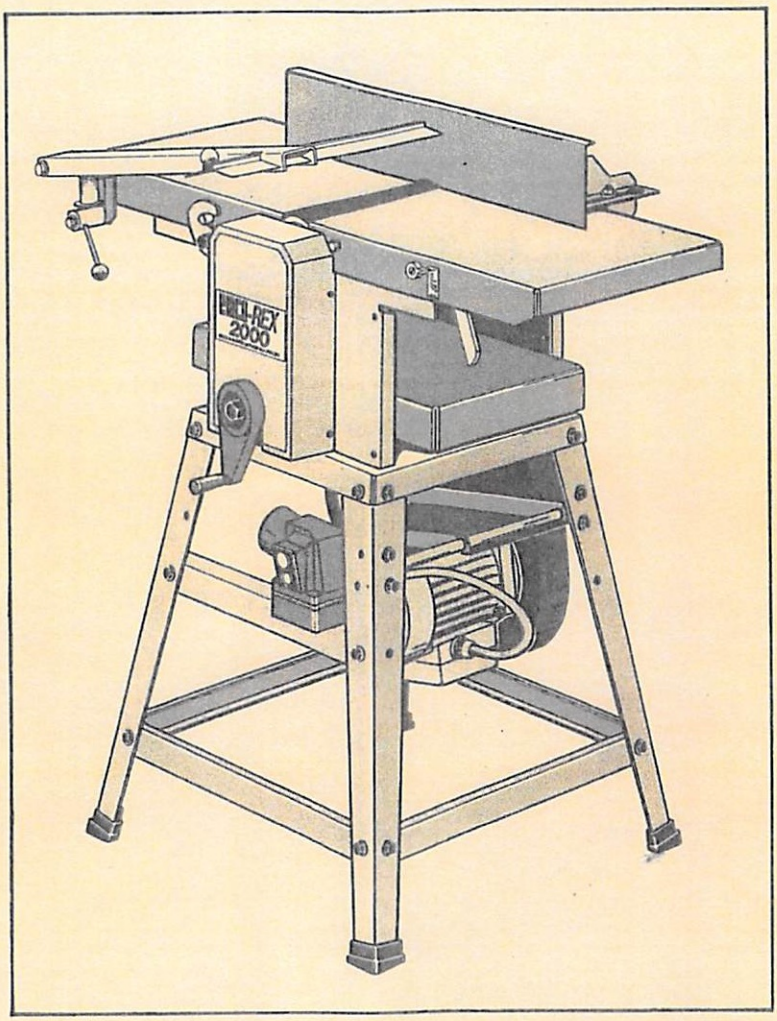
Instruction book

Service parts

EMCO-REX 2000



ENGLISH

Edition 8006 Ref. Nr. EN 6 610

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Accident Prevention

General:

+ During maintenance work and changing knives secure machine against running (remove plug).

Electrical Connection:

+ The electrical connection must be carried out professionally, a grounding receptacle must be available.

Planing:

+ Only work with well-sharpened planing knives; danger of kick-back is substantially reduced.

+ The cutter spindle must be covered with the fence the complete width of the board.

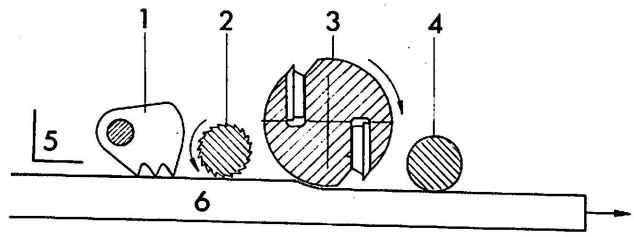
+ For planing short workpieces use feeding device.

+ For pressing workpieces against table, use palm of the hand - not fingertips. Hand must be held flat; do not hold workpiece on the sides.

+ Remove lose twigs or branches from the workpiece before planing.

Thicknessing:

+ The EMCO REX 2000 planing and thicknessing machine is equipped with a kick-back guard, which guarantees that the workpiece is not thrown against feeding direction.



1 Kick-back guard

2 Serrated roller or feed roller

3 Cutter spindle

4 Discharge roller

5 Sheet

6 Workpiece

If ledges of different sizes are planed at the same time, the thiner pieces could be thrown back. This is prevented by the kick-back guard. The guard allows the workpiece to pass in feed direction, but presses it to the table and holds it, if kick-back occurs.

+ Resins remaining under guard should be removed with terpentine or similar cleaning fluid.

+ Always cover cutter spindle with swarf extractor.

+ Remove nails and other foreign objects from the workpieces.

+ Workpieces which are shorter than 130 mm must not be fed into the machine because the transport rollers are unable to transport them through the machine.

+ After finishing work, turn thicknessing table to lowest position - by means of the handwheel. - In this way, swarf can be removed easily.

Technical Data

Length of planing table	850 mm
Length of thicknessing table	450 mm
Dia. of cutter spindle	60 mm
Number of knives	2
Speed of cutter spindle	6000 1/min
Max. planing width	260 mm
Thicknessing opening	150 x 250 mm
Max. cutting depth	3 mm
Automatic feed (thicknessing)	5 m/min
Weight: approx.	65 kg

Subject to technical changes without notice!

Electrical Equipment

All the electrical equipment is dust- and splashproof according to IP 54.

Motor single-phase:

IEC-Standard motor, size 90, type B3
Motor capacity:
P1: 1,3 kW, S6 - 40 % intermittant duty (ID)
P2: 1,85 kW

Motor three-phase:

IEC-Standard motor, size 80, type B3
Motor capacity:
P1: 1,5 kW, S6 - 40 % intermittant duty (ID)
P2: 2,05 kW

Motor switch: alternatively

1. Rocker-type switch completely enclosed with supply cable (3m)
2. VDE push-bottom switch, with low-volt release, completely enclosed with supply cable (3m)
3. Push-bottom switch, with low-volt release, completely enclosed, socket with shrouded contacts.

Basic Equipment

+ Machine with planing and thicknessing table, automatic feed drive
+ Machine base
+ Motor with switch, belt and belt cover
+ 2 knives (mounted)
+ Fence with 45° scale, adjustable cross to table, can be inclined up to 45°
+ Cutter spindle guard (Standard or SUVA)
+ Swarf extractor
+ Adjusting gauge for knives
+ Operating and servicing tools

  1 Ring spanner 17 x 23, DIN 837 A
  1 Hexagon key H5A 000 400
  1 Pin 6 x 120, H5A 000 480
  1 Open ended spanner 13 x 10, DIN 895

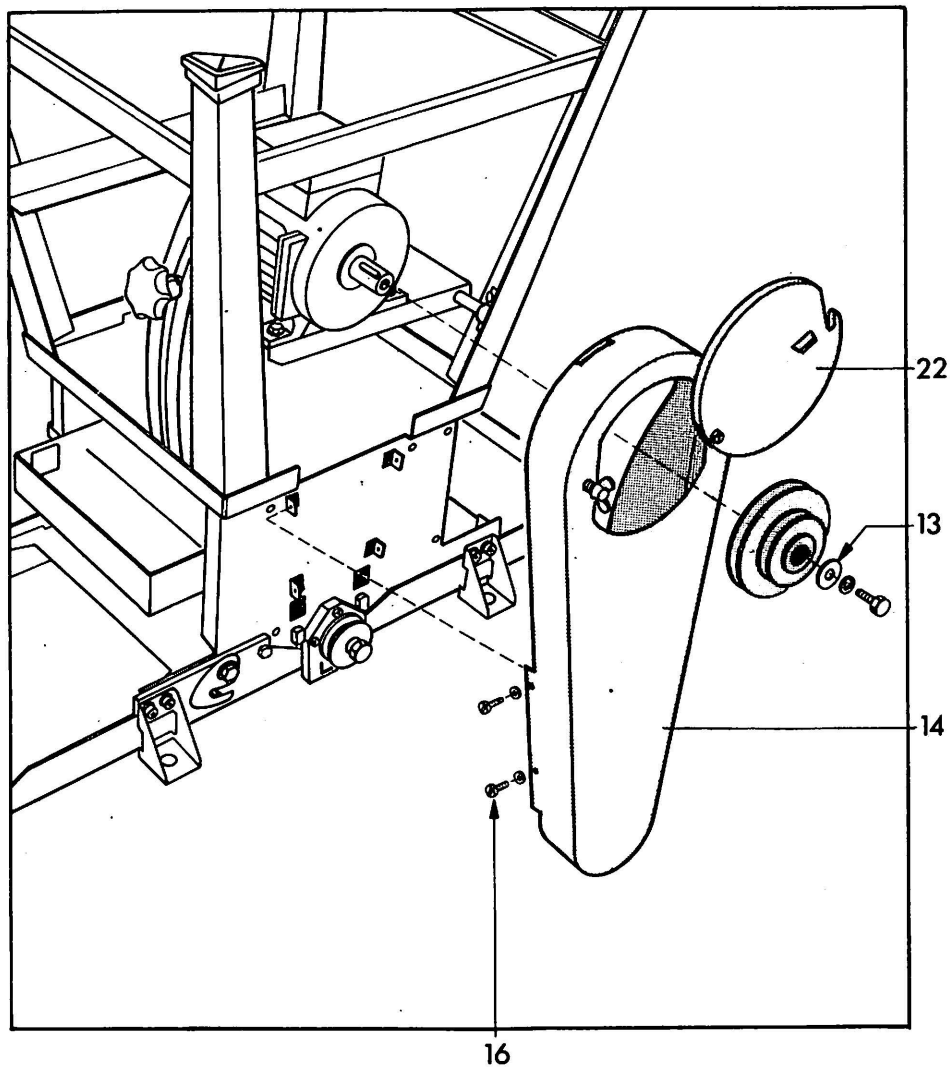
Accessories

Adjustable roller support, as a help when working with long workpieces.

Silbergleit: non adhesive dry lubricant for planing and thicknessing table.

Tools

+ Replacement knives (HSS quality)
+ Replacement knives, carbide tipped



For easing the assembly of the machine, the belt cover will be pre-assembled starting September 1980.
Therefore, the assembly instructions on page 4, point 3,4,5 change.

ASSEMBLING WITH BELT GUARD PRE-ASSEMBLED

(see also page 4)

3. Open the transparent cover (22) and place the driving belt on the pulley of the spindle.
   Mount the belt cover (14) with the 4 self-tapping screws (16) and washers to the machine housing.

4. Mount the motor pulley with the large washer (13), the spring washer and the hexagon screw M8 x 20. Take care about the position of the key on the motorshaft and the groove of the pulley when you slip on the pulley.

5. Place the belt on the larger diameter and tighten it (the smaller pulley serves for driving the circular saw, mortising attachment and the milling arbor.

Note:

If the metal sheet of the belt cover (position 12, page 4) touches the motor pulley, clamp the belt cover in adjusted position.

Remark:

The transparent cover and the mounting elements (position 25 - 29, in spare parts list page 8,9) will be packed with the machine starting September 80. If you bought an earlier machine, your dealer will provide you with these parts free of charge.

Assembling the Planing and Thicknessing Machine

For transport reasons the machine is not delivered completely assembled. After unpacking, check machine for any possible transport damage and for completeness of parts (see basic equipment).

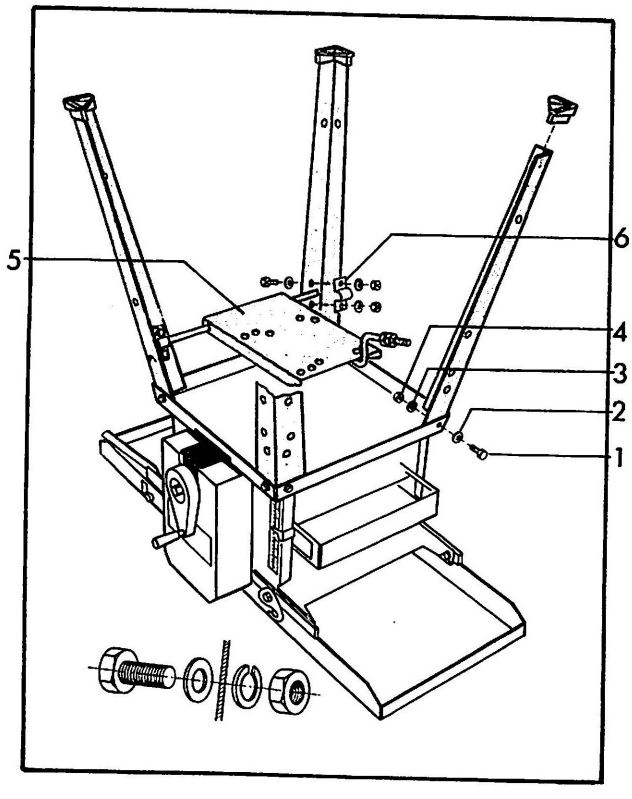
For simplest mounting of the machine stand, etc., place the machine upside down onto the styrofoam base with the planing table resting on the floor.

Note:

Do not bend the extending sheet on the planing table.

Mount handle A with the hexagon nut. The hexagon nut is inserted from the rear side.

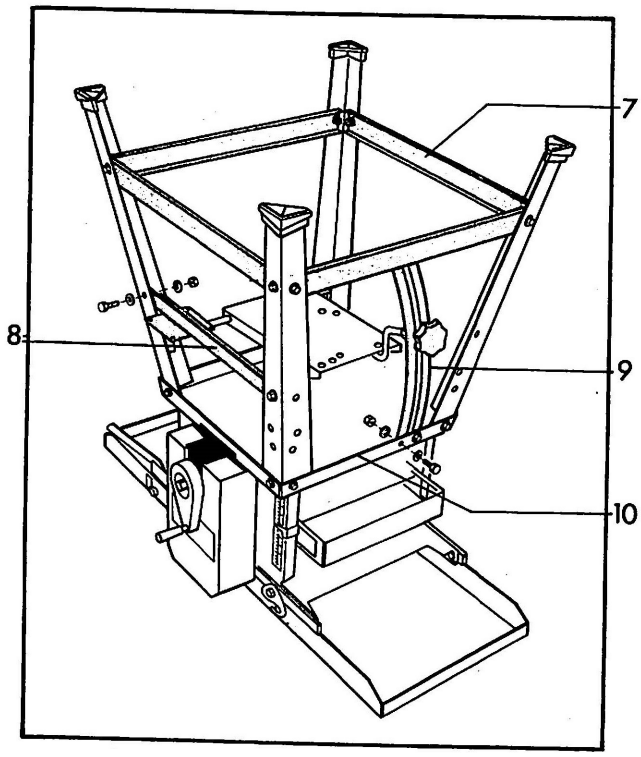
MOUNTING THE MACHINE BASE AND THE MOTOR PIVOTING BASE



1. Mount the stand legs with the hexagon screws M8 x 16 (1), washers (2), spring washers (3) and hexagon nuts (4). - The motor pivoting plate (5) is fixed by means of the fishplate (6) to the stand legs.
   Mount the plastic elements onto the ends of the machine legs.

2. Mount the four connection sheets (7) and the switch sheet (8). Clamp the holder sheet (9) with the hexagon screws, washers, spring washers and hexagon nuts so, that it is at a right angle with the edge of the machine housing (10).

   Counter the two hexagon nuts on the arbor of the motor pivoting plate in this position that the swing radius of the nuts equals the radius of the pivoting plate - but so, that the pivoting plate is not bent.
   Fix the motor pivoting plate with the star knob in horizontal position.

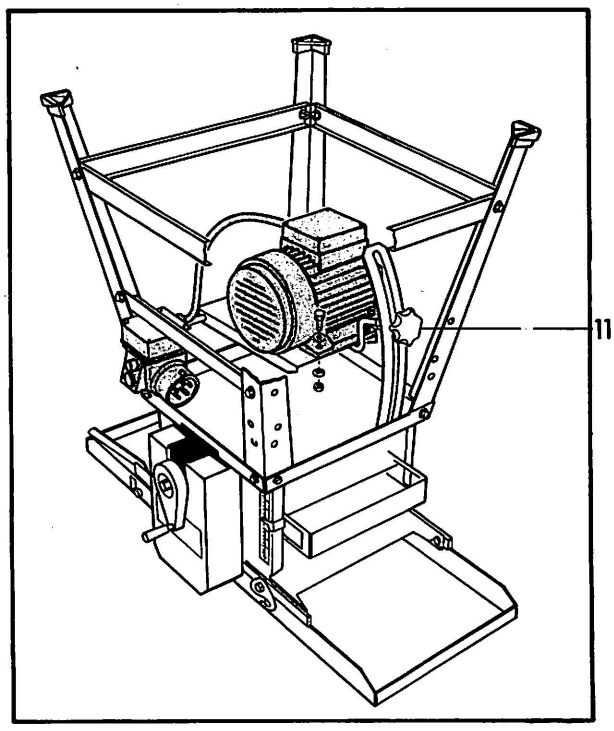


MOUNTING THE MOTOR, THE MOTOR SWITCH AND THE BELT COVER

Clamp the motor pivoting plate with the star knob (11) in horizontal position.

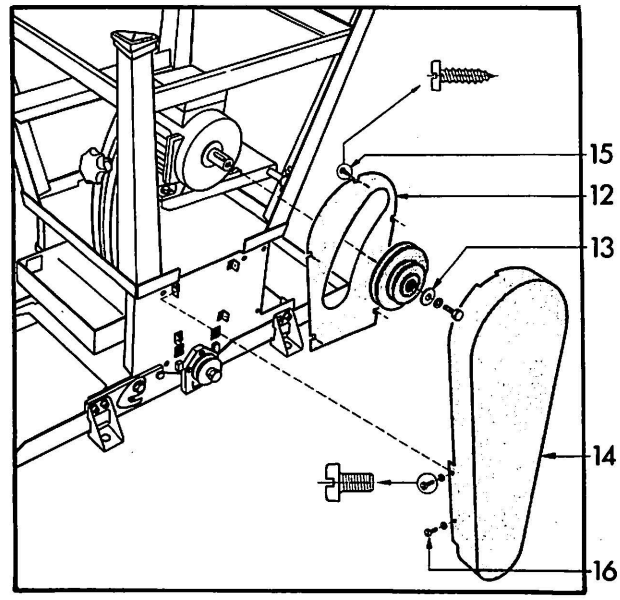
1. Bolt the motor with the four hexagon screws (M8 x 25), washers, spring washers and hexagon nuts to the pivoting plate.

2. Fix the motor switch with the two flat head screws (M4 x 50), spring washers and hexagon nuts on the switch sheet.



3. Slip the cover sheet (12) and the motor pulley onto the motor shaft. Secure the motor pulley with the large washer (13), the spring washer and the hexagon screw (M8x20).

   Place the V-belt on the larger pulley diameter and pulley of the planer shaft and tension it by swinging up the motor (the smaller pulley on the motor serves for driving the additional devices: circular saw, mortising attachment and spindle moulder).



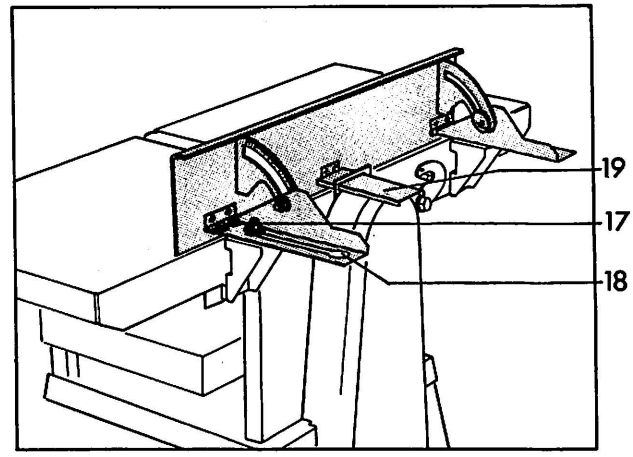
4. Mount the cover sheet (12) with the four sheet metal screws (15) to the belt cover (14).

5. Bolt the assembled belt cover with the four flat head screws (16) and washers to the machine housing.

6. Return assembled machine to upright position.

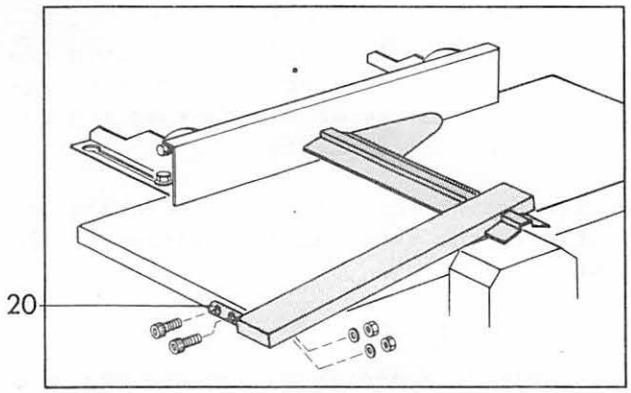
MOUNTING THE FENCE

Loosen the hexagon nuts (17), put the fence shanks with its bores (18) over the hexagon nuts. Insert the cover sheet (19) into the slot of the extending sheet; slide the fence to the required position and clamp it.



MOUNTING THE CUTTER SPINDLE GUARD STANDARD

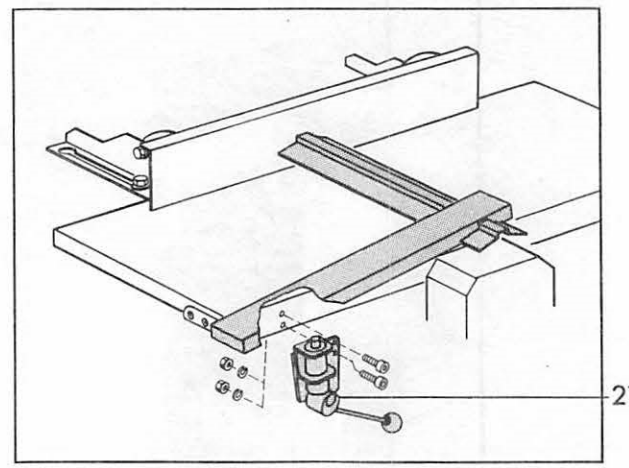
Fix the arbor (20) with the socket head screws (M6 x 25), spring washers and hexagon nuts on the planing table.



MOUNTING THE CUTTER SPINDLE GUARD SUVA

Fix the arbor (20) with the socket head screws (M6 x 25), spring washers and hexagon nuts to the planing table.

Mount the guard holder (21) to the side of the planing table as illustrated. By swivelling the handle of the guard holder, the cutter spindle guard is lifted and lowered.



Electrical Connection

Due to the different electrical safety regulations in the countries supplied, different switches are available.

The cable is supplied without a plug. The connections of a plug must be carried out professionally.

MOUNTING THE PLUGS

Note:

The electrical connections must be carried out professionally!!

Single-phase version:

Connect the yellow-green wire (grounding wire) to the grounding contact (symbol ⏚). The brown and blue wires (R and N) are connected to the other contact points.

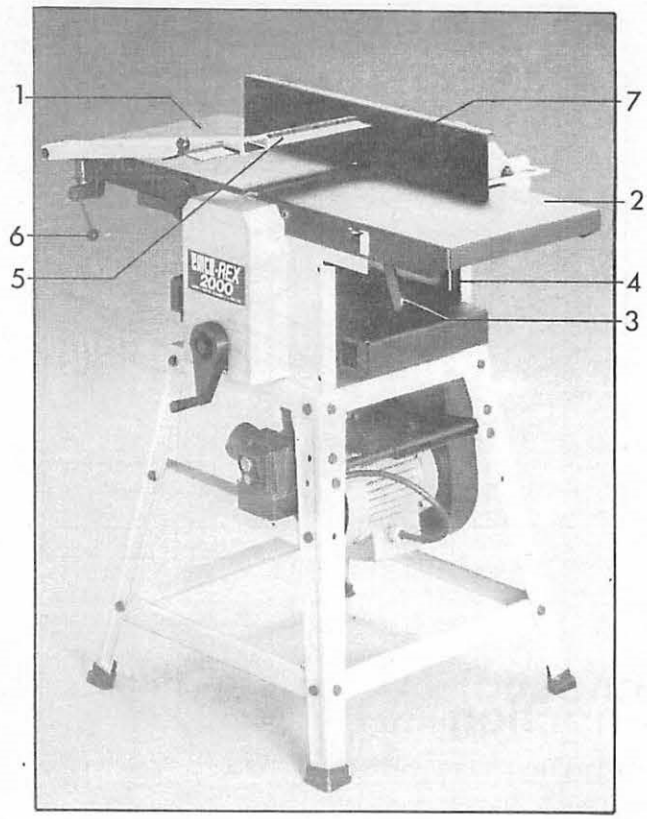
Three-phase version:

The yellow-green wire SL (grounding wire) is clamped to the grounding contact (symbol ⏚). The blue, brown and black wires (R,S,T) are clamped to the contacts R,S,T.

With three-phase motors it happens that they run in the wrong direction. In this case, interchange the clamping of two wires (for example the blue and brown).

Planing

OPERATING ELEMENTS, WORKING TIPS



Discharge table (1)

The discharge table is fixed to the housing with two excenter clamps. It is not adjustable in height. When thicknessing, the table is removed.

Feed table (2)

By swinging the lever (3) the feed table is adjusted in height. The indicator shows on the scale (4) the height difference of discharge and feed tables. If a workpiece is planed, as many mm are taken off as indicated on the scale.

Discharge and feed table are called planing table.

Cutter spindle guard (5)

The cutter spindle guard can be moved parallel to the cutter spindle. So the cutter spindle is completely guarded regardless of the fence position.

By swivelling the lever (6) the guard is lifted to the individual thickness of the board.

The fence (7)

The fence is adjustable cross to the cutter spindle to compensate the natural wear of the cutting edges along the cutter blade. By means of the scale an exact angle adjustment of the fence is possible (max. 45°).

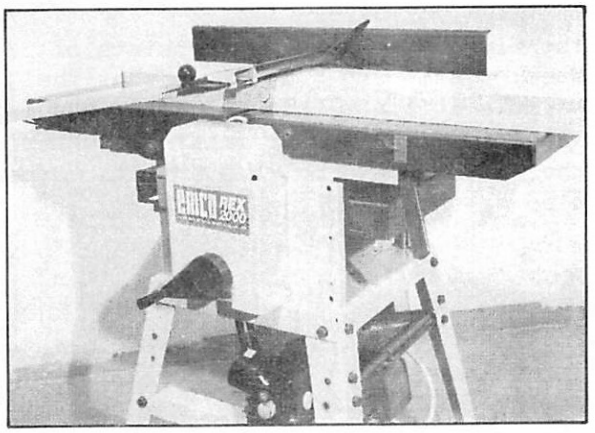
WORKING TIPS

1. When planing bring thicknessing table to lowest position so that there is enough space for the swarf. Adjust the required planing thickness.

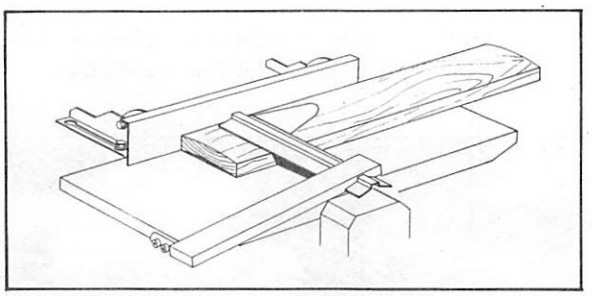
2. While feeding the workpiece, press it on discharge table.

3. When planing workpieces with uneven surfaces, do not start with thick cuts.

PLANING WIDE BOARDS



+ Adjust required planing thickness.
+ Slide cutter spindle so that the cutter spindle is guarded over the complete length.
+ Swivel the lever (6) to pass the board under the guard.
+ Plane arched boards on the concave side, otherwise you will not get a plane surface.

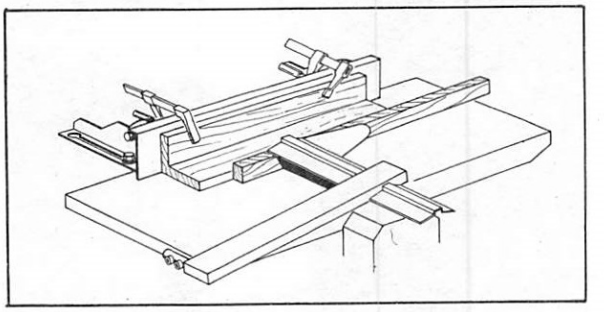


PLANING NARROW SIDES OF BOARDS

Clamp the fence in the desired angle. Position the cutter spindle guard so that the cutter spindle is guarded - except the board width.

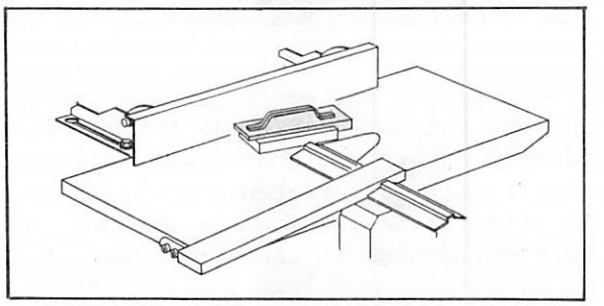
PLANING WORKPIECES WITH SMALL CROSS SECTION

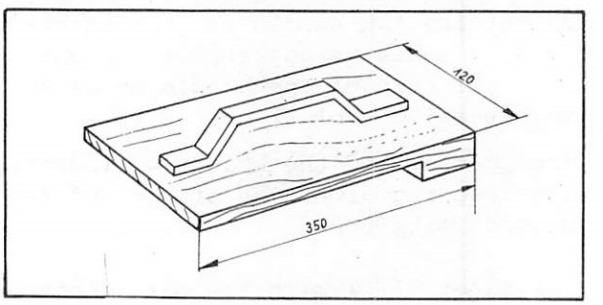
It is difficult and dangerous to guide small workpieces along the fence. Therefore mount a self-made auxiliary fence to the fence as illustrated.
Cover cutter spindle to workpiece width.



PLANING SHORT WORKPIECES

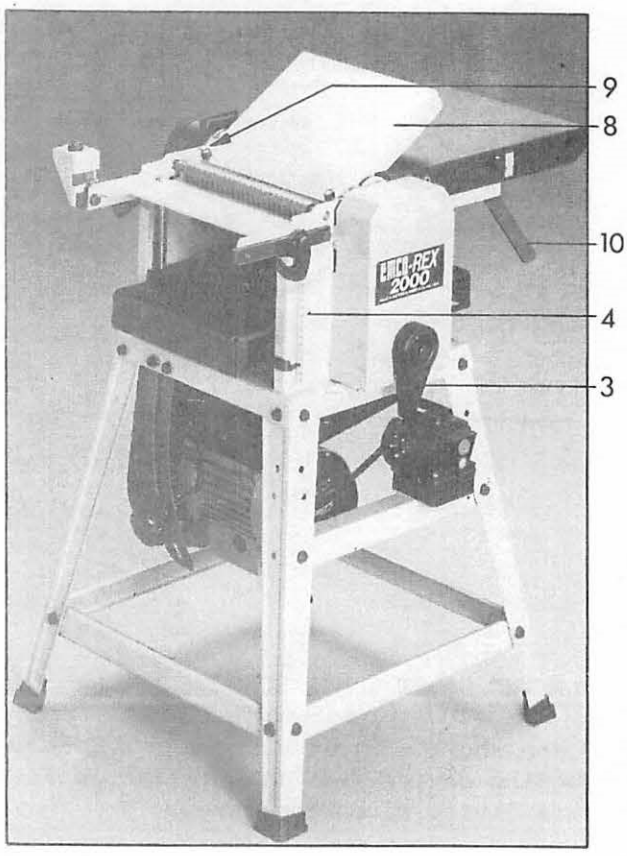
Plane short workpieces with a self-made feeding device (see illustration). Feed this device with both hands.





Thicknessing

CONSTRUCTION - OPERATING ELEMENTS



The two feed rollers (1,2) are driven by the cutter spindle via V-belt, reduction gears and chain. The feed roller (1) is serrated; the discharge roller (2) has a smoother surface to prevent damage to the workpiece.

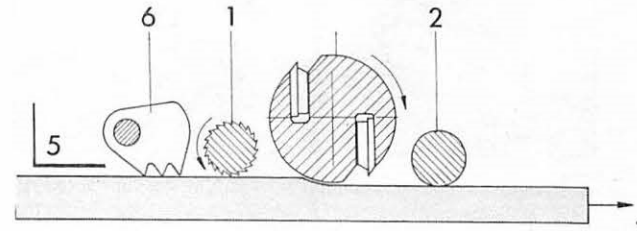
Both rollers are spring loaded.

By turning the handle (3) the thicknessing table is adjusted in height. One full turn of the handle moves the thicknessing table 1 mm.

The pointer and the scale (4) indicate the required dimension of the thicknessed workpiece.

The sheet (5) limits the max. depth of cut to 3 mm and prevents the machine against overload.

The kick-back guard (6) consists of 23 steel plates and guarantees that the workpiece is not thrown against feeding direction. Any resins remaining under the guard should be removed with terpentine or similar cleaning fluid.



PREPARING THE MACHINE FOR THICKNESSING

1. Clamp the fence in the utmost side position.

2. Loosen the two excentric clamps (7) and take off the discharge table.

3. Swivel lever (10) downwards, insert swarf extractor (8) onto the metal sheet (9) and fix the swarf extractor by swinging the lever (10) upwards.

WORKING TIPS - THICKNESSING

+ Prior to thicknessing, every workpiece has to be planed, to achieve plane and parallel surfaces. The workpiece must then be placed with the planed side on the thicknessing table and moved forwards by hand to the serrated roller.

  Insert workpieces with uneven thickness with the thicker side first to prevent jamming of the workpiece.

+ If the table is adjusted for more than 3 mm cutting depth, a metal sheet prevents the workpiece to be inserted.
  Taking off more than 3 mm is done by several thicknessing operations.

+ When a workpiece jams, immediately reduce cutting depth.
  The reason could be:

  Uneven thickness of boards: workpiece jams between thicknessing table and the metal sheet.

  Table is dirty (resins): remove resin with petrol, terpentine or similar fluid, dry the table and rubb it with "Silbergleit". The table should not be treated with oil as the workpiece would absorb the oil and become unfit for gluing, staining and varnishing.

  Flat belt too loose: If the flat belt driving the feeding mechanism is too loose and therefore slips, it would be damaged. So regularly check the tension of the flat belt (see page 11 - checking of the flat belt).

+ If thin boards (less than 5 mm) are thicknessed, place them on a thicknessed board (about 20 mm thick) and pass them through together.

+ Remove lose twigs and branches from the workpiece before planing.

+ Workpieces which are shorter than 130 mm must not be fed into the machine because the transport rollers are unable to transport them through the machine.

Maintenance

PLANING TABLE, THICKNESSING TABLE

+ Remove resin from tables with terpentine.

+ Rubb the tables regularly with "Silbergleit", especially when machining wood with much resin (like fir wood).

+ Before longer working pauses prepare the tables with rust preventiv.

ADJUSTING SPINDLES FOR THICKNESSING TABLE

+ Remove dirt and swarf and oil them lightly.

SERRATED ROLLER

+ Dismount discharge table and remove resin (with terpentine) and wood bits (with a screw driver or similar).

KICK-BACK GUARD

+ Every kick-back lamella must fall to the basic position itself when it is lifted.
Resin on the lamellas would prevent the swivelling back, which would increase possibilities of the workpiece being thrown back. So check the lamellas regularly and if necessary remove the resin with terpentine.

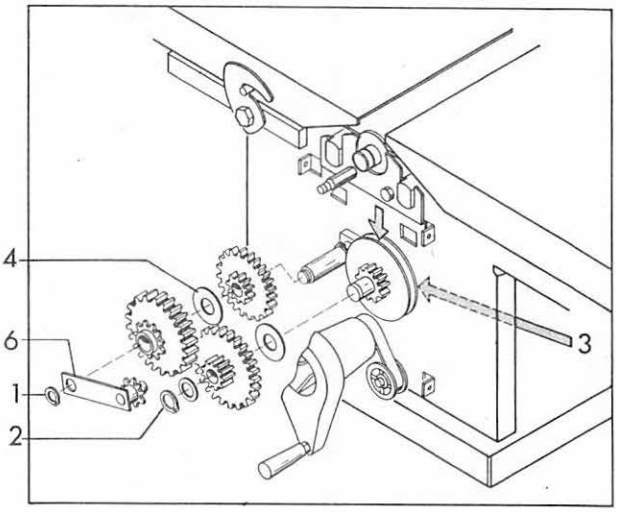
SWARF EXTRACTOR

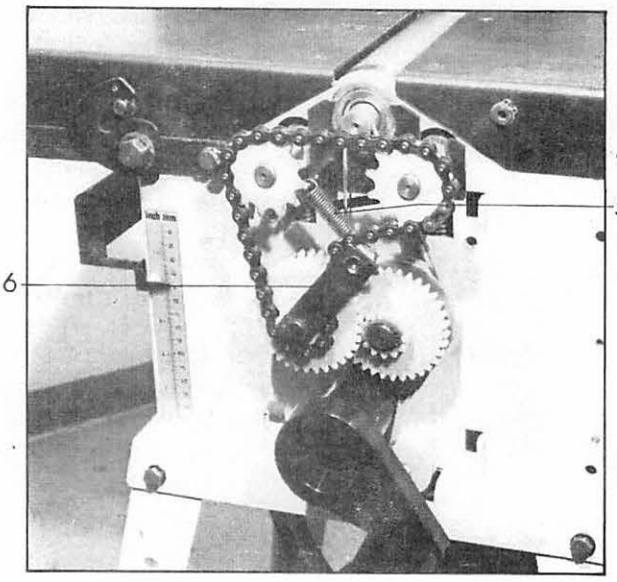
+ If necessary remove any resin in the swarf extractor with terpentine.

Adjustments

A Mounting a new flat belt for the feeding mechanism

1. Remove cover and bring thicknessing table to lowest position.
2. Dismount the chain
3. Remove retaining washers (1,2), the gears and spacing washers (4) between gears.
4. Loosen the first hexagon screw (3)- it is positioned inside the housing- and lift the pulley for placing the new belt. Care must be taken that the pulley grooves are free of oil and grease.





5. Tension the belt by pressing the pulley downwards and tighten the hexagon screw (3).
6. Mount the gears (note the position of the spacing washers (4), the chain spanner (6), the spring (5) as well as the chain and the cover.

Correct tensioning of the flat belt

Thickness a board of approx. 200 mm (8") width. When holding the board the serrated rollers must slip on the board, not the flat belt. If the flat belt slips it has to be tensioned. For tensioning the belt the gears must not be removed.

Note:

A slipping flat belt would be worn within short time.

B Tensioning the toothed belt for the spindle drive, adjusting the thicknessing table

The thicknessing table is adjusted in height by means of 4 threaded spindles which are driven by the toothed belt. If the drive is overloaded (for example through excessive adjustment of table during the thicknessing operation the workpiece is clamped between thicknessing table and the metal sheet) the toothed belt slips on the handle.

If the belt would slip on one of the spindles, the thicknessing table would be disaligned. Disalignment means that thicknessing table and cutter spindle are not parallel and this causes also a lack of spindle and nut.

BECAUSE OF THIS SPECIAL CONSTRUCTION THE FOLLOWING COULD HAPPEN:

Toothed belt slips on handle - the thicknessing table can be moved neither upwards nor downwards.

Remedy to move table downwards

Press belt at position one (1) in the direction indicated and turn handle counterclockwise.

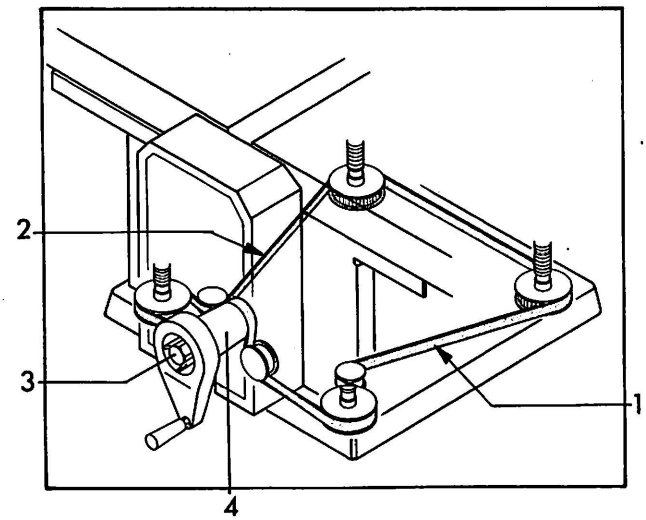
Remedy to move table upwards

Press belt at position two (2) in the direction indicated and turn handle clockwise.

TENSIONING THE TOOTHED BELT

If a slip of the belt on the handle occurs, not caused by excessive adjustment, the belt has to be tensioned.

Loosen the bearing bolt (3), press handle (4) upwards (by this the toothed belt is tensioned) and fix the handle with the bearing bolt.



C Readjustment of spindle pulley position

A slip of the V-belt on a spindle pulley could happen if you press the belt on the wrong side when compensating the slip on the handle.
So if the belt is hard to move though spindles are not resined or if the thicknessed boards are not parallel, probably the position of one spindle pulley is not congruent with the others.

Adjustment

1. Carefully tilt the machine until the markings on the bottom of the housing can be seen.

2. Turn the handle so that the markings on the spindle pulleys are congruent with the markings on the machine housing.

3. If one marking is not congruent, loosen bearing bolt (3), turn spindle pulley to congruent position and tighten toothed belt.

4. Control: If the table adjustment is difficult or if the boards are not parallel, you turned the spindle pulley in wrong direction.

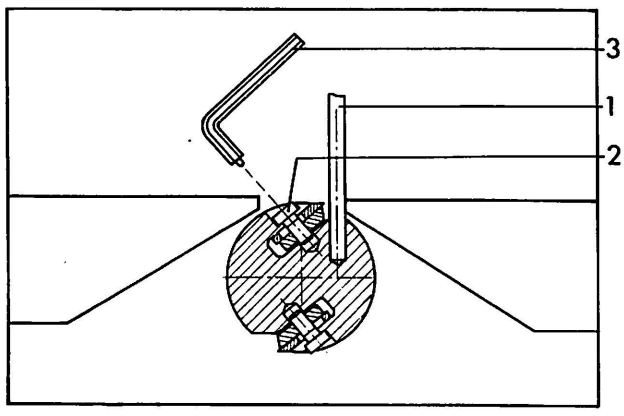
Changing the Knives

Unplug machine from outlet

Dismounting the knives

1. Insert dowel pin (1) into the bore at the cutter spindle.

2. Unscrew the socket head screws (2) with the hexagon key (3) delivered with the machine. Note that this key has a plug. With other keys these socket head screws would be damaged.

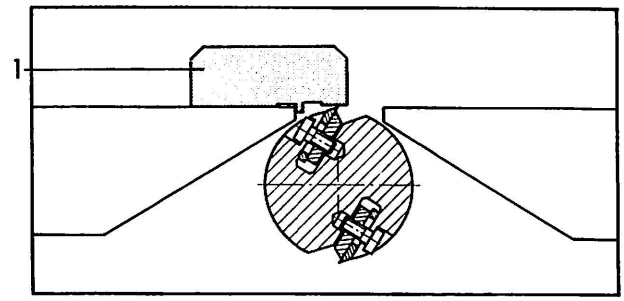


Mounting the knives

Clean the slots of the cutter spindle and free the knives of oil.
Insert the blades together with the pressure bar and hold them with the socket head screws.

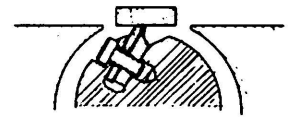
Setting the knives to correct height

Place the adjustment gauge (1) on the discharge table.
The knives must be clamped so, that cutting edges touch the area A when turning the cutter spindle; but the cutting edges must not lift the adjustment gauge.
Make this adjustment and check on both sides of the discharge table.
For tightening the socket head screws use the dowel pin to fix the cutter spindle.



Sharpening the knives in mounted position

If apart from chips much wood dust is generated, this is an indication that the knives are no longer sufficiently sharp.
They can be sharpened without dismounting them with an oilstone (fine grain) and oil. The oilstone is placed on the cutting edge and evenly moved forwards and backwards along the entire length of the knife under moderate pressure until the knife is sharp.



GRINDING THE KNIVES

+ Cutter knives must be ground on a grinding machine to be absolutely straight.

+ Grind the knives in pairs in order to have the same width. Knives with unequal width would cause unbalanced run.

+ The rake angle is 40^{o}. Do not alter this angle.

+ For evening the cutting edge use an oilstone.

ACCIDENT PREVENTION

+ Cracked knives must not be used

+ For tightening the hexagon head screws use only the hexagon key with the plug.

+ Dull knives increase the possibility of kick-back.

Problem – Possible Reason – Remedy

Problem - Possible Reason - Remedy

PLANING Problem	Possible Reason	Remedy
Excessive hand power for feeding	Resin on table	Clean tables with terpentine and rubb them with with "Silbergleit".
	Dull knives	Sharpen or grind knives
Large grooves on workpiece	Grooves in knives (possibly caused by nails or stones in the wood)	Grind and replace knives
THICKNESSING Workpiece feed stops	Resin on table	Clean table with terpentine and rubb it with "Silbergleit".
	Flat belt slips	Tighten flat belt and check correct tensioning (see adjustments).
	Workpiece jams because of uneven thickness	Immediately turn thicknessing table downwards
	Very wet wood	Rubb thicknessing table frequently with "Silbergleit".
Thicknessing table hard to adjust	Resined spindles	Clean spindles and oil them
	Toothed belt slipped on one spindle pulley	Adjust spindle pulley (see adjustments).
Toothed belt slips on handle - thicknessing table can not be adjusted	Table under excessive tension, toothed belt has too little tension	See adjustments

CIRCUIT DIAGRAM

Single Phase

Standard

A12.726

b1 Motor switch
k1 Condenser
m1 Main motor

CIRCUIT DIAGRAM

Three Phase

Standard

A 12.711

b1 Motor switch
m1 Main motor

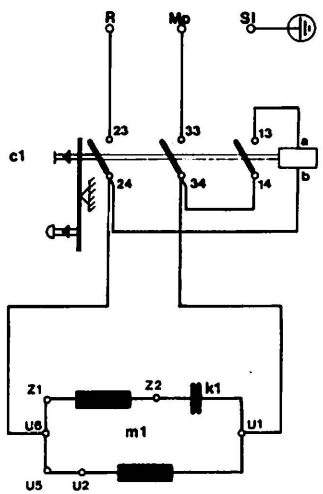
Switching Δ or Y see motor capacity plate

A12.727

CIRCUIT DIAGRAM

Single Phase

VDE



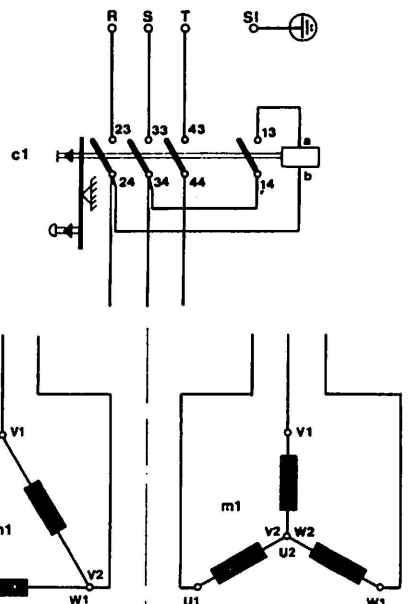
c1 Low-volt release
k1 Condenser
m1 Main motor

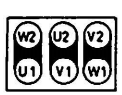
A12.712

CIRCUIT DIAGRAM

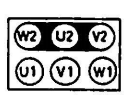
Three Phase

VDE





c1 Low-volt release
m1 Main motor

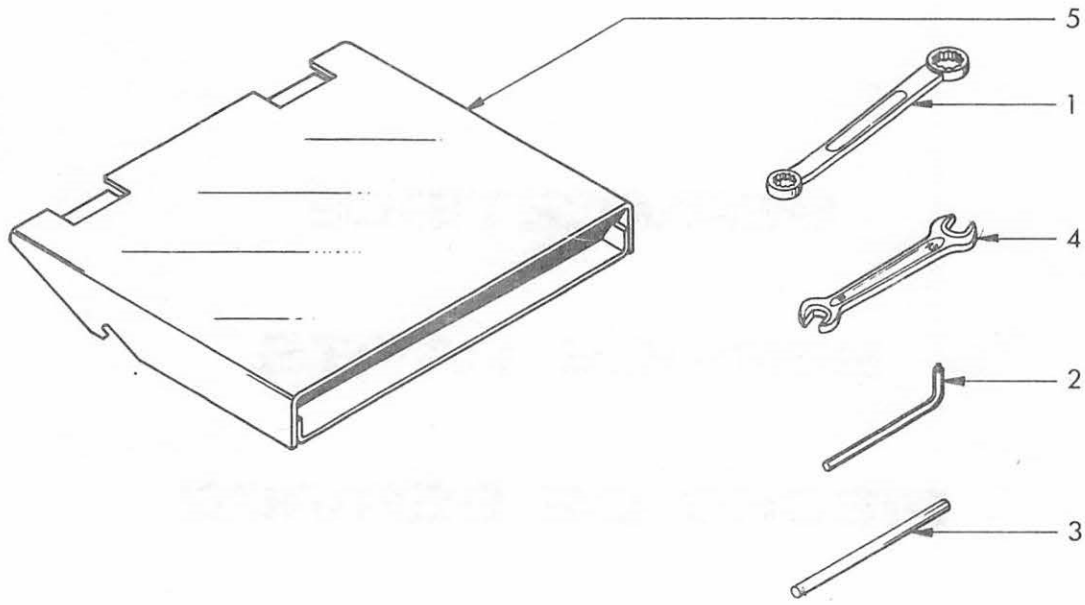


Switching △ or ⅄ see motor capacity plate

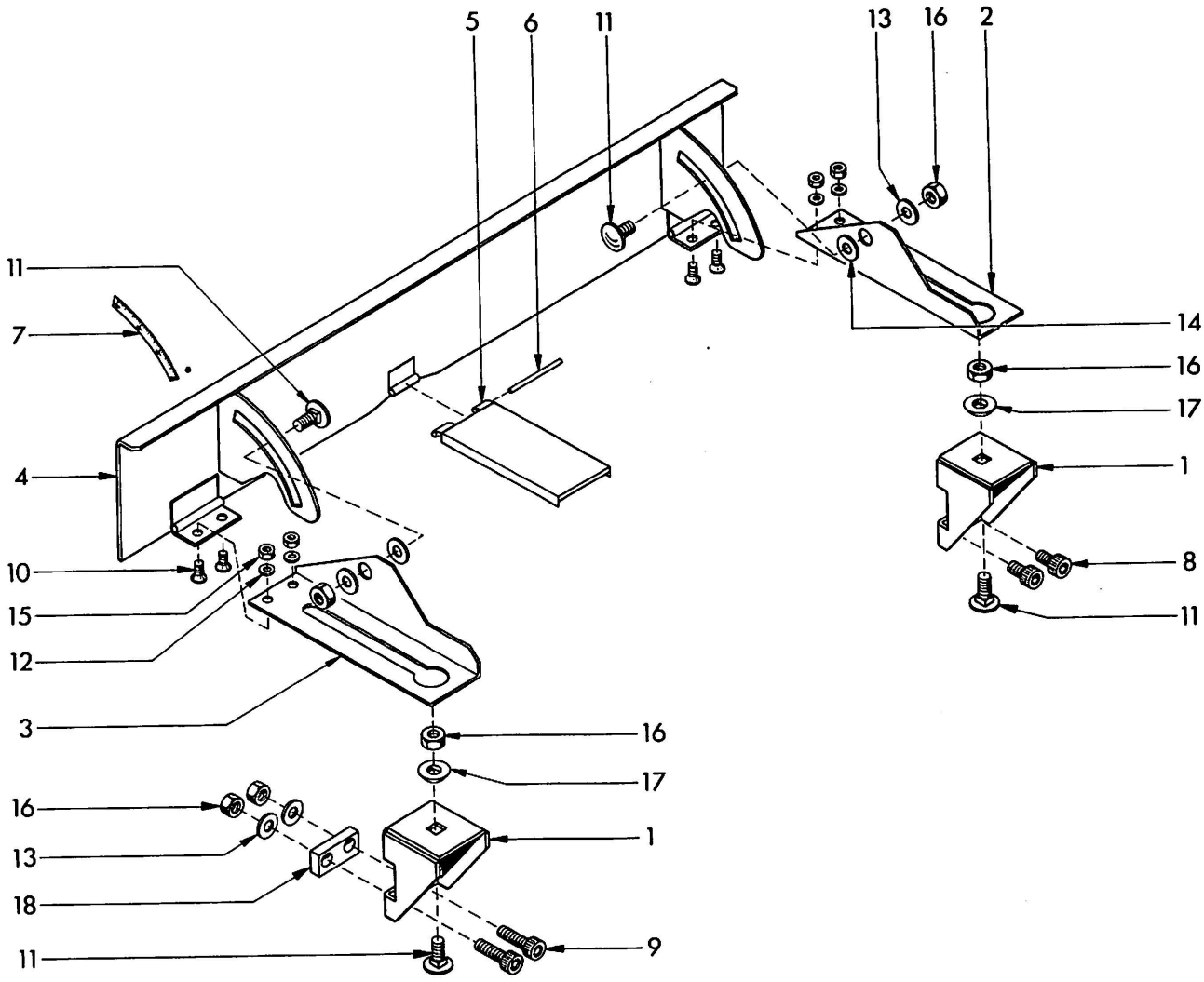
SERVICETEILE

SERVICE PARTS

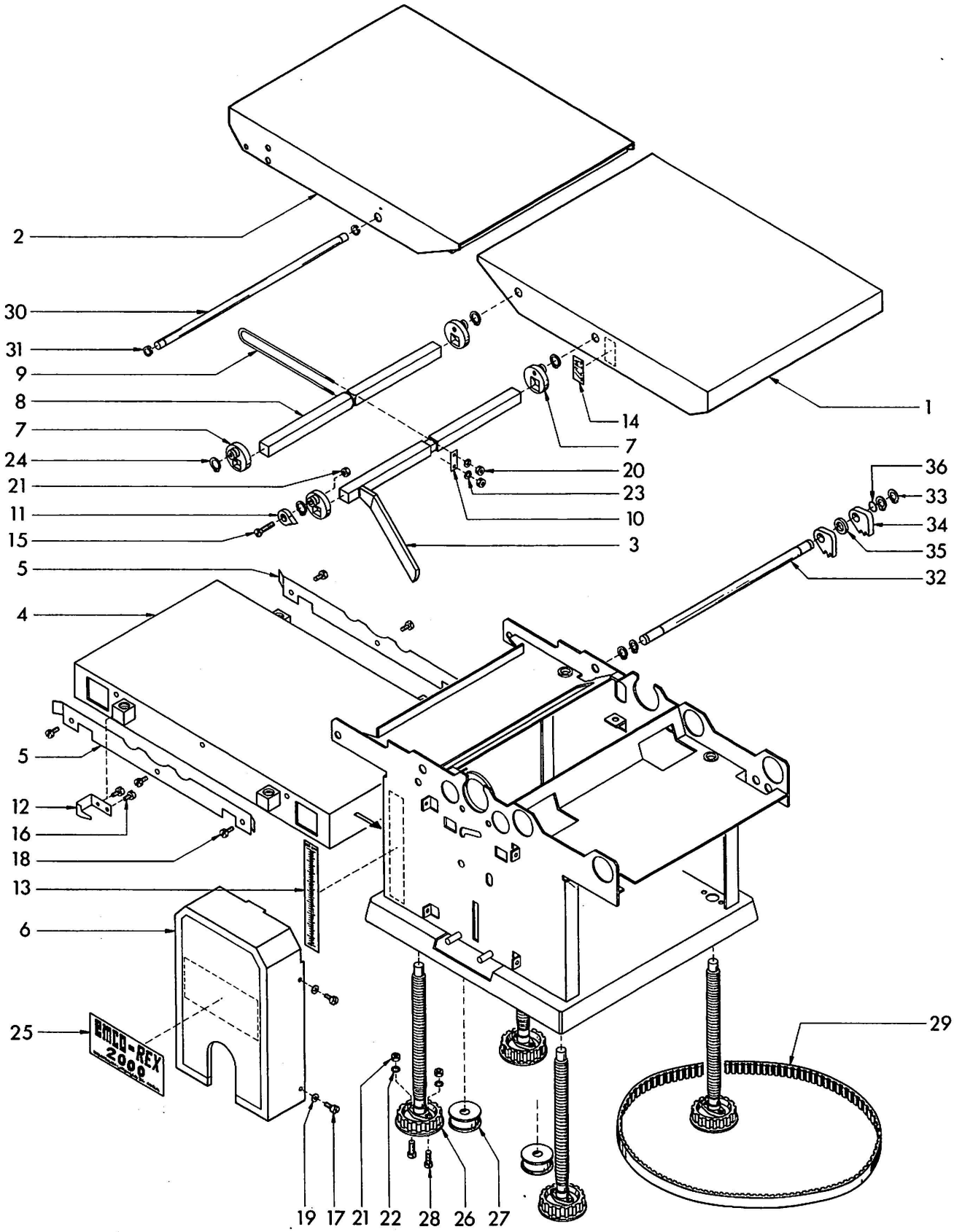
PIECES DE SERVICE



Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
				Grundausstattung	**Basic equipment**	**Equipement de base**
1	ZWZ 36 1317	A13x17 DIN 837		Ringschlüssel	Ring spanner	Clé double à oeil
2	H5A 000 400			Sechskantstiftschlüssel	Hexagonal key	Clé à six pans
3	H5A 000 480			Stift	Dowel pin	Tige de serrage
4	ZWZ 95 1310	13x10 DIN 895		Maulschlüssel	Open-ended spanner	Clé plate simple
5	H9A 000 460			Späneauswurfhaube	Chip evacuator	Capot d'ejection des copeaux
6	H9A 000 440			Einstellehre	Setting gauge	Jague d'ajustage



Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
	H9A 090 000			**Gruppe Fügeanschlag**	**Fance compl.**	**Guide parallèle**
1	H9A 090 010			Anschlaghalter	Fance holder	Equerre en tôle
2	H9A 090 020			Anschlagschlitten 1	Fance slide 1	Semelle horizontale 1
3	H9A 090 030			Anschlagschlitten 2	Fance slide 2	Semelle horizontale 2
4	H9A 090 040			Fügeanschlag	Fance	Guide en tôle
5	H9A 090 110			Schutzblech	Cover sheet	Tôle de protection
6	ZST 06 0350	3m 6x50 DIN 7		Zylinderstift	Parallel pin	Tige de serrage
7	H9A 090 070			Gradskala	Graduated scale	Echelle
8	ZSR 12 0810	M8x10 DIN 912-6.9		Zylinderschraube	Socket head screw	Vis 6 pans creux
9	ZSR 12 0825	M8x25 DIN 912-8.8		Zylinderschraube	Socket head screw	Vis 6 pans creux
10	ZSR 63 0510	M5x10 DIN 963-4.8		Senkschraube	Countersunk screw	Vis tête fraise
11	ZSR 03 0820	M8x20 DIN 603-4.6		Flachrundschraube	Square neck bolt	Collet carre
12	ZSB 22 0530	B5,3 DIN 9021		Scheibe	Washer	Rondelle
13	ZSB 25 0840	B8,4 DIN 125		Scheibe	Washer	Rondelle
14	ZSB 10 2181	SS 12x18x1,2		Stützscheibe	Supporting ring	Rondelle support
15	ZMU 34 0500	M5 DIN 934-5		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
16	ZMU 34 0800	M8 DIN 934-6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
17	H9A 090 090			Scheibe	Washer	Rondelle
18	H9A 090 100			Distanzleiste	Spacer gib	Lardon de écartement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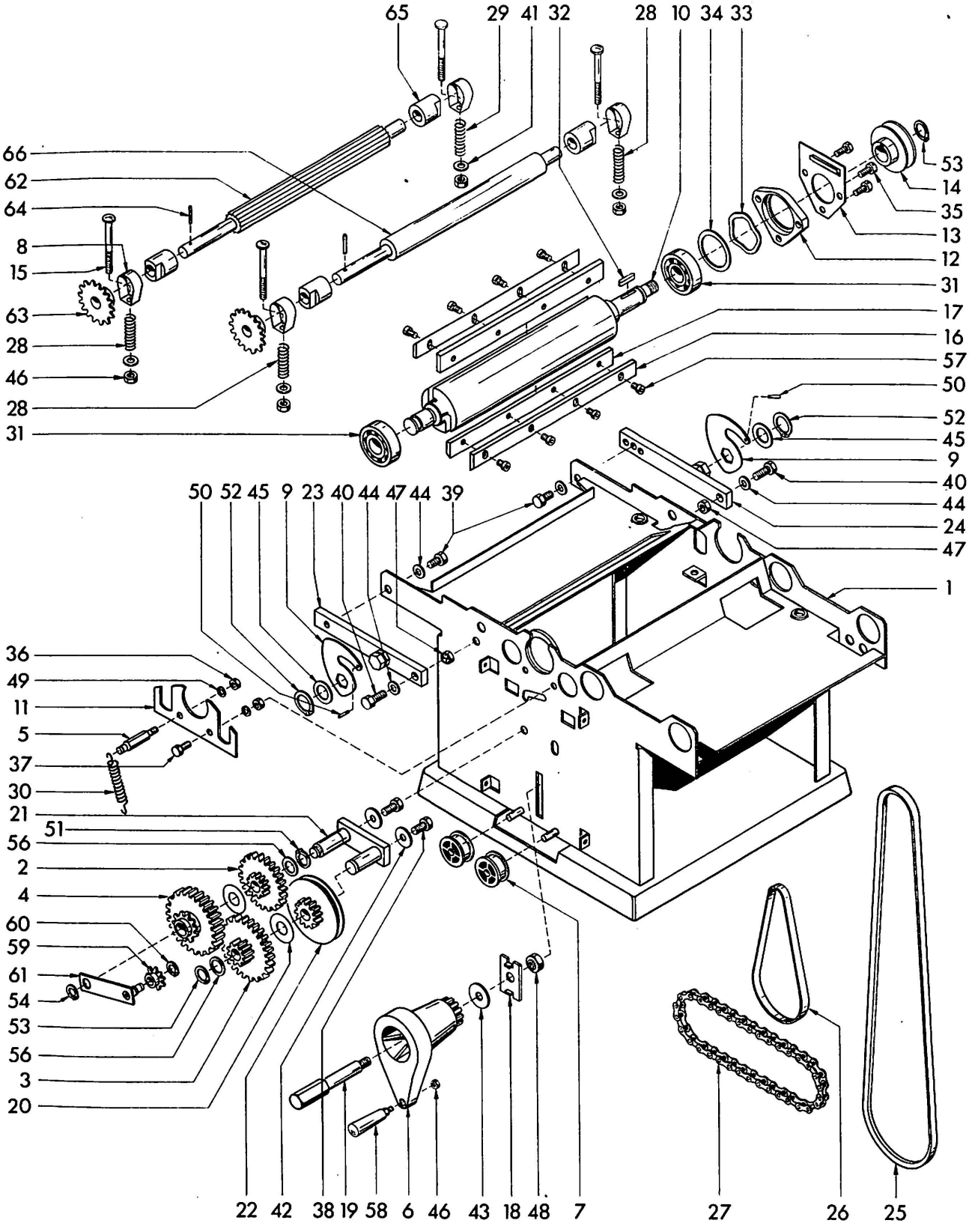
Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
1	H9A 070 000			Aufgabetisch	Feed table	Table d'entrée
2	H9A 080 000			Abgabetisch	Discharge table	Table de sortie
3	H9A 120 000			Zustellhebel	Lever	Levier de reglage
4	H9A 140 000			Dickentisch	Table bed	Table de rabotage
5	H9A 000 030	•		Führungsleiste	Guide sheet	Tole de guidage
6	H9A 000 080			Getriebeschutz	Gear cover	Protecteur de boîte à vitesses
7	H9A 000 100			Exzenterscheibe	Excentric washer	Rondelle de excentrique
8	H9A 000 140			Exzenterwelle	Excentric shaft	Arbre de excentrique
9	H9A 000 150			Spannbügel	U–Spanner	Etrier de serrage
10	H9A 000 160			Federblech	Tensioning sheet	Tole ressort
11	H9A 000 190			Zeiger	Pointer	Aiguille
12	H9A 000 200			Dickenzeiger	Pointer	Aiguille
13	H9A 000 220			Höhenskala	Scale	Echelle
14	H9A 000 230			Zustellskala	Scale	Echelle
15	ZSR 63 0525	M5x25 DIN 963-4.8		Senkschraube	Countersunk screw	Vis tête fraise
16	ZSR 84 0406	M4x6 DIN 84-4.8		Zylinderschraube	Flat head screw	Vis a tête cylindrique
17	ZSR 98 0009	M4 x 10		Gewindeformschraube	Screw	Vis
18	ZSR 98 0008	M4 x 8		Gewindeformschraube	Screw	Vis
19	ZSB 25 0430	A4,3 DIN 125		Scheibe	Washer	Rondelle
20	ZMU 34 0400	M4 DIN 934-5		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
21	ZMU 34 0500	M5 DIN 934-5		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
22	ZRG 28 0050	B5 DIN 127		Federring	Spring washer	Rondelle à ressort
23	ZRG 28 0040	B4 DIN 127		Federring	Spring washer	Rondelle à ressort
24	ZRG 71 1210	W 12x1 DIN 471		Sicherungsring	Retaining ring	Anneau de retenue
25	H9A 000 430			Firmenschild	Name plate	Ecusson
26	H9A 010 000			Spindel	Spindle	Arbre fileté
27	H9A 000 130			Umlenkrolle	Tension rollers	Rouleau de guidage
28	ZSR 84 0516	M5x16 DIN 84-4.8		Zylinderschraube	Flat head screw	Vis à tête cylindrique
29	ZRM 50 5600	600 L 050		Zahnriemen	Tooth belt	Courroie crantée
30	H9A 080 020			Klemmwelle	Clamping shaft	Arbre de blocage
31	ZRG 71 1010	10x1 DIN 471		Sicherungsring	Retaining ring	Anneau de retenue
	H9A 130 000			**Gruppe Rückschlag-sicherung**	**Safety valve compl.**	**Ens. Cliquet anti-retour**
32	H9A 130 010			Klinkenwelle	Shaft	Arbre porte-cliquets
33	ZRG 71 1210	12x1 DIN 471		Sicherungsring	Retaining ring	Anneau de retenue
34	H9A 130 020			Rückschlagsicherung	Safety valve	Cliquet anti-retour
35	H9A 130 040			Scheibe	Washer	Rondelle
36	ZSB 12 1205	12x18x0,5 DIN988		Paßscheibe	Shim ring	Rondelle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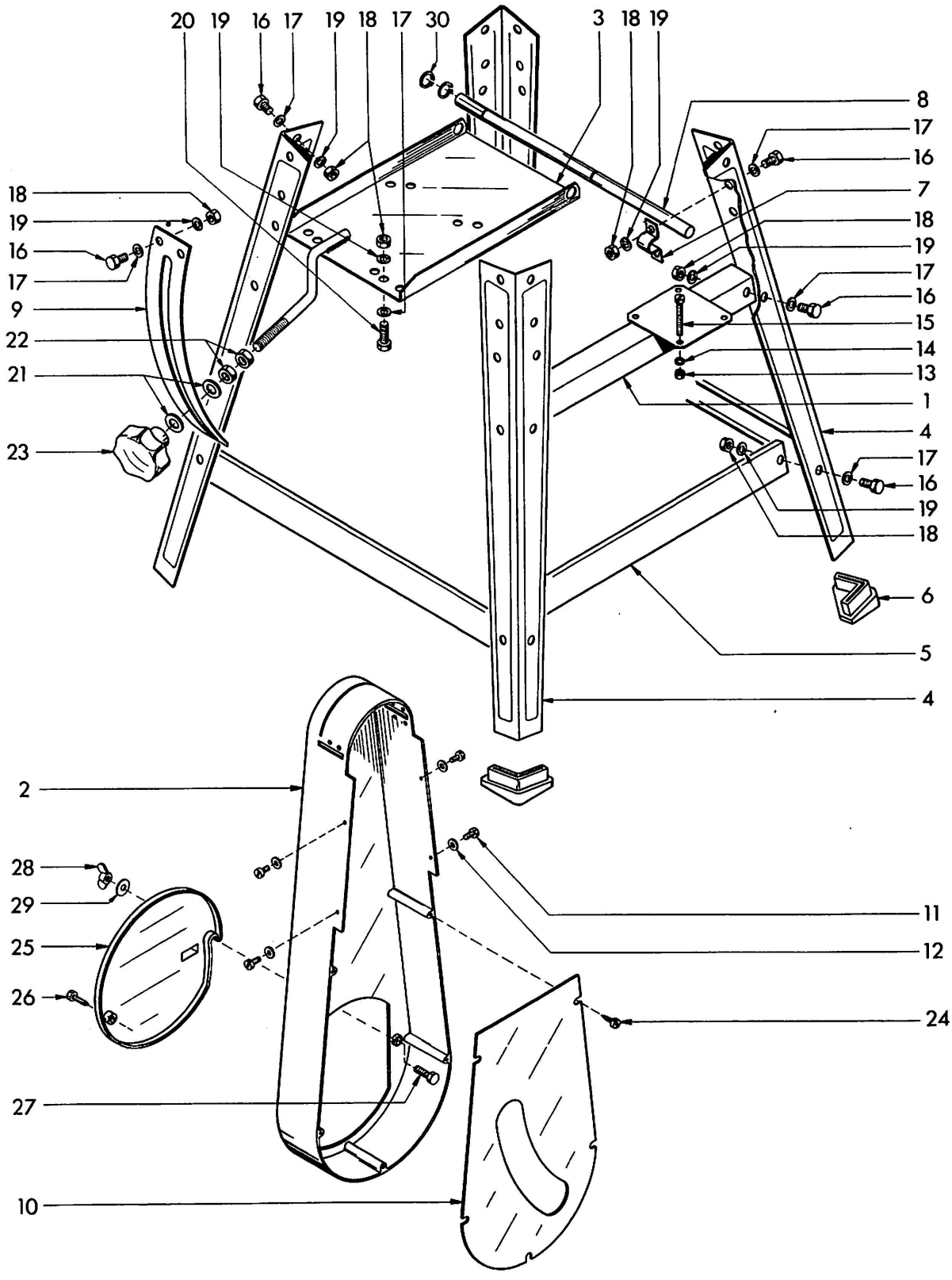
Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
1	H9A 000 010			Gehäuse	Housing	Corps
2	H9A 000 040			Getrieberad 2	Gear 2	Roue dentee 2
3	H9A 000 050			Getrieberad 3	Gear 3	Roue dentee 3
4	H9A 000 060			Getrieberad 4	Gear 4	Roue dentee 4
5	H9A 000 070			Spannbolzen	Tensioning bolt	Boulon de serrage
6	H9A 000 120			Handkurbel	Handle	Manivelle
7	H9A 000 130			Umlenkrolle	Tension rollers	Rouleau de guidage
8	H9A 000 170			Niederhalterblech	Hold down sheet	Tole serrage
9	H9A 000 180			Exzenterspanner	Excentric spanner	Serrage excentrique
10	H9A 000 210			Hobelwelle	Planing spindle	Arbre porte-couteaux
11	H9A 000 240			Arretierungsblech	Locking sheet	Tole blocage
12	H9A 000 250			Lagerflansch	Flange	Bride palier
13	H9A 000 260			Halteblech	Support plate	Tole serrage
14	H9A 000 270			Riemenscheibe	Pulley	Poulie
15	H9A 000 390			Flachrundschraube	Square neck bolt	Collet carre
16	627 100			Hobelmesser	Cutter	Fer
17	H5A 000 141			Druckleiste	Pressure bar	Languette de pression
18	H9A 000 400			Führungsblech	Guide sheet	Tole de guidage
19	H9A 000 410			Lagerbolzen	Bearing bolt	Boulon
20	H9A 000 450			Anlaufscheibe	Washer	Poulie
21	H9A 020 000			Lagerblech	Bearing sheet	Tole palier
22	H9A 040 000			Getrieberad	Gear	Roue dentee
23	H9A 160 000			Auflageleiste 1	Support bar 1	Lardon support 1
24	H9A 170 000			Auflageleiste 2	Support bar 2	Lardon support 2
25	ZRM 10 1180	10/Z-1180LiDIN2215		Keilriemen	V-belt	Courroie trapézoidale
26	ZRM 71 3706	PU 370x6x2,5		Flachriemen	Flat belt	Courroie plate
27	ZKE 19 8360	36Gl. DIN 8187		Rollenkette	Roller chain	Chaine à rouleau
28	ZFD 20 4231	D–231		Druckfeder	Compression spring	Ressort de compression
29	ZFD 20 4286	D–286		Druckfeder	Compression spring	Ressort de compression
30	ZFD 50 0108	Z–108		Zugfeder	Tension spring	Ressort de traction
31	ZLG 62 0402	6204–2Z		Rillenkugellager	Ball bearing	Roulement à billes
32	ZFD 85 6625	A6x6x25 DIN 6885		Paßfeder	Parallel key	Clavette parallèle
33	ZSB 03 6005	6005/K3		Ausgleichscheibe	Compensating washer	Rondelle de compensation
34	ZSB 12 3702	PS37x47x0,2		Paßscheibe 0,2	Shim ring 0,2	Rondelle 0,2
	ZSB 12 3705	PS37x47x0,5		Paßscheibe 0,5	Shim ring 0,5	Rondelle 0,5
35	ZSR 98 0007	M6x20 TAPTITE		Gewindeformschraube	Screw	Vis
36	ZMU 34 0600	M6 DIN 934-6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
37	ZSR 33 0616	M6x16 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
38	ZSR 33 0816	M8x16 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
39	ZSR 33 0812	M8x12 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
40	ZSR 33 0820	M8x20 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
41	ZSB 22 0530	B5,3 DIN 9021		Scheibe	Washer	Rondelle
42	ZSB 21 0840	A8,4 DIN 9021		Scheibe	Washer	Rondelle
43	ZSB 21 1050	A10,5 DIN 9021		Scheibe	Washer	Rondelle
44	ZSB 25 0840	B8,4 DIN 125		Scheibe	Washer	Rondelle
45	ZSB 02 6002	6002 – K2		Ausgleichscheibe	Compensating washer	Rondelle de compensation
46	ZMU 34 0500	M5 DIN 934–5		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
47	ZMU 50 0800	M8		KALEI Setzmutter	Nut – KALEI	Ecrou type KALEI
48	ZMU 50 1000	M10		KALEI Setzmutter	Nut – KALEI	Ecrou type KALEI
49	ZRG 28 0060	B6 DIN 127		Federring	Spring washer	Rondelle à ressort

Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
50	ZHL 81 0306	3x6 DIN 1481		Spannhülse	Lock pin	Goupille de serrage
51	ZRG 71 1610	W16x1 DIN 471		Sicherungsring	Retaining ring	Anneau de retenue
52	ZRG 71 1912	W19x1,2 DIN 471		Sicherungsring	Retaining ring	Anneau de retenue
53	ZSB 99 1200	12 DIN 6799		Sicherungsscheibe	Retaining washer	Poulie de retenue
54	ZSB 99 1000	10 DIN 6799		Sicherungsscheibe	Retaining washer	Poulie de retenue
55	ZRG 71 2012	W 20x1,2 DIN 471		Sicherungsring	Retaining washer	Poulie de retenue
56	ZSB 12 1605	PS 16x22x0,5		Paßscheibe	Shim ring	Rondelle
57	ZSR 11 0612	M6x12 DIN 6912-6.9		Zylinderschraube	Socket head screw	Vis 6 pans creux
58	C6A 040 080			Konusgriff	Handle	Levier sphérique
59	H9A 030 010			Kettenrad	Sprocket	Roue à chaine
60	ZRG 71 1010			Sicherungsring	Retaining ring	Anneau de retenue
61	H9A 031 000			Spannblech	Tensioning sheet	Tole de serrage
62	H9A 050 010			Riffelwalze	Grooved roller	Rouleau cannelé
63	H9A 050 020			Kettenrad	Sprocket	Roue à chaine
64	ZHL 81 0428	4x28 DIN 1481		Spannhülse	Lock pin	Goupille de serrage
65	H5A 000 278			Lagerbüchse	Bearing block	Douille - palier
66	H9A 060 010			Transportwalze	Transport roller	Rouleau entraineur

Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
1	H9A 190 000			Schalterblech	Switch sheet	Base de l'interrupteur
2	H9A 000 090			Riemenschutz	Belt cover	Protecteur de couroie
3	H9A 000 290			Motorwippe	Pivoting motor base	Basculeur
4	H9A 000 300			Ständerfuß	Stand	Socle
5	H9A 000 310			Verbindungsblech	Connection sheet	Tole de connection
6	H9A 000 320			Abschlußkappe	Cap	Chapeau
7	H9A 000 330			Lasche	Fishplate	Colier de fixation
8	H9A 000 340			Wippenwelle	Shaft	Arbre
9	H9A 000 350			Wippenhalter	Holder sheet	Porte de basculeur
10	H9A 000 370			Abdeckung	Cover sheet	Tole de protection
11	ZSR 98 0009	M4x10		Gewindeformschraube	Screw	Vis
12	ZSB 25 0430	A4,3 DIN 125		Scheibe	Washer	Rondelle
13	ZMU 34 0400	M4 DIN 934-5		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
14	ZRG 28 0040	B4 DIN 127		Federring	Spring washer	Rondelle - ressort
15	ZSR 84 0450	M4x50 DIN 84-4.8		Zylinderschraube	Flat head screw	Vis à tête cylindrique
16	ZSR 33 0816	M8x16 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
17	ZSB 25 0840	B8,4 DIN 125		Scheibe	Washer	Rondelle
18	ZMU 34 0800	M8 DIN 934-6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
19	ZRG 28 0080	B8 DIN 127		Federring	Spring washer	Rondelle - ressort
20	ZSR 33 0825	M8x25 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
21	ZSB 25 1050	B10,5 DIN 125		Scheibe	Washer	Rondelle
22	ZMU 34 1000	M10 DIN 934-6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
23	ZGF 36 6310	63xM10 DIN 6336		Sterngriff	Star handle	Poigneé - étoile
24	ZSR 71 3513	B3,5x13		Blechschraube	Sheet metal screw	Vis en tôle
25	H9A 000 470			Deckel	Cover	Couvercle
26	ZSR 71 4819	B4,8x19 DIN7971		Blechschraube	Sheet metal screw	Vis en tôle
27	ZSR 33 0620	M6x20 DIN933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
28	ZMU 15 0600	M6 DIN 315		Flügelmutter	Wing nut	Ecrou à oreilles
29	ZSB 21 0640	A6,4 DIN 9021		Scheibe	Washer	Rondelle
30	ZRG 71 1410	14x1 DIN 471		Sicherungsring	Retaining ring	Anneau de retenue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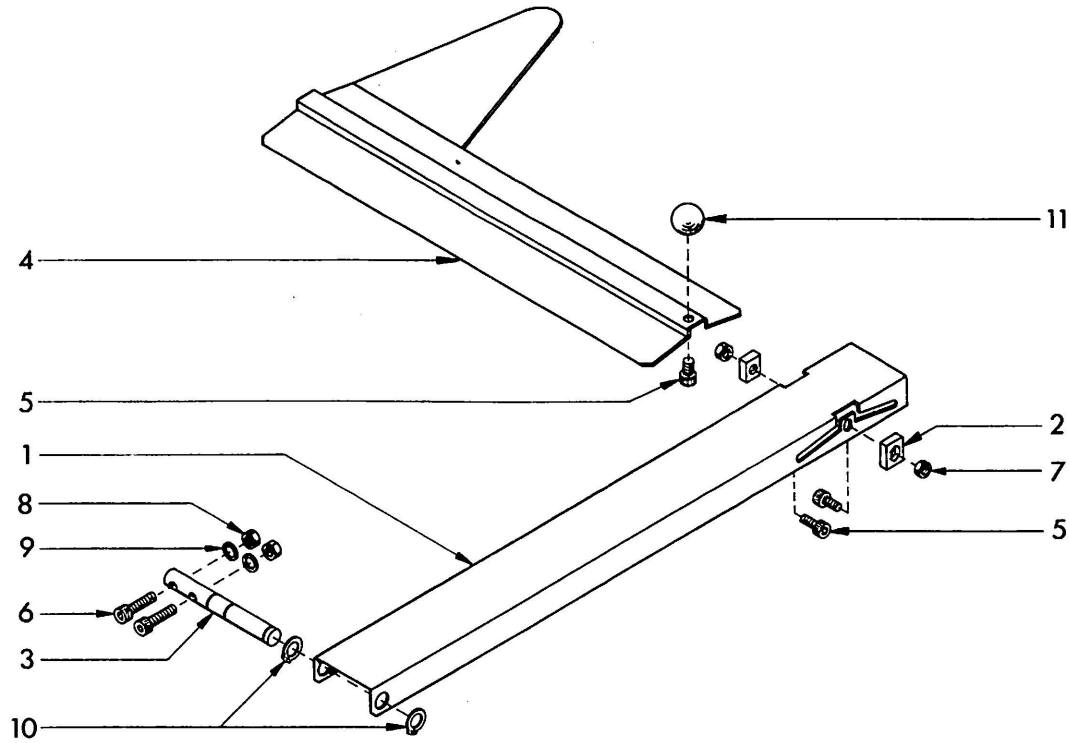
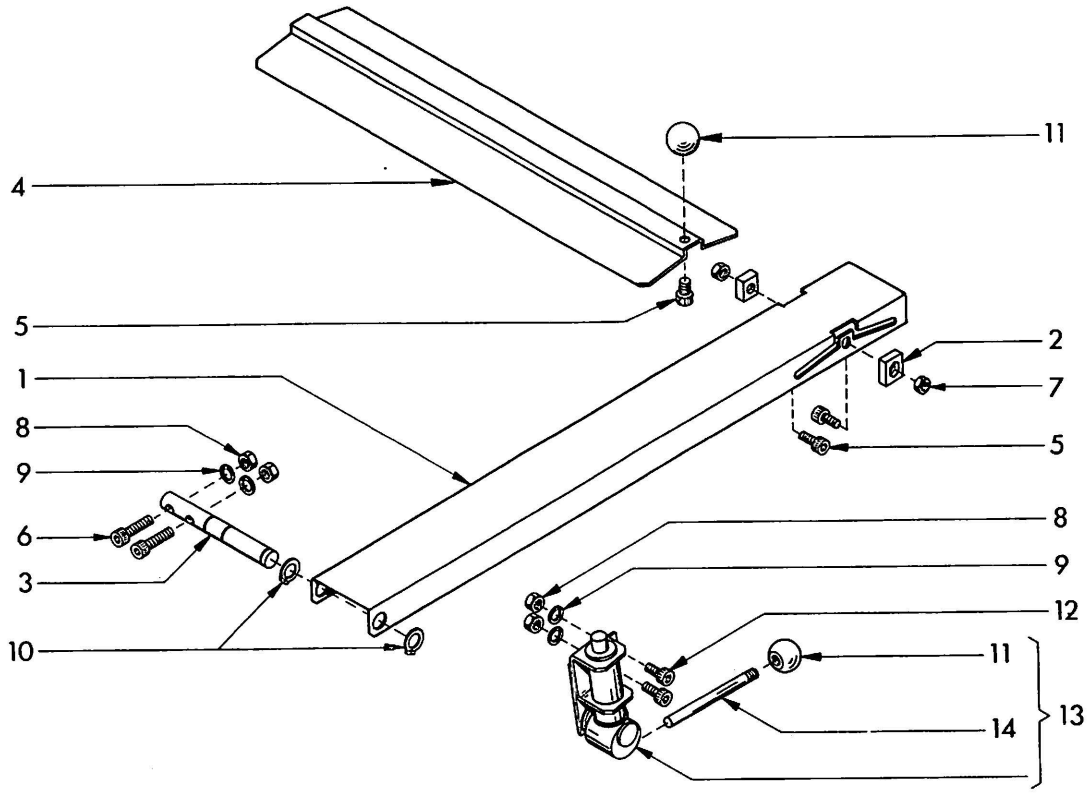
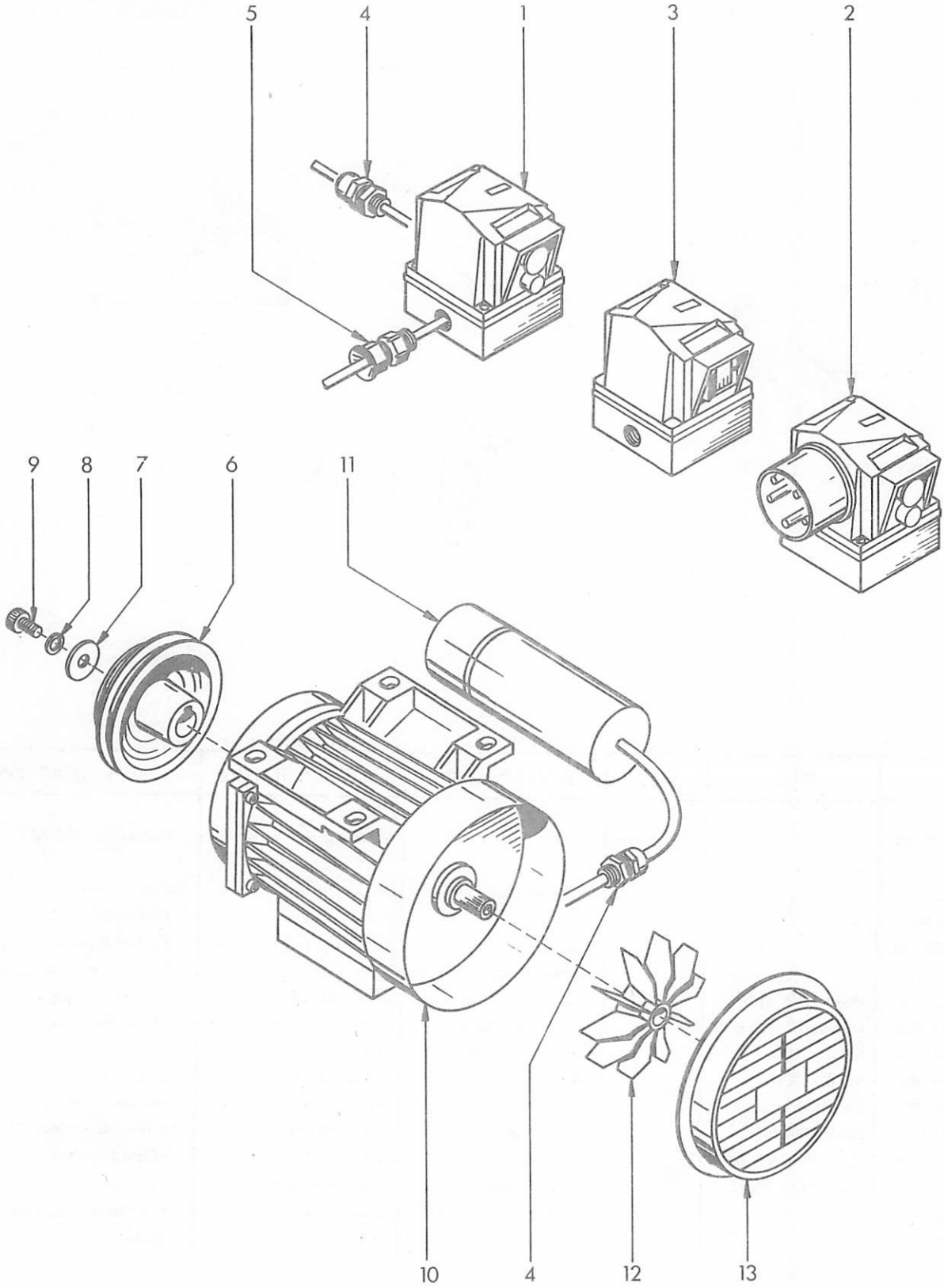


Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
	H9A 180 000			**Messerschutz standard**	**Cutter guard**	**Protecteur de lames**
1	H9A 180 010			Schwenkarm	Swivel arm	Bras pivotant
2	H9A 180 020			Gleitbacke	Sliding block	Coulisseau
3	H9A 180 030			Lagerbolzen	Bearing bolt	Boulon
4	H9A 181 000			Schutzblech	Cover sheet	Tôle de protection
5	ZSR 12 0510	M5x10 DIN 912-6.9		Zylinderschraube	Socket head screw	Vis 6 pans creux
6	ZSR 12 0625	M6x25 DIN 912-6.9		Zylinderschraube	Socket head screw	Vis 6 pans creux
7	ZMU 34 0500	M5 DIN 934-5		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
8	ZMU 34 0600	M6 DIN 934-6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
9	ZRG 28 0060	B6 DIN 127		Federring	Spring washer	Rondelle - ressort
10	ZRG 71 1210	W12 x 1 DIN 471		Sicherungsring	Retaining ring	Anneau de retenue
11	ZGF 19 2005	C20 x M5 DIN 319		Kugelknopf	Ball knob	Poignee à billes



Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
	H9C 180 000			**Messerschutz SUVA**	**SUVA–Guard**	**Protecteur "SUVA"**
1	H9A 180 010			Schwenkarm	Swivel arm	Bras pivotant
2	H9A 180 020			Gleitbacke	Sliding block	Coulisseau
3	H9A 180 030			Lagerbolzen	Bearing bolt	Boulon de palier
4	H9A 181 010			Schiebeblech	Cover sheet	Tôle de protection
5	ZSR 12 0510	M5x10 DIN 912-6.9		Zylinderschraube	Socket head screw	Vis 6 pans creux
6	ZSR 12 0625	M6x25 DIN 912-6.9		Zylinderschraube	Socket head screw	Vis 6 pans creux
7	ZMU 34 0500	M5 DIN 934-5		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
8	ZMU 34 0600	M6 DIN 934-6		Sechskantmutter	Hexagonal nut	Ecrou 6 pans
9	ZRG 28 0060	B6 DIN 127		Federring	Spring washer	Rondelle - ressort
10	ZRG 71 1210	W12x1 DIN 471		Sicherungsring	Retaining ring	Anneau de retenue
11	ZGF 19 2005	C20xM5 DIN 319		Kugelknopf	Ball knob	Poignée à billes
12	ZSR 12 0612	M6x12 DIN 912-6.9		Zylinderschraube	Socket head screw	Vis 6 pans creux
13	H9C 181 000			Gruppe Schutzträger	Guard holder	Ens. Support de protection
14	H9C 183 010			Knebel	Toggle	Garrot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Pos.	Ref. No.	DIN		BENENNUNG	DESCRIPTION	DESIGNATION
1	ZEL 30 0004			Schalter Wechselstrom	Switch singlephase	Interrupteur monophasé
	ZEL 30 0002			Schalter Drehstrom	Switch threephase	Interrupteur triphasé
2	ZEL 30 0005			Schalter Wechselstrom	Switch singlephase	Interrupteur monophasé
	ZEL 30 0001			Schalter Drehstrom	Switch threephase	Interrupteur triphasé
3	ZEL 30 0006			Schalter Wechselstrom	Switch singlephase	Interrupteur monophasé
	ZEL 30 0003			Schalter Drehstrom	Switch threephase	Interrupteur triphasé
4	ZPG 10 0010	STP 13		Kabelverschraubung	Screw-type conduit fitting	Raccordement à vis
5	ZPG 10 0008	MZP 13		Kabelverschraubung	Screw-type conduit fitting	Raccordement à vis
6				Motorriemenscheibe für	Motor belt pulley for	Poulie de moteur pour
	H9A 110 010			Motor Wechselstrom	motor singlephase	moteur monophasé
	H9A 100 010			Motor Drehstrom 1,5kW	motor threephase 1,5 kW	moteur triphasé 1,5 kW
	H9A 110 010			Motor Drehstrom 2,2kW	motor threephase 2,2 kW	moteur triphasé 2,2 kW
7	H9A 110 020			Scheibe	Washer	Rondelle
8	ZRG 28 0080	B8 DIN 127		Federring	Spring washer	Rondelle - ressort
9	ZSR 33 0820	M8x20 DIN 933-5.6		Sechskantschraube	Hexagon head screw	Vis hexagonale
10	ZMO . . . . . *			Motor	Motor	Moteur
11	ZKO . . . . . *			Kondensator	Condenser	Condensateur
12				Lüfterflügel für:	Fan for	Ventilateur pour
	ZME 20 0053			Motor Wechselstrom	motor singlephase	moteur monophasé
	ZME 20 0055			Motor Drehstrom 1,5kW	motor threephase 1,5 kW	moteur triphasé 1,5 kW
	ZME 20 0053			Motor Drehstrom 2,2kW	motor threephase 2,2 kW	moteur triphase 2,2 kW
13				Lüfterhaube für:	Fan cover for	Carter de ventilateur pour
	ZME 20 0052			Motor Wechselstrom	motor single phase	moteur monophasé
	ZME 20 0054			Motor Drehstrom 1,5kW	motor threephase 1,5 kW	moteur triphasé 1,5 kW
	ZME 20 0052			Motor Drehstrom 2,2kW	motor threephase 2,2 kW	moteur triphasé 2,2 kW

* Ref. Nr. siehe Tabelle

* Ref. Nr. see table

* Ref. Nr. voir tableau

Wechselstromausführung
Single phase equipment
Equipement monophase

Spannung Voltage (V) Tension	Frequenz Frequency Frequence	Ref. Nr. für Motor Ref. Nr. for motor Ref. Nr. moteur	Ref. Nr. für Kondensator Ref. Nr. for condenser Ref. Nr. condensateur
110	50	ZMO 26 1110	ZME 20 0050
220	50	ZMO 26 1220	ZME 20 0051
230	50	ZMO 26 1230	ZME 20 0051
240	50	ZMO 26 1240	ZME 20 0051
250	50	ZMO 26 1250	ZME 20 0051
100	50	ZMO 26 1100	ZME 20 0050
115	60	ZMO 27 1115	ZME 20 0050
220	60	ZMO 27 1220	ZME 20 0051
100	60	ZMO 27 1100	ZME 20 0050

Drehstromausführung
Three phase equipment
Equipement triphase

Leistung Motor rating Puissance	Spannung Voltage (V) Tension	Frequenz Frequency Frequence	Ref. Nr. für Motor Ref. Nr. for motor Ref. Nr. moteur
1,5 kW	220	50	ZMO 26 3220
1,5 kW	440	50	ZMO 26 3440
1,5 kW	380	50	ZMO 26 3380
1,5 kW	220	60	ZMO 27 3220
2,2 kW	380	50	ZMO 26 3381