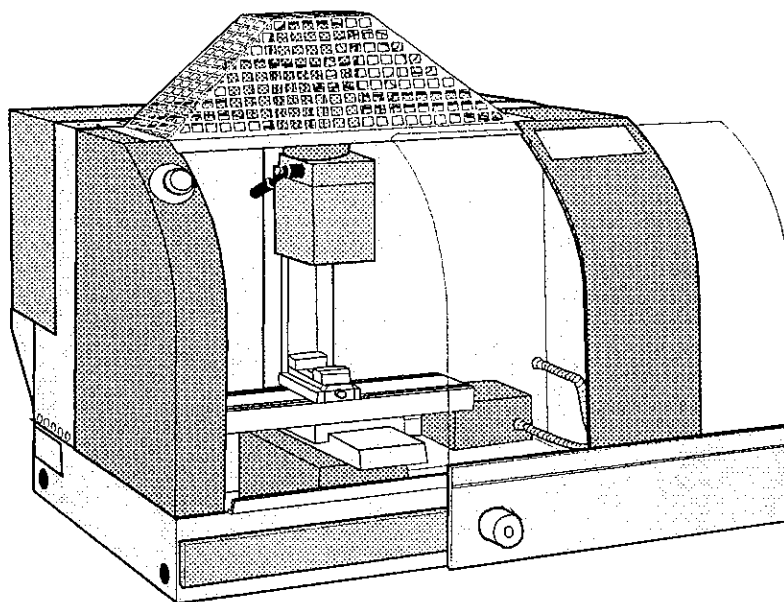


Machine description

EMCO PC MILL 55

Milling machine



Edition 1999

Ref. No. EN 4326

Machine description
EMCO PC MILL 55
C99-11 EN 4326

emco

Introduction

For more than five decades EMCO has been developing metal working machines and has also been successfully on the market since 1980 with computer controlled machine tools (CNC machines), particularly on the training sector.

This high degree of experience is a profit for the turning and milling machines of the PC TURN and PC MILL model series.

The newly designed compact machines meet entirely today's requirements in construction and set up as well as safety.

The PC machines are operated via a conventional personal computer (PC). This kind of operation permits an efficient training of the most different CNC controls (SIEMENS, FANUC, etc.) with one and the same machine. The CNC monitor of the installed CNC control is simulated on the PC screen, input of data is carried out alternatively via the PC keyboard or via a control keyboard available as accessory.

Due to the worldwide industrial use of our machines we dispose of a service network which covers all world areas.

Immediately available service engineers, telephone service as well as a 100% sparepart supply exceeding the 10-year obligatory provision is something natural for us.

One of our more than 100 general representatives worldwide will inform you on particular new developments (e.g. clamping options for work pieces or tools, new softwares, etc.) and their fitting possibilities.

In the present operating instructions you will find a complete description of safety hints, transport, set-up, operation and maintenance of the machine. Therefore read this instructions completely before machine start-up.

EC conformity



The CE sign certifies together with the EC declaration of conformity that the machine and the manual correspond to the EC guideline for machines 89/392/EEC and its modifications 91/368/EEC and 93/68/EEC.

EMCO MAIER Gesellschaft m. b. H.
Abteilung Technische Dokumentation
A-5400 Hallein, Austria

emco

industrial training systems

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Adequate use

The machine is designed for milling and turning work of machinable metals (aluminium, brass and, to a limited degree, steel) and machinable synthetic materials. Machining of other materials is not admitted and may be carried out in particular cases only after consultation with the machine manufacturer.

Adequate use also includes compliance with the operating, maintenance and repairing instructions indicated by the manufacturer.

The machine may exclusively be operated and maintained by persons familiar with operation, maintenance and repair and who know about the hazards.

All regulations for the prevention of accidents and safety instructions for work with machine tools and CNC machine tools have to be complied with at any time.

In case of inadequate use of the machine the manufacturer renounces any liability and the responsibility is transferred exclusively to the user.

Warranty conditions for new EMCO machines

1. The warranty period for new EMCO machines is, without limitation of operating hours, 12 months after initial shipment of the machine from EMCO or its authorized representative. Should the installation be completed by EMCO or its authorized representative, the warranty period begins with the completed installation of the machine.
If a delay of installation occurs which is not caused by EMCO or its representative, the warranty period becomes invalid 12 months after scheduled installation date.
2. The warranty extends to the elimination of all defects in material or workmanship which affect the regular function of the machine.
3. Occuring defects must be immediately reported to the EMCO representative or the next EMCO service department with detailed description of the defect in written or oral form, followed by a written verification.
4. Defects which are correctly reported and under warranty will be corrected by either repair or replacement delivery to the original buyer free-of-charge; defective parts are to be returned to EMCO or the EMCO authorized representative, freight prepaid, if requested.
5. Warranty for spare parts: Emco guarantees to the original buyer that, only those parts sold directly by Emco or through an authorized representative will be free from defects, which render part commercially unacceptable in material and workmanship, for a period according to applicable national law, at least three (3) months, but not to exceed six (6) months from the date of initial shipment or installation by Emco or its representative.
In the case of repeated claims for the same part: Warranty replacement does not extend the period of the original warranty.
6. There is no claim of warranty for defects which occurred by:
Negligence of operating instruction manuals, safety and handling regulations or other instructions regarding delivery, installation, set-up or usage of the machine, incorrect set-up resp. installation, as well as, unauthorized, not expressed regulated or allowed alternations or modifications of the machine by the original buyer or third parties, natural wear, improper or negligent handling, chemical, electro-chemical or electrical influences, inadequate energy supply or force majeure.
7. Any service performed by EMCO or its authorized representative beyond warranty will be charged at EMCO's or its authorized representative's regular rates.

Safety recommendations

Read documentation

Read this documentation completely before you start up the machine.

Electrical connection

The electrical connection of the machine must only be carried out by electricians experts.

Authorized operation

The machine may only be operated by authorized persons.

Protect the machine against unauthorized start-up (main switch which can be locked).

Start-up

Make sure that prior to each start-up the machine is in perfect maintenance state and that no safety features have been removed.

No modifications on machine

Modifications on your own on safety features, bridgings of control features as well as any interference with the electric/electronic part of the machine is prohibited.

In case of hazards EMERGENCY-OFF

In case of hazards immediately actuate EMERGENCY-OFF key to stop machine.

Safe tool-clamping

Prior to start of operation check if workpiece and tool are clamped safely.

Observe speed limits

Clamping devices are subject to speed limits. Thus observe the maximum speed of the clamping devices used by you.

Use chip hook

Remove chips only with machine switched off and by means of a chip hook.

Do not reach into running machine!

Tool change

Change machining tools only during standstill of machine.

Measurement work

Carry out measurement work only during standstill of the machine and with EMERGENCY-OFF key actuated.

Wear body protection

Mind that your hair does not get caught in the machine - hair protection to be worn.

Protect your eyes with safety-glasses.

Do not wear loose working clothes. Mind that the working clothes are tight around the wrists and hips.

Machine supervision

Never leave running machine unattended.

Before leaving the working place switch off machine.

Maintenance and readjustment work

All maintenance and readjustment work may be carried out only with machine switched off and EMERGENCY-OFF key actuated.

Claim

In the event of a collision or instance of damage, contact the representative or manufacturer.

In case of complaints, damage, confusions and spare parts orders always indicate the machine number.

For parts not supplied by EMCO, EMCO will not assume liability.

Technical data of the machine

| | | |
|--|----------|----------------|
| Working Area | | |
| Slideway longitudinal (X-axis) | [mm] | 190 |
| Slideway cross (Y-axis) | [mm] | 125 |
| Slideway vertical (Z-axis) | [mm] | 190 |
| effective Z-stroke | [mm] | 120 |
| Distance spindle nose - table surface (milling spindle vertical) | [mm] | 30-220 |
| Distance spindle nose - table surface (milling spindle horizontal) | [mm] | 82-272 |
| Milling Table | | |
| Clamping surface (L x D) | [mm] | 420x125 |
| Maximum table load | [kg] | 10 |
| 2 T-slots | [mm] | 11 |
| Distance of T-slots | [mm] | 90 |
| Milling Spindle | | |
| Spindle bearing | [mm] | ø35 |
| Type of bearing | | roller bearing |
| Clamping fixture similar to DIN 2079 | | SK30 |
| Tightening bolt | | works standard |
| Tool clamping | | manual |
| Milling Spindle Drive | | |
| A.C.-motor | | |
| Power with 100%/60% D.C. | [W] | 500/750 |
| Nominal motor speed | [rpm] | 1400 |
| Speed range (infinitely variable) | [rpm] | 100-3500 |
| maximum torque on milling spindle | [Nm] | 3,7 |
| Drilling capacity in aluminium | [mm] | ø10 |
| Thread-cutting capacity in aluminium | [mm] | M6x15 |
| Feed Drives | | |
| Step resolution/output resolution | [µm] | 0,5 |
| Operating feed in X/Y/Z (infinitely variable) | [mm/min] | 0-2000 |
| Rapid feed in X/Y/Z | [mm/min] | 2000 |
| max. feed force X/Y/Z | [N] | 800/800/1000 |
| Electrical Connection | | |
| Power supply | [V] | 100/110/230 |
| maximum voltage fluctuations | [%] | +5/-10 |
| Frequency | [Hz] | 50/60 |
| Connected load | [kVA] | 0,9 |
| Main fuse | [A-slow] | 10 |

Subject to technical modifications!

| Machine Dimensions | | |
|---|---------|-----------------|
| total length x total depth x total height | [mm] | 840 x 865 x 816 |
| total weight of machine | [kg] | 160 |
| Sound Level | | |
| mean sound level | [dB(A)] | 70 |
| With the following conditions: measuring method: enveloping surface method according to DIN 45 635 operating method: maximum speed during idle running | | |

PC Configuration

| | Minimum Configuration |
|-----------------------|---|
| IBM or IBM compatible | Pentium 100 |
| Hard disk | 20 MB free |
| Disk drive | 3½" |
| Operating system | Windows 95 |
| Main storage | 16 MB |
| Graphics card | VGA color graphics card |
| Display | color display 14" |
| Keyboard | MF-2 |
| BUS (free slot) | ISA or EISA slot for installing the interface card PCCOM (RS422/CAN) |

Subject to technical modifications!

Declaration of conformity

Product: PC-controlled lathe for training

| | | |
|----------------------|--------------|-------------------|
| Machine data: | Model | Type |
| | EMCO | PC TURN 55 |

Address of manufacturer: Emco Maier Ges.m.b.H
Salzachtal Bundesstraße Nord 58
A-5400 Hallein

Bases of standards: EN 292-1; EN 292-2; EN 294; EN 418; EN 60204-1; prEN 954-1;
prEN 1037; prEN 1050; prEN 1088

Regulations: MSV (BGBl. Nr. 306/1994, 27.4.94)

Test certificates:

**Particular notes ,
enclosures:** Electrical documentation as applicable

We herewith declare that the above-mentioned product referring to the subject declaration is in conformity with the currently valid stipulations of the directive of the Council dated June 14th, 1989 for the alignment of the legal stipulations of the member states for machines (89/392/EEC) and its modifications dated June 20th, 1991 (91/368/EEC), June 14th, 1993 (93/44/EEC), July 22nd, 1993 (93/68/EEC), with the directive of the Council dated May 3rd, 1989 for the alignment of the legal stipulations for electromagnetic compatibility (89/336/EEC) and its modifications dated April 28th, 1992 (92/31/EEC) and July 22nd, 1993 (93/68/EEC), and with the directive of the Council dated February 19th, 1973 concerning low voltage equipment (73/23/EEC) and its modification dated July 22nd, 1993 (93/68/EEC).

Furthermore, the conformity of the subject product with the above-mentioned standard bases and regulations is effective.

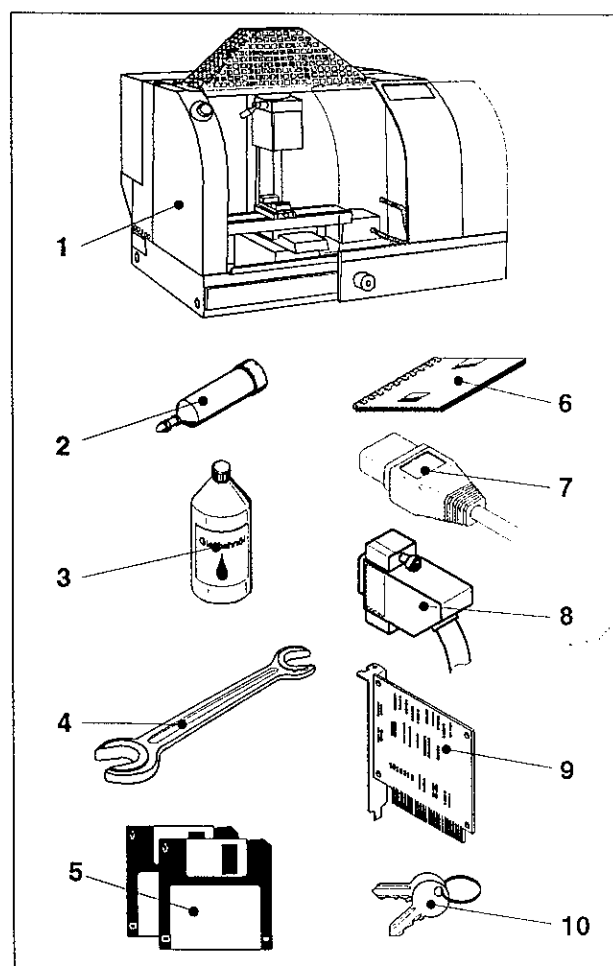
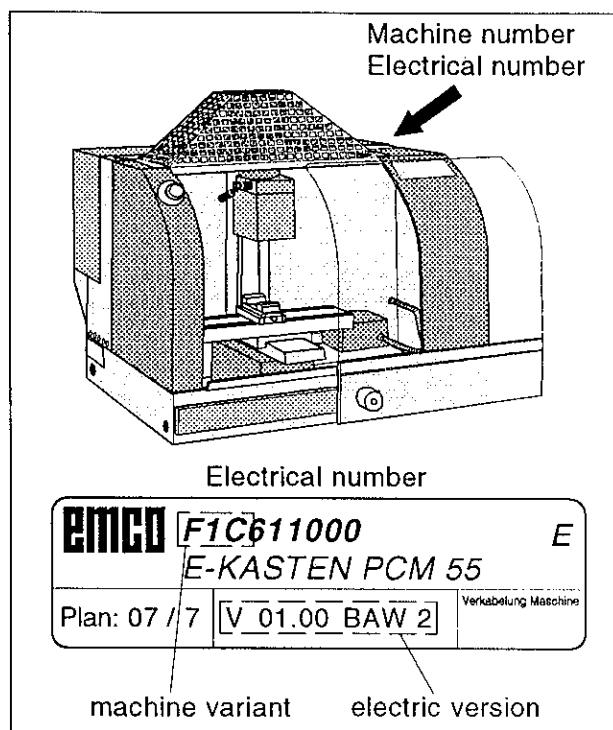
Place, date: Hallein, 11.02.98

Authorized person: Head of quality department

Peter Binggl



A Machine installation



Scope of supply

Machine acceptance

- Check the machine for any transport damage and completeness of the delivery. If you find any defects, please contact the dealer or the insurance company.
- In case of complaints always specify the exact designation of the machine and the machine number. The self-adhesive plate indicating the machine number and the electric number is on the machine side below the key switch.

On the plate with the electric number you'll find:

- machine variant (e.g. "F1C")
- Electric version (e.g. "V 01.00 BAW 2")

The available circuit diagrams for this machine you will find in the Electrical Documentation, which is put inside of the electrical cabinet of the machine.

The Electrical Documentation may also be ordered from EMCO:

Electrical Documentation EMCO PC MILL 55
Ref. No. ZVP 675 020

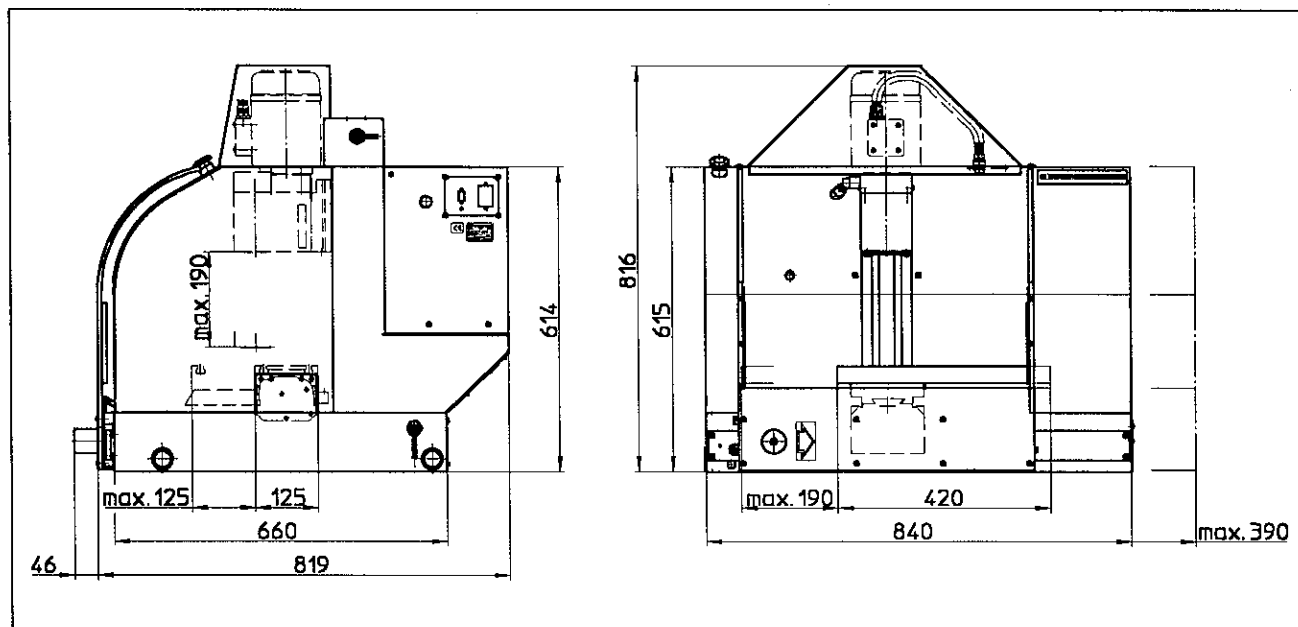
Version F1C_V01.00 BAW 2
(= machine variant and electrical version of your machine)

- The rust protection agent must be removed by the customer

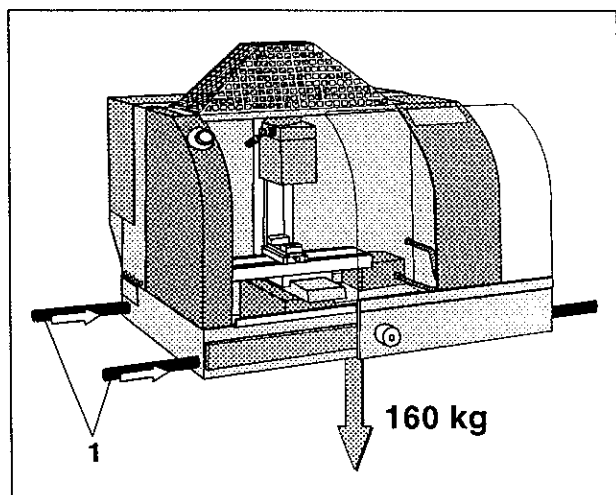
Scope of supply

1. Milling machine EMCO PC MILL 55 with chip tray, splash guard, complete electric equipment, chip guard door and safety package.
2. 1 oil gun
3. 1 bottle (0.25l) of slideway oil
4. 1 hexagonal key SW10x13
5. Floppies with NC software and machine data
6. 1 machine- and software description
1 electrical documentation
7. 1 power cable
8. 1 9-pole interface cable (RS 422)
9. 1 PC interface card PCCOM (RS 422/CAN)
10. 2 keys for main switch

Dimensions of the machine



Dimensions of the machine



Transport of machine

Transport of the machine

For transporting the machine two bars can be pushed through the holes (1).

Weight of machine approx. 160 kg

Danger:



For transporting the machine only use such bars which ensure that the carrying capacity of the bars corresponds at least to the weight of the machine.

Installation requirement

The machine has to be placed on a stable table.

Weight of machine 160 kg

Ideal table height approx. 650 mm

Installation width x depth 840 x 660 mm

Note:



Mind that the ventilation slots on the electric cabinet are not blocked or covered.

In case of insufficient ventilation disturbances on the machine due to too high temperature might occur.

Electrical connection of the machine



Danger:

A ground wire contact has to be available at the socket.

Voltages: 100 V 1/N/PE~50/60 Hz
110 V 1/N/PE~50/60 Hz
230 V 1/N/PE~50/60 Hz

Connected load: 0,9 kVA

Preliminary fuse: max. 10 A slow

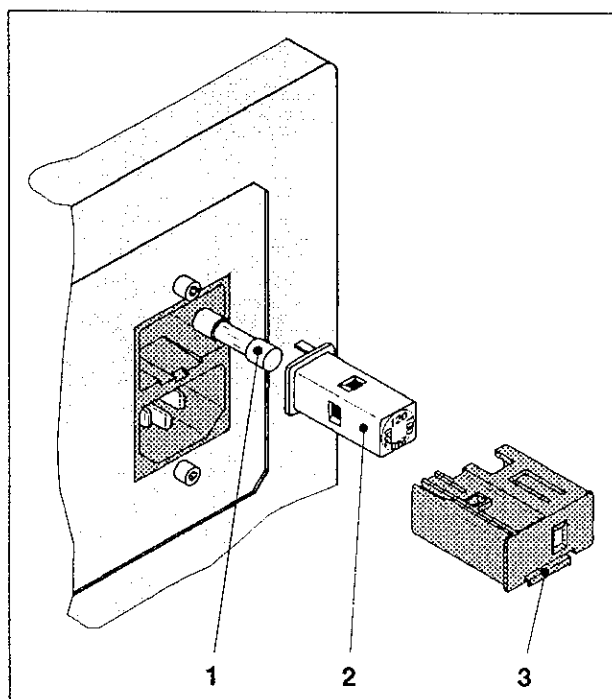
Max. voltage fluctuations: +5/-10%

Adjustment of the required supply voltage

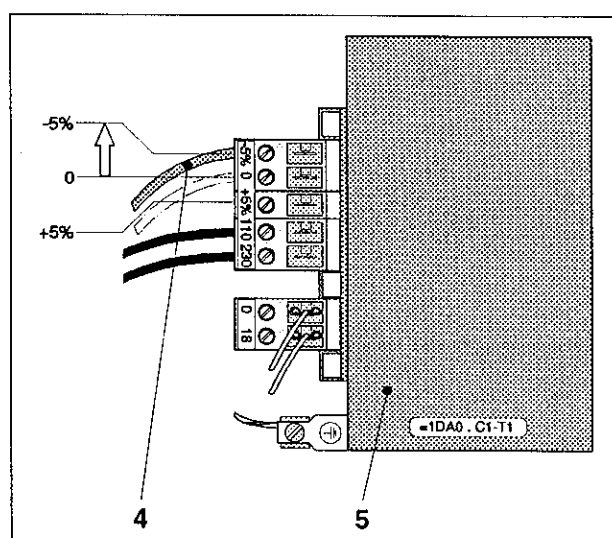
- Push up the latch on the casing (3) and remove the casing with the fuse (1) and the selector pin (2).
- Turn the selector pin (2) in such a way that in the window of the casing (3) the following voltage setting appears:

| Mains supply | Setting in control window |
|--------------|----------------------------|
| *100V-mains | setting 100V + Transformer |
| 110V-mains | setting 120V |
| 230V-mains | setting 220V |

- Put the whole unit with fuse (1), selector pin (2) and casing (3) again into the socket.



Adjustment of the supply voltage



100V-voltage adjustment on the transformer



Attention:

With the 100V mains supply there has to be done a modification on the transformer of the machine!

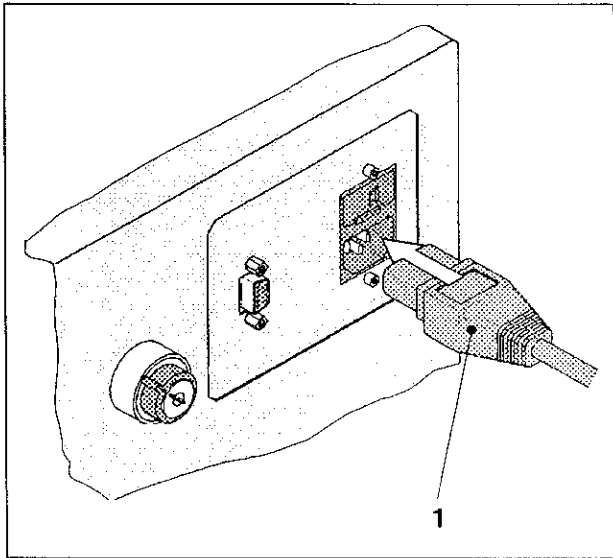
Modification on transformer for 100V mains supply



Danger:

Modifications in the electric cabinet may only be carried out by an electrician expert.

- Unscrew cover of the electric cabinet on the rear side of the machine.
- Connect blue core (4) on the transformer (5) from setting "0" to setting "-5%".
- Remount cover of electric cabinet.



Power connection of the machine

Connection of the power cable

- Plug in the power cable (1) at the machine and the other end at a socket with ground wire contact.

Installation of the interface card

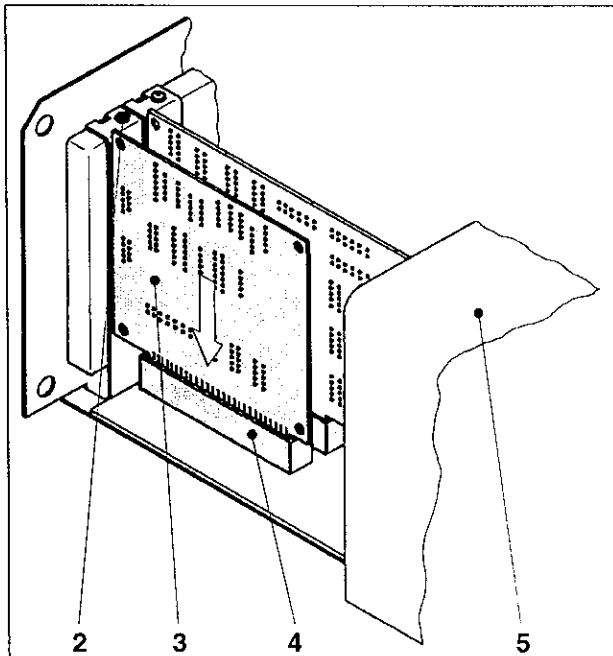
Prior to installing the software the interface card should be mounted.

The interface is a serial interface RS 485 and is used for connecting the computer with the machine.



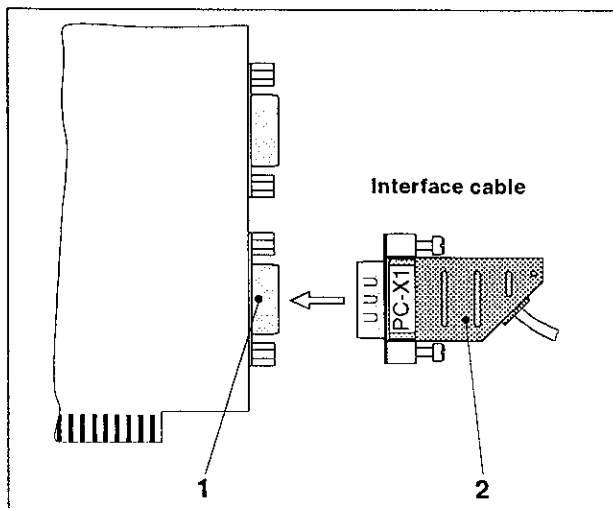
Danger:

- The interface card may be only be mounted if the computer is disconnected from the power supply (take off plug).
- The computer may be connected again to the power supply only if the frame is mounted again.



Installation of the interface card

- Switch off computer and take off plug.
- Take off frame cover (5) of the computer.
- Insert interface card (3) in a free slot (4).
- Tighten interface card (2) with fixation screw (2).
- Remount frame cover (5).
- Connect power supply plug.



Connection of interface cable to the PC

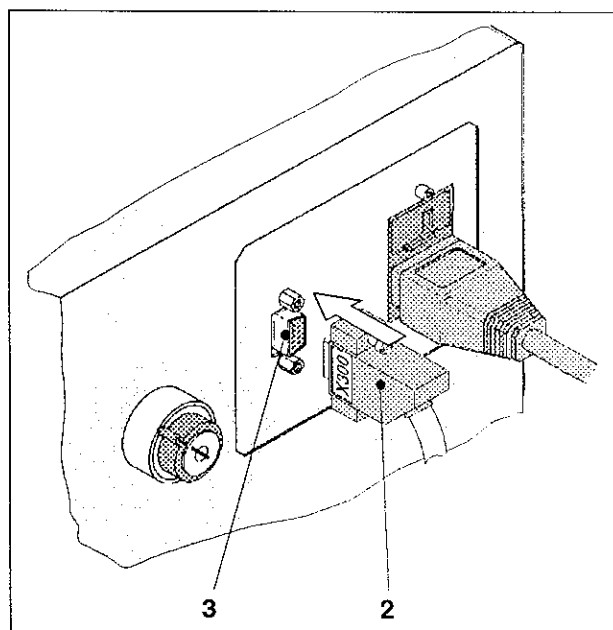
Connection PC-machine



Attention:

The machine cannot be controlled, if the interface cable will be connected wrongly.

- Connect interface cable (2) with the plug named "PC-X1" on the lower socket of the interface card (1).

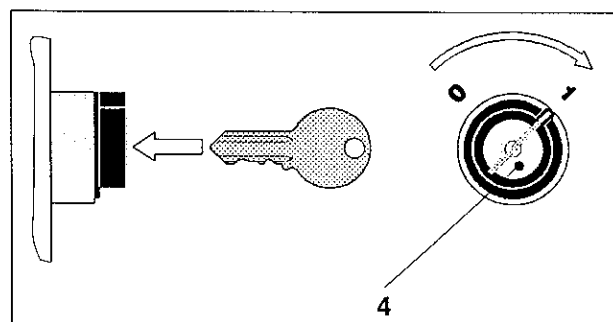


Connection of interface cable to the machine

- The free end of the interface cable with the plug named "Maschine-X300" has to be connected on the socket (3) of the machine.

Initial start-up

- Machine is to be cleaned from rust preventive agent with a clean cloth.
- Establish power connection.
- Switch on machine at key switch (4).



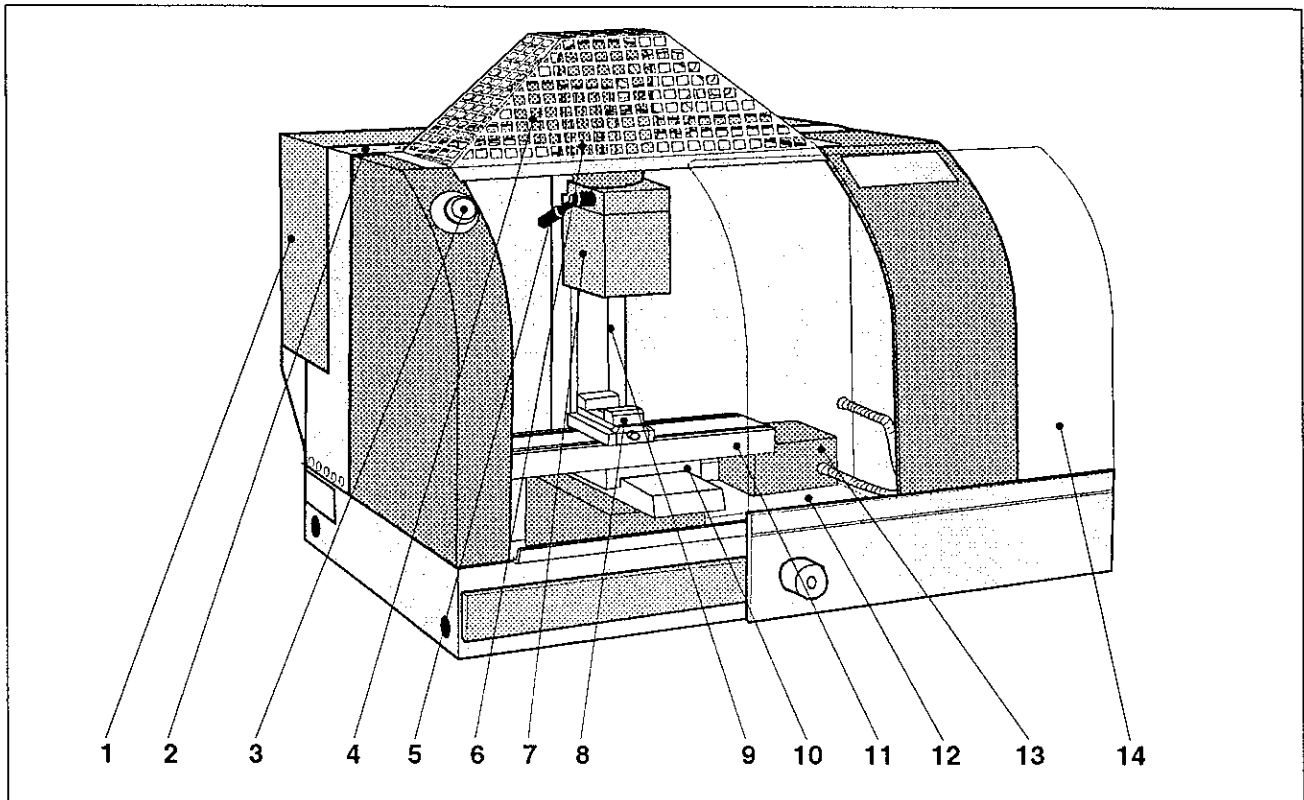
Key switch on the machine

Note:

If the machine is not used for a longer period of time, slightly oil blank parts, protect machine against unauthorized start-up (take off key) and cover machine with dust protection.



B Description of machine

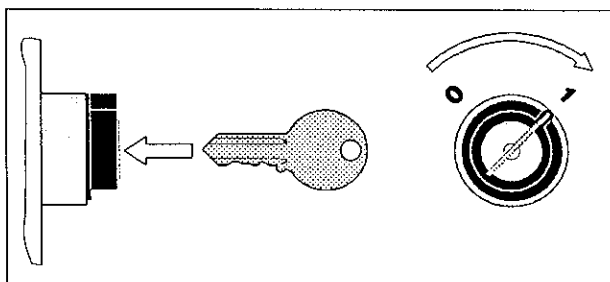


EMCO PC MILL 55

- | | |
|--------------------------------------|-----------------------------|
| 1. Electric cabinet | 8. Machine vice (accessory) |
| 2. Tool support for 4 tools | 9. Z-guide |
| 3. EMERGENCY-OFF key | 10. Y-slide |
| 4. Protection cap | 11. Milling table (X-slide) |
| 5. Clamping lever for tool clamping | 12. Chip tray |
| 6. Drive motor for milling spindle | 13. Step motor X-axis |
| 7. Milling head with milling spindle | 14. Chip guard door |

Operating elements

Key switch



Key switch

Danger:

Always take off key to protect the machine against unauthorized start-up.



With the key switch position "1" and released EMERGENCY-OFF key the machine is ready for operation.

The main and feed motors are supplied with power.

EMERGENCY-OFF key

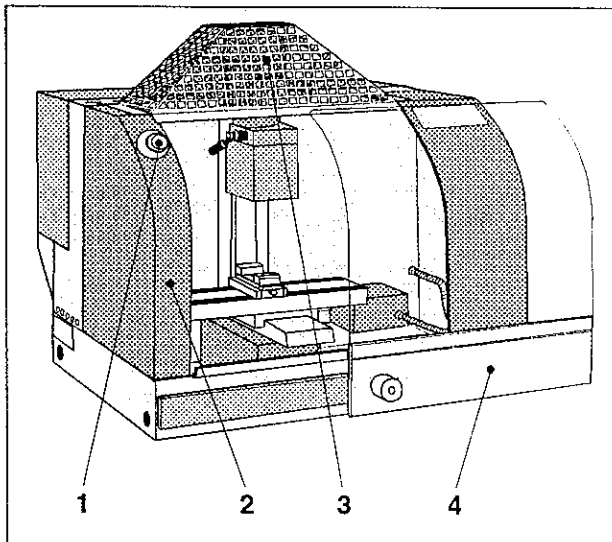


Danger:

The EMERGENCY-OFF key is to be actuated immediately in any hazard situation.

When actuating the EMERGENCY-OFF key (1) the power supply to the main and feed motors is interrupted.

For unlocking turn knob in clockwise direction.



Safety package

Safety package



Danger:

Modifications on safety devices as well as bridgings of control devices are prohibited!

The safety package is contained in the base machine and facilitates generally risk-free operation of the machine.

By opening the chip guard door the power supply to main and feed motors is interrupted.

The safety package comprises:

- EMERGENCY-OFF key (1)
- Protective cover around the entire working area of the machine (2)
- Protection cap (3)
- Chip guard door with limit switch (4)

The step motors

The step motors are used for driving the slides in X-, Y- and Z-direction.

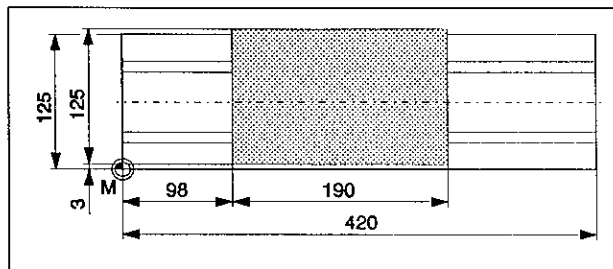
| | |
|-------------------------------|----------------|
| Feed speed X/Y/Z | 0-2 000 mm/min |
| Rapid traverse X/Y/Z | 2 000 mm/min |
| Step resolution | 0.5 μ m |
| Traversing path X-slide | 190 mm |
| Traversing path Y-slide | 125 mm |
| Traversing path Z-slide | 190 mm |
| Feed force X/Y | max. 800 N |
| Feed force Z | max. 1000 N |

Working area

Working area in X- and Y-axes

Traversing path X-axis 190 mm

Traversing path Y-axis 125 mm



Traversing paths of the X- and Y-slides

Note:

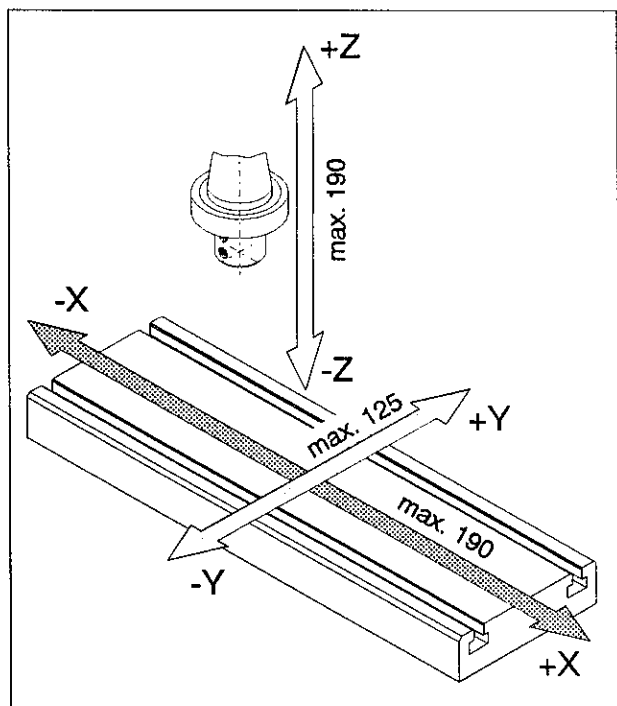
Mind that the clamped workpieces in the traversing area of the milling cutters are clamped at the milling table.

Working area in Z-axis

The working area in Z-direction depends on the length of the clamped workpiece.

Further details are to be found at the respective clamping device.

effective Z-stroke 190 mm



Working area and coordinate system

Limitation of traversing paths

The traversing paths of the slides are limited by software limit switches.

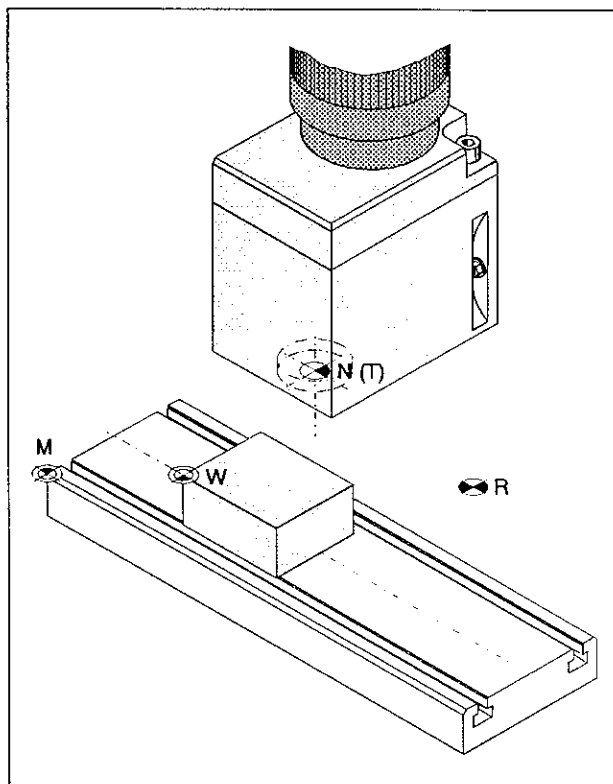
When reaching a software limit switch the respective feed motor stops and a message is indicated at the monitor of the control.

By means of the software limit switches a mechanical overload of the axis spindles due to fixed stops is avoided.

Coordinate system

The coordinate system is turning in clockwise direction. The origin lies in the machine zero point M or in the workpiece zero point W.

Points at the machine



Points at the machine

Machine zero point M

The machine zero point M lies on the surface of the milling table on the left front edge.

The machine zero point M is the origin of the coordinate system.

Reference point R

The reference point is a fixed point on the machine. It serves for the calibration of the measuring system.

The reference point must be approached after each switch-on of the machine to communicate the exact distance between the points M and N (T) to the control.

Workpiece zero point W

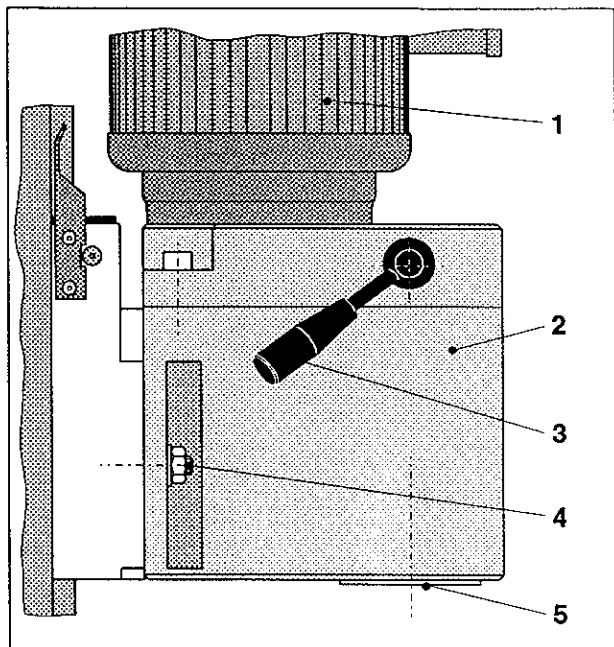
The workpiece zero point W can be freely programmed by the user.

By programming a workpiece zero point the origin of the coordinate system is displaced from the machine zero point M into the workpiece zero point W.

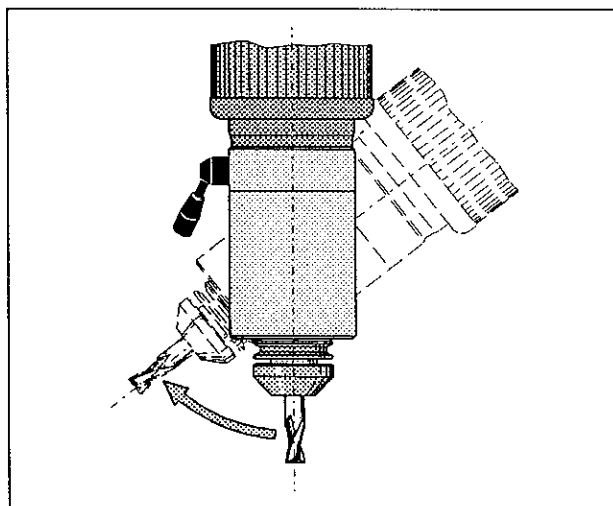
Tool-holding fixture reference point N (T)

The tool-holding fixture reference point N (T) lies exactly in the rotary axis at the front of milling spindle nose.

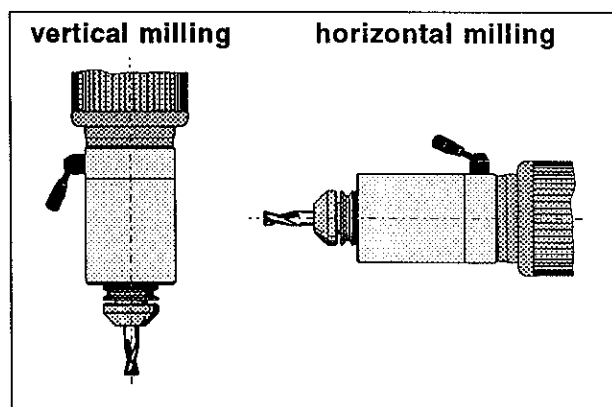
The tool lengths are described from this point.



Milling head



Swivelling the milling head



Kinds of milling

The milling head

In the milling head (2) the milling spindle (5) with the inner cone and the clamping device (3) for the tool support are placed.

The drive motor (1) for the milling spindle is mounted on the milling head.

For horizontal milling the milling head together with the drive motor can be swivelled by 90°. The limitation of the max. swivel movement of 90° is carried out by stop bolts.

Swivelling the milling head

Applications with swivelled milling head:

- Milling of chamfers
- Milling of grooves with the disk milling cutter
- etc.

Danger:

Swivelling the milling head may only be carried out during machine standstill.

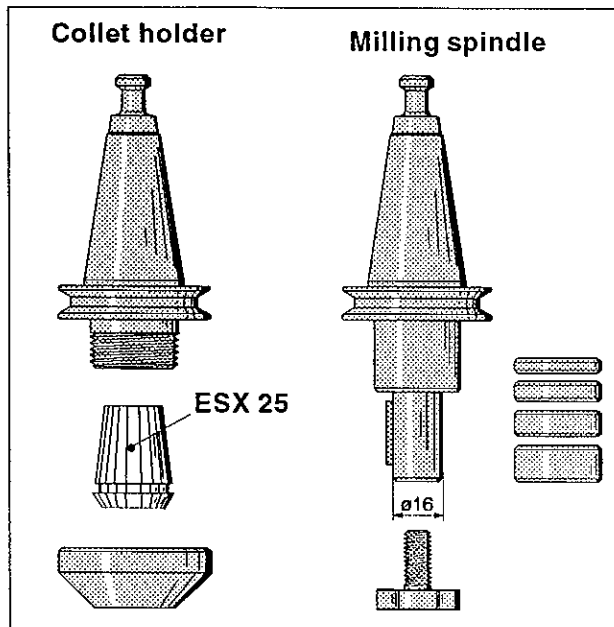
- Move milling head downwards (–Z-direction)
- Untighten the clamping nuts SW13 (4) on both sides of the milling head (2).
- Swivel milling head (2) together with drive motor (1) into the desired direction.
- Tighten clamping nuts (4).

Attention:

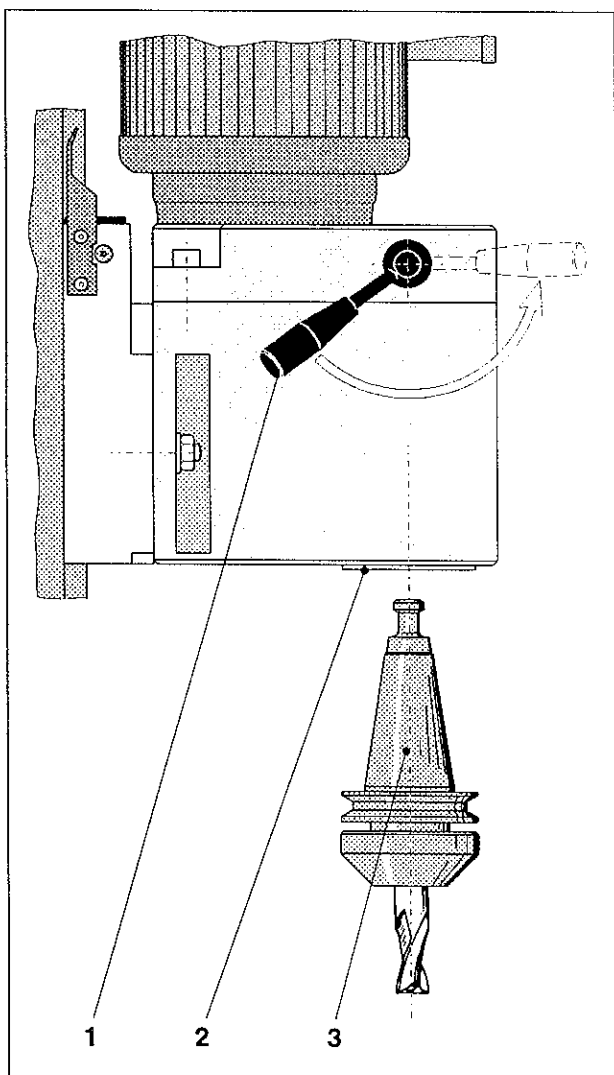
- Mind during swivelling that the milling head does not knock too hard against the stop bolts in order to avoid damages at the stop bolts and milling head.
- Pay attention to the changed directions of the axis of the coordinate system
- Take care, that the milling head will not collide with the protection cap at swiveled milling head! (too great +Z-movement)

Vertical-horizontal milling

The terms vertical milling and horizontal milling refer to the position of the milling spindle axis (vertical or horizontal).



Toolholder



Mounting and dismounting the toolholder

The toolholder

The machining tools are mounted on the toolholder.

Drills, end-milling cutters and profile cutters are clamped by means of chucks into the collet chuck, shell end mills and disk milling cutters are mounted on the shell end mill arbor.

Tool support similar to DIN 2079 SK 30
Clamping bolt works standard

Mounting the toolholder



Danger:

- Mounting and dismounting the toolholder may only be carried out during machine standstill.
- Due to the modified DIN tool support only toolholders bought particularly for this machine from EMCO may be clamped.

- Pull forward spring-weighed clamping lever (1) until stop (turn to the right) and hold in this position.
- Insert toolholder (3) into the support (2). Do not release the toolholder.
- Let clamping lever (1) swivel back slowly (lever turns to the left).
- The toolholder (3) is clamped into the tool support (2) by the spring power.

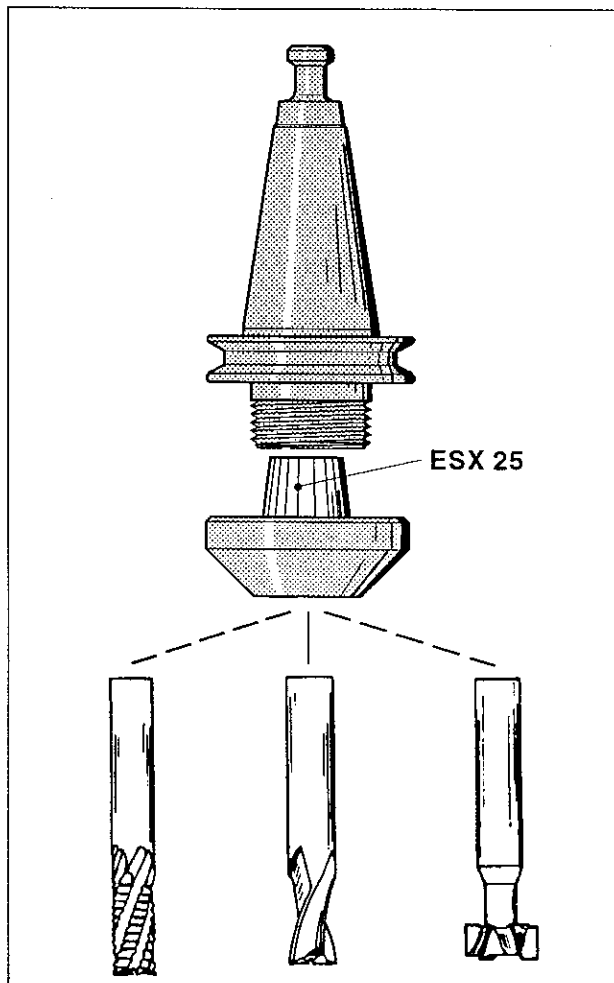
Note:

When mounting the toolholder clamping taper of the toolholders and inner cone of the tool support must be free of dirt and grease.



Dismounting the toolholder

- Hold fast toolholder (3).
- Pull forward clamping lever (1) (turn to the right) with the other hand.
- The toolholder (2) falls out of the tool support (2).



Collet holder

Collet holder

In the collet holder drills, end-milling cutters and profile cutters are clamped.

Order no. F1Z 010
Clamping range 1.5 up to 16 mm
Collet type ESX 25

Maintenance of collets and collet holders

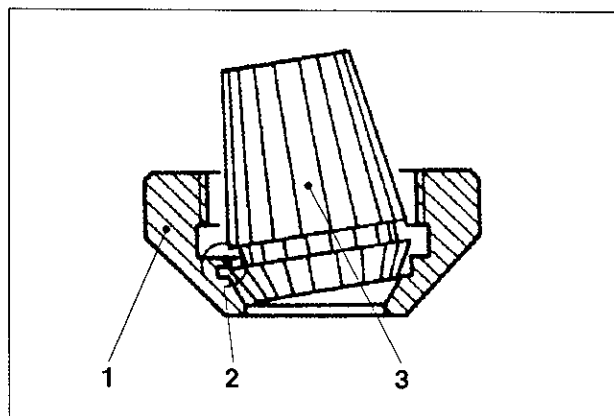
Note:

In case of insufficient maintenance dirt and chips may damage collet holder and collets. Thus, the round-run accuracy of the tool might be impaired.

The collet holders and the collets have to be cleaned carefully and oiled slightly before and after use.

Mounting the collets

- Loosen clamping nut (1).
- Insert collet (3) obliquely into the clamping nut (1) so that the eccentric ring (2) engages in the groove of the collet.
- Screw collet with clamping nut onto collet holder.



Mounting the collets

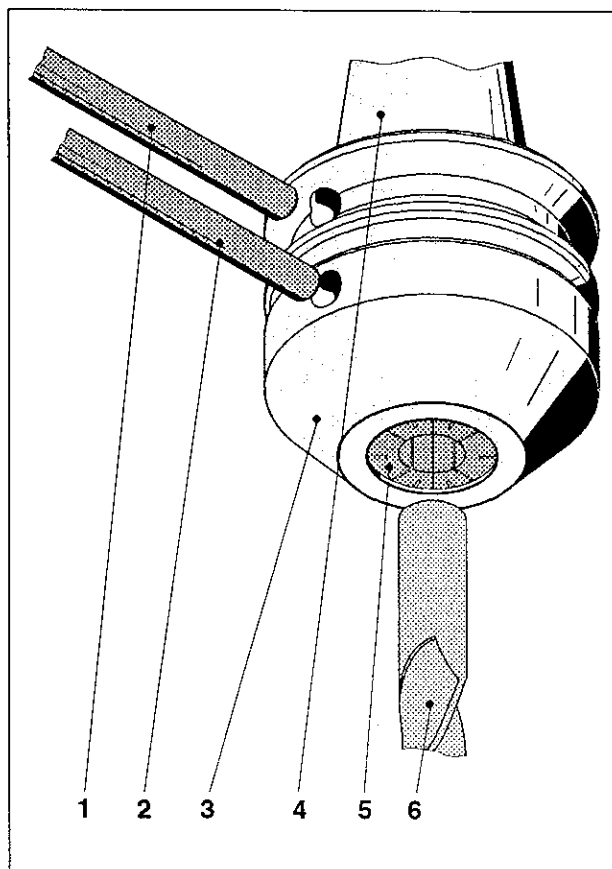
Danger:

Mounting and dismounting of the collet holders may only be carried out during machine standstill.



Dismounting the collets

- Loosen clamping nut (1).
- Via the eccentric ring (2) in the clamping nut the collet (3) is pressed out when screwing off the clamping nut.



Clamping the tools in the collet holder

Clamping the tools in the collet holder

- Mount adequate collet (5).
- Insert tool (6) into the collet (5).
Mind that the tool is pushed in far enough into the collet. When clamping too short the tool may be ejected from the device.
- Tighten clamping nut (3) with clamping pin (2). Countertighten the collet holder (4) with the second clamping pin (1).



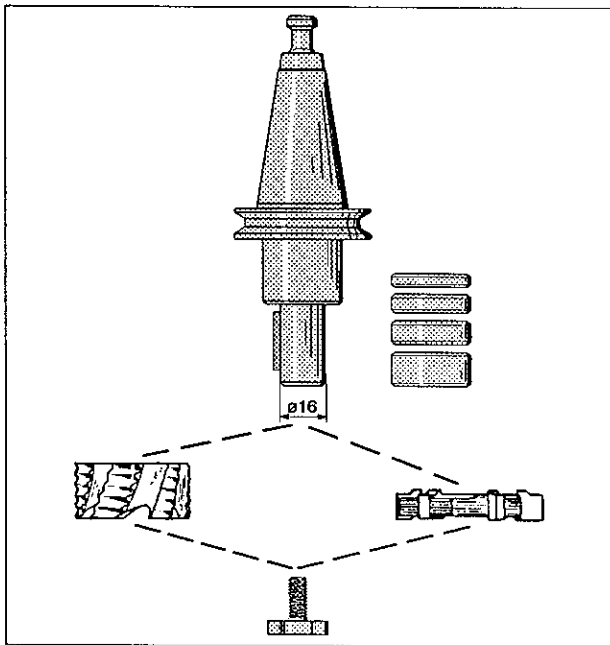
Danger:

- Clamping the tools may only be carried out during machine standstill.
- The "clamping ranges" indicated in the table must be complied with, otherwise the tools cannot be clamped safely.

Clamping ranges

The clamping ranges are engraved in the respective collet.

| Nominal diameter of the collet | Clamping range | |
|--------------------------------|----------------|-------------------|
| | [mm] | [inch] |
| 2.0 | 1.5-2.0 | 1/16-5/64 |
| 2.5 | 2.0-2.5 | 3/32 |
| 3.0 | 2.5-3.0 | 7/64 |
| 4.0 | 3.0-4.0 | 1/8-9/64-5/32 |
| 5.0 | 4.0-5.0 | 11/64-3/16 |
| 6.0 | 5.0-6.0 | 13/64-7/32-15/64 |
| 7.0 | 6.0-7.0 | 1/4-17/64 |
| 8.0 | 7.0-8.0 | 9/32-19/64-5/16 |
| 9.0 | 8.0-9.0 | 21/64-11/32 |
| 10.0 | 9.0-10.0 | 23/64-3/8-25/64 |
| 11.0 | 10.0-11.0 | 13/32-27/64 |
| 12.0 | 11.0-12.0 | 7/16-29/64-15/32 |
| 13.0 | 12.0-13.0 | 31/64-1/2 |
| 14.0 | 13.0-14.0 | 33/64-17/32-35/64 |
| 15.0 | 14.0-15.0 | 18/32-38/64 |
| 16.0 | 15.0-16.0 | 19/32-39/64-10/16 |

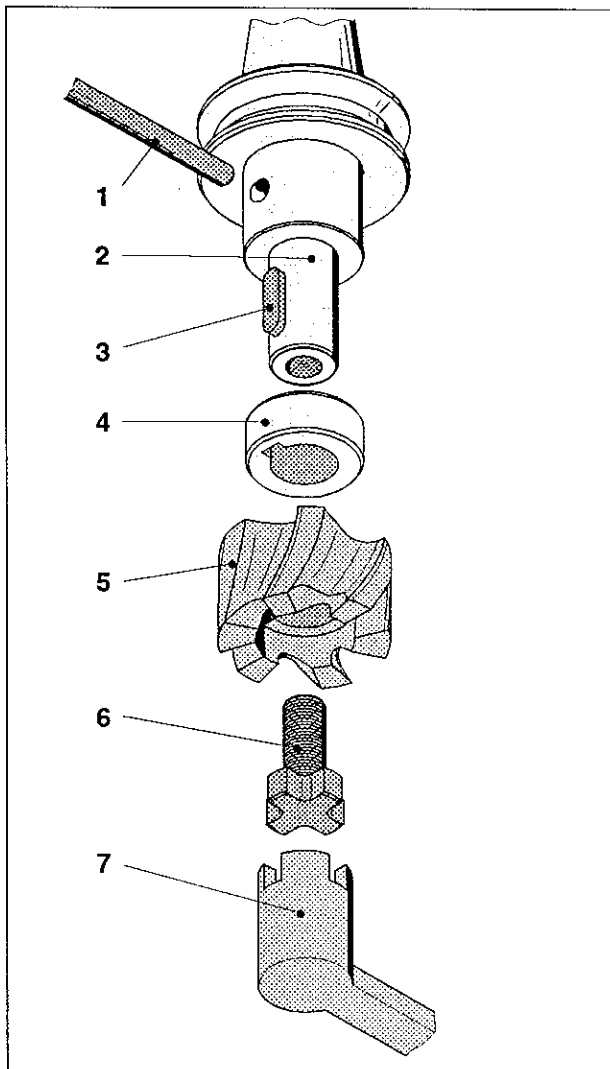


Milling spindle

Milling spindle

In the milling spindle shell end mills, disk milling cutters and circular saw blades are clamped. With the milling spindle collars are supplied for compensating the milling cutter width and a wrench for tightening the screw.

Order no. F1Z 020
Tool support shaft ø16 mm



Clamping the tools in the milling spindle

Clamping the tools in the milling spindle

Danger:



- Clamping the tools may only be carried out during machine standstill.
- Only tools with a bore of ø16 mm and square key groove may be clamped.

- Unscrew screw (6).
- If necessary, mount adequate collar (2) on the collar shaft (2).
Take care of the square key (3).
- Mount (5) tool on the shaft (square key).
- Screw screw (6) into the shaft and tighten with the wrench (7).
Countertighten the milling spindle with the clamping pin (1).

Tap holder

Because of the tap holder with integrated length compensation it is possible to tap.

Three different tap holders are offered:

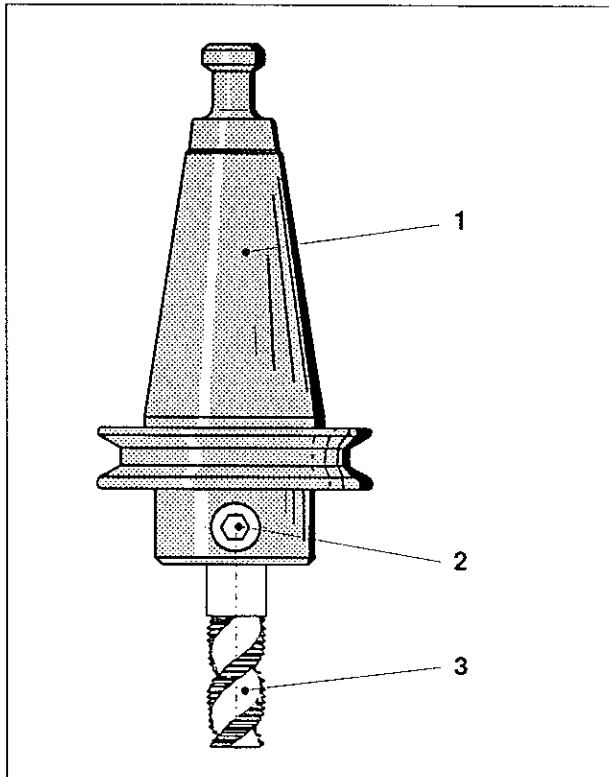
Order -No.:

Tap holder M3 F1Z 260

Tap holder M4 F1Z 270

Tap holder M5, M6, M8 F1Z 280

Length compensation ± 6 mm



Mounting of the tap

Clamping tools in the tap holder

Danger:



- Clamping the tools in the tap holder may only be carried out during machine standstill!
- Only taps may be clamped in the tap holder, which are designated clearly for the used tap holder!

- Loosen thread pin (2) with the hexagonal key (wrench size 2,5).
- Put in tap (3) into the seat of the holder (1) and turn it in a way, that the square of the tap gears into the square of the holder
- Tighten thread pin (2) to fix the tap (3).

Engraving spindle

Order-no..... **F1Z 590**

In cause of the gear ratio to a very high spindle-speed, engraving works are possible.

Technical data

Spindle speed max. 18 000 rpm
 gear ratio..... $i = 1:5$
 clamping diameter for tools max. $\varnothing 3$ mm
 clamping system collets

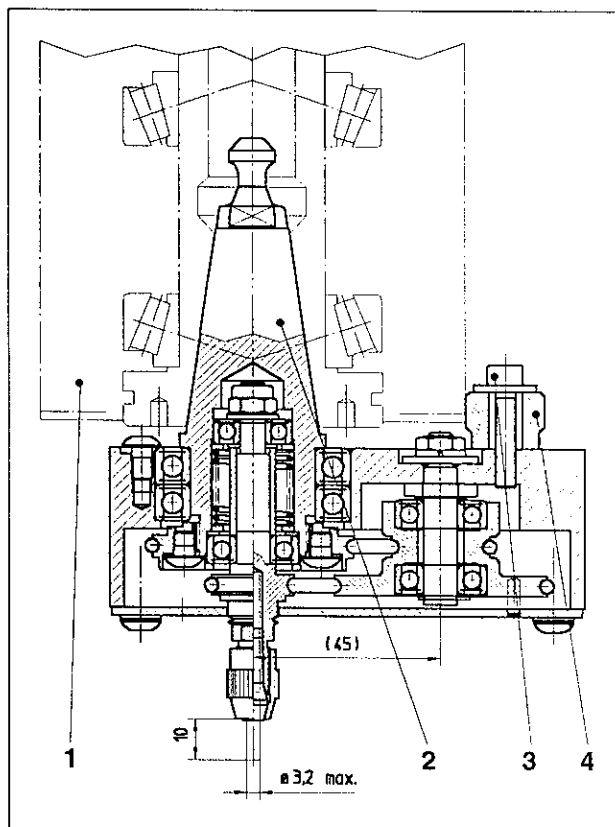
Range

Engraving

Qualified for aluminium, nonferrous metals, plastics and hardwood

Boring

Aluminium, nonferrous metals max. $\varnothing 2$ mm



Engraving Spindle

Danger:



The engraving spindle may not be used for milling-works!
 Otherwise the spindle and the tool would be damaged, and persons could be hurt!

Mounting

Danger:



• Mounting and dismounting the engraving spindle may only be carried out during machine standstill.

- Loosen the socket head screw(3).
- Mount the spindle shaft (2) in the main spindle.
- Press the twisting safety device (4) against the spindlestock (1) and clamp the screw (3).

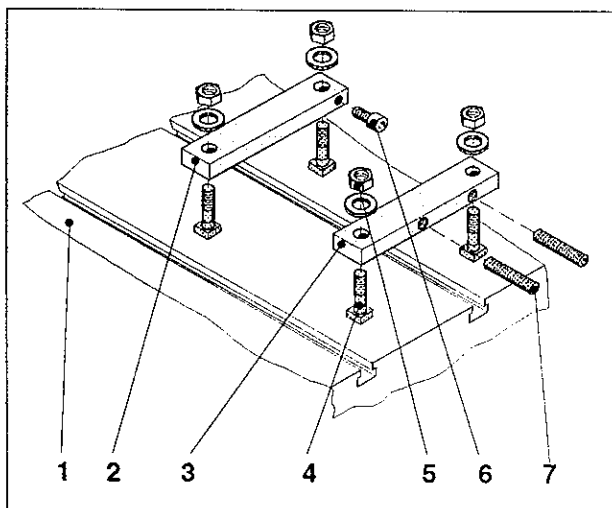
Clamping the Workpieces

Clamping rails

Order-No. F1Z 060

Mounting the clamping rails

- Thread in slot screws (4) at the milling table (1) and screw down clamping rails (2) and (3) with the nuts SW13 (5).
- Before tightening align clamping rails by means of a stop square rectangularly to the milling table.



Mounting the clamping rails

Clamping the workpieces

- Put workpiece between the clamping rails. The clamping rail (2) and the cheese head screw (6) serve as stop.
- Clamp workpiece with the two locking screws SW6 (7).



Danger:

- Clamping of the workpieces and the collets on the milling table may only be carried out during machine standstill.
- The workpieces must be clamped tightly and safely.
- The admissible clamping ranges must always be complied with..

The machine vice

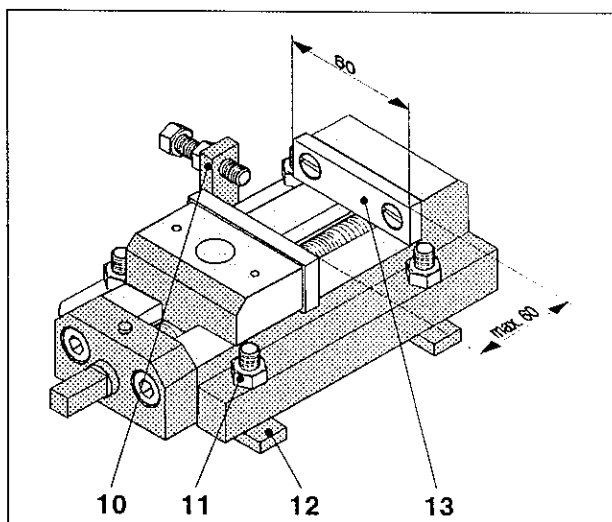
The machine vice is provided with exchangeable clamping jaws (13) and a stop (10).

The stop (10) is mounted laterally on the vice with a hexagon screw SW10.

Order no. F1Z 310

Jaw width 60 mm

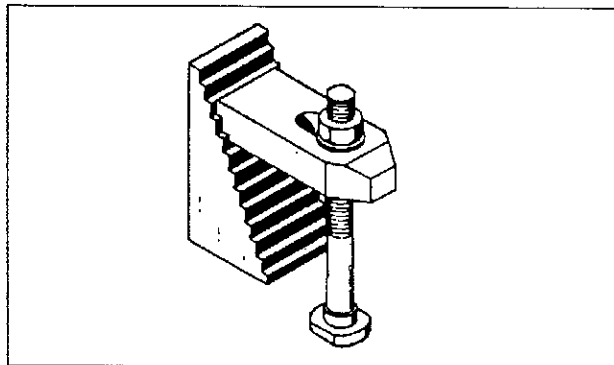
Clamping width max. 60 mm



Machine vice

Mounting the machine vice

- Thread in sliding blocks (12) into the T-slots on the milling table.
- Align vice by means of a stop square rectangularly to the milling table.
- Clamp down vice tightly and safely by means of all 4 hexagon nuts SW13 (11).



Incremental strap

Incremental straps

Incremental straps are suitable for clamping irregular and high workpieces.

For clamping a workpiece at least 2 incremental straps are required.

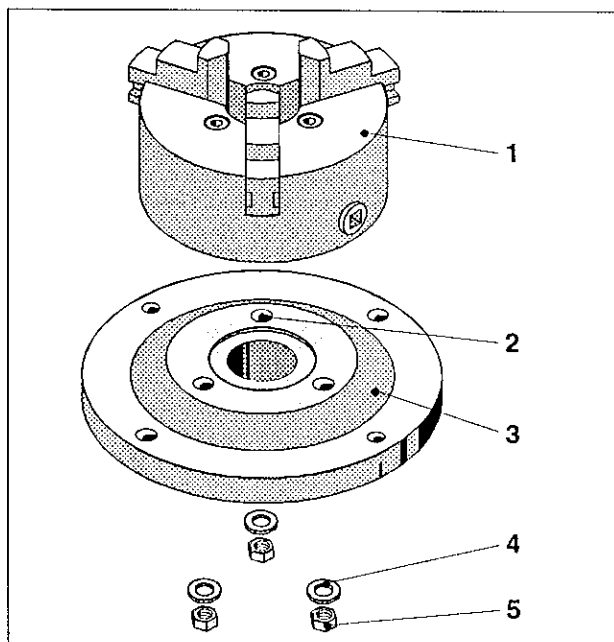
Order no. C3Z 300

Clamping height 60 mm

Danger:



Clamping and releasing the workpieces with incremental straps may only be carried out during machine standstill.



Mounting the chuck

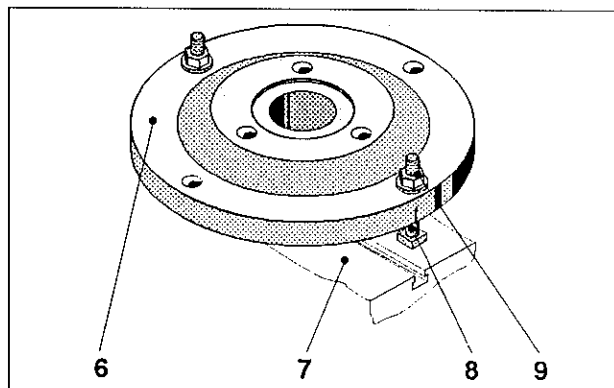
Support flange

Order no. B4Z 250

The support flange (3) is used for the support of the 3- and the 4-jaw chuck as well as the clamping plate. It is mounted on the milling table.

Mounting the chuck on the support flange

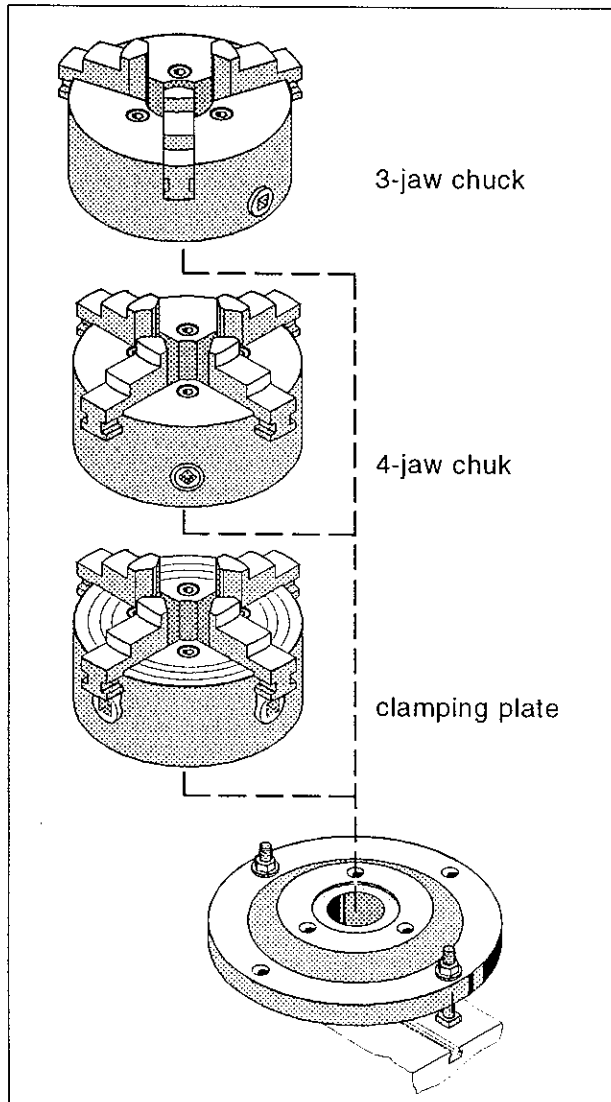
- Insert chuck (1) with the mounted clamping bolts into the support bores (2) of the support flange (3).
- Thread washers (4) and nuts (5) on clamping bolts of the chucks and tighten nuts SW13 (5).



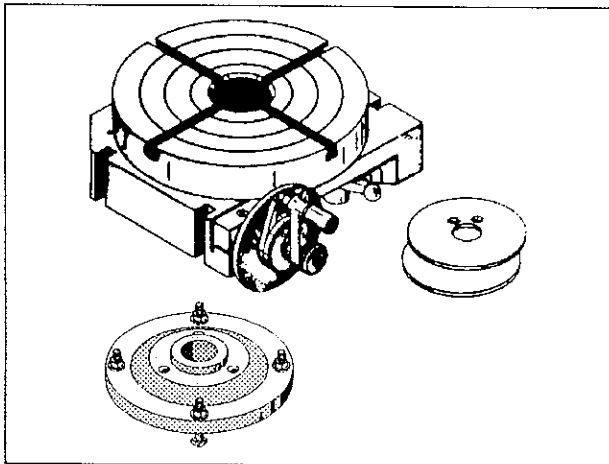
Mounting the support flange

Mounting the support flange on the milling table

- Thread in support flange (6) with both T-slot screws 15 x 4,5 (8) on the milling table (7).
- Tighten clamping nuts SW13 (9).



Chucks



Dividing head with Intermediate flange

Chucks

Also mind the instruction enclosed in the respective chuck.

3-jaw chuck

Order no. V1C 326
Serves for centre clamping of round, hexagonal and twelve-sided workpieces.

4-jaw chuck

Order no. V1C 328
Serves for centre clamping of round, four-sided and eight-sided workpieces.

Clamping plate

Order no. P3E 324
With the clamping plate workpieces can be clamped centrally and eccentrically. Each jaw can be adjusted and reversed individually.

Dividing head

Order-No. 745 000

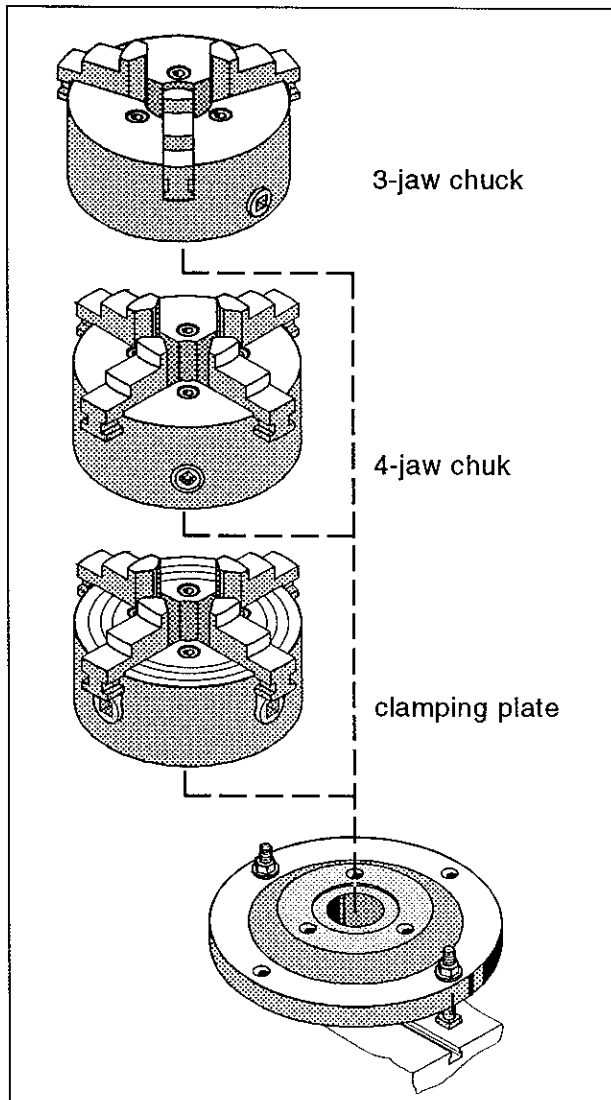
Dividing head with table $\varnothing 150$ mm and indexing disks.

For manufacturing gears, squares, hexagons, etc.

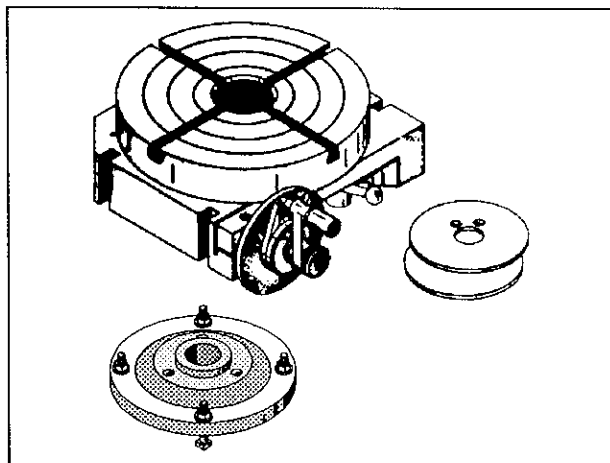
Intermediate flange

Order-No. B4Z 170

Necessary to mount chucks and clamping plate on the dividing head.



Chucks



Dividing head with Intermediate flange

Chucks

Also mind the instruction enclosed in the respective chuck.

3-jaw chuck

Order no. V1C 326
Serves for centre clamping of round, hexagonal and twelve-sided workpieces.

4-jaw chuck

Order no. V1C 328
Serves for centre clamping of round, four-sided and eight-sided workpieces.

Clamping plate

Order no. P3E 324
With the clamping plate workpieces can be clamped centrally and eccentrically. Each jaw can be adjusted and reversed individually.

Dividing head

Order-No. 745 000

Dividing head with table $\varnothing 150$ mm and indexing disks.

For manufacturing gears, squears, hexagons, etc.

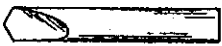

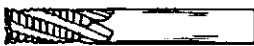

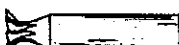







Intermediate flange

Order-No. B4Z 170

Necessary to mount chucks and clamping plate on the dividing head.

Tools

All listed tools are to be ordered by EMCO with the given Order-Numbers.

| Description | | Order No. |
|---|---|-----------|
|  | NC-start drill (HSS) | |
| | shank-ø 10mm, acute angle 120° | 771 010 |
|  | Slot milling cutter (HSS) according to DIN 327, form B | |
| | milling-ø 3mm, shank-ø 6mm | 764 301 |
| | milling-ø 4mm, shank-ø 6mm | 764 302 |
| | milling-ø 5mm, shank-ø 6mm | 764 303 |
| | milling-ø 6mm, shank-ø 6mm | 764 304 |
| | milling-ø 8mm, shank-ø 8mm | 764 306 |
| | milling-ø 10mm, shank-ø 10mm | 764 308 |
| | milling-ø 12mm, shank-ø 12mm | 773 300 |
|  | Heavy duty shank cutter (HSS) acc. to DIN 844, form A | |
| | milling-ø 8mm, shank-ø 8mm | 764 200 |
| | milling-ø 10mm, shank-ø 10mm | 781 152 |
| | milling-ø 12mm, shank-ø 12mm | 781 151 |
| | milling-ø 16mm, shank-ø 16mm | 771 020 |
|  | Radius milling cutter (HSS) | |
| | shank-ø 6mm | 771 030 |
| | shank-ø 12mm | 771 040 |
|  | Angle milling cutter (HSS) acc. To DIN 1833, form A, 60° | |
| | milling-ø 16mm, shank-ø 12mm | 764 400 |
|  | Angle milling cutter (HSS) acc. To DIN 1833, form B, 45° | |
| | milling-ø 16x4mm, shank-ø 12mm | 771 050 |
|  | Boring bar | |
| | for bores ø16-40mm, shank-ø 15mm | F1Z 050 |
|  | Edge indicator | |
| | ø4/ø10mm, shank-ø 10mm | F1Z 090 |
|  | Taps | |
| | Set of 5 taps M3-M8 | 781 300 |
|  | Drills | |
| | Set of 25 drills for core holes | 271 230 |
|  | Heavy duty shell end mill (HSS), bore ø16mm | |
| | ø40x20mm, bore ø16mm with roughing-/ finishing teeth | 764 410 |
|  | Staggered tooth side mill (HSS), bore ø16mm | |
| | ø35x5mm | 764 900 |
| | ø50x6mm | 764 910 |

Determination of the speed S during milling and drilling

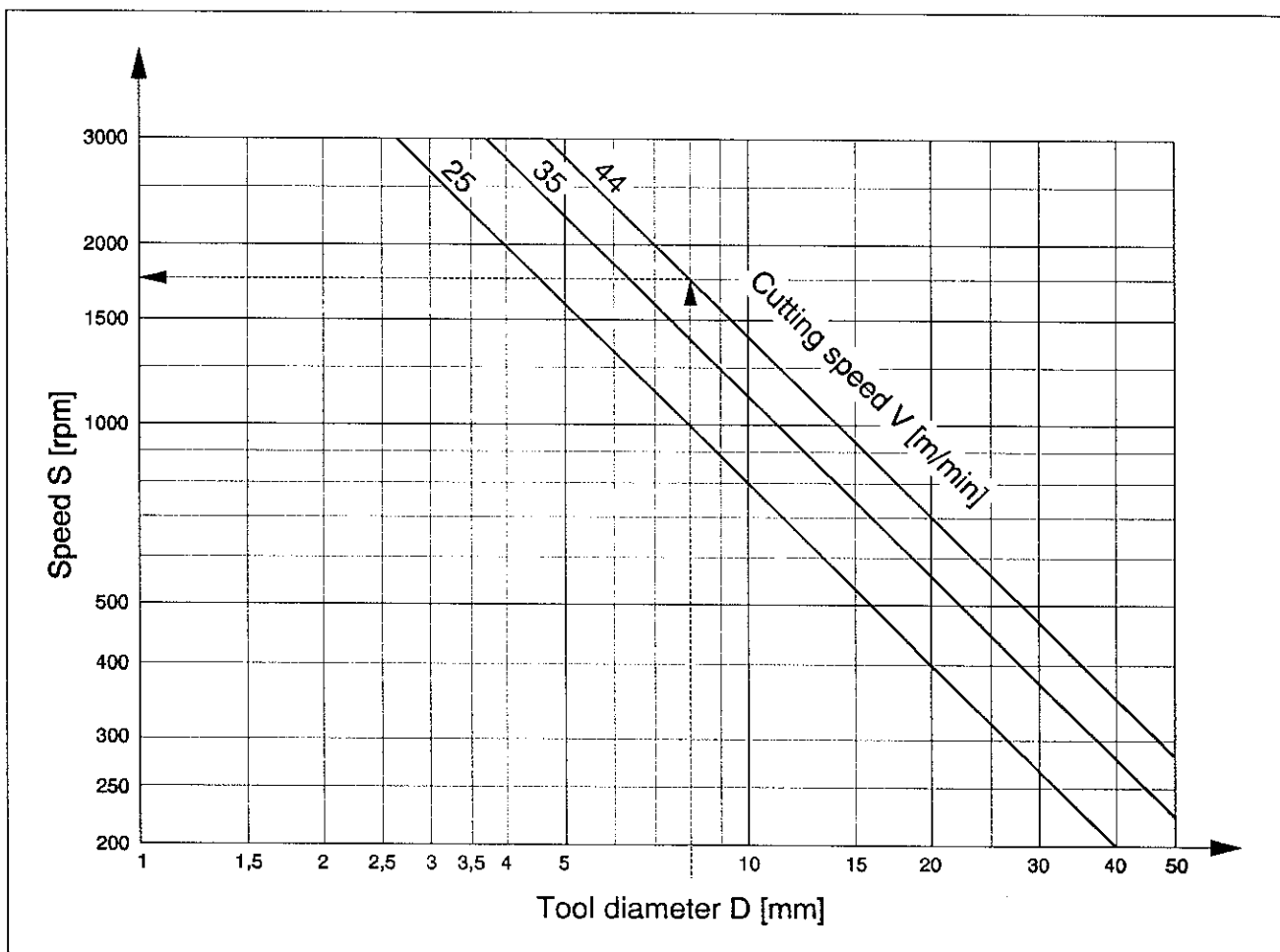
Example:

You know:

- tool diameter $D = \varnothing 8 \text{ mm}$
- cutting speed $V = 44 \text{ m/min}$

You want to know:

- speed S in [rpm]



Determination of the speed

Solution:

speed $S = 1750 \text{ rpm}$

Determination of the cutting depth t during milling

Example:

You know:

- workpiece material Torradur B
- diameter of milling cutter $D = \varnothing 12 \text{ mm}$
- feed speed $F = 70 \text{ mm/min}$

You want to know:

- cutting depth t in [mm]

Determination of the feed speed F during milling

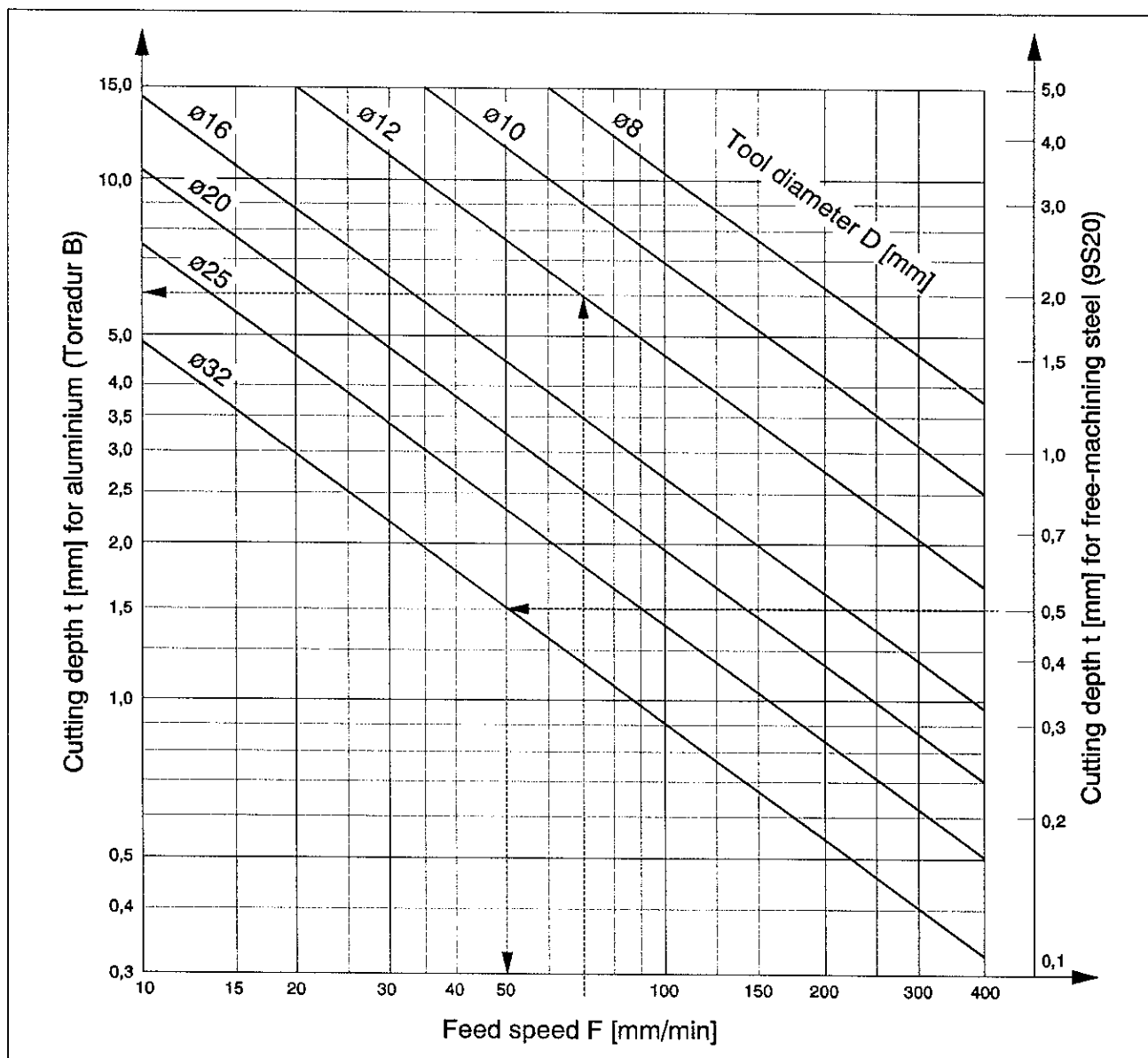
Example:

You know:

- workpiece material free-machining steel 9S20
- diameter of the milling cutter $D = \varnothing 32 \text{ mm}$
- cutting depth $t = 0,5 \text{ mm}$

You want to know:

- feed speed F in [mm/min]



Milling - determination of the cutting depth t and the feed speed F

Solution:

cutting depth $t = 6 \text{ mm}$

Solution:

feed speed $F = 50 \text{ mm/min}$

Determination of the feed speed F during drilling

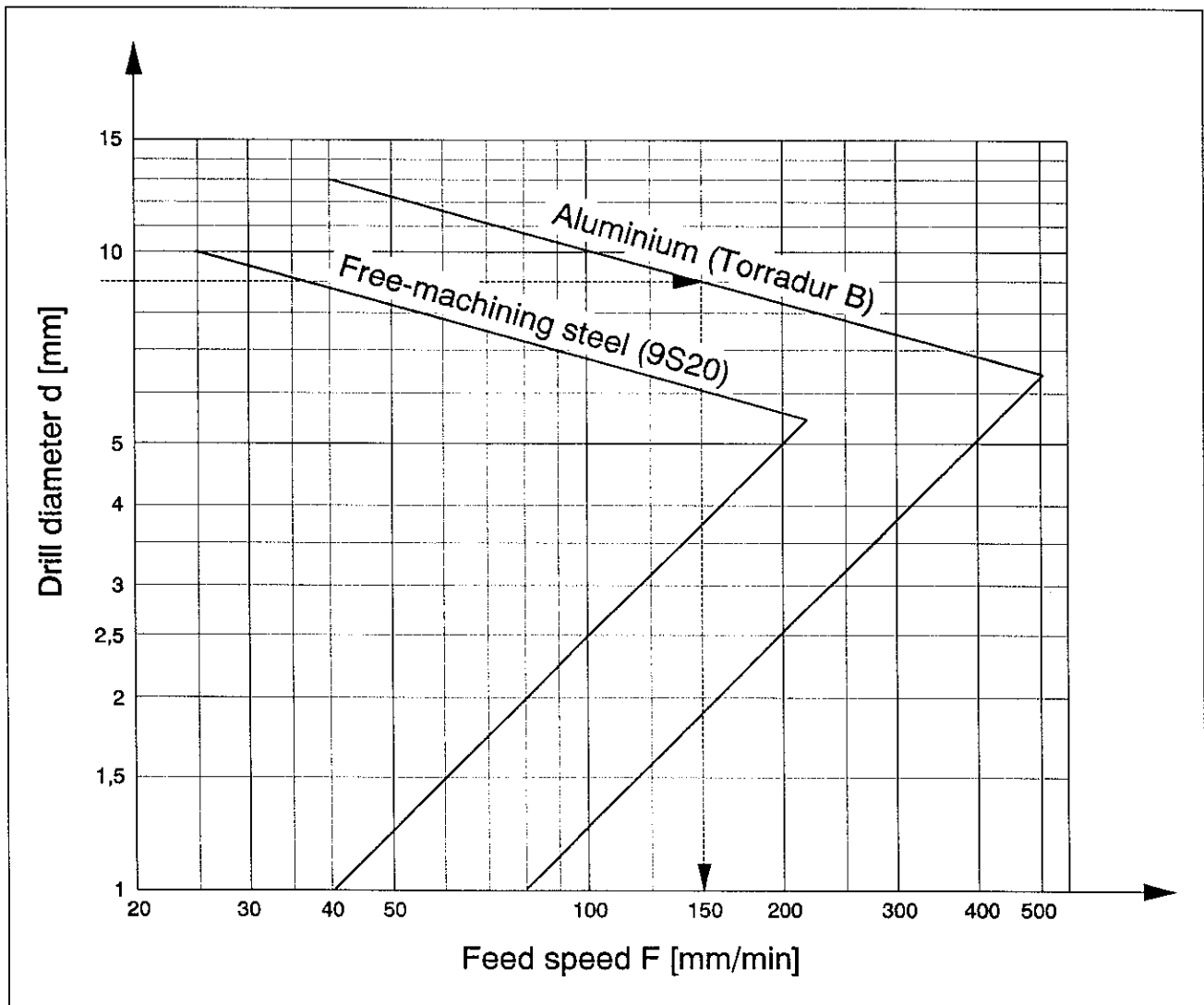
Example:

You know:

- workpiece material..... Torratur B
- diameter of drill $D = \varnothing 9 \text{ mm}$

You want to know:

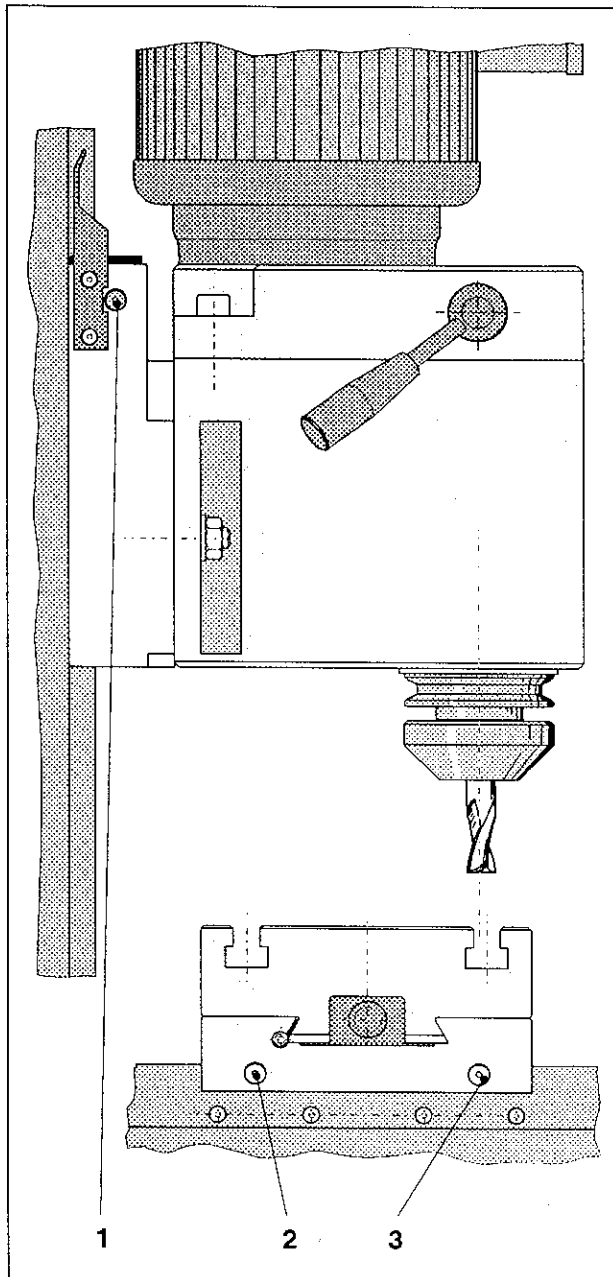
- Feed speed F in [mm/min]



Drilling - Determination of the feed speed

Solution:

feed speed $F = 150 \text{ mm/min}$



Lubricating nipples at the machine

Maintenance of the machine

Danger:

All adjustment and maintenance work may only be carried out with the machine switched off.



Clean the machine carefully from chips and other dirt after each operation.

Note:

Never clean the machine with compressed air since chips get jammed in the guides and thus could cause damages at the guides.



Slightly oil the milling table and the blank guides every day with slideway oil.

The guideways are supplied daily with slideway oil via the lubricating nipples (1), (2) and (3).

Main spindle bearing and ball screws of the slide guides are maintenance-free.

DIN

**CGLP
68**

51502

Slideway oil

DIN designation: CGLP DIN 51 502 ISO VG 68

e.g.:

BP Maccurat 68
 CASTROL Magnaglide D 68
 ESSO Febis K 68
 KLÜBER Lamora Super Pollad 68
 MOBIL Vactra No. 2

Ersatzteilliste EMCO PC MILL 55

Service parts for EMCO PC MILL 55

Pièces de service pour EMCO PC MILL 55

Ausgabe 99-11
Edition 99-11

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| 2 | Werkzeuge | Tools | Outils |
| 3 | Tischspannleisten | Table clamping gibs | Lardon de serrage |
| 4 | Kreuzschlitten | Cross slide | Chariot transversal |
| 6 | Vertikalschlitten | Vertical slide | Chariot vertical |
| 8 | Fräskopf | Milling head | Tête de fraisage |
| 10 | Blechaufbau / Tür | Sheet metal assembly/Door compl. | Assemblage en tôle/Ens. Porte |
| 12 | Blechaufbau E-Kasten | Assembly switch cabinet | Assemblage du montant de boîte electr. |
| 13 | Supportflansch | Cross slide adapter | Bride de chariot |
| 14 | Teilapparat | Dividing head | Appareil diviseur |
| 16 | Plotter | Plotter | Traceur de courbes |
| 17 | Mechanischer Schraubstock | Manual vice | Étau-machine mécanique |
| 18 | Werkzeughalter | Tool holder | Porte outils |
| 19 | 3- und 4 Backenfutter | 3- And 4 jaw chuck | Mandrin à 3- et 4 mors |
| 20 | Planscheibe mit 4 Backen | 4-jaw independent chuck | Plateau de tour à 4 mors |
| 21 | Pneumatikrüstung | Pneumatic equipment | Équipement pneumatique |
| 22 | Elektr. Schraubstock | Electric vice | Etau-machine électrique |
| 24 | Gravierspindel | Graving spindle | Broch de graveur |
| 26 | Türautomatik | Automatic door | Porte automatique |
| 27 | Maschinenleuchte | Machine lamp | Lampe machine |
| 29 | Elektrische und elektronische Teile | Electrical and electronical parts | Pieces électriques et électroniques |

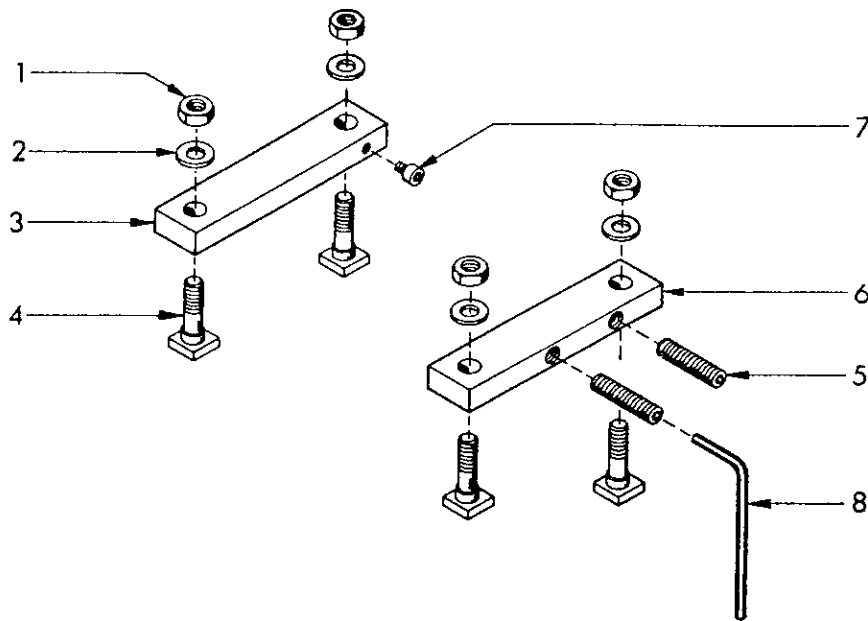


In dieser Neuauflage sind alle veränderten bzw. neuen Positionen grau markiert.
Changed resp. new positions are marked grey in this new edition.
Positions changées sont maquées en gris dans cette nouvelle édition.

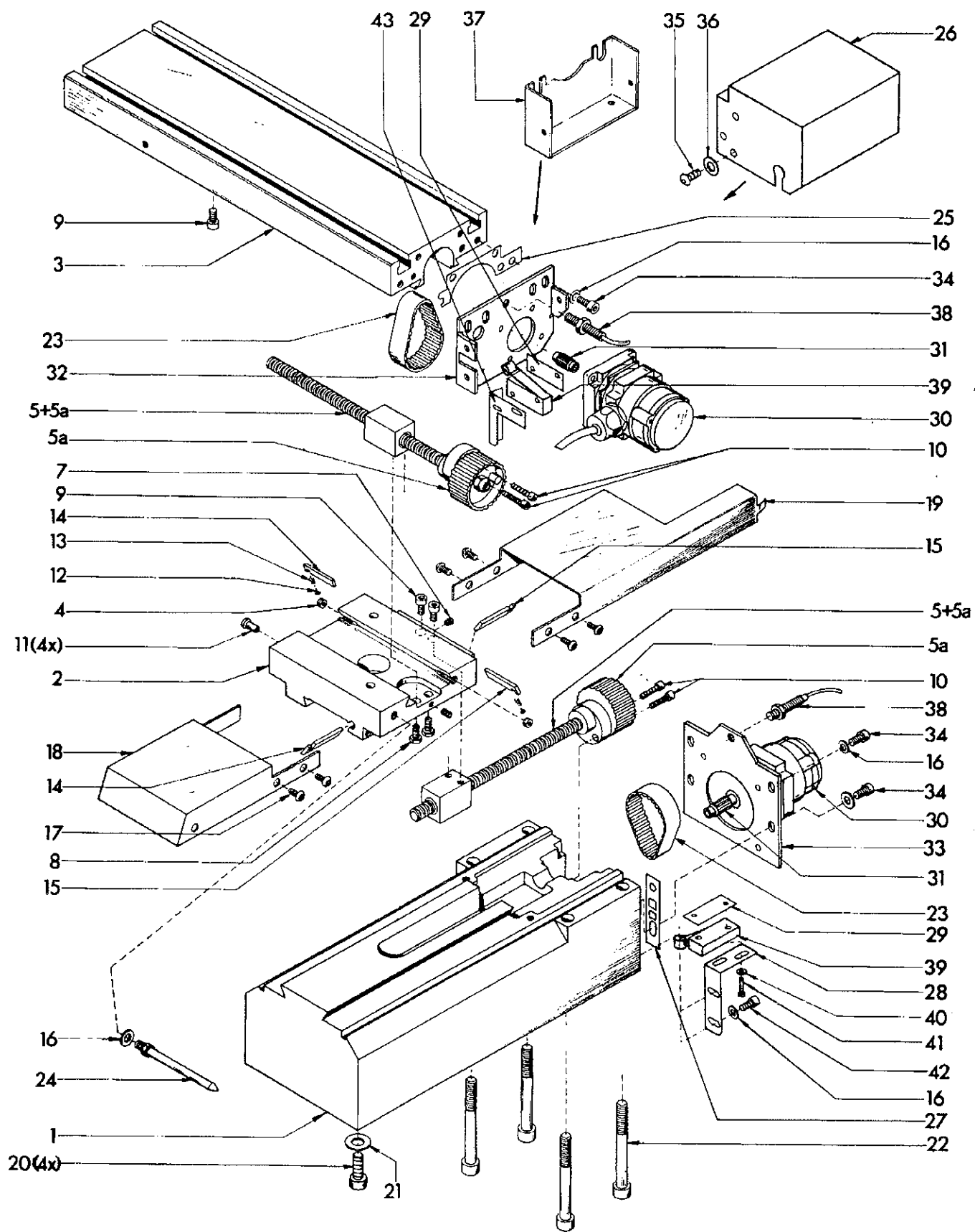
emco

EMCO MAIER Gesellschaft m.b.H. – Postfach 131 – A-5400 Hallein/Austria – Tel. (06245) 891 – Fax (06245) 86965

| Pos. | Ref.No. | DIN | Type | Benennung | Description | Designation |
|------|-------------|-----------------|------|-------------------------|----------------------|--------------------|
| | | | | Werkzeuge | Tools | Outils |
| | ZWZ 993 010 | T18012 SPMST | | Stoßfettpresse | Grease gun | Pompe de graissage |
| | F1A 190 000 | | | Gleitölf flasche | Oil bottle | Bouteille de huile |
| | ZST 110 710 | 6 h11x100 DIN 7 | | Zylinderstift | Parallel pin | Tige de serrage |
| | ZWZ 95 1310 | | | Doppelmaulschlüssel | Double ended spanner | Clé plate double |
| | ZWZ 11 0250 | SW 2,5 DIN 911 | | Innensechskantschlüssel | Hexagonal key | Clé à six pans |
| | ZWZ 11 0300 | SW 3 DIN 911 | | Innensechskantschlüssel | Hexagonal key | Clé à six pans |
| | ZWZ 11 0400 | SW 4 DIN 911 | | Innensechskantschlüssel | Hexagonal key | Clé à six pans |



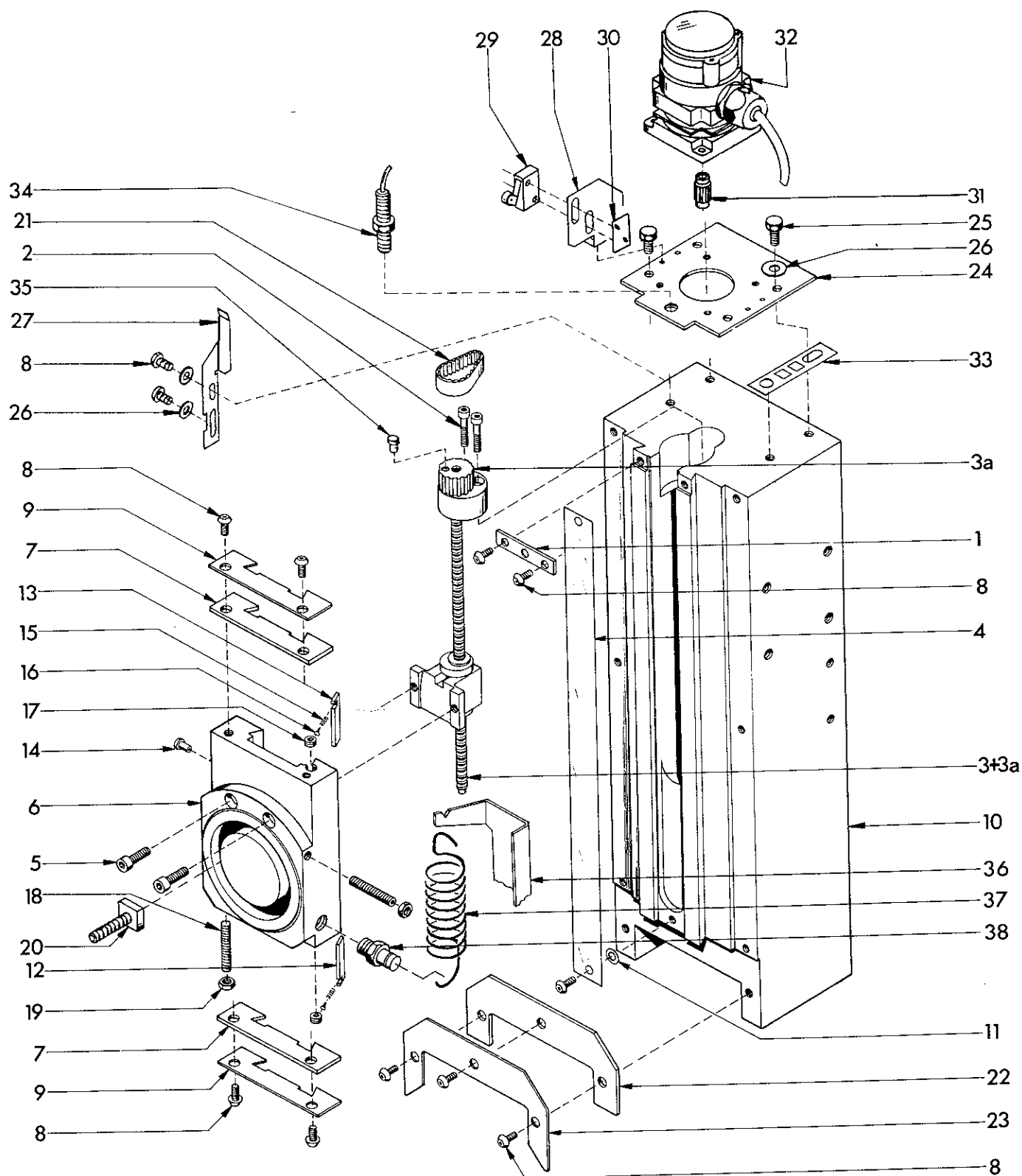
| Pos. | Ref. No. | Type | | Benennung | Description | Designation |
|------|----------------|------------------|--|--------------------------------|----------------------------------|--------------------------|
| | 783 100 | F1Z 060 | | Gruppe Tischspannleiste | Table clamping gib compl. | Barres de serrage |
| 1 | ZMU 34 0800 | M8 DIN 934-6 | | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |
| 2 | ZSB 25 0840 | B8,4 DIN 125 | | Scheibe | Washer | Rondelle |
| 3 | F1Z 060 010 | | | Anschlagleiste | Stop gib | Barres de butée |
| 4 | C4Z 030 020 | | | Nutenschraube | T-nut bolt | Boulon en T |
| 5 | ZSR 99 0003 | M8x35 | | Stiftschraube | Set screw | Vis pointeau |
| 6 | F1Z 060 020 | | | Spannleiste | Clamping gib | Barres de serrage |
| 7 | ZSR 12 0506 | M5x6 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 8 | ZWZ 11 0400 | SW4 DIN 911 | | Schraubendreher | Hexagonal key | Clé à six pans |



| Pos. | Ref.No. | DIN | | Benennung | Description | Designation |
|------|--------------------|---------------------|------------|--------------------------|---------------------------|---------------------------------|
| 15 | F1L 030 001 | | | G. Kreuzschlitten | Cross slide compl. | Ens. Chariot transversal |
| 1 | F1A 030 011 | | | Sockel | Base | Socle |
| 2 | F1L 030 020 | | | Kreuzschlitten | Cross slide | Chariot transversal |
| 3 | F1A 030 030 | | | Frästisch | Milling table | Table de fraisage |
| 4 | F1A 020 070 | | | Stellschraube | Adjusting screw | Vis de réglage |
| 5+5a | F1L 031 000 | | | X/Y-Spindel komplett | X/Y-spindle complete | Ens. vis-mère X/Y |
| 5a | F1A 020 130 | | | Riemenscheibe 40 | Pulley 40 | Poulie 40 |
| 7 | ZST 130 404 | M4x4 DIN 913-45H | | Gewindestift | Set screw | Vis pointeau |
| 8 | ZSR 340 616 | M6x16 DIN 933-8.8 | | Sechskantschraube | Hexagon head screw | Vis hexagonal |
| 9 | ZSR 120 612 | M6x12 DIN 912-8.8 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 10 | ZSR 120 525 | M5x25 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 11 | ZNP 012 000 | A2 | | Schmiernippel | Grease nipple | Graisseur |
| 12 | ZNA 760 204 | 2,0x4 DIN 1476-4.6 | | Kerbnagel | Rivet | Clou cannelé |
| 13 | ZFD 204 061 | D-061 | | Druckfeder | Compression spring | Ressort de pression |
| 14 | F1A 020 050 | 4,68 mm | | Keilleiste kurz links | Taper gib short left | Lardon conique à gauche |
| | F1A 020 060 | 4,55 mm | | Keilleiste lang links | Taper gib long left | Lardon conique à gauche |
| 15 | F1A 020 110 | 4,68 mm | | Keilleiste kurz rechts | Taper gib short right | Lardon conique à droite |
| | F1A 020 120 | 4,55 mm | | Keilleiste lang rechts | Taper gib long right | Lardon conique à droite |
| 16 | ZSB 250 640 | B6,4 DIN 125 ST | | Scheibe | Washer | Rondelle |
| 17 | ZSR 880 610 | M6x10 -10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 18 | F1L 000 010 | | | Schutzblech 1 | Cover sheet 1 | Tôle de protection 1 |
| 19 | F1L 000 021 | | | Schutzblech 2 | Cover sheet 2 | Tôle de protection 2 |
| 20 | ZSR 121 020 | M10x20 DIN 912-8.8 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 21 | ZSB 251 050 | B10,5 DIN 125-St | | Scheibe | Washer | Rondelle |
| 22 | ZSR 121 090 | M10x90 DIN 912-10.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 23 | ZRM 525 600 | 600 MXL 050 | | Zahnriemen | Timing belt | Courroie crantée |
| 24 | F1L 000 620 | | | Schaltstift | Switching bolt | Boulon de mise au point |
| 25 | F1L 000 630 | | | Distanzblech X | Spacer sheet metal X | Tôle d'espacement |
| 26 | F1C 000 430 | | | Abdeckung X | Cover X | Couvercle X |
| 27 | F1L 000 650 | | | Distanzblech Y | Spacer sheet Y | Tôle d'écartement Y |
| 28 | F1L 000 640 | | | Endschalterblech Y | Support sheet Y | Tôle de support |
| 29 | A6L 000 350 | | | Gewindeblech | Thread sheet metal | Tôle de filetage |
| 30 | ZMO 780 030* | VDRM 564-50LN | Bergerlahr | Schrittmotor X,Y,Z | Step motor X,Y,Z | Moteur pas à pas X,Y,Z |
| | ZMO 780 031** | VRDM366/50LHA | | Schrittmotor X, Y, Z | Step motor X, Y, Z | Moteur pas à pas X, Y, Z |
| 31 | F1L 621 010* | | | Riemenscheibe 20 | Pulley 20 | Poulie 20 |
| | A6P 090 000** | | | Riemenscheibe 20 | Pulley 20 | Poulie 20 |
| 32 | F1L 000 150* | | | Motorplatte X | Motor plate X | Plaque de moteur X |
| | F1C 000 150** | | | Motorplatte X | Motor plate X | Plaque de moteur X |
| 33 | F1L 000 160* | | | Motorplatte Y | Motor plate Y | Plaque de moteur Y |
| | F1C 000 160** | | | Motorplatte Y | Motor plate Y | Plaque de moteur Y |
| 34 | ZSR 120 616 | M6x16 DIN 912 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 35 | ZSR 880 510 | M5x10-8.8 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 36 | ZSB 210 530 | B5,3 DIN 125-St | | Scheibe | Washer | Rondelle |
| 37 | F1C 000 140 | | | Riemenschutz | Belt protection | Protection de courroie |
| 38 | ZEL 212 022 | 1200mm lg. | | Näherungsschalter | Proximity dedector | Initiateur inductiv |
| 39 | ZEL 239 002 | MILTAC | | Schnappschalter | Quick break switch | Interrupteur instantané |
| 40 | ZSB 210 320 | A3,2 DIN 9021-ST | | Scheibe | Washer | Rondelle |
| 41 | ZSR 840 316 | M3x16 DIN 84-4.8 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 42 | ZSR 120 612 | M6x12 DIN 912-8.8 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 43 | F1L 621 020 | | | Endschalterblech X | Limit switch sheet X | Tôle d'commutateur X |

*) für Maschinen bis Maschinenummer F1C M2 025

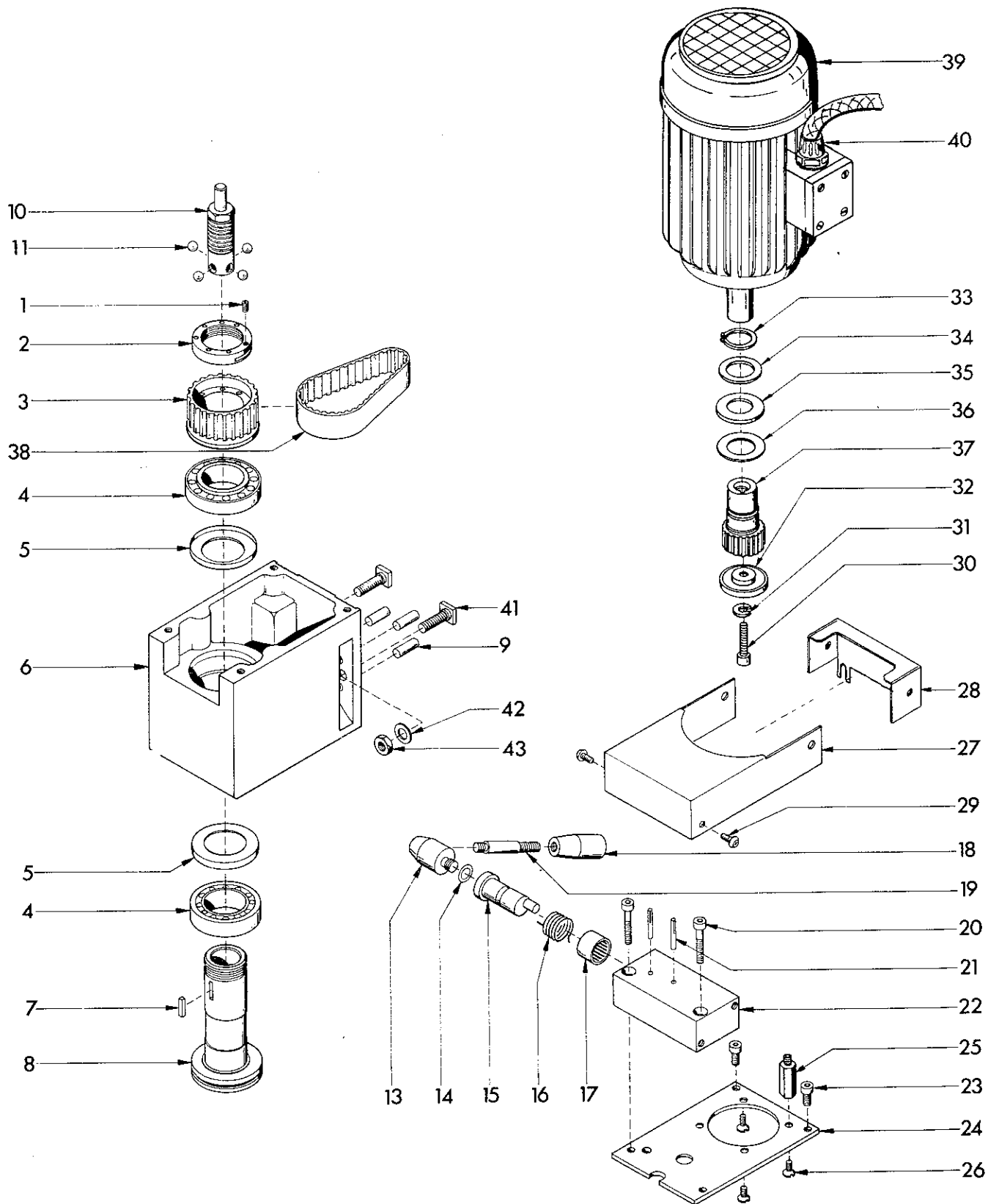
**) für Maschinen ab Maschinenummer F1C M6 001



| Pos. | Ref.No. | DIN | | Benennung | Description | Designation |
|-------------|--------------------|-------------------|---------|-----------------------------|-------------------------------|---|
| 1-20 | F1L 020 000 | | | G. Vertikalschlitten | Vertical slide compl. | Ens. chariot vertical |
| 1 | F1A 020 040 | M5x25 DIN912-6.9 | | Halteblech | Clamping sheet | Tôle d'arrêt |
| 2 | ZSR 120 525 | | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 3+3a | F1L 021 000 | | | Z-Spindel komplett | Z-spindle complete | Ens vis-mère Z |
| 3a | F1A 020 130 | | | Riemenscheibe 40 | Pulley 40 | Poulie 40 |
| 4 | F1A 020 030 | M6x20 DIN912-6.9 | | Schutzband | Protection strip | Bande de protection |
| 5 | ZSR 120 620 | | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 6 | F1L 020 020 | | | Vertikalschlitten | Vertical slide | Chariot vertical |
| 7 | F1A 020 080 | | | Abstreiffilz | Feltwiper | Feutre racleur |
| 8 | ZSR 880 610 | M6x10-6.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 9 | F1A 020 090 | | | Abstreifblech | Wiper plate | Tôle racleur |
| 10 | F1A 020 010 | | | Vertikalsäule | Vertical column | Colonne verticale |
| 11 | ZSB 120 605 | | | Paßscheibe | Shim ring | Rondelle d'ajustage |
| 12 | F1A 020 050 | PS6x12x0,5 DIN988 | 4,68 mm | Keilleiste | Taper gib | Lardon conique |
| | F1A 020 060 | | 4,55 mm | Keilleiste | Taper gib | Lardon conique |
| 13 | F1A 020 110 | | 4,68 mm | Keilleiste | Taper gib | Lardon conique |
| | F1A 020 120 | | 4,55 mm | Keilleiste | Taper gib | Lardon conique |
| 14 | ZNP 012 000 | A2 | | Schmiernippel | Grease nipple | Graisseur |
| 15 | ZFD 204 061 | D-061 | | Druckfeder | Compression spring | Ressort de pression |
| 16 | ZNA 760 204 | 2x4 DIN 1476-4.6 | | Kerbnagel | Rivet | Clou cannelé |
| 17 | F1A 020 070 | M6x40 DIN915-45H | | Stellschraube | Adjusting screw | Vis de réglage |
| 18 | ZST 150 640 | | | Gewindestift | Set screw | Vis pointeau |
| 19 | ZMU 340 600 | | | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |
| 20 | C4Z 030 020 | | | Nutenschraube | T-nut bolt | Boulon en T |
| 21 | ZRM 525 600 | 600 MXL 050 | | Zahnriemen | Timing belt | Courroie crantée |
| 22 | F1A 000 350 | M6x16 DIN 933-6.9 | | Filzabstreifer | Felt wiper | Feutre racleur |
| 23 | F1A 000 030 | | | Dichtblech | Wiper plate | Tôle racleur |
| 24 | F1L 000 170* | | | Motorplatte Z | Motor plate Z | Plaque de moteur Z |
| | F1C 000 170** | | | Motorplatte Z | Motor plate Z | Plaque de moteur Z |
| 25 | ZSR 330 616 | B6,4 DIN 125 ST | | Sechskantschraube | Hexagon head screw | Vis hexagonal |
| 26 | ZSB 025 640 | | | Scheibe | Washer | Rondelle |
| 27 | F1L 000 660 | | | Schaltblech Z | Switch sheet metal Z | Tôle d'commutateur defin de course Z |
| 28 | F1L 623 000 | | | Endschalterblech Z | Limit switch sheet metal Z | Tôle d'commutateur defin de course Z |
| 29 | ZEL 239 002 | MILTAC | | Schnappschalter | Quick break switch | Interrupteur instantané |
| 30 | A6L 000 350 | | | Gewindeblech | Thread sheet metal | Tôle de filetage |
| 31 | F1L 621 010* | | | Riemenscheibe 20 | Pulley 20 | Poulie 20 |
| | A6P 090 000** | | | Riemenscheibe 20 | Pulley 20 | Poulie 20 |
| 32 | ZMO 780 030* | VDRM 564-50LN | | Schrittmotor X,Y,Z | Step motor X,Y,Z | Moteur pas à pas X,Y,Z |
| | ZMO 780 031** | VRDM 366/50LHA | | Schrittmotor X,Y,Z | Step motor X,Y,Z | Moteur pas à pas X,Y,Z |
| 33 | F1L 000 650 | 1200mm lg. | | Distanzblech Y | Spacer sheet Y | Tôle d'écartement Y |
| 34 | ZEL 212 022 | | | Näherungsschalter | Proximity dedector | Initiateur inductiv |
| 35 | A6L 020 090 | | | Stift | Pin | Broche |
| 36 | F1T 000 840** | | | Federhalter | Support sheet | Tôle-support |
| 37 | ZFD 500 149** | | | Zugfeder | Tension spring | Ressort de traction |
| 38 | F1C 000 730** | | | Federbolzen | Bolt | Boulon |

*) für Maschinen bis Maschinennummer F1C M2 025

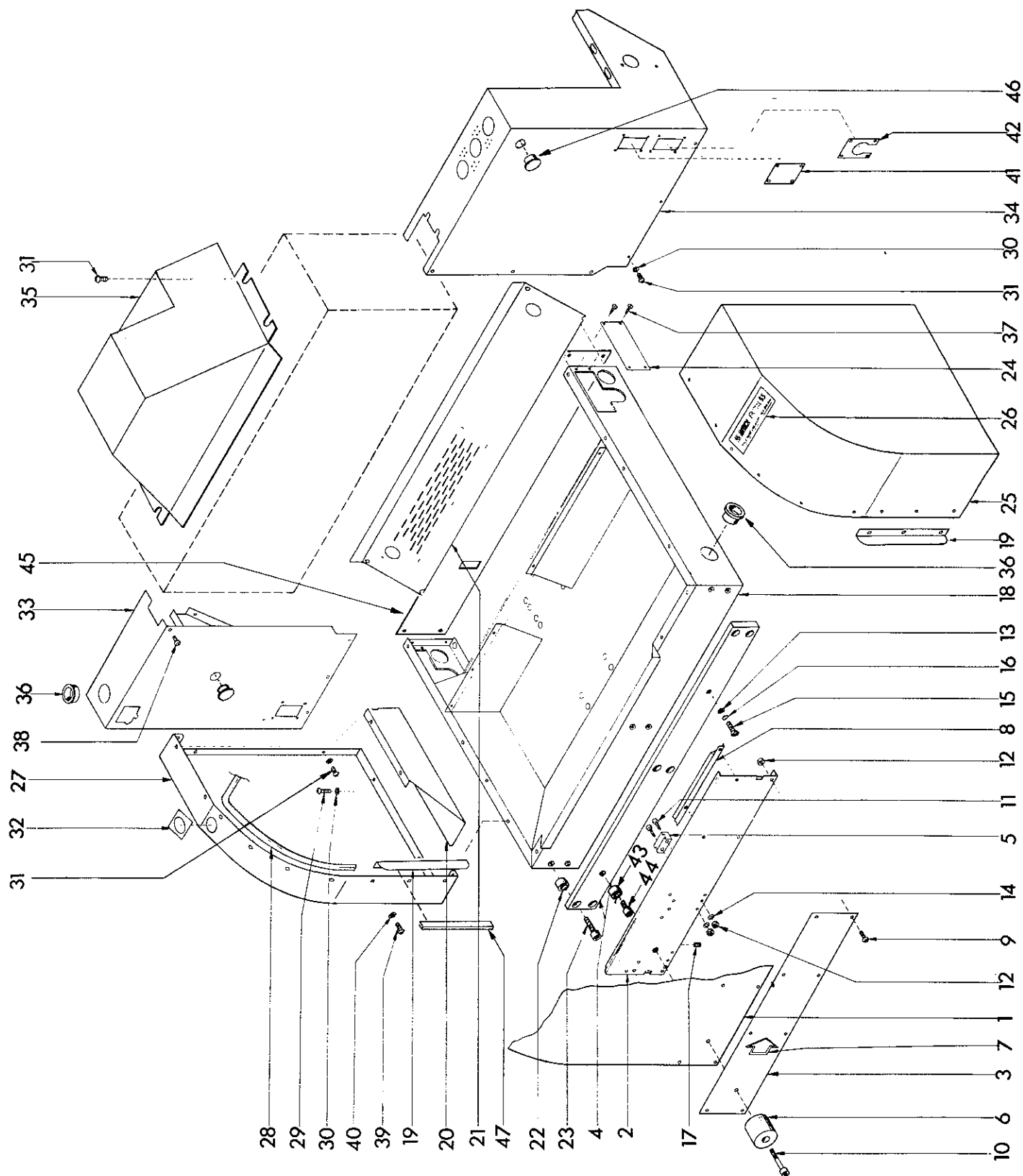
**) für Maschinen ab Maschinennummer F1C M6 001



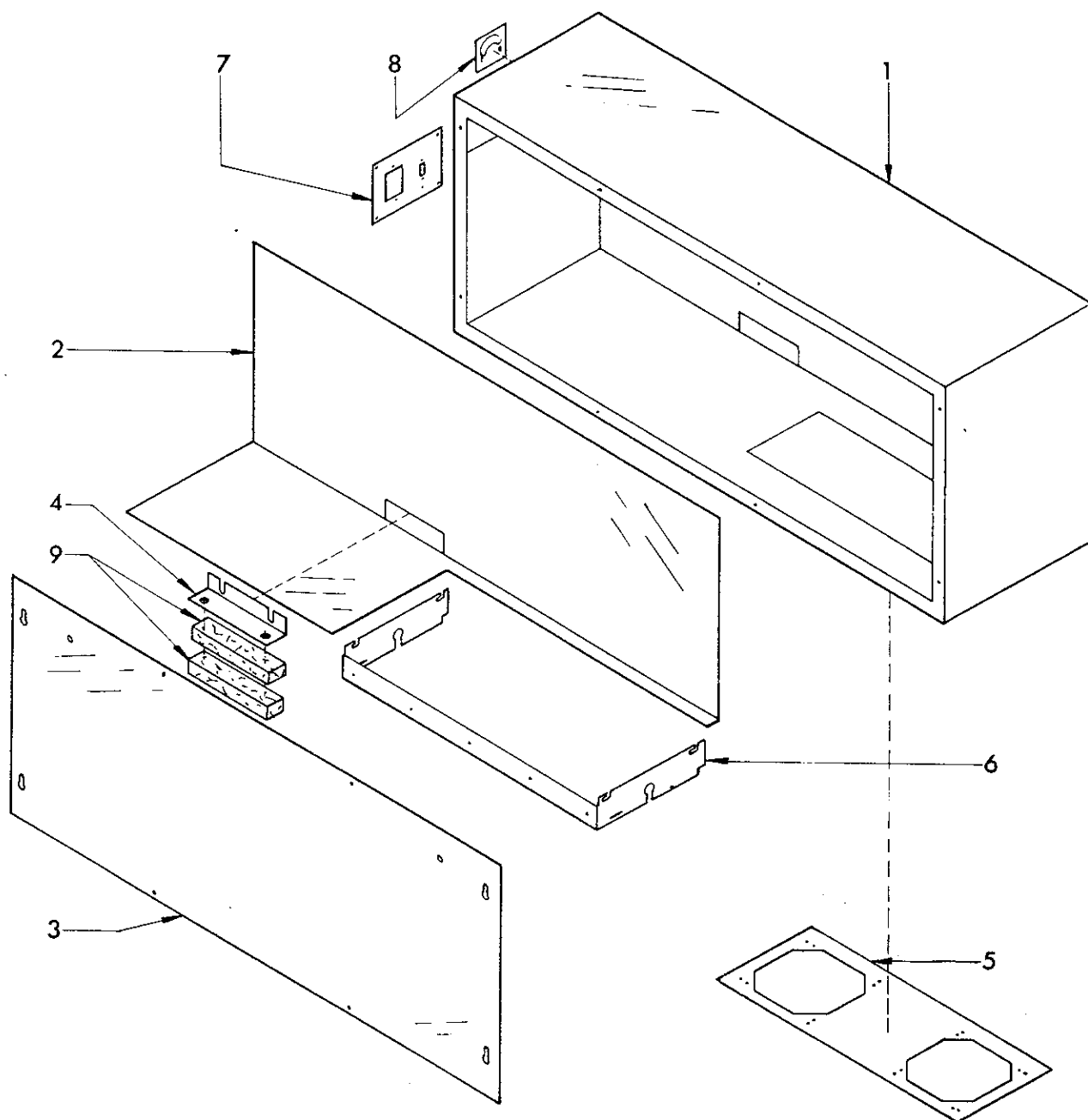
| Pos. | Ref.No. | DIN | Type | Benennung | Description | Designation |
|------------|----------------------|---------------------|------|-----------------------|----------------------------|-------------------------------|
| 138 | F1L 010 000* | | | G. Fräskopf | Milling head compl. | Ens. tête de fraisage |
| 138 | F1C 010 000** | | | G. Fräskopf | Milling head compl. | Ens. tête de fraisage |
| 1 | ZSR 270 416 | M4x16 DIN 427-5.8 | | Schaftschraube | Set screw | Vis pointeau |
| 2 | F1L 010 040* | | | Ringmutter | Ring nut | Ecrou crénelé |
| | F1C 010 040** | | | Ringmutter | Ring nut | Ecrou crénelé |
| 3 | F1L 010 030* | | | Riemenscheibe 38 | Pulley 38 | Poulie 38 |
| | F1C 010 030** | | | Riemenscheibe 38 | Pulley 38 | Poulie 38 |
| 4 | ZLG 320 076 | | | Kegelrollenlager | Taper rolled bearing | Roulement à rouleaux coniques |
| 5 | B1A 030 060 | | | Deckel | Cover | Couvercle |
| 6 | F1A 010 010 | | | Fräskopf | Milling head | Tête de fraisage |
| 7 | ZFD 854 418 | A4x4x18 DIN 6885 | | Paßfeder | Square key | Clavette parallèle |
| 8 | F1A 010 020 | | | Frässpindel | Milling spindle | Broche de fraisage |
| 9 | ZST 070 824 | 8m6x24 DIN 6325 | | Zylinderstift | Parallel pin | Tige de serrage |
| 10 | F1A 040 000 | | | Federeinheit | Belleville spring ass. | Unité à ressort |
| 11 | ZKG 001 071 | ø 7 GK4 DIN5401 | | Kugel | Ball | Bille |
| 13 | F1A 000 410 | | | Nabe | Hub | Moyeu |
| 14 | ZSB 121 001 | 10x16x0,1 DIN 988 | | Paßscheibe 0,1 | Shim ring 0,1 | Rondelle d'ajustage 0,3 |
| | ZSB 121 003 | 10x16x0,3 DIN 988 | | Paßscheibe 0,3 | Shim ring 0,3 | Rondelle d'ajustage 0,3 |
| 15 | F1A 000 070 | | | Exzenterbolzen | Eccentric bolt | Boulon d'excentrique |
| 16 | F1A 000 100 | | | Schenkelfeder | Torsion spring | Ressort à branches |
| 17 | ZLG 781 816 | INA-HK 1816 | | Nadellager | Needle roller bearing | Roulement à aiguilles |
| 18 | ZGF 162 108 | 21M8 GN 519 | | Zylinderknopf | Cylindrical knob | Poignée de cylindre |
| 19 | F1A 000 080 | | | Stange | Bar | Barre |
| 20 | ZSR 120 635 | M6x35 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 21 | ZST 720 530 | | | Paßkerbstift | Grooved pin | Goupille fendue |
| 22 | F1A 000 400 | | | Exzenterblock | Eccentric block | Bloc d'excentrique |
| 23 | ZSR 120 612 | M6x12 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 24 | F1L 000 050* | | | Motorplatte | Motor plate | Plaque de moteur |
| | F1C 000 050** | | | Motorplatte | Motor plate | Plaque de moteur |
| 25 | F1L 000 700 | | | Distanzbolzen | Distance bolt | Boulon d'écartement |
| 26 | ZSR 790 512 | M5x12 DIN 7991-8.8 | | Senkschraube | Counter sunk screw | Vis tête fraise |
| 27 | F1L 000 420* | | | Abdeckhaube | Cover | Couvercle |
| | F1C 000 420** | | | Abdeckhaube | Cover | Couvercle |
| 28 | F1L 000 710 | | | Halter | Holder | Appui |
| 29 | ZSR 880 610 | M6x10-10.9 | | Linsenschraube | Fillister head screw | Vis à tête lentiforme |
| 30 | ZSR 120 545 | M5x45 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 31 | ZRG 280 050 | B5 DIN 127 | | Federring | Spring washer | Rondelle ressort |
| 32 | F1L 000 120* | | | Bordscheibe | Washer | Rondelle |
| | F1C 000 120** | | | Bordscheibe | Washer | Rondelle |
| 33 | ZRG 712 512* | W25x1,2 DIN 471 | | Sicherungsring | Retaining ring | Circlip |
| | ZRG 713 015** | W30x1,5 DIN 471 | | Sicherungsring | Retaining ring | Circlip |
| 34 | ZSB 122 503* | PS 25x35x0,3 | | Paßscheibe | Shim | Rondelle d'ajustage |
| 35 | ZSB 026 002* | 6002/K2 | | Ausgleichscheibe | Compensating washer | Rondelle de compensation |
| | ZSB 026 004** | 6004/K2 | | Ausgleichscheibe | Compensating washer | Rondelle de compensation |
| 36 | ZSB 108 402* | SS28x40x2 | | Stützscheibe | Supporting disk | Rondelle pour bague de frein |
| | F1C 000 130** | | | Anlaufscheibe | Supporting disk | Rondelle pour bague de frein |
| 37 | F1L 000 110* | | | Motorriemenscheibe | Motor pulley | Poulie de moteur |
| | F1C 000 110** | | | Motorriemenscheibe | Motor pulley | Poulie de moteur |
| 38 | ZRM 513 110 | 110 XL 075 | | Zahnriemen | Timing belt | Courroie dentée |
| 39 | ZMO 473 380* | 0,37 kW , 1370U/min | | Hauptmotor | Motor | Moteur |
| | ZMO 473 381** | 0,55 kW , 1400U/min | | Hauptmotor | Motor | Moteur |
| 40 | ZLT 500 100 | LKI 11 | | Schlauchverschraubung | Screw-type conduit fitting | Raccord à vis pour tuyaux |
| 41 | C4Z 030 020 | | | Nutenschraube | T-nut screw | Boulon en T |
| 42 | ZSB 25 0840 | 8,4 DIN 125 | | Scheibe | Washer | Rondelle |
| 43 | ZMU 33 0801 | M8 DIN 934-10B1E | | Mutter | Nut | Ecrou |

*) für Maschinen bis Maschinennummer F1C M2 025

**) für Maschinen ab Maschinennummer F1C M6 001



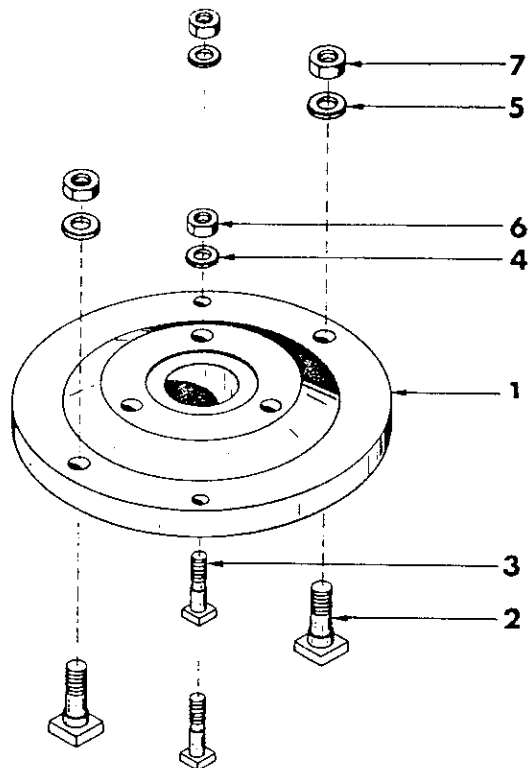
| Pos. | Ref.No. | DIN | Type | Benennung | Description | Designation |
|-------------|--------------------|--------------------|------|---------------------|-----------------------------|---------------------------|
| 1-17 | F1L 290 000 | | | Blechaufbau | Sheet metal assembly | Assemblage en tôle |
| | | | | G. Tür | Door compl. | Ens. Porte |
| 1 | F1A 000 240 | | | Tür | Door | Porte |
| 2 | F1L 000 450 | | | Türblech | Door sheet | Tôte de porte |
| 3 | F1L 000 460 | | | Frontblech | Front sheet metal | Capot en tôle |
| 4 | F1A 000 480 | | | Führungsschiene | Safeguard | Glissière |
| 5 | F1A 000 490 | | | Führungsleiste | Guide bead | Barre conductrice |
| 6 | F1A 000 510 | | | Griff | Handle | Poignée |
| 7 | F1L 000 570 | | | Pfeil | Arrow | Flèche |
| 8 | F1L 291 000 | | | Schaltblech | Switch sheet metal | Tôle d'interrupteur |
| 9 | ZSR 880 520 | M5x20 - 10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 10 | ZSR 120 855 | M8x55 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 11 | ZSR 120 520 | M5x20 DIN 912-8.8 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 12 | ZMU 340 500 | M5 DIN 934-5 | | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |
| 13 | ZSB 250 530 | B5,3 DIN 125-ST | | Scheibe | Washer | Rondelle |
| 14 | ZSB 980 530 | A5,3 DIN 6798 | | Fächerscheibe | Serrated lock washer | Rondelle éventail |
| 15 | ZSR 790 512 | M5x12 DIN 7991-8.8 | | Senkschraube | Countersunk screw | Vis tête fraise |
| 16 | ZOR 006 030 | OR 6 - 3 | | O-Ring | O-ring | Joint tonique |
| 17 | ZST 130 506 | M5x6 DIN 913-45H | | Gewindestift | Set screw | Vis pointeau |
| 18 | F1L 060 000 | | | Spänetasse | Chip tray | Plateau à copeaux |
| 19 | F1L 000 720 | | | Deckwinkel | Angle covering | Cornière couvre |
| 20 | F1L 000 670 | | | Deckblech | Cover plate | Coiffe |
| 21 | F1L 000 230 | | | Rückwand | Back cover | Paroi arrière |
| 22 | F1A 000 500 | | | Distanzring | Spacer ring | Bague d'ecartement |
| 23 | ZSR 120 520 | M5x20 DIN 912-8.8 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 24 | F1A 000 293 | | | Durchführungsblech | Sheet | Tôle de traverse |
| 25 | F1L 140 000 | | | Verkleidungsblech 2 | Side guard 2 | Tôle d'habillage |
| 26 | F1C 000 550 | | | Namensschild | Adhesive label | Etiquette |
| 27 | F1L 130 000 | | | Verkleidungsblech 1 | Side guard 1 | Tôle d'habillage |
| 28 | ZGU 770 631 | KS 6/20-00, 1200mm | | Kantenprofil | Edge protection | Bordure de protection |
| 29 | ZSR 880 516 | M5x16-10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 30 | ZSB 210 530 | A5,3 DIN 9021-ST | | Scheibe | Washer | Rondelle |
| 31 | ZSR 880 510 | M5x10-10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 32 | Y1A 010 100 | | | Kontrastfläche | Plate | Plaquette |
| 33 | F1C 340 000 | | | Seitenwand 1 | Side wall 1 | Paroi latérale 1 |
| 34 | F1C 350 000 | | | Seitenwand 2 | Side wall 2 | Paroi latérale 2 |
| 35 | F1C 360 001 | | | Abdeckhaube | Cover | Couvercle |
| 36 | ZXM 012 240 | | | Schnappdurchführung | Ring | Traversée |
| 37 | ZSR G14 295 | B4,2x9,5 DIN 7981 | | Blechschrabe | Sheet metal screw | Vis à tôle |
| 38 | ZSR 880 610 | M6x10-10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 39 | ZSR 880 406 | M4x6-10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 40 | ZSB 250 430 | B4,3 DIN 125 ST | | Scheibe | Washer | Rondelle |
| 41 | F1A 000 370 | | | Abdeckblech | Cover | Couvercle |
| 42 | F1A 000 310 | | | Kabelblech 1 | Cable sheet metal 1 | Tôle de câble |
| 43 | ZPU 10 0090 | 5J 5009 | | Elastikpuffer | Resilient pad | Coussin élastique |
| 44 | ZSR 12 0510 | M5x10 DIN 912 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 45 | F1A 000 330 | | | Rückwand 2 | Back cover 2 | Paroi arrière 2 |
| 46 | ZDK 031 430 | ø14,3x16,7x10,3 | | Abdeckkappe | Cap | Couvercle |
| 47 | ZGU 770 622 | KS 6/20-00, 338mm | | Kantenprofil | Edge protection | Bordure de protection |



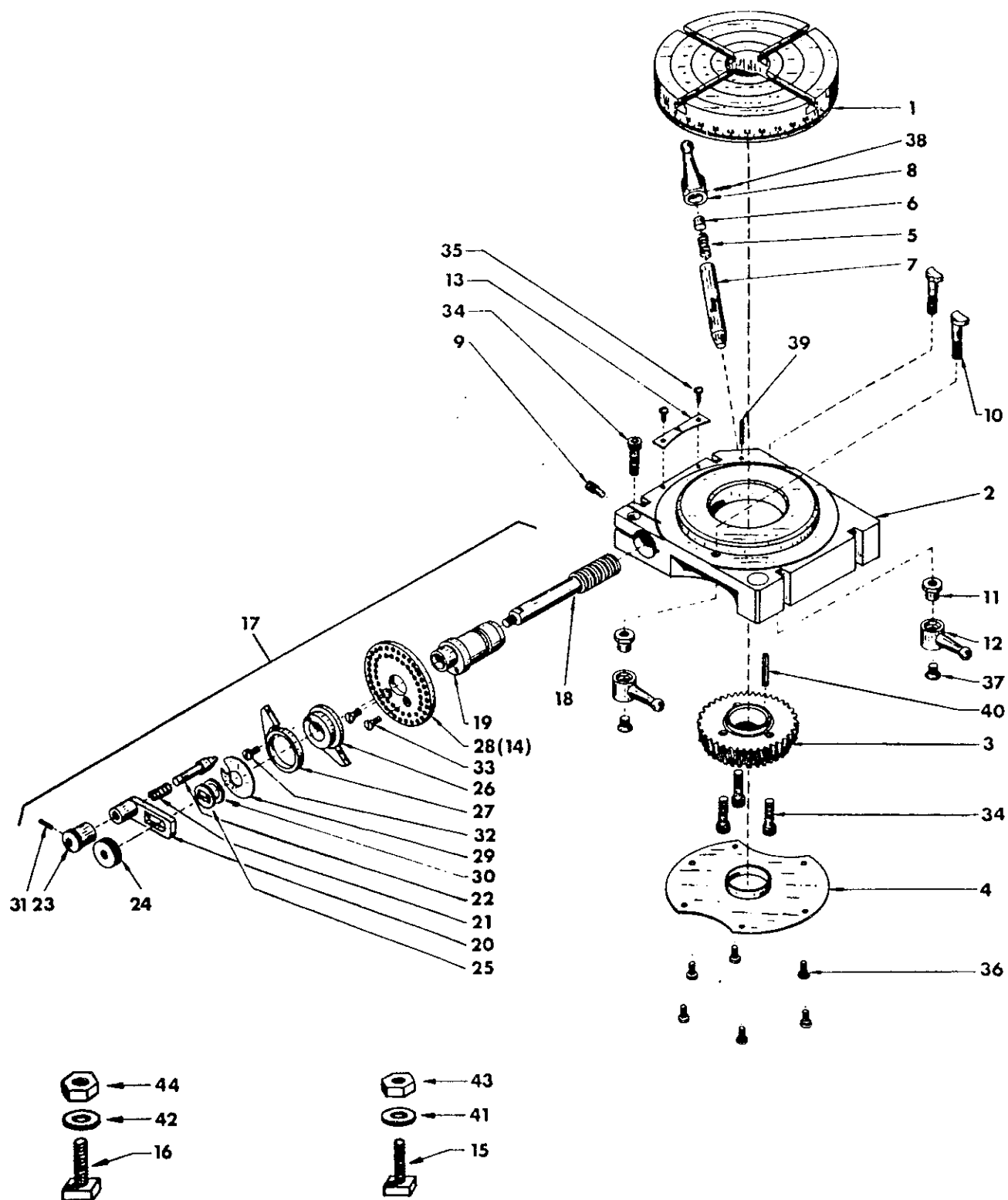
| Pos. | Ref.No. | DIN | | Benennung | Description | Designation |
|------|---------------|-----|--|-----------------------------|--------------------------------|--|
| | | | | Blechaufbau E-Kasten | Assembly switch cabinet | Assemblage du montant de boîte électrique |
| 1 | A6L 301 000* | | | Gehäuse | Housing | Caisse |
| | A6P 301 000** | | | Gehäuse | Housing | Caisse |
| 2 | A6L 306 000* | | | Montageplatte | Mounting plate | Plaque de montage |
| | A6P 306 000** | | | Montageplatte | Mounting plate | Plaque de montage |
| 3 | A6L 311 010 | | | Abdeckung | Cover | Couvercle |
| 4 | A6L 311 020 | | | Klemmblech | Clamping sheet metal | Tôle de serrage |
| 5 | A6L 311 030* | | | Ventilatorblech | Fan sheet metal | Tôle de ventilateur |
| 6 | A6L 311 041* | | | Träger | Carrier | Support |
| 7 | A6L 311 050* | | | Steckerblech | Connector sheet metal | Tôle de connecteur |
| | A6P 311 050** | | | Steckerblech | Connector sheet metal | Tôle de connecteur |
| 8 | A6L 311 080 | | | Aufkleber 0-1 | Transfer picture 0-1 | Image à décalquer 0-1 |
| 9 | ZGU 783 011 | | | Neopren | Neoprene | Néoprène |

*) für Maschinen bis Maschinennummer F1C M2 025

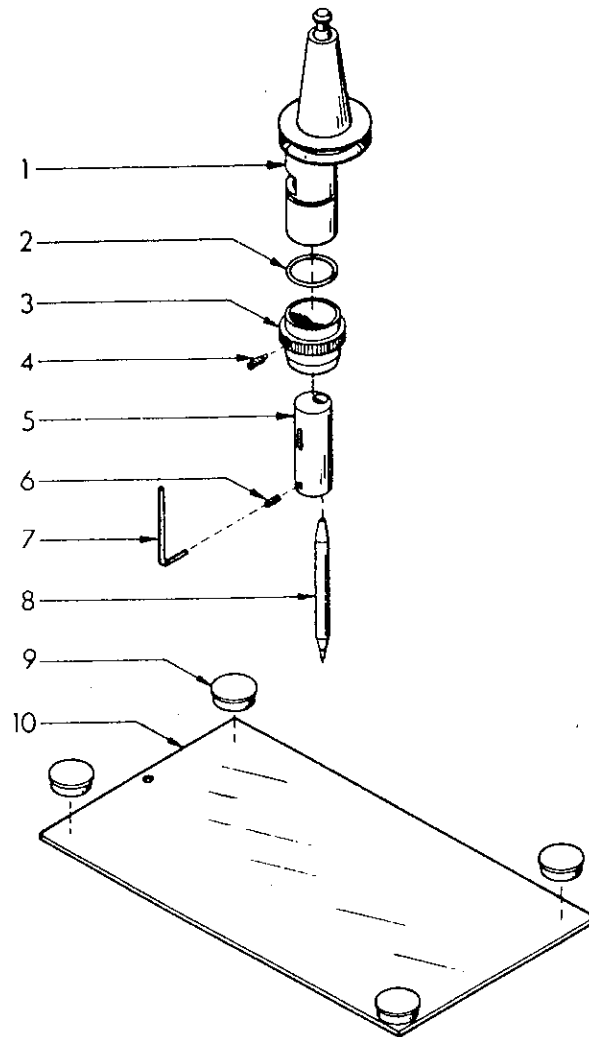
**) für Maschinen ab Maschinennummer F1C M6 001



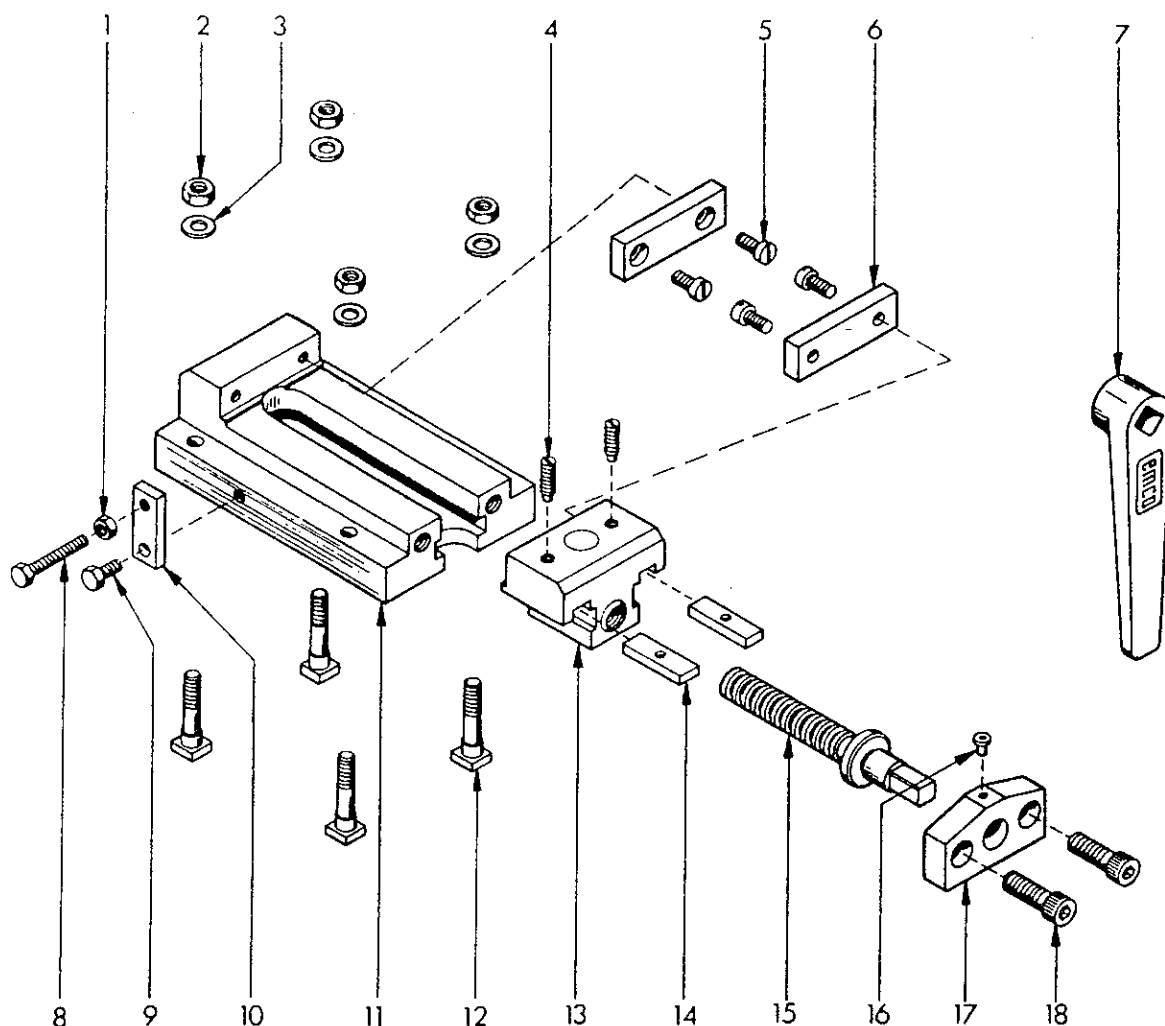
| Pos. | Ref. No. | Type | | Benennung | Description | Designation |
|------|----------------|--------------|--|------------------------------|-----------------------------------|---------------------------|
| | 346 510 | | | Gruppe Supportflansch | Cross slide adaptor compl. | Ens. bride support |
| 1 | | | | Supportflansch | Cross slide adaptor | Bride support |
| 2 | C4Z 030 020 | | | Nutenschraube M8 | T-nut bolt M8 | Boulon en T M8 |
| 3 | B2Z 310 070 | | | Nutenschraube M6 | T-nut bolt M6 | Boulon en T M6 |
| 4 | ZSB 25 0640 | B6,4 DIN 125 | | Scheibe | Washer | Rondelle |
| 5 | ZSB 25 0840 | B8,4 DIN 125 | | Scheibe | Washer | Rondelle |
| 6 | ZMU 34 0600 | M6 DIN 934-6 | | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |
| 7 | ZMU 34 0800 | M8 DIN 934-6 | | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |



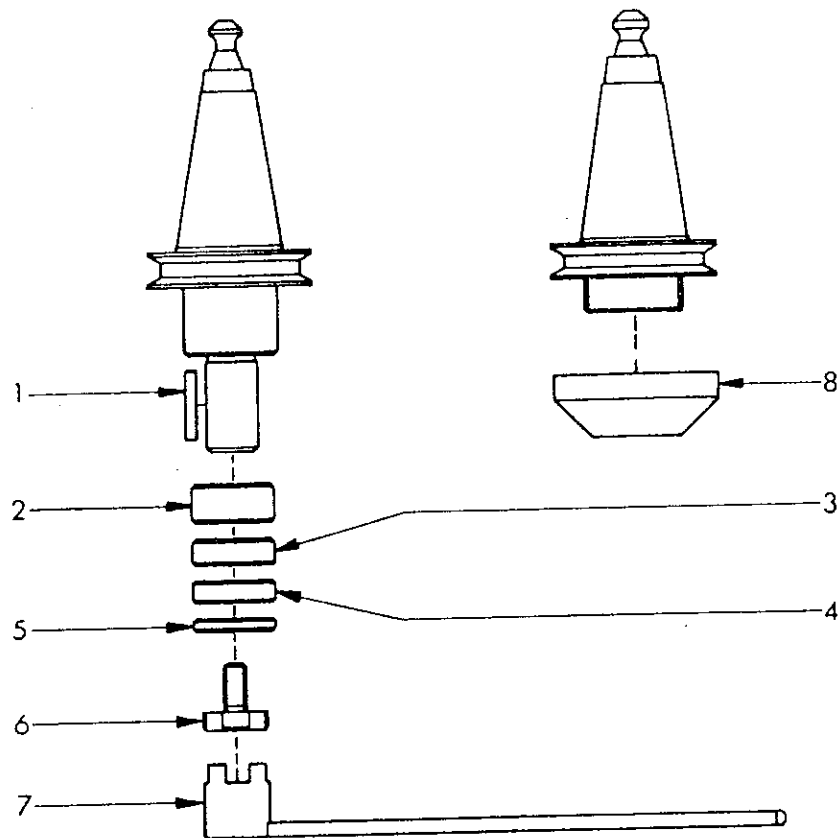
| | 745 000 | | | G. Teilapparat | Dividing head |
|-----|-------------|---------------|--|------------------------|--------------------|
| Pos | Ref. No. | DIN | | BENENNUNG | DESCRIPTION |
| 1 | B2Z 320 010 | | | Rundtisch | Table |
| 2 | B2Z 320 020 | | | Gehäuse | Housing |
| 3 | B2Z 320 030 | | | Teilrad | Table flange |
| 4 | B2Z 320 040 | | | Deckblech | Cover mount |
| 5 | B2Z 320 050 | | | Druckfeder | Compression spring |
| 6 | B2Z 320 060 | | | Druckbolzen | Bolt |
| 7 | B2Z 320 070 | | | Index | Locking pin |
| 8 | B2Z 320 080 | | | Knebelgriff | Lever |
| 9 | B2Z 320 090 | | | Anschlagschraube | Bushing |
| 10 | B2Z 320 100 | | | Klemmschraube | Locking bolt |
| 11 | B2Z 320 110 | | | Mutter | Nut |
| 12 | B2Z 320 120 | | | Knebelgriff | Lever |
| 13 | B2Z 320 130 | | | Zeiger | Guide |
| 14 | B2Z 320 140 | | | Lochscheibe 33-36-39 | Indexing plate |
| | B2Z 320 150 | | | Lochscheibe 38-40 | Indexing plate |
| 15 | B2Z 320 160 | M 6 | | Nutenschraube | T-Nut |
| 16 | B2Z 320 170 | M 8 | | Nutenschraube | T-Nut |
| 17 | B2Z 321 000 | | | Gr. Schnecke | Worm shaft |
| 18 | B2Z 321 010 | | | Schnecke | Worm shaft |
| 19 | B2Z 321 020 | | | Exzenter | Assembly arbor |
| 20 | B2Z 321 030 | | | Kurbel | Crank |
| 21 | B2Z 321 040 | | | Druckfeder | Compression spring |
| 22 | B2Z 321 050 | | | Absteckbolzen | Bolt |
| 23 | B2Z 321 060 | | | Hülse | Sleeve |
| 24 | B2Z 321 070 | | | Rändelmutter | Knurled nut |
| 25 | B2Z 321 080 | | | Scheibe | Plate |
| 26 | B2Z 321 090 | | | Schere rechts | Section arm r. h. |
| 27 | B2Z 321 100 | | | Schere links | Section arm l. h. |
| 28 | B2Z 321 120 | | | Lochscheibe 27-36-42 | Indexing plate |
| 29 | B2Z 321 130 | | | Tellerfeder | Spring washer |
| 30 | B2Z 321 140 | | | Scheibe 1,8 | Plate 1,8 |
| | B2Z 321 150 | | | Scheibe 2,0 | Plate 2,0 |
| | B2Z 321 160 | | | Scheibe 2,2 | Plate 2,2 |
| 31 | ZHL 81 0212 | 2x12 DIN 1481 | | Spannhülse | Pin |
| 32 | ZSR 85 0406 | AM4x6 DIN 85 | | Zylinderschraube | Flat head screw |
| 33 | ZSR 63 0410 | M4x10 DIN 963 | | Senkschraube | Flat head screw |
| 34 | ZSR 12 0625 | M6x25 DIN 912 | | Innensechskantschraube | Allen head screw |
| 35 | ZSR 84 0304 | M3x4 DIN 84 | | Zylinderschraube | Flat head screw |
| 36 | ZSR 84 0406 | M4x6 DIN 84 | | Zylinderschraube | Flat head screw |
| 37 | ZSR 63 0608 | M6x8 DIN 963 | | Senkschraube | Flat head screw |
| 38 | ZHL 81 0214 | 2x14 DIN 1481 | | Spannhülse | Pin |
| 39 | ZHL 81 0322 | 3x22 DIN 1481 | | Spannhülse | Pin |
| 40 | ZHL 81 0530 | 5x30 DIN 1481 | | Spannhülse | Pin |
| 41 | ZSB 25 0640 | 86,4 DIN 125 | | Scheibe | Washer |
| 42 | ZSB 25 0840 | 88,4 DIN 125 | | Scheibe | Plate |
| 43 | ZMU 34 0600 | M6 DIN 934 | | Mutter | Nut |
| 44 | ZMU 34 0800 | M8 DIN 934 | | Mutter | Nut |



| Pos. | Ref. No. | DIN | | Benennung | Description |
|------|----------------|-------------------|--|------------------------|------------------|
| | <u>770 300</u> | | | <u>Plotter</u> | <u>Plotter</u> |
| 1 | F1Z 300 010 | | | Aufnahmedorn | Arbor |
| 2 | ZOR 02 3324 | OR 23,3 - 2,4 | | O-Ring | O-Ring |
| 3 | F1Z 300 030 | | | Einstellring | Adjusting ring |
| 4 | ZST 15 0412 | M4x12 DIN 915-45H | | Gewindestift | Set screw |
| 5 | F1Z 300 020 | | | Exzenterhülse | Eccentric sleeve |
| 6 | ZST 13 0408 | M4x8 DIN 913-45H | | Gewindestift | Set screw |
| 7 | ZWZ 11 0200 | SW2 DIN 911 | | 6-Kant Schraubendreher | Hexagonal key |
| 8 | ZST 99 1000 | | | Faserstift | Plotter pen |
| 9 | ZXM 00 2008 | Ø 20x8 | | Haltemagnet | Magnetic disc |
| 10 | F1Z 301 000 | | | Aufspannplatte | Clamping plate |



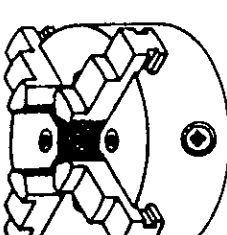
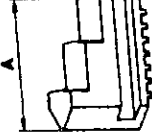
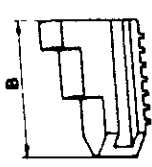
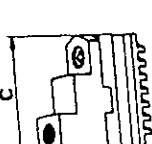
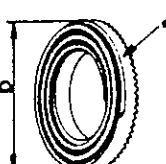
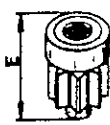
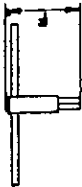
| Pos. | Ref. No. | DIN | Benennung | Description |
|------|----------------|-------------------|------------------------------|---------------------|
| | <u>77o 31o</u> | | <u>Maschinenschraubstock</u> | <u>Machine vice</u> |
| 1 | ZMU 34 o6oo | M6 DIN 934-6 | Sechskantmutter | Hexagonal nut |
| 2 | ZMU 34 o8oo | M8 DIN 934-6 | Sechskantmutter | Hexagonal nut |
| 3 | ZSB 25 o84o | 8,4 DIN 125 | Scheibe | Washer |
| 4 | ZST 17 o515 | M5x15 DIN 417-5.8 | Gewindestift | Set screw |
| 5 | ZSR 84 o512 | M5x12 DIN 84-4.8 | Zylinderschraube | Flat head screw |
| 6 | B2Z 31o o5o | | Aufsatzbacke | Jaw |
| 7 | B2Z 31o o8o | SW10 | Schlüssel | Key |
| 8 | ZSR 33 o64o | M6x4o DIN 933-5.6 | Sechskantschraube | Hexagon head bolt |
| 9 | ZSR 33 o612 | M6x12 DIN 933-5.6 | Sechskantschraube | Hexagon head screw |
| 10 | F1Z 31o o3o | | Anschlagplatte | Stop plate |
| 11 | F1Z 31o o1o | | Körper | Body |
| 12 | F1Z 31o o2o | | Nutenschraube | T-bolt |
| 13 | B2Z 31o o2o | | Backe | Moving jaw |
| 14 | B2Z 31o o6o | | Einstelleiste | Adjusting gib |
| 15 | B2Z 31o o4o | | Spindel | Operating screw |
| 16 | ZNP o1 1ooo | | Schmiernippel | Grease nipple |
| 17 | B2Z 31o o3o | | Spindelträger | Screw mount |
| 18 | ZSR 12 o825 | M8x25 DIN 912-8.8 | Zylinderschraube | Socket head screw |



| Pos. | Ref. No. | DIN | Benennung | Description |
|------|-------------|------------------|--------------------|--------------|
| 1 | ZFD 85 4422 | A4x4x22 DIN 6885 | Paßfeder | Square key |
| 2 | F1Z o2o o5o | | Fräsdornring 12 mm | Collar 12 mm |
| 3 | F1Z o2o o4o | | Fräsdornring 8 mm | Collar 8 mm |
| 4 | F1Z o2o o3o | | Fräsdornring 6 mm | Collar 6 mm |
| 5 | F1Z o2o o2o | | Fräsdornring 4 mm | Collar 4 mm |
| 6 | ZSR 67 o8oo | M8 DIN 6367 | Schraube | Screw |
| 7 | ZWZ 58 16oo | 16 DIN 6368 | Schlüssel | Key |
| 8 | A5Z o4o o2o | | Spannmutter | Nut |

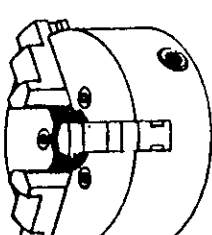
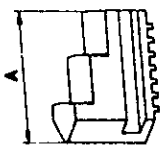
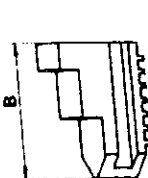
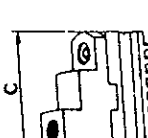
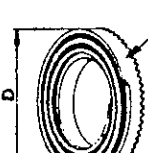
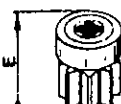
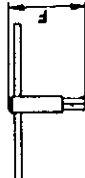
4-BACKEN-FUTTER, SELBSTZENTRIEREND **4-JAW-CHUCK, SELF-CENTERING** **MANDRIN À 4 MORS, SERRAGE CONCENTRIQUE**

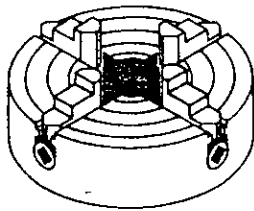
- * Am Außenring des Zahnkranzes ist eine Ziffer (0,1,2,3 ...) eingraviert.
Bei Bestellung zusätzlich zur Bestellnummer diese Ziffer angeben.
- * On the outside ring of the scroll a number (0,1,2 or 3) is engraved.
Please state this number also when ordering a scroll.
- * Sur l'anneau extérieur de la couronne dentée est gravé un chiffre (0,1,2 ou 3).
Prière d'indiquer en plus ce chiffre ensemble avec le numéro de référence.

| | | | | | | | | | | | | | | | |
|---|---|---|--|---|---|--|--|---|---------------------------------|---|-------------------------------|---|---------------------------------|---------|--|
|  | Futter- durchmesser Dia of chuck Dia du mandrin |  | Satz von 4 nach außen abgestuften Backen Set of 4 inside jaws Jeu de 4 mors intérieurs |  | Satz von 4 nach innen abgestuften Backen Set of 4 outside jaws Jeu de 4 mors extérieurs |  | Satz von 4 Umkehr- backen. Set of 4 reversible jaws. Jeu de 4 mors reversibles. |  | Zahnkranz Scroll Couronne |  | Triebling Pinion Pignon |  | Schlüssel Key(Wrench) CLE | VIC 328 | |
| | | | | | | | | | | | | | | | |
| | ∅ 110 mm | 42 | V3Z 070 | 42 | V3Z 080 | | | 79 | ZME 301 140 | 37 | V3L 000 030 | 78 | V3L 000 070 V2C 000 080 | | |

3-BACKEN-FUTTER, SELBSTZENTRIEREND **3-JAW-CHUCK, SELF-CENTERING** **MANDRIN À 3 MORS, SERRAGE CONCENTRIQUE**

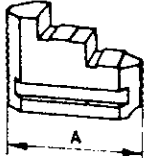
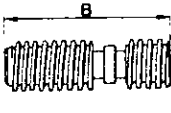
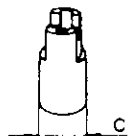
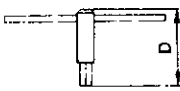
- * Am Außenring des Zahnkranzes ist eine Ziffer (0,1,2,3 ...) eingraviert.
Bei Bestellung zusätzlich zur Bestellnummer diese Ziffer angeben.
- * On the outside ring of the scroll a number (0,1,2 or 3) is engraved.
Please state this number also when ordering a scroll.
- * Sur l'anneau extérieur de la couronne dentée est gravé un chiffre (0,1,2 ou 3).
Prière d'indiquer en plus ce chiffre ensemble avec le numéro de référence.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|--|-----------|----------|-----------|----------|---|---|-----------|----------|--|---|-----------|-------------|---|---------------------------------|-----------|----------------------------|-----------|----------|---|-------------------------------|---|---------------------------------|---------|----------------------------|
|  | Futterdurch- messer Dia of chuck Dia du mandrin |  | Satz von 3 nach außen abgestuften Backen Set of 3 inside jaws Jeu de 3 mors intérieurs | A (mm) | Ref. No. | B (mm) | Ref. No. |  | Satz von 3 nach innen abgestuften Backen Set of 3 outside jaws Jeu de 3 mors extérieurs | C (mm) | Ref. No. |  | Satz von 3 Umkehr- backen. Set of 3 reversible jaws. Jeu de 3 mors reversibles | D (mm) | Ref. No. |  | Zahnkranz Scroll Couronne | E (mm) | Ref. No. | F (mm) | Ref. No. |  | Triebling Pinion Pignon |  | Schlüssel Key(Wrench) CLE | VIC 326 | V3L 000 070 V2C 000 080 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ø 110 mm | 42 | V3Z 050 | 42 | V3Z 060 | | | | | | | | | 79 | ZME 301 140 | 37 | V3L 000 030 | 78 | V3L 000 070 V2C 000 080 | | | | | | | | |



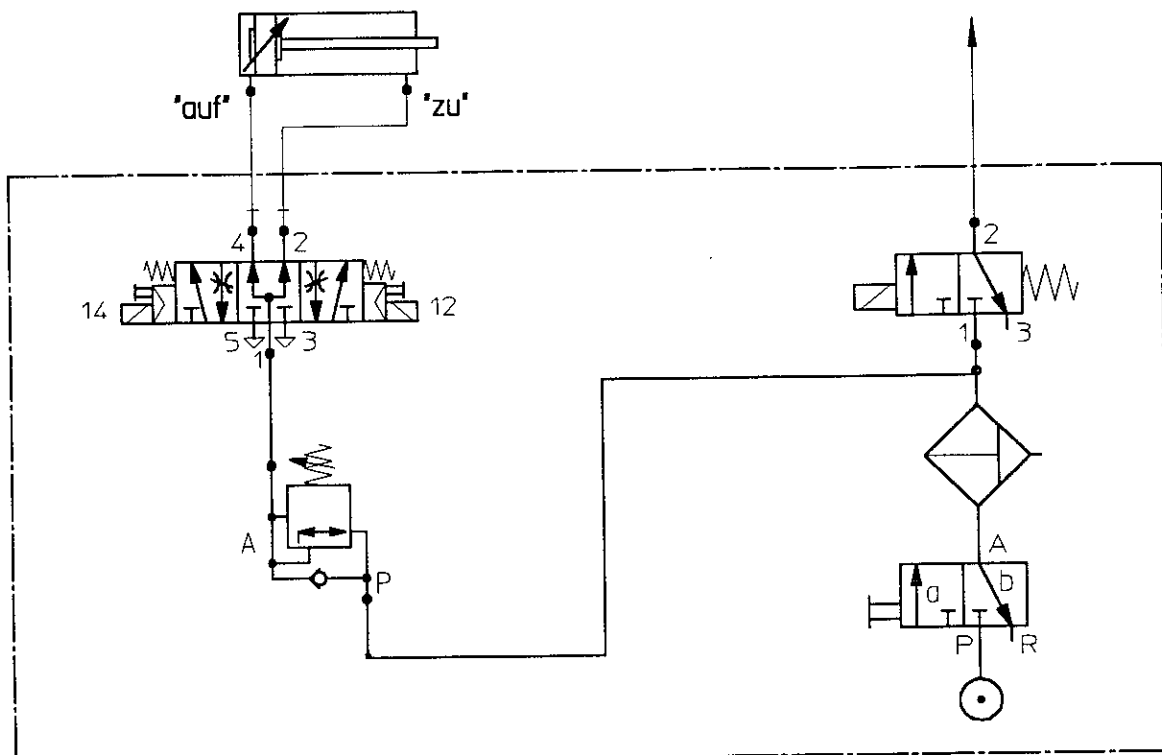
P3E 324

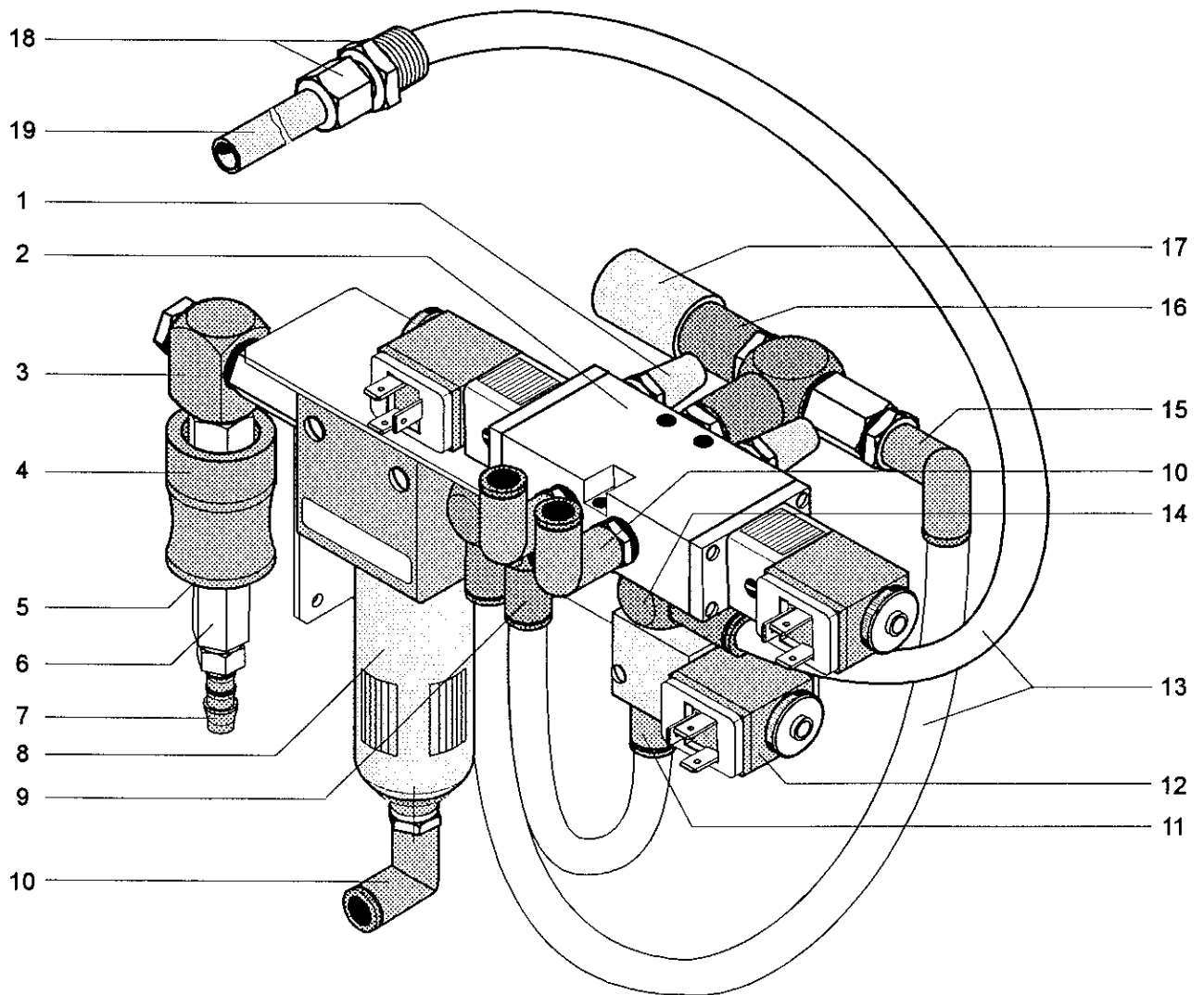
PLANSCHKEIBE MIT 4 BACKEN 4-JAW INDEPENDEND CHUCK PLATEAU DE TOUR À 4 MORS

| | | | | | | | | |
|---|---|--|---|---|--------|-------------|--------|-------------|
|  |  |  |  | | | | | |
| | | | | | | | | |
| | | | | Satz von 4 Umkehrbacken Set of 4 reversible jaws Jeu mors revers. | | | | |
| | | | | Spindel Spindle Broche | | | | |
| | | | | Gabelbolzen Bolt Axe a couble fourche | | | | |
| | | | | Schlüssel Key (Wrench) CLE | | | | |
| D (mm) | A (mm) | Ref. No. | B (mm) | Ref. No. | C (mm) | Ref. No. | D (mm) | Ref. No. |
| 152 mm 6" | 51 | P1E 004 | 48 | P0E 000 030 | 18 | P1E 000 150 | 90 | P0E 001 000 |

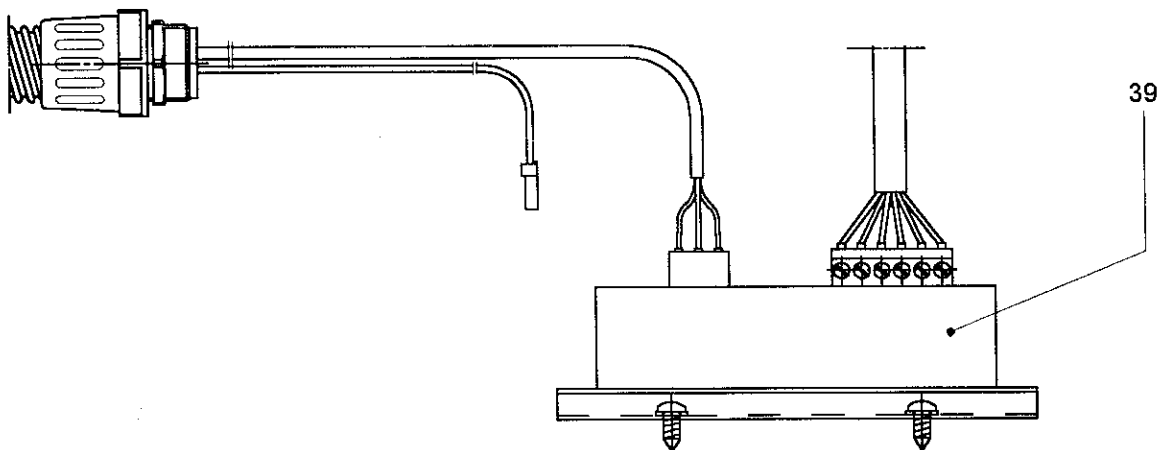
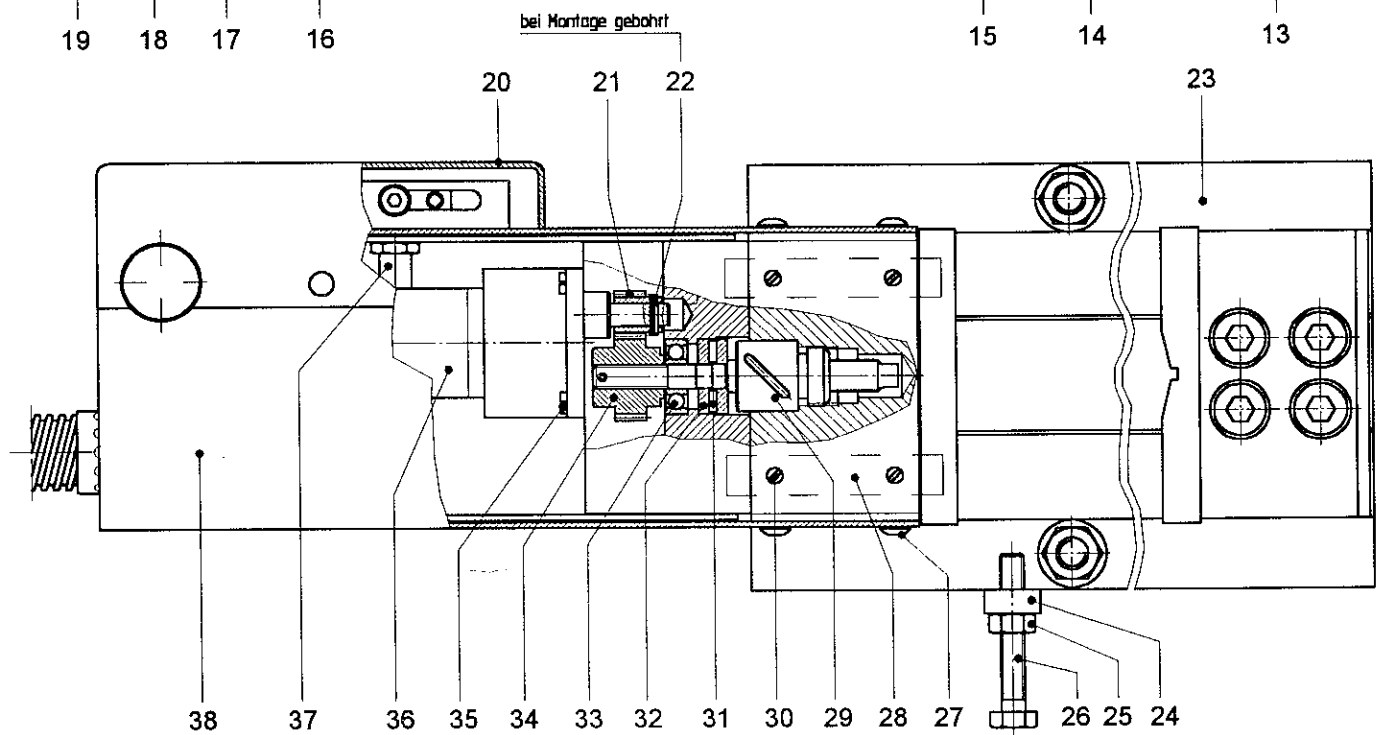
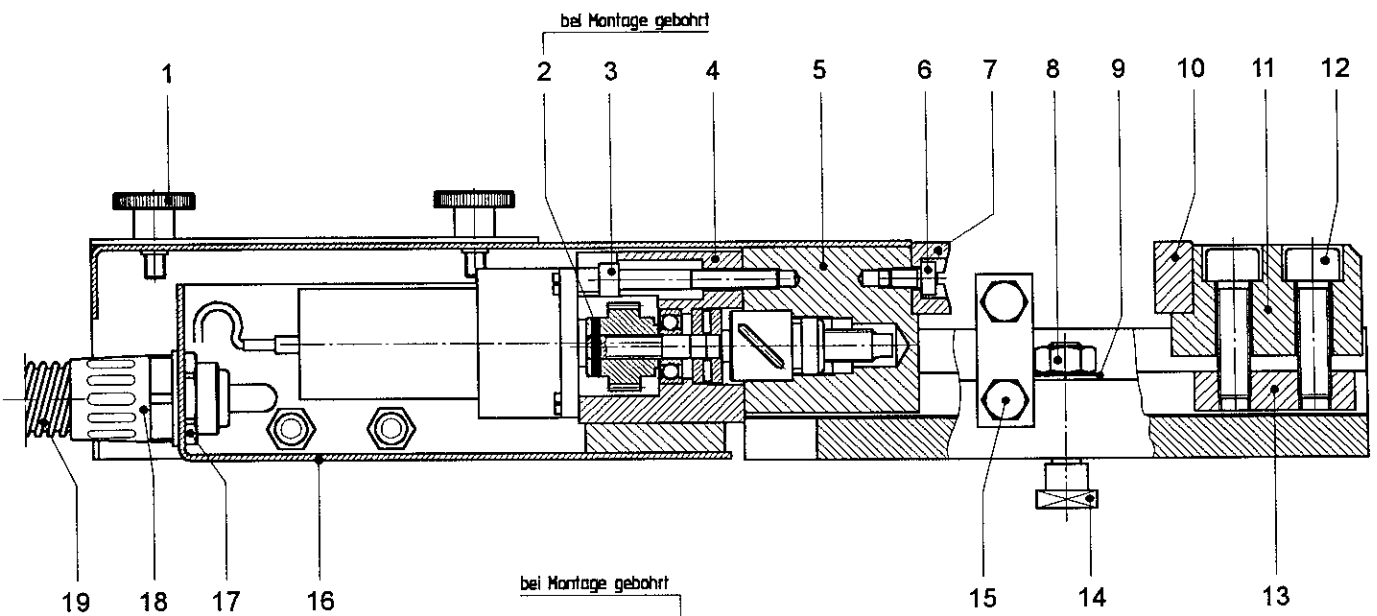
Türautomatik
Automatic door
Porte automatique

Schraubstock ausblasen (Pos 18,19)
Vice puff blowing (Pos 18,19)

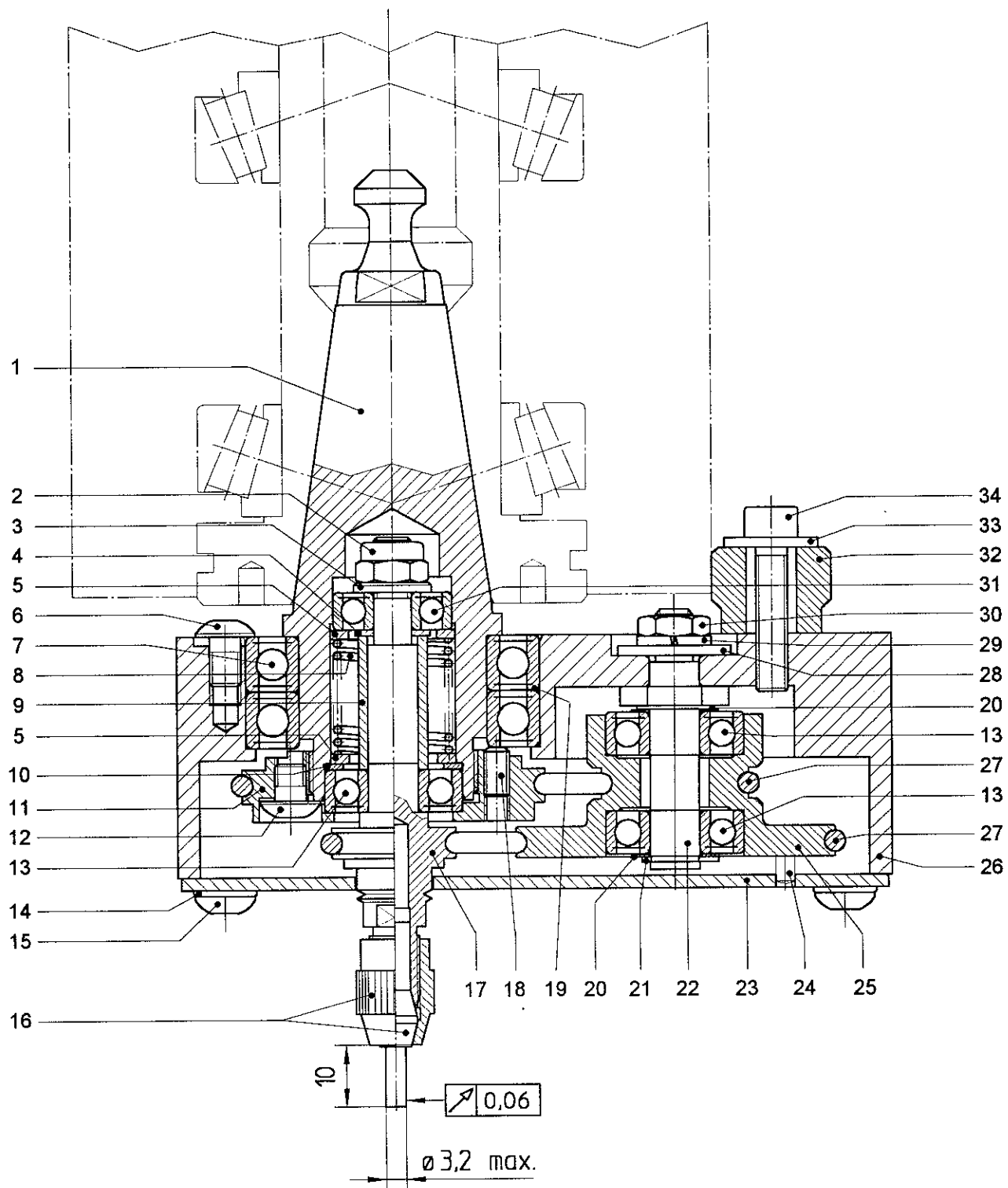




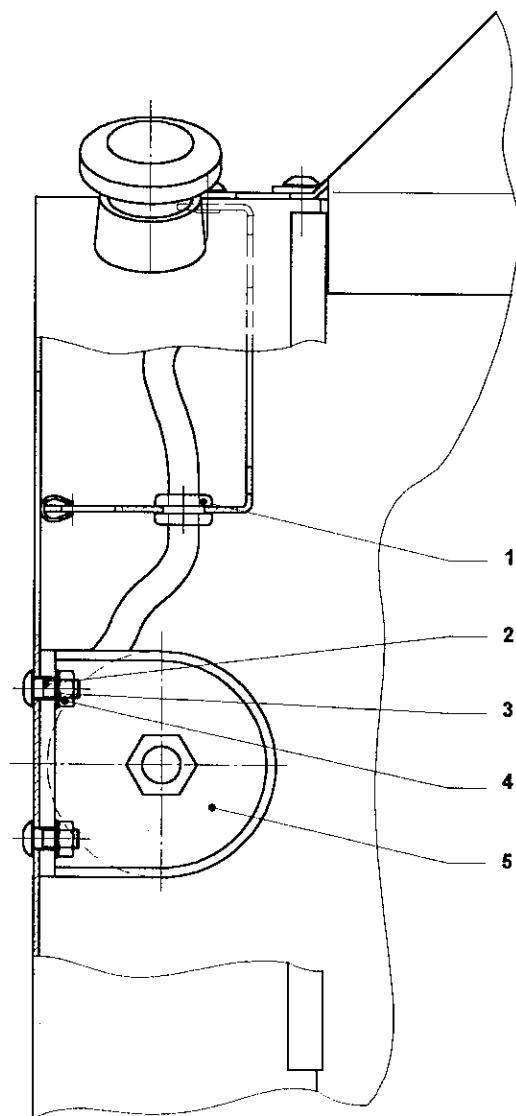
| Pos. | Ref. No. EMCO | Ref. No. Hersteller Manufacturer | Type | Benennung | Description | Designation |
|-------------|------------------|--|----------------|----------------------------|----------------------------|-------------------------------|
| 1-16 | 783 550 | Fa. Bosch | F1Z 550 | Pneumatikausrüstung | Pneumatic Equipment | Equipement pneumatique |
| 1 | | AV-395028 | 1/8" kurz | Schalldämpfer | Sound absorber | Silencieux |
| 2 | ZME 280 649 | 0 820 034 151 | 1/8" 24V= | 5/3 Wegeventil | 5/3 Valve | 5/3 Soupape |
| 3 | | 1-823-391-048 | G 1/4" | Schwenkverschraubung | Knee hose fitting | Raccord de tuyau |
| 4 | ZME 200 401 | 0-820-405-001 | NG 6 1/4" | Handschiebeventil | Slide type valve | Robinet à soupape |
| 5 | | 1-820-209-014 | G 1/4" | Dichtung | Gasket ring | Joint d' étanchéité |
| 6 | | 1-823-300-001 | G 1/4" | Muffe | Socket joint | Manchon |
| 7 | | 1-823-386-055 | 10 R 1/4" | Gerade Verschraubung | Straight hose fitting | Raccord droite |
| 8 | ZME 200 461 | 0 821 303 400 | | Filter | Filter | Filtre |
| 9 | | 1-823-391-171 | 1/4" ø6 | Verteilerring | Distributing ring | Bague de distribution |
| 10 | ZME 280 654 | 1-823-391-237 | 1/8" ø6 | Winkelverschraubung | Knee hose fitting | Raccord de tuyau |
| 11 | ZME 200 705 | 1-823-391-157 | 1/8" ø6 | Gerade Verschraubung | Straight hose fitting | Raccord droite |
| 12 | ZME 200 460 | 0-820-019-301 | | 3/2 Wegventil | 3/2 Valve | 3/2 Soupape |
| 13 | ZLT 99 0059 | | 1700mm6x1 | Kunststoffrohr | Hose | Tuyau flexible |
| 14 | | 1-823-391-165 | | Winkelverschraubung | Knee hose fitting | Raccord de tuyau |
| 15 | ZME 200 702 | 1-823-391-238 | 1/4" ø6 | Winkelverschraubung | Knee hose fitting | Raccord de tuyau |
| 16 | | 0-821-302-029 | NG6 G1/4" | Druckregler | Pressure controller | Manocontact |
| 17 | F1Z 550 020 | | | Kappe | Cap | Chapeau |
| 18 | ZVR 950 040 | | | Schottanschluß | Hose fitting | Raccord de tuyau |
| 19 | ZLT 311 010 | | 6x1 125mm | Kupferrohr | Copper tube | Tube de cuivre |



| Pos. | Ref. No. | Type | | Benennung | Description | Designation |
|------|-------------|--------------------|-----------|--------------------------|---------------------|----------------------------|
| 1-39 | 783 520 | F1Z 520 | | Elektr. Schraubstock | Vice complete | Etau-machine complete |
| 1 | ZSR 64 0511 | M5x10 DIN 464 | Böllhofer | Rändelschraube | Knurled screw | Vis moletée |
| 2 | ZHL 81 0214 | 2x14 DIN 1481 | | Spannhülse | Lock pin | Douille de serrage |
| 3 | ZSR 12 0540 | M5x40 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 4 | F1Z 320 120 | | | Lagerbock | Bracket | Support |
| 5 | F1Z 320 060 | | | Spannbacke | Clamping jaw | Mors de serrage |
| 6 | ZSR 80 0508 | M5x8 DIN 7984-8.8 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 7 | F1Z 320 050 | | | Prismenbacke 1 | Jaw 1 | Mors 1 |
| 8 | ZMU 34 0800 | M8 DIN 934-6 | | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |
| 9 | ZSB 25 0840 | B8,4 DIN 125 | | Scheibe | Washer | Rondelle |
| 10 | F1Z 320 130 | | | Prismenbacke 2 | Jaw 2 | Mors 2 |
| 11 | F1Z 320 030 | | | Verstellbacke | Moving jaw | Mors mobile |
| 12 | ZSR 12 0830 | M8x30 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |
| 13 | F1Z 320 040 | | | Klemmstück | Plate | Plaque |
| 14 | F1Z 310 020 | | | Nutenschraube | T-nut screw | Boulon en T |
| 15 | ZSR 33 0612 | M6x12 DIN 933-5.6 | | Sechskantschraube | Hexagon head screw | Vis hexagonal |
| 16 | F1Z 520 090 | | | Montagegehäuse | Housing | Boîte |
| 17 | ZPG 20 1100 | PG 11 Nr.8011 | | Gegenmutter | Nut | Ecrou |
| 18 | ZLT 500 100 | PG 11 | | Schlauchverschraubung | Hose fitting | Raccord de tuyau |
| 19 | ZLT 99 0001 | FPS 13x17 | | Flex. PVC Schlauch | Hose | Tuyau flex. |
| 20 | F1Z 520 140 | | | Haube | Cover | Couvercle |
| 21 | F1Z 320 110 | | | Ritzel | Gear | Engrenage |
| 22 | ZHL 81 0210 | 2x10 DIN 1481 | | Spannhülse | Lock pin | Douille de serrage |
| 23 | F1Z 320 020 | | | Körper | Body | Corps |
| 24 | F1Z 310 030 | | | Anschlagplatte | Stop plate | Plaque de butée |
| 25 | ZMU 34 0600 | M6 DIN 934-6 | | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |
| 26 | ZSR 33 0640 | M6x40 DIN 933-5.6 | | Sechskantschraube | Hexagon head screw | Vis hexagonal |
| 27 | ZSR 88 0406 | M4x6-10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 28 | F1Z 320 100 | | | Einstelleiste | Plate | Plaque |
| 29 | F1Z 321 000 | | | Spindel mit Montagehülse | Lead screw compl. | Broche compl. |
| 30 | ZST 17 0515 | M5x15 DIN 417-5.8 | | Gewindestift | Set screw | Vis pointeau |
| 31 | ZLG 76 0619 | AXK 0619 TN | | Axial-Nadelkranz | Roller-collar | Cage d'aiguille de roulem. |
| 32 | ZLG 77 0004 | LS 0619 | | Axiallagerscheibe | Axial washer | Rondelle axiale |
| 33 | ZLG 062 601 | 626-Z | | Rillenkugellager | Ball bearing | Roulement à billes |
| 34 | F1Z 320 080 | | | Zahnrad 27 | Gear 27 | Engrenage 27 |
| 35 | ZSR 84 0258 | M2.5x8 DIN 84 A4.8 | | Zylinderschraube | Fiat head screw | Vis à tête cylindrique |
| 36 | ZMO 78 0124 | 12 V | | Gleichstrommotor | Motor | Moteur |
| 37 | ZEL 21 2023 | | | Ind. Näherungsschalter | Proximity detector | Initiateur inductif |
| 38 | F1Z 520 070 | | | Deckel | Cover | Couvercle |
| 39 | Y4A 035 000 | | | Spannmittelplatine | Circuit board | Carte de régulation |



| Pos. | Ref. No. | Type | | Benennung | Description | Designation |
|-------------|----------------|-------------------------------|---------|--------------------------|---------------------------|------------------------------|
| 1-34 | F1Z 590 | | | Gravierspindel | Graving spindle | Broche de graveur |
| 1 | F1Z 590 010 | | | Aufnahme | Mandrin | Porte |
| 2 | ZMU 80 0600 | NM6 DIN 980 | | Sicherungsmutter | Securing nut | Ecrou de sûreté |
| 3 | ZSB 25 0640 | B6,4 DIN 125 | | Scheibe | Washer | Rondelle |
| 4 | ZSB 12 0610 | PS6x12x1 | | Paßscheibe | Shim | Rondelle d'ajustage |
| 5 | ZSB 10 4201 | SS14x20x1,5 | | Stützscheibe | Supporting disk | Rondelle pour bague de frein |
| 6 | ZSR 88 0508 | M5x8-10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 7 | ZME 200 720 | 61906-2RZ | SKF | Rillenkugellager | Ball bearing | Roulement à billes |
| 8 | | D-180Y-01 | Gutekun | Druckfeder | Compression spring | Ressort de pression |
| 9 | F1Z 590 050 | | | Hülse | Sleeve | Douille |
| 10 | ZSB 12 1610 | PS16x22x1 | | Paßscheibe | Shim | Rondelle d'ajustage |
| 11 | F1Z 590 040 | | | Riemenscheibe 1 | Pulley 1 | Poulie 1 |
| 12 | ZSR 88 0506 | M5x6-10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 13 | ZLG 06 0801 | 608-Z | SKF | Rillenkugellager | Ball bearing | Roulement à billes |
| 14 | ZSB 25 0530 | B5,3 DIN 125 | | Scheibe | Washer | Rondelle |
| 15 | ZSR 88 0512 | M5x12-10.9 | | Linsenschraube | Filister head screw | Vis à tête lentiforme |
| 16 | | Proxxon Ref. Nr.28940 | Proxxon | Spannzangensatz 7-teilig | Set of 6 collets with nut | Jeu de 6 pinces avec ecrou |
| 17 | F1Z 590 030 | | | Gravierspindel | Graving spindle | Broche de graveur |
| 18 | ZST 13 0408 | M4x8 DIN 913 | | Gewindestift | Set screw | Vis pointeau |
| 19 | | PS37x47x0,1 | | Paßscheibe | Shim | Rondelle d'ajustage |
| 20 | ZSB 12 0802 | PS 8x14x0,2 | | Paßscheibe | Shim | Rondelle d'ajustage |
| 21 | ZRG 71 0808 | W 8x0,8 DIN 471 | | Sicherungsring | Retaining ring | Circlip |
| 22 | F1Z 590 080 | | | Achse | Arbor | Arbre |
| 23 | F1Z 590 070 | | | Deckblech | Cover sheet | Couvercle |
| 24 | | 3m6x8 DIN 7 | | Zylinderstift | Parallel pin | Tige de serrage |
| 25 | F1Z 590 060 | | | Riemenscheibe 2 | Pulley 2 | Poulie 2 |
| 26 | F1Z 590 020 | | | Gehäuse | Housing | Boîte |
| 27 | ZME 200 721 | 53,57x3,53; 2-227; C557-70 | Parker | Antriebsriemen | O-ring | Bague-O |
| 28 | ZSB 21 0640 | A6,4 DIN 9021 | | Scheibe | Washer | Rondelle |
| 29 | ZRG 27 0060 | A6 DIN 127 | | Federring | Spring washer | Rondelle ressort |
| 30 | ZMU 39 0600 | BM6 DIN 439 04 | | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |
| 31 | ZLG 06 2601 | 626-Z | SKF | Rillenkugellager | Ball bearing | Roulement à billes |
| 32 | F1Z 590 090 | | | Verdrehsicherung | Locking piston | Disp. de sécurité de torsion |
| 33 | ZSB 21 0530 | A5,3 DIN 9021 | | Scheibe | Washer | Rondelle |
| 34 | ZSR 12 0525 | M5x25 DIN 912-6.9 | | Zylinderschraube | Socket head screw | Vis 6 pans creux |



| Pos. | Ref. No. | Type | Benennung | Description | Designation |
|------|-------------|----------------|---------------------|---------------------|--------------------------|
| 1-6 | F1Z 570 | | G. Maschinenleuchte | Machine lamp compl. | Ens. Lampe machine |
| 1 | ZEL 15 0008 | LA 8 | Durchföhrfülle | Grommet | Douille |
| 2 | ZSR 88 0512 | M5×12-6.9 | Linsenkopfschraube | Lens head screw | Vis à tête lentiforme |
| 3 | ZSB 25 0530 | A5,3 DIN125-St | Scheibe | Washer | Rondelle |
| 4 | ZMU 34 0500 | M5 DIN934-6 | Sechskantmutter | Hexagonal nut | Ecrou hexagonal |
| 5 | ZEE 53 1130 | SRL 111 | Leuchte komplett | Lamp compl. | Lampe complet |
| 5a | ZME 00 0110 | 11W | Leuchtstoffröhre | Fluorescent tube | Tube fluorescent |
| 5b | ZME 00 0111 | | Schutzrohr | Protection tube | Tube protecteur |
| 6 | ZEK 22 0799 | | Betätigungswerkzeug | Actuating tool | Outillage d'actionnement |

Ersatzteilliste für elektrische und elektronische Teile
Service parts for electrical and electronical parts
Pièces de service pour electriques et electroniques pièces

EMCO PC Mill 55

Ausgabe 99-9 V01
Edition 99-9 V01

Hinweis:

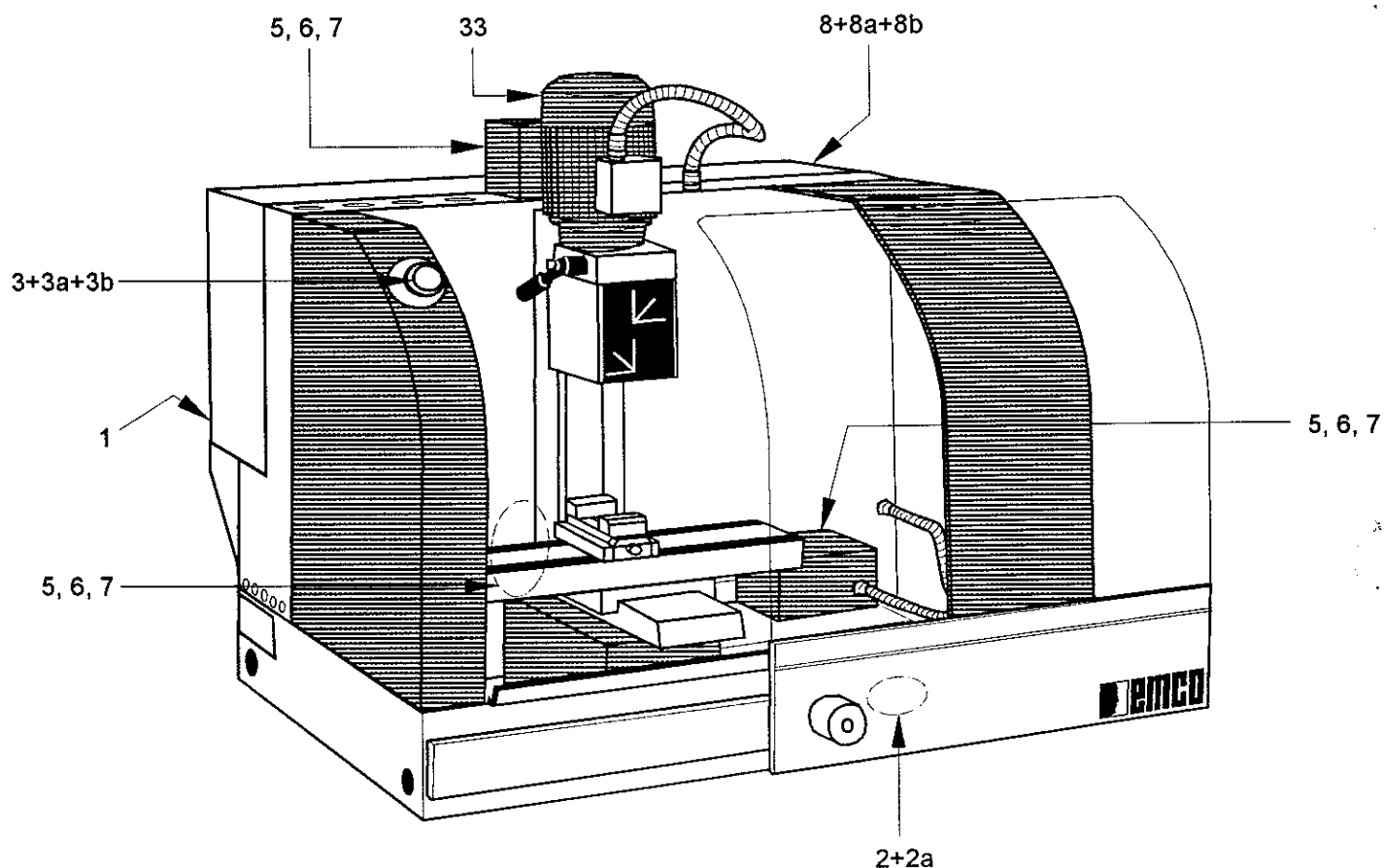
Diese Ersatzteilliste ist ein Auszug aus der Elektro-Dokumentation. Vergleichen Sie die beiden Ausgaben! Bei unterschiedlichen Ausgaben (V...) ist nur die Elektro-Dokumentation verbindlich für die elektrische Ausführung Ihrer Maschine.

Note:

This service parts list is an extract from the electrical documentation. Compare both editions! In case of different versions (V...) only the electrical documentation is correct for the electrical execution of your machine.



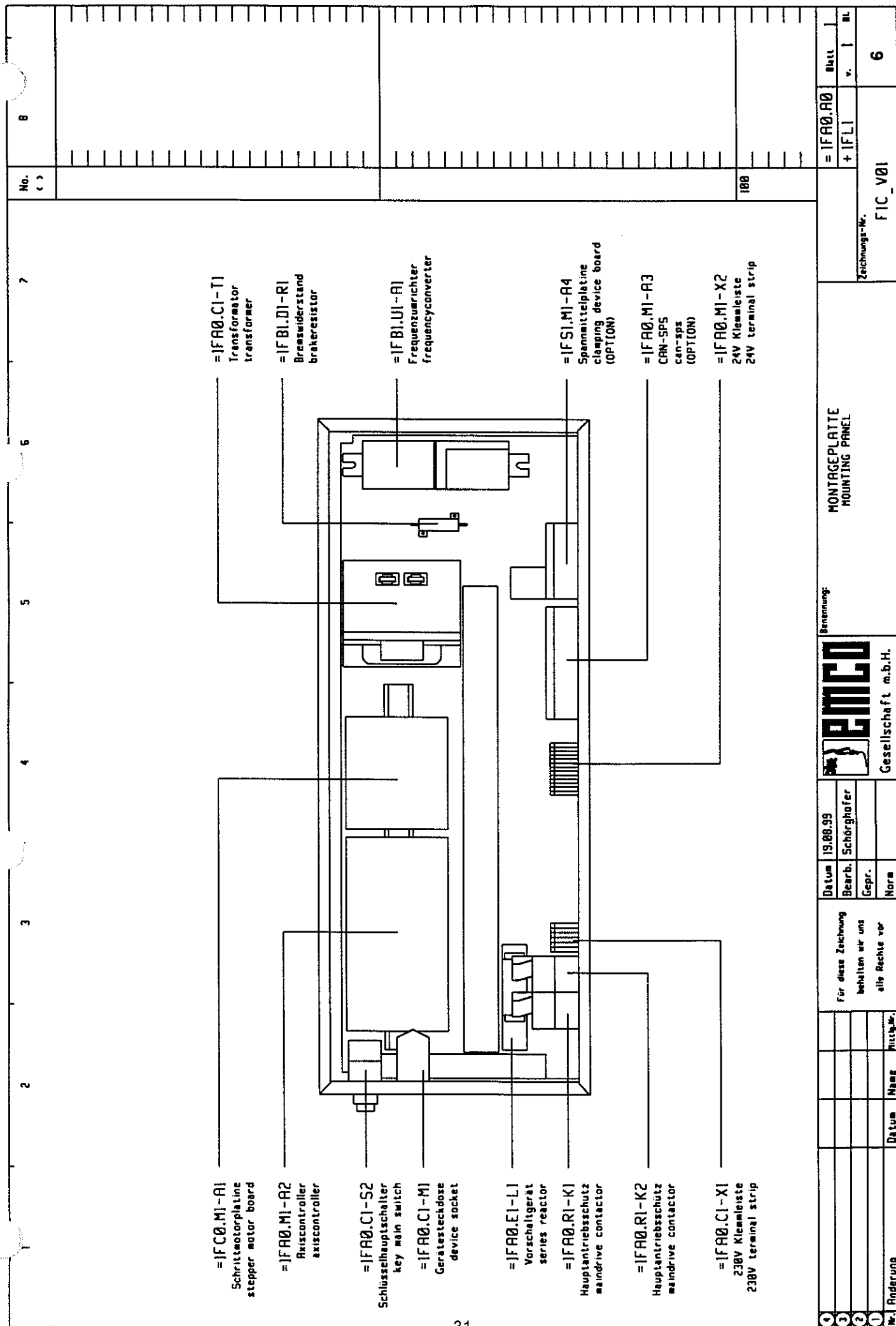
EMCO MAIER Gesellschaft m.b.H. – P.O. Box 131 – A-5400 Hallein/Austria – Tel. (06245) 891 – Fax (06245) 86965



| Pos. | Ref. No. EMCO | Ref. No. Hersteller Manufacturer | Ref. No. Hersteller Manufacturer | Benennung | Description | Designation |
|------|------------------|--|--|--------------------------|-------------------------|------------------------------|
| 1 | ZMO 789 220* | | | Elektrische Teile | Electrical parts | Pieces electriques |
| 2 | ZEL 212 030 | ZS 236-11Z | Schmersal | Endschalter | Limit switch | Commutateur de fin de course |
| 2a | ZEE 470 231 | ZR231-11Y | Schmersal | Rollenhebel | Roller lever | Levier à galet |
| 3 | ZEL 401 010 | 1.30043.551/030 | RAFI | Not-Aus Taste | Emergency off button | Touche arrêt d'urgence |
| 3a | ZEL 491 040 | GHV 87066002P4 | ABB | Kontaktelement | Contact unit | Unité de contact |
| 3b | ZEE 710 701 | GHV 87066002P2 | ABB | Kupplung | Intermediate part | Pièce intermédiaire |
| 4 | ZMO 473 380* | 0,37 kW-1370min ⁻¹ | | Hauptmotor | Motor | Moteur |
| | ZMO 473 381** | 0,55 kW-1400min ⁻¹ | Elin | Hauptmotor | Motor | Moteur |
| 5 | ZMO 780 030* | VDRM 564-50LN | | Schrittmotor X, Y, Z | Step motor X, Y, Z | Moteur pas à pas X, Y, Z |
| | ZMO 780 031** | VRDM366/50LHA | Bergerlahr | Schrittmotor X, Y, Z | Step motor X, Y, Z | Moteur pas à pas X, Y, Z |
| 6 | ZEL 212 023 | BES 516-324-EOL | Balluf | Ind. Näherungsschalter | Proximity switch | Commutateur capacitif |
| 7 | ZEL 239 002 | V-10FL2-1C2 | Omron | Schnappschalter | Quick base switch | Interrupteur instantané |
| 8 | ZEL 440 022 | ZB2 BG2 | Telemecanique | Schlüsseltaster | Key switch | Commutateur à clé |
| 8a | ZEL 491 103 | ZB2 BZ103 | Telemecanique | Kontaktelement 2-fach | Contact unit double | Unité de contact |
| 8b | ZEL 491 101 | | Telemecanique | Kontaktelement 1-fach | Contact unit single | Unité de contact |

*) für Maschinen bis Maschinenummer F1C M2 025

**) für Maschinen ab Maschinenummer F1C M6 001



 * G E R Ä T E S T Ü C K L I S T E F1C_V01 Datum: 29.06.99
 * appliance list date

 *EMCO Maier GMBH * * Seite *
 *Salzachtal Bundesstraße Nord 58 * Projektbez.: PC MILL 55 * page *
 *A-5400 HALLEIN-TAXACH * Zeichn.Nr.: F1C_V01 * 1 *
 *Tel.: 06245/891-0 * *

| Anlage | Ort | BMK | Pfad | SachNr. | Technische Beschreibung | Hersteller/manufact |
|------------------|-----|-----------|---|----------|---------------------------|------------------------|
| install | loc | equ. | path | parts no | technical description | Bestellnr./ordernumber |
| | | | | | Funktionstext/description | |
| =1FA0.C1+1FL1-P1 | 1.3 | ZEE750028 | GLASROHRSICHERUNG 10 AT 5x20 | | WICKMANN | |
| | | | glas tube fuse 10 AT time-lag 5x20 | | | |
| =1FA0.C1+1FL1-S2 | 1.2 | ZEL440022 | SCHLOSSTASTE ZB2 BG2 | | TELEMECANIQUE | |
| | | | 2 Stellungen rastend, links abziehbar | | ZB2 BG2 | |
| | | | key-switched-button ZB2 BG2 | | | |
| | | | two positions grided, strippable left | | | |
| =1FA0.C1+1FL1-S2 | 1.2 | ZEL491103 | KONTAKTELEMENT ZB2 BZ103 2 Schließer | | TELEMECANIQUE | |
| | | | contact element ZB2 BZ103 two NO contacts | | ZB2 BZ103 | |
| =1FA0.C1+1FL1-S2 | 1.2 | ZEL491101 | KONTAKTBLOCK 1 SCHLIESSER | | TELEMECANIQUE | |
| | | | contactbloc 1 nc | | | |
| =1FA0.C1+1FL1-T1 | 1.2 | ZET000386 | TRANSFORMATOR | | HABERMANN | |
| | | | PRIM.SPARWICKLUNG: 110V/10 A, 230V/3A | | | |
| | | | SEKUNDÄR: 24VDC/4A, 30VDC/15A | | | |
| | | | tranformer | | | |
| | | | prim.autotransformer: 110V/10 A, 230V/3A | | | |
| | | | sec.: 24Vdc/4A, 30Vdc/15A | | | |
| =1FA0.E1+1FL1-E1 | 1.4 | ZEE531130 | SCHUTZROHRLEUCHTE SRL111 IN PLEXIGLASAUSF., | | WALDMANN | |
| | | | 1X11W ENERGIESPARRÖHRE, OHNE DROSSEL, | | 101961000 | |
| | | | IP67, 354MM LÄNGE | | | |
| | | | protective tube lamp SRL111, | | | |
| | | | 1X11W power saving tube, without choke, | | | |
| | | | IP67, 354MM length | | | |
| =1FA0.E1+1FL1-L1 | 1.4 | ZEG200111 | VORSCHALTGERÄT 230V/50HZ LOSE ZUM EINBAU | | WALDMANN | |
| | | | FÜR MASCHINENLEUCHTE SRL111 | | 309105010 | |
| | | | TYP: 7-9-11/23SY-V120 | | | |
| | | | series reactor 230V/50Hz | | | |
| | | | for machine lamp SRL111 | | | |
| | | | type: 7-9-11/23SY-V120 | | | |
| =1FA0.M1+1FL1-A2 | 1.4 | Y4A080000 | G.AXISCONTROLLER AC95 MONTAGEPLATTE | | EMCO | |
| | | | g.axiscontroller AC95 mounting panel | | | |
| =1FA0.M1+1FL1-A2 | 1.4 | Y4A091000 | G.STECKERPL. AC95 MONTAGEPLATTE FREMD FU | | EMCO | |
| | | | g.plugin-board AC95 mounting panel buy FC | | | |

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* appliance list

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| Anlage | Ort | BMK | Pfad | SachNr. | Technische Beschreibung | Hersteller/manufact |
|--------------------|-----|------|------|-----------|--|-------------------------|
| install | loc | equ. | path | parts no | technical description | Bestellnr./ordernumber |
| | | | | | Funktionstext/description | |
| =1FA0.M1+1FL1-A3 | | 5.2 | | Y4A029000 | G.SPS-ERWEITERUNG g.sps-extension board | EMCO |
| =1FA0.M1+1FL1-A4 | | 1.3 | | Y4A085000 | G.FILTERPLATINE g.filter-board | EMCO |
| =1FA0.M1+1FL1-A8 | | 1.2 | | ZES150061 | GERÄTESTECKER 1-POLIG 10A/250V TYP:KEC MIT STECKKONTAKTEN 4,8x0,8 single-pole plug 10A/250V type:KEC with male contacts 4,8x0,8 | SCHURTER 4303.0091 |
| =1FA0.M1+1FP1-A300 | | 2.2 | | Y4A083000 | G.PC-EINSCHUB RS422 g.PC insert-card RS422 | EMCO |
| =1FA0.R1+1FL1-K1 | | 1.2 | | ZEL590210 | WECHSELSTROMSCHÜTZ alternating current contactor | SIEMENS 3TJ5001-0BB4 |
| =1FA0.R1+1FL1-K1 | | 1.2 | | ZED450200 | ENTSTÖRDIODE 3TX4490-4A FÜR HILFSSCHÜTZ 3TH2.. supression diode for relay type 3TH2.. | SIEMENS 3TX4490-4A |
| =1FA0.R1+1FL1-K2 | | 1.3 | | ZEL590210 | WECHSELSTROMSCHÜTZ alternating current contactor | SIEMENS 3TJ5001-0BB4 |
| =1FA0.R1+1FL1-K2 | | 1.3 | | ZED450200 | ENTSTÖRDIODE 3TX4490-4A FÜR HILFSSCHÜTZ 3TH2.. supression diode for relay type 3TH2.. | SIEMENS 3TX4490-4A |
| =1FA0.R1+1FU1-S1 | | 1.2 | | ZEL401010 | PILZTASTE mushroom button | RAFI 1.30043.551/030 |
| =1FA0.R1+1FU1-S1 | | 1.2 | | ZEL491040 | KONTAKTELEMENT Aufschnappkontakt 1ÖFFNER contact-element snapp-on-contact one NC-contact | ABB GHV 8706606P4 |
| =1FA0.R1+1FU1-S1 | | 1.2 | | ZEE710701 | KUPPLUNG 45294/0 coupling 452940 | ABB GHV 8706602P2 |

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| Anlage | Ort | BMK | Pfad | SachNr. | Technische Beschreibung | Hersteller/manufact |
|------------------|-----|------|-----------|---|---------------------------|------------------------|
| install | loc | equ. | path | parts no | technical description | Bestellnr./ordernumber |
| | | | | | Funktionstext/description | |
| =1FA0.R1+1FU1-S3 | | 1.2 | ZEL212030 | ENDSCHALTER | | SCHMERSAL |
| | | | | IEC947 VDE660 IP67 CSA UL AC-15 | | ZS 236-11Z |
| | | | | UE 230/220VAC IE 3,8/4A | | |
| | | | | zwangsöffnender Öffner | | |
| | | | | limit-switch | | |
| | | | | IEC947 VDE660 IP67 CSA UL AC-15 | | |
| | | | | UE 230/220VAC IE 3,8/4A | | |
| | | | | positive-operated break-contact | | |
| =1FA0.R1+1FU1-S3 | | 1.2 | ZEE470231 | ROLLENHEBEL | | SCHMERSAL |
| | | | | | | ZR231-11Y |
| | | | | roll-lever | | |
| =1FB1.D1+1FU1-M1 | | 1.4 | ZMO473381 | DREHSTROMMOTOR 0.55KW 1400U/MIN 220/380V | | ELIN |
| | | | | BAUGRÖSSE 71,BAUFORM B14 KL.FLANSCH | | |
| | | | | three-phase-motor 0,55KW 1400upm 220/380V | | |
| | | | | size 71, design B14 small flange | | |
| =1FB1.U1+1FL1-A1 | | 1.2 | ZEG905075 | FREQUENZUMRICHTER 230V 0,75KW | | LENZE |
| | | | | TYP:E82EV751 VECTOR | | |
| | | | | Frequency converter 230V 0,75kW | | |
| | | | | typ:E82EV751 VECTOR | | |
| =1FC0.M1+1FL1-A1 | | 1.2 | Y4B031000 | 3-PHASEN SCHRITTMOTORPLATINE FÜR 3 ACHSEN | | EMCO |
| | | | | 3-phase stepper motor board for 3 axis | | |
| =1FC1.G1+1FU1-M1 | | 1.4 | ZMO780031 | SCHRITTMOTOR VRDM366/50LHA 3-PHASIG | | BERGERLAHR |
| | | | | 40V 5,8A 0,9NM | | |
| | | | | Stepper motor VRDM366/50LHA 3-phase | | |
| | | | | 40V 5,8A 0,9NM | | |
| =1FC1.M1+1FU1-B1 | | 1.6 | ZEL212023 | INDUKTIVER NÄHERUNGSSCHALTER | | BALLUF |
| | | | | PNP-Schließer M8x1 | | BES 516-324-EOJ |
| | | | | 7m Kabel | | |
| | | | | inductance proximity switch | | |
| | | | | PNP-closer M8x1 | | |
| | | | | 7m cable | | |
| =1FC1.M1+1FU1-S1 | | 1.5 | ZEL239002 | BASISSCHALTER V-10FL2-1C2 V3L-E9001M-D18 | | OMRON |
| | | | | microswitch V-10FL2-1C2 V3L-E9001M-D18 | | |
| =1FC2.G1+1FU1-M1 | | 1.4 | ZMO780031 | SCHRITTMOTOR VRDM366/50LHA 3-PHASIG | | BERGERLAHR |
| | | | | 40V 5,8A 0,9NM | | |
| | | | | Stepper motor VRDM366/50LHA 3-phase | | |
| | | | | 40V 5,8A 0,9NM | | |

Fortsetzung auf Seite 4

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| Anlage | Ort | BMK | Pfad | SachNr. | Technische Beschreibung | Hersteller/manufact |
|------------------|-----|------|-----------|--|---------------------------|------------------------|
| install | loc | equ. | path | parts no | technical description | Bestellnr./ordernumber |
| | | | | | Funktionstext/description | |
| ===== | | | | | | |
| =1FC2.M1+1FU1-B1 | | 1.7 | ZEL212023 | INDUKTIVER NÄHERUNGSSCHALTER | | BALLUF |
| | | | | PNP-Schließer M8x1 | | BES 516-324-EOL |
| | | | | 7m Kabel | | |
| | | | | inductance proximity switch | | |
| | | | | PNP-closer M8x1 | | |
| | | | | 7m cable | | |
| ----- | | | | | | |
| =1FC2.M1+1FU1-S1 | | 1.6 | ZEL239002 | BASISSCHALTER V-10FL2-1C2 V3L-E9001M-D18 | | OMRON |
| | | | | microswitch V-10FL2-1C2 V3L-E9001M-D18 | | |
| ----- | | | | | | |
| =1FC3.G1+1FU1-M1 | | 1.4 | ZMO780031 | SCHRITTMOTOR VRDM366/50LHA 3-PHASIG | | BERGERLAHR |
| | | | | 40V 5,8A 0,9NM | | |
| | | | | Steppermotor VRDM366/50LHA 3-phase | | |
| | | | | 40V 5,8A 0,9NM | | |
| ----- | | | | | | |
| =1FC3.M1+1FU1-B1 | | 1.6 | ZEL212023 | INDUKTIVER NÄHERUNGSSCHALTER | | BALLUF |
| | | | | PNP-Schließer M8x1 | | BES 516-324-EOL |
| | | | | 7m Kabel | | |
| | | | | inductance proximity switch | | |
| | | | | PNP-closer M8x1 | | |
| | | | | 7m cable | | |
| ----- | | | | | | |
| =1FC3.M1+1FU1-S1 | | 1.5 | ZEL239002 | BASISSCHALTER V-10FL2-1C2 V3L-E9001M-D18 | | OMRON |
| | | | | microswitch V-10FL2-1C2 V3L-E9001M-D18 | | |
| ----- | | | | | | |
| =1FP1.M1+1FU1-S1 | | 1.5 | ZEL212030 | ENDSCHALTER | | SCHMERSAL |
| | | | | IEC947 VDE660 IP67 CSA UL AC-15 | | ZS 236-11Z |
| | | | | UE 230/220VAC IE 3,8/4A | | |
| | | | | zwangsöffnender Öffner | | |
| | | | | limit-switch | | |
| | | | | IEC947 VDE660 IP67 CSA UL AC-15 | | |
| | | | | UE 230/220VAC IE 3,8/4A | | |
| | | | | positive-operated break-contact | | |
| ----- | | | | | | |
| =1FP1.M1+1FU1-S1 | | 1.5 | ZEE470231 | ROLLENHEBEL | | SCHMERSAL |
| | | | | | | ZR231-11Y |
| | | | | roll-lever | | |
| ----- | | | | | | |
| =1FS1.M1+1FL1-A4 | | 1.2 | Y4A035000 | G.SPANNMITTELPLATINE | | EMCO |
| | | | | g.clamping device board | | |
| ----- | | | | | | |
| =1FS1.M1+1FL1-M1 | | 1.2 | ZMO780122 | DC-MOTOR 2332.909-13.151-050 MIT | | MAXON |
| | | | | GETRIEBE 2938.804-0100.0-000 100:1 | | |
| | | | | DC-motor 2332.909-13.151-050 with | | |
| | | | | transmission 2938.804-0100.0-000 100:1 | | |

Fortsetzung auf Seite 5

| Anlage | Ort | BMK | Pfad | SachNr. | Technische Beschreibung | Hersteller/manufact |
|------------------|-----|------|-----------|------------------------------|---------------------------|------------------------|
| install | loc | equ. | path | parts no | technical description | Bestellnr./ordernumber |
| | | | | | Funktionstext/description | |
| =1FS1.M1+1FU1-B2 | | 1.5 | ZEL212023 | INDUKTIVER NÄHERUNGSSCHALTER | | BALLUF |
| | | | | PNP-Schließer M8x1 | | BES 516-324-EOL |
| | | | | 7m Kabel | | |
| | | | | inductance proximity switch | | |
| | | | | PNP-closer M8x1 | | |
| | | | | 7m cable | | |
| =1FS1.M1+1FU1-B3 | | 1.6 | ZEL212023 | INDUKTIVER NÄHERUNGSSCHALTER | | BALLUF |
| | | | | PNP-Schließer M8x1 | | BES 516-324-EOL |
| | | | | 7m Kabel | | |
| | | | | inductance proximity switch | | |
| | | | | PNP-closer M8x1 | | |
| | | | | 7m cable | | |

Ende der Liste