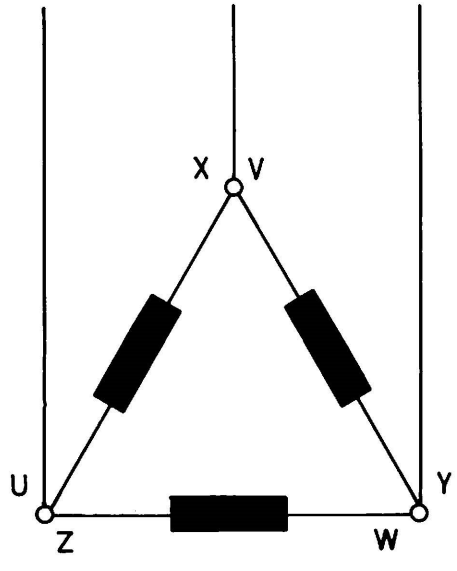
Single-phase

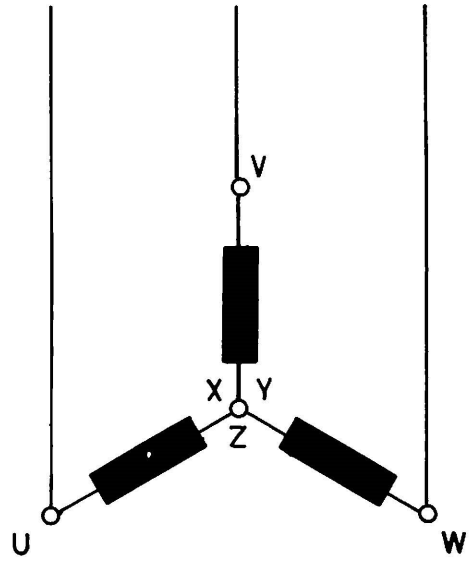


Three - phase

△ or Y connection see Motor Capacity plate



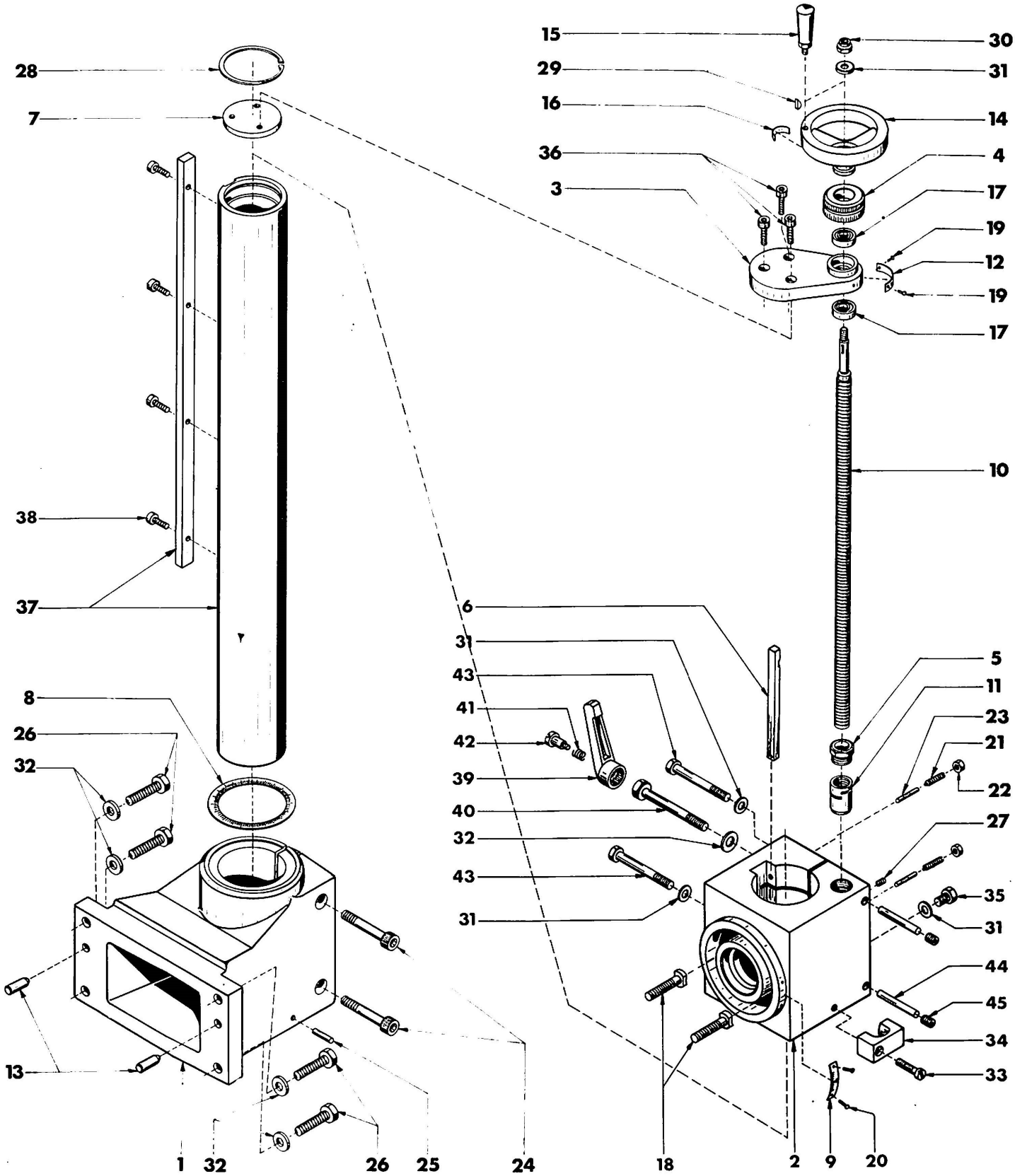




SERVICETEILE

SERVICE PARTS

PIECES DE SERVICE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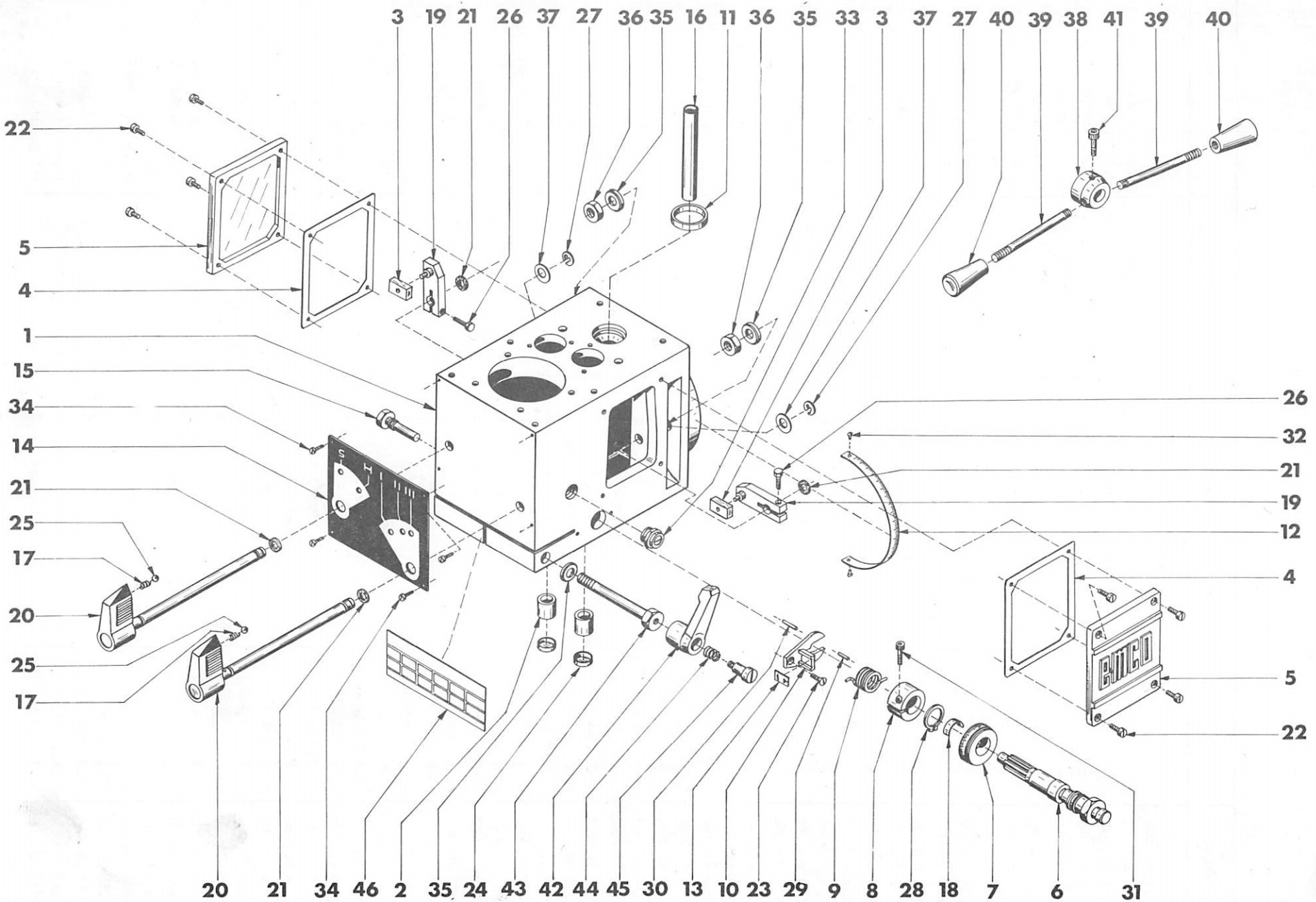
9
20

Pos.	Ref. No.	DIN		Benennung	Description	Designation
1	E3A ooo o1o			Sockel	Pedestal	Socle support
2	E3A ooo o31			Vertikalschlitten	Vertical slide	Support poupée coulissant
3	E3A ooo o4o			Spindelträger	Screw mount	Porte-broche
4	E3A ooo o5o			Skalenring metrisch	Scale ring metric	Bague echelle M
	E3B ooo o5o			Skalenring USA	Scale ring USA	Bague echelle USA
5	E3A ooo o6o			Einstellmutter	Adjusting nut	Ecrou reglage
6	E3A ooo o7o			Druckleiste	Gib	Lardon blocage
7	E3A ooo o8o			Trägerplatte	Plate	Plaque
8	E3A ooo o9o			Gradskala	Graduated scale	Echelle
9	E3A ooo 1oo			Nonius	Vernier	Vernier
1o	E3A ooo 13o			Vertikalspindel metr.	Vertical screw metr.	Vis mère M
	E3B ooo 13o			Vertikalspindel USA	Vertical screw USA	Vis mère USA
11	E1A ooo o8o			Vertikalmutter metr.	Vertical nut metr.	Ecrou M
	E1B ooo o8o			Vertikalmutter USA	Vertical nut USA	Ecrou USA
12	B2A ooo o6o			Skalenschild metr.	Graduated scale metr.	Echelle M
	B2B ooo o6o			Skalenschild USA	Graduated scale USA	Echelle USA
13	E3A ooo 16o			Bolzen	Bolt	Boulon
14	B4A o4o o11			Handrad 1oo	Handwheel	Volant
15	C6A 13o ooo			G. Kegelgriff	Handle compl.	Ens. levier spherique
16	B2A ooo o8o			Bogenfeder	Feed spring	Lame ressort d'entrainement
17	ZLG 6o ooo2	6ooo-2Z		Rillenkugellager	Ball bearing	Roulement à billes
18	ZSR 87 1o4o	M1ox4o DIN 787		T-Nutschraube	T-nut screw	Boulon en T
19	ZNA 76 o144	1,4x4 DIN 1476-4.6		Kerbnagel	Rivet	Rivet de fixation
2o	ZSR 14 o256	BM2,5x6 DIN 751.3		Gewindeschneidschr.	Self tapping screw	Vis taraud
21	ZST 17 o62o	M6x2o DIN 417-5.8		Gewindestift	Set screw	Vis pointeau
22	ZMU 34 o6oo	M6 DIN 934-6		Sechskantmutter	Hexagon nut	Ecrou 6 pans
23	ZST 11 o528	5h11x28 DIN 7		Zylinderstift	Dowel pin	Tige de serrage
24	ZSR 12 1o55	M1ox55 DIN 912-6.9		Zylinderschraube	Allen head screw	Vis 6 pans creux
25	ZST 72 o62o	6x2o DIN 1472-6.8		Paßkerbstift	Grooved adjusting pin	Cheville de posit.
26	ZSR 33 1o35	M1ox35 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
27	ZST 16 o61o	M6x1o DIN 916-45H		Gewindestift	Set screw	Vis pointeau
28	ZRG 72 6525	65x2,5 DIN 472		Sicherungsring	Circlip	Anneau de retenue
29	ZFD 88 o337	3x3,7 DIN 6888		Scheibenfeder	Circlip	Clavette
3o	ZMU 8o o8oo	NM8 DIN 98o-8		Sicherungsmutter	Securing nut	Ecrou de sûreté
31	ZSB 25 o84o	B8,4 DIN 125		Scheibe	Washer	Rondelle
32	ZSB 25 1o5o	B1o,5 DIN 125		Scheibe	Washer	Rondelle
33	ZSR 84 o525	M5x25 DIN84-4.8		Zylinderschraube	Flat head screw	Vis tête cylindrique
34	E3A ooo 18o			Kabelhalter	Cable holder	Support câble
35	ZSR 33 o812	M8x12 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
36	ZSR 12 o62o	M6x2o DIN 912-6.9		Zylinderschraube	Allen head screw	Vis 6 pans creux
37	E3A o2o ooo			Gr. Vertikalsäule	Vertical column comp.	Ens. colonne verticale
38	ZSR 84 o512	M5x12 DIN 84-4.8		Zylinderschraube	Allen head screw	Vis 6 pans creux
39	E3A o4o o1o			Klemmhebel	Clamping lever	Levier de serrage
4o	E3A o4o o2o			Schraube	Screw	Vis
41	E3A o4o o3o			Druckfeder	Spring	Ressort de compression
42	ZSR 23 o516	M5x16 DIN923-5.8		Schraube	Screw	Vis
43	ZSR 31 o87o	M8x7o DIN 931-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
44	ZST o8 o65o	6h8x5o DIN 7		Zylinderstift	Dowel pin	Tige de serrage
45	ZST 13 o81o	M8x1o DIN 913-45H		Gewindestift	Set screw	Vis pointeau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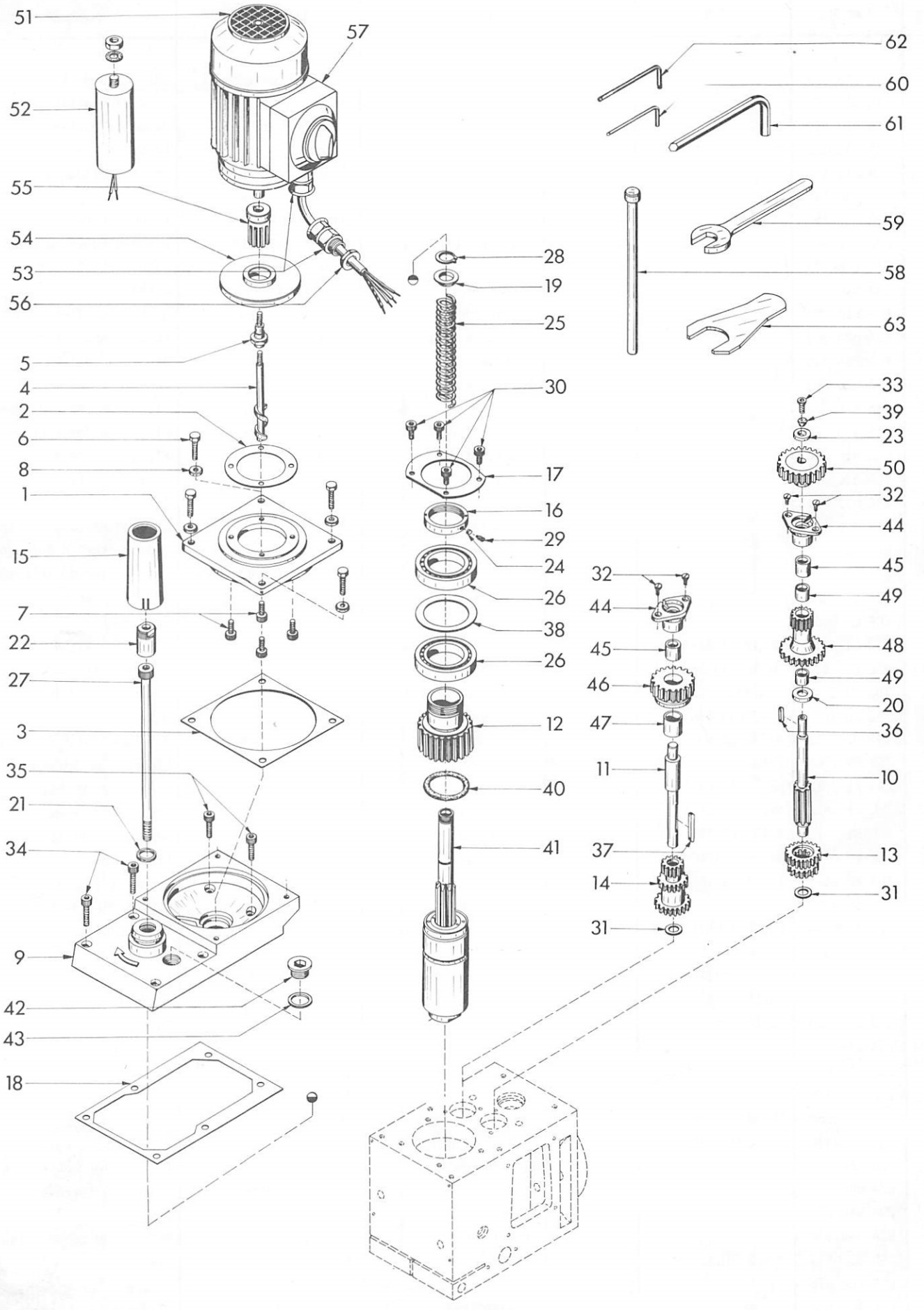
Pos.	Ref. No.	DIN		Benennung	Description	Designation
	E3A o1o ooo			Gr. Vertikalkopf	Vertical unit compl.	Ens. tête de fraisage et p.
1	E3A o1o o1o			Vertikalkopf	Head	Tête de fraisage et perçage
2	E3A o1o o9o			Lagerbüchse	Bearing bush	Bague de parlier
3	E3A o1o 1oo			Gleitstein	Slider	Crosse
4	E3A o1o 13o			Dichtung 1	Seal 1	Joint d'étanchéité
5	E3A o1o 14o			Deckel	Cover	Couvercle
6	E3A o1o 15o			Triebling	Shaft pinion	Pignon arbré
7	E3A o1o 16o			Skalenring metrisch	Scale ring metric	Bague graduée metrique
	E3B o1o 16o			Skalenring USA	Scale ring USA	Bague graduée USA
8	E3A o1o 17o			Anschlagring	Stop ring	Butée
9	E3A o1o 18o			Schenkelfeder	Torsion spring	Ressort de flexion à boudin
1o	E3A o1o 19o			Trieblinghalter	Pinion holder	Porte-pignon arbré
11	E3A o1o 24o			Zentrierring	Centering ring	Bague de centrage
12	E3A o1o 25o			Gradskala	Graduated scale	Echelle
13	E3A o1o 26o			Funktionsschild metr.	Function plate metr.	Plague de fonction metr.
	E3B o1o 26o			Funktionsschild USA	Function plate USA	Plague de fonction USA
14	E3A o1o 29o			Frontschild	Front plate	Plague frontale
15	E3A o1o 31o			Anschlagbolzen	Bolt	Tige de butée
16	E3A o1o 32o			Rohr	Tube	Tube
17	H1A ooo 38o			Rastenfeder	Spring	Ressort de compression
18	B2A ooo o8o			Bogenfeder	Feed spring	Lame ressort d'entrainement
19	E3A o16 ooo			G. Schaltarm	Operating lever comp.	Ens. levier de sélection
2o	E3A o17 ooo			G. Schaltstange	Operating bar	Barre de manceuvre
21	ZOR oo 6o2o			O-Ring	O-Ring	Bague-O
22	ZSR 84 o412	M4x12 DIN84-4.8		Zylinderschraube	Flat head screw	Vis tête cylindrique
23	ZSR 63 o41o	M4x1o DIN 963-4.8		Senkschraube	Countersunk screw	Vis tête fraise
24	ZDK 43 18oo	DIN 443		Verschlußdeckel 18	Cover	Bouchon de palier
25	ZKG oo 1o6o	6GK3 DIN 54o1		Stahlkugel	Ball	Bille acier
26	ZSR 33 o516	M5x16 DIN933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
27	ZSB 99 o7oo	7DIN6799		Sicherungsscheibe	Circlip	Rondelle de blocage
28	ZRG 71 2o12	W2ox1,2 DIN 471		Sicherungsring	Circlip	Anneau de retenue
29	ZHL 81 o412	4x12 DIN 1481		Spannhülse	Lock pin	Goupille serrage
3o	ZHL 81 o416	4x16 DIN 1481		Spannhülse	Lock pin	Goupille serrage
31	ZSR 12 o416	M4x16 DIN912-6.9		Zylinderschraube	Allen head screw	Vis ô pans creux
32	ZNA 76 o144	1,4x4DIN1476-4.6		Kerbnagel	Rivet	Rivet de fixation
33	ZDK 8o 3800			Ölstandsauge R3/8	Oil level gauge	Voyant d'huile
34	ZSR 14 o258	BM2,5x8 DIN7513		Gewindeschneidschraube	Self tapping screw	Vis taraud
35	ZSB 25 1o5o	B1o,5 DIN 125		Scheibe	Washer	Rondelle
36	ZMU 34 1ooo	M1o DIN 934-6		Sechskantmutter	Hexagon nut	Ecrou ô pans
37	ZSB 12 1oo1	1ox16xo, 1 DIN988		Paßscheibe	Washer	Rondelle
	ZSB 12 1oo3	1ox16xo,3 DIN988		Paßscheibe	Washer	Rondelle
	E3A o3o ooo			Gr. Stecknabe	Hub compl.	Ens. moyeu
38	E3A o3o o1o			Stecknabe	Hub	Moyeu
39	E3A o3o o2o			Knebel	Toggle	Garrot
4o	ZGF 39 25o8	25xM8 GN 419		Konuskopf	Cone knob	Bouton conique
41	ZSR 12 o416	M4x16 DIN 912-6.9		Zylinderschraube	Allen head screw	Vis ô pans creux
	E3A o4o ooo			Gr. Klemmhebel	Clamping lever compl.	Ens. levier de serrage
42	E3A o4o o1o			Klemmhebel	Clamping lever	Levier de serrage
43	E3A o4o o2o			Schraube	Screw	Vis
44	E3A o4o o3o			Druckfeder	Spring	Ressort de compression
45	ZSR 23 o516	M5x16 DIN923-5.8		Schraube	Screw	Vis
46	E3A 1oo o2o			Drehzahlschild 5o Hz	Speed plate 5o Hz	Plaquette de vitesses 5o Hz
	E3B 1oo o2o			Drehzahlschild 6o Hz	Speed plate 6o Hz	Plaquette de vitesses 6o Hz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Pos.	Ref. No.	DIN		Benennung	Description	Designation
1	E3A ooo o2o			Motorflansch	Flange	Fausse bride
2	E3A ooo 11o			Dichtung 2	Seal 2	Joint d'étanchéité 2
3	E3A ooo 12o			Dichtung 4	Seal 4	Joint d'étanchéité 4
4	E3A ooo 14o			Förderschnecke	Worm	Vis sans fin
5	E3A ooo 15o			Adapter	Adaptor	Adapteur
6	ZSR 33 o62o	M6x2o DIN933-5.6		Sechskantschraube	Hexagonal head screw	Vis hexagonale
7	ZSR 12 o512	M5x12 DIN912-6.9		Zylinderschraube	Allen head screw	Vis 6 pans creux
8	ZSB 25 o64o	B6,4 DIN 125		Scheibe	Washer	Rondelle
9	E3A o1o o2o			Getriebedeckel	Gearing cover	Couvercle
1o	E3A o1o o3o			Schiebewelle	Spline shaft	Abre rainure
11	E3A o1o o4o			Schaltwelle	Control shaft	Abre de débrayage
12	E3A o1o o5o			Zahnrad 42	Gear 42	Elément dentê 42
13	E3A o1o o6o			Schiebezahnrad	Sliding gear	Train baladeur
14	E3A o1o o7o			Zahnradblock	Gear bank	Bloc baladeur
15	E3A o1o o8o			Schutzhaube	Cover	Couvercle
16	E3A o1o 11o	M45x1		Mutter	Nut	Ecrou
17	E3A o1o 12o			Spanndeckel	Cover	Couvercle
18	E3A o1o 22o			Dichtung 3	Seal 3	Joint d'étanchéité 3
19	E3A o1o 23o			Druckscheibe	Pressure washer	Disque de pression
2o	E3A o1o 27o			Anlaufscheibe	Washer	Rondelle
21	ZOR 8o 1824	G18x24x3		Dichtring	Sealing ring	Bague d'étanchéité
22	E3A o1o 3oo			Abdrückmutter	Nut	Ecrou
23	E3A o1o 33o			Scheibe	Washer	Rondelle
24	B2A o3o o6o			Druckscheibe	Disc	Rondelle pointeau
25	E3A o1o 34o			Druckfeder	Spring	Ressort de compression
26	ZLG 16 oo93	16oo9/C3		Rillenkugellager	Ball bearing	Roulement à billes
27	ZSR 13 12oo	M1ox2oo DIN912-1o.9		Zylinderschraube	Allen head screw	Vis 6 pans creux
28	ZRG 71 1812	W18x1,2 DIN 471		Sicherungsring	Circlip	Anneau de retenue
29	ZST 17 o4o5	M4x5 DIN417-5.8		Gewindestift	Set screw	Vis pointeau
3o	ZSR 12 o61o	M6x1o DIN912-6.9		Zylinderschraube	Allen head screw	Vis 6 pans creux
31	ZSB 1o 2181	SS12x18x1,2 DIN988		Seeger Stützscheibe	Washer	Rondelle
32	ZSR 63 o41o	M4x1o DIN963-4.8		Senkschraube	Countersunk screw	Vis tête fraisée
33	ZSR 79 o412	M4x12 DIN7991-8.8		Senkschraube	Countersunk screw	Vis tête fraisée
34	ZSR 12 o625	M6x25 DIN912-6.9		Zylinderschraube	Allen head screw	Vis 6 pans creux
35	ZSR 12 o62o	M6x2o DIN912-6.9		Zylinderschraube	Allen head screw	Vis 6 pans creux
36	ZFD 85 332o	A3x3x2o DIN6885		Paßfeder	Key	Clavette
37	ZFD 85 4432	A4x4x32 DIN6885		Paßfeder	Key	Clavette
38	ZSB 12 6oo5	PS6ox75xo,5		Seeger Paßscheibe	Washer	Rondelle
39	ZSB 98 o432	V4,3 DIN 6798		Fächerscheibe	Serrated lock washer	Rondelle
4o	ZOR o4 6o31	OR 46-3		O-Ring	O-ring	Bague-O
41	E3A o11 ooo			Gr. Pinole	Quill compl.	Ens. canon
42	ZSR o8 1415	M14x1,5 DIN9o8-4.6		Verschlußschraube	Screw plug	Bouchon fileté
43	ZRG o5 1418	14x18x1,5cuDIN76o3		Dichtring	Sealing ring	Bague d'étanchéité
44-45	E3A o12 ooo			Gr. Lagerdeckel	Bearing cover compl.	Ens. chapeau de palier
44	E3A o12 o1o			Lagerdeckel	Bearing cover	Chapeau de palier
45	E3A o1o o9o			Lagerbüchse	Bearing bush	Bague de palier
46-47	E3A o13 ooo			Gr. Zahnrad 33	Gear 33 compl.	Ens. engrenage 33 dents
46	E3A o13 o1o			Zahnrad 33	Gear 33	Engrenage 33
47	E3A o13 o2o			Lagerbüchse	Bearing bush	Bague de palier
48-49	E3A o14 ooo			Gr. Zahnrad	Gear compl.	Ens. engrenage
48	E3A o14 o1o			Zahnrad	Gear	Engrenage
49	E3A o14 o2o			Lagerbüchse	Bearing bush	Bague de palier
5o	E3A o15 ooo			Zahnrad 47	Gear 47	Engrenage 47

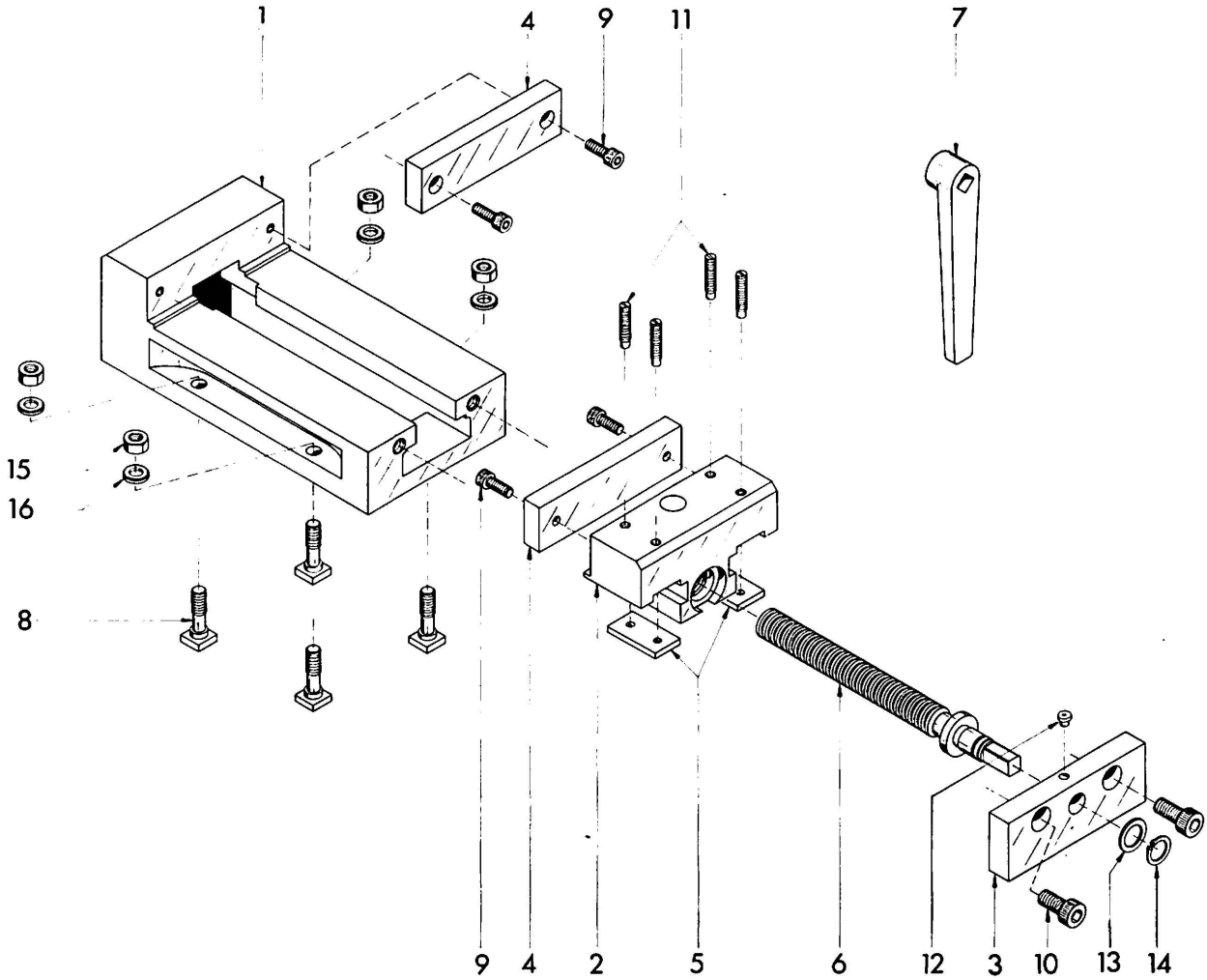
Pos.	Ref. No.	DIN		Benennung	Description	Designation
				E-Ausrüstung	Drive unit	Entrainement
51	ZMO			Motor	Motor	Moteur
52	ZKO			Kondensator	Condenser	Condensateur
53	ZPG 1o ooo8	Mz B13		Kabelverschraubung	Screw-type conduit fitting	Raccordement à vis
54	E3A 1o1 ooo			Schwungscheibe mit Motorritzel	Flywheel with motor pinion	Disque volant avec pignon
55	E3A 1o1 o2o			Motorritzel	Motor pinion	Pignon
56	ZPG 2o 135o	PG 13,5		Gegenmutter	Lock nut	Contre écrou
57	ZME 2o ooo1			Schalter	Switch	Interrupteur
				Grundausstattung	Tools	Equipement de base
58	E3A ooo 17o			Abdrückstange	Rod	Vis de dégagement
59	ZWZ 94 17oo	SW17 DIN894		Einmaulschlüssel	Single-ended spanner	Clé de service
6o	ZWZ 11 o3oo	SW3 DIN 911		Sechskantschrauben-dreher	Hexagonal key	Clé à six pans
61	ZWZ 11 o8oo			Sechskantschrauben-dreher	Hexagonal key	Clé à six pans
62	ZWZ 11 o4oo	SW4 DIN 911		Sechskantschrauben-dreher	Hexagonal key	Clé à six pans
63	E1A 000 320			Schlüssel	Key wrench	Clé

WECHSELSTROMAUSFÜHRUNG
SINGLE PHASE EQUIPMENT
EQUIPEMENT MONOPHASE

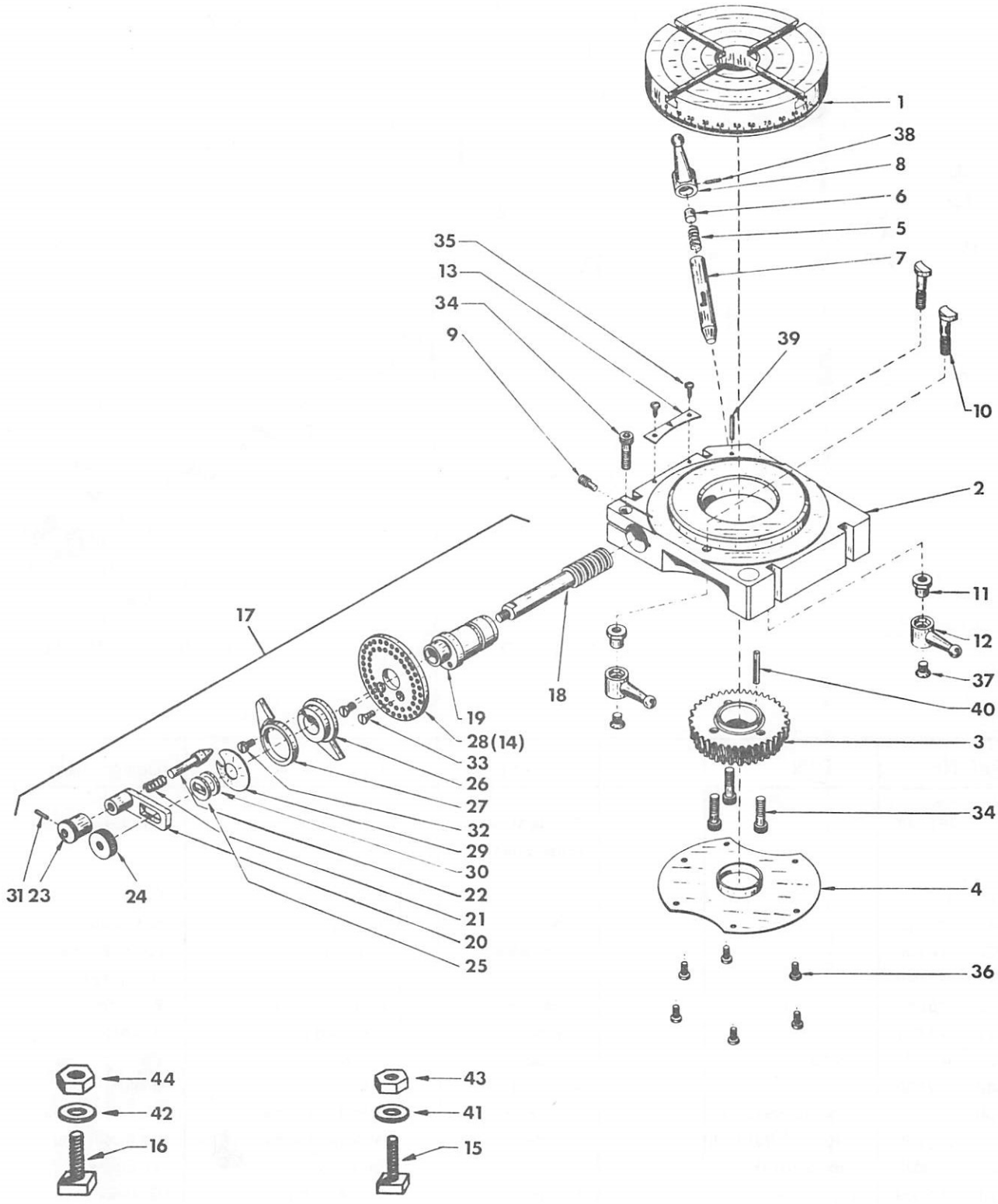
Spannung Voltage (V) Tension	Frequenz Frequency Fréquence	Ref.Nr. für Kondensator Ref.Nr. for condenser Ref.Nr. condensateur	Ref.Nr. für Motor mit Schalter Ref.Nr. for motor with switch Ref.Nr. moteur avec interrupteur
22o	6o	ZKO 2o 42o8	ZMO 73 122o
115	6o	ZKO 2o 243o	ZMO 73 1115
1oo	6o	ZKO 2o 254o	ZMO 73 11oo
25o	5o	ZKO 2o 46o6	ZMO 72 125o
24o	5o	ZKO 2o 46o6	ZMO 72 124o
23o	5o	ZKO 2o 42o8	ZMO 72 123o
22o	5o	ZKO 2o 42o8	ZMO 72 122o
11o	5o	ZKO 2o 243o	ZMO 72 111o
1oo	5o	ZKO 2o 254o	ZMO 72 11oo
115	6o CSA	ZKO 2o 243o	ZMO 71 1115

DREHSTROMAUSFÜHRUNG
THREE PHASE EQUIPMENT
EQUIPEMENT TRIPHASE

Spannung Voltage (V) Tension	Frequenz Frequency Fréquence	Ref.Nr. für Motor mit Schalter Ref.Nr. for motor with switch Ref.Nr. moteur avec interrupteur
44o	6o	ZMO 73 344o
22o	6o	ZMO 73 322o
44o	5o	ZMO 72 344o
38o	5o	ZMO 72 338o
22o	5o	ZMO 72 322o
22o	6o CSA	ZMO 71 322o



Pos.	Ref. Nr.	DIN		Benennung	Description	Designation
	761 310			**Gruppe Maschinen-schraubstock**	**Vice compl.**	**Ens. Etau-machine**
1	F2Z 310 010			Körper	Body	Corps
2	F2Z 310 020			Backe	Moving jaw	Mors mobile
3	F2Z 310 030			Spindelträger	Screw mount	Porte - broche
4	F2Z 310 040			Einsatz	Jaw	Garniture de mors
5	F2Z 310 050			Druckleiste	Plate	Plaquette
6	F2Z 310 060			Spindel	Operating screw	Broche
7	B2Z 310 080	SW 10		Schlüssel	Key wrench	Clé
8	C4Z 030 020			Nutenschraube	T-Bolt	Boulon-T
9	ZSR 12 0616	M6x16 DIN912-6.9		Zylinderschraube	Allen head screw	Vis 6 pans creux
10	ZSR 12 1020	M10x20 DIN912-8.8		Zylinderschraube	Allen head screw	Vis 6 pans creux
11	ZST 17 0625	M6x25 DIN417-5.8		Gewindestift	Set screw	Vis pointeau
12	ZNP 01 2000			Schmiernippel	Grease fitting	Graisseur
13	ZSB 10 4201	14x20x1,5		Stützscheibe	Washer	Rondelle
14	ZRG 71 1410	W14x1 DIN 471		Sicherungsring	Circlip	Anneau de retenue
15	ZMU 34 0800	M8 DIN 934-6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
16	ZSB 25 0840	B8,4 DIN 125		Scheibe	Washer	Rondelle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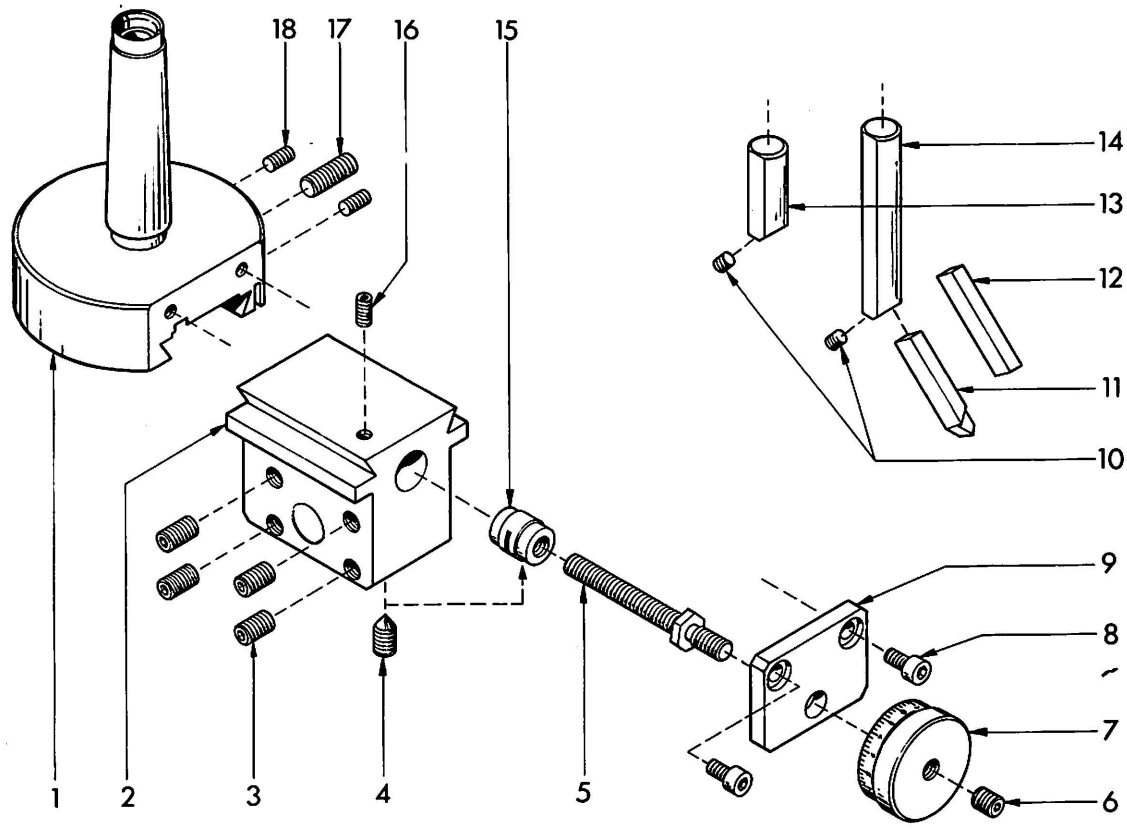
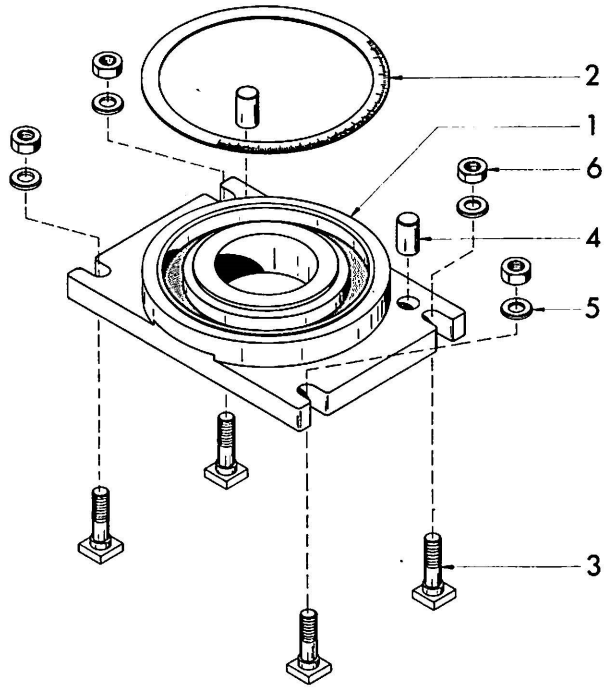
	745 000			G. Teilapparat	Dividing head	Appareil diviseur
Pos	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
1	B2Z 320 010			Rundtisch	Table	Table
2	B2Z 320 020			Gehäuse	Housing	Corps
3	B2Z 320 030			Teilrad	Table flange	Broche diviseur
4	B2Z 320 040			Deckblech	Cover mount	Couvercle
5	B2Z 320 050			Druckfeder	Compression spring	Ressort à pression
6	B2Z 320 060			Druckbolzen	Bolt	Boulon
7	B2Z 320 070			Index	Locking pin	Index
8	B2Z 320 080			Knebelgriff	Lever	Levier
9	B2Z 320 090			Anschlagschraube	Bushing	Douille
10	B2Z 320 100			Klemmschraube	Locking bolt	Vis de blocage
11	B2Z 320 110			Mutter	Nut	Ecrou
12	B2Z 320 120			Knebelgriff	Lever	Levier
13	B2Z 320 130			Zeiger	Guide	Indicateur
14	B2Z 320 140			Lochscheibe 33-36-39	Indexing plate	Disque à trous
	B2Z 320 150			Lochscheibe 38-40	Indexing plate	Disque à trous
15	B2Z 320 160	M 6		Nutenschraube	T-Nut	Glissière
16	B2Z 320 170	M 8		Nutenschraube	T-Nut	Glissière
17	B2Z 321 000			Gr. Schnecke	Worm shaft	Vis sans fin
18	B2Z 321 010			Schnecke	Worm shaft	Vis sans fin
19	B2Z 321 020			Exzenter	Assembly arbor	Excentrique
20	B2Z 321 030			Kurbel	Crank	Manivelle
21	B2Z 321 040			Druckfeder	Compression spring	Ressort à pression
22	B2Z 321 050			Absteckbolzen	Bolt	Boulon
23	B2Z 321 060			Hülse	Sleeve	Gousse
24	B2Z 321 070			Rändelmutter	Knurled nut	Ecrou moletée
25	B2Z 321 080			Scheibe	Plate	Poulie
26	B2Z 321 090			Schere rechts	Section arm r. h.	Lyre droite
27	B2Z 321 100			Schere links	Section arm l. h.	Lyre gauche
28	B2Z 321 120			Lochscheibe 27-36-42	Indexing plate	Disque à trous
29	B2Z 321 130			Tellerfeder	Spring washer	Ressort hélicoidal
30	B2Z 321 140			Scheibe 1,8	Plate 1,8	Poulie 1,8
	B2Z 321 150			Scheibe 2,0	Plate 2,0	Poulie 2,0
	B2Z 321 160			Scheibe 2,2	Plate 2,2	Poulie 2,2
31	ZHL 81 0212	2x12 DIN 1481		Spannhülse	Pin	Tige de serrage
32	ZSR 85 0406	AM4x6 DIN 85		Zylinderschraube	Flat head screw	Vis cylindriques
33	ZSR 63 0410	M4x10 DIN 963		Senkschraube	Flat head screw	Vis de sûreteé
34	ZSR 12 0625	M6x25 DIN 912		Innensechskantschraube	Allen head screw	Vis six pans creux
35	ZSR 84 0304	M3x4 DIN 84		Zylinderschraube	Flat head screw	Vis cylindriques
36	ZSR 84 0406	M4x6 DIN 84		Zylinderschraube	Flat head screw	Vis cylindriques
37	ZSR 63 0608	M6x8 DIN 963		Senkschraube	Flat head screw	Vis de sûreteé
38	ZHL 81 0214	2x14 DIN 1481		Spannhülse	Pin	Tige de serrage
39	ZHL 81 0322	3x22 DIN 1481		Spannhülse	Pin	Tige de serrage
40	ZHL 81 0530	5x30 DIN 1481		Spannhülse	Pin	Tige de serrage
41	ZSB 25 0640	B6,4 DIN 125		Scheibe	Washer	Rondelle
42	ZSB 25 0840	B8,4 DIN 125		Scheibe	Plate	Poulie
43	ZMU 34 0600	M6 DIN 934		Mutter	Nut	Ecrou
44	ZMU 34 0800	M8 DIN 934		Mutter	Nut	Ecrou

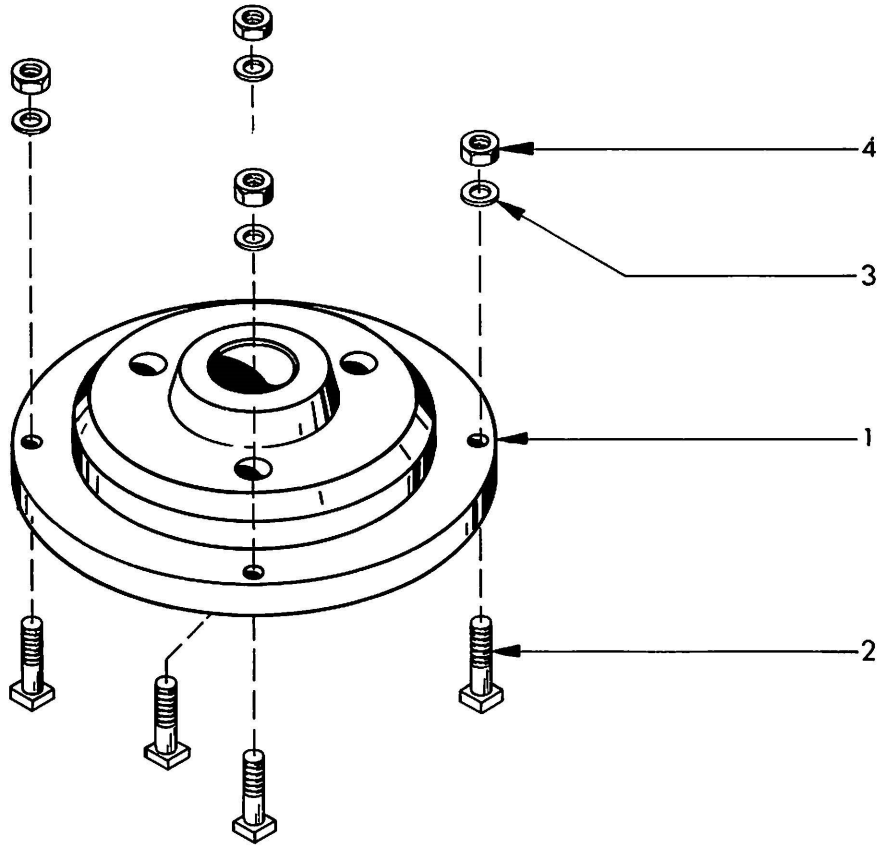
Ausdrehkopf Boring head Tête d'alésage



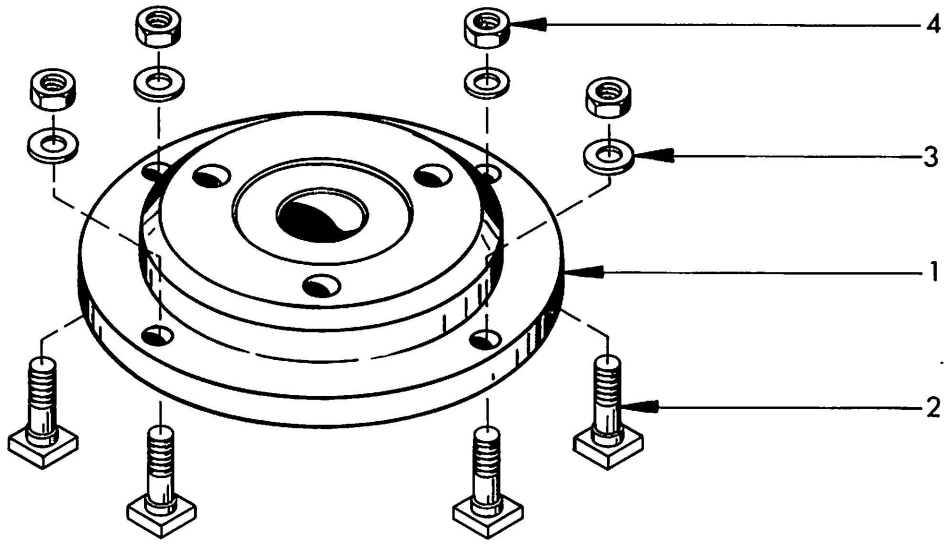
Pos.	Ref. No.	DIN		Benennung	Description	Designation
1	E3Z o3o o1o			Ausdrehkopf	Boring head	Tête d'alésage
2	E3Z o3o o4o			Schlitten	Slide	Chariot
3	ZST 13 o61o	M6x1o DIN 913		Gewindestift	Set screw	Vis pointeau
4	ZST 14 o6o8	M6x8 DIN 914		Gewindestift	Set screw	Vis pointeau
5	E3Z o3o o5o			Spindel	Feed screw	Vis filetée
6	ZST 13 o6o6	M6x6 DIN 913		Gewindestift	Set screw	Vis pointeau
7	E3Z o3o o3o			Skalenring	Micrometer collar	Bague d'echelle
8	ZSR 12 o4o8	M4x8 DIN 912-6.9		Zylinderschraube	Socket head screw	Vis 6 pans creux
9	E3Z o3o o2o			Spindelträger	Bracket	Porte-broche
10	ZST 16 o4o4	M4x4 DIN 916		Gewindestift	Set screw	Vis pointeau
11	A3Z 1oo o3o			Plandrehstahl	Boring bit	Outil d'alésage
12	A3Z 1oo o2o			Drehstahl Rohling	Unground bit	Acier brute
13	E3Z o3o o8o			Stahlhalter	Boring bar	Porte-outil
14	E3Z o3o o7o			Stahlhalter	Boring bar	Porte-outil
15	E3Z o3o o6o			Mutter	Nut	Ecrou
16	ZST 13 o4o8	M4x8 DIN 913		Gewindestift	Set screw	Vis pointeau
17	ZST 14 o616	M6x16 DIN 914		Gewindestift	Set screw	Vis pointeau
18	ZST 14 o4o8	M4x8 DIN 914		Gewindestift	Set screw	Vis pointeau
19	ZWZ 11 o2oo	SW2 DIN 911		Schraubendreher	Allen key wrench	Clé à écrous
20	ZWZ 11 o3oo	SW3 DIN 911		Schraubendreher	Allen key wrench	Clé à écrous
21	ZWZ 11 o5oo	SW5 DIN 911		Schraubendreher	Allen key wrench	Clé à écrous



Pos.	Ref. Nr.	DIN		Benennung	Description	Designation
	761 320			**Gruppe Untersatz**	**Swivel base compl.**	**Ens. Base rotative**
1	F2Z 320 010			Untersatz	Base plate	Embase
2	F2Z 320 020			Skalenschild	Scale plate	Bande rèpere graduée
3	C4Z 030 020			Nutenschraube	T-Bolt	Boulon-T
4	C4Z 030 030			Nutenstift	Guide	Douille - guide
5	ZSB 25 0840	B8,4 DIN 125		Scheibe	Washer	Rondelle
6	ZMU 34 0800	M8 DIN 934-6		Sechskantmutter	Hexagon nut	Ecrou 6 pans



Pos.	Ref. No.	DIN		Benennung	Description	Désignation
	584 170			G. Zwischenflnasch	Adaptor plate compl.	Ens. Flasque intermédiaire
1				Zwischenflansch	Adaptor plate	Flasque intermédiaire
2	B4Z 170 020	M6		Nutenschraube	T–bolt	Boulon–T
3	ZSB 25 0640	B6,4 DIN 125		Scheibe	Washer	Rondelle
4	ZMU 34 0600	M6 DIN 934–6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans



Pos.	Ref. No.	DIN		Benennung	Description	Désignation
	584 250			**G. Supportflansch**	**Support backplate compl.**	**Ens. Flasque support**
1				Supportflansch	Support backplate	Flasque support
2	C4Z 030 020			Nutenschraube	T–bolt	Boulon–T
3	ZSB 25 0840	B8,4 DIN 125		Scheibe	Washer	Rondelle
4	ZMU 34 0800	M8 DIN 934–6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans