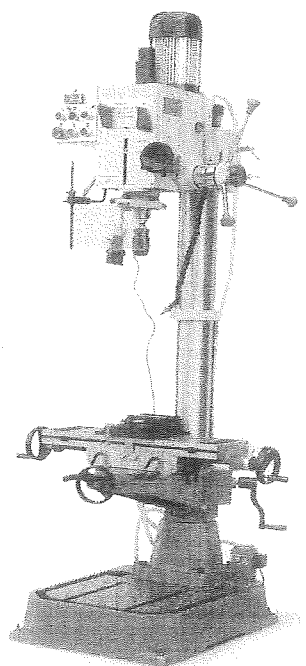




DRILLING & MILLING MACHINE

MODEL : ZX-40BPC



Instruction manual

ENGLISH

CE

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I. Safety Rules

- 1、 Read this manual carefully, acknowledge the structure and feature of machine in prevent of potential danger.
- 2、 Be sure that the voltage and frequency on the data sheet is consistent with the power supply before operating
- 3、 The power plug and the antennas in it must be reliable instead of being loose or untouched..
- 4、 Don't abuse power lines or pull the line of the outlets forcefully. The power lines must be far away from place where it is hot, too greasy or with sharp-pointed things.
- 5、 The machine must be on the earth reliable.
- 6、 If there are some problems, cut off power immediately, turn off the switch then check and repair.
- 7、 When the machine is working、 checking and debugging, install a dusty shield on the working place.
- 8、 Before working, remove all the tools eg. Wrench which leaving on the machine.
- 9、 Keep the work place clean, the disorder 、 moisture 、 faint light and inflammable place is not suitable to run the machine.
- 10、 Don't the children near the machine and keep the entire visitor away the safe distance.
- 11、 Raise the alert when working.
- 12、 Don't overload the machine by putting too much than its maximum cutting capacity.
- 13、 Don't wear loose clothing, gloves, necklaces or jewelry to get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair. Roll long sleeves above the elbow.
- 14、 Do not operate the machine under the tiredness、 drinking and palsy.
- 15、 Keep proper footing and balance at all time.
- 16、 Maintain the machine regularly; keep the tools sharp and clean.
- 17、 Make sure the switch on OFF before connect the power to avoid the incident.
- 18、 Use the accessory by our company product or recommended.
- 19、 Don't store sundries near or above the machine, in case of serious incident.
- 20、 Check the easily damaged parts in order to repair and place in time.
- 21、 When cutting large diameter holes, keep the speed slower.
- 22、 Before the machine working must tighten handle which should be clamped the work piece firmly to the table.

II. Main applications and suitable scope

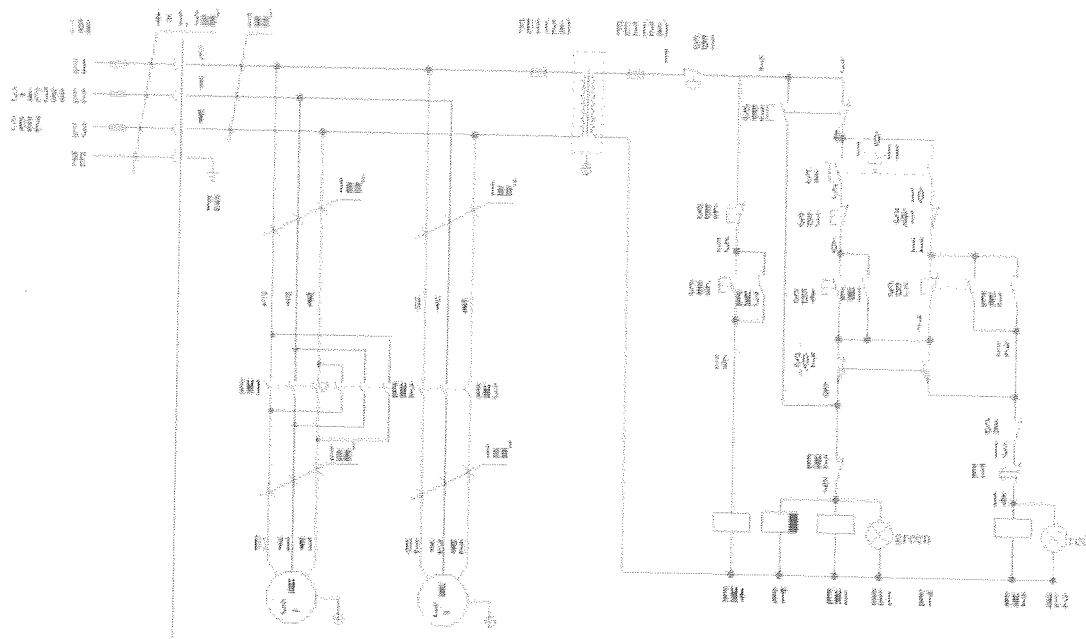
This machine can be used in drilling, extending or reaming within 45/40mm hole on the cast iron and tapping within M12mm screw, milling section width below 80mm, keyway below 22mm. It is suit for cutting and face process and fix of a little batch accessory.

III. Technical Parameters

Max. Drilling Capacity	40mm
Max. Face Milling Capacity	80mm
Max. End Milling Capacity	28mm
Max. Tapping Capacity	12mm
Spindle travel.....	120mm
Spindle taper.....	MT4
Spindle speed.....	95,170,280,540,960,1600r/min
Max. Distance spindle nose to worktable.....	475mm
Distance spindle to column surface.....	260mm
Dimension of worktable surface.....	730×210mm
Motor.....	1100W
Packing Dimension.....	72×74×191cm
Net weight.....	375kg

Power connection

When you use the machine first time, you should ask a qualified electrician to install fuse and turn the power supply switch to STOP position. Connect the power, the power supply in a stop position. (electric principle diagram, see fig.2)



ZX-40BP/BPC

V、 Main Structure and work principle

The position of main structure and every handle, please see fig.3.

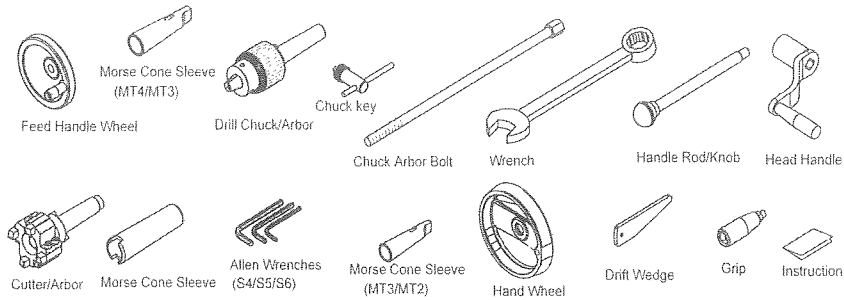
The mainly transmission route: the spindle rotated by pulley insert which the motor through three-class gear. When use the 1400r/min motor as power source, you can get six classes speed by the changing position of moving gear (transmission system, see fig 4)

The spindle feeding structure has two forms. Direct feeding form: the spindle feeding is drove by the feeding handle which installed on the gear spindle, the spindle feeding 88mm when the gear moving one cycle. Jiggle feeding form: the jiggle feeding handle drive the worm, through the prick clutch drive the gear to moving, make the spindle feed, the spindle feeding 2.5mm when jiggle running one cycle.

It can realize the drilling 、 tapping and milling function, which controlled by diversion switch.

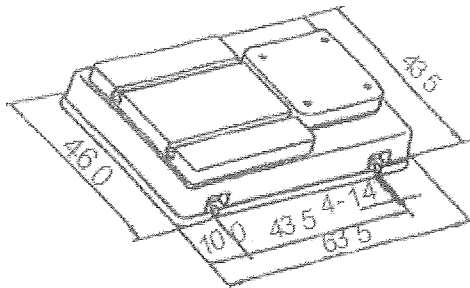
IV. Unpacking, checking and installation

Machine packed by wooden case. When you unpacking it, please open the accessory box first. Then do as follows: Besides the drilling and milling machine, please check your machine to see parts listed below (Quantity as follows):

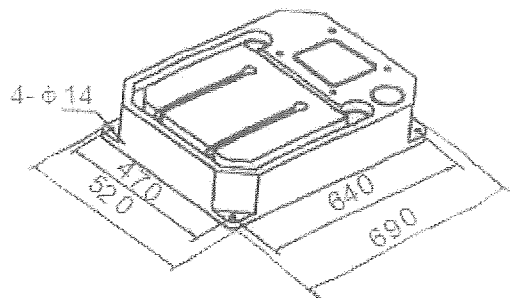


Put these parts at a suitable place. Move away machine from the baseboard (put some soft material under the spindle case, avoid damaging the varnish), clear the oil from the surface of the machine process, and paste lubricant.

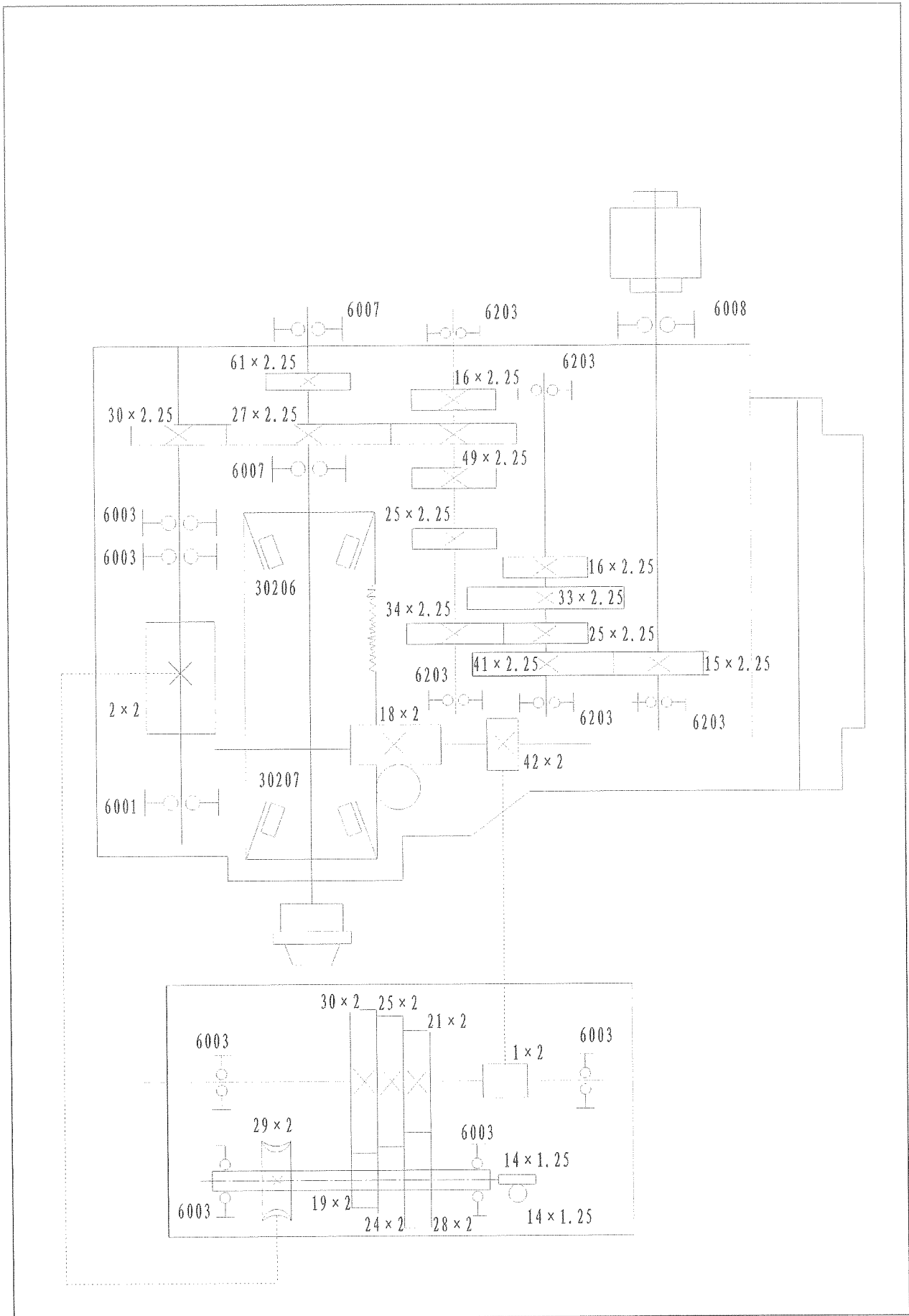
- (1) If your machine have stand, you only have to fix it on the stand.
- (2) If the machine haven't the stand. Then you should drill holes on the base table as the machine measurement diagram (See fig.1). Then fix it on the baseboard by screw.

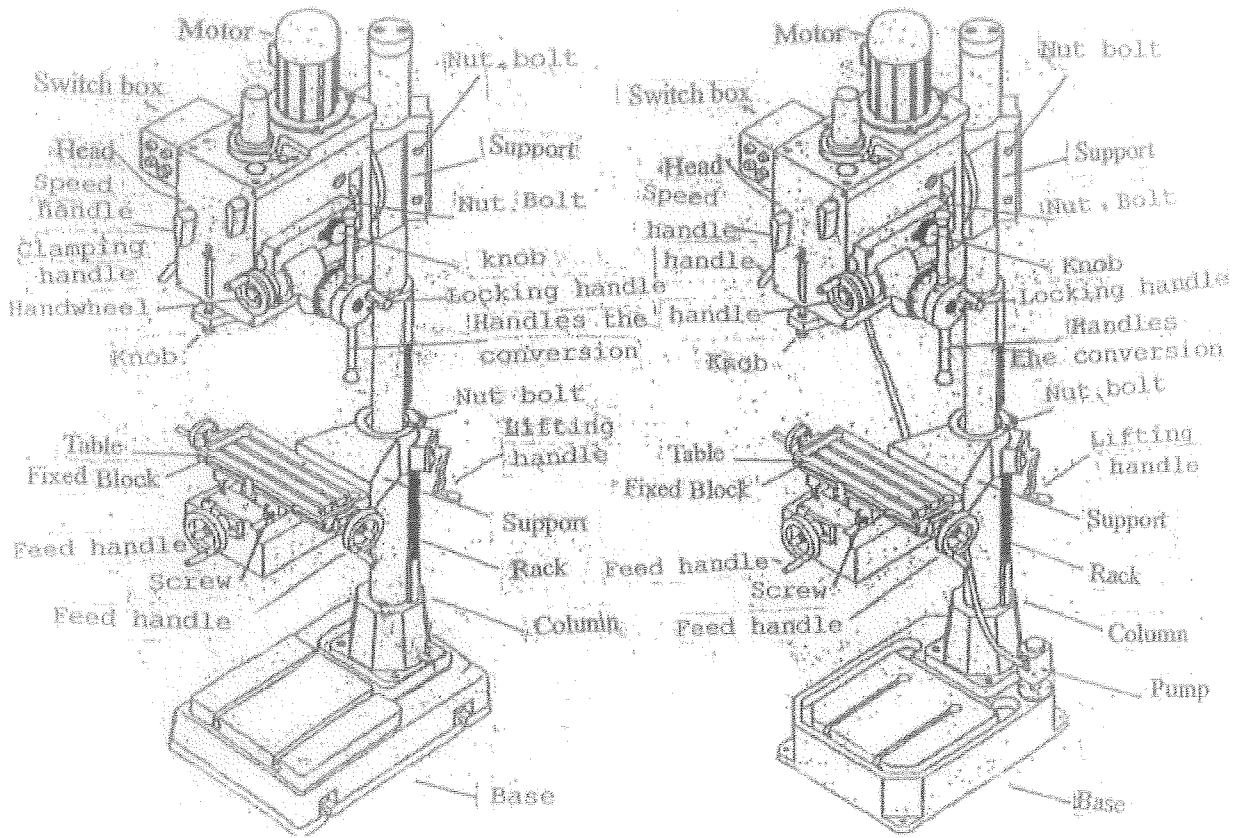


ZX-40BHC



ZX-40BPC





MACHINE TRANSMISSION SYSTEM DRAWING

(2)、The two baffle boards and one in the front of the worktable are used for process limited position。When use it , loosen the screw on the board by allen wrenches ,move the board to the foresee position, then tighten the screw。

(3)、Worktable can move portrait and landscape orientation, rotate the handle wheel between worktable and base-table, it can obtain the worktable feeding, at this time the leaf screws on the worktable are all under the relaxed condition。

(4)、The compensation after worktable move portrait and landscape orientation gap damaged。

Use the tool to adjust screws until shaking the worktable feel a little tired。

(5)、The T slot measurement of worktable。(see fig.6)

4、 Adjust the spindle speed(see fig.7)

Adjust the spindle speed, you must be reference

to the speed plate and adjust the speed handle

to proper position. If the speed handle isn't agile,

please take move the cover and rotate the spindle

Then do it. If the speed handle appears to skid,

please you tighten the screw.

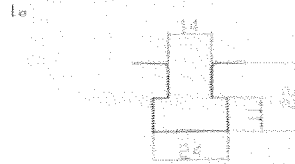


Fig.6

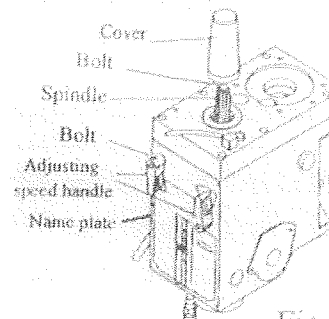


Fig.7

Attention: Exchange the speed only after the machine stopped running.

5、 Drilling (see fig.8&10)

(1)、 Installing drill chuck or drill. Use clean

Cloth to clear all parts of drill chuck or drill, and then put it in the end of spindle. For the drill chuck you should use bolt to pull it, in order to take away the cover, put the bolt into the spindle hole, rotate and fasten the bolt, let it pull the drill chuck, then close the cover. (See figure 7) rotate the cover of drill chuck make the jaw has enough patulous, then put the

drill in, then fasten the jaw by drill chuck key

, tighten the drill.

(2)、 Adjust the drill hole depth. Rotate the button to the arranged position according to the ruler of the instruction board.

(3)、 Drilling Rotate the handle, make the handle and worm wheel move away, rotate the spindle feeding handle. That's Ok. Also can rotate the jiggle feeding wheel, make the jiggle cutting.

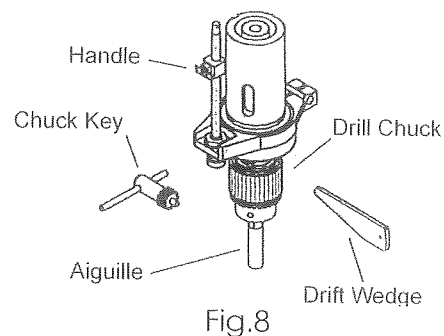


Fig.8

VI、 Operation (see fig.3)

1、 (1)、 Operation

Before Operation	After Operation
(a) Fill in lubricant	(a) Switch off power supply
(b) Make sure no sundries on worktable	(b) Take off tools
(c) Make sure jig is correctly installed, work piece is tighten	(c) Wash the machine
(d) Make sure the spindle speed is proper	(d) Fill in Lubricant
(c) Make sure everything is ready before use	(e) Use cover (or a piece of clean cloth) cover machine

(2)、 In order to avoid damaging the machine, you'd better use small than $\phi 40\text{mm}$ (ZX-40HC/PC)、 $\phi 45\text{mm}$ (ZX-40BPC) drill and small than $\phi 28\text{mm}$ cutter, when milling please use the cutter which are provided.

(3)、 When use the machine to cutting ,avoid bits falling on the moving path of the worktable.

2、 Adjustment of head

(1)、 Up and down of the head Loosen firm handle of column, rotate the handle make the spindle to the position you want, then firm the handle.

(2)、 head rotate

The head can move around the spindle 360° , loosen the firm handle and screw , adjust the angle of head, then firm the handle.

(3)、 The rotating of the head.(see the fig5.)

The head can move around stand, using 24mmr two-ways wrench to loose pulley nut, screw, rotate the head to viewed angle, then tighten :

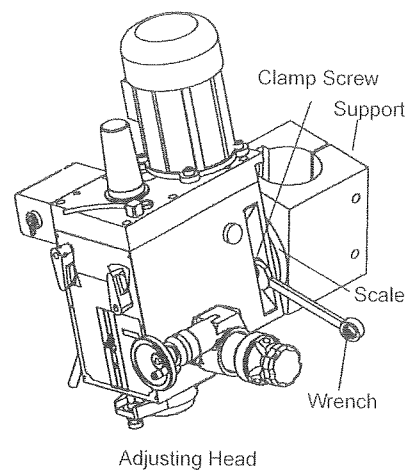


Fig.5

3、 Adjustment of worktable and operation.

(1)、 The two leaves screw in the front of and on the left of worktable are uses for lock worktable, when it need, it can lock worktable's portrait and landscape orientation movement, when drilling, you'd better lock it tightly, avoid work piece shaking

VII、 Accessories

1、 Standard accessories

(1)、 Φ 16mm chuck	1/set
(2)、 Φ 80mm cutter	1/set
(3)、 Arbor MT3/MT2	1/pc
(4)、 Arbor MT4/MT3	1/pc
(5)、 Drift wedge	1/pc
(6)、 Allen key 4,5,6	each of 1/pc
(7)、 24mm Two-way wrench	1/pc
(8)、 Bolt	1/pc
(9)、 Handle	1/set
(10)、 Arbor MT4/B18	1/pc

VIII、 Maintenance

i. Daily maintenance (by operator)

(1)、 Fill the lubricant on the point before starting machine (include every oil cups and track surface on the worktable).

(2)、 If the temperature of spindle too hot or have deviant noisy, stop the machine immediately to check it.

(3)、 Keep work area clean: Release vise, tools and so on from the worktable and leave after lubricate the machine.

ii. Weekly maintenance

Check to see whether sliding surface and turning parts lack of lubricant. If yes, Please fill it in time.

iii. Monthly maintenance

(1)、 Adjust the accurate gap of slide both on portrait & landscape orientation feeding.

(2)、 Lubricate bearing, gear and rack.

iv. Yearly maintenance

(1)、 Adjust table to horizontal position for keep a accurate.

(2)、 Check wires, plug at least per a year to avoid loosening or wearing our.

(3)、 Replace the lubricant in head every year.

(4)、Discharge of drill chuck and drill When discharge the drill chuck, firstly pull out the bolt from spindle, rotate spindle handle, make the quill reduce to the waist slot, put the drift wedge into it, strike the drift wedge with wood stick, then hold the drill chuck or drill so it is discharged.

6、Milling (see fig.9&10)

(1)、Installing cutter The method of installing cutter is the same as installing drill chuck.

But when install cutter need to put the.

(2)、Milling After install the Work piece, rotate the handle, make the base handle join with worm wheel, operate the machine, rotate the jig table

handle wheel to make the cutter reach its needed position, move the lock handle tighten quill. Rotate the portrait and landscape orientation handle of the worktable, then it works.

(3)、Discharge the cutter, the discharge of the cutter is the same as the drill chuck.

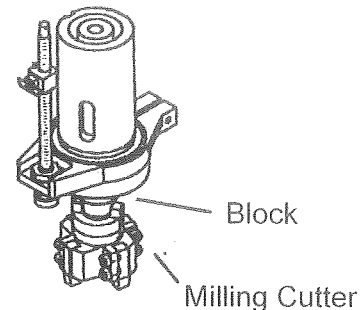


Fig.9

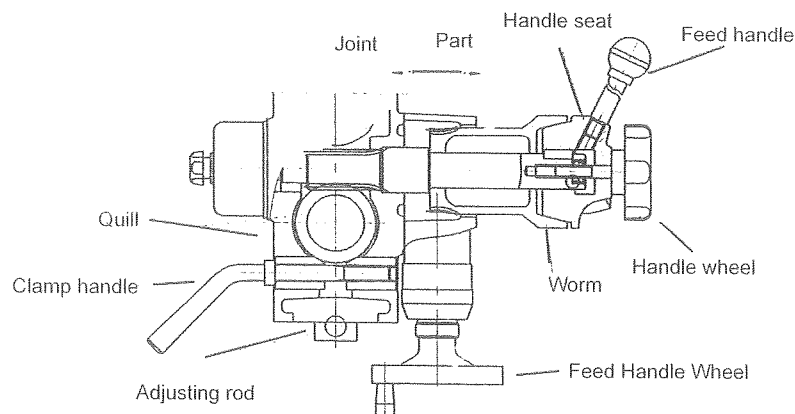


Fig.10

7、Tapping

(1)、Rotate the knob which below the spindle, adjust the tapping depth.

(2)、Make the power supply knob to the tapping position, press the green know, the spindle rotate. When the tapping to a certain depth, the machine counter-rotate immediately, make the tapping chuck drop out.

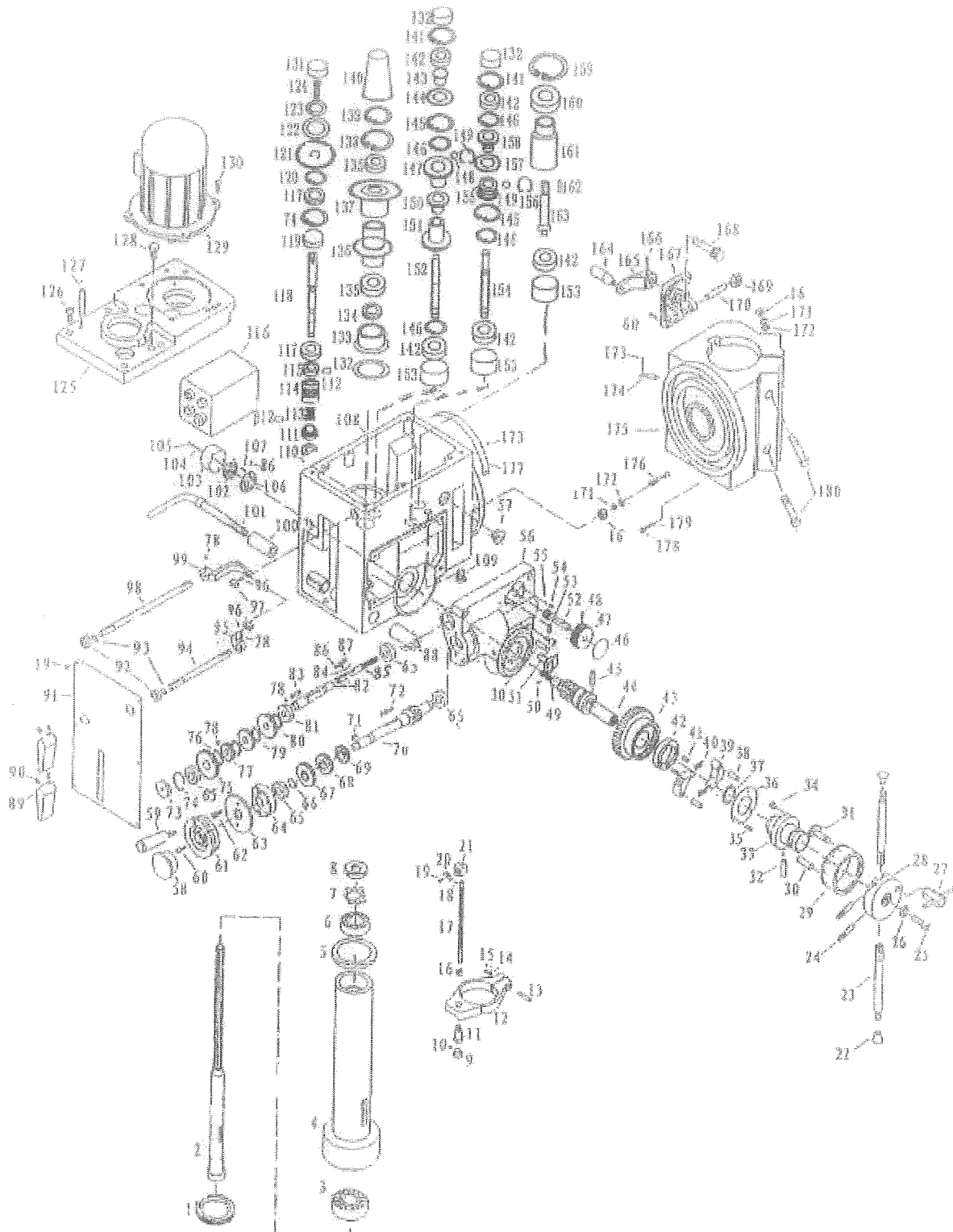
(3)、If some emergent thing occur in the working process, press the red-mushroom button, the spindle counter-rotate at once and drop out. Rotate the red-mushroom button according to arrowhead direction.

X、 Trouble shooting

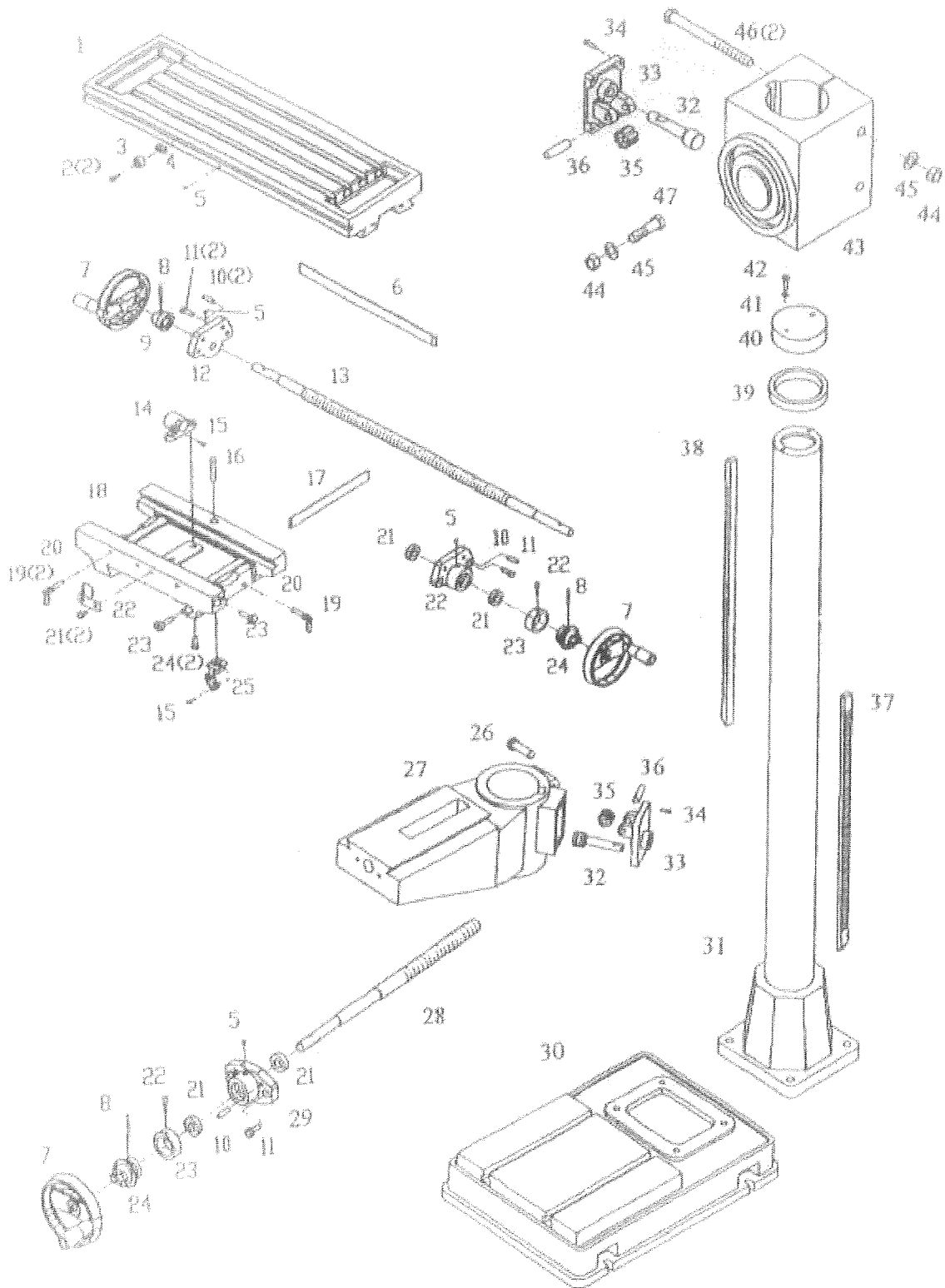
Trouble	Problem Cause	Remedy
Motor over heating or no power	<ol style="list-style-type: none"> 1. Over-load 2. Lower voltage 3. Damaged motor 4. Poor contact or aging wire 	<ol style="list-style-type: none"> 1. Decrease the feed load 2. Adjust voltage 3. Replace with new one 4. Check the wire and replace it
The temperature of the spindle bearing is too hot	<ol style="list-style-type: none"> 1. Spindle bearing isn't enough lubricate 2. Turning with high speed for a long time 	<ol style="list-style-type: none"> 1. Fill in the lubricant 2. Adjust the spindle speed
Unsteady jig feeding work	<ol style="list-style-type: none"> 1. Not connect between base handle and worm wheel 2. Damaged worm wheel and worm 3. Loosen screw on the jig feeding handle wheel 	<ol style="list-style-type: none"> 1. Tighten the handle 2. Replace worm wheel and worm 3. Tighten the screw
Unbalance of worktable travel	<ol style="list-style-type: none"> 1. Loosen portrait leaf screw 2. Feeding too deep 	<ol style="list-style-type: none"> 1. Adjust the screw 2. Decrease depth of feeding
Excessive spindle and roughness of working surface	<ol style="list-style-type: none"> 1. The gap of spindle bearing too wide 2. Loosen drill chuck 3. Dull cutter 4. Loosen work piece 	<ol style="list-style-type: none"> 1. Adjust the gap in proper or replace bearing with new one 2. Fasten drill chuck 3. Reshaped it 4. Tighten work piece
Drill burns	<ol style="list-style-type: none"> 1. Improper speed 2. Removing bits not smoothly 3. dull drill 4. feed too slow 	<ol style="list-style-type: none"> 1. Adjust the speed 2. Withdraw drill, clean up it 3. resharpen drill 4. speed up it
Without accuracy in performance	<ol style="list-style-type: none"> 1. Imbalance of heavy work piece 2. Often us hammer to strike work piece 3. Inaccurate horizontal table 	<ol style="list-style-type: none"> 1. Must consider the principle of balance while holding work piece 2. Forbidden to use hammer 3. Maintain table regularly
Work piece or clamp loosen or rotated	Work piece or clamp not fasten tightly on the work table	Fasten it completely

X、 Trouble shooting

Trouble	Problem Cause	Remedy
Motor over heating or no power	<ol style="list-style-type: none"> 1. Over-load 2. Lower voltage 3. Damaged motor 4. Poor contact or aging wire 	<ol style="list-style-type: none"> 1. Decrease the feed load 2. Adjust voltage 3. Replace with new one 4. Check the wire and replace it
The temperature of the spindle bearing is too hot	<ol style="list-style-type: none"> 1. Spindle bearing isn't enough lubricate 2. Turning with high speed for a long time 	<ol style="list-style-type: none"> 1. Fill in the lubricant 2. Adjust the spindle speed
Unsteady jig feeding work	<ol style="list-style-type: none"> 1. Not connect between base handle and worm wheel 2. Damaged worm wheel and worm 3. Loosen screw on the jig feeding handle wheel 	<ol style="list-style-type: none"> 1. Tighten the handle 2. Replace worm wheel and worm 3. Tighten the screw
Unbalance of worktable travel	<ol style="list-style-type: none"> 1. Loosen portrait leaf screw 2. Feeding too deep 	<ol style="list-style-type: none"> 1. Adjust the screw 2. Decrease depth of feeding
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Drill burns	<ol style="list-style-type: none"> 1. Improper speed 2. Removing bits not smoothly 3. dull drill 4. feed too slow 	<ol style="list-style-type: none"> 1. Adjust the speed 2. Withdraw drill, clean up it 3. sharpen drill 4. speed up it
Without accuracy in performance	<ol style="list-style-type: none"> 1. Imbalance of heavy work piece 2. Often us hammer to strike work piece 3. Inaccurate horizontal table 	<ol style="list-style-type: none"> 1. Must consider the principle of balance while holding work piece 2. Forbidden to use hammer 3. Maintain table regularly
Work piece or clamp loosen or rotated	Work piece or clamp not fasten tightly on the work table	Fasten it completely



ZX-40HC/PC BASE & COLUMN PARTS DIAGRAM



HEAD PARTS LIST

No.	NAME	No.	NAME	No.	NAME	No.	NAME
1	Bearing cover	35	Screw	69	Gear	103	Spring cap
2	Spindle	36	Cover	70	Worm	104	Washer
3	Bearing	37	Retaining Ring	71	Key	105	Knob
4	Sleeve	38	Pin	72	Key	106	Sleeve
5	Mat	39	Clutch Claw	73	Cover	107	Screw
6	Bearing	40	Spring	74	Retaining Ring	108	Head
7	Lock Washer	41	Pin	75	Worm feeding	109	Oil plug
8	Nut	42	Seat	76	Washer	110	Bearing
9	Knob	43	Gear	77	Gear	111	Nut
10	Pin	44	Pinion Shaft	78	Screw	112	Screw
11	Positioning units	45	Pin	79	Gear	113	Spring
12	Feeding seat	46	Oil level pointer	80	Gear	114	Worm
13	Screw	47	Knob	81	Ring	115	Clutch
14	Washer	48	Screw	82	Shaft	116	Switch box
15	Nut	49	Block	83	Key	117	Bearing
16	Nut	50	Screw	84	Spring	118	Vertical axis
17	Adjusting rod	51	Screw	85	Rack	119	Ring
18	Pin	52	Gear	86	Pin	120	Ring
19	Screw	53	Zero set	87	Key	121	Gear
20	Indicator	54	Spring	88	Block	122	Washer
21	Limit block	55	Steel ball	89	Handle	123	Washer
22	Handle the ball	56	Gear Case	90	Screw	124	Screw
23	Handle bar	57	Oil level pointer	91	Nameplate	125	Cover
24	Pin	58	Cover	92	Oil cover	126	Screw
25	Screw	59	Handle	93	Retaining Ring	127	Pin
26	Washer	60	Screw	94	Shaft	128	Plug
27	Clamp Handle	61	Handwheel	95	Fork	129	Motor
28	Handle Seat	62	Screw	96	Pin	130	Screw
29	Dial	63	Zero set	97	Block	131	Closures
30	Pin	64	Cover	98	Shaft	132	Washer
31	Tension Screw	65	Bearing	99	Fork	133	Seal Block
32	Pin	66	Retaining Ring	100	Block	134	Oil cover
33	Set	67	Gear	101	Clamp handle	135	Bearing
34	Step Pin	68	Gear	102	Spring	136	Gear

Base & Column Parts List

No.	NAME	No.	NAME	No.	NAME	No.	NAME
1	Table	2	Nut	3	"T" Nut	4	Baffle piece
5	Oil cup	6	Gib strip	7	Feeding wheel	8	Pin
9	Clutch	10	Screw	11	Pin	12	Seat
13	Screw	14	Nut	15	Screw	16	Screw
17	Gib strip	18	Center base	19	Leaf screw	20	Steel ball
21	Screw	22	Baffle board	23	Screw	24	Screw
25	Nut	26	Bolt	27	Preserve	28	Plate
29	Screw	30	Seat	31	Base	32	Column
33	Gear axis	34	Bearing	35	Cover	36	Screw
37	Oil cup	38	Nut	39	Washer	40	Support
41	Screw	42	Bearing	43	Umbrella Gear	44	Bearing
45	Washer	46	Screw	47	Key	48	Column cover
49	Preserve	50	Screw	51	Seat	52	Screw
53	Gib strip	54	Bolt	55	Washer	56	Nut
57	Bolt	58	Washer				

ZX-40BPC

Test Certificate

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DRILLING & MILLING MACHINE

MODEL: ZX-40BPC

TEST CERTIFICATE

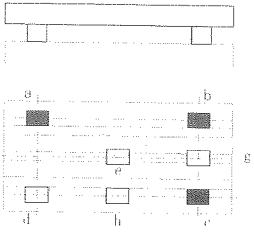
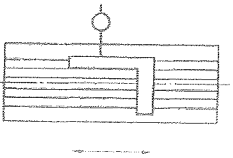
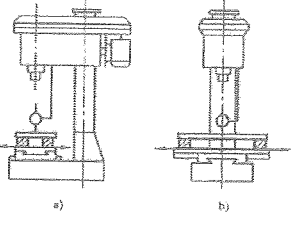
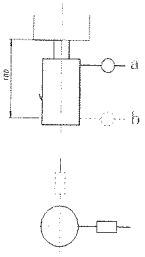
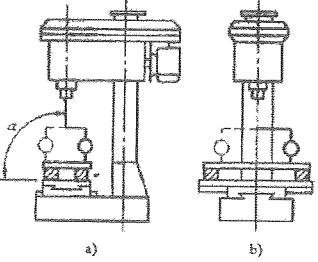
MAX.DRILLING CAPACITY : 40mm

SERIAL NO:

HEAD PARTS LIST

No.	NAME	No.	NAME
137	Gear	168	Worm
138	Retaining Ring	169	Gear
139	Retaining Ring	170	Pin
140	Cover	171	Lock washer
141	Retaining Ring	172	Washer
142	Bearing	173	Rivet
143	Gear	174	Angle indication
144	Gear	175	Stent
145	Retaining Ring	176	Bolt
146	Retaining Ring	177	Angle indication
147	Gear	178	Nut
148	Steel ball	179	Pin
149	Lap card	180	Bolt
150	Gear		
151	Gear		
152	Shaft		
153	Plug		
154	Shaft		
155	Gear		
156	Lap card		
157	Gear		
158	Gear		
159	Retaining Ring		
160	Bearing		
161	Connected sets		
162	Key		
163	Gear		
164	Handle		
165	Handle		
166	Screw		
167	Stent		

TEST FOR GEOMETRIC ACCURACY

No.	Tested Item	Diagram	mm	
			Permissible Error	Real Error
G1	Checking flatness of worktable surface		$L \leq 500$ 0.05 $L > 500$ 0.08 0.025 at any 200 measured length	
G2	Checking square-ness of longitudinal movement of work table to spindle		0.04/300	
G3	Checking of parallelism of worktable to movement of worktable a. Transverse movement b. Longitudinal movement		a. At any measured length of 100: 0.02 b. $L \leq 400$ 0.05 $L > 400$ 0.08	
G4	Measurement of run-out of the spindle bore axis a. At close to spindle end face b. At location of 100mm from point "a"		a 0.015 b 0.020	
G5	Checking of square-ness of spindle bore axis to working table surface a. Transverse plane surface b. Longitudinal plane surface		a. 0.05/300 $\alpha \leq 90^\circ$ b. 0.05/300	

ZX-40BPC

Test Certificate

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The machine had been tested according to the specified standard JB/T7421.2-2006 and technical requirements, and found satisfactory for dispatch

Director:

Chief of Inspection Department:

Date:

Annexed : Test for Geometric Accuracy