JET

JUM-1464VHXL DRO

Milling Machine

Original:
GB
Operating Instructions

EAC

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Operating Instructions

Dear Customer,

Many thanks for the confidence you have shown in us with the purchase of your new JET-machine. This manual has been prepared for the owner and operators of a JET JUM-1464 VHXL DRO Milling Machine to promote safety during installation, operation and maintenance procedures. Please read and understand the information contained in these operating instructions and the accompanying documents. To obtain maximum life and efficiency from your machine, and to use the machine safely, read this manual thoroughly and follow instructions carefully.

1. Declaration of conformity

On our own responsibility we hereby declare that this product complies with the regulations* listed on page 2. Designed in consideration with the standards**.

2. Warranty

JPW Tool Group Hong Kong Limited guarantees that the supplied product(s) is/are free from material defects and manufacturing faults.
This warranty does not cover any defects which are caused, either directly or indirectly, by incorrect use,
carelessness, damage due to accidents, repairs or inadequate maintenance or cleaning as well as normal wear and tear.
Further details on warranty (e.g. warranty period) can be found in the General Terms and Conditions (GTC) that
are an integral part of the contract.
These GTC may be viewed on the website of your dealer or sent to you upon request.
JPW Tool Group Hong Kong Limited reserves the right to make changes to the product and accessories at any time.

3. Safety

3.1 Authorized use

This **Milling Machine** centre is designed for milling and drilling machinable metal and plastic materials only. Machining of other materials is not permitted and may be carried out in specific cases only after consulting with the manufacturer.

Never cut magnesium- high danger to fire!

The proper use also includes compliance with the operating and maintenance instructions given in this manual.

The machine must be operated only by persons familiar with its operation and maintenance and who are familiar with its hazards.

The required minimum age must be observed.

The machine must only be used in a technically perfect condition.

When working on the machine, all safety mechanisms and covers must be mounted.

In addition to the safety requirements contained in these operating instructions and your country's applicable regulations, you should observe the generally recognized technical rules concerning the operation of metalworking machines.

Any other use exceeds authorization.

In the event of unauthorized use of the machine, the manufacturer renounces all liability and the responsibility is transferred exclusively to the operator.

3.2 General safety notes

Metalworking machines can be dangerous if not used properly. Therefore the appropriate general technical rules as well as the following notes must be observed.

Read and understand the entire instruction manual before attempting assembly or operation.

Keep this operating instruction close by the machine, protected from dirt and humidity, and pass it over to the new owner if you part with the tool.

No changes to the machine may be made.

Daily inspect the function and existence of the safety appliances before you start the machine.

Do not attempt operation in this case, protect the machine by unplugging the power cord.

Remove all loose clothing and confine long hair.

Before operating the machine, remove tie, rings, watches, other jewellery, and roll up sleeves above the elbows.

Wear safety shoes; never wear leisure shoes or sandals.

Always wear the approved working outfit.

Do **not** wear gloves.

Wear goggles when working

Install the machine so that there is sufficient space for safe operation and work piece handling.

Keep work area well lighted.

The machine is designed to operate in closed rooms and must be bolted to the cabinet stand or a solid work bench.

Make sure that the power cord does not impede work and cause people to trip.

Keep the floor around the machine clean and free of scrap material, oil and grease.

Stay alert!

Give your work undivided attention. Use common sense. Do not operate the machine when you are tired.

Do not operate the machine under the influence of drugs, alcohol or any medication. Be aware that medication can change your behaviour.

Never reach into the machine while it is operating or running down.

Never leave a running machine unattended. Before you leave the workplace switch off the machine.

Keep children and visitors a safe distance from the work area.

Do not operate the electric tool near inflammable liquids or gases.
Observe the fire fighting and fire alert options, for example the fire extinguisher operation and place.

Do not use the machine in a dump environment and do not expose it to rain.

Work only with well sharpened tools.

Always close the chuck guard and pulley cover before you start the machine.

Remove the chuck key and wrenches before machine operation.

Specifications regarding the maximum or minimum size of the work piece must be observed.

Do not remove chips and work piece parts until the machine is at a standstill.

Do not stand on the machine.

Connection and repair work on the electrical installation may be carried out by a qualified electrician only.

Have a damaged or worn power cord replaced immediately.

Never place your fingers in a position where they could contact any rotating tool, chuck or cutting chips.

Secure work piece against rotation. Use fixtures, clamps or a vice to hold the work piece.
Never hold the work piece with your hands alone.

When using a vice, always fasten it to the table.

Never do any works "freehand" (hand-holding the work piece rather than supporting it).

Never move the head while the machine is running.

If a work piece overhangs the table such that it will fall or tip if not held, clamp it to the table or provide auxiliary support.

Check the save clamping of the work piece before starting the machine.

Remove cutting chips with the aid of an appropriate chip hook when the machine is at a standstill only.

Never stop the rotating chuck or tool with your hands.

Measurements and adjustments may be carried out when the machine is at a standstill only.

Setup work may only be carried out after the machine is protected against accidental starting by pressing the emergency stop button.

Maintenance and repair work may only be carried out after the machine is protected against accidental starting by pulling the mains plug.

Do not use wire wheels or grinding wheels on this machine.

To avoid injury from parts thrown by the spring, follow instructions exactly as given when adjusting the spring tension of the quill (see chapter 7.5)

3.3 Remaining hazards

When using the machine according to regulations some remaining hazards may still exist.

The rotating chuck, tool and cutting chips can cause injury.

Thrown and hot work pieces and cutting chips can lead to injury.

Chips, dust and noise can be health hazards. Be sure to wear personal protection gear such as safety goggles, dust mask and ear protection.

The use of incorrect mains supply or a damaged power cord can lead to injuries caused by electricity.

4. Machine Safety for JUM-1464VHXL DRO

The JUM-1464VHXL DRO series milling machines are universal machines that are capable of diverse machining, like drilling, reaming, milling and boring.

Flat, slant, vertical surfaces cutting and slotting can be done with formed cutter or face mill. With the spindle center line rotating at any angle in the first half hemisphere of the rotary head, it has a diverse cutting capacity.

The machines have a wide application for single-piece or small batch production in manufacturing, instruments, construction, maintenance and repair workshops and so like industries.

Featuring optimum structure, easy operation and less maintenance, the machine can also be equipped with DRO system for higher positioning and efficiency in batch production.

Features:
★ Fine elaborate workmanship and neat appearance with perfect paint finish.
★ **High Rigidity**: Robust & rugged machine body made of high grade casting assuring superb stability and long lasting life.
★ **Bigger Travels**: Ram stroke for extended cross feed length and wider cutting scope.
★ **High Versatility**: Universal milling head with 2 x 45° swivel shells that swivels 360° left to right and 0-90° up to down for high versatile vertical, horizontal and universal machining in a semi-sphere scope.
★ Universal milling head firmly fixed on ram for robust cutting performance.
★ Motor coupled directly into the gear transmission for extraordinary heavy cutting.
★ **Gear-driven horizontal spindle** is equipped for extraordinary heavy power cutting.
★ Horizontal milling spindle is supported with heavy loading taper roller bearing at optimized distance featuring robust cutting capacity.
★ Wide speed ranges of the milling spindles for enhanced cutting on different material.
★ **Patented-design with a Servo motor drive** mechanism with gear speed reduction for feeding transmission.
★ **Automatic feeding** on 3 axes, ie. X, Y, Z axes. Boring function can be done.
★ Feed selection among X / Y / Z axes **via one lever only**, easier operation, avoiding interference of axes.
★ Rapid traverse function on 3 axes for easier operation and high machining efficiency.

★ Compulsory lubrication on main transmission gears for efficient cooling.
★ A manual centralized lubricator unit equipped for lubrication on leadscrews and guide ways for smooth travel and longer machine life.
★ Modular design with wide options for diverse needs: 2-axis DRO unit, 3-axis DRO unit, table guards, universal dividing heads, various clamping kits, vices, tool holders, etc.

★ *Working Ranges:*

Swivel of universal milling head	360°

★ *Axis Movement:*

	Manual feed	Auto feed	Rapid traverse	Remarks
X axis	*Yes*	*Yes*	*Yes*	
Y axis	*Yes*	*Yes*	*Yes*	
Z axis	*Yes*	*Yes*	*Yes*	

Working Conditions:
a). Power supply: 380V ±10%, 50Hz ±1Hz, 3Ph
b). Ambient temperature: 0℃- 40℃
c). Relative humidity: 30% - 85% (at 20℃)
d). Atmospheric pressure: 86 – 106kPa
e). Dust density: ⩽10mg/m3
f). Environment: clean from harmful / corrosive / explosive gas, acid, alkali, liquids, etc
g). Foundation: solid, flat, clean, well-lightened, clear from vibration, thermal sources

5. STRUCTURE

The machine consists of main transmission mechanism, base, column, knee, table, ram, universal head as well as coolant system, lubrication system and electrical system.

The column is fixed on the base. The column is fixed on the base. The ram is placed on top of the column. Ram moves forward or backward on the column top. Main transmission mechanism is installed in the column and provides power via gears and shafts to the horizontal spindle. The horizontal spindle is with an ISO 50, 7:24 taper and is compatible for end-mill or horizontal mill arbor. The horizontal mill arbor is to be supported in a bracket at the other end that moves along the dovetail guide ways on ram.

Universal milling head is mounted on the front side of the ram. It has two shells with 45° angle on the coupling surfaces. Two pairs of helix bevel gears are integrated inside with one of 45° angle and the other 135° angle. The front shell swivels along the ring type T-slot on the rear shell. The rear shell swivels along the ring type T-slot on the flange that fixed on the ram. With the compound rotation of the front and rear shells, the universal head can swivel to different angle in a semi-sphere scope. Loose the locking pins, the head can swivel 360° left to right and 0-90° up to down. After rotate to the required angle, insert the pins to lock the universal head.

The knee with saddle and table on the top is mounted along guide ways of the column. Loose the locking bolt, rotate the hand to drive the knee up and down. The feeding mechanism is fitted inside the knee. A servo feeding motor is equipped for variable speed output to the horizontal, cross and vertical direction via gear transmission.

Compulsory lubrication of horizontal milling head is done with independent pump. Lubrication of feeding mechanism is through oil splashing bath lubrication. Lubrication of other locations is to be done with hand pump or oil gun.

Coolant pump is mounted on the machine base and provides coolant to the cutting tool and work-piece through a hose.

Electrics are inside a cabinet that is well sealed and easy for check and maintenance.

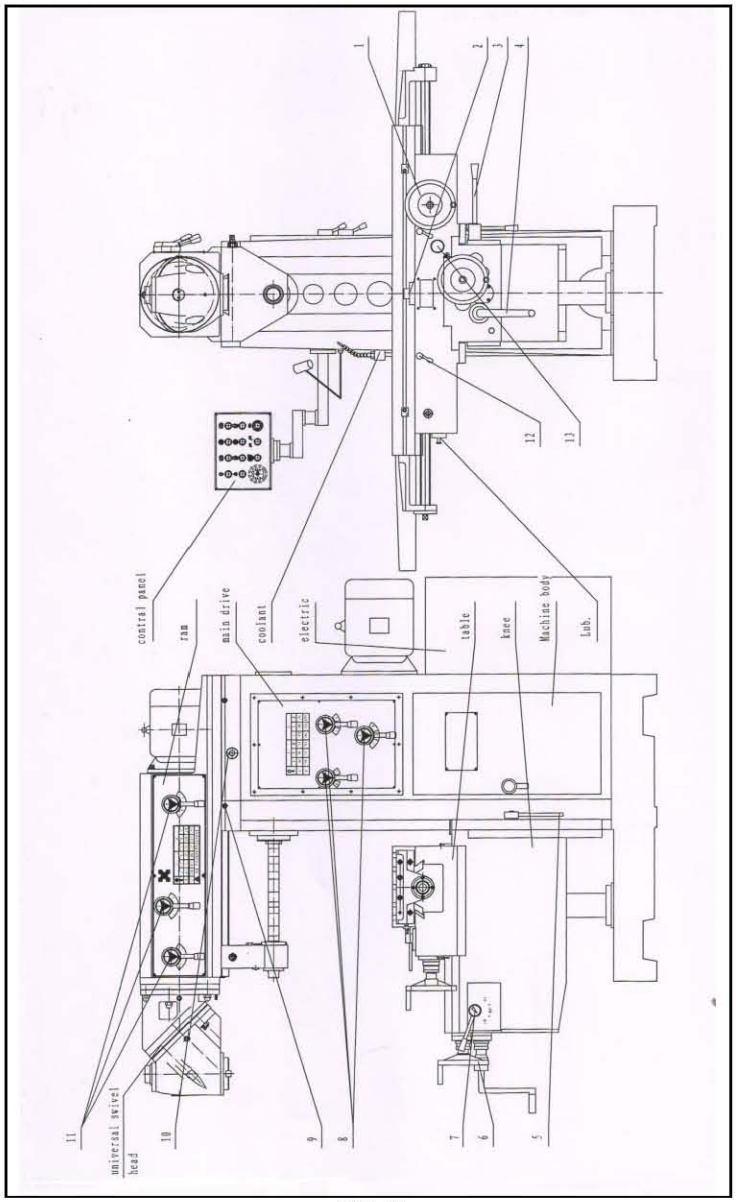


FIG. 2

6. Main Technical Specifications

No.	Items	JUM-1464VHXL DRO
1	Table size	360 x 1600 mm
2	Max. table load capacity	500 kg
3	T-slots (number x width x pitch)	3 x 18 x 80 mm
4	X axis travel (longitudinal)	1300 mm
5	Y axis travel (cross)	320 mm
6	Z axis travel (vertical)	400 mm
7	Distance between horizontal spindle to table top	20 – 470 mm
8	Distance between vertical head end to table top	196 – 646 mm
9	Swivel of universal milling head	360°
10	Feed rate of X axis	(8 kinds) 30-750mm/min
11	Feed rate of Y axis	(8 kinds) 20-500mm/min
12	Feed rate of Z axis	(8 kinds) 15-375mm/min
13	Rapid traverse speed of X / Y / Z axes	1200 / 800 / 600 mm/min
14	Universal milling head spindle taper	ISO 50, 7:24
15	Universal milling head spindle speed	(12 steps) 60 – 1750 rpm
16	Horizontal spindle taper	ISO 50, 7:24
17	Horizontal spindle speed	(12 steps) 60 – 1800 rpm
18	Stroke of ram	550 mm
19	Power of horizontal spindle motor	5.5 kW
20	Power of universal milling head motor	4 kW
21	Torque of feed motor	10 Nm, servo motor
22	Machine dimension (approximate)	2520 x 2100 x 2000 mm
23	Machine weight (approximate)	2850 kg

7. UN-PACKING AND INSTALLATION

1. Transportation and Handling
Place the machine on flat surface and secure it firmly for transportation in a smooth and vibration-proof manner.

Lift the machine as per diagram shown. Use a sling of minimum **3 tons load capacity** to lift the machine.

Cautions:
★ Lift the machine ONLY with qualified slings.
★ Keep the slings away from machine surfaces, levers and handles.
★ Put wooden block (100 x 100 x 200 mm) or soft mattress on the contacting surfaces to avoid damage to the painting.
★ Move the ram backward and table in the middle to keep the machine in balance.
★ Do not lift the machine too high and move it slowly to avoid any accident.

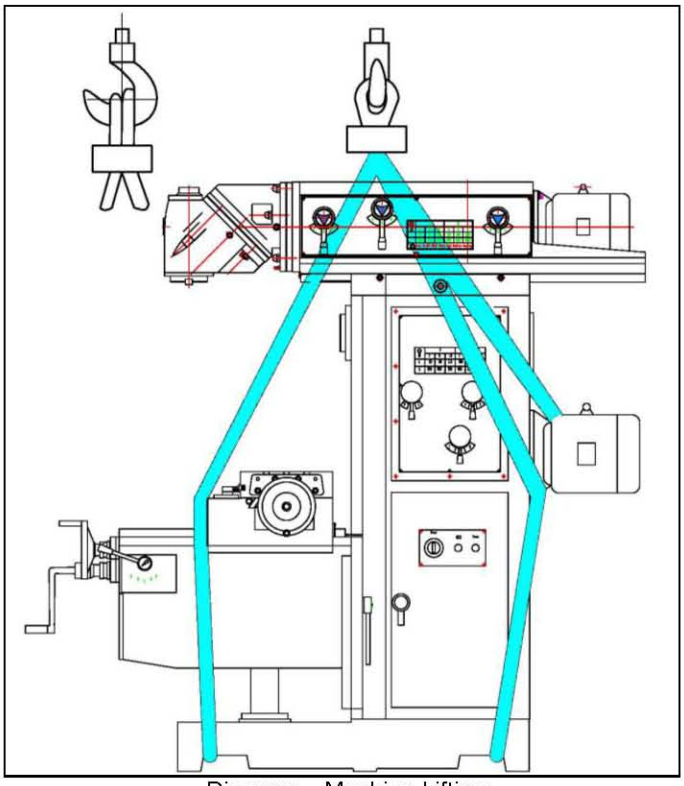


Diagram – Machine Lifting

2. Un-packing
Un-pack the machine properly to avoid damages to the machine and its components. Contact the transportation company, the insurance company and us promptly if any damages occur.
3. Cleaning
Clean the machine thoroughly and remove the anti-rust oil and grease with proper solvent. Do NOT run the table, saddle and knee without proper clean and lubrication. Contacting surfaces under the table, saddle and knee should also be cleaned and lubricated properly. Loose locking bolts on the machine, move it forward or backward to clean and lubricate the contacting surfaces. *Note: Do NOT use petrol or other flammable solvent for cleaning.*
4. Installation
Keep the floor flat with fine concrete. Steel plates can be used to keep rough floor flat if the machine is to be placed on the floor. (However, it is recommended to grout the machine to avoid movement or inclination of the machine due to un-even load.) Make sure machine base contacts the floor firmly before tightening the foundation bolts to avoid inclination or deformation of the machine. Level the machine in both horizontal and cross directions. The tolerance is 0.04/1000mm. After leveling, grout the anchor bolts into pits with fine concrete. When the concrete becomes solid, tighten the anchor bolts and level the machine again for check. Some handles are to be removed for easier transportation. Fit them back when the machine is installed.

Cautions:
★ Prepare the foundation with a depth of minimum 500 mm.
★ Concrete should be grade No.150 or above.
★ Grout the anchor bolts and tighten them ONLY after the concrete becomes solid.

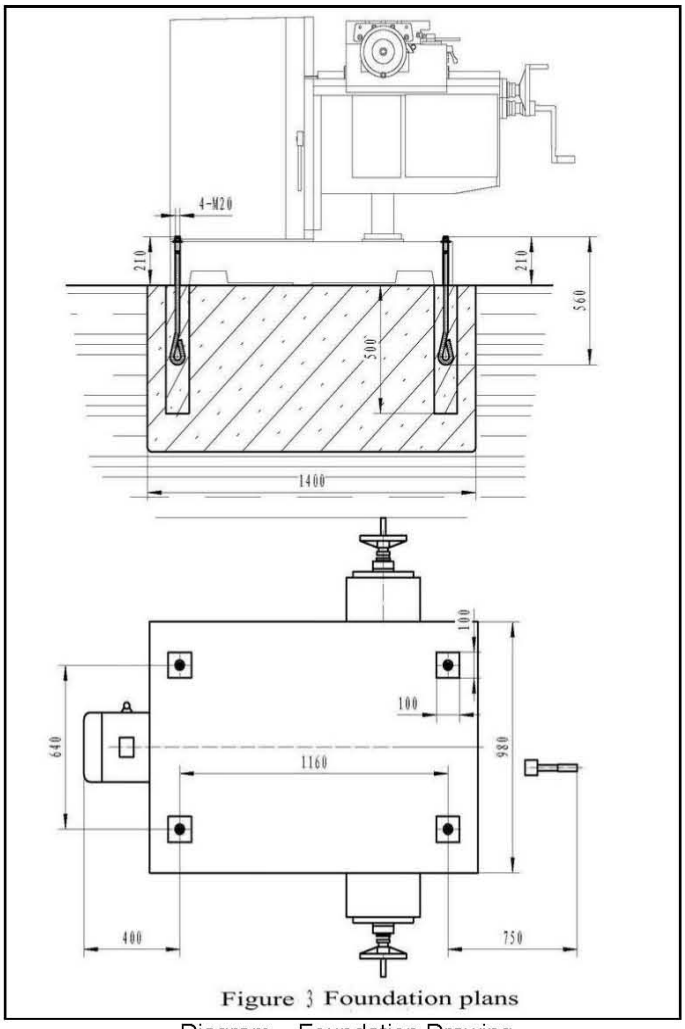


Figure 3 Foundation plans

Diagram – Foundation Drawing

5. Alignment of Machine
Align the machine with a precision leveling gauge longitudinally and cross on the table. The allowance is 0.04 / 1000mm. After the alignment, move down the saddle and knee.
6. Wiring of Power
Wire the power by a qualified electrician as per procedures below:
(1) Make sure the power input is proper for the machine.
(2) Wire the power cable as per local safety rules and regulations.
(3) Make sure the spindle rotates in the correct direction. Viewing from the top, the spindle should rotate clock wisely at high speed.

8. TRANSMISSION SYSTEM

1. Transmission System of Horizontal Spindle
The transmission system is installed inside the column. It is driven by a 5.5 kW motor via gears and shafts. Horizontal spindle speed can be changed with the three handles on the column for 12 different speeds of 60-1800rpm.
2. Feed Mechanism
The transmission system is installed in the knee. It is driven by an AC servo motor via gears that provides variable speeds. It features compact structure and big torque output. This system has two operation modes, ie. manual or automatic. In automatic mode, select among X / Y / Z axes via a handle on the right side of the knee and then select the feed rate on the operation panel. In manual mode, shift the X / Y / Z axes selection handle to neutral and operate the machine via hand-wheels.
3. Table
Table is placed on top of the saddle and the knee. Alignment of the table can be adjusted by the gib strips in between the table and the saddle. Manual or automatic feed can be carried in horizontal, cross or vertical directions of the table.
4. Knee
The knee is fitted on the column. Alignment can be adjusted by the gib strip between the knee and the column. Movement of the knee can be either in manual or in automatic mode. Automatic movement of the knee is driven by the servo motor inside the knee.
5. Ram
The ram is mounted on top of the column. Alignment can be adjusted by the gib strip between the ram and the column. Movement of the ram is through pinion and rack. Horizontal milling arbor can be fitted with a support bracket mounted in the front of the ram. The support bracket is equipped with a copper sleeve as a bearing of the horizontal milling arbor. Oil reservoir is provided inside the support bracket to supply lubrication oil to the copper bearing.
6. Universal Milling Head
Universal milling head is fitted in front of the ram. Spindle inside the head is driven by two bevel gears and a spline shaft that is coupled with a spline sleeve inside the ram. It can rotated via pinion, rack, worm gear and worm shaft for specific angle as per needs.

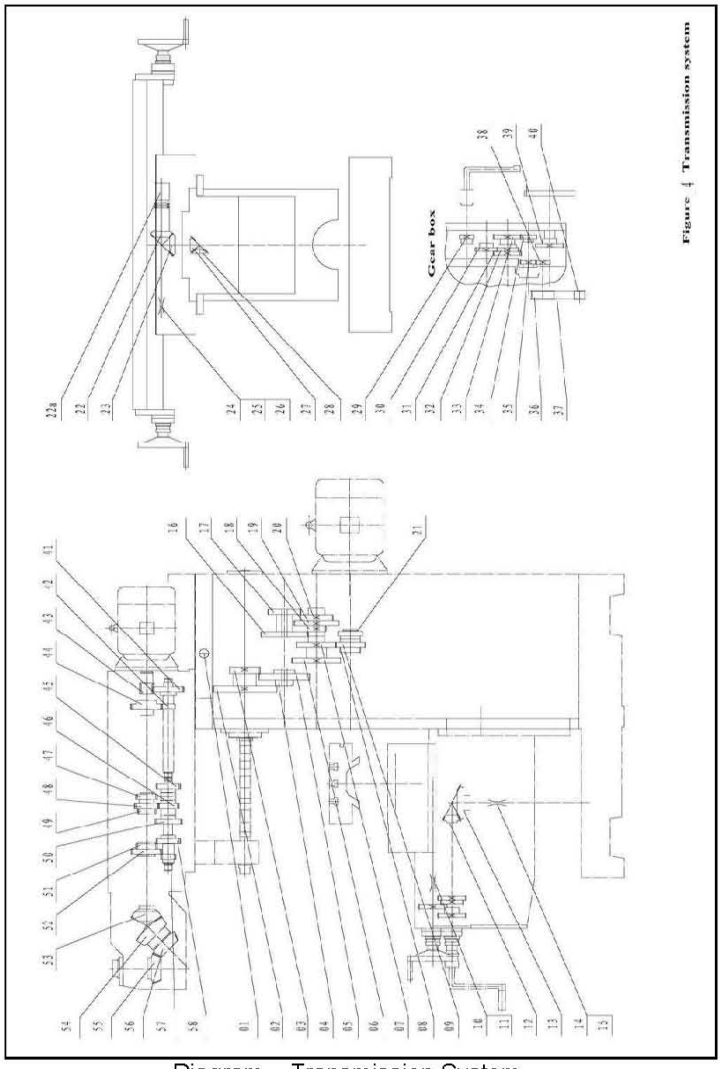


Figure 4 Transmission system

Diagram – Transmission System

Part List in the Transmission System:

No.	Part No.	Item
1	05206	Pinion shaft
2	06204	Gear
3	06205	Gear
4	06202	Sliding gear
5	06201	Sliding gear
6	06217	Gear
7	06218	Gear
8	06224	Sliding gear
9	06223	Sliding gear
10	02231	Cross leadscrew
11	52K713	Cross leadscrew nut
12	02210	Bevel gear
13	02207	Bevel gear
14	02226	Vertical leadscrew
15	02304	Vertical leadscrew nut
16	06207	Sliding gear
17	06208	Sliding gear
18	06221	Gear
19	06219	Gear
20	06220	Gear
21	06222	Sliding gear
22	03204	Bevel gear
22a	03233A	Clutch
23	03201	Bevel gear
24	03205	Hori. leadscrew
25	03301	Hori. leadscrew nut
26	03302	Hori. leadscrew nut
27	03222	Bevel gear
28	03223	Bevel gear
29	02224	Gear
30	02246	Gear
31	02213	Gear
32	02214	Gear
33	02218	Gear
34	Sliding gear	02216
35	Gear	02215
36	Pulley	02235
37	Timing belt	
38	Pulley	02239
39	Gear	02232
40	Gear	02238
41	Gear	03213
42	Gear	03206
43	Gear	03208
44	Gear	03207
45	Gear	03209
46	Gear	03205
47	Bevel gear	X52K62-740
48	Gear	X5005215
49	Pinion shaft	X5005203
50	Pinion shaft	X5005216
51	Gear	X5005214
52	Gear	X5005212
53	Gear	X5005210
54	Gear	X5005211
55	Gear	X5005209
56	Gear	X5005208
57	Gear	X5005207
58	Gear	X5005202
59	Gear	X5005201
60	Spiral gear	X643606204
61	Spiral gear	X643606205
62	Spiral gear	X643606209
63	Spiral gear	X643606208
64	Pinion gear	X5005206
65	Gear	X5005205

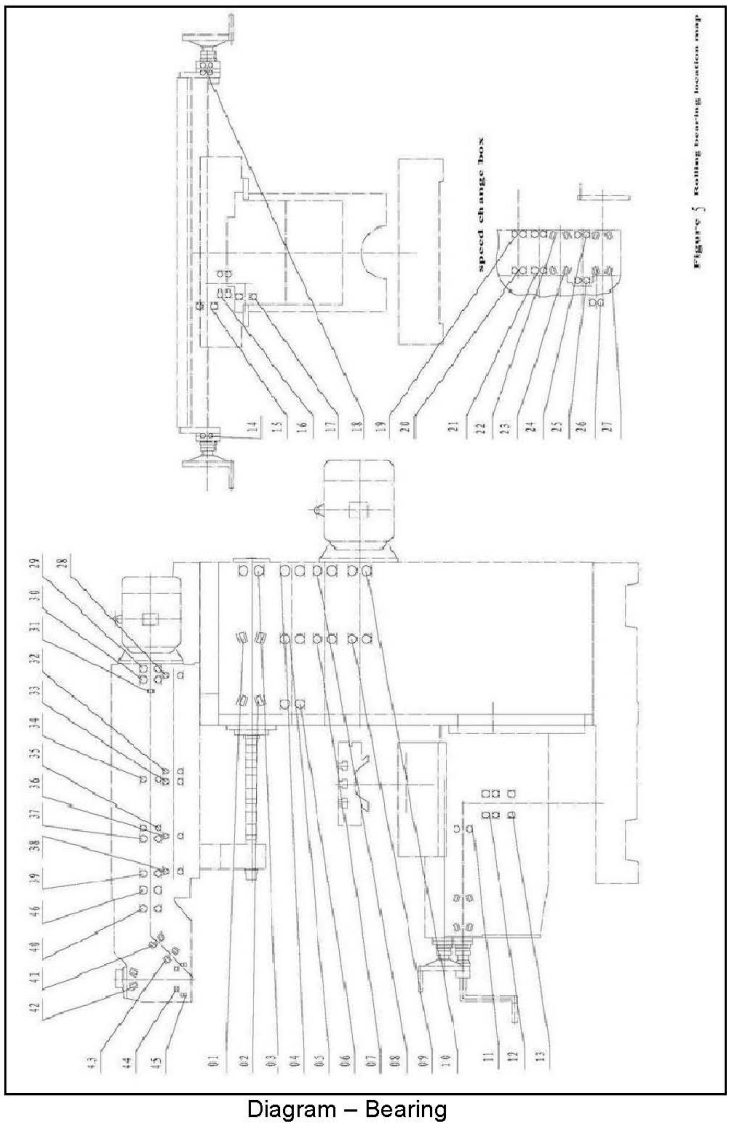


Diagram – Bearing

List of Bearings:

No.	Item	Model	Size	Qty.
1	Taper roller bearing	30311, P5	55 × 120 × 31.5	1
2	Taper roller bearing	32217, P5	85 × 150 × 38.5	1
3	Deep groove ball bearing	6309	45 × 100 × 25	1
4	Deep groove ball bearing	6308	40 × 90 × 23	1
5	Deep groove ball bearing	6209	45 × 85 × 19	1
6	Deep groove ball bearing	6307	35 × 80 × 21	1
7	Deep groove ball bearing	6308	40 × 90 × 23	1
8	Deep groove ball bearing	6308	40 × 90 × 23	1
9	Deep groove ball bearing	6306	30 × 72 × 19	1
10	Deep groove ball bearing	6211-2RS	55 × 100 × 21	1
11	Deep groove ball bearing	6005	25 × 47 × 12	1
12	Thrust ball bearing	51207	40 × 68 × 19	2
13	Deep groove ball bearing	6207	35 × 72 × 17	1
14	Deep groove ball bearing	6006	30 × 55 × 13	1
15	Thrust ball bearing	51112	60 × 85 × 17	1
16	Deep groove ball bearing	6006	30 × 55 × 13	2
17	Thrust ball bearing	51112	60 × 85 × 17	1
18	Angular contact ball bearing	7006AC	30 x 55 x 13	2
19	Deep groove ball bearing	6205	25 x 52 x 15	1
20	Deep groove ball bearing	6204	20 x 47 x 14	1
21	Deep groove ball bearing	6206	30 x 62 x 16	2
22	Taper roller bearing	30206	30 x 62 x 17.25	1
23	Taper roller bearing	30206	30 x 62 x 17.25	1
24	Deep groove ball bearing	6005	25 x 47 x 12	1
25	Deep groove ball bearing	6005	25 x 47 x 12	1
26	Deep groove ball bearing	6205	25 x 52 x 15	1
27	Taper roller bearing	30206	30 x 62 x 17.25	2
28	Deep groove ball bearing	6004	20 x 42 x 12	1
29	Deep groove ball bearing	6004	20 x 42 x 12	1
30	Thrust ball bearing	51104	20 × 35 × 10	1
31	Deep groove ball bearing	6005	25 × 47 × 12	1
32	Thrust ball bearing	51105	25 × 42 × 11	1
33	Deep groove ball bearing	6005	25 × 47 × 12	1
34	Deep groove ball bearing	6206/2RS	30 × 62 × 16	1
35	Deep groove ball bearing	6010	80 × 50 × 16	1
36	Deep groove ball bearing	6010	80 × 50 × 16	1
37	Needle bearing	NA4903	17 × 30 × 13	1
38	Deep groove ball bearing	6206/2RS	30 × 62 × 16	1
39	Deep groove ball bearing	6206/2RS	30 × 62 × 16	1
40	Deep groove ball bearing	6208/2RS	40 × 68 × 15	1
41	Deep groove ball bearing	6206/2RS	30 × 62 × 16	1
42	Deep groove ball bearing	6207/2RS	35 × 62 × 14	1
43	Deep groove ball bearing	6010	80 x 50 x 16	1
44	Deep groove ball bearing	6206/2RS	30 × 62 × 16	1
45	Deep groove ball bearing	6010	80 x 50 x 16	1
46	Angular contact ball bearing	7009/AC	45 × 75 × 16	1
47	Angular contact ball bearing	7009/AC	45 x 75 x 16	1
48	Taper roller bearing	32007	35 × 62 × 18	1
49	Taper roller bearing	30201, P5	50 x 90 x 21.75	1
50	Taper roller bearing	30207	35 × 72 × 18.25	1
51	Thrust ball bearing	51116, P5	80 x 105 x 19	1
52	Double-row cylindrical roller bearing	NN3018K, P5	90 x 140 x 37	1

9. LUBRICATION SYSTEM

Timely proper lubrication will maintain a long machine life.

1. Lubricate the machine as per instruction with clean and clear N46 machine oil.

2. Horizontal milling spindle is compulsorily lubricated with an individual pump. When the horizontal spindle motor is turned on, the pump will start pumping lubrication oil to the horizontal milling spindle, gears and shafts.

3. Feed mechanism adopts splashing bath lubrication. Fill lubrication oil inside the knee oil reservoir.

4. Surfaces, column, saddle, table and lead screws should be properly lubricated with hand piston pump or oil gun. Lubricate minimum four times per shift. A centralized automatic oil lubricator is available as an option. When an automatic oil lubricator is equipped, oil volume of each shot

is rated and lub. interval time can be set. When an alarm for low oil level is given, add oil to the lubricator tank promptly.

5. Supporting sleeve bearing for the horizontal milling arbor should also be lubricated properly in a timely manner.

6. Lubrication of gears inside the universal milling head is with lithium grease. Add new grease inside the head every 3 months.

7. Lubrication oil should be sufficient for gears in the ram and horizontal spindle. Oil level can be observed on the level scale.

8. All the oil reservoirs should be cleaned in a timely manner. Clean them and change with new oil once in the first three months and then clean them once every six months.

10.COOLANT SYSTEM

General emulsified coolant mixture can be used for cooling of the cutting tools. Different coolant can be used for different material. The coolant pump is installed and is compatible with different coolant for different cutting tools. Coolant is stored in the machine base reservoir and pumped to the nozzle via hose. The nozzle can be adjusted to different angle as per needs. Coolant flows back to the reservoir through T slots on the table, hose and filter net.

A switch is installed on the left electric cabinet door. Turn it on and the pump will work. To change the coolant, pull the plug from the right and drain the coolant. Inject new coolant through the filter net.

11.ELECTRIC SYSTEM

1. The machine is suitable for 400V（or 380V）, 3Ph, 50Hz power supply. Power supply for feed is AC 220V, 1Ph, 50Hz. Make sure motor rotates as per the direction sign on it. Electric components are clearly marked. Refer to the *Electric Schematic Diagram* and *List of Electric Components* for repair.

2. The machine should be properly earthed for safety.

3. Before start of the machine, make sure the electric cabinet door is securely closed. Release the Emergency Stop button and turn on the main power switch. Shift the direction switch for horizontal or vertical spindle to CW or CCW direction, press the START button (green), the horizontal or vertical spindle will run accordingly. Press the STOP button (red), the motor will stop.

4. Keep clean of the electrics. Clean them periodically.

5. Pressing the red Emergency Stop button in emergency will cut off the machine. Release the button to re-start the machine.

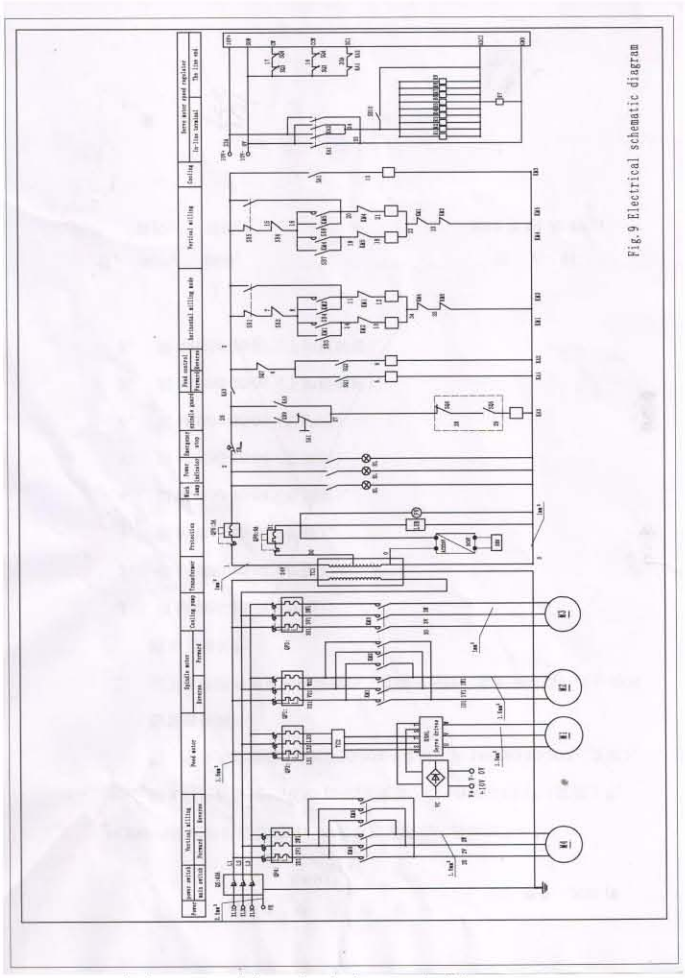


Diagram - Electric Schematic Diagram

12.OPERATION

1). Read the *Operation Manual* carefully before starting the machine. The operator should be familiar with the machine structure, functions of handles, knobs, coolant system, lubrication system, electric systems, switches, etc.

2). Before starting the machine, make sure the locking mechanism locks firmly and wire connection and earthing are proper.

3). After powering on the machine, check functioning of the switches and buttons. Make sure they work properly. The power switch (#17) powers on or cuts off the machine. When it powers on, the lamp (#19) will illuminate as a signal. The button (#18) is for spindle JOG. Press the button, the spindle will rotate. Release the button, the spindle will stop. The button is useful for gear change. Rotary switch (#8) is for feed rate regulation. Rotating the switch will generate different feed rates. Switch (#2) is for clock-wise and counter-clock-wise rotation of universal milling head spindle, and switch (#3) is for clock-wise and counter-clock-wise rotation of horizontal spindle. Lever (#10) is for positive or negative feeding of table. Button (#6) is for coolant on or off. Button (#7) is for table JOG. Button (#5) is the emergency stop button. The machine will fully stop when the button is pressed. The button is useful in emergency.

4). To change the horizontal spindle speed, it has to stop the spindle firstly. Different spindle speed can be get by shifting

the 3 levers (#28) between A, B, I, II, III, M and L on the plate.

5). To change the universal milling head spindle speed, it has to stop the spindle firstly. Different spindle speed can be get by shifting the 3 levers (#20) between A, B, C, I, II, III, M and L on the plate.

6). To move the table up and down, loose the locking lever (#13) firstly. In manual mode, rotate the handwheel (#12). In automatic mode, take off the handwheel (#12), shift lever (#15) to "Z", and then press JOG button (#7) to move the table to specific position. For precision fine positioning, use the handwheel (#12). After movement, use the lever (#13) to lock it firmly before cutting.

Cautions: Take off the handwheel (#12) to avoid injury due to sudden rotation in automatic mode. Power will ONLY provide to the lifting motor when switch (#13) is on after taking off the handwheel (#12).

Warning: When DRO units are installed, care should be taken to avoid damage of the DRO rulers when the table moves to the spindle end, or the limit blocks fitted on the column.

7). To move the table in cross direction, loose lever (#11) firstly. In manual mode, shift lever (#15) to neutral "0" position and rotate handwheel (#14) for movement. In automatic mode, shift lever (#15) to cross "Y" position and rotate the switch (#8) to get specific feed rate.

8). To move the table in horizontal direction, loose lever (#16) firstly. In manual mode, shift lever (#27) to "Manual" position and rotate handwheel (#9) for movement. In automatic mode, shift lever (#15) to horizontal "X" position, shift lever (#27) to "AUTO" position and rotate the switch (#8) to get specific feed rate.

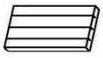
Cautions: Loose the locking levers before any movement. After movement, lock the levers again to boost rigidity of the machine.

9). To move the ram backward and forward, loose the two screws (#21) firstly and then rotate the pinion shaft (#22) for specific position and then tighten the two screws (#21).

Cautions: When using the feed override switch for movement of the table in X / Y / Z axes, start it from low speed gradually to higher speed. Do NOT turn it to a sharp high speed to avoid damages or injuries.

10). To use the universal milling head for horizontal milling, remove the locking pin and loose the locking nut half or one circle (Caution: Do NOT loosen it fully to avoid falling down of the universal head), then rotate the head 180° and fit the locking pin and tighten the locking nuts. Guiding rod is fitted for easier mounting and align it with the signs and then tighten the bolts. Fit the auxiliary supporting bracket and the guiding sleeve on the machine. Align the guiding rod and then tighten bolts on the auxiliary supporting bracket.

Cautions:
a). When using the universal head for horizontal milling, move the table to the column and move the ram backwards for more rigidity.
b). Mount the milling tool in the inner side of the arbor.
c). Shorten the distance of the auxiliary supporting bracket to increase the rigidity.

operation symbol meaning detail			
No.	symbol	symbol meaning	
1		vertical spindle forward	
2		vertical spindle reverse	
3		fast moving	
4		worktable	
5		coolant pump	
6		emergency	
7		stop	
8		electric, danger!	
9		ground	
10		vertical feeding	
11		cross feeding	
12		longitudinal feeding	
13		horizontal spindle forward	
14		horizontal spindle reverse	
15		do not change speed when machine running	

Operation Signs

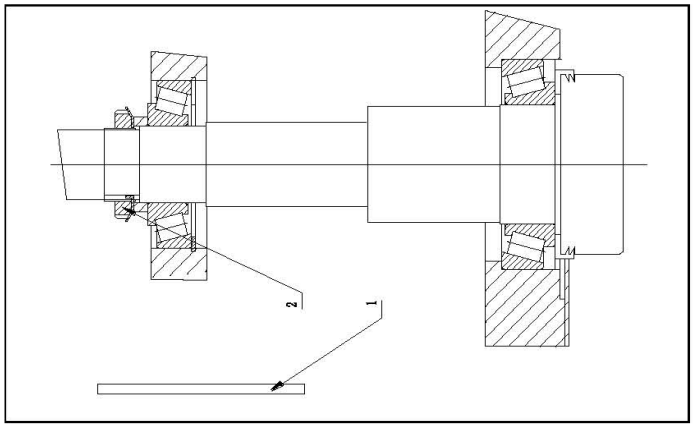
13. MAINTENANCE

1. Instructions:
1). The operator should NOT start the machine before he fully understands the machine structures and instructions in this Operation Manual.
2). Do NOT put tools and other articles on the spindle. Workpiece should be firmly clamped before start of the machine.
3). Add auxiliary guards if the machine is to run at high speed.
4). Do NOT carry out repair or maintenance of the electrics before turning off the power.
5). Loose the locking bolts before movement.
6). If the machine is to be stored in a long time, anti-rust oil / grease should be pasted on all the machined surfaces. If it is stored more than one year and a half, the anti-rust oil / grease should be removed and pasted with new ones.

2. Adjustment:

To keep the machine running with high accuracy in a long term, periodical maintenance and proper adjustment are required.

1). Adjustment of Horizontal Spindle Bearing
The spindle bearing space has been adjusted to a proper position. If the bearing space get larger because of worn, it should be done by professional person. Firstly, take off the right side cover (#1), rotate the round nut (#2) for proper clearance. After the adjustment, fit the cover back on the machine.

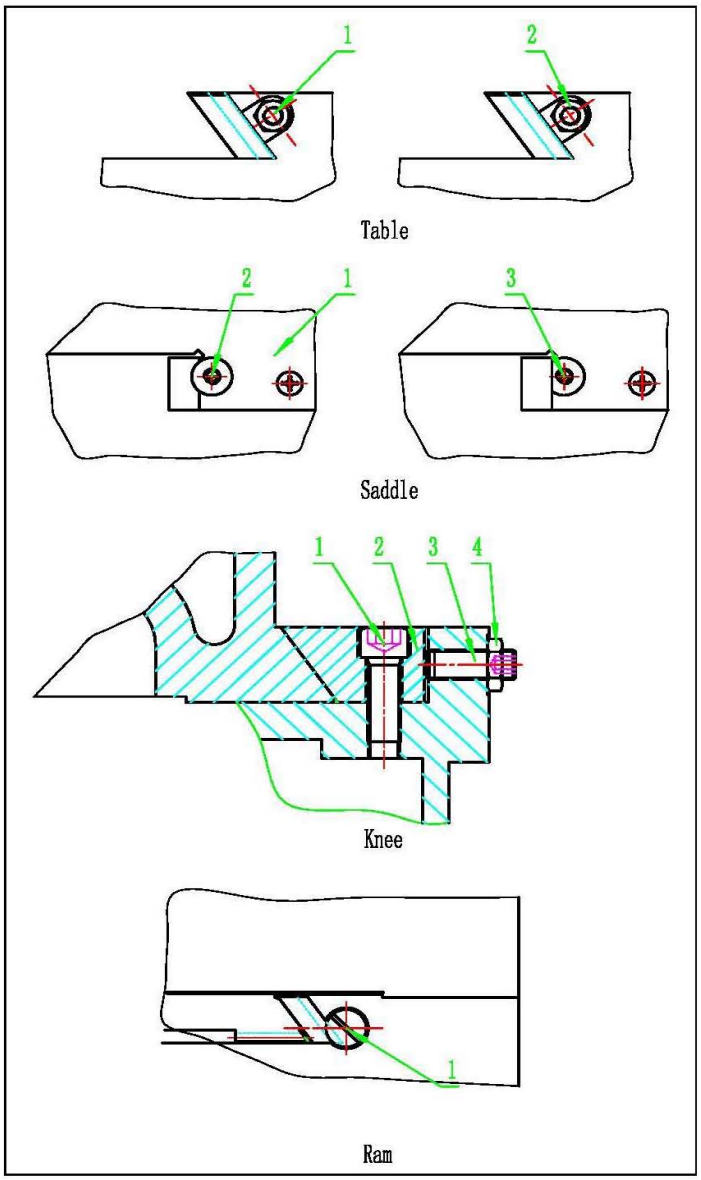


2). Adjustment of Gib Strip between X / Y / Z and Ram Guide Ways:
Big clearance will have a negative effect on machining accuracy. The gib strips should be adjusted properly and timely for maintaining the accuracy.
Longitudinal gib strip:
Firstly, loose the bolt (#1) at the small end of the gib strip, adjust big end bolt (#2) to suitable position, and then lock the bolt (#1).

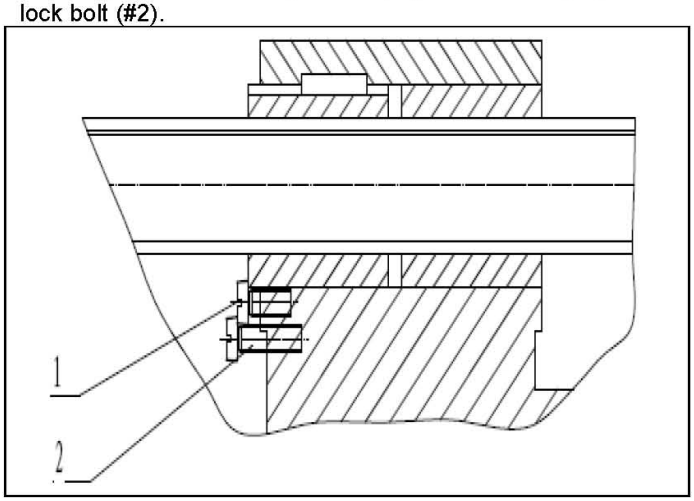
Cross gib strip:
Firstly, remove the guideway wipers (#1), loose the bolt (#2) at the small end of the gib strip, adjust big end bolt (#3) to suitable position, and then lock the bolt (#2). Fit the wipers back after the adjustment.

Vertical gib strip:
Firstly, remove the guideway wipers (#1), loose the bolt (#2) at the small end of the gib strip, adjust big end bolt (#3) to suitable position, and then lock the bolt (#2). Fit the wipers back after the adjustment.

Ram gib strip:
Adjust bolt (#1) to reduce the clearance.



3). Adjustment of Leadscrew and Nut Clearance
Big clearance between the leadscrew and nut has a negative effect on machining accuracy and surface roughness. An adjusting bolt is fitted on the longitudinal leadscrew. To adjust, loose bolt (#1) firstly, and then adjust bolt (#2) to suitable position. After adjustment, tighten the bolt (#1) to lock bolt (#2).



4). Alignment of Universal Milling Head

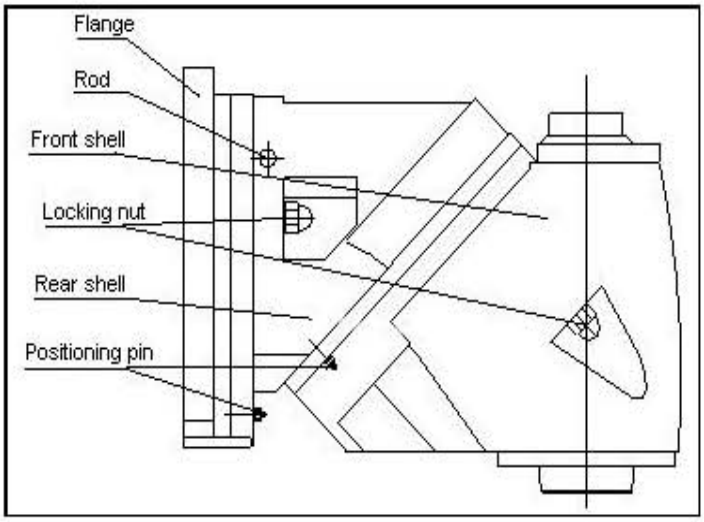
a). Horizontal and Vertical Positions of the Universal Milling Head Spindle

① When the front and rear shells are at 0° position, the spindle is in horizontal position.

② When the front shell rotate 180° , the spindle is in vertical position.

③ When the spindle is in horizontal position, rotating the rear shell 180° will move the spindle to a upper position for enlarged machining scope.

Cautions: To maintain a proper parallelism and perpendicularity of the spindle against the table, taper pins are provided for precision positioning of the front and rear shells. The taper pin is specific for particular holes. Do NOT mismatch or knock the taper pin into the holes by force.



b). Left and Right Set-off of the Universal Milling Head Spindle

Rotating the rear shell 90° clock-wise or counter-clock-wise will set off the spindle to the left or right side to increase the cut scope horizontally.

Cautions: Do NOT loose all the tightening bolts while rotating the universal milling head to avoid sudden falling down of the head due to gravity that may damage the table or the work-pieces.

c). Rotating Adjustment of the Universal Milling Head Spindle in Horizontal Plane

When the arbor supporting bracket is mounted, the spindle can be adjusted in horizontal plane to increase the rigidity (especially for left / right spiral milling). Rotating the front and rear shells in different directions will get the spindle in specific angles.

A chart is listed below for easy check.

The formula is:

$$\cos\beta = 2\cos\theta - 1$$

$$\mathrm{tg}\alpha = \sqrt{2}/2\ \mathrm{tg}(\beta/2)$$

θ – angle between spindle center line and table cross movement

β – angle of front shell

α – angle of rear shell

For example,

① For 45° left spiral milling

Rear shell: 24° 28'11" (counter-clock-wise)

Front shell: 65° 31'49" (clock-wise)

② For 30° left spiral milling

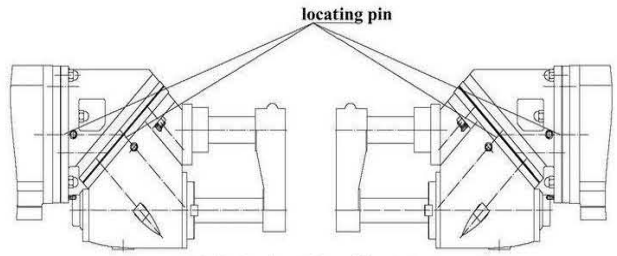
Rear shell: 15° 32'32" (clock-wise)

Front shell: 42° 56'29" (counter-clock-wise)

Angle Chart

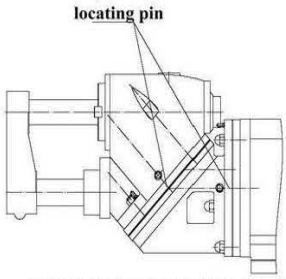
Spindle Angle θ	Front Shell Angle β	Rear Shell Angle α
1°	1° 24'51"	0° 30'00"
2°	2° 49'43"	1° 00'00"
3°	4° 14'35"	1° 30'02"
4°	5° 39'29"	2° 00'05"
5°	7° 04'24"	2° 30'09"
6°	8° 29'21"	3° 00'15"
7°	9° 54'20"	3° 30'24"
8°	11° 19'22"	4° 00'35"
9°	12° 44'28"	4° 30'50"
10°	14° 09'37"	5° 01'09"
11°	15° 35'50"	5° 31'32"
12°	17° 00'08"	6° 01'59"
13°	18° 25'28"	6° 32'32"
14°	19° 50'56"	7° 03'10"
15°	21° 16'29"	7° 33'54"
16°	22° 42'08"	8° 04'45"
17°	24° 07'54"	8° 35'42"
18°	25° 33'46"	9° 06'47"
19°	26° 59'46"	9° 38'00"
20°	28° 25'54"	10° 09'21"
21°	29° 52'11"	10° 40'51"
22°	31° 18'36"	11° 12'31"
23°	32° 45'12"	11° 44'20"
24°	34° 11'56"	12° 18'20"
25°	35° 38'52"	12° 48'31"
26°	37° 05'58"	13° 20'53"
27°	38° 33'17"	13° 53'28"
28°	40° 00'48"	14° 26'15"
29°	41° 28'32"	14° 59'17"
30°	42° 56'29"	15° 32'32"
31°	44° 24'41"	16° 06'02"
32°	45° 53'07"	16° 39'48"
33°	47° 21'50"	17° 13'49"
34°	48° 50'48"	17° 48'08"
35°	50° 20'04"	18° 22'44"
36°	51° 49'38"	18° 57'38"
37°	53° 19'31"	19° 32'52"
38°	54° 49'44"	20° 08'27"
39°	56° 20'17"	20° 44'22"
40°	57° 51'12"	21° 20'39"
41°	59° 22'30"	21° 57'20"
42°	60° 54'10"	22° 34'23"
43°	62° 54'10"	23° 11'52"
44°	63° 58'50"	23° 49'48"
45°	65° 31'49"	24° 28'11"

46°	67° 05’17”	25° 07’03”
47°	68° 39’15”	25° 46’24”
48°	70° 13’44”	26° 26’17”
49°	71° 48’47”	27° 06’42”
50°	73° 24’24”	27° 47’42”
51°	75° 00’38”	28° 28’17”
52°	76° 37’30”	29° 11’30”
53°	78° 15’02”	29° 54’22”
54°	79° 53’17”	30° 37’56”
55°	81° 32’17”	31° 22’13”
56°	83° 12’04”	32° 07’16”
57°	84° 52’40”	32° 53’06”
58°	86° 34’10”	33° 39’47”
59°	88° 16’35”	34° 27’22”
60°	90°	35° 15’51.8”
61°	91° 44’28”	36° 05’21”
62°	93° 30’02”	36° 55’54”
63°	95° 17’47”	37° 47’33”
64°	97° 04’48”	38° 40’21”
65°	98° 54’11”	39° 34’25”
66°	100° 45’01”	40° 29’49”
67°	102° 07’23”	41° 26’38”
68°	104° 31’26”	42° 24’57”
69°	106° 27’18”	43° 24’55”
70°	108° 25’08”	44° 26’37”
71°	110° 25’04”	45° 30’13”
72°	112° 27’20”	46° 35’50”
73°	114° 32’08”	47° 43’41”
74°	116° 39’43”	48° 53’57”
75°	118° 30’23”	50° 05’52”
76°	121° 04’29”	51° 22’41”



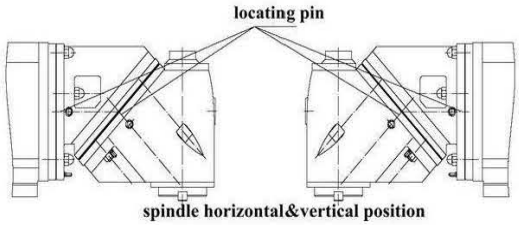
spindle horizontal position（the lowest）

front case 0 back case 0



spindle horizontal position（the highest）

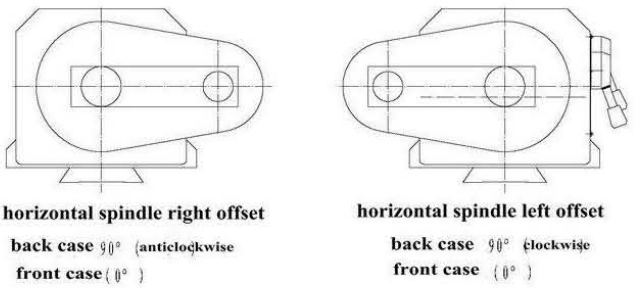
back case 180 front case 0



spindle horizontal&vertical position

back case 0 front case 180

Figure10、 universal swiveling head horizontal&vertical position



11、

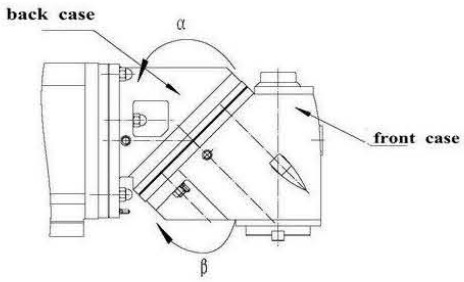


Figure12、 front case&back case clockwise& anticlockwise angle

Diagram – Universal Milling Head

5). Trial run
a). Before the trial run, loose the locking bolts on all three directions.
b). Remove antirust oil all parts of the machine. Do NOT use harsh tools which may scratch the surfaces. After cleaning the surface, paste it with a thin layer of lubricant oil.
c). Add oil into the tank as per instructions. Lubricate every point and check.
d). Check every manual operating hand wheel whether they are smooth and reliable.
e). After connecting to the power, check the spindle rotate direction, work table feed and knee lifting direction and find out whether the directions are the same with signs marked.
f). To run the machine, use JOG firstly to check for proper functioning of limit switches of the longitudinal, cross and vertical axes. Check every speeds by shifting gears and trial run the machine for at least 30 minutes at lowest speed and then increase the speed gradually to for test. Make sure that the gear shifting functions properly and reliably.

3. Maintenance
1). Instructions:
Clean lubrication oil should be provided through the lubrication points.

Lack of lubrication oil may cause vibration or extra heat. Prompt feed of clean lubrication oil is needed. Stop the machine and remove the plug to feed oil.

Lubrication oil should be drained out and changed with new one periodically. Gears should be cleaned at the meantime.

Do NOT change speeds or rotation direction of the spindle unless the machine is stopped.

Check wiring of the electric system and bearing of the motor every 6 months. Grease of the bearing should be replaced at the meantime. Power the machine off before checking the wiring. Clean the dust or dirt from the wires with dry cloth and hand fan. Do NOT clean them with petrol or diesel in case of damage to the sealing and further accident.

Charts for periodical check should be formulated and followed.

Daily Check Chart:

No.	Location	Items	Remarks
1	Lubrication oil	● Check for sufficient oil ● Check for clean oil	Feed or change
2	Coolant	● Check for sufficient coolant ● Check for clean coolant	Feed or change
3	Guide ways	● Check for proper lubrication ● No damage on wipers	
4	Pipes	● No oil leakage ● No coolant leakage	
5	Motor, gears and other rotary parts	● No abnormal noise or vibration ● No abnormal heat	
6	Movable parts	● No abnormal noise or vibration ● Check for smooth running	
7	Operation panel	● Check for proper functioning ● No alarm	
8	Safety device	● Check for proper functioning	
9	Coolant unit	● Check for proper functioning	
10	Cables, wires	● No breakage ● No damage on sheath	
11	Table and base	● Cleanness	Remove chips

Periodical Check Chart:

No.	Location	Items	Remarks
1	Lubrication system	Oil	Change periodically
2	Oil reservoir in machine base	Oil	Change periodically
3	Lubrication oil in ram	Oil	Change in first 3 months and every 6 months afterwards
4	Centralized oil lubricator (opt.)	Oil	Feed oil when an alarm is given
5	Coolant system	Coolant and filter	Clean filter

2). Trouble shooting: Refer to the following procedures for general troubles:

Observation	Possible Reasons	Solution
Abnormal of spindle brake	Worn-out of braking disc	Replace the disc
Abnormal rotation of the spindle	1. Switch is broken 2. Loose V-belt 3. Motor is broken	1. Check the switch 2. Adjust or replace 3. Repair or replace
Wrong rotation direction	Wrong lever position	Put the lever in the correct position
Big run-out of horizontal spindle	Worn-out of bearing or loose locking nut	Tighten the nut, and adjust the clearance of the bearing
Abnormal feed of three axes	1. Gib strip is too tight 2. Clearance in the bolt and nut is not proper 3. Lack of lubrication oil	1. Replace the gib strip 2. Adjust the clearance 3. Add more oil
Vibration of the machine	1. Foundation is not solid enough 2. Abnormal cutting conditions	1. Tighten the grouting bolts 2. Use proper setting of cutting rates, material and cutting tools.
Motor not running after power on	1. Incorrect power source 2.Incorrect connection Wire 3. Terminal block loose	1.Input correct power 2.Check correct connection 3.Tighten the terminal block
Failure of spindle running	1.Main transmission speed change gear grade shift not in the position 2. Cutting overload 3. Motor broken 4. Spindle mechanical part damage	1.Check main transmission speed change box 2.Use the machine according to the cutting rule 3.Check the motor 4. Check the mechanical part manual
High temperature of spindle	1. Bearing damage 2. Lock nut too tight	1. Change bearing 2. Adjust lock nut
Spindle accuracy not good	1. bearing damage or adjusting not so well 2. spindle inner hole wear 3.spindle temperature too high cause heat deformation 4. lock nut get loose	1. change bearing or adjusting 2. change spindle 3. adjusting bearing 4. tighten lock nut
No gear change for spindle speed change	Spindle motor impulse line contact failure	Check electrical wire, adjusting impulse shaft tail end bolts, reach the impulse contact.
Feed box high noise	1,Transmission gear not in the position or loose 2. Motor noise	1. Check every transmission gear 2. Check motor
Feed box no feed movement	1.Feed motor not connecting with power or damage 2. Feed electrical clutch does not function	Check electrical part wire connection and electrical unit failure and exclude
Abnormal movement part sound	1.Articles fall inside 2. Screw and nut connecting part loose	1. Clean the foreign matter 2. Tighten the bolts
Axial movement of moving parts	1. Screw and nut connection loose 2.Screw bearing bracket loose. 3. Screw and nut space too large.	1. Tighten the loosen bolts 2. Tighten bearing bracket 3. Adjusting the screw and nut space.
Crawl movement of moving parts	1. Guideway not be fully lubricated 2. No lubrication	1. Check the pipe jam or not, oil distributer damage, lubrication system abnormal 2. Lubricate the machine as operation manual.
Motor broken	1. Water or oil into the electrical wire, circuit gets short-circuit. 2. Wire damage cause short circuit.	1. Contact with manufacture. 2. Eliminate the problem and change the motor.
Abnormal noise	1. Transmission gear loose 2. Foreign matter fall into the machine	1. Retighten the loosen gear 2. Clean foreign matter
Quick consumption of lubrication oil	1. Oil pipe damage 2. Oil distributor damage	1. Change oil pipe 2. Change oil distributor
Insufficient lubrication or no lubrication of guide ways and leadscrews	1.Oil distributor damage or oil is not enough, 2. Lubrication break off or pipe block 3.No lubrication 4. Machine oil outlet block up	1. Change the lubrication pipe joint. 2. Change oil pipe. 3. Fill up the lubrication oil. 4. Repair the ou-let hole.
No coolant supply	1.Coolant liquid is too dirty coolant filter filter mesh block, 2. Coolant pipe leak or fold 3. Nozzle get block	1.Clean filter mesh and change clean coolant liquid 2. Change pipe 3. Clean nozzle.
Coolant pump fault	1.Longtime work, voltage too high 2.Coolant pump block up, motor too hot. 3.Coolant pump damage.	1.Pull on thermal relay 2. Clean coolant pump, pull on thermal relay. 3.Change coolant pump motor.

	4.Thermal relay burn out 5.Wrong motor rotation direction. 6.No coolant liquid	4.Change thermal relay. 5. reconnection 6. Fill up the coolant liquid
Vibration when cutting	1. Cutting parameter is unreasonable 2. Spindle bearing loose. 3. Worn of gibs and big guide ways clearance 4. Workpiece is not be clamped tighten or unreasonable clamping method	1. Adjusting the cutting parameter 2. Repair the spindle box 3. Repair the gibs 4. Tighten the workpiece
Poor cutting finish	1. Workpiece is not be tighten clamped. 2. Transmission part have space or preload is insufficient 3. Cutting feed is not correct.	1. Tighten the workpiece 2. Adjust the guideway space 3. Change the cutting parameter.

EASY-WORN PARTS (available at extra charge)

	Drawing No.	Item	Qty.
1	X603202304	Knee lifting leadscrew nut	1
2	X603203301	Longitudinal leadscrew nut	1
3	X603203302	Longitudinal leadscrew nut	1
4	X6005301	Sleeve	1
5	X52K713	Cross leadscrew nut	1

14. Environmental protection

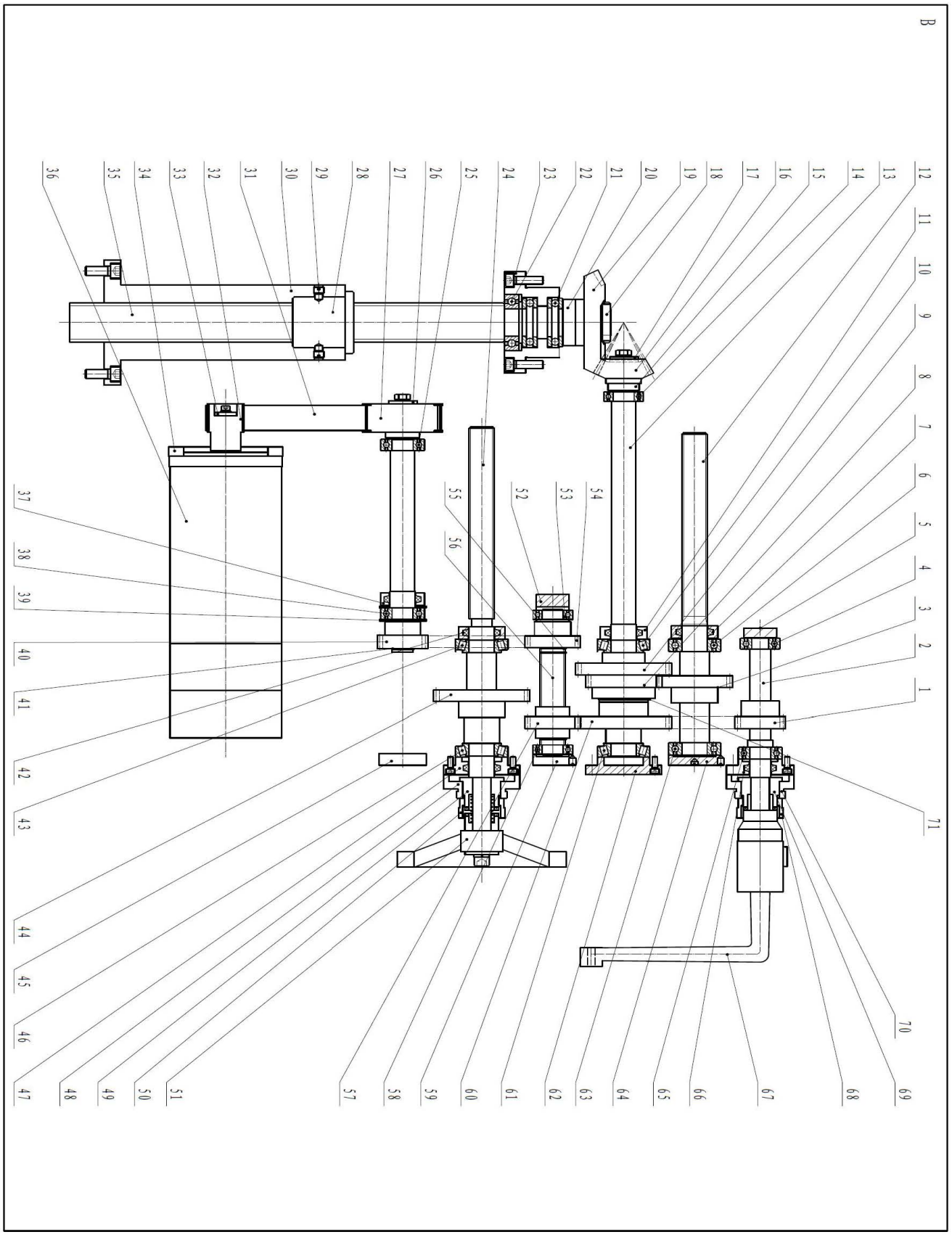
Protect the environment.

Your appliance contains valuable materials which can be recovered or recycled. Please leave it at a specialized institution.

15. Available accessories

Refer to the JET-Price-list

Exploded View for JUM-1464VHXL DROMilling Machine – Lifting Platform Assembly A

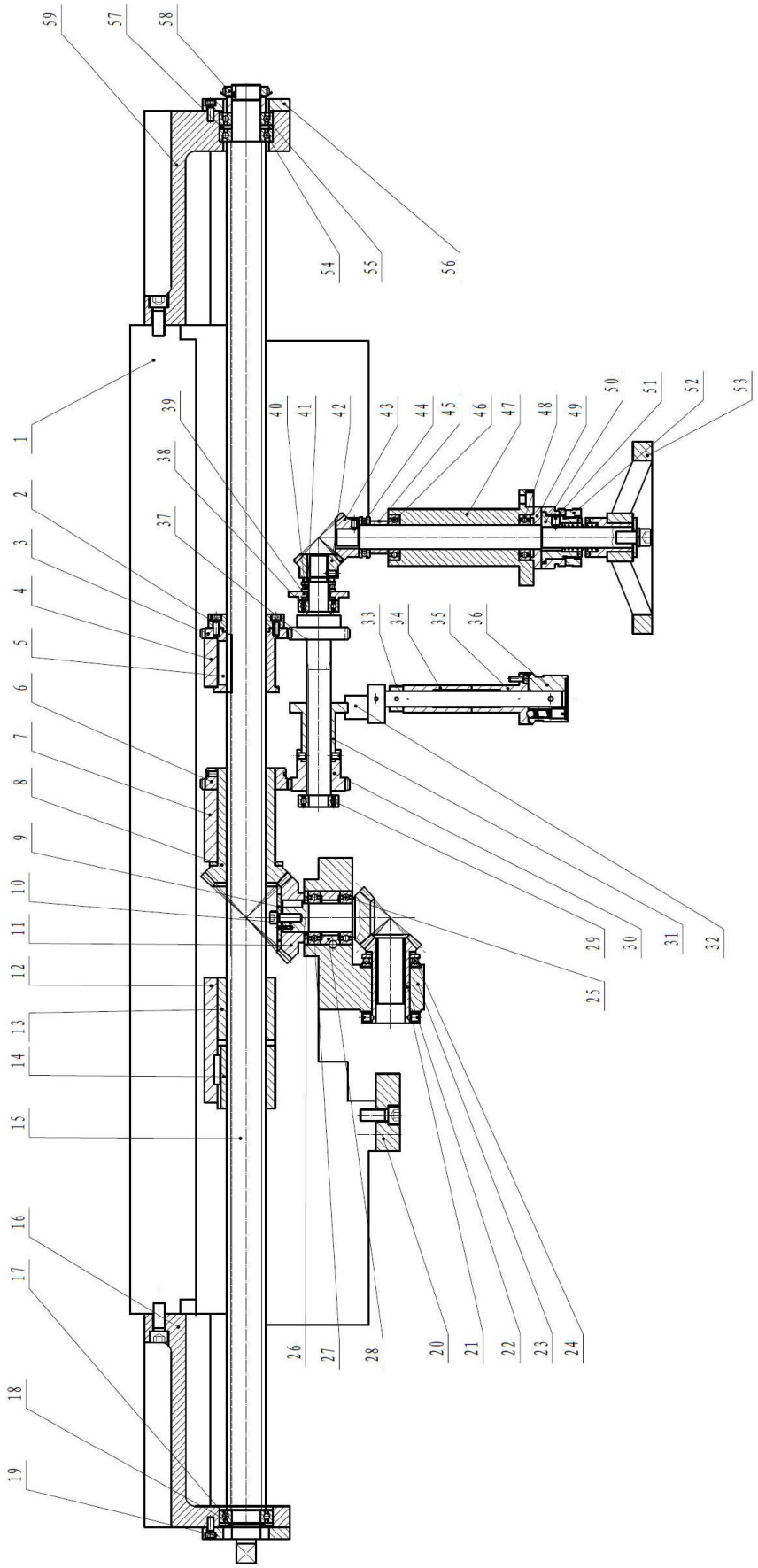


Part List for JUM-1464VHXL DRO Milling Machine – Lifting Platform Assembly A

Index No.	Part No.	Description	Size	Qty.
1	JUM1464-C-001	gear		1
2	JUM1464-C-002	shaft		1
3	JUM1464-C-003	gear		1
4	JUM1464-C-004	deep groove ball bearing	6204	1
5	JUM1464-C-005	plug		1
6	JUM1464-C-006	deep groove ball bearing	6206	1
7	JUM1464-C-007	sleeve		1
8	JUM1464-C-008	gear		1
9	JUM1464-C-009	gear		1
10	JUM1464-C-010	taper roller bearing	30206	1
11	JUM1464-C-011	sleeve		1
12	JUM1464-C-012	spline shaft		1
13	JUM1464-C-013	shaft		1
14	JUM1464-C-014	deep groove ball bearing	6005	1
15	JUM1464-C-015	sleeve		1
16	JUM1464-C-016	bevel gear		1
17	JUM1464-C-017	washer		1
18	JUM1464-C-018	round nut	M33×1.5	1
19	JUM1464-C-019	bevel gear		1
20	JUM1464-C-020	washer		1
21	JUM1464-C-021	thrust ball bearing	51207	2
22	JUM1464-C-022	deep groove ball bearing	6207	1
23	JUM1464-C-023	bearing house		1
24	JUM1464-C-024	cross leadscrew		1
25	JUM1464-C-025	deep groove ball bearing	6205	1
26	JUM1464-C-026	washer		1
27	JUM1464-C-027	large synchronous pulley		1
28	JUM1464-C-028	lifting nut		1
29	JUM1464-C-029	slotted cylindrical end locking screw	M12×16	2
30	JUM1464-C-030	lifting nut house		1
31	JUM1464-C-031	pulley	HTD-645-5M-30	1
32	JUM1464-C-032	small synchronous pulley		1
33	JUM1464-C-033	washer		1
34	JUM1464-C-034	motor mounting plate		1
35	JUM1464-C-035	lifting leadscrew		1
36	JUM1464-C-036	servo motor	QS130A100B15-4EL	1
37	JUM1464-C-037	sleeve		1
38	JUM1464-C-025	deep groove ball bearing	6205	1
39	JUM1464-C-039	washer	52	2
40	JUM1464-C-040	gear		1
41	JUM1464-C-041	clip	25	1
42	JUM1464-C-042	sleeve		1
43	JUM1464-C-010	taper roller bearing	30206	1
44	JUM1464-C-044	gear		1
45	JUM1464-C-045	plug		1
46	JUM1464-C-010	taper roller bearing	30206	1
47	JUM1464-C-047	flange		1
48	JUM1464-C-048	ring dial		1
49	JUM1464-C-049	coupling		1
50	JUM1464-C-050	sleeve		1

51	JUM1464-C-051	cross hand wheel		1
52	JUM1464-C-052	plug		1
53	JUM1464-C-014	deep groove ball bearing	6005	1
54	JUM1464-C-054	gear		1
55	JUM1464-C-055	washer	65Mn	3
56	JUM1464-C-056	spline shaft		1
57	JUM1464-C-057	gear		1
58	JUM1464-C-014	deep groove ball bearing	6005	1
59	JUM1464-C-059	plug		1
60	JUM1464-C-060	gear		1
61	JUM1464-C-010	taper roller bearing	30206	1
62	JUM1464-C-062	flange		1
63	JUM1464-C-063	deep groove ball bearing		1
64	JUM1464-C-064	plug		1
65	JUM1464-C-025	deep groove ball bearing	6205	1
66	JUM1464-C-066	flange		1
67	JUM1464-C-067	lifting crank		1
68	JUM1464-C-068	coupling		1
69	JUM1464-C-069	sleeve		1
70	JUM1464-C-070	ring dial		1
71	JUM1464-C-071	clip	58	1

Exploded View for JUM-1464VHXL DRO Milling Machine – Table Assembly B

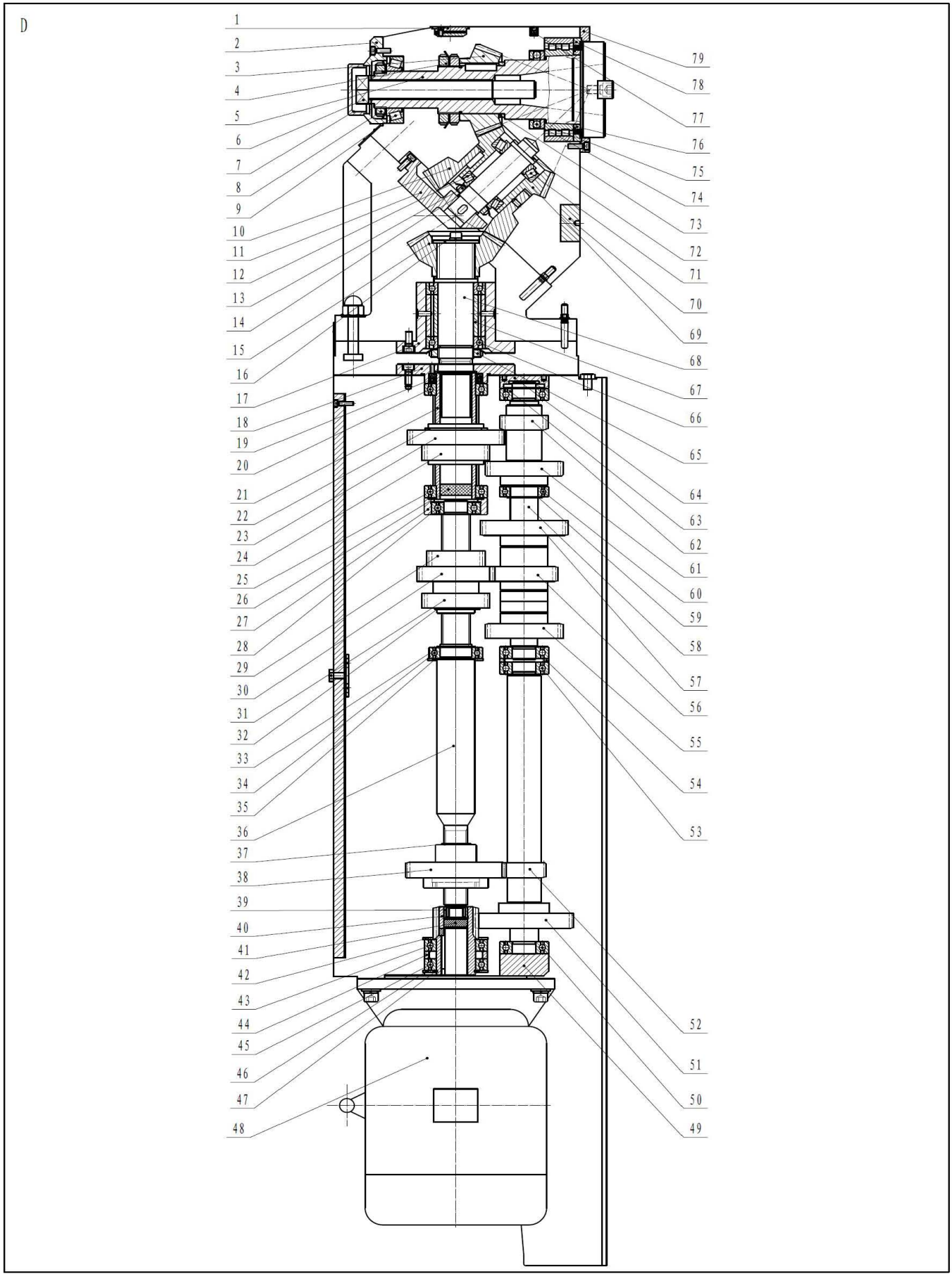


Part List for JUM-1464VHXL DRO Milling Machine – Table Assembly B

Index No.	Part No.	Description	Size	Qty.
1	JUM1464-A-001	table		1
2	JUM1464-A-002	flange		1
3	JUM1464-A-003	gear		1
4	JUM1464-A-004	nut seat		1
5	JUM1464-A-005	key		1
6	JUM1464-A-006	gear		1
7	JUM1464-A-007	nut seat		1
8	JUM1464-A-008	bevel gear		1
9	JUM1464-A-009	washer		1
10	JUM1464-A-010	bevel gear		1
11	JUM1464-A-011	bevel gear		1
12	JUM1464-A-012	nut seat		1
13	JUM1464-A-013	horizontal leadscrew nut		1
14	JUM1464-A-014	horizontal leadscrew nut		1
15	JUM1464-A-015	horizontal leadscrew nut		1
16	JUM1464-A-016	left supporting bracket		1
17	JUM1464-A-017	deep groove ball bearing	6006	1
18	JUM1464-A-018	A type clip	30	1
19	JUM1464-A-019	cover		1
20	JUM1464-A-020	clamping plate		1
21	JUM1464-A-021	sleeve		1
22	JUM1464-A-022	bevel gear		1
23	JUM1464-A-023	cross supporting bracket		1
24	JUM1464-A-024	thrust ball bearing		1
25	JUM1464-A-025	deep groove ball bearing	6006	1
26	JUM1464-A-026	washer		1
27	JUM1464-A-027	deep groove ball bearing	6006	1
28	JUM1464-A-028	sleeve		1
29	JUM1464-A-029	deep groove ball bearing	6004	1
30	JUM1464-A-030	gear		1
31	JUM1464-A-031	sleeve		1
32	JUM1464-A-032	shifting fork		1
33	JUM1464-A-033	sleeve		1
34	JUM1464-A-034	sleeve		1
35	JUM1464-A-035	sleeve		1
36	JUM1464-A-036	knub		1
37	JUM1464-A-037	gear		1
38	JUM1464-A-038	deep groove ball bearing	6004	1
39	JUM1464-A-039	cover		1
40	JUM1464-A-040	thrust ball bearing	51104	1
41	JUM1464-A-041	washer		1
42	JUM1464-A-042	bevel gear		1
43	JUM1464-A-043	bevel gear		1
44	JUM1464-A-044	thrust ball bearing	5105	1
45	JUM1464-A-045	bush		1
46	JUM1464-A-046	deep groove ball bearing	6005	1
47	JUM1464-A-047	sleeve		1
48	JUM1464-A-048	deep groove ball bearing	6005	1
49	JUM1464-A-049	sleeve		1
50	JUM1464-A-050	coupling		1

51	JUM1464-A-051	sleeve		1
52	JUM1464-A-052	sleeve		1
53	JUM1464-A-053	hand wheel		1
54	JUM1464-A-054	deep groove ball bearing	7006AC	1
55	JUM1464-A-055	deep groove ball bearing	7006AC	1
56	JUM1464-A-056	flange		1
57	JUM1464-A-057	washer		1
58	JUM1464-A-058	round nut	M30×1.5	1
59	JUM1464-A-059	right supporting bracket		1

Exploded View for JUM-1464VHXL DRO Milling Machine – Tool RAM box & Milling Head Assembly C



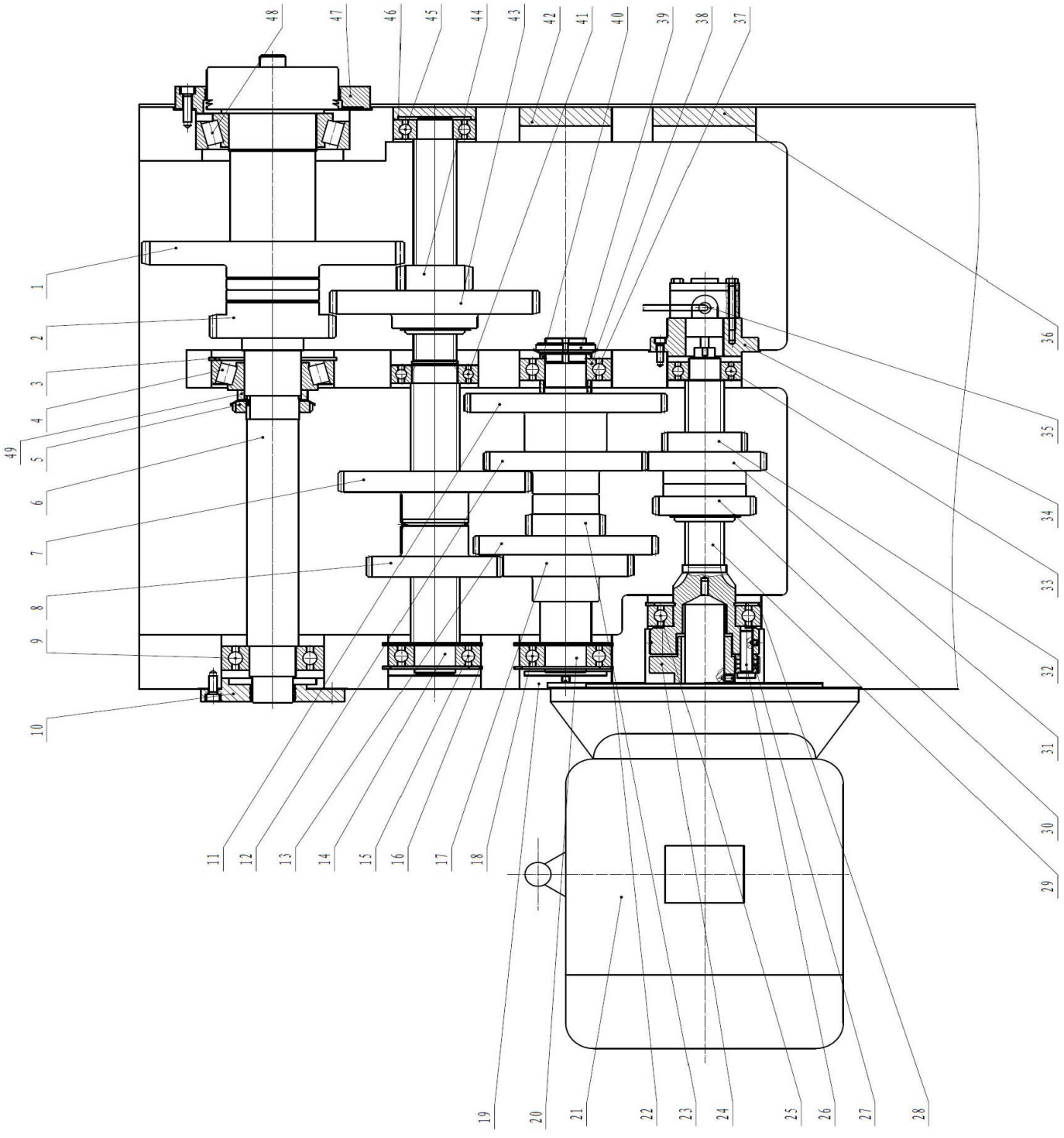
Part List for JUM-1464VHXL DRO Milling Machine –Tool RAM box & Milling Head Assembly C

Index No.	Part No.	Description	Size	Qty.
1	JUM1464-B-001	cover		1
2	JUM1464-B-002	flange		1
3	JUM1464-B-003	gear		1
4	JUM1464-B-004	Round nut	M64×2	2
5	JUM1464-B-005	spindle		1
6	JUM1464-B-006	Draw bar		1
7	JUM1464-B-007	cover		1
8	JUM1464-B-008	Round nut	M50×1.5	1
9	JUM1464-B-009	taper roller bearing	30210/P5	1
10	JUM1464-B-010	gear		1
11	JUM1464-B-011	flange		1
12	JUM1464-B-012	taper roller bearing	32007	1
13	JUM1464-B-013	Round nut	M35×1.5	1
14	JUM1464-B-014	adjusting washer		1
15	JUM1464-B-015	gear		1
16	JUM1464-B-016	pad		1
17	JUM1464-B-017	bearing house		1
18	JUM1464-B-018	flange		1
19	JUM1464-B-019	frame oil seal	FB5068	1
20	JUM1464-B-020	Deep groove ball bearing	6010	1
21	JUM1464-B-021	Spline sleeve		1
22	JUM1464-B-022	clip	70	1
23	JUM1464-B-023	gear		1
24	JUM1464-B-024	gear		1
25	JUM1464-B-025	Deep groove ball bearing	6010	1
26	JUM1464-B-026	plug		1
27	JUM1464-B-027	bearing house		1
28	JUM1464-B-028	Deep groove ball bearing	6206/2RS	1
29	JUM1464-B-029	gear		1
30	JUM1464-B-030	gear		1
31	JUM1464-B-031	gear		1
32	JUM1464-B-032	clip	48	1
33	JUM1464-B-033	clip	40	1
34	JUM1464-B-034	Deep groove ball bearing	6008/2RS	1
35	JUM1464-B-035	washer	68	1
36	JUM1464-B-036	shaft		1
37	JUM1464-B-037	clip	30	1
38	JUM1464-B-038	gear		1
39	JUM1464-B-039	Needle roller shaft	NA4903	1
40	JUM1464-B-040	gear		1
41	JUM1464-B-041	plug		1
42	JUM1464-B-042	washer	80	1
43	JUM1464-B-043	Deep groove ball bearing	6010	1
44	JUM1464-B-044	pad		1
45	JUM1464-B-045	Deep groove ball bearing	6010	1
46	JUM1464-B-046	washer	80	1
47	JUM1464-B-047	clip	50	1
48	JUM1464-B-048	three-phase asynchronous motor	Y112M-4/5.5HP	1
49	JUM1464-B-049	plug		1
50	JUM1464-B-050	Deep groove ball bearing	6206/2RS	1

Part List for JUM-1464VHXL DRO Milling Machine – Tool RAM & Milling Head Assembly C

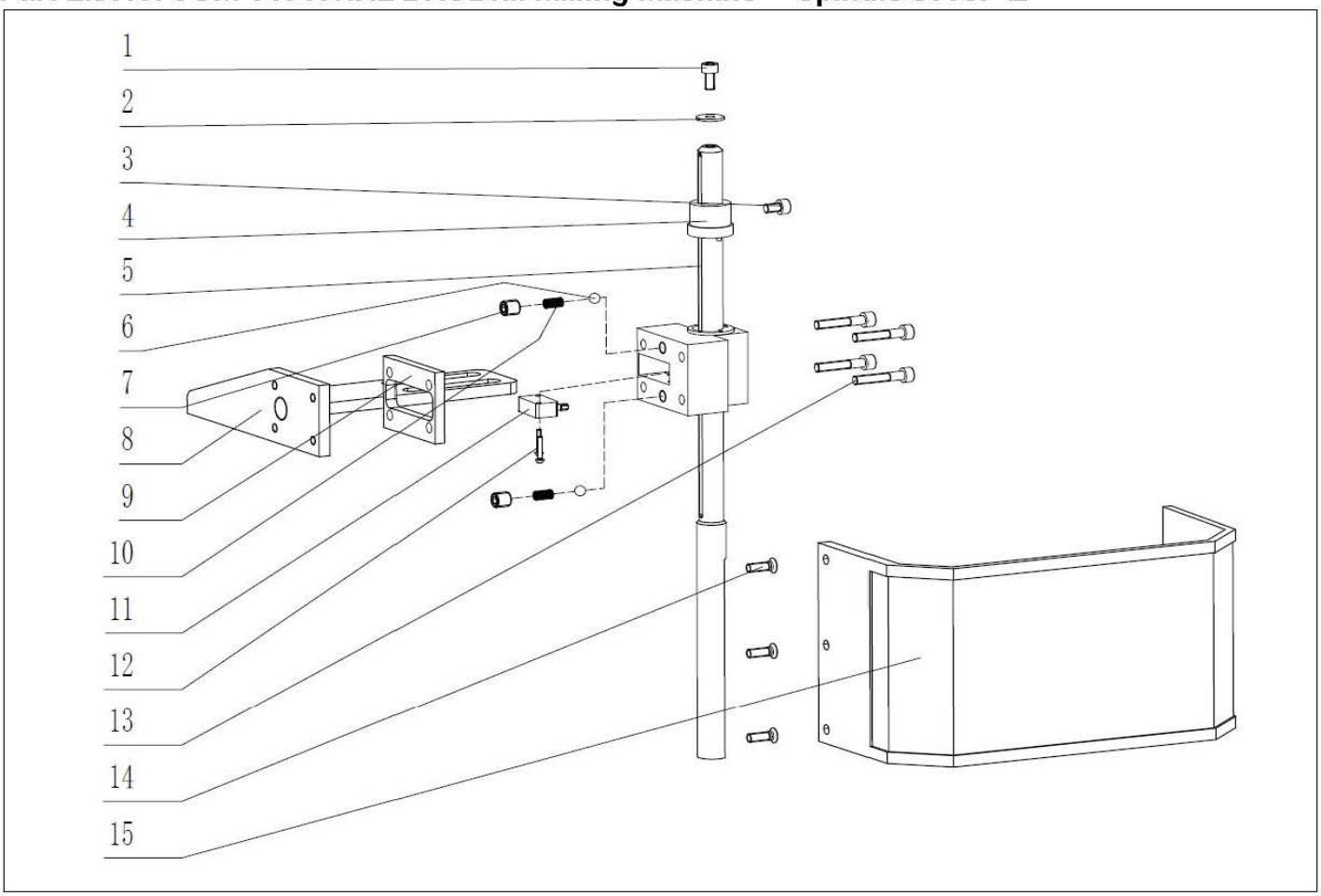
Index No.	Part No.	Description	Size	Qty.
51	JUM1464-B-051	gear		
52	JUM1464-B-052	Gear shaft		1
53	JUM1464-B-053	Deep groove ball bearing	6206/2RS	2
54	JUM1464-B-054	washer		1
55	JUM1464-B-055	gear		1
56	JUM1464-B-056	gear		1
57	JUM1464-B-057	gear		1
58	JUM1464-B-058	shaft		1
59	JUM1464-B-059	clip	35	1
60	JUM1464-B-060	Deep groove ball bearing	6007/2RS	1
61	JUM1464-B-061	gear		1
62	JUM1464-B-062	Gear shaft		1
63	JUM1464-B-063	Deep groove ball bearing	6206/2RS	1
64	JUM1464-B-064	plug		1
65	JUM1464-B-065	Round nut	M45×1.5	1
66	JUM1464-B-066	Angular contact ball bearing	7009AC	2
67	JUM1464-B-067	sleeve		1
68	JUM1464-B-068	Spline shaft		1
69	JUM1464-B-069	gear		1
70	JUM1464-B-070	plug		1
71	JUM1464-B-071	Taper roller bearing	30207	2
72	JUM1464-B-072	pad		1
73	JUM1464-B-073	pad		1
74	JUM1464-B-074	Thrust ball bearing	51116/P5	1
75	JUM1464-B-075	Double row cylindrical roller bearings	NN3018K/P5	1
76	JUM1464-B-076	pad		1
77	JUM1464-B-077	Pressure piston oil cup	10	1
78	JUM1464-B-078	pad		1
79	JUM1464-B-079	flange		1

Part List for JUM-1464VHXL DRO Milling Machine – Tool Assembly D



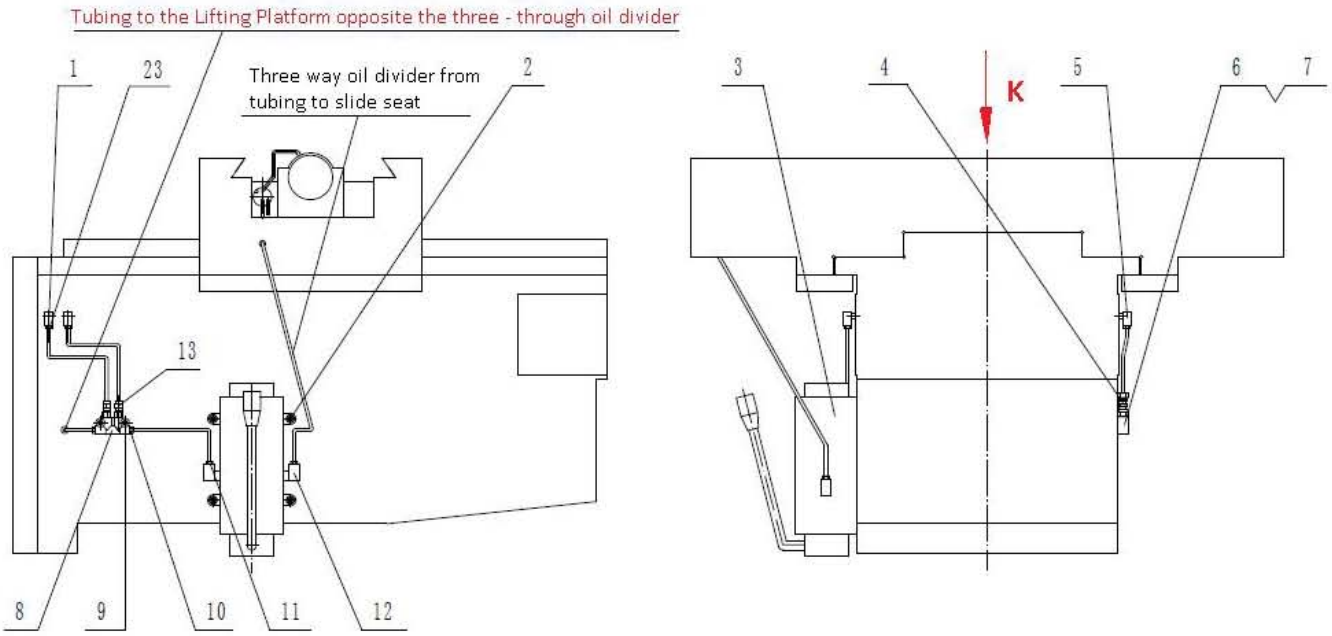
Index No.	Part No.	Description	Size	Qty.
1	JUM1464-D-001	gear		1
2	JUM1464-D-002	gear		1
3	JUM1464-D-003	washer	120	1
4	JUM1464-D-004	taper roller bearing	30311/P5	1
5	JUM1464-D-005	round nut	M52×1.5	1
6	JUM1464-D-006	spindle		1
7	JUM1464-D-007	gear		1
8	JUM1464-D-008	gear		1
9	JUM1464-D-009	deep groove ball bearing	6309	1
10	JUM1464-D-010	flange		1
11	JUM1464-D-011	gear		1
12	JUM1464-D-012	gear		1
13	JUM1464-D-013	gear		1
14	JUM1464-D-014	shaft		1
15	JUM1464-D-015	deep groove ball bearing		
16	JUM1464-D-016	washer	96	2
17	JUM1464-D-017	gear		1
18	JUM1464-D-018	deep groove ball bearing		
19	JUM1464-D-019	plug		1
20	JUM1464-D-020	shaft		1
21	JUM1464-D-021	three-phase asynchronous motor	Y132S-4/B5	1
22	JUM1464-D-022	washer	96	2
23	JUM1464-D-023	gear		1
24	JUM1464-D-024	flange		1
25	JUM1464-D-025	deep groove ball bearing	6212-2RS	1
26	JUM1464-D-026	Small shaft		1
27	JUM1464-D-027	washer		24
28	JUM1464-D-028	washer	110	1
29	JUM1464-D-029	shaft		1
30	JUM1464-D-030	gear		1
31	JUM1464-D-031	gear		1
32	JUM1464-D-032	gear		1
33	JUM1464-D-033	deep groove ball bearing	6306	1
34	JUM1464-D-034	flange		1
35	JUM1464-D-035	Oil pump	KBBY-0.84	1
36	JUM1464-D-036	plug		1
37	JUM1464-D-037	washer		1
38	JUM1464-D-038	deep groove ball bearing	6308	1
39	JUM1464-D-039	round nut	M40×1.5	1
40	JUM1464-D-040	washer		1
41	JUM1464-D-041	deep groove ball bearing	6209	1
42	JUM1464-D-042	plug		1
43	JUM1464-D-043	gear		1
44	JUM1464-D-044	gear		1
45	JUM1464-D-045	deep groove ball bearing	6307	1
46	JUM1464-D-046	plug		1
47	JUM1464-D-047	flange		1
48	JUM1464-D-048	taper roller bearing	32217/P5	1
49	JUM1464-D-049	washer		1

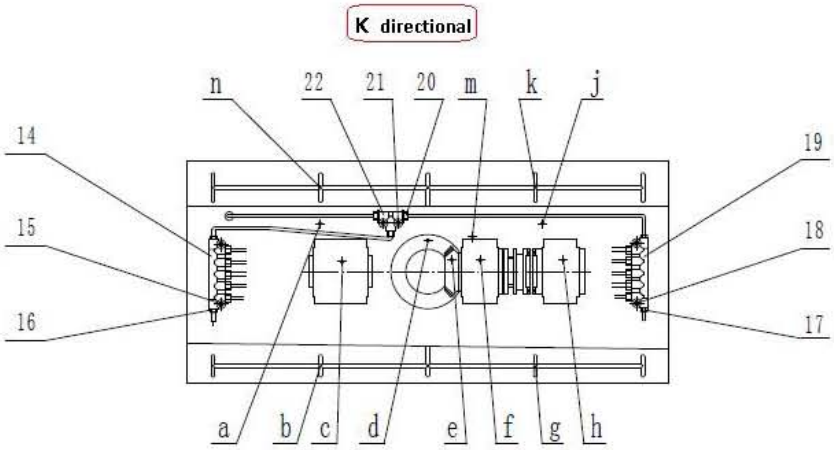
Part List for JUM-1464VHXL DRODrill Milling Machine – spindle cover E



Index No.	Part No.	Description	Size	Qty.
01	JM125-D-001	hexagon socket head cap screws	M6*12	1
02	JM125-D-002	baffle		1
03	JM125-D-001	hexagon socket head cap screws	M6*12	1
04	JM125-D-004	set piece		1
05	JM125-D-005	Cover rod		1
06	JM125-D-006	steel ball	Φ6	2
07	JM125-D-007	hexagon socket head cap screws	M10*10	2
08	JM125-D-008	Fixed bracket		1
09	JM125-D-009	Plate		1
10	JM125-D-010	Compression flat end spring	Φ0.5*φ6*19	2
11	JM125-D-011	microswitch		1
12	JM125-D-012	pan head screws with cross recess	M3*16	2
13	JM125-D-013	hexagon socket head cap screws	M6*35	4
14	JM125-D-014	cross recessed countersunk flat head screws	M6*16	3
15	JM125-D-015	cover		1

Part List for JUM-1464VHXL DRO Milling Machine – Lubrication System F



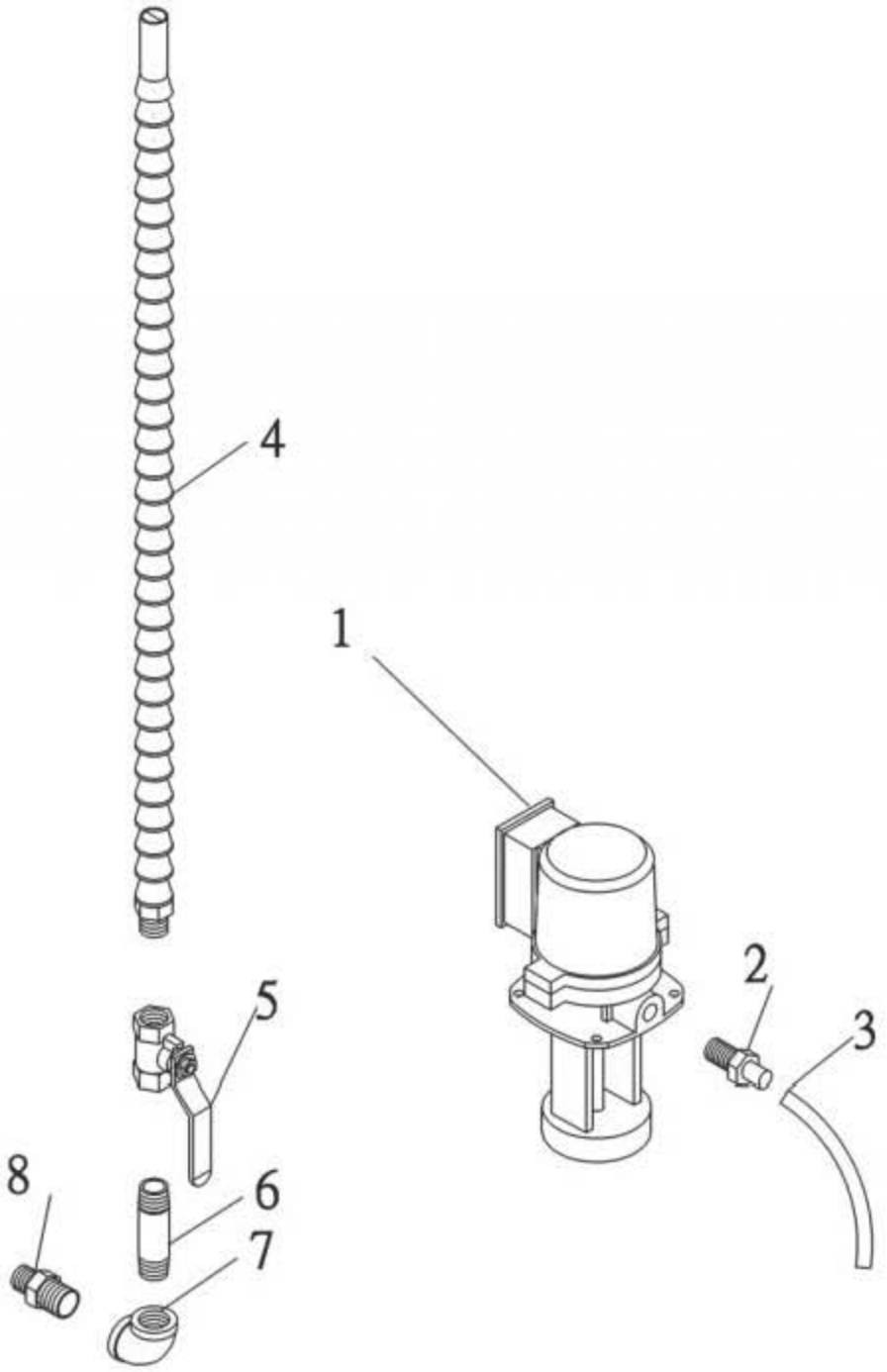


lubrication points	Description of lubrication point
a	Sliding seat transverse left guide surface
b	Longitudinal front left guide surface of slide carriage
c	Longitudinal filament （X）
d	Lower bevel gear
e	Upper bevel gear
f	Upper bevel gear cover
g	Longitudinal front right guide surface of sliding seat
h	Longitudinal clutch
j	Slide seat transverse right rail surface
k	Slide seat longitudinal rear right rail surface
m	Horizontal wire mother
n	Sliding seat longitudinal rear left rail surface

Part List for JUM-1464VHXL DRO Milling Machine – Lubrication System F

Index No.	Part No.	Description	Size	Qty.
01	JM125-E-001	Oil pipe right angle joint	PL408	2
02	JM125-D-014	hexagon socket head cap screws	M6*16	4
03	JM125-E-003	Manual lubrication pump		1
04	JM125-E-004	Set up oil quantity components	ZJBM	2
05	JM125-E-001	Oil pipe right angle joint	PL408	2
06	JM125-E-006	Three way oil divider	TH-3	1
07	JM125-E-007	Tubing joint	PA-4	1
	JM125-E-008	Double taper ferrule	PB-4	1
08	JM125-E-009	Four through oil divider	TH-4	1
09	JM125-E-010	hexagon socket head cap screws	M6*25	4
10	JM125-E-007	Tubing joint	PA-4	3
	JM125-E-008	Double taper ferrule	PB-4	3
11	JM125-E-013	Tubing joint	PA-4	2
	JM125-E-014	Double taper ferrule	PB-4	2
12	JM125-E-015	Oil pipe right angle joint	PL410	2
13	JM125-E-004	Set up oil quantity components	ZJBM	2
14	JM125-E-017	Seven through oil divider	TH-7	1
15	JM125-E-010	hexagon socket head cap screws	M6*25	4
16	JM125-E-007	Tubing joint	PA-4	7
	JM125-E-008	Double taper ferrule	PB-4	7
17	JM125-E-007	Tubing joint	PA-4	7
	JM125-E-008	Double taper ferrule	PB-4	7
18	JM125-E-010	hexagon socket head cap screws	M6*25	4
19	JM125-E-017	Seven through oil divider	TH-7	1
20	JM125-E-007	Tubing joint	PA-4	3
	JM125-E-008	Double taper ferrule	PB-4	3
21	JM125-E-010	hexagon socket head cap screws	M6*25	4
22	JM125-E-006	Three way oil divider	TH-3	1
23	JM125-E-007	Tubing joint	PA-4	2
	JM125-E-008	Double taper ferrule	PB-4	2

Part List for JUM-1464VHXL DRO Milling Machine – Coolant Pump Assembly G



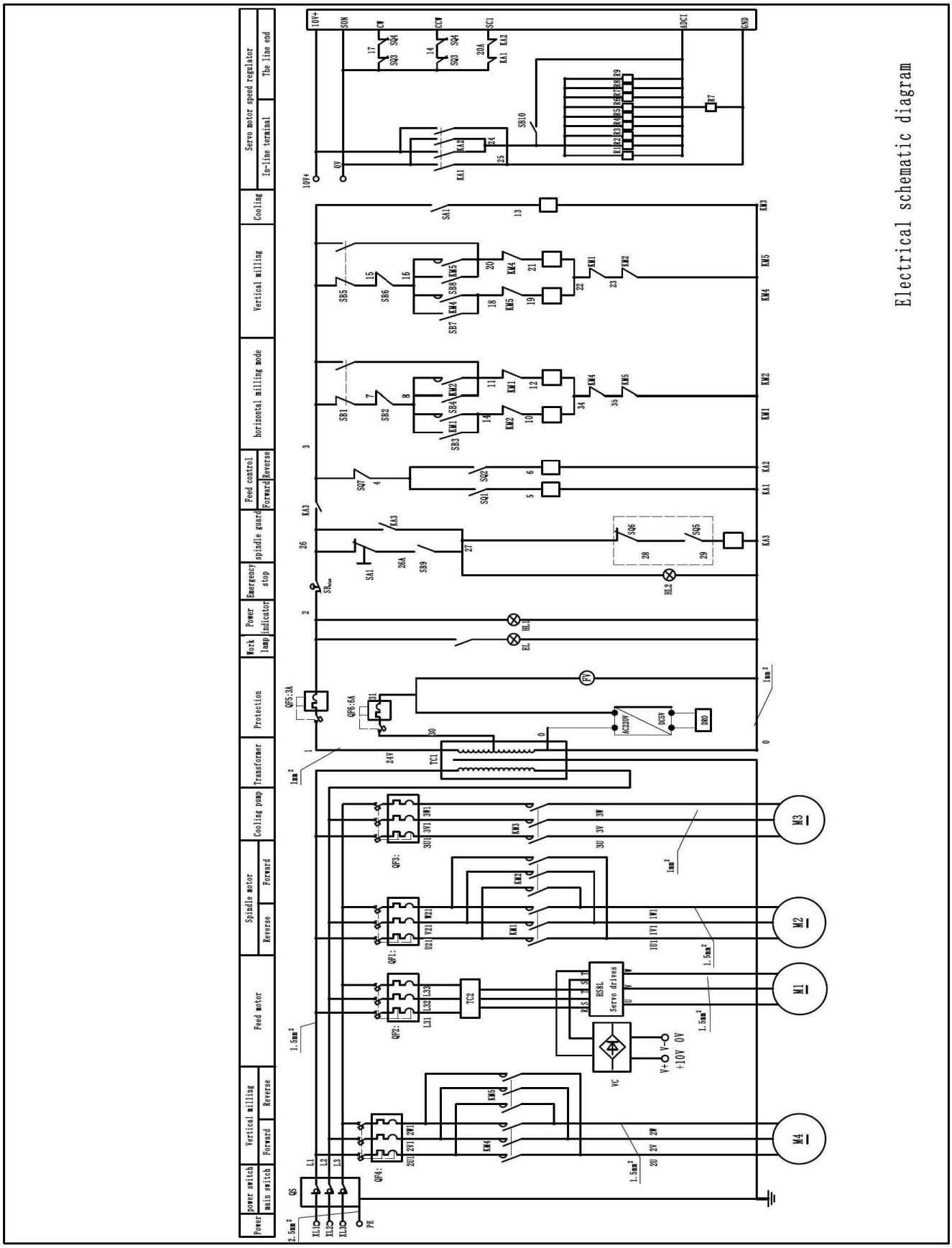
Index No.	Part No.	Description	Size	Qty.
01	JM125-F-001	Coolant pump	400V-50HZ-90W	1
02	JM125-F-002	Connect Elbow		1
03	JM125-F-001	Hose		1
04	JM125-F-004	Nozzle		1
05	JM125-F-005	Valve		1
06	JM125-F-006	Extend Elbow		2
07	JM125-F-007	90° Joint		2
08	JM125-F-008	Connect Elbow		1

Part List for JUM-1464VHXL DRO Milling Machine – Operation Panel Assembly H

Index No.	Part No.	Description	Size	Qty.
01	JMI25-G-001	Power Light		1
02	JMI25-G-002	H-Spindle CW	LXWS-1162	1
03	JMI25-G-003	H-Spindle Stop Switch		1
04	JMI25-G-004	H-Spindle CCW	LXWS-1162	1
05	JMI25-G-005	Power on/reset		1
06	JMI25-G-002	V-Spindle CW	LXWS-1162	1
07	JMI25-G-003	V-Spindle Stop Switch		1
08	JMI25-G-004	V-Spindle CCW	LXWS-1162	1
09	JMI25-R7	Change feed speed	XL-TSQ-V7	1
10	JMI25-G-007	Table quick feed button		1
11	JMI25-G-008	Coolant Pump Switch		1
12	JMI25-G-009	Emerge Stop Switch		1
13	JUM-1464-H-001	For JUM-1464VHXL DRO		1

Wiring Diagram for JUM-1464VHXL DRO

50000854T 3~400V 50Hz



PACKING LIST

No.	Name	Detail	Qua.	rmk
1	Milling machine		1	
2	7：24 middle cover	7：24 / ISO50/MS4	1	
3	Taper shank sets milling cutter arbor	7:24 / ISO50-Φ32	1	
4	Draw bar	M24 (vertical, horizontal)	1	
5	Washer	24	1	
6	Allen Wrench	5、10、14	1	
7	Double-ended wrench	13x17	1	
8	Double-ended wrench	22x24	1	
9	Double-ended wrench	36x41	1	
10	milling cutter arbor	Φ27	1	
11	milling cutter arbor	Φ32	1	
12	Nut	M24	2	
13	ISO50 sets milling chuck	7:24 / ISO50	1	
14	Certification		1	
15	Packing list		1	
16	EP1C series servo manual		1	
17	Operation manual		1	

INSPECTING

No.	Inspecting items		Tolerance	Actually
1	Straightness of knee vertical movement	A: At the cross vertical surface B:At the longitudinal vertical surface	A： 0.05/300 B： 0.05/300	
2	Verticality of the table surface to knee guide	A :At the cross vertical surface B :At the longitudinal vertical surface	A： 0.05/300 a ≤90° B： 0.05/300	
3	Flatness of the table surface		0.04/500	
4	Table surface to the table movement	A : cross B :longitudinal	A； 0.05/300 B： 0.03/300 Max0.06	
5	Spindle axial movement		0.02	
6	Spindle taper hole runout	A : near spindle end face B :300mm to end surface	A： 0.01 B： 0.03	
7	The parallelism Spindle spin axis to table		0.05/300 (only down)	
8	The parallelism Spindle spin axis to table cross moving	A: At the vertical surface	0.05/300 (only down)	
		B: At the horizontal surface	0.05/300	
9	Straightness of Table cross movement to longitudinal		0.04/300	
10	The parallelism of beam guide to Spindle spin axis	A :At the vertical surface	0.05/300 (only down)	
		B: At the horizontal surface	0.05/300	
11	The parallelism of beam guide to Spindle spin axis	A: At the vertical surface	0.03 (only down)	
		B: At the horizontal surface	0.03	
12	The Verticality of Spindle spin axis to table (vertical)	A: At the cross vertical surface	a 0.03/300 a〈90°	
		B: At the longitudinal vertical surface	b 0.03/300	
13	Spindle axis diameter runout (vertical)		0.01	
14	The spindle shaft shoulder bearing surface runout (vertical)		0.02	
15	Spindle taper hole runout(vertical)	A: near spindle end face	0.01	
		B: 300mm to end surface	0.03	