AMCO

Drilling Press

Model No: D100
Serial No: 103930

Operation Manual

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Z5025A

Z5025 $^{-1A}_{-3A}$ UPRIGHT DRILLING MACHINE

OPERATION MANUAL

MAX.DRILLING DIAMETER 25mm (1 in)

CONTENTS

* This document is a general—purpose instruction, some differences between figures and objects are permitted.

1. Outline Urawing

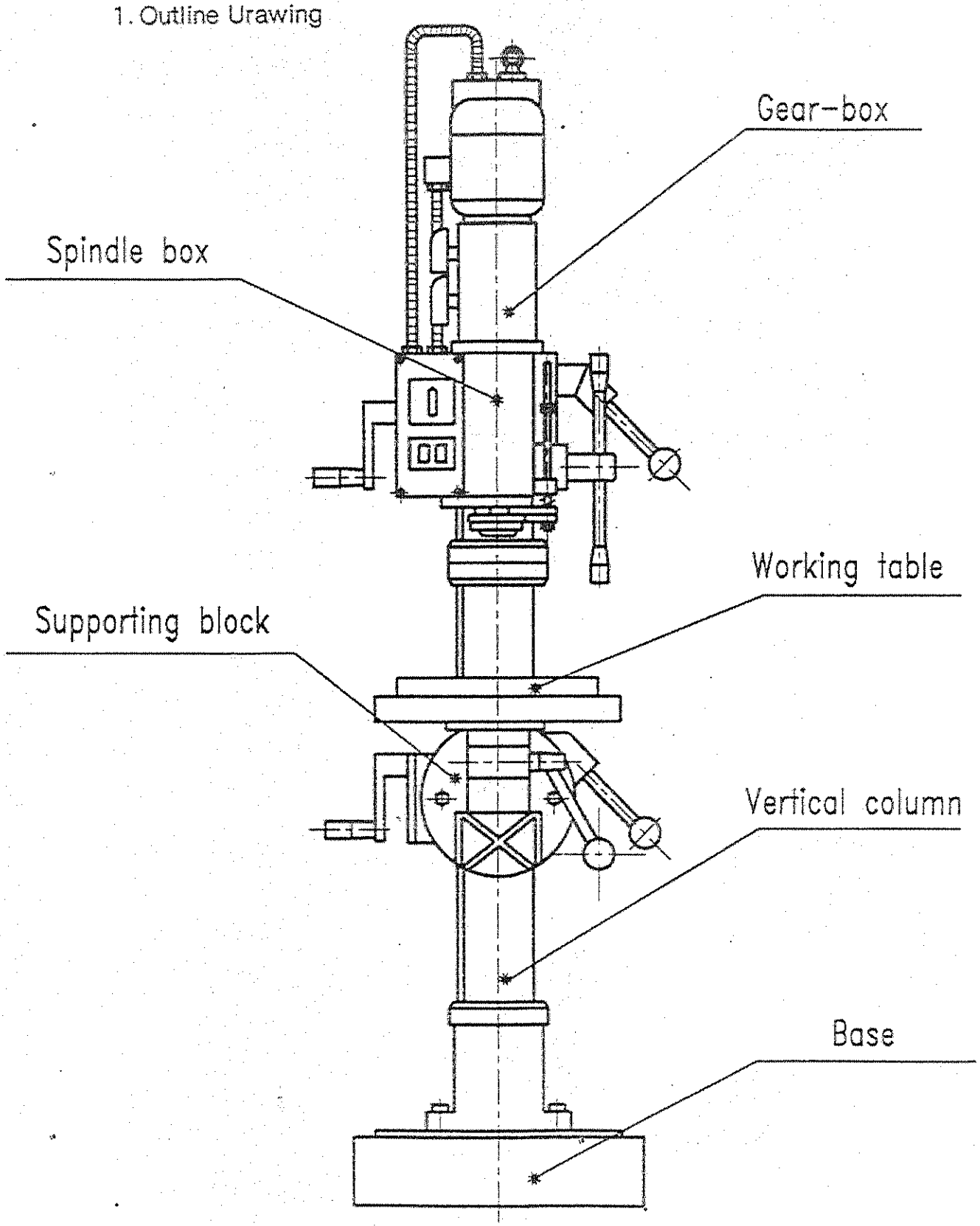


Figure 1

2. Main Applications and Features

This machine tool is a kind of universal machine tool which is mainly applicable for drilling as well as for hold slash, spot facing, chamfering, reaming, tapping, boring, etc. maximum drilling diameter is 25mm. It is suitable for single—piece, small batch or large scale production and it is applicable to use in machine shop, fitting shop, repair shop.

Speed of main spindle is controlled by speed changing handle 5 and 6 <as show in figure 10 >, four <4> different speeds can be changed, with switch 14, spindle can obtai eight <8> different rotating speeds. After loosening clamping handle 9, spindle box can be moved up and down by handwheel 4 and can be rotated 360° around the vertical column Main spindle is in sleeve between ball bearing and roller bearing. The clearance of the spindle can be adjusted. Re-setting is controlled automatically by sping.

Only manual feed is available.

Driving gears are engaged by steel gears and MC nylon gears.

It runs with sweet sound and low noise.

All shafts are made of superior steel, critical area has been hardened.

Working table 16 is mounted on the supporting block 17.

Supporting block 17 can be turned 360° around the vertical column, working table can be turned 360° on the supporting block, after the mode has been changed, it can be tilted ±50° also.

Depth of drill is ensured by scale 7 fixed on the sleeve and setting nut 8. It is reliable and easy job can be done.

In order to easily change tools the automatic tool stripping device is mounted in the spindle for drill holder, taper shank and taper sleeve stripping.

All critical casting parts are made of high—strength cast iron which passed through ageing treatment.

3. Main technical specification and data

No	Technical specifications and data		unit	Z5025A	Z5025 - 1A	Z5025 - 3A
3.1	Maximum drilling diameter. (σ_b = 500 - 600Mpa)		mm <in>	25<1>		
3.2	Maximum travel of spindle.		mm <in>	140<5$\frac{1}{2}$>		
3.3	Taper hole spindle			Morse No.3		
3.4	Distance between the centre of spindle and the surface of the vertical column		mm <in>	315<12$\frac{3}{8}$>	225<8$\frac{7}{8}$>	
3.5	Maximum distance between the spindle nose and the surfance of working table		mm <in>	660<26>	620<24$\frac{1}{2}$>	600<23$\frac{5}{8}$>
3.6	Maximum distance between the spindle nose and the base surface		mm <in>	1200<47$\frac{1}{4}$>	1075<44$\frac{5}{16}$>	
3.7	Maximum travel of the supporting block of working table		mm <in>	480<18$\frac{7}{8}$>	390<15$\frac{3}{8}$>	412<16$\frac{1}{4}$>
3.8	Maximum travel of spindle box		mm <in>	240<9$\frac{7}{16}$>		
3.9	Dimensions of working table		mm <in>	315 * 415 <12$\frac{3}{8}$ * 16$\frac{3}{8}$>	Ø390/Ø440 (Ø15$\frac{3}{8}$/Ø17$\frac{3}{8}$)	275 * 315 <10$\frac{13}{16}$ * 11$\frac{11}{16}$>
3.10	Steps of spindle			8		
3.11	speeds of spindle		r/min	50HZ:100, 205, 345, 440, 690, 885, 1450, 2900 60HZ:120, 245, 415, 530, 830, 1060, 1740, 3480		
3.12	Dimensions of the base surface		mm <in>	475 * 400 <18$\frac{11}{16}$ * 15$\frac{3}{4}$>	305 * 297 <12 * 12$\frac{7}{16}$>	
3.13	Double - speed 3 - phase motor	type		YD71-2/4		
		power	kw	0.55/0.75		
		speed	r/min	50HZ:1400/2800; 60HZ:1680/3360		
3.14	Dverall dimensions <L * W * H>		mm <in>	788 * 560 * 1820 <31 * 22 * 72>	640 * 470 * 1670 <25 * 18$\frac{1}{2}$ * 67>	
3.15	Weight of machine		kg	404	243	254

4. Transmission System

<As show in Figure 2>

The spindle with eight <8> different speeds is driven by motor shaft Ⅰ through gears 10 —11 or 9—18 to intermediate shaft Ⅱ, and gears 12—16 or 13—14 to shaft Ⅲ <the shaft Ⅲ is keyed to spindle> feeding downward is performed by gear 20 driving toothed rack 19. Reposition of spindle sleeve can be performed automatically by spiral power spring fixed on gear 20.

Headstock can be moved up and down through worm 7, worm—gear 6, gear 5 and toothed rack 8.

Supporting block of working table can be moved up and down through worm 4, wormgear 3, gear 2 and toothed rack 1.

Distribution of roller bearings is as show as in Figure 3.

Schedule of the parts of Transmission

Name		Gear Box Spindle Box Supporting Block of Table, Column, Base										
Parts in Figure 2		1	2	3	4	5	6	7	8	9	10	11
No. of Tooth	Z5025A	72	15	28	1	15	28	1	34	42	16	68
	Z5025—$\frac{1}{3}$A	80	20			17			43			
Modle	Z5025A	2.5	2.5	2	2	2.5	2	2	2.5	1.5	1.5	1.5
	Z5025—$\frac{1}{3}$A	2	2			2			2			
Spiral Angle and Direction				5°6′8″		4°23′55″	4°23′55″					
Precision Grade		9—GJ	9—FH	9—De	9—De	9—FH	9—De	9—De	9—FH	7—GJ	7—FH	7—GJ
Material		45	45	45	45	45	45	45	45	Mc nylon	45	Mc nylon

Parts in Figure 2	12	13	14	15	16	17	18	19	20		
No of tooth	16	34	33		51		42	29	16		
Modle	2	2	2		2		1.5	2	2		
Spiral Angle and Direction											
Precision Grade	7—FH	7—FH	7—GJ		7—GJ		7—FH	8—GJ	8—GJ		
Material	45	Mc nylon	45	45	Mc nylon	45	45	45	45	45	

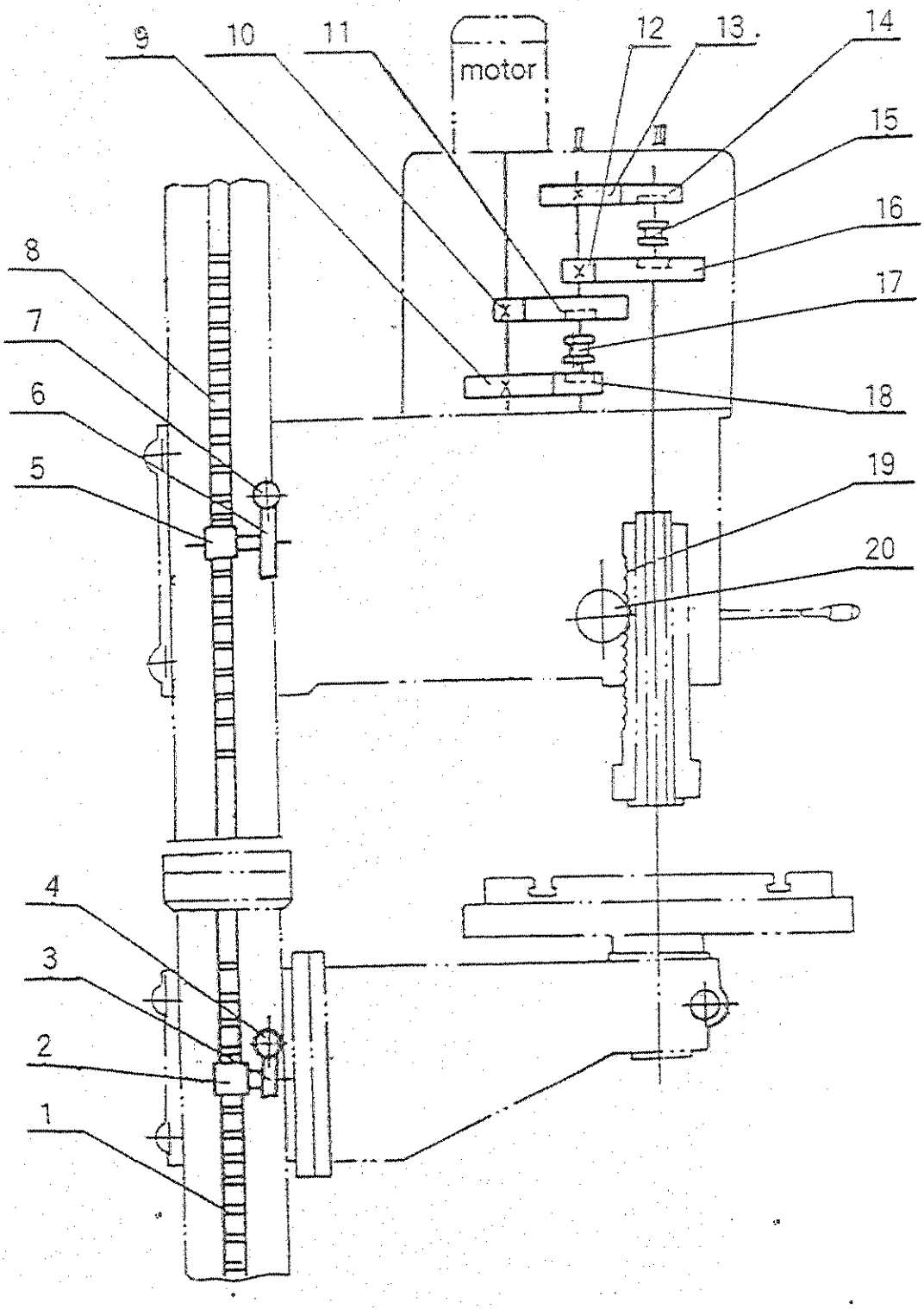


Figure 2 Drawing of Transmission System.

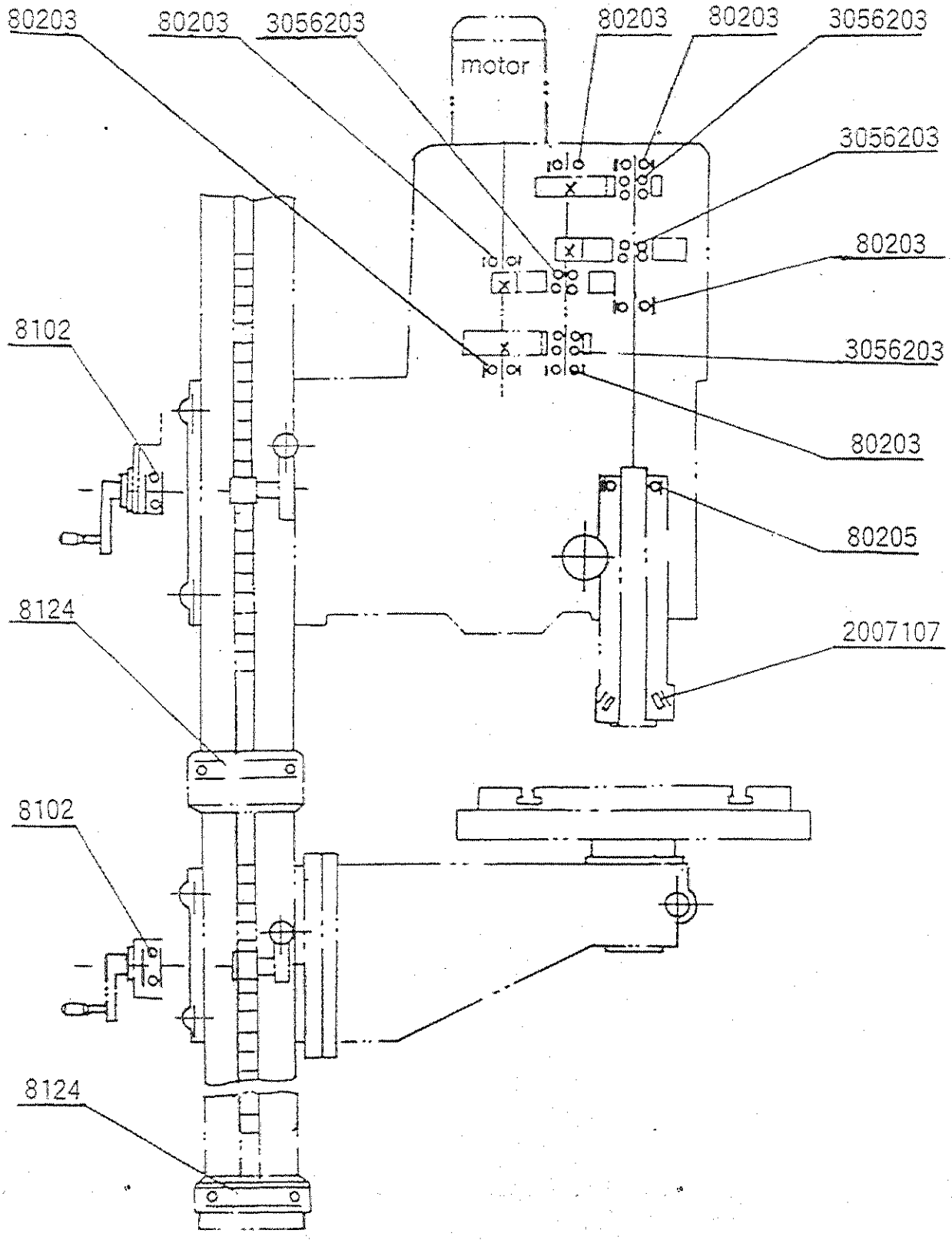


Figure 3 Location of Rolling Bearings

List of Bearings

Code	Name of Bearings	specification	Qty	Precision Grade / Remarks
80203	Single—row centripeta ball bearing	17×40×12	6	
80205	Single—row centripeta ball bearing	25×52×15	1	
3056203	Double—row angular contact ball bearing	17×40×17.5	4	
2007107	Single—row tapered roller bearing	35×62×17	1	D
8102	Single—way thrust ball bearing	15×28×9	2	
8124	Single—way thrust ball bearing	120×155×25	2	Z5025A
8120	Single—way thrust ball bearing	100×135×25	2	Z5025 —1A —3A

5. Main Structucture

See Fig. 13 - 18.

6. Electrics

Figure 4 is diagrammatical layout. Figure 5 is installation diagram of electrics. Figure 6 is wiring diagram. Electric components are show in list of Electrics.

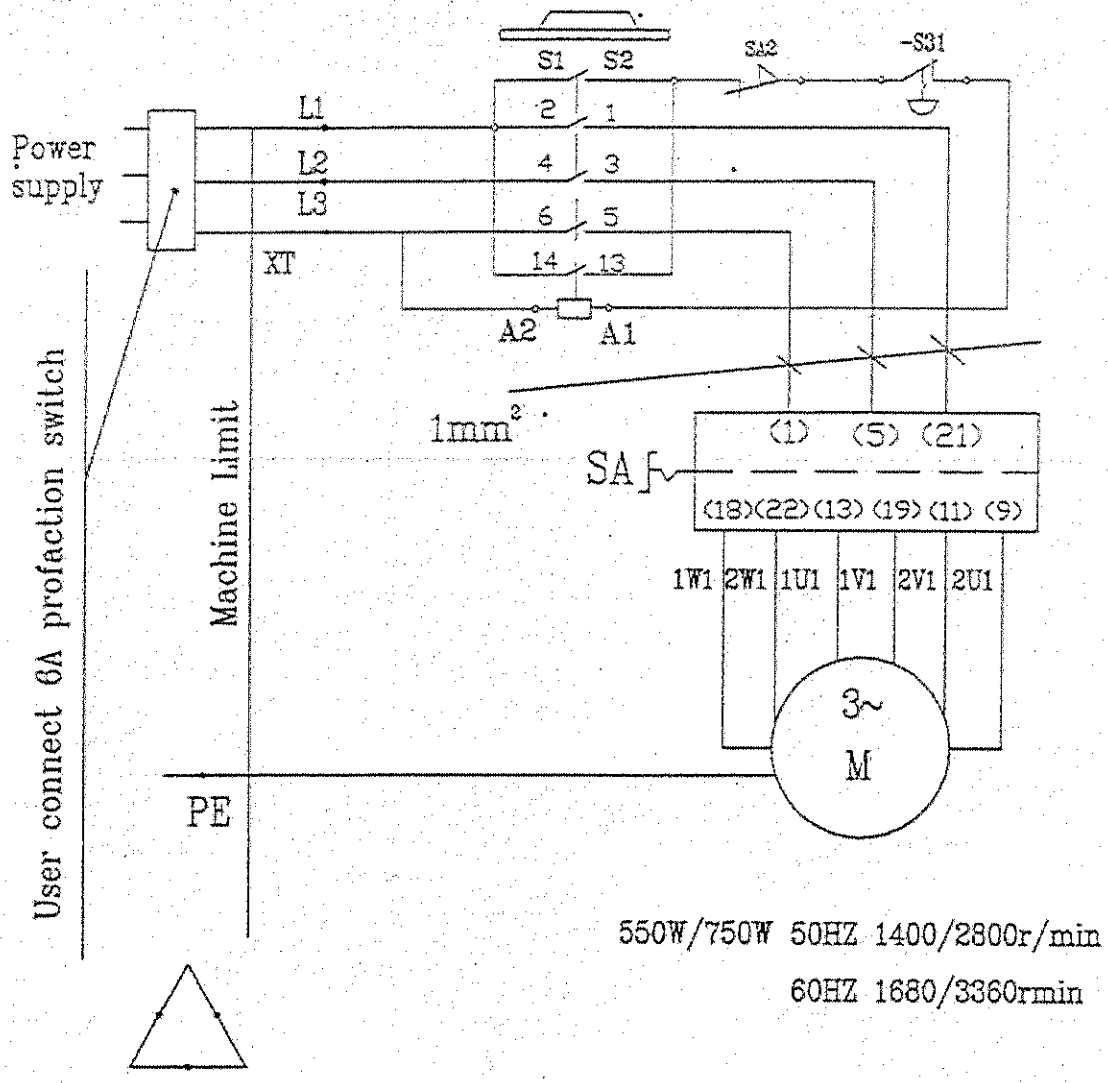
Three phase AC power with 50HZ,380V,50HZ,400V,50HZ,420V,and 60HZ, 220V are available to choose.

There is no fuse in the machine. We recommend that a three—phase 6A fuse should be placed in socket power. The grouond wire must be grounded tightly.

The douoble—speed motor is used, speeds of the motor are 1400/2800r/min at 60HZ. Motor power is 550W at low speeds amd 750W at high speeds. SA switch is desinged to select high speeds or low speeds, as well as high or low speeds in the reverse dirction. QS button is designed to start and stop motor.

List of Electrics

Code	Name	Specification	Qty	Remarks
QS	Manual starter	KJD11-10ZF/4 380V 10A	1	
SA	Speed-change switch	T-16EXF64D-6	1	
M	Double-speed Motor	2/4pole 750/550W 2800/1400r/min 50HZ 3360/1680r/min 60HZ	1	
XT	Terminal board	jx5-1005	1	
M1	Cool pump motor	90W 50HZ or 60HZ	1	
SA1	Cool pump switch	LW39A-16C03/2	1	
SA2	Limit switch	LXW5-11Z	1	



With "*" is uesd in special requirement

Figure 4 Circuit diagram

SA Connection("+"means connected)

NO:	T-16EXF64D-6	NO:	RHI CW	0	RLOW CW	0	FLOW CCW	0	FHI CCW
(1)	U	(2)					+		+
(3)		(4)	+		+				
(5)	V	(6)	+		+				
(7)		(8)					+		+
(9)	2U1	(10)	+						+
(11)	2V1	(12)	+						+
(13)	1U1	(14)			+		+		
(15)		(16)			+		+		
(17)	1W1	(18)	+						+
(19)	1V1	(20)	+						+
(21)	W 2W1	(22)	+						+
(23)		(24)			+		+		

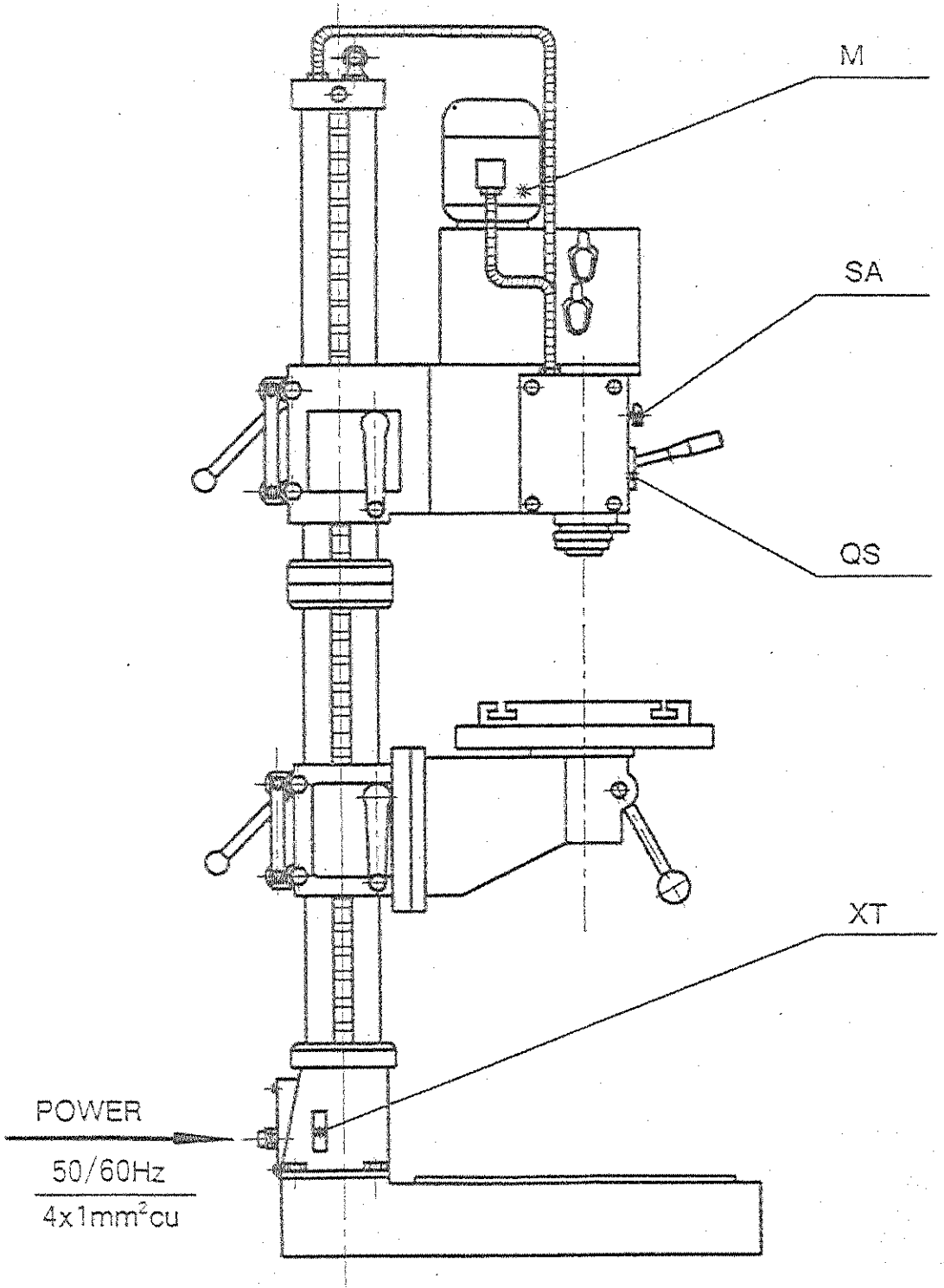


Figure 5 Installation Diagram For Electrics

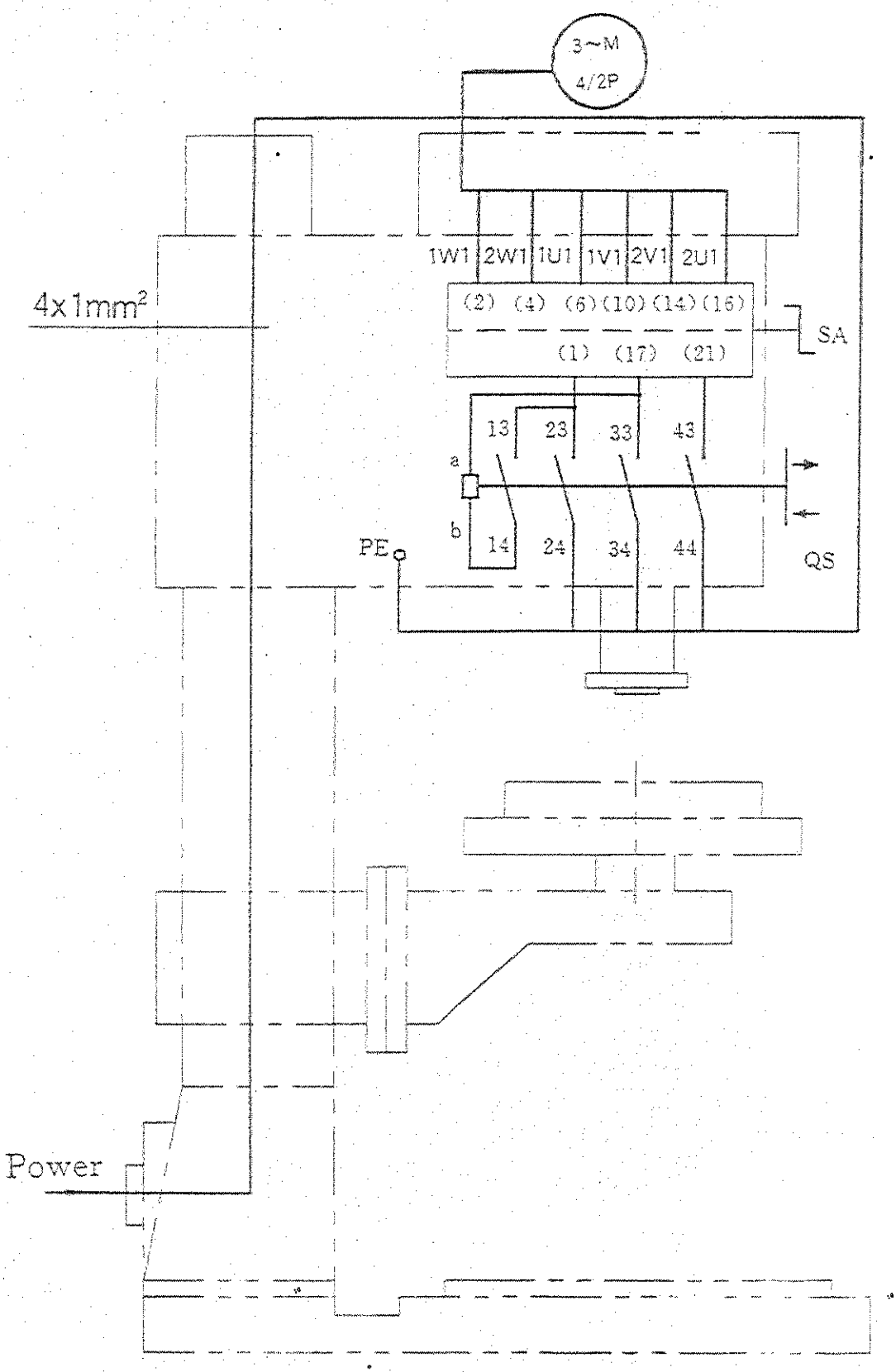


Figure 6 Interconnection Diagram of Electrics

7. Lubrication

The precision pure spindle—grease No. 2 is used for gear—box and spindle lubrication. The grease should be replaced once a year. Add lubrication oil No. 30 to the spindle—box and the up and down handle of supporting block every shift. Reference Figure 7 for the location of lubrication.

8. Lifting and Installation

After the machine arrives, you had better do a cross—check against packing list. If anything is damage or not compete, you need note and demand.

All locking handles must be locked before lift. <As shown in figure 8>.

Depth calculation of base is maximum area which the working table turns 360° around the vertical column.

Figure 9 is minimum dimension, you can adjust its height according to your request.

When installing the machine, bury the footscrew in a cement foundation accorrking to the position of base holes, after the cement has condensed completely, place the machine on the cement foundation, adjust it to the demand of Go item on the inspec—tion certificate with horizital meter, then screw the footscrew steadly and evenly.

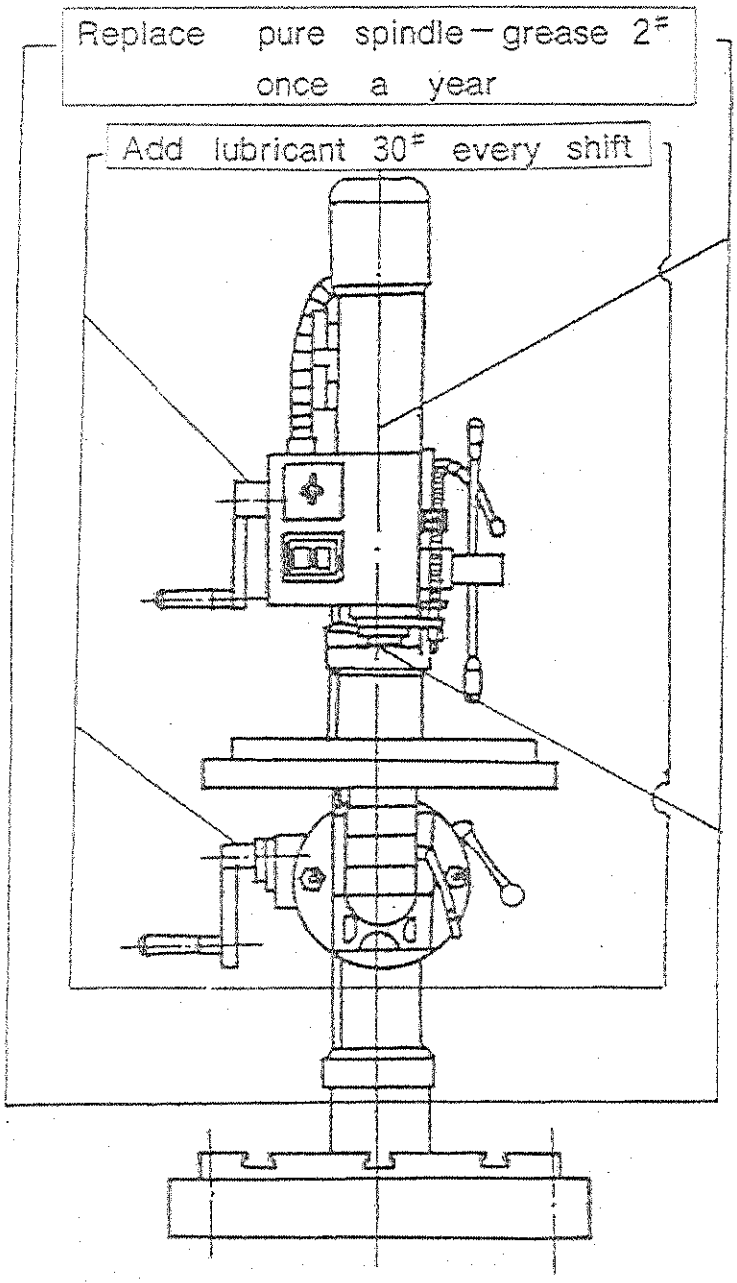


Figure 7 Location of Lubrication

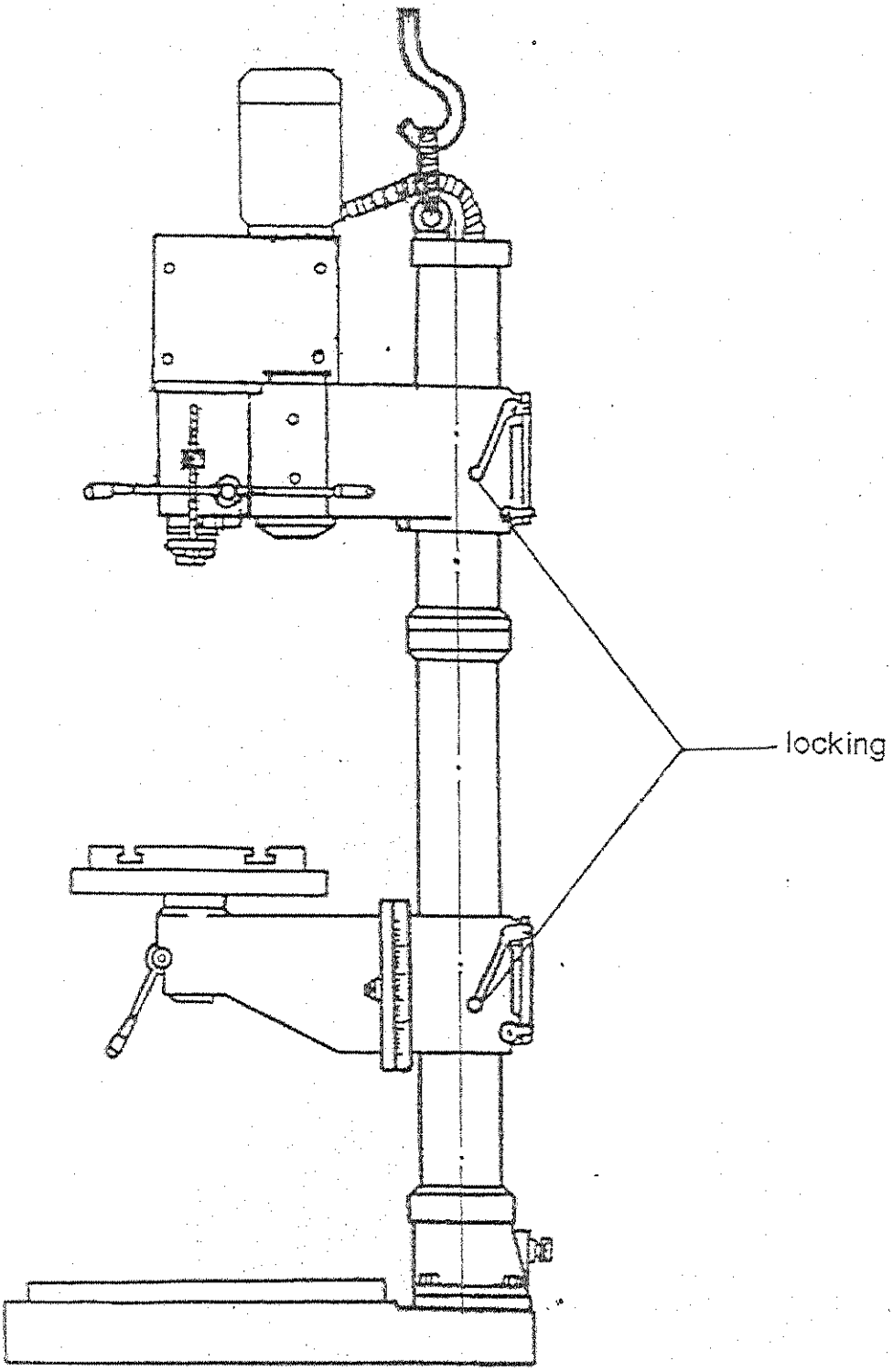


Figure 8 Location of Lifting

Model		Z5025A	Z5025－$\frac{1A}{3A}$
A×B	mm	635×360	360×265
	in	25×14 $\frac{3}{16}$	14 $\frac{3}{16}$×10 $\frac{7}{16}$

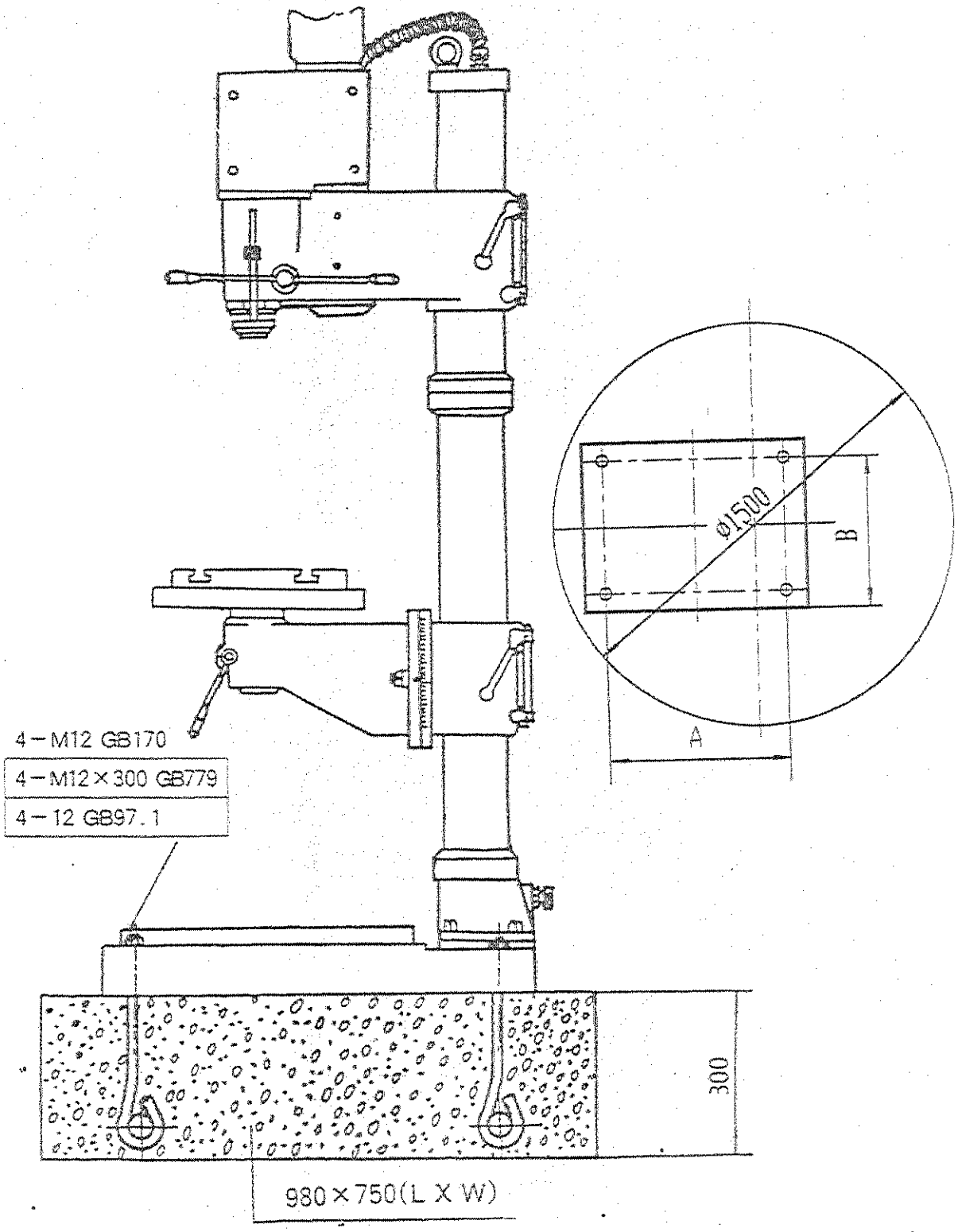


Figure 9 Installation of Foundation

9. Operation. Test Run. Adjustment

Pay attention to the following before operation:

1. Read the operation manual entirely and carefully before installing and starting.
2. Users should obey the rules for application of this machine.
3. Users must obey the method of lubrication of this machine.
4. Give some clearance between the tail of taper—shank of twist drill and touching point of unloading device. The tail of non—standard taper shank and improper sleeve of taper tool should not be used.
5. Clean the rust—resisting paint carefully and add lubricant.
   Then run the machine from low speed to high speed and check for proper operation.
6. When tapping, after the motor must be stopped, then the reversal direction start motor.

List of the Parts of Operation

<As shown in Figure 10>

No	Name	No	Name
1	Lock screw	10	Feed handle of spindle
2	Up and down handle of supporting block	11	Lock handle of supporting block
3	Tool retracting handle	12	Lock screw
4	Up and down handle of head box	13	Lock handle of working—table
5	Speed chang handle	14	Converting switch of double speed motor
6	Speed change handle	15	Start and stop switch of motor
7	Scale	16	Working table
8	Depth setting nut	17	Supporting table
9	Lock handle of head—box	18	Lock screws and nuts

Before starting the motor, the converting switch 14 should be in proper location. <"1R" for low speed, "2R" for high speed; in the reversal driection, "1L" for low speed, "2L" for high-speed>. Then push the switch 15 to "ON" for motor starting, push the switch to "OFF", the motor stops. For reverse, push the switch 15 to "OFF" first, and point the switch 14 to "1L" or "2L" position, and point the switch 14 to "1L" or "2L" position, then push switch 15 to "ON".

According to the speed plate, four <4> different speeds of spindle can be obtained by changing handle 5 and 6. With switch 14, eight <8> different speed can be obtained from 100-2900r/min. Pay attention to the following: before changing handles 5 and 6, the machine must be stopped.

Up and down movement of headstock: loosening the lock handle 9, turning handle 4, the spindle box can be moved upward and downward. And it can be rotated 0-360° around the column.

Spindle feed: turning handle 10 <clockwise>, the spindle goes downward, loosening handle 10 <clockwise>, the spindle goes upward, loosening handle 10, spindle automaticall is reseted under the spring force.

Tool stripping: pulling out tool releasing button 3 first and then pushing handle 10 upward, the tools can be stripped. And pushing handle 3 in first, the tool can be installed again.

Hold the drilling depth: moveing the depth setting nut 8 on the scale 7 to the required dimention.

Up and down movement of working table: loosening lock handle 11, turning handle 2, the working table can be moved upward or downward. The supporting block can be rotated 0-360° around the column by turning working table. The working table can be rotated 0-360° after releasing handle 13.

Adjustment of spindle clearance: Gear box id mounted on the upper part of spindle box By removing three connecting screws, taking off the gear box, loosening lock washer 2 <as show in figure 11>, the clearance of spindle can be adjusted by nut 1. Be care: if the clearance is too small, overheating of the spindle bearing or other troubles may be happened.

Adjustment of resetting spring of spindle: by removing switch board 3, loosening lock screw 1, turning spring base 2, the springforce can be adjusted. Then tighten up screw 1 <as show in Figure 12>.

Adjustment of spindle box and locking device of the supporting block of working table: by tightening up the hex nut on screw 18, and twisting acom nut on the hex nut, adjust the hex nuts <as shown in Figure 10> until the swinging angle of lock handles 9 and 11 are in right place, the tighten up the acorn nuts.

By removeing gear box as mentioned above, the motor maintenance can be done. Before pulling out stator for maintenance, the two lock screws on the right side of spindle box have to be unscrewed.

All parts of this machine have been adjusted before it is delivered, do not adjust unless it is necessary.

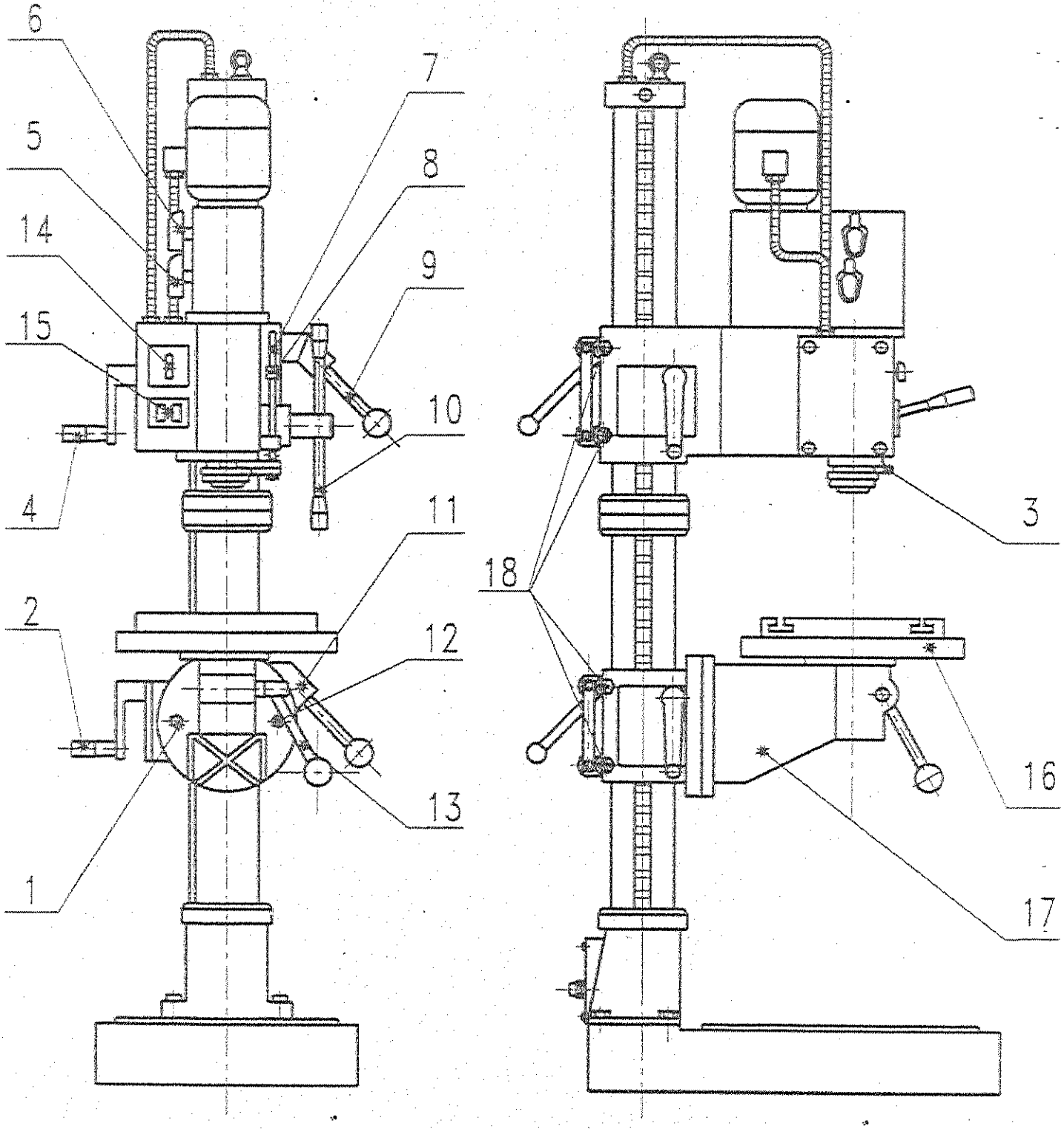


Figure 10

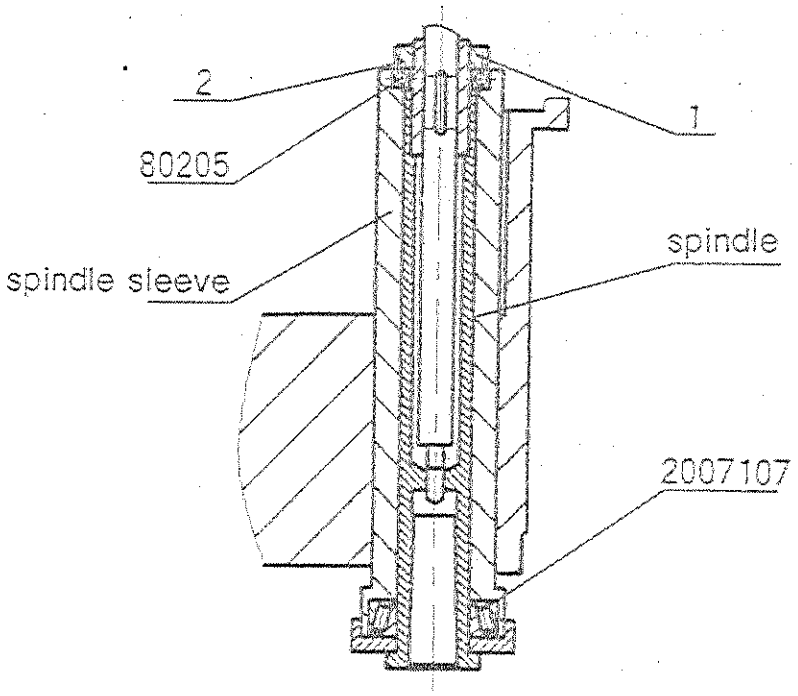


Figure 11

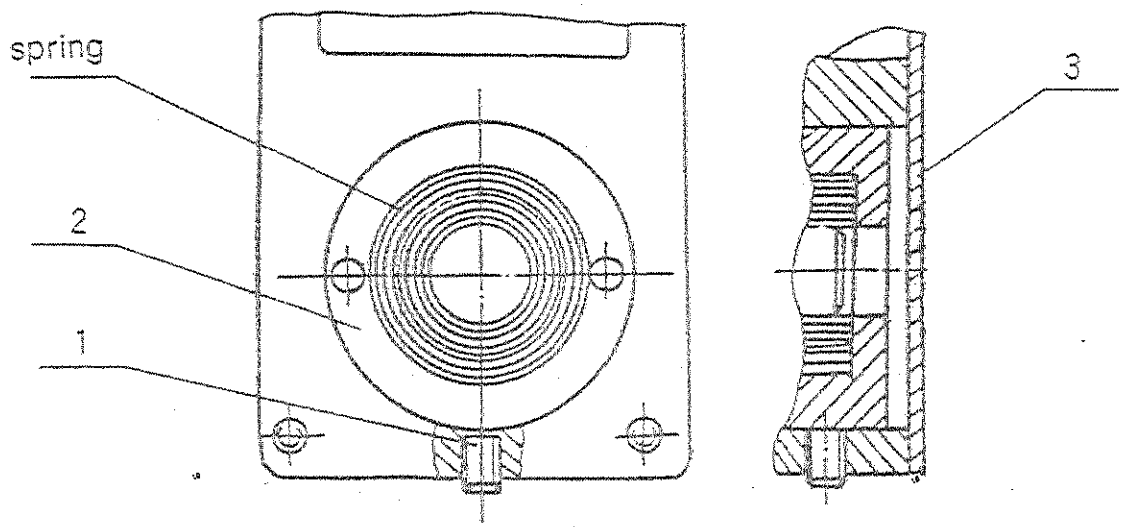


Figure 12

10. They are listed below

No	Name	Specification	Quantity
1	3—jaw drill chuck	1—13mm	1
2	Taper sleeve	3/2	1
3	Taper sleeve	3/1	1
4	Drill chuck holder	ZF01	1
5	wedge for taper shank tool	ZF02	1

11. Safety cover equipment

The safety cover equipment is available as requirement.

The organic glass cover can protect the operator effectively. It can move up and down for covering different work—pieces.

13. Noise intensity

RPM	100	2900
dB	73	78

13. Part list<as shown in figure 13—18>.

No.	Name
1.	bottom base
2.	spring washer
3.	hex nut
4.	hose connector
5.	cover plate
6.	round head screw
7.	vertical column
8.	flexible metal pipe
9.	lift gear rack
10.	vertical clumn top cover
11.	inner hex screw
12.	eye screw
13.	cross slot screw
14.	inner hex screw
15.	earth plate
16.	cross slot screw
17.	handle
18.	handle
19.	flexible metal pipe
20.	hose connector
21.	change switch
22.	spring washer
23.	toothed washer
24.	round head screw
25.	electromaganetic switch
26.	tapered head fasten screw
27.	round head screw
28.	worm shaft
29.	taper pin
30.	bush
31.	bearing 8102
32.	hex nut
33.	taper head fasten screw
34.	round pin
35.	spring
36.	washer
37.	scaled ruler
38.	knurled nut
39.	round head screw
40.	round nut
41.	anti—motion washer
42.	bearing 80205E
43.	guide key
44.	spindle sleeve
45.	feed gear rack
46.	spindle
47.	spindle box
48.	handle
49.	sleeve fasten ring
50.	bearing D2007107
51.	bearing cover
52.	o shape seal
53.	oil cup
54.	taper head fasten screw
55.	fixture sleeve
56.	key
57.	worm gear Z28
58.	sleeve
59.	small shaft
60.	gear Z17
61.	connection rod
62.	handle base
63.	handle ball
64.	handle bar
65.	handle base
66.	pin
67.	elastic block ring
68.	washer
69.	spindle box
70.	fasten bolt.

No. Name

71. round head fasten screw
72. hex nut
73. cover nut
74. round head screw
75. cover plate
76. sink screw
77. sink screw
78. coil spring
79. cover plate
80. spring base
81. lift gear shaft Z16
82. electric panel
83. round head fasten screw
84. spring
85. round head screw
86. ruler base
87. spring sleeve
88. handle rod
89. handle sleeve
90. gear box
91. gear box
92. round head screw
93. taper pin
94. bearing 80203
95. gear Z42
96. key
97. sleeve
98. key
99. gear Z16
100. gear Z68
101. cover
102. gear Z16
103. motor connect shaft
104. motor base
105. round head screw

No. Name

106. key
107. sleeve
108. gear Z34
109. sleeve
110. round head screw
111. middle shaft
112. cover plate
113. motor
114. key
115. rivet
116. center shaft
117. sleeve
118. connect sheet
119. gear Z33
120. Inner gear sheet
121. connector
122. key
123. gear Z51
124. sleeve
125. bearing 3056203
126. gear Z42
127. fixture ring
128. taper pin
129. pin
130. arm
131. shaft pin
132. tape pin
133. handle
134. spring
135. steel ball

No.	Name
136.	small shaft
137.	gear—worm gear
138.	worm shaft
139.	bearing 8102
140.	sleeve
141.	work table
142.	handle rod
143.	ball
144.	press block
145.	turning shaft
146.	bracket
147.	sliding box
148.	gear rack

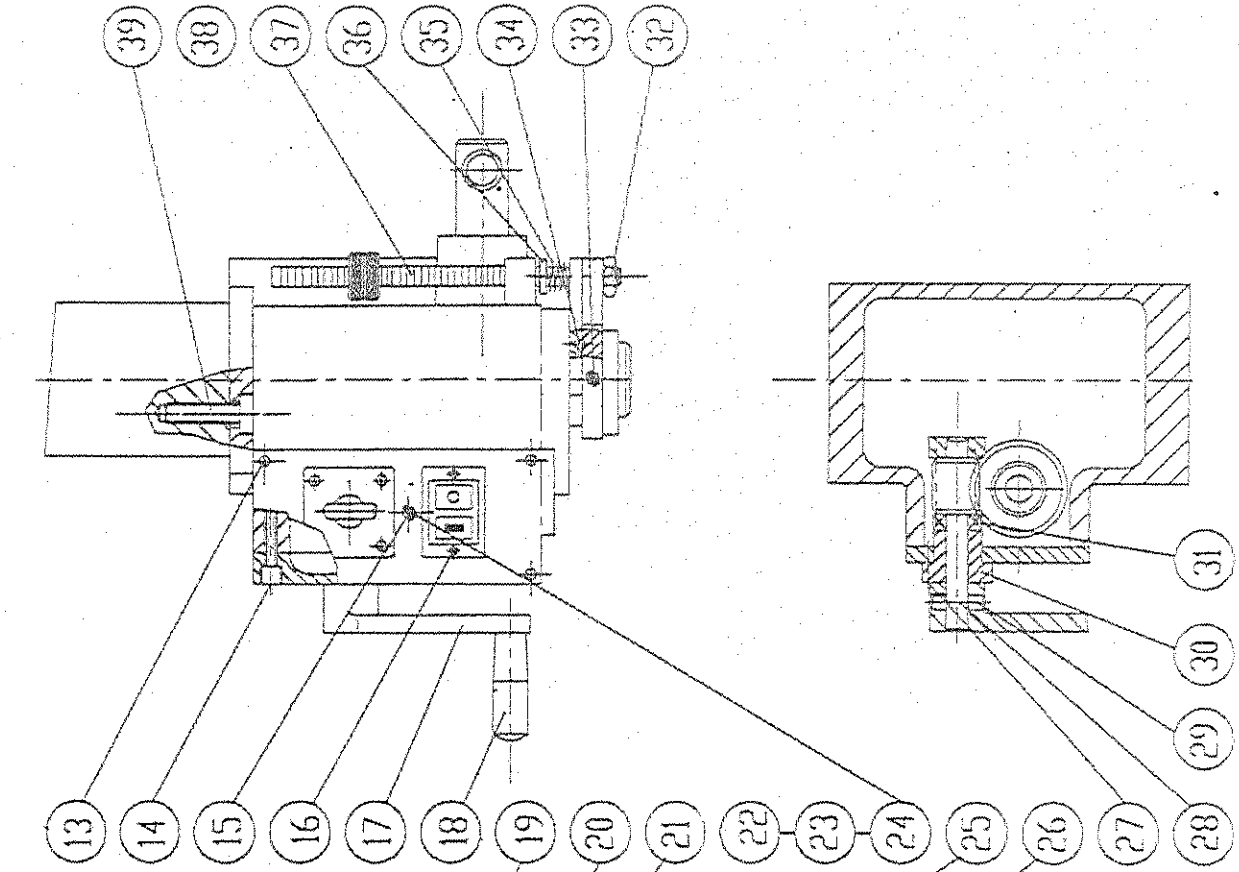


Figure 14

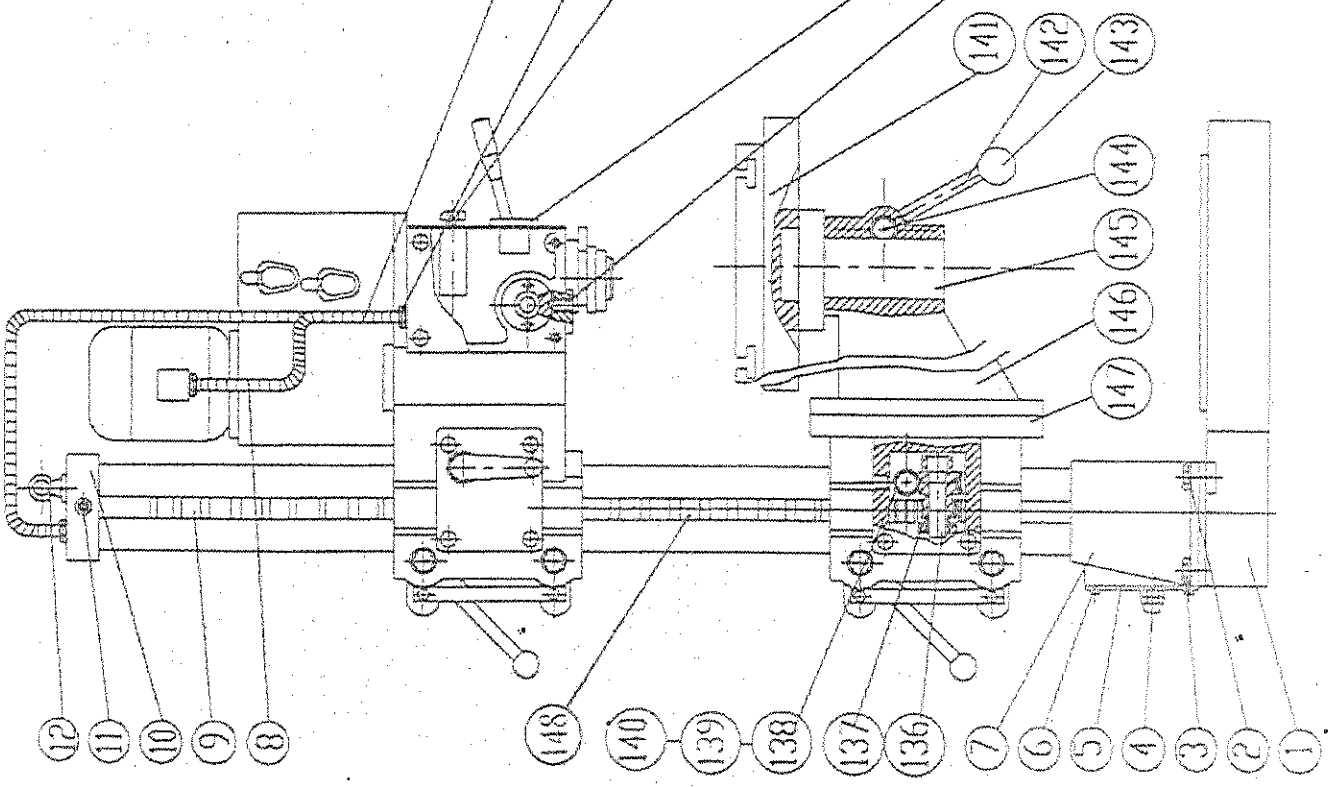


Figure 13

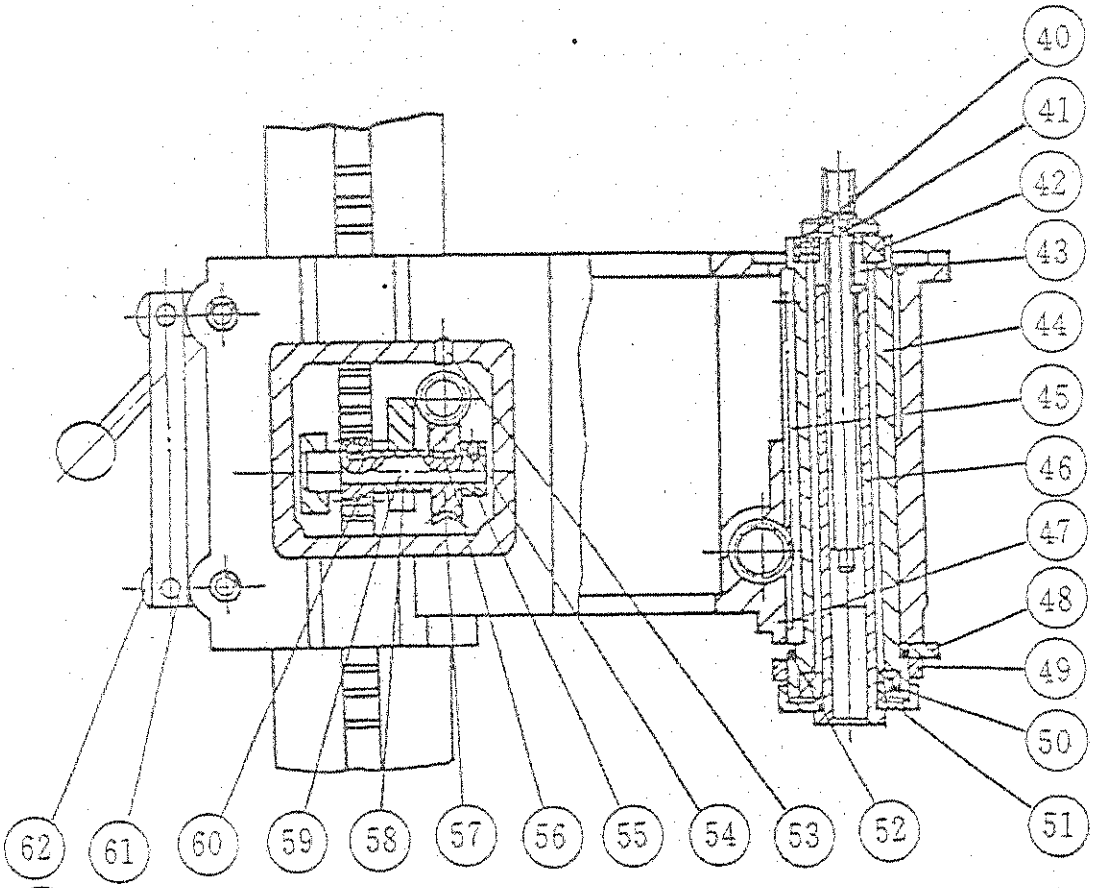

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Fig. 15

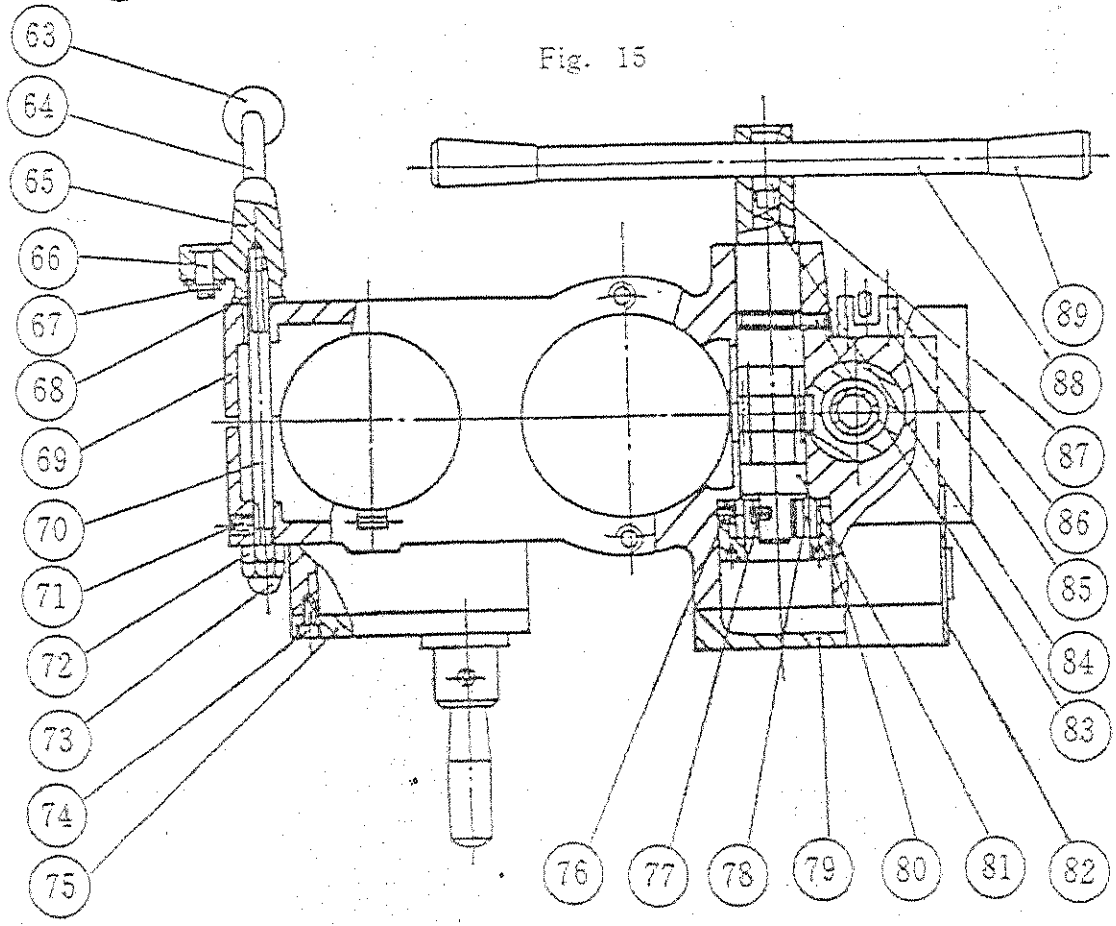
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Fig. 16

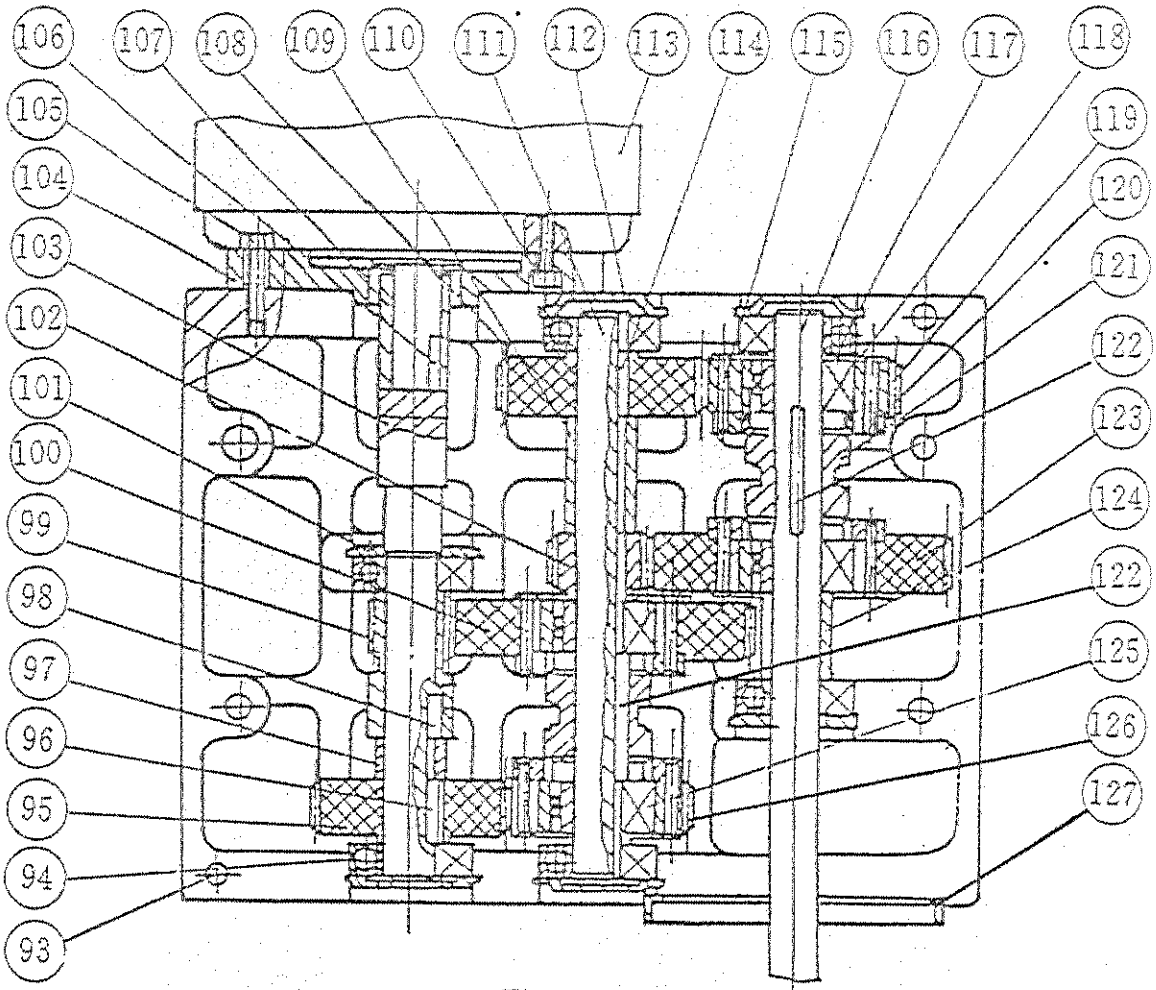
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Fig. 17

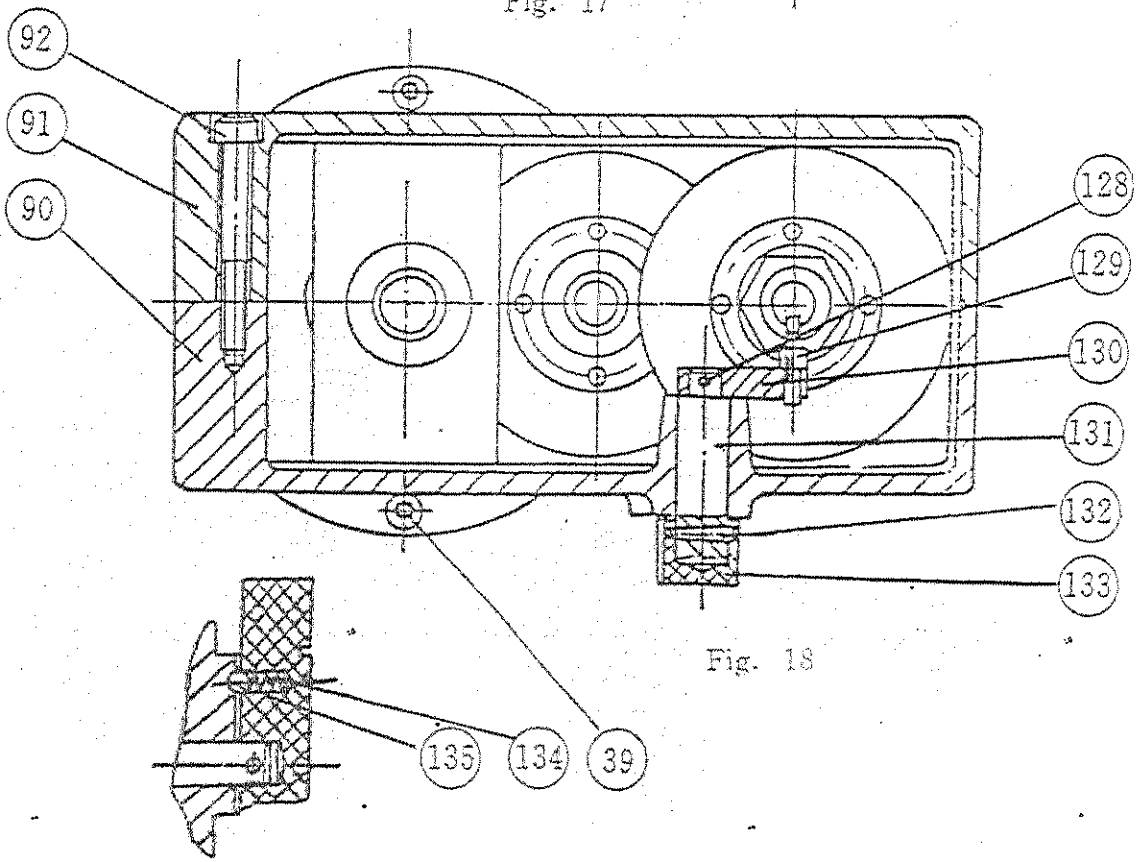
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Fig. 18

Z5025A
Z5025 —1A
—3A UPRIGHT DRILLING MACHINE

INSPECTION CERTIFICATE

MAX. DRILLING DIAMETER 25mm(1 in)

SERIAL NO: Z/03930

INSPECTION CERTIFICATE

This machine has been inspected and is

qualified for delivery according to

GB/T 4018.1～4018.2－1997.(eqv ISO 2773－1～2773－2:1973)

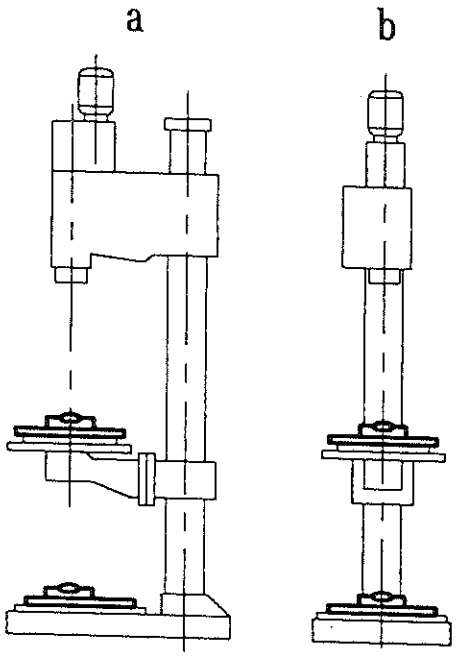
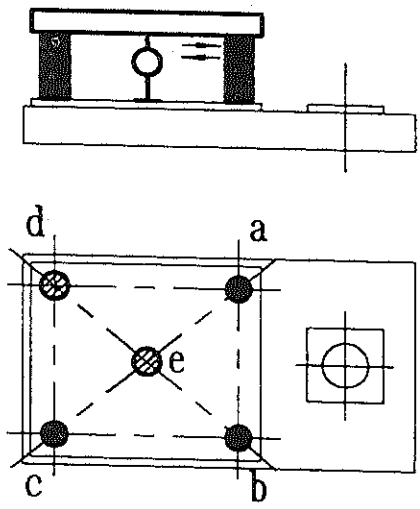
Director of Inspection Department:

President:

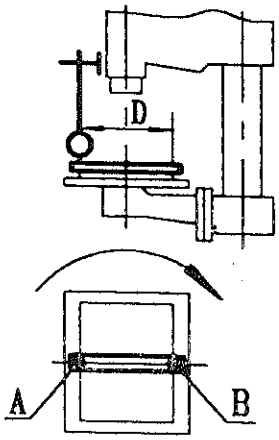
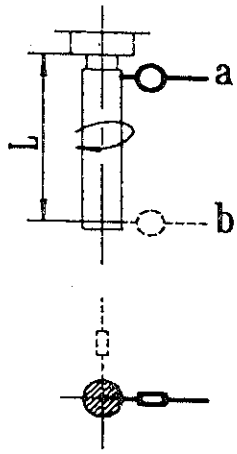
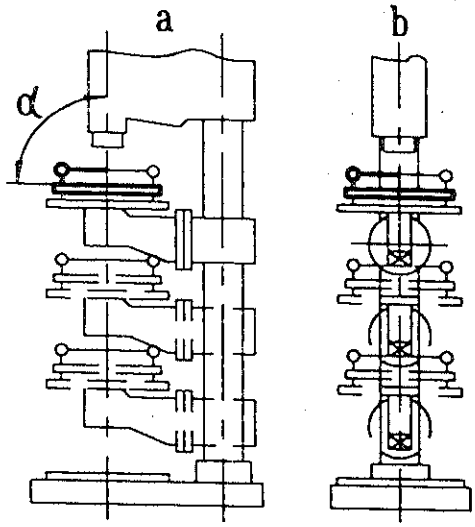
Date: 08.)、31

	INSPECTION CERTIFICATE	Page 2 of 4

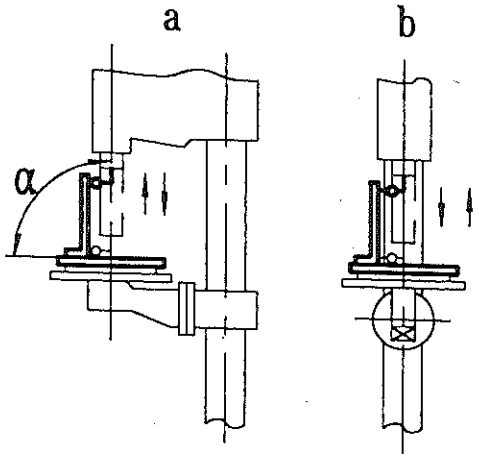
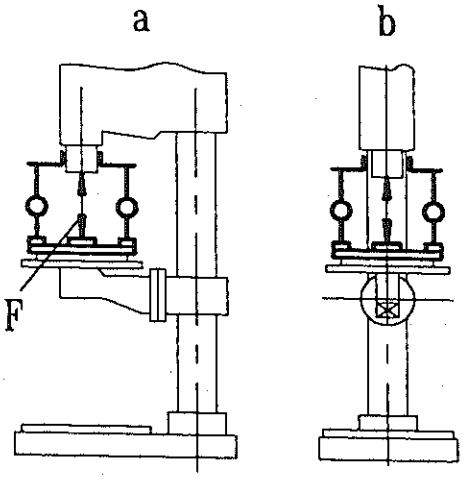
NOTEKEEPING FOR PRECISION TEST
I. GEOMETRICAL PRECISION INSPECTION

NO	ITEMS	SKETCH	ACCURACY	
			Permissible tolerances(mm)	Measured
GO	Machine level adjustment a) in the plane of cross direction b) in the plane of longitudinal direction		0.03/300 (0.0012″/12″)	a 0.02 b 0.02
G1	Flatness of table surface and bottom base working surface		At length of 300(12″) measured 0.03(0.0012″) (flat or concave)	0.02

INSPECTION CERTIFICATE

NO	ITEMS	SKETCH	ACCURACY	
			Permissible tolerances(mm)	Measured
G2	End face runout of work table		D=300(12″) 0.05 (0.002″)	0.02
G3	Radial runout of axis of spindle taper hole a) At the place near the end face of spindle b) At the distance 200mm length from end face of spindle		L=200(8″) a)0.020 (0.0008″) b)0.035 (0.0014″)	a: 0.012 b: 0.02
G4	Perpendicular alignment of circular axis of spindle to the worktable and the bottom base working surface a) in the plane of cross direction b) in the plane of longitudinal direction		a)0.06/300 * (0.0024″/12″) (α≤90°) b)0.06/300 * (0.0024″/12″)	a: 0.02 b: 0.02

Note: * Is the distance between probes of indicator

	INSPECTION CERTIFICATE			Page 4 of 4
NO	ITEMS	SKETCH	ACCURACY	
			Permissible tolerances(mm)	Measured
G5	Perpendicular alignment of movement of spindle sleeve to the table face a) in the plane of cross direction b) in the plane of longitudinal direction		a)0.10/300 (0.004″/12″) (α≤90°) b)0.10/300 (0.004″/12″)	a: 0.04 b: 0.03
II. WORKING PRECISION INSPECTION				
P1	Change of perpendiculer alignment of spindle axis to table face under the action of axial force	 F=5880N	2/1000 * (0.08″/40″)	1.6

Note: * Is the distance between probes of indicator

PACKING LIST

	Z5025A	Z5025－1A	Z5025－3A
serial No.			
case dimensions (L×W×H) cm	194×68×106	180×51×88	180×51×88
gross weight:kg	507	299	310
net weight:kg	404	243	254

No.	DESCRIPTION	SPECIFICATION	QTY	REMARKS
1	upright－drilling machine		1	
2	3－jaw drill chuck	1－13mm	1	
3	drill chuck holder	ZF01	1	
4	wedge for taper shank tool	ZF02	1	
5	taper sleeve	3/1	1	
6	taper sleeve	3/2	1	
7	operation manual		1	
8	inspection certificate		1	
9	packing list		1	

packing inspector

date