

JET

JUTM-1834 Servo DRO

Milling Machine

Original:
GB
Operating Instructions



JPW Tool Group Hong Kong Limited

98 Granville Road, Tsimshatsui East, Kowloon, Hong Kong, PRC
www.jettools.com

Импортер в РФ: ООО «ИТА Технолоджи»
105082, Москва, Переведеновский пер., д. 17
www.jettools.ru

Made in PRC / Сделано в КНР

M/P- 50000853T

2022-09

GB - ENGLISH

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 JUTM-1834 Servo 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 damp 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 safe 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 Milling Machine

The 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.

Description:

★ : It describes a danger state will occur immediately; If not avoided, it will result in death or serious injury.

☆ : It is a possible danger state; if not avoided, it may result in death or serious injury.

▲ : It is a possible danger state; if not avoided, it may result in varying degrees of personal injury or damage to the machine.

△ : It means this clause should be paid more attention.

2.1 Machine installation

△ Fully understand installation requirement and procedure in the Manual.

△ During installation, all personnel must communicate with each other.

▲ Check the lifting slings and tools to see if they are

complied with the safety standard.

2.2 Requirements to operator and maintenance personnel

▲ □ The machine operators should be trained and qualified person. Before operation, the operator should read this Operation Manual carefully and fully understand the content of the Manual. And they must be qualified to operate the machine.

▲ Only the qualified person or professional maintenance person can repair the machine.

△ Do use recommended lubricant and grease.

▲ Do not allow changing machine parameters at will.

2.3 Dry run

△ Every day before processing formally, carry out dry run for warming up.

△ During dry run, check the function of each device; Check each movement parts; and check all lubricant oil ways.

△ Check the scraper for damage.

▲ If the machine is idle for a long time, before machining, carry out dry run firstly, and ensure lubricate it fully.

2.4 Safety regulations before operating

△ Ensure to use special tooling and the process parameters confirm to the technical parameters of the machine.

▲ Replace the worn or damaged tools.

△ Test cutting should be carried out after the tool is installed.

2.5 Safety regulations during operation

△ Never touch switches with wet hands.

▲ Do not clean the chips during machining.

▲ Do not touch the working tool by hand or in other ways.

☆ Before cutting, make sure the workpiece is clamped firmly.

△ Clean the iron chips with brush, and never use bare hands.

▲ Always mount or dismount tools when machine is stopped.

▲ Do not leave machine without attending during operation.

2.6 After operating

△ Clean the machine thoroughly.

▲ Check the coolant and lubricant for oil contamination; replace it if necessary.

▲ When stop the machine after finishing working, turn off the power on the operation panel, and turn off

the main power on electric cabinet too.

2.7 Check, maintenance and service

△ Clarify the fault condition of machine tool according to the information provided by the operator.

△ Develop inspection and maintenance work steps and scope of work.

☆ During servicing, hang the label of "under repair" around the machine.

☆ Turn off the mains switch to prevent external power suddenly switched on and dangerous occur. Place a warning label "do not switch on" on the mains switch.

☆ When working inside of the machine, do remember switch off the mains and place a warning label "do not switch on" on the mains switch.

★ Never touch cables, electrics and switches with wet hands.

▲ Use standard and dedicated tools.

▲ Do not place any tool or clothes on moving parts.

☆ When using lifting machinery, only qualified tools are allowed to be used.

▲ Before installing the fuse, be sure the machine power is off.

▲ Replace with specified accessories.

3. Brief Introduction

This machine is a kind of universal machine; it is applied to various industries. Especially for tools, fixtures, molds or other complex shape parts processing in instrumentation and machinery manufacturing industry.

The machine is suitable for processing small and medium-sized parts. The workpiece can be milled, drilled and bored in any coordinate direction and can achieve higher accuracy. Accessories can be provided according to requirements to increase the versatility of the machine.

The machine is equipped with three-axis digital display system. It improves the machining accuracy and processing convenience.

4. Machine Lifting and Installation

During transportation, the inclination of the packing case should not exceed 10°.

After unpacking, insert a round steel tube (about 50 in diameter) into the holes at the upper part of the bed. Tied to both ends of steel tube with sling or wire rope (bearing capacity is not less than the weight of machine tool). Apply a suitable piece of wood pad between the sling or wire rope and machine bed to prevent damage to the paint and exposed parts of the machine surface.

Lift the machine tool, and remove the bottom of the case, then move it to the prepared foundation. Put 4 off anti-shock pad irons under the machine base, then put the machine on these pad irons. The anti-shock pad iron can reduce the noise and also increase the machining accuracy.

Machine tool lifting diagram is as follows:

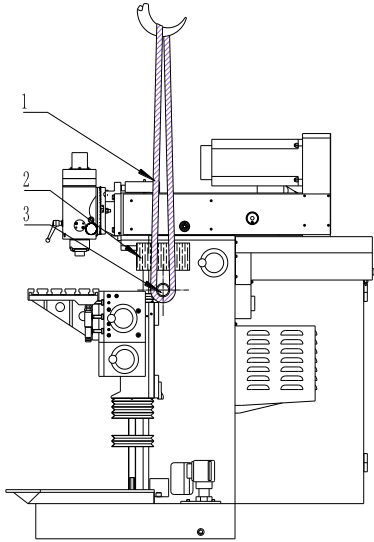


Fig.1: Machine lifting diagram
1: sling 2: wood pad 3: round steel pipe

5. Machine Specifications and Parameters

Parameter	Unit	Specification
		JUTM-1834 DRO
Dimension of horizontal worktable (L x W)	mm	850x450
Horizontal T-slot number	pce	5
Horizontal worktable T-slot width	mm	14
Horizontal worktable T-slot distance	mm	63
Vertical worktable dimension (L x W)	mm	1190x250
Vertical worktable T-slot number	pce	3
Vertical worktable T-slot width	mm	14
Vertical worktable T-slot distance	mm	63
X-axis travel	mm	600
Y-axis travel	mm	450
Z-axis travel	mm	450
Spindle bore		ISO40
Spindle speed	rpm	40-2000
X-axis feed (stepless)	mm/min	10-1000
Y-axis feed (stepless)	mm/min	10-1000
Z-axis feed (stepless)	mm/min	10-1000
Rapid feed speed (X/Y/Z)	mm/min	1200

Distance from vertical spindle end surface to horizontal worktable	mm	75-525
Distance from horizontal spindle end surface to horizontal worktable	mm	1475-625
Distance from vertical spindle axis to column guide surface	mm	170-620
Main motor power	kW	5.5
X-axis feed servo motor torque	Nm	10
Y-axis feed servo motor torque	Nm	10
Z-axis feed servo motor torque	Nm	15
Machine weight	kg	1950

6. Machine Main Structure

The machine tool is composed of basement, bed, sliding block, horizontal worktable, vertical worktable, ram and vertical mill head.

Whole machine:



Fig. 2: Machine tool effect picture

6.1 Base:

The rectangular box structure base can bear whole machine weight. The base is fitted with bed and lifting

screw seat. There is a coolant tank in base cavity; and the coolant pump is equipped on the base.

Base parts effect picture:

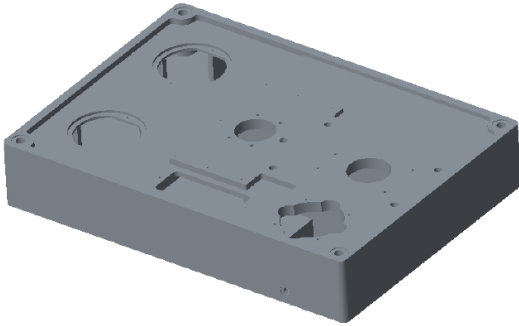


Fig. 3: Base effect picture

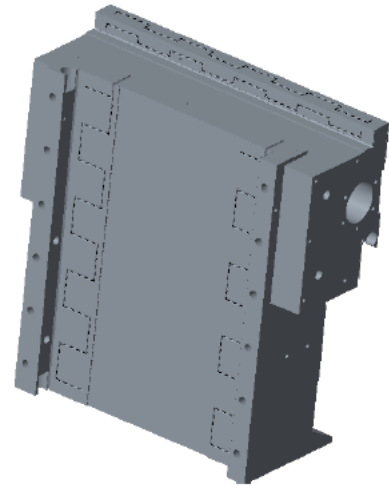


Fig. 5: Sliding block effect picture

6.2 Bed:

The bed is mounted on the base, and securely connected through high strength bolts; the upper part is connected with ram, providing transverse movement guideway; the front part is connected with sliding block to provide the vertical guideway; transverse feed motor is mounted behind and then through the horizontal screw to achieve horizontal feed; electric cabinet and operation box are equipped at the side of bed.

Bed effect picture is as follows:

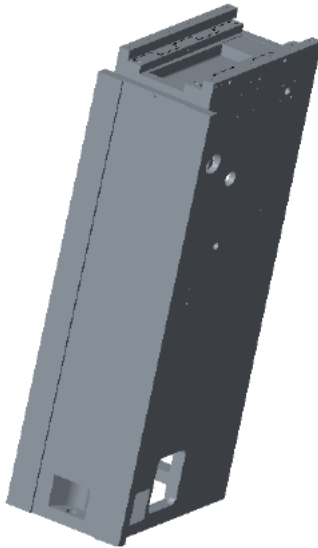


Fig. 4: Bed effect picture

6.3 Sliding block:

Designed with rectangular and dovetail rails for the table of longitudinal sliding, so as to achieve the vertical movement of worktable. A rectangular guide is at back so that the sliding block can slide on the rectangular guide of the bed to form a Z-direction movement. The lift feed motor is mounted on the base, located in the cavity of the bed, providing driving force of lifting.

The sliding block effect picture is shown as below:

6.4 Horizontal worktable:

Horizontal worktable is installed on the vertical table, mainly being used for workpiece installation. There are T-slots on horizontal table, which is used for workpiece positioning and clamping.

The horizontal worktable effect picture:

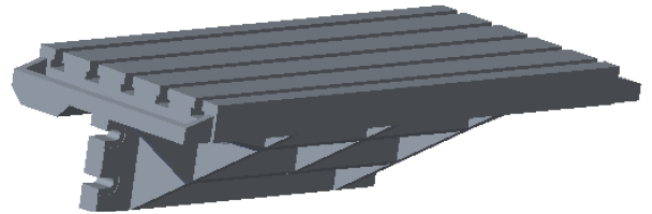


Fig. 6: Horizontal worktable effect picture

6.5 Vertical worktable:

The vertical worktable is fixed on sliding block, and slides left and right to form longitudinal movement. The working surface of vertical table is in vertical state. There are 3 T-slots on it for horizontal table or other accessories positioning and clamping.

The vertical worktable effect picture:

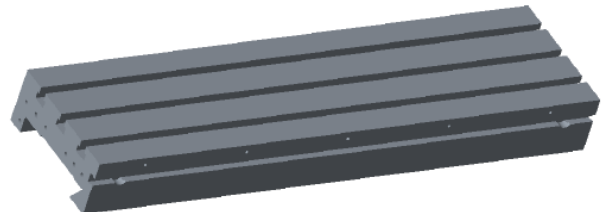


Fig. 7: Vertical worktable effect picture

6.6 Ram:

The ram is installed on upper part of the bed, realizing the spindle of the horizontal feed and spindle speed changing function. Ram is equipped with a horizontal shaft spindle, which can realize the horizontal milling process. The main motor is mounted on the rear end of the ram and provides the main cutting power. The front end of the ram is fitted with a vertical mill head or over beam bracket.

The ram effect picture:

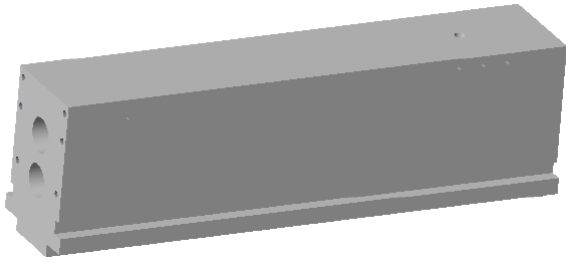


Fig. 8: Ram effect picture

6.7 Vertical milling head:

The vertical milling head is mounted on the front end face of ram, inside is equipped with a vertical spindle to realize the vertical milling process. The vertical milling head rotate clockwise or counterclockwise by 45° around the milling head seat to carry out oblique milling. When the horizontal milling is required, release the fastening bolt of vertical milling head, after that rotate the milling head to the left side of ram and fixed it on fixed block of ram. Vertical milling head effect picture:

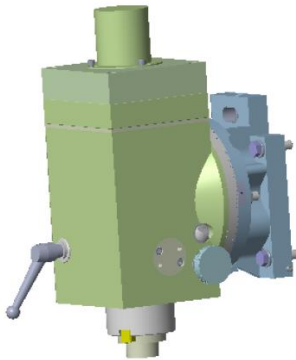


Fig. 9: Vertical milling head effect picture

7. Transmission System

The machine transmission system (see Fig. 4) is composed of spindle transmission system and X、Y、Z-axis motorized feed.

Transmission structure diagram is as follows:

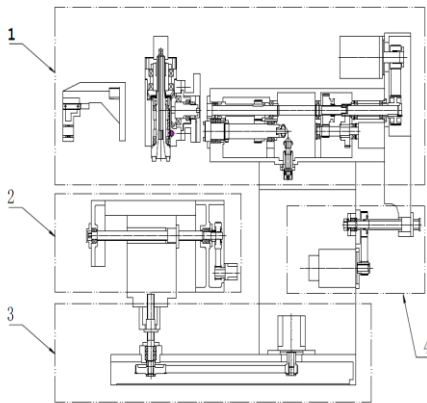


Fig. 10:

Machine transmission system diagram

1: Spindle transmission system 2: X-axis drive 3: Z-axis drive 4: Y-axis drive

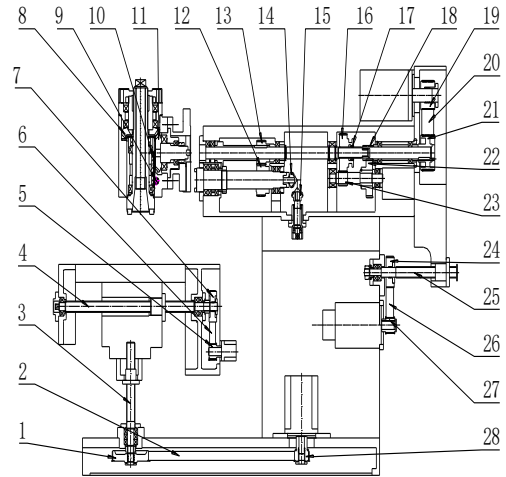


Fig. 11: Machine transmission parts diagram

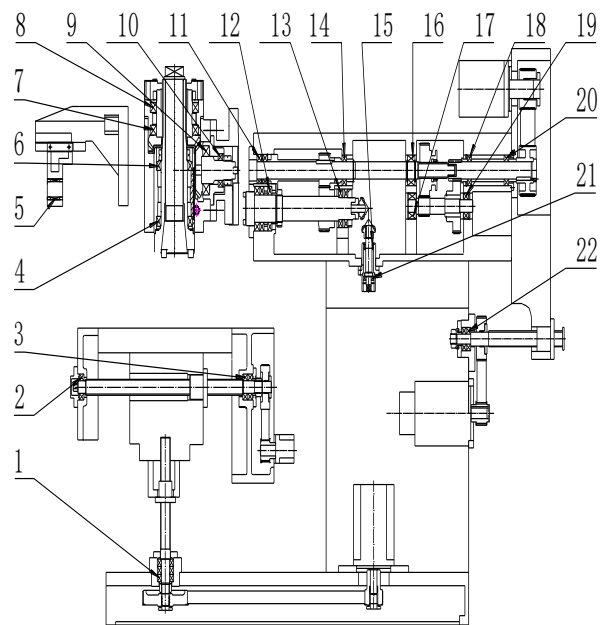


Fig. 12: Transmission system bearings distribution

1) Spindle transmission system (see Fig. 10 & Fig. 11)

The spindle transmission system is composed of ram gearbox and milling head, for detail, see block chart 4 in Fig. 10. For specific driving parts, see Fig. 11. And the transmission principle is as follows:

The flange type servo motor shaft has a small multi-wedge pulley 19, which transmits power to the large multi-wedge pulley 21 on the input shaft of ram box via wedge belt 20. The gear (gear 18) on input shaft is engaged with inner gear (gear 17) of sliding gear to form a direct drive, and achieve a high speed range of the spindle; while the spindle low speed is achieved as follows: first, outer gear (gear 16) on sliding gear is engaged with gear 23, then the power is transmitted to spindle through gear 18, gear 22, gear 23 and gear 16. Within power transmission chain, reduce speed via gear 13 and gear 12 to get large output torque.

There is a pair of spiral bevel gears in mill head, which achieves converting horizontal power into vertical power, so the machine can complete vertical milling.

2)X-axis drive (see Fig 10, Fig. 11)

X-axis drive is shown in block chart 2 in Fig. 10; for transmission parts, see Fig. 11, and the transmission principle is as follows:

X-axis feed motor is the servo motor, together with timing pulley and timing belt are mounted on the left side of vertical worktable. The rotation of the motor is carried out by the timing pulley 5, the timing belt 6 and the timing pulley 7, and transmit power to X-axis ballscrew 4 to make worktable move longitudinally.

3)Y- axis drive (see Fig 10, Fig. 11)

Y-axis drive is shown in block chart 4 in Fig. 10; for transmission parts, see Fig. 11, and the transmission principle is as follows:

Y-axis feed motor is the servo motor. The motor shaft is equipped with timing pulley 27. The power is transmitted to the large timing pulley 24 via the timing belt 26. While the timing pulley 24 is connected with leadscrew 25, so that the rotation of leadscrew 25 will drive ram moving to form Y-axis movement.

4)Z-axis drive (see Fig 10, Fig. 11)

Z-axis drive is shown in block chart 3 in Fig. 10; for transmission parts, see Fig. 11, and the transmission principle is as follows:

Z-axis feed motor is the servo motor, which is installed in the cavity of the bed on the upper part of base. On which, there is timing pulley 28, and then pass through timing belt 1 and timing pulley 2, the power is transmitted to the lifting leadscrew 3 to convert the source power of the motor into lifting movement.

Gear and Transmission Parts List(Fig.11)

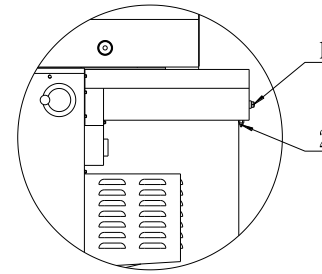
No.	Name	teeth	Module	Remarks
1	Timing pulley	45	T10	
2	Timing belt		T10	Lp=920
3	Z-axis ball screw	32x5		
4	X-axis ball screw	32x5		
5	X-axis small pulley	28	5M	
6	Timing belt		5M	HTD565-5M
7	X-axis large pulley	56	5M	
8	Gear	31	3.5	
9	Gear	12	1.5	
10	Gear	21	1.5	
11	Gear	36	3.5	
12	Gear	39	2	
13	Gear	33	2	
14	Gear	16	2.5	
15	Gear	16	2.5	
16	Gear	53	2	
17	Gear	19	2	

18	Gear	19	2	
19	Multi-wedge pulley			
20	Multi-wedge belt			20-PJ-700
21	Multi-wedge pulley			
22	Gear	53	2	
23	Gear	19	2	
24	Timing pulley	56	5M	
25	Leadscrew	32x5		
26	Timing belt			HTD-550-5M
27	Timing pulley	28	5M	
28	Timing pulley	18	T10	

Rolling Bearings List (see Fig. 12)

No.	Name	Model	Qty.	Remarks
1	Bearing	7602025TN/P4TBT	1	HBB
2	Bearing	6205-2RS-GB/T276	1	
3	Bearing	7602025TN/P4DB	1	HBB
4	Bearing	32009/P6 GB/T297	1	
5	Bearing	RNA6905 GB/T5801	1	
6	Bearing	32009/P6 GB/T297	1	
7	Deep groove ball bearing	6015-2Z GB/T276	1	
8	Bearing	6015-2Z GB/T276	1	
9	Bearing	7211C/P6	1	
10	Deep groove ball bearing	6008-2Z GB/T276	1	
11	Deep groove ball bearing	61907-Z GB/T276	2	
12	Bearing	71911ACTA/P4/TBT/B	1	HBB
13	Bearing	71909ACTA/P4/DB/B	1	HBB
14	Deep groove ball bearing	6007-2Z GB/T276	1	
15	Deep groove ball bearing	61804-2Z GB/T276	1	
16	Deep groove	6007-2Z GB/T276	1	

	ball bearing			
17	Bearing	NJ205E GB/T283	1	
18	Deep groove ball bearing	6007-2Z GB/T276	1	
19	Deep groove ball bearing	6205-2LS GB/T276	1	
20	Deep groove ball bearing	6007-2Z GB/T276	1	
21	Deep groove ball bearing	16003-2Z GB/T276	1	
22	Bearing	7602020TN/P4 DB	1	HBB



9. Cooling System

Machine coolant tank is installed in the base. And the coolant pump is on the base. The cutting fluid is supplied from coolant pump, through cooling pipe, flows to machine points. Then the coolant will return back to the tank in base for recycling. The coolant drain hole is at the side of the base.

10. Machine Operation

8. Lubrication System

- 1) Milling head: the gears in milling head are lubricated by means of oil splashing. Observe the oil level of lubricant in milling head through oil leveler. If the oil level is too low, add the lubricant in time. The new machine tool carries out the first oil change after three month use, after that change the oil every half a year. The bearings in milling head are lubricated by pre-loaded grease.
- 2) Ram box: the box itself is the oil pool. Splash oil at the bottom of oil pool onto gears through the rotation of oil pan or gear assembled on transmission shaft, to achieve gears or part of bearings lubrication. The first oil exchange is at three month after machining, after that change the oil every half a year. The daily maintenance is only to ensure the liquid level in the box through observing the liquid level oil leveler on the box.
- 3) Leadscrew, guideway and bearing lubrication: The machine tool is equipped with automatic lubrication pump, which can realize X、Y、Z-axis guideways and leadscrews lubrication. When the oil in the automatic lubrication pump is low, add oil in time.

Note: There is an oil box at the back of the bed (as shown below). The oil box has an oil window 1 and an oil plug 2. When the oil in the oil box reaches the position of the oil window 1, the oil plug 2 is needed to be released, and the oil in the oil box is released. Do not need to fill the oil box manually.

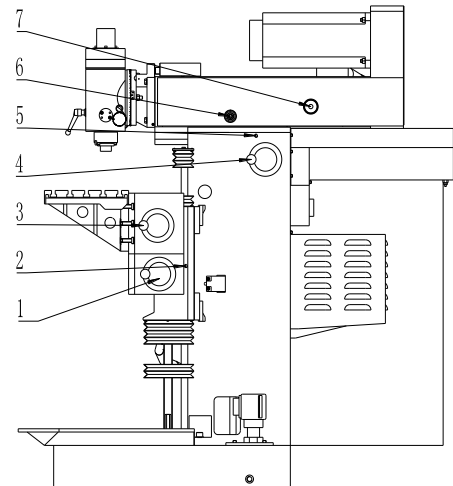


Fig. 13: Machine operation position 1

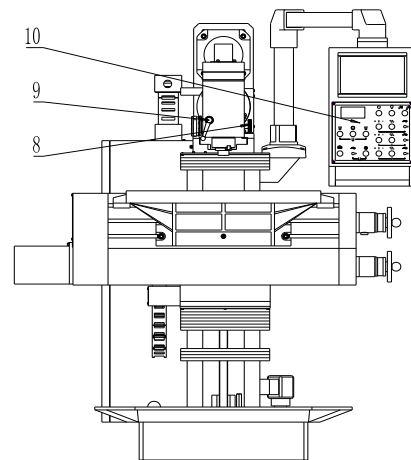


Fig. 14: Machine operation position 2

For machine operation positions, see Fig. 13 and Fig. 14.

The parts are as follows:

- 1. Z-axis electric handwheel; 2. Z-axis lock bolt
- 3. X-axis electric handwheel; 4. Y-axis electric handwheel;
- 5. Y-axis lock bolt; 6. Horizontal axis tool unclamp handle;
- 7. Spindle speed change handle; 8. Sleeve lifting handle;
- 9. Sleeve locking handle; 10. Operation panel

The operation panel is as follows:

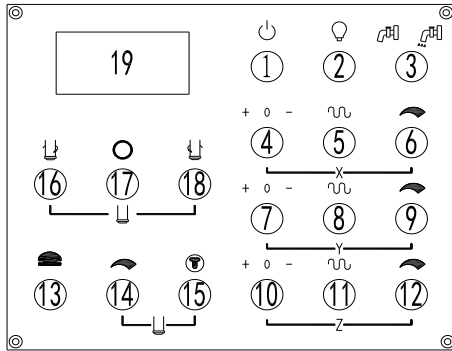


Fig. 15: Operation panel diagram

The functions of these buttons:

- 1, Power start feed; 2, Power indicator
- 3, Cooling; 4, x-axis forward or reverse feed
- 5, X-axis rapid move; 6, X-axis feed rate regulation;
- 7, Y-axis forward or reverse feed; 8, Y-axis rapid move;
- 9, Y-axis feed rate regulation; 10, Z-axis forward or reverse feed
- 11, Z-axis rapid move; 12, Z-axis feed rate regulation;
- 13, Emergency stop; 14, Spindle speed regulation;
- 15, Spindle jog; 16, Spindle forward
- 17, Spindle stop; 18, Spindle reverse
- 19, Spindle speed display

11. Machine adjustment

a) Horizontal spindle bearing adjustment:

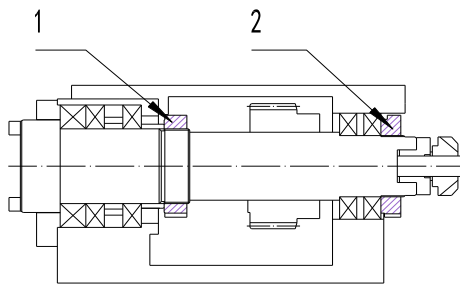


Fig. 16: Horizontal spindle bearing adjustment

Remove the cover plate at side of ram, and unscrew the bolts on round nut 1 and nut 2. Then, tighten two round nuts properly to adjust the accuracy. After adjusting, lock the bolts on nuts.

b) Vertical spindle bearing adjustment:

Dismount spindle and sleeve assembly, and release the bolt on round nut 1. Then, rotate the round nut to adjust the accuracy. At last, tighten the bolt on nut 1.

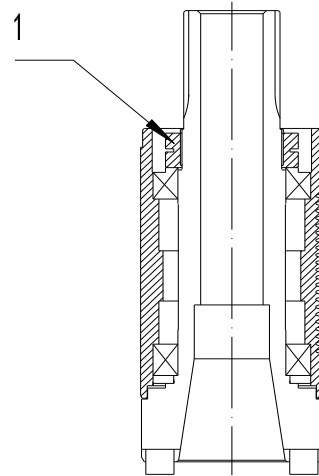


Fig. 17: Vertical spindle bearing adjustment

c) Milling head angle adjustment:

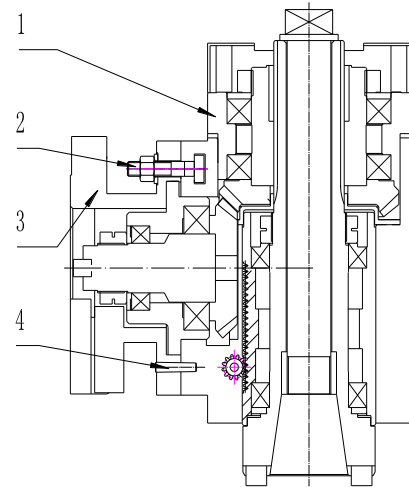


Fig. 18: Milling head angle adjustment

Shown as the above figure, milling head shell 1 can rotate around milling head rest 3. Before turn the vertical spindle, release T-slot bolt and nut 2, make milling head shell 1 rotate around milling head rest 3 for a desired angle, then lock T-slot bolt and nut 2.

If the spindle is in vertical state, before rotation, dismount positioning pin 4; while after finishing rotation, insert the positioning pin.

12. Maintenance and servicing

During machine running, incorrect operation and maintenance will cause machine failures. At this time, stop the machine at once, and remove the failure according to the methods listed in the Manual. But, when the failure has not yet been identified or has not mastered the repair technology, shall not be disassembled and repaired. Contact the manufacturer in time, and ask for assist in inspection and repair.

Do not allow to change handle position during machine running. Before change the handle position, stop the machine firstly.

13. Common trouble and trouble shooting

	Trouble	Cause	Trouble Shooting
1	No power while machine starts	<ol style="list-style-type: none"> 1) input power is not correct 2) incorrect connection 3) terminal is loose 	<ol style="list-style-type: none"> 1) Input the correct power 2) Connect correctly 3) Press terminals
2	Spindle temperature rise out of limit	<ol style="list-style-type: none"> 1) Bearing damage 2) Lack of grease 3) Bearing is too tight 	<ol style="list-style-type: none"> 1) Replace the bearing 2) Add grease 3) Adjust bearing gap
3	Big noise of spindle	<ol style="list-style-type: none"> 1) Gears damage 2) Gap between gears is improper 3) Spindle bearing wear 	<ol style="list-style-type: none"> 1) Repair the gears 2) Adjust the gap of gear 3) Adjust the clearance or replace bearing
4	Movement parts jog	<ol style="list-style-type: none"> 1) insufficient lubrication of guideway 2) drive bearing is damaged 	<ol style="list-style-type: none"> 1) Check pipeline for jam or oil distributor broken. 2) Repair the bearing
5	No coolant	<ol style="list-style-type: none"> 1) coolant filter blockage 2) pipeline leaking or hose is folded 3) nozzle blockage 	<ol style="list-style-type: none"> 1) Clean filter, replace new coolant 2) Replace hose 3) Clean nozzle
6	Coolant pump failure	<ol style="list-style-type: none"> 1) Electrical components are abnormal 2) Cooling pump blocking 3) Motor rotates in wrong direction 4) No coolant 	<ol style="list-style-type: none"> 1) Check air switch or thermal relay 2) Clean cooling pump 3) Reconnect the wiring 4) Add coolant;
7	Spindle vibration	<ol style="list-style-type: none"> 1) Cutting parameter selection is not reasonable 2) Spindle bearing loose or damaged 3) No clamping of workpiece or clamping method is wrong 	<ol style="list-style-type: none"> 1) Adjust the cutting parameters 2) Check or replace the bearing 3) Clamp the workpiece or change the method

14. Main quick-wear parts:

No.	Name	Specification	Qty.	Remarks
1	Machine frame oil seal	B 32x47x8	1	For JUTM-1230、1632
2	Machine frame oil seal	B 40x55x8	1	For JUTM-1834
3	O-ring	Φ110 (ID) x2.65 (section)	1	
4	O-ring	Φ10 (ID) x1.8 (section)	4	

15. List of documents supplied with machine tool

No.	Description	Qty.	Remarks
1	Operation Manual	1 copy	
2	Certificate of Quality	1 copy	
3	Packing List	1 copy	

15. Environmental protection

Protect the environment.

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

**16. Available accessories**

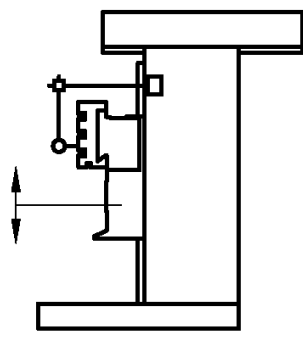
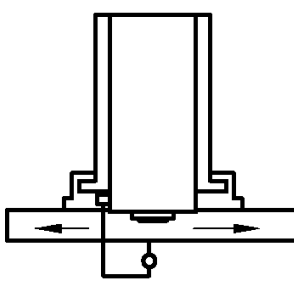
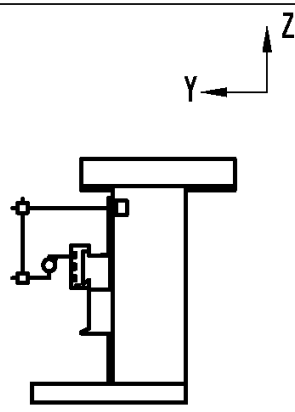
Refer to the JET-Price-list

1. Geometric accuracy

No.	Item	Diagram	Accuracy (mm)	
			Tolerance	Actual
G1	Flatness of worktable surface		at length of 1000: 0.040 (0.03/750) Local tolerance: 0.020/300	
G2	Straightness of lifting platform vertical movement: a: in horizontal plane; b: in vertical plane.		a: 0.020/300 b: 0.020/300	
G3	Verticality of horizontal worktable surface to be vertical guideway: a: in horizontal plane; b: in vertical plane.		a: 0.020/300 $\alpha \leq 90^\circ$ b: 0.020/300	

Certificate of Quality

Total 6
Page 2

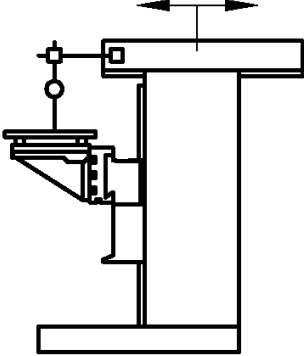
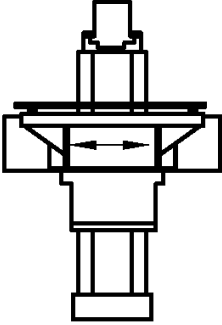
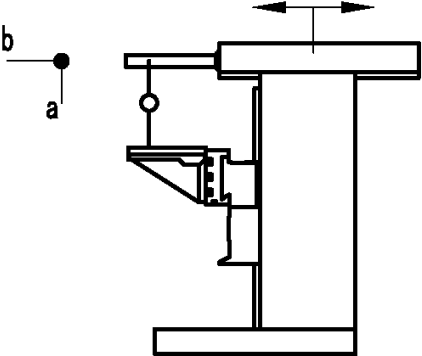
No.	Item	Diagram	Accuracy (mm)	
			Tolerance	Actual
G4	Parallelism in vertical plane of worktable surface to lifting table vertical movement.		0.020/300 (top end of worktable only tend to the bed)	
G5	Parallelism in vertical plane of worktable surface to worktable longitudinal movement		0.015/300 0.030 at the full length	
G6	Parallelism for side face of positioning T-slot to worktable longitudinal movement (X-axis)		0.015/300 0.030 at full length	

No.	Item	Diagram	Accuracy (mm)	
			Tolerance	Actual
G7	Runout of spindle nose: a) Radial runout of spindle centering journal b) Axial play c) Runout of spindle shoulder bearing surface		a: 0.010 b: 0.010 c: 0.015	
G8	Radial runout of horizontal spindle cone hole: a) Near to spindle end b) 300mm distance to spindle end		a: 0.010 b: 0.020	
G9	Verticality of horizontal worktable longitudinal movement to ram cross movement:		0.020/300	

Certificate of Quality

Total 6

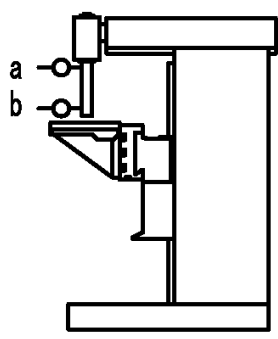
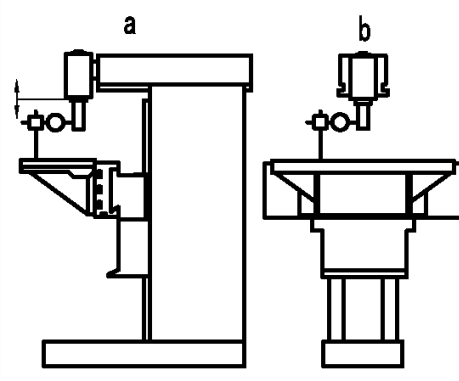
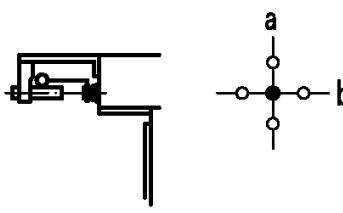
Page 4

No.	Item	Diagram	Accuracy (mm)	
			Tolerance	Actual
G10	Parallelism of ram cross movement to horizontal worktable		0.020/300 0.030 at full length (fix ram at front of machine, only down)	
G11	parallelism of horizontal worktable surface to worktable longitudinal movement		0.015/300 0.030 at full length	
G12	parallelism of horizontal spindle rotation axis to ram cross movement: a) in vertical plane b) in horizontal plane		a: 0.020/300 b: 0.020/300	

No.	Item	Diagram	Accuracy (mm)	
			Tolerance	Actual
G13	Parallelism of T-slot in the middle of horizontal worktable to worktable longitudinal movement		0.015/300	
G14	Verticality of vertical spindle rotation axis to horizontal worktable surface: a) in transverse plane b) in longitudinal plane		a: 0.020/300 $\alpha \leq 90^\circ$ b: 0.020/300	
G15	Runout vertical to spindle end: a) Radial runout of spindle centering journal b) Axial play c) Runout of spindle shoulder bearing surface		a: 0.010 b: 0.010 c: 0.015	

Certificate of Quality

Total 6
Page 6

No.	Item	Diagram	Accuracy (mm)	
			Tolerance	Actual
G16	Radial runout of the vertical spindle taper axis: a) near to spindle end b) 300mm to spindle end		a: 0.010 b: 0.020	
G17	Parallelism of vertical spindle rotation axis to vertical spindle sleeve: a) in transverse plane b) in longitudinal plane		a: 0.010 b: 0.010	
G18	coincidence of the axis of the shank bracket hole to rotation axis of the horizontal spindle: a) in vertical plane b) in horizontal plane		a: 0.020 b: 0.030	