

# AMCO

## *Drilling Press*

*Model No: D125*

*Serial No: K1601004*

*Operation Manual*



**WESTWAY Machinery Ltd.**  
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Model Z5032A  
VERTICAL DRILLING MACHINE

**Operation Manual**

**Max. Drilling Dia: 32mm**

**Serial No: K 1601004**

## RELEASE NOTE

This Machine (Serial No. *K1201004*)  
should be connected with electric supply  
of *575* V *60* Hz, 3-phase,  
4-core wires (L1, L2, L3, N).

Fuse current 8 A



## General Machinery Safety Instructions

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You are required to read this entire Manual before using this machine.

- 1. Read the entire Manual before starting machinery.** Machinery may cause serious injury if not correctly used.
  - 2. Always use correct hearing protection when operating machinery.** Machinery noise may cause permanent hearing damage.
  - 3. Machinery must never be used when tired, or under the influence of drugs or alcohol.** When running machinery you must be alert at all times.
  - 4. Wear correct Clothing.** At all times remove all loose clothing, necklaces, rings, jewelry, etc. Long hair must be contained in a hair net. Non-slip protective footwear must be worn.
  - 5. Always wear correct respirators around fumes or dust when operating machinery.** Machinery fumes & dust can cause serious respiratory illness. Dust extractors must be used where applicable.
  - 6. Always wear correct safety glasses.** When machining you must use the correct eye protection to prevent injuring your eyes.
  - 7. Keep work clean and make sure you have good lighting.** Cluttered and dark shadows may cause accidents.
  - 8. Personnel must be properly trained or well supervised when operating machinery.** Make sure you have clear and safe understanding of the machine you are operating.
  - 9. Keep children and visitors away.** Make sure children and visitors are at a safe distance for you work area.
  - 10. Keep your workshop childproof.** Use padlocks, Turn off master power switches and remove start switch keys.
  - 11. Never leave machine unattended.** Turn power off and wait till machine has come to a complete stop before leaving the machine unattended.
  - 12. Make a safe working environment.** Do not use machine in a damp, wet area, or where flammable or noxious fumes may exist.
  - 13. Disconnect main power before service machine.** Make sure power switch is in the off position before re-connecting.
  - 14. Use correct amperage extension cords.** Undersized extension cords overheat and lose power. Replace extension cords if they become damaged.
  - 15. Keep machine well maintained.** Keep blades sharp and clean for best and safest performance. Follow instructions when lubricating and changing accessories.
  - 16. Keep machine well guarded.** Make sure guards on machine are in place and are all working correctly.
  - 17. Do not overreach.** Keep proper footing and balance at all times.
  - 18. Secure workpiece.** Use clamps or a vice to hold the workpiece where practical. Keeping the workpiece secure will free up your hand to operate the machine and will protect hand from injury.
  - 19. Check machine over before operating.** Check machine for damaged parts, loose bolts, Keys and wrenches left on machine and any other conditions that may effect the machines operation. Repair and replace damaged parts.
  - 20. Use recommended accessories.** Refer to instruction manual or ask correct service officer when using accessories. The use of improper accessories may cause the risk of injury.
  - 21. Do not force machinery.** Work at the speed and capacity at which the machine or accessory was designed.
  - 22. Use correct lifting practice.** Always use the correct lifting methods when using machinery. Incorrect lifting methods can cause serious injury.
  - 23. Lock mobile bases.** Make sure any mobile bases are locked before using machine.
  - 24. Allergic reactions.** Certain metal shavings and cutting fluids may cause an allergic reaction in people and animals, especially when cutting as the fumes can be inhaled. Make sure you know what type of metal and cutting fluid you will be exposed to and how to avoid contamination.
  - 25. Call for help.** If at any time you experience difficulties, stop the machine and call you nearest branch service department for help.
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# WARNING

## Drilling Machine Safety Instructions

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You are required to read this entire Manual before using this machine.

- 1. Maintenance.** Make sure the Drill is turned off and disconnect from the main power supply and make sure all moving parts have come to a complete stop before any inspection, adjustment or maintenance is carried out.
  - 2. Drill Condition.** Drill must be maintained for a proper working condition. Never operate a Drill that has damaged or worn parts. Scheduled routine maintenance should be performed on a scheduled basis.
  - 3. Leaving a Drill Unattended.** Always turn the Drill off and make sure all moving parts have come to a complete stop before leaving the Drill. Do not leave Drill running unattended for any reason.
  - 4. Avoiding Entanglement.** Remove loose clothing, belts, or jewelry items. Never wear gloves while machine is in operation. Tie up long hair and use the correct hair nets to avoid any entanglement with the Drill spindle or moving parts.
  - 5. Chuck key & wrench safety.** Always remove chuck keys, wrenches and any service tools immediately after use. Chuck keys left in the chuck can cause serious injury.
  - 6. Understand the machines controls.** Make sure you understand the use and operation of all controls.
  - 7. Drill bit selection.** Always use the correct Drill bit for the job you are Drilling. Make sure you use the correct shank drill bit for your drilling machine.
  - 8. Secure the Drill Bit.** Properly tighten and securely lock the drill bit in the chuck.
  - 9. Cutting Tool inspection.** Inspect Drill for sharpness, chips, or cracks before use. Replace any cutting tools immediately if dull, chipped or cracked. Handle new cutting tools with care. Cutting edges are very sharp and can cause lacerations.
  - 10. Reversing the spindle.** Make sure the spindle has come to a complete stop before changing the direction of the spindle.
  - 11. Stopping the spindle.** Do not slow or stop the spindle by using your hand.
  - 12. Speed selection.** Select the appropriate speed for the type of work, material, and tool bit. Allow the Drill to reach full speed before beginning a cut.
  - 13. Changing Belts for speed selection.** Always allow the machine to come to a complete stop and turn power off before changing belts. Not turning power off when changing belts can cause serious injury.
  - 14. Clearing chips.** Always use a brush to clear chips. Never clear chips when the drill is running.
  - 15. Power outage.** In the event of a power failure during use of the drill, turn off all switches to avoid possible sudden start up once power is restored.
  - 16. Clean work area.** Keep the area around the drill clean from oil, tools, chips.
  - 17. Surface/workpiece area.** Before turning the drill on, make sure the table is clear of any objects (tools, scraps, off-cuts etc.) Do not drill material that does not have a flat surface, unless a suitable support is used.
  - 18. Table Lock.** Make sure the table is tightened before starting the drill.
  - 19. Drilling Sheet metal.** All sheet metal should be clamped to the table before drilling.
  - 20. Mounting workpieces.** Use clamps or vices to secure workpiece before drilling. Position work so you avoid drilling into table.
  - 21. Guarding.** Do not operate the drill when chuck guard is removed.
  - 22. Eye and hand protection.** A face shield with safety glasses is recommended. Always keep hands and fingers away from the drill bit. Never hold a workpiece in your hand while drilling. Do not wear gloves while operating the drill.
  - 23. Drill operation.** Never start the drill with the drill bit pressed against the workpiece. Feed the drill evenly into the workpiece. Back the drill out of deep holes. Turn the machine off and clear chips and scrap pieces with a brush. Turn power off, remove drill bit, and clean the table before leaving the machine.
  - 24. Call for help.** If at any time you experience difficulties, stop the machine and call your nearest branch service department for help.
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# PLANT SAFETY PROGRAM

## NEW MACHINERY HAZARD IDENTIFICATION, ASSESSMENT & CONTROL

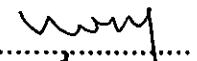

### Drilling Machine

Item No.	Hazard Identification	Hazard Assessment	Risk Control Strategies (Recommended for Purchase/Buyer/User)
A	ENTANGLEMENT	HIGH	Eliminate, avoid loose clothing / Long hair etc.
B	CRUSHING	LOW	Secure & support work material on drill table.
C	CUTTING, STABBING, PUNCTURING	MEDIUM	Isolate power to machine prior to any checks or maintenance being carried out. Do not adjust or clean until the machine has fully stopped.
D	SHEARING	MEDIUM	Isolate power to machine when changing speeds or maintenance is being carried out. Make sure all guards are secured shut when machine is on.
E	STRIKING	MEDIUM	Ensure workpieces are tightly secured on machine. Wear safety glasses. Ensure correct spindle direction when drilling..
F	ELECTRICAL	MEDIUM	All electrical enclosures should only be opened with a tool that is not to be kept with the machine. Never clean or dust machine when power is on. Machine should be installed & checked by a Licensed Electrician.
G	HIGH TEMPERATURE	LOW	Wear appropriate protective clothing to prevent hot swarf.
H	OTHER HAZARDS, NOISE	LOW	Wear hearing protection as required.
Plant safety Program to be read in conjunction with manufactures instructions			

Authorised and signed by:

Safety Officer: .....

Manager: .....

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**0. Attention****0.0 Inspection And Acceptance**

Please check carefully when the package and make sure no parts are missing.

**0.0 Safety**

Please read the operation manual carefully before the installation and adjustment of the machine. When finish the installation, check all the details and trial run the machine iddly before put it into operation. Should any quality problems arise, contact the dealer.

**0.0 Caution**

Keep in mind the safety measures for electrical and operating protection.



## **1. Machine Appearance, application and work environment**

### **1.0 Machine Appearance**

The machine appearance, refers to Fig.1. The machine is constructed with main motor, gear box, spindle box, column, work table, bracket, base and electrical cabinet. The gear box and spindle box are mounted on the elevating sleeve, the elevating sleeve is slid on the column. The main motor is at top of the head stock.

The work table is supported by the bracket which is assembled in the middle of the column. The column sits on the base. The electrical cabinet is fixed on the back of the head stock.

The contour design of the machine is composed of straight lines and squares, gives a feeling of light, artistic and flexible.

### **1.0 Application**

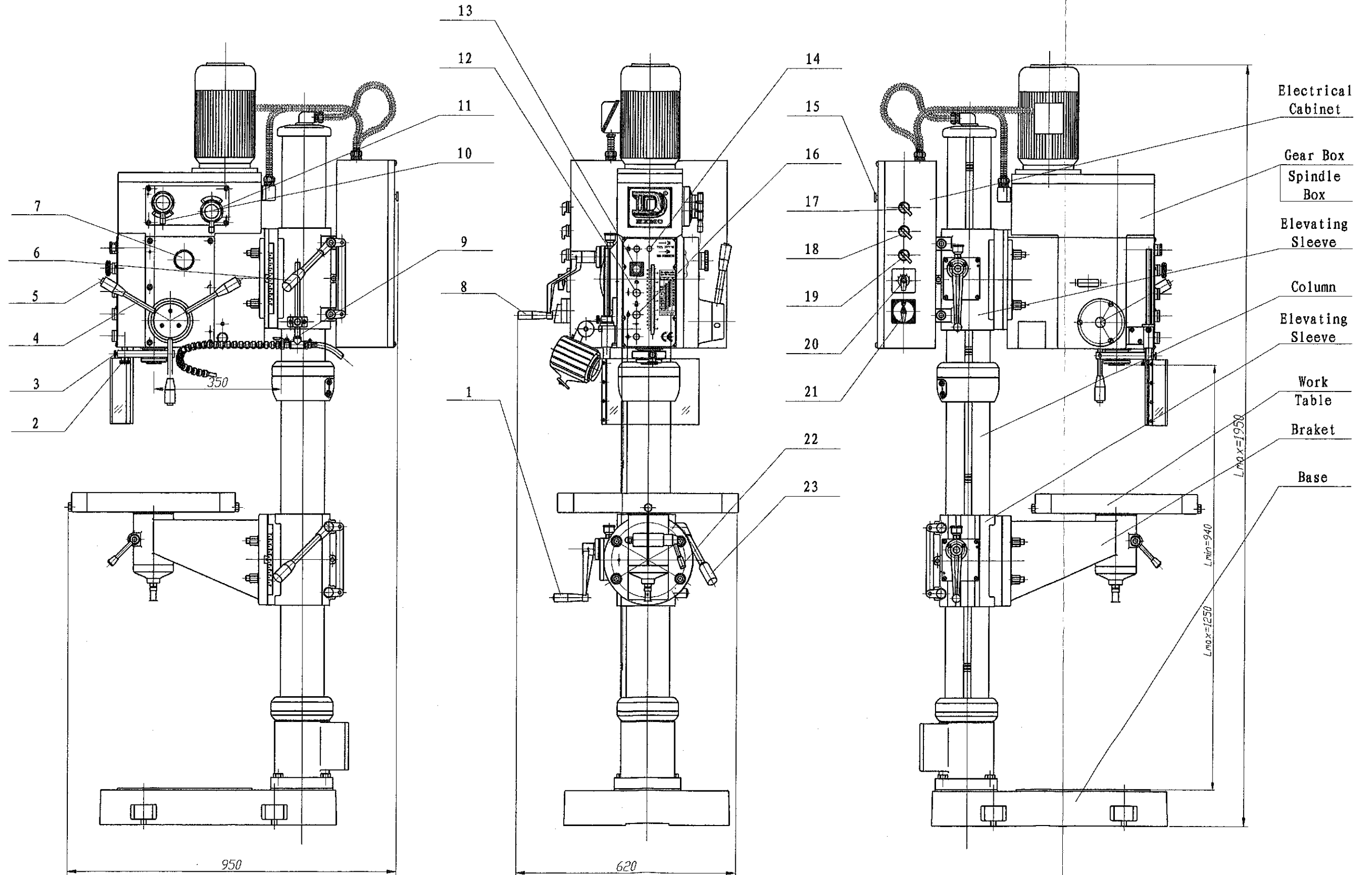
The machine is designed with multi-function of drilling, broaching, reaming, tapping and conterboring etc. The special application oblique angle drilling, with a strengthened capacity of drilling it allows the workpieces to be drilled with larger range of size. It is suitable for using in both production and maintenance shops.

The worktable bracket can move up and down along the column at  $\pm 45^\circ$  horizontally. The work table can move with the bracket at  $360^\circ$  ,or  $45^\circ$  parallel to the bracket. It is more flexible and easy to operate.

### **1.0 Work Environment**

- The elevation of the workshop has to be 2000m or less.
- The environmental temperature should be  $-20^\circ\text{C}$  to  $+40^\circ\text{C}$ .
- With a medium temperatures of  $20 \pm 5^\circ\text{C}$ , the relative humidity should not exceed 85%.
  - No conductive dust allowed.
  - No explosive factor allowed.
  - No corrosive gas or steam which may corrode metal or damage the insulation.
  - Keep away from the source of impact or vibration.

Fig.1 Outside Drawing



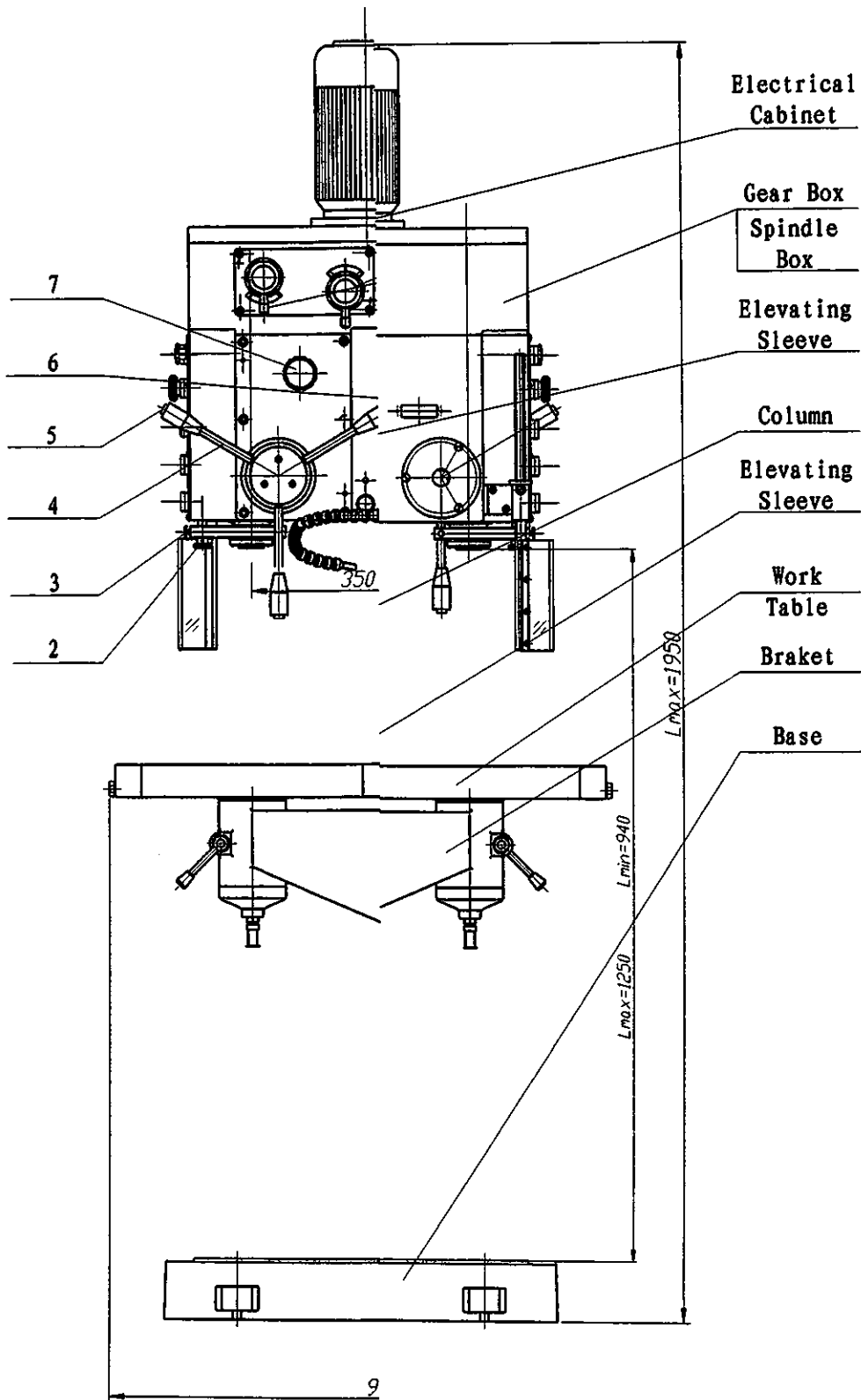


Table (1)

## 3. Main specifications

NO.	Descriptions	Specification	Unit	
1	Max. Dia. of drilling	32	mm	
2	Distance between axis of spindle and generating line of column	350	mm	
3	Max. Distance between spindle nose and surface of worktable	690	mm	
4	Max. Distance between spindle nose and base surface	1250	mm	
5	Max. Travel of spindle	160	mm	
6	Horizontal swing degree of spindle box	$\pm 45^\circ$	Degree	
7	Max travel of work table and bracket	490	mm	
8	Horizontal swing degree of work table and bracket	$\pm 45^\circ$	Degree	
9	Taper of spindle bore	4	Morse	
10	Number of spindle speeds	12	Step	
11	Range of spindle speeds	65~2600	r/min	
12	Spindle feed steps	3	Steps	
13	Spindle feed range	0.1, 0.2, 0.3	mm/r	
14	Dia. of column	$\Phi 120$	mm	
15	Effective working area of worktable(L×W)	430×380	mm	
16	Effective working area of base(L×W)	400×360	mm	
17	Work table and base T-slot	2-14	mm	
18	3-phase 2-speed AC Motor (YD90L2-6/4-Special type)	Power	1/1.5	kW
		Voltage	380 (220、400、420)	V
		Speed	960/1450	r/min
19	3-phase electrical pump	Power	0.085	kW
		Voltage	380 (220、400、420)	V
		Flow rate	6	L/min
20	Electromagnetic Clutch (DLYO-10S)	Power	0.024	kW
		Voltage	24	V
21	Machine dimension(L×W×H)	950×620×1950		mm
22	Machine weight (Gross/net)	550/485		kg

#### 4. Transportation and Installation

##### 4.1 Transport of the machine

- 4.1.1 Handle with care when transporting the machine. Pay close attention to the shipping marks. Don't lay down the machine on the wrong side. Avoid impact.
- 4.1.2 The machine is fully assembled and packed before shipping to the customer. Please check carefully when open the package and make sure no parts are missing
- 4.1.3 When lifting the machine by crane, the center-of-gravity should be close watched. For the correct way, see Fig. 3.

To avoid damaging the machine surface preferably put soft materials between the rope and machine surface.

##### 4.2 Foundation and Installation

- 4.2.1 Take the work table as Radius, go 360° around the column would be the max. area of the foundation.

The diameter of the foundation is  $\phi 1430$ mm. See Fig. 2.  
Customers can decide the Foundation area according to their own needs.

- 4.2.2 The depth of the foundation is selected so that it rests on a dense soil. The depth provided in Fig. 4 is for reference.

- 4.2.3 Bury the foundation bolts in the concrete mortar at the accurate position After solidification of the concrete, lay the machine on the foundation and fully tighten the foundation bolts and carefully leveled by spirit level in its longitudinal and transversal direction.

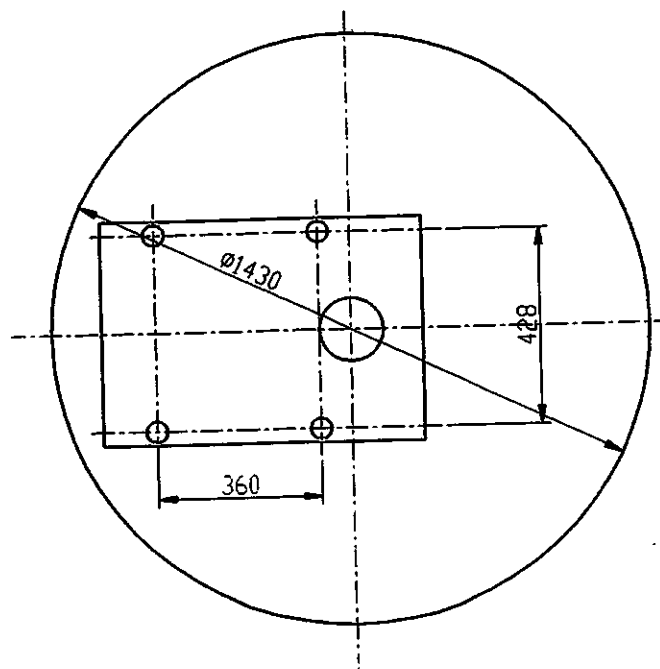


Fig. 2 Dimension of the foundation

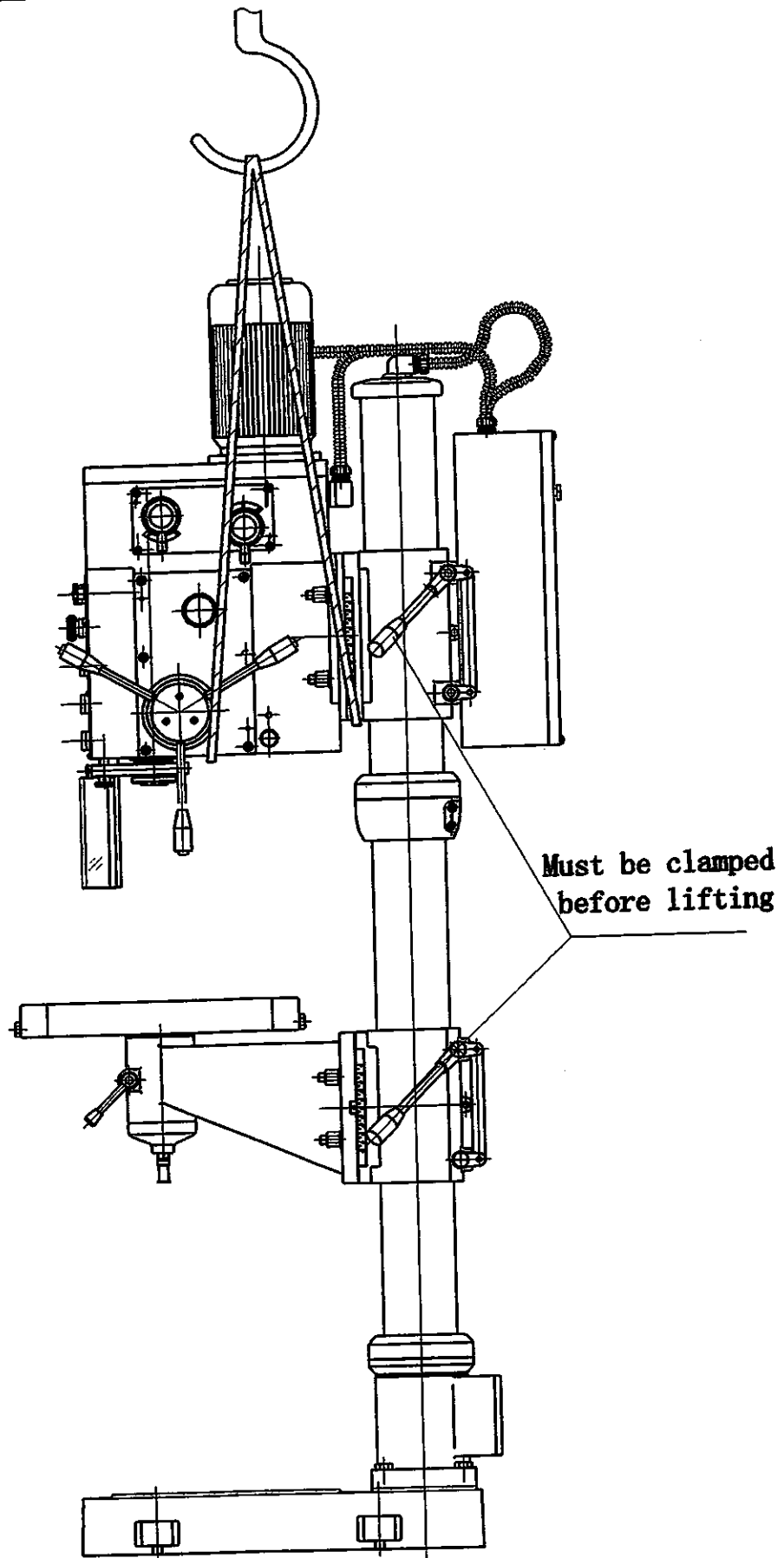
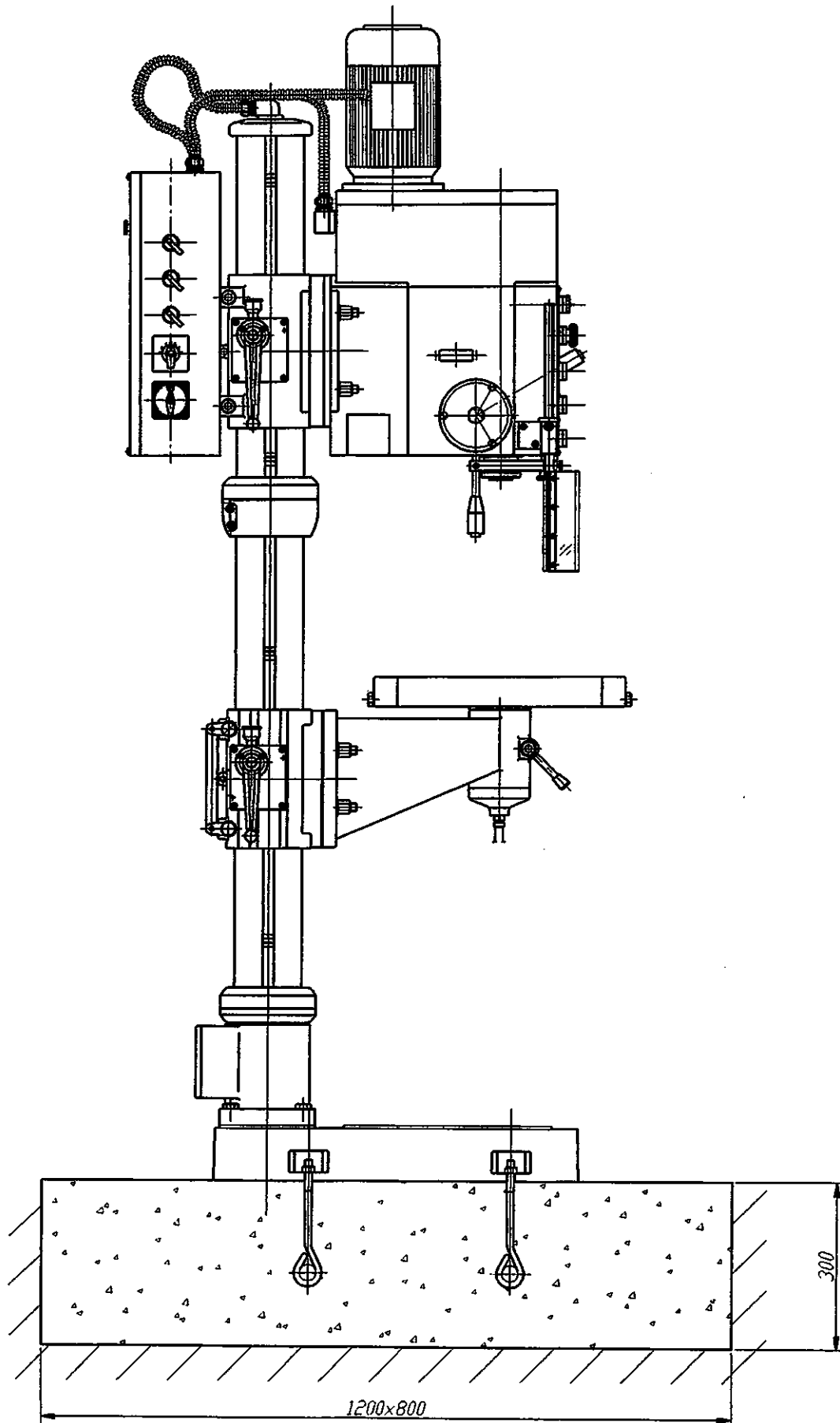


Fig.3 Transport of the machine

Fig. 4 Foundation and installation



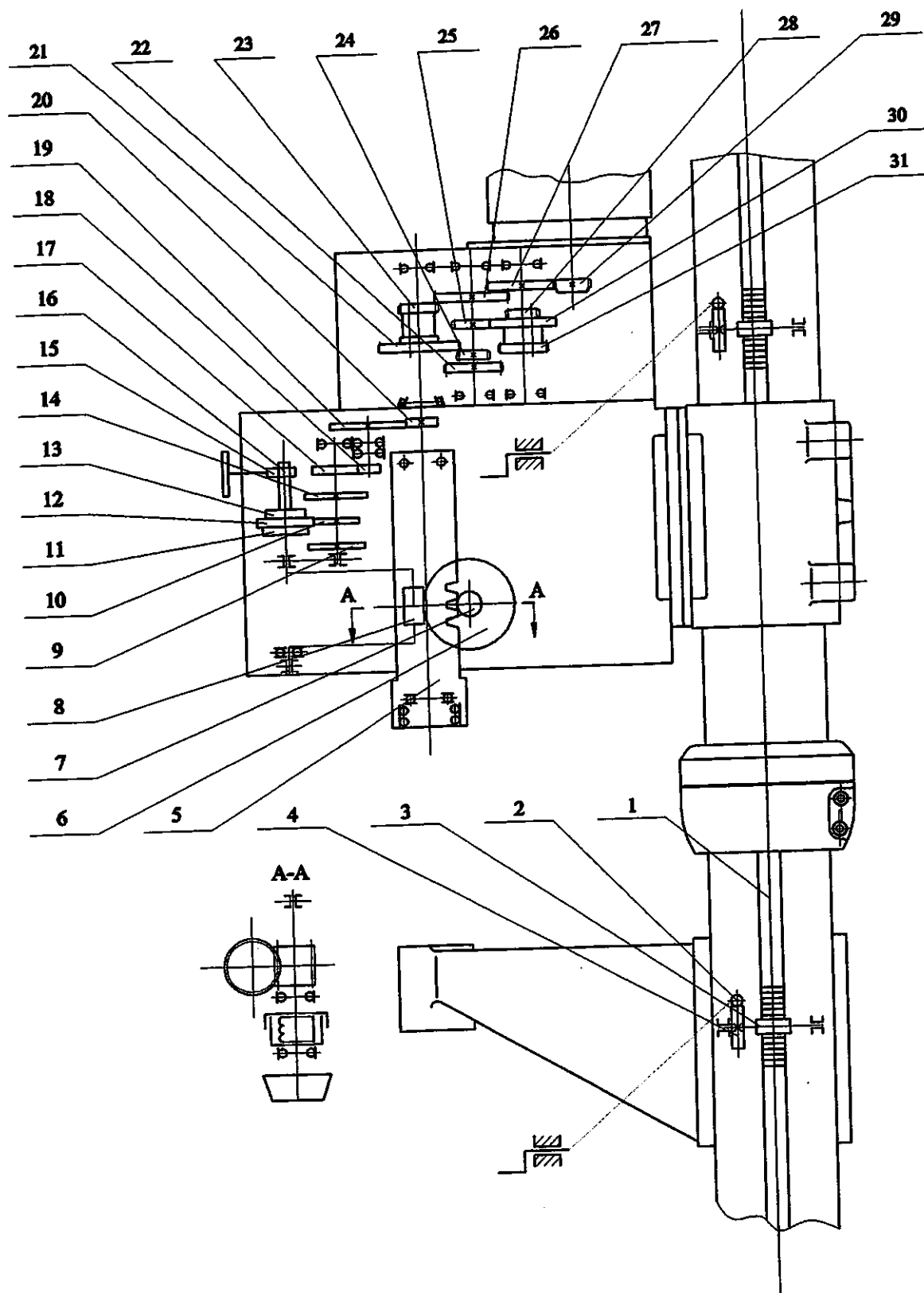


Fig. 5 Transmission System



## 6. Operation Instruction

### 6.1 Starting the Machine

6.1.1 Before starting the machine, please read carefully the operation manual and be fully acquainted with all the details.

6.1.2 The operator should be familiar with all the rules and points of attention of running and maintaining the machine.

6.1.3 Strictly follow the instruction of lubrication. To fill the oiling places with lubricant at regular intervals.

6.1.4 When push in the tool unloading spacing shaft, there should be a clearance between the end of the tapershank of the twist drill and the ram of the tool unloading device. Unqualified taper shank and sleeve adapter can not be used.

6.1.5 Remove all the anti-rust coating or grease from the machine. Fill the machine with lubricant. Run the machine form low to high speed and check if it is normal.

### 6.2 Description of control parts. See Fig.1

#### 6.2.1 Code of the control parts. See table (3)

Table (3)

1	Bracket table lift handle	13	Emergency stop button
2	Feed depth adjusting handle	14	Tool unload handle
3	Feed depth leadscrew lock handle	15	Electrical cabinet handle
4	Manual feed handle	16	Main motor stop button
5	Connect or shut off button for feed Electro-magnetic clutch	17	Lamp button
6	Spindle box clamp/loose lever	18	Coolant pump button
7	Feed regulating lever	19	Tapping select button
8	Spindle box lift handle	20	Speed motor switch
9	Water supply cock	21	Power supply switch
10	Spindle speed change handle A	22	Table clamp/loose lever
11	Spindle speed change handle B	23	Bracket clamp/loose lever
12	Main motor start button		

### 6.3 Spindle speed change control

The 12 steps of spindle speed are accomplished by gear driving system and 2-speed motor. See Fig.5 to change speed, first stop the motor. Turn the speed change handles (10) and (11) to the desired position, then turn the switch (20) to position "1" or "2", the speed of forward is selected.

Turn the switch to position "R", the same speed of reverse is selected.

### 6.4 Spindle feed operation (Fig .1)

#### 6.4.1 Automatic feed

First, stop the motor. Turn the feed change lever (7) to the desired feed rate on the feed chart. Push down the button (5) on the end of manual feel lever (4) to engage the electromagnetic clutch the power feed of the selected amount is realized.

If need to stop in the process, push button (5) to disengage the electromagnetic clutch.

#### 6.4.2 Manual feed

Turn the handle (4) counter-clockwise, the Manual feel of spindle drilling can be realized.

#### 6.4.3 Tapping

The power feed button should not be pushed down when tapping, because the spindle feeds according to the pitch. For safety, please turn the tapping select button (19) to the tapping position and keep it interlocked with power feed.

### 6.5 Spindle reset

The balance and reset of the spindle are accomplished by the spring.

The force of spindle balance can be adjusted by loosening screw of the spring cover and turn the angle of spring cover.

### 6.6 Tool loading and unloading

#### 6.6.1 Tool loading

Push in the tool loading lever (14) toward the spindle box, the limit shaft blocks the spindle sleeve from rising to its limit height. Push the tool taper shank into spindle bore and fit it tightly.

#### 6.6.2 Tool Unloading

Pull the tool-unloading lever (14) out. Grasp the tool with one hand, turn the hand feed lever (4) with another hand. The spindle arises rapidly. The tool shank knocks into the ram on the end of the splin shaft. The tool is pushed out.

### 6.6.3 Points need attention

a. Never pull out the tool unloading lever (14) while the machine is running. It is dangerous because when the spindle arise and the ram on the end of spline shaft knock into the tool taper shaft, the tool will drop.

b. In case the tool taper shank fits in the spindle bore tightly, turn the hand feed lever (4) quickly and make the tool taper shank into the ram three times. It still can not come out, extend the spindle sleeve and use a tool unloading wedge to knock down the tool.

### 6.7 Control of the feed depth

The cutting depth is realized by moving the scale nut on the scale rod. In batch production, the cutting depth is controlled by loosening screw (3) and turn hand wheel (2) and moving the scale nut to the desired depth.

### 6.8 Coolant system

Coolant system: Turn coolant pump button (18) to "on" position, then turn the water supply cock (9), the coolant supply is controled.

### 6.9 Work table bracket

By loosening lever (23) and turning lift handle (1), the work table bracket can be elevated to its desired height. It also can swing around the column at certain angle.

By loosening lever (22), the worktable can swing around the center at  $\pm 180^\circ$  and clamp the levers (22)(23) tightly.

By loosening the 4 nuts of M14 on the bracket and taking out of the roller pin, the worktable can swing at  $\pm 45^\circ$  horizontally. To reset the bracket, readjust the accuracy according to G5 and push the roller pin back in.

### 6.9 Spindle box and Gear box

By loosening lever (6) and turning lift handle (8), the Sspindle box with gear bpx can be elevated to its desired height. It also can be swing around the column at certain angle, then clamp it by lever (6).

By loosening the 4 nuts of M14 on the spindle box and taking out of the roller pins, the spindle box can be swing at  $\pm 45^\circ$  horizontally. To reset the spindle box, readjust the accuracy according to G5 and push the roller pin back in.

## 7. Lubrication System

7.1 The machine adopts two ways of lubrication

- a. Grease lubricating
- b. Hand oiling

7.2 The gears in the gear box are lubricated by No.3 lithium grease. For new machines, after 6 months of running, the lubricant shall be cleaned and changed.

Then change lubricating grease once per year. The bears in the driving system are lubricated by No.3 lithium grease, the worm is lubricated in oil tank.

The lubricant in the oil tank is machine oil. The oil should be changed every 6 months. On the right side of the machine, there are a filling hole and an oil gauge.

The oil outlet at the bottom of the oil tank. The level of the oil is indicated by the oil gauge.

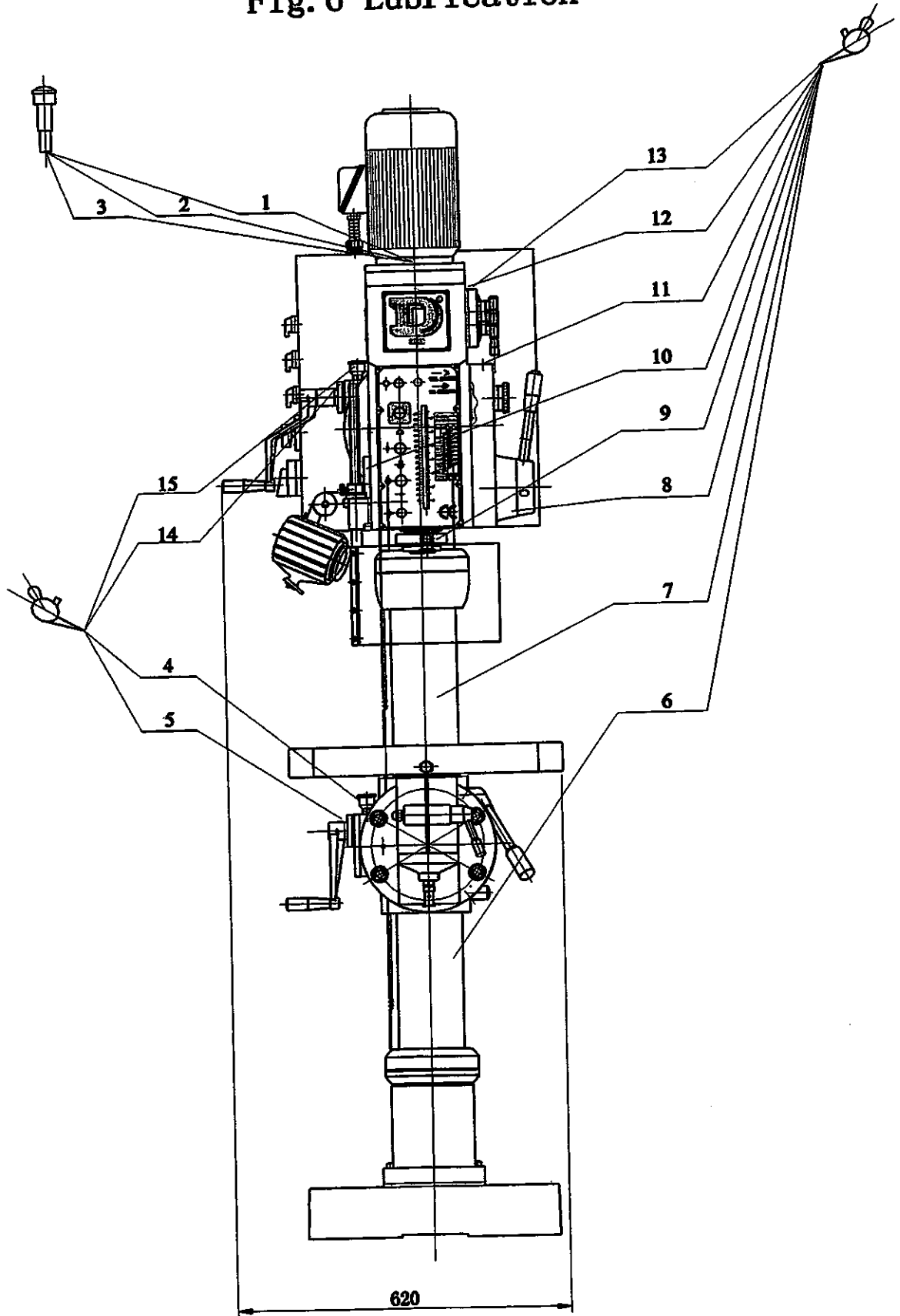
7.3 The machine needs hand lubrication

- a. Hand lubricating places (see Fig.6)
- b. Method of hand lubricating (see Table.4)

Table (4)

No. Of place need lubrication	Name of the place	Method	Name of lubricant	Cycle
1	Main driving shaft I bearing	Oil gun	No. 3 Lithium Grease	Every 3 months
2	Main driving shaft II bearing	Oil gun	No. 3 Lithium Grease	Every 3 months
3	Main driving shaft III bearing	Oil gun	No. 3 Lithium Grease	Every 3 months
4	Bracket lift system	Oil gun	No. 40 machine oil	Every shift
5	Bracket lift worm bearing	Oil gun	No. 40 machine oil	Every shift
6	Column guideway surface	Oil gun pouring	No. 40 machine oil	Every shift
7	Column guideway surface	Oil gun pouring	No. 40 machine oil	Every shift
8	Feed worm wheel	Oil gun	No. 40 machine oil	Every 6 months
9	Spindle sleeve surface	Oil gun Pouring	No. 40 machine oil	Every shift
10	Gear shaft bearings	Oil gun	No. 40 machine oil	Every shift
11	Feed mechanism	Oil gun	No. 40 machine oil	Every shift
12	Speed declutch shift shaft	Oil gun	No. 40 machine oil	Every shift
13	Speed declutch shift shaft	Oil gun	No. 40 machine oil	Every shift
14	Spindle box lift mechanism and worm bushes	Oil gun	No. 40 machine oil	Every shift
15				

Fig. 6 Lubrication



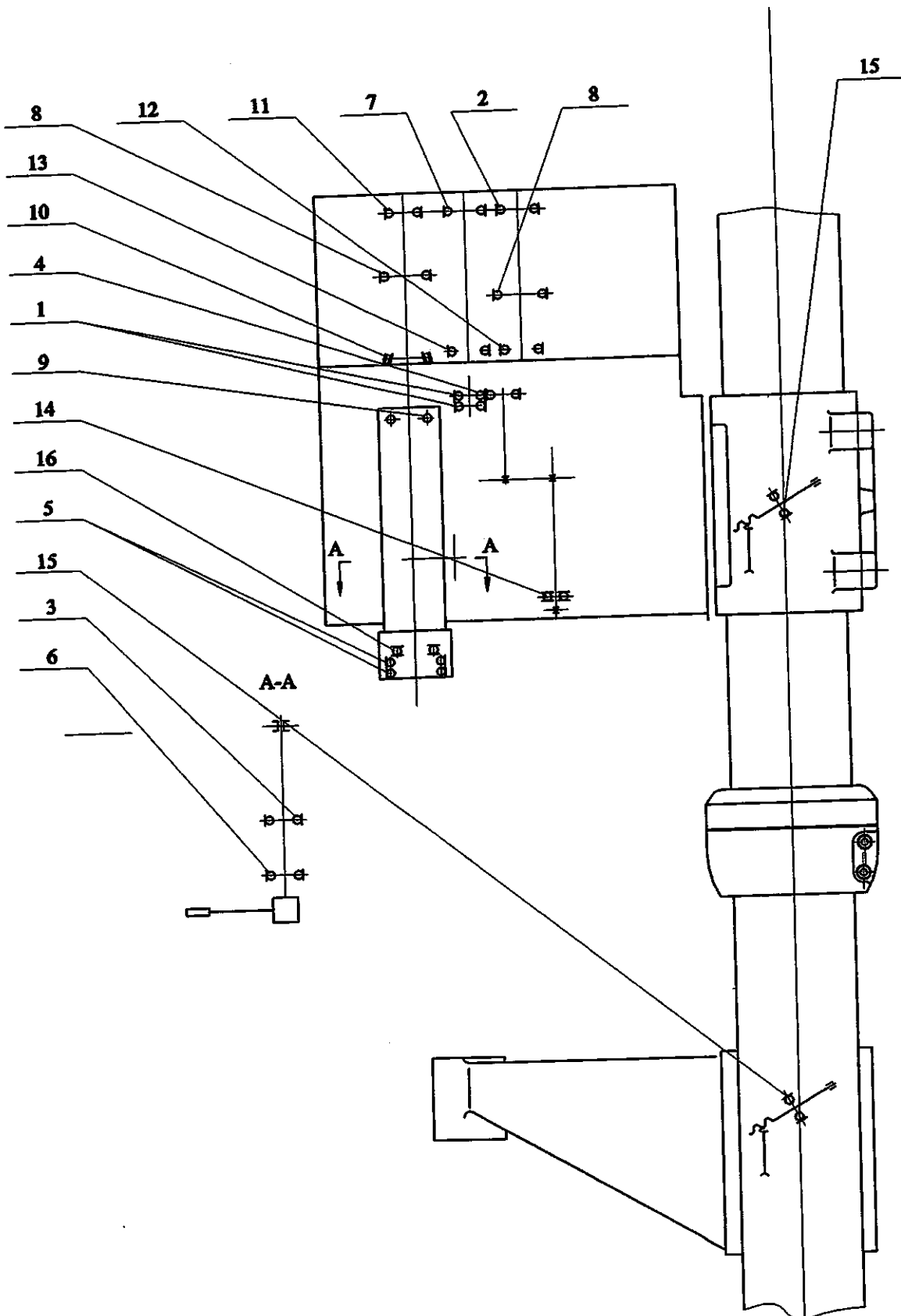


Fig. 7 Distribution of rolling bearings

**8.2 List of rolling bearings**

No.	Model	Description	Specification	Quantity	Accuracy
1	GB276;101	Deep-groove bearing	12×28×8	2	
2	GB276;202	Deep-groove bearing	30×55×13	1	
3	GB276; 107	Deep-groove bearing	35×62×14	1	
4	GB276;202	Deep-groove bearing	15×35×11	1	
5	GB276; 7000108	Deep-groove bearing	35×62×9	2	P5
6	GB276; 1000809	Deep-groove bearing	45×58×7	1	
7	GB276;204	Deep-groove bearing	20×47×14	1	
8	GB276;7000108	Deep-groove bearing	40×68×9	2	
9	GB276;1000906	Deep-groove bearing	30×47×9	1	P5
10	GB297;2007106	Tapered roller bearing	30×55×17	1	
11	GB277; 50105	Deep-groove bearing with snapping groove	25×47×12	1	
12	GB277; 50303	Deep-groove bearing with snapping groove	17×47×14	1	
13	GB277; 50204	Deep-groove bearing with snapping groove	20×47×14	1	
14	GB301; 8102	Thrust ball bearing with flat seat	15×28×9	1	
15	GB301; 8103	Thrust ball bearing with flat seat	17×30×9	1	
16	GB301; 8107	Thrust ball bearing with flat seat	35×52×12	1	

## 9. Electrical system

### 9.1 General

The power supply of the machine is of 380V/50HZ, 3-phase, 60HZ and other voltages are possible. Power supply for control circuit and lighting system is of 24V, which is provided by control transformare. On the control circuit, there are fuses for short circuit protection and an emergency stop button for emergency stop. The transmission is driven by a 2-speed, 3-phase AC asynchronous motor, its speed change is realized by turning the switch.

The electrical cabinet is amounted on the back of the head stock. The emergency stop button and other switches are on the front left site of the spindle box. (See Fig.1)

To ensure the safety of the operator, the electrical system has a safe ground connection.

### 9.2 Electrical circuit

#### 9.2.1 Main power switch (QS1)

The main power switch (QS1) is for the control of the power supply. It has a lock for rotection.

#### 9.2.2 Protection of main motor

The main motor is protected by 3VU1340 auto switch (QF1), which can protect the motor from overload.

#### 9.2.3 Protection of Coolant Pump

Protection of the coolant pump is provided by 3VE automatic Switch (QF2).

#### 9.2.4 Tapping operation

Tapping operation is controlled by contactors KM1, KM2 and select button SB6. The travel limit of tapping is controll by SQ2, SQ3.

When tapping, turn the select button SB6 on position "1" ("0" for drilling), and turn the change switch 6LBB-20 to position "1", start the spindle forward,(KM1 engaged), then turn the spindle downward by hand until touching the work piece and begin tapping. When tap to the desired depth, travel switch SQ2 is on, the spindle reverse (KM2 engaged), the screw taper withdraws from the work piece. When spindle return to the highest position, limit switch SQ3 is on, then spindle rotate forward and one cycle of the operation is finished.

If need to stop tapping during the process, should push the button SB7 on the end of feed handle, and the spindle reverses(KM2 engaged), the screw taper withdraws from the work piece. If push button SB7 again, the spindle run forward, then you could continue to tap.

For tapping again, repeat the above-said steps. For drilling, turn the button SB6 on position "0".



**Warning! The load is too heavy when the motor turns forward and reverse frequently during tapping, so it's not suitable to use too long time. Generally, it should not exceed 8 times per minute. Please stop the motor and cool it down when it is hot, otherwise, the motor could be burnt down.**

#### 9.2.5 Operation of power feed

When power feed, first, the spindle should be moved down over 5~10mm and push any button of the three feed handles, the electromagnetic clutch is engaged and power feed is starting and the indicating lamp HL2 is lighted. When feed to the desired depth, it touched the limit switch, the electromagnetic clutch disengage, then the spindle turn back automatically.

If need to stop the power feed in the process, push any button on the feed handle again to disengage the electromagnetic clutch, and the spindle reset the former position.

#### 9.2.6 Emergency stop

When the machine is in the process of machining, and need to emergency stop, push emergency stop button SB3, let the control circuit lose electricity, then the machine stops. After removing the troubles, should turn the emergency stop button in rightward to relieve the mechanical lock of the button to restart the machine.

#### 9.2.7 Zero voltage protection

Contactors KM1 have the function of Zero voltage protection, when the electrical source intermits and after renewing, should re-start the button SB4 let the contactor engage, and then the machine can work normally.

#### 9.2.8 The protection function of fender

The fender is of the protection function. The spindle cannot be started when the fender is opened. When the spindle is working, if open the fender, the spindle stops immediately. Only close the fender, the spindle can work.

### 9.3 Installation of main motor

9.3.1 Engage the gears in the main motor with gears in the gear box, tighten it with the 4-M14×35 hex bolt.

9.3.2 Connect the power wire and ground wire according to the electrical diagram (9-1).

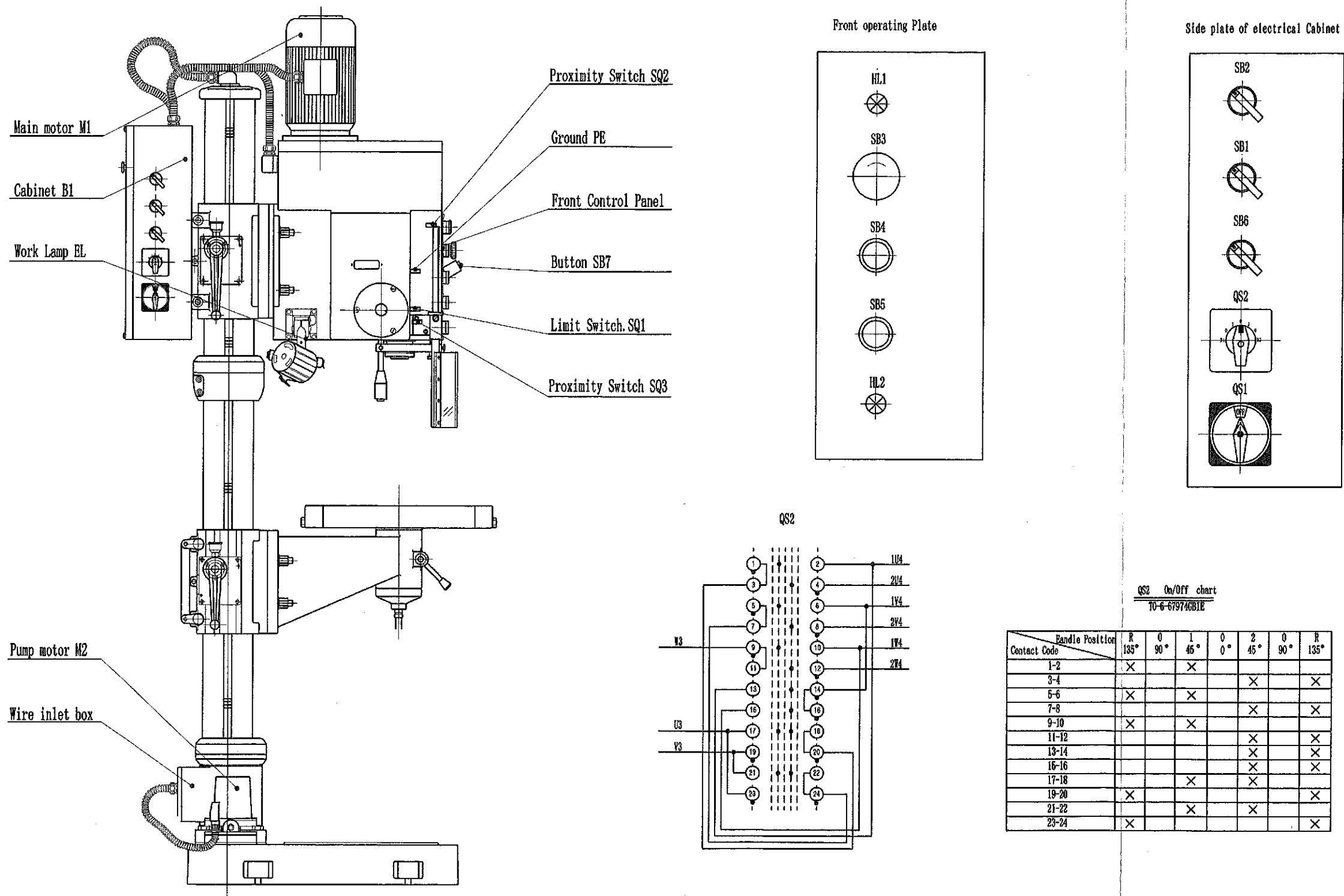
### 9.4 Maintenance of the electrical equipment

Disconnect the main power supply before checking the electrical equipment. Keep the electrical equipment clean by removing dust, dirt and grease regularly. Kerosene or gasoline is prohibited using as cleaner. The working voltage of the motor cannot exceed  $\pm 10\%$  of the rated voltage. To ensure the machine running normally, regular maintenance of the electrical equipment is a must.

## 9.4 List of Electrical parts

Table 6

Symbol	Item	Model & Specification	Qty	Remarks
QS1	Main Switch	P1-25/BA/SVB	1	
QS2	Conversion Switch	TO-6-67974GB/E	1	
QF1	Circuit Breaker	MS116 1.6 ~ 2.5A	1	
QF2	Circuit Breaker	MS116 0.16 ~ 0.25A	1	
SB1; SB2; SB6	Select Switch	C2SS2-10B-10	3	
SB3	Emergency stop Button	YW1B-V4B02R	1	Red Mushroom Head
SB4	Start Button	CP1-10G-10	1	Green
SB5	Stop Button	CP1-10R-01	1	Red
SB7	Handle Button		3	Made by ourself
SQ1	Micro-switch	SS-5GL-F	1	
SQ2; SQ3	Proximity Switch	TL-Q5MC1	2	
KM1~KM3	Contactor	A12D-30-01	3	
HL1; HL2	Signal Lamp	CL502G AC24V	2	
EL1	Working Lamp	25W AC24V	1	Screw
T1	Control Transformer	JBK5TH-100VA 575/24; 27; 27; 9	1	
U1	Circuit Board	HXPCB5-C	1	
M1	Two-speed Main Motor	YD90L-6/4	1	
M2	Coolant Pump	AYB-6B	1	
YC1	Electromagnetic Clutch	DYLO-10S	1	
	Electrical Brush	M16X1	1	Special Order
R1	Resistor	62Ω 2W	1	
D1	Diode	1N5404	1	
FU1~FU3		8A	3	
FU4 ~ FU6		3A	3	
FU7		5A	1	
FU8; FU9		1A	2	
		31110	4	
		31112	1	
		31113	1	



QS2 On/Off chart  
10-6-67974GB1E

Contact Code	Handle Position							
	R 135°	0 90°	1 45°	0 0°	2 45°	0 90°	R 135°	
1-2	×		×					
3-4					×		×	
5-6	×		×					
7-8					×		×	
9-10	×		×					
11-12					×		×	
13-14					×		×	
15-16					×		×	
17-18			×		×			
19-20	×						×	
21-22			×		×			
23-24	×						×	

Fig. 8 Machine Electrical Diagram

Power inlet

Main Power Switch

Two speed Main Motor

Coolant Pump

Transformer

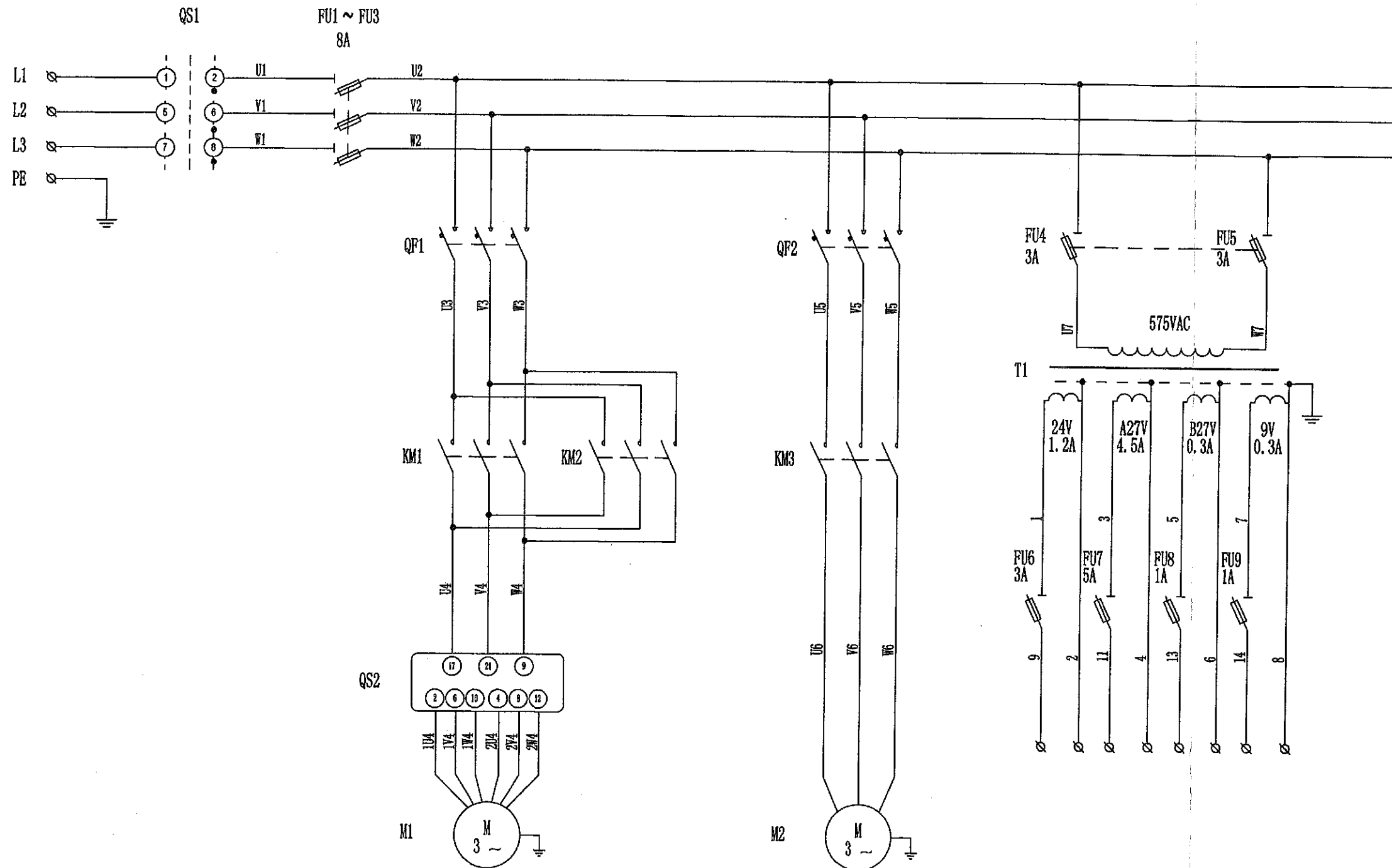


Fig. 9-1 Machine Electrical Diagram

Electrical Control Wiring

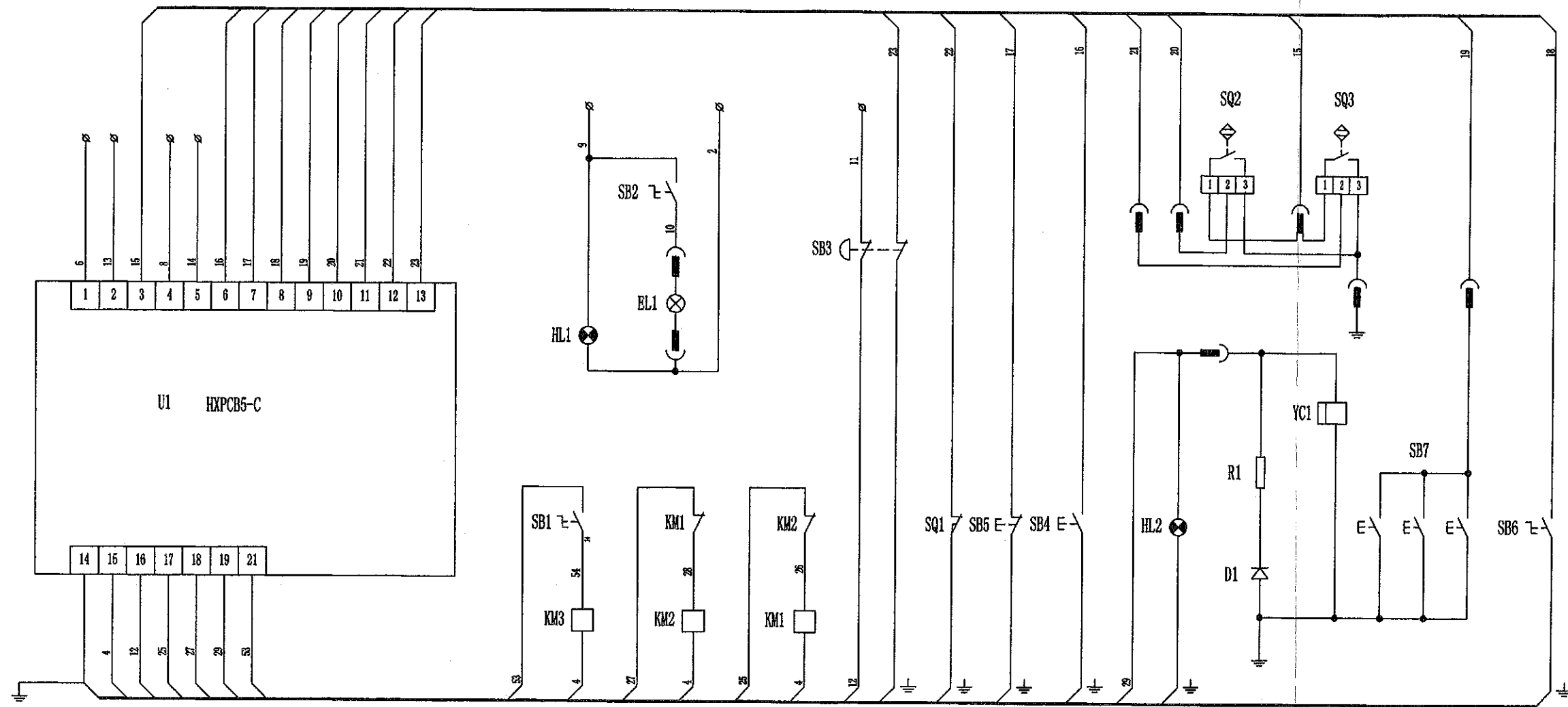


Fig.9-2 Machine Electrical Diagram

**10. List of Accessories**

NO.	Description	Standard No.	Specification	QTY
1	Spanner drill chuck	GB6087	1~13	1pc
2	Connecting bar of drill chuck	Z5035-50-206		1pc
3	Short sleeve for taper shank tool	JB3477	4—3	1pc
		JB3477	4—2	1pc
		JB3477	3—1	1pc
4	Wedge for taper shank tool	JB3482	Wedge 1	1pc
		JB3482	Wedge 3	1pc
5	Hex Nut	GB6170	M12	4 pcs
6	Foundation Bolts	GB799	M12×300	4 pcs
7	Washer	GB97.2	12	4 pcs
8	Double head wrench	GB4388	22×24	1 pc
9	Fuse		3A	2 pcs
10	Fuse		5A	2 pcs

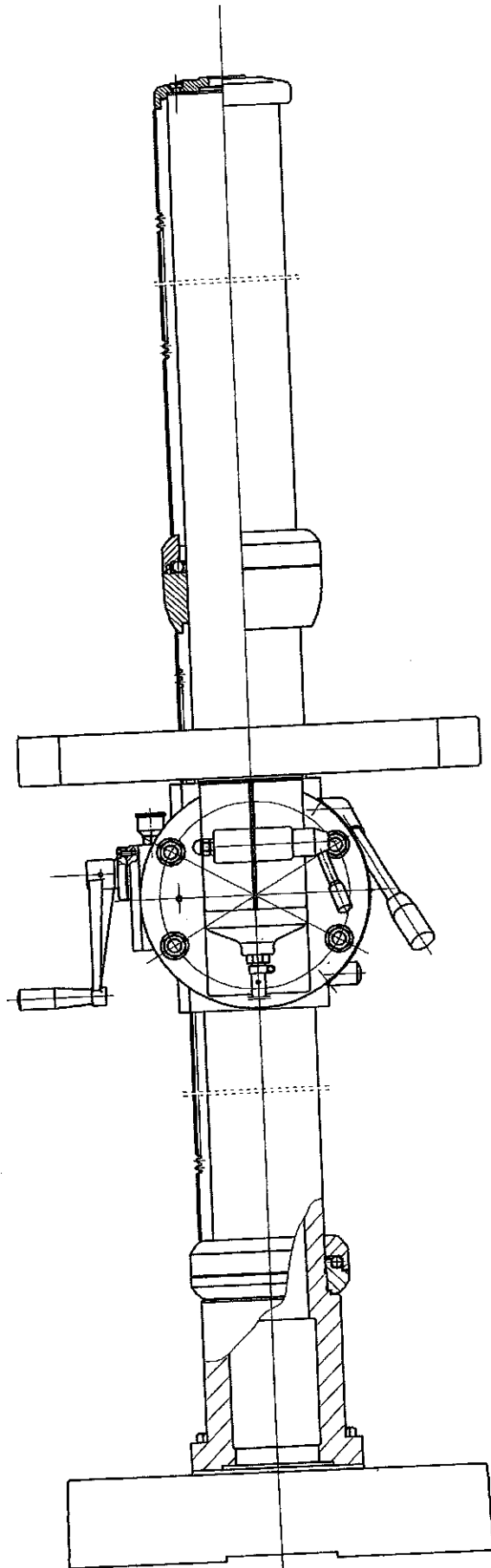
**11. Structure of main components**

11.1 Structure of column and bracket worktable Fig 10

11.2 Structure of spindle box and gear box Fig 11

11.3 Spread drawing of feed gear Fig 12

Fig. 10 Structure of Column and Bracket table



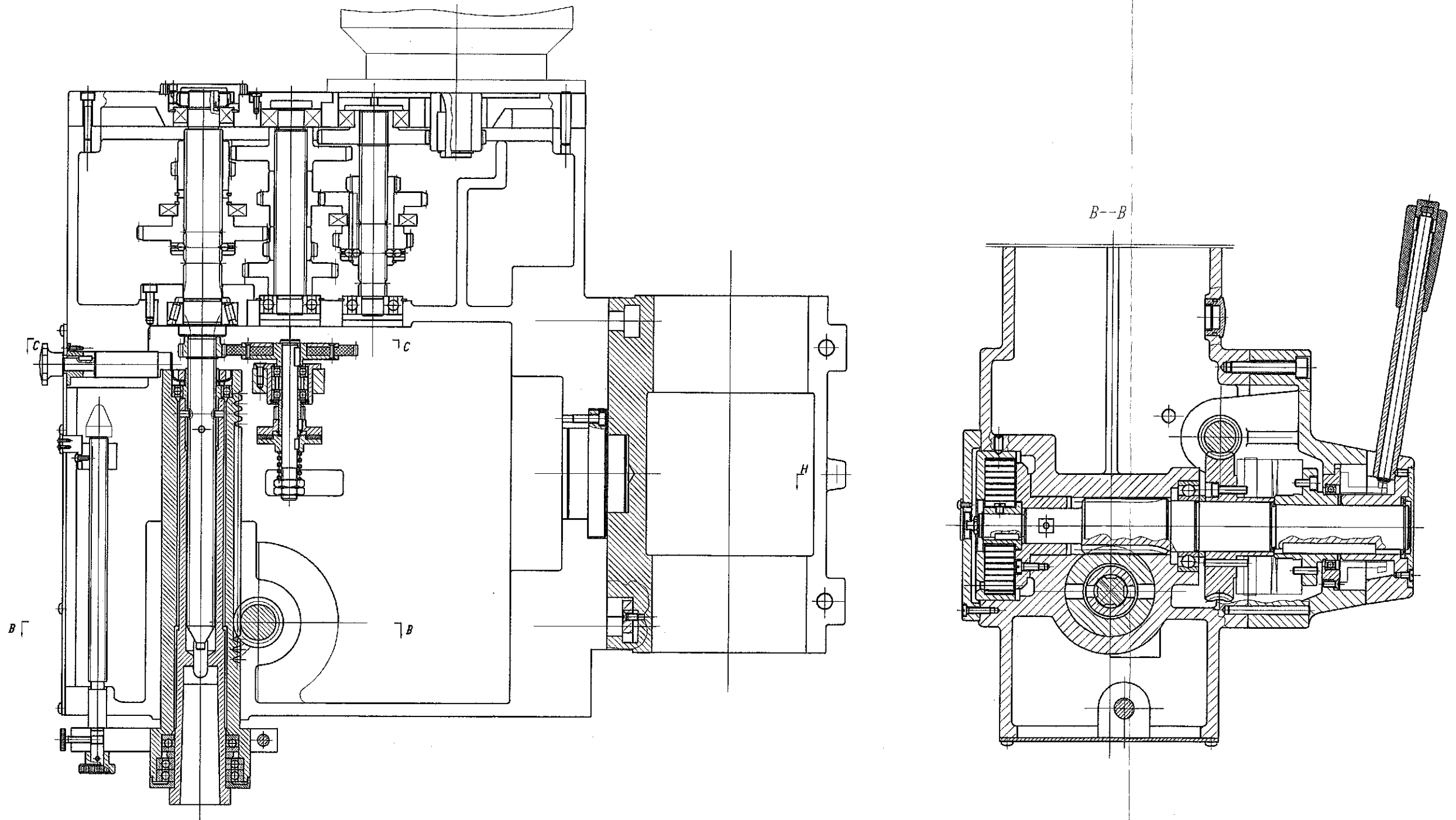
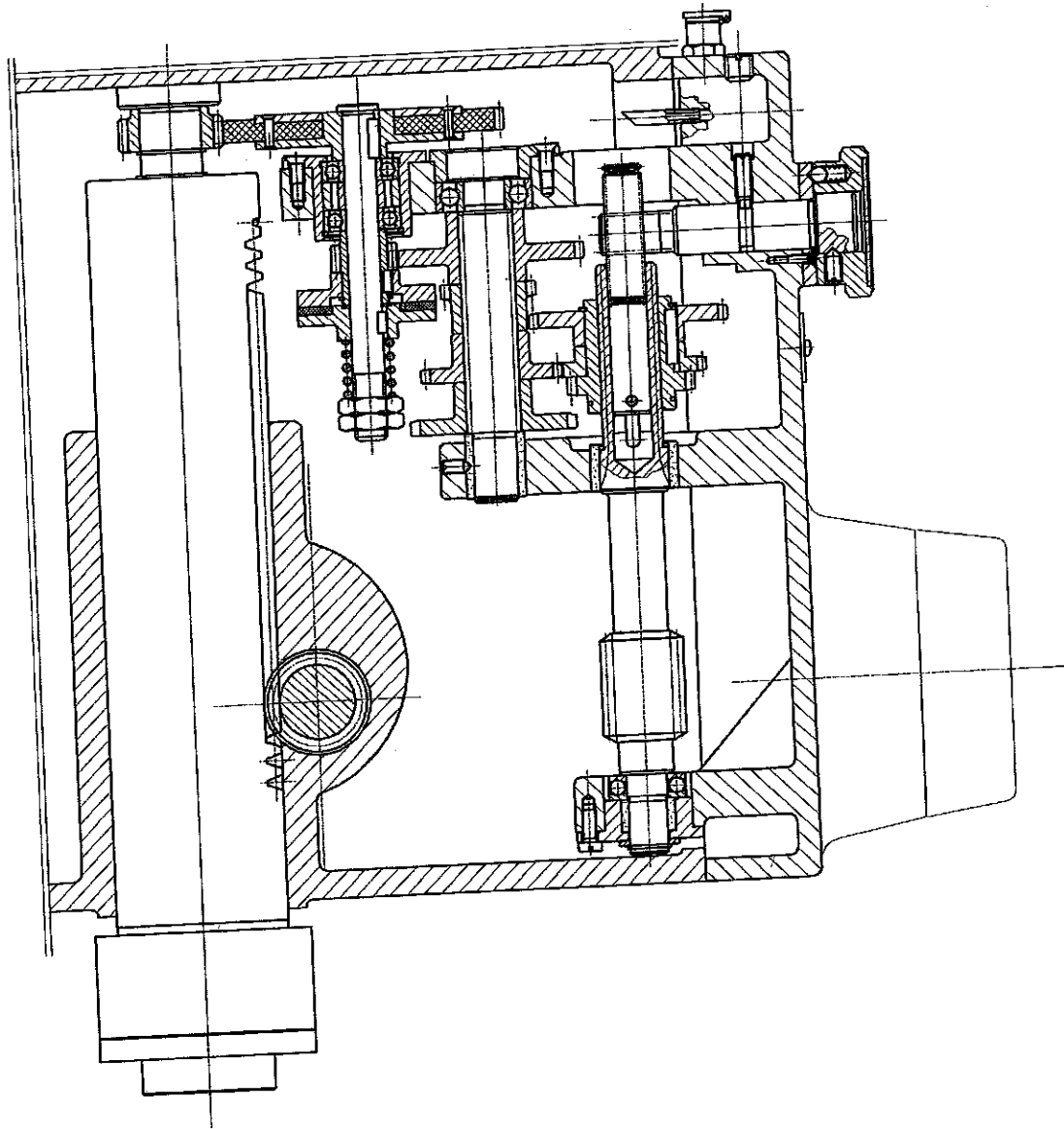


Fig. 11 Structure of Spindle Box and Gear Box



Fig. 12 Feed Gear Box



**MODEL Z5032A**

**VERTICAL DRILLING MACHINE**

**CERTIFICATE OF INSPECTION**

**MAX.DRILLING DIA.: 32mm**

**SERIAL NO:** *K1601004*

**The machine is inspected and conforms to the standard Q/SOMS1-2000. It is permitted to delivery.**

Factory Director: *zhangbin*      Date:

Inspection Director: *lizigang*      Date:

Precision Inspection Record

Geometrical Precision Test:

No.	Item	Brief Drawing	Precision	
			Allowance (mm)	Actual Test
G1	Parallelism of the base surface		0.06 at any tested Length of 300 (flat or concave)	$\frac{0.055}{300}$ (123)
G2	Parallelism of the work table surface		0.04 at any tested Length of 300 (flat or concave)	$\frac{0.035}{300}$ (123)
G3	surface runout of worktable		D=300 0.04	0.03

Precision Inspection Record

Geometrical Precision Test:

No.	Item	Brief Drawing	Precision	
			Allowance (mm)	Actual Test
G4	Spindle bore axis runout a) Close to spindle surface b) at a distance of L to spindle surface		L=200 a) 0.02 b) 0.035	a) 0.01 b) 0.03
G5	Perpendicularity of the spindle axis to work table surface		a) 0.1/300* (a ≤ 90°) b) 0.06/300*	a) <del>0.08</del> /300 (α=90°) b) <del>0.05</del> /300
G6	Perpendicularity of the spindle axis to Base plate table surface		a) 0.10/300* (a ≤ 90°) b) 0.10/300*	a) <del>0.07</del> /300 (α=90°) b) <del>0.07</del> /300

Distance between two contacts of indicator probe

Precision Inspection Record

Germetrical Precision Test:

No.	Item	Brief Drawing	Precision	
			Allowance (mm)	Actual Test
G7	Perpendicularity of the vertical movement of spindle sleeve to work table surface		a. 0.1/300 (a ≤ 90°) b. 0.1/300	a) $\frac{0.08}{300}$ (2290°) b) $\frac{0.08}{300}$

Work Acuracy:

P1	The change of Perpendicularity of spindle axis to work table surface under the axial force.		F=5000N 2/1000	$\frac{1.99}{1000}$
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**MODEL Z5032A**

**VERTICAL DRILLING MACHINE**

**PACKING LIST**

**MAX.DRILLING DIA.: 32mm**

**SERIAL NO:** *K1601004*

MODEL Z5032A

## Packing List

PAGE 1 OF 1

Case No: 1/1  
 Dimension: (L\*W\*H) :  
 103cm×61cm×225cm  
 Gross Weight: 550kg  
 Net Weight: 485kg

No.	Item	Spec. & Marks	Qty	Remarks
1	Main machine		1 set	
2	Main motor	YD90L2-6/4	1set	On the machine
3	Spanner drill chuck	1~13; GB6087	1PC	
4	Connecting bar of drill chuck	Z5035—50—206	1PC	
5	Short sleeve for taper shank tool	4—3; JB3477	1PC	
		4—2; JB3477	1PC	
		3—1; JB3477	1PC	
6	Wedge for taper shank tool	Wedge1; JB3482	1PC	
		Wedge3; JB3482	1PC	
7	Hex nut	M12; GB6170	4PCS	
8	Foundation bolt	M12×300; GB799	4PCS	
9	Washer	12; GB97.2	4PCS	
10	Double head wrench	22×24; GB4388	1PC	
11	Fuse	3A	2PCS	
12	Fuse	5A	2PCS	
13	Operation Manual		1copy	
	Certificate of Inspection		1copy	
	Packing List		1copy	

Packing Inspector: *Wizigang*

Date:



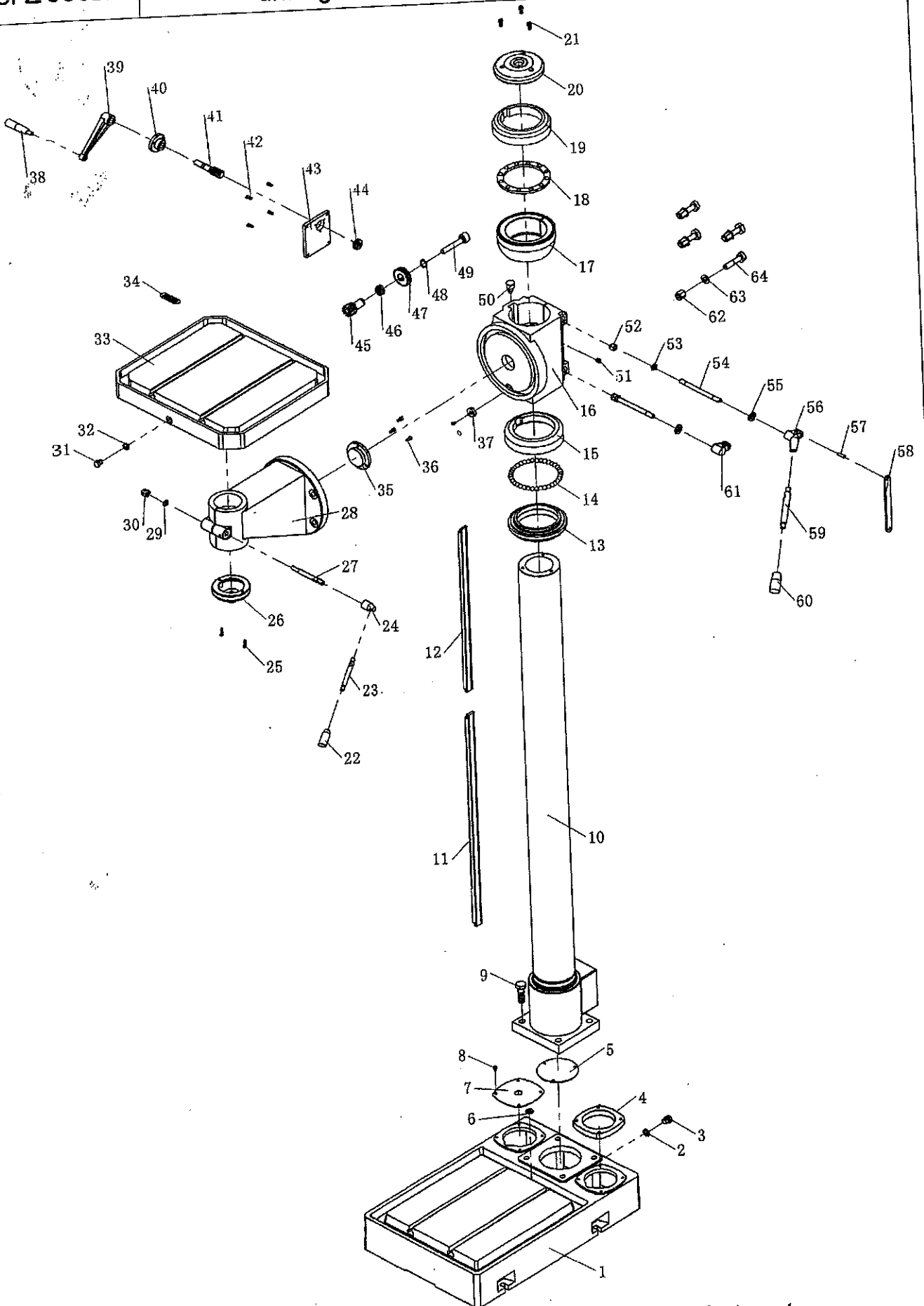


Fig1. Three-view drawing of work table and bracket parts

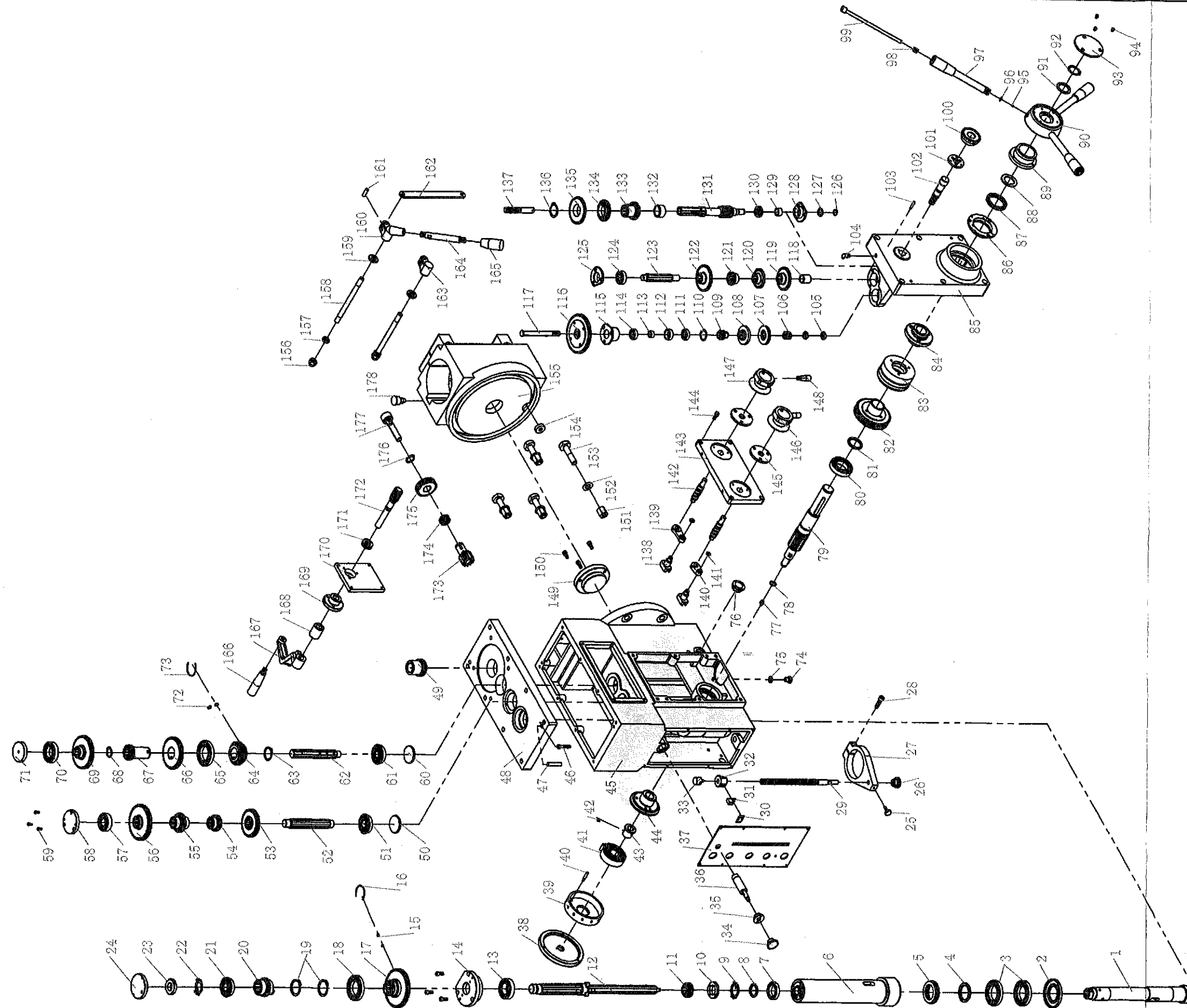


Fig2. Three-view drawing of spindle box and geared system