

# JET

## JMD-X1

## MILLING DRILLING CENTER

Original:

GB

Operating Instructions



### JPW (Tool) AG

Tämperlistrasse 5

CH-8117 Fällanden

Switzerland

Phone +41 44 806 47 48

Fax +41 44 806 47 58

[www.jettools.com](http://www.jettools.com)

M-50000025M

2014-02

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## **Some Safety Features of this Machine**

- a) Purpose of this machine: This machine is designed for drilling, deep milling and face milling of small work piece with limit of size “300mm × 200mm × 200mm” .  
If the operator intend to use this machine beyond our design purpose, please contract the manufacturer or your dealer before operation.
- b) The following items is prohibited for this machine
- operating machine without going through of manual.
  - opreating machine without professional training of drilling & milling work.
  - operation machine beyond the design purpose and limit of this machine without gitting sufficient consultant about safety from manufacturer or our agent.
  - operating machine without making sure that every safety precaution is well according to this instruction.
- c) Some important safety information.
- The noise level during operation is 70~75dB(A).
  - The temperature rang suitable for the operation & storage of this machine is -20~+40 degree C.
- d) Special Warning for this machine
- Warning! After interruption due to power failure, There exist the risk of accidentally running up. Be sure to pay attention to this risk and turn off machine as soon as machine interrupt.
  - Warning! Always wear approved eye protection during operation.
- e) Correct handling of this machine.
- The net weight of this machine is 50Kg. It would be better to handle this machine with the help of appropriate lifting tool.
  - If the operator has to handle this machine without lifting tool, be sure to make sure you can afford this weight, and handle it with care and with common sense of self-protection.

# CHAPTER 1 SPECIFICATION

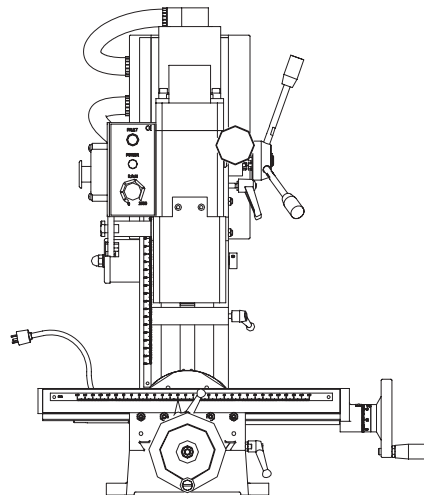
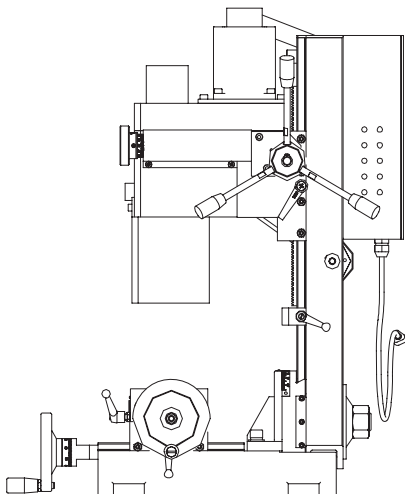
This is a mini vertical milling machine with multiple functions on either face mill or drill. There are various sizes and kinds of cutter currently. It's easy to purchase, that can apply different function to insure you work more accurate and more efficient as long as you change the cutter upon your demand.

## *1-1 Machine Specification*

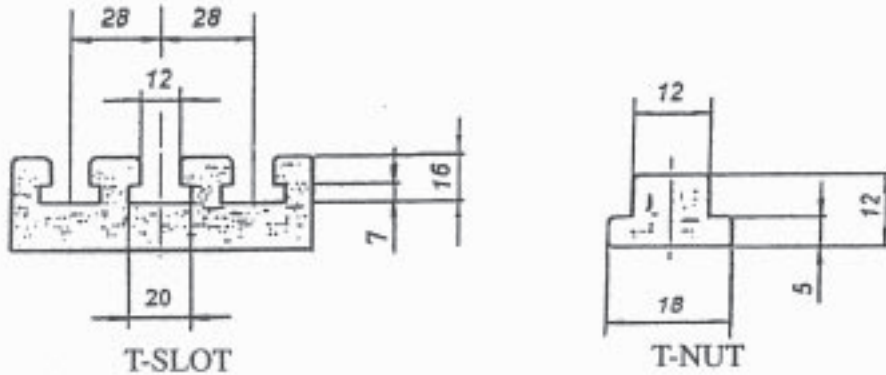
### SPECIFICATION

Max.table travel	(220mm)
Max.cross slide	(100mm)
Max.spindle travel	(180mm)
Spindle Rotary Angle	-45 <sup>0</sup> ~+45 <sup>0</sup>
Spindle Speed	0~2500rpm
Taper of hole in spindle	MT #3
Drilling Capacity	(13mm)
End Milling Capacity	(13mm)
Face Milling Capacity	(30mm)
Machine Weight	GW:68kg NW:50 Kg

Remark: The item marked (\*) has different choice, see the label in front of the machine or ask information to your dealer.

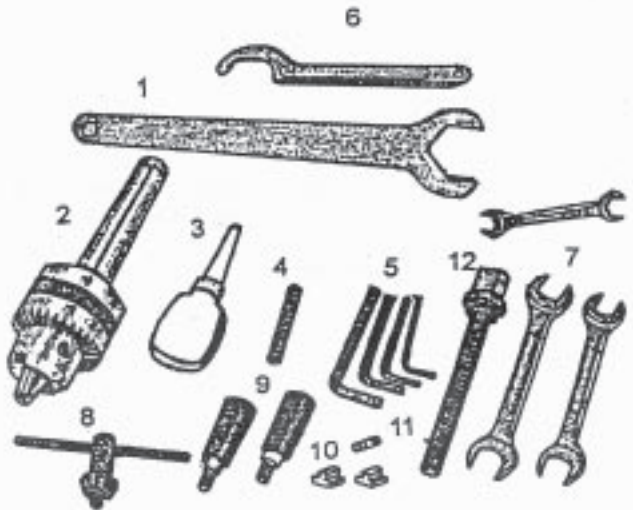


## □ T-Slot Specification (mm)



### ***1-2 Packing list of Accessories***

- |   |   |
|---|---|
| 1. Large wrench S:36                      | 1 |
| 2. Drill chuck & taper shank              | 1 |
| 3. Oil can                                | 1 |
| 4. Fixing Pin                             | 1 |
| 5. L Hex. Wrench S:3,4,5,6                | 4 |
| 6. Socket head wrench D:45-52             | 1 |
| 7. Double end wrench 8-10,14-17,<br>17-19 | 3 |
| 8. Drill chuck holder                     | 1 |
| 9. Handle                                 | 2 |
| 10 T-Nut                                  | 2 |
| 11 Fuse 10 A(110V)or 5A(230V)             | 1 |
| 12 Draw bar                               | 1 |



# CHAPTER 2 MACHINE INSTALLATION

## *2-1 Fundamental Locating of The Machine*

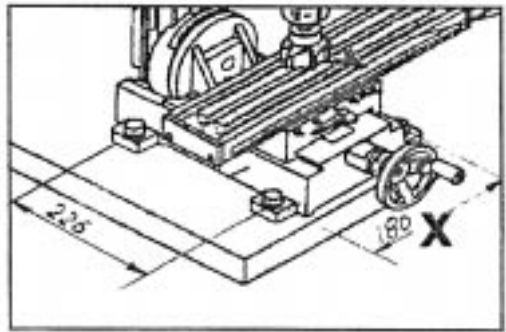
The machine should be fixed on the working table with four Hexagon bolts. Please install it to an appropriate location in order to demand the precision requirements of the machine.

### **The Selection of The Installing Location**

- (1) The working table should have a flat surface.
- (2) Avoid the place with direct sunshine, heavy moisture and dust.

### **Method of Fundamental Locating**

- (1) Please drill 4 locating holes on working table, the dimensions should be the same as the holes on the machine's base.  
(Attention: the machine's position. You had better consider Y-axis hand wheel, because the exceeding of Y-axis hand wheel will benefit later on.)
- (2) Please adjust the machine to horizon and fix the worktable with 4 M10 bolts and nuts.



## *2-2 Check the Follow Items Before Switching On the Machine:*

1. Remove all of fixtures which used for fixing the machine when you equipped the machine.
2. Check whether the power voltage is suited to the machine.  
(see label in front of the machine.)
3. Remove all obstacle which are around the machine.
4. Remove anti-rust protection which were used before you fixed the machine.
5. Check the angle of the pillar and adjust the bolts to see if they are tight enough.
6. Check the chuck, chuck holder and fixing pin on spindle to make sure they are unloaded.
7. Check the High-Low speed on spindle to see if it sets on right speed.
8. Turn on the machine and check the direction of spindle rotating (clockwise).
9. Operate Longitudinal Axis (Working table), Cross Axis (Saddle seat), Vertical Axis (Fuselage) to ensure it's in normal condition,
10. During the operation, watch out while you're manipulating the machine.  
If there is any unusual situation, stop operating and repair immediately.

# CHAPTER 3 PREVENTION AND MAINTENANCE

## *3-1 Prevention And Maintenance*

### **3-1.1 Daily Maintenance**

- (1) Inspect each operating part to ensure the condition of lubrication.
- (2) To examine each component if the part is fixed and no other abnormal situations.
- (3) Please clean and remove the obstacles around the machine in order to prevent machine damage and safety of the operator.
- (4) Please keep the machine clean after daily use and lubricate the movement parting to prevent rust.
- (5) Please watch out the operation while you're manipulating the machine.  
In case that there is any unusual phenomena, please stop and repair immediately.

### **3-1.2 Seasonal Maintenance**

- (1) Please use clean cotton or soft gauze to clean each part of the machine.
- (2) Please confirm whether the motion of machine's head and fixture are smooth or loosen.
- (3) Check whether the spindle is over-swing.
- (4) Check whether each bolt and nut is loosen.
- (5) Examine the overall circuit (contact points conductor, plugs and switches...) to ensure its normal condition.

### **3-1.3 Seasonal Maintenance**

- (1) Please perform the maintenance on each level and make record.
- (2) Please stop the machine before replacing the part or maintenance in order to avoid danger.
- (3) Maintenance and repair should be done regularly. If any abnormal situation occurs, stop the machine and repair immediately.
- (4) If the abnormal situation is beyond the regular maintenance, please contact our service engineer nearest to you in order to avoid further damage and safety.

## *3-2 Maintenance of Accessories*

### **3-2.1 Maintenance of Cutter**

- (1) Use rag while install or unload the cutter to prevent the cutter falling and cause the split of blade as well as hurt the figures.
- (2) Keep the cutter in wooden or plastic box when you don't need it. In order to maintain the sharp blade, the cutter should be kept respectively.
- (3) Pay extra attention on cutter rotating direction. Wrong rotating direction might cause sharpness and split blade and accelerate the cutter exhaustion. If it is hard to identify the blade direction in high speed revolving, please turn off the machine, during the process, in decelerating speed, easier to identify the blade direction.
- (4) Put the cutter and working piece (or chuckpiece) in right places before

you turn on the machine. After turn on the machine, the cutter will get close to the working piece and mill it.

(5)Sharpen the cutter as soon as it gets sharpness. Sharpness cutter is not only hard to do the milling work but also easy to cause damage on blade.

**3-2.2Attention Items For Accessories**

- (1)Please keep the taper shank clean.
- (2)Please keep the taper shank and cutter in order and keep the same cutter together.Next time when you use them,you will feel more convenient.
- (3)Draw bar and chuck have their own wrenches.For your convenience,please keep the wrenches near by the machine and never operate the machine with inappropriate tools.
- (4)Please use wrench to tight the nuts and never use other tools such as steel hammer to do so.

**3-3 Mechanics Lubrication**

In order to ensure the precision,keep lubrication on contact face.

In accessories, ther is an oil-can,use it to lubricate.Please inject some lubricant to all of contact face before operating.

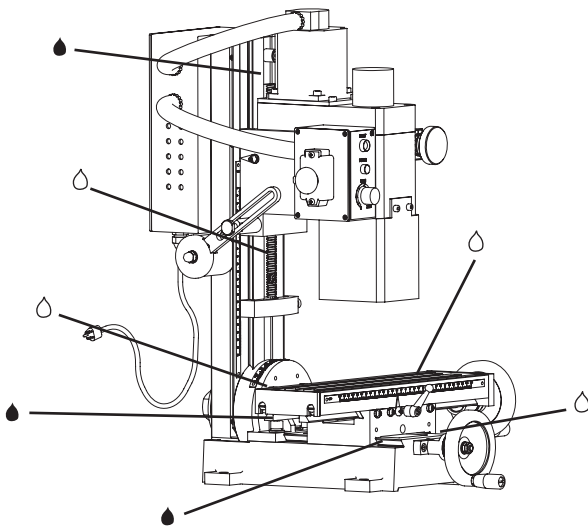
The following are the item that needs to make lubrication on machine.

**USE LUBRICATING OIL**

- (1) Basement and saddle seat slide face.
- (2) Saddle seat and working atable slide face.
- (3) Fuselage sear and connecting strut slide face.
- (4) Fuselage and spindle box slide face.

**USE LUBRICATING GREASE**

- (1) X-Axis feeding screw(saddle seat)
- (2) Y-Axis feeding screw(working table).
- (3) Z-Axis feeding gear rack(fuselage).

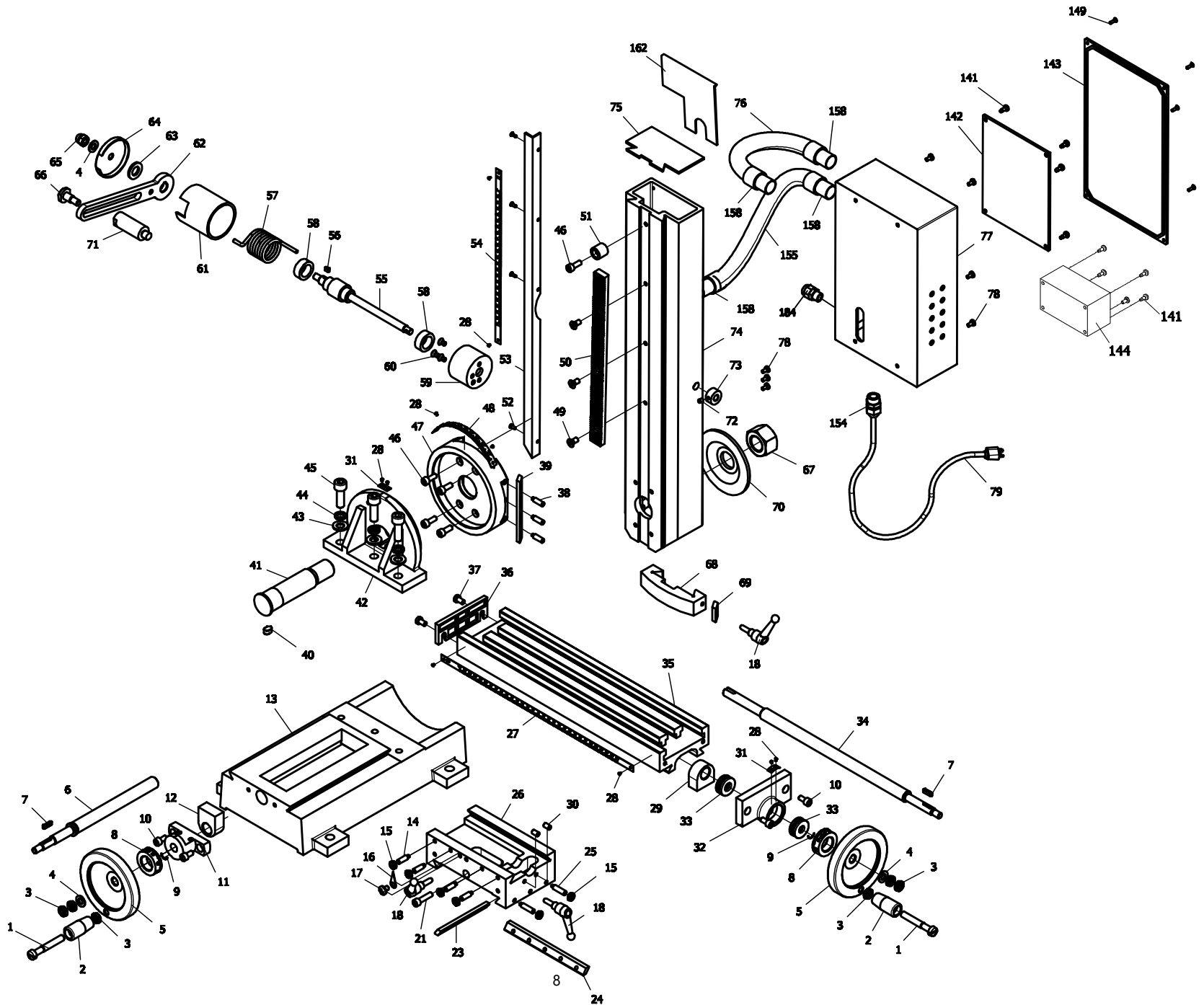


  **Lubricating grease**  
 **Lubricating oil**

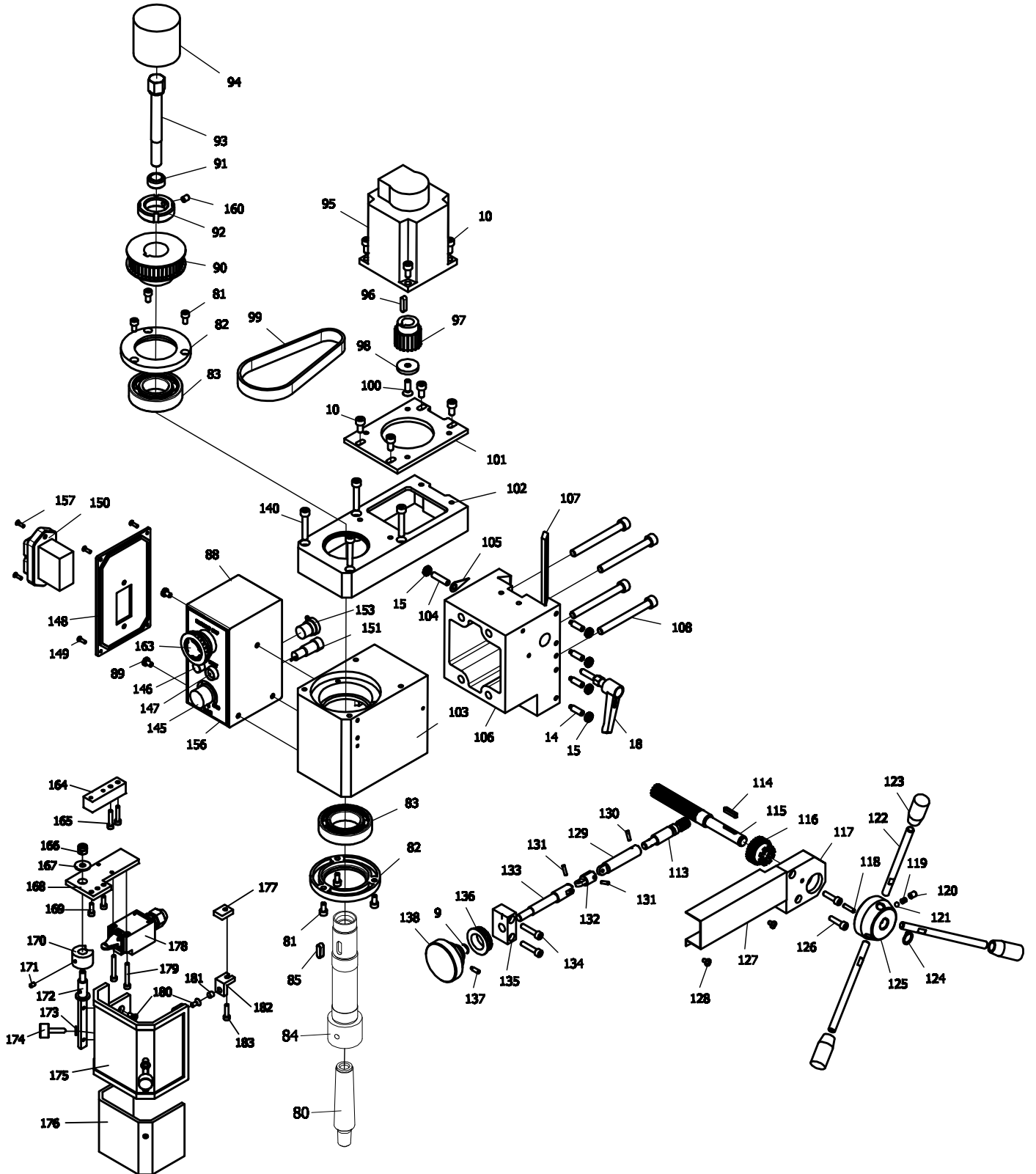
After working,clean the work table and lubricate with a little lubricant to protect the worktable



# Parts Breakdown For JMD-X1 MILLING/DRILLING CENTER (I)



# Parts Breakdown For JMD-X1 MILLING/DRILLING CENTER (II)



**PART LIST FOR JMD-X1 MILLING DRILLING CENTER**

<b>No.</b>	<b>Part no.</b>	<b>Description</b>	<b>Size</b>	<b>Qty.</b>
1	JMDX1-1	Screw	M8X55	2
2	JMDX1-2	Handle		2
3	JMDX1-3	Nut	M8	6
4	JMDX1-4	Washer	8	3
5	JMDX1-5	Handle		2
6	JMDX1-6	X-AXIS Feeding Screw		1
7	JMDX1-7	Key	4X16	2
8	JMDX1-8	Dial		2
9	JMDX1-9	Spring		3
10	JMDX1-10	Screw	M6X12	12
11	JMDX1-11	X-AXIS Screw Seat		1
12	JMDX1-12	Nut		1
13	JMDX1-13	Base		1
14	JMDX1-14	Screw	M6X20	8
15	JMDX1-15	Nut	M6	11
16	JMDX1-16	Indicator		1
17	JMDX1-17	Screw	M6X8	1
18	JMDX1-18	Spring Series# 13061262 and down		3
	JMDX1-18A	Handle Series#13091263 and up		4
19	JMDX1-19	Screw Series# 13061262 and down		3
		CANCEL Series# 13091263 and up		
20	JMDX1-20	Handle Series# 13061262 and down		3
		CANCEL Series#13091263 and up		
21	JMDX1-21	Screw	M6X25	1
22	JMDX1-22	Bolt Series# 13061262 and down		3
		CANCEL Series#13091263 and up		
23	JMDX1-23	X-AXIS Wedge		1
24	JMDX1-24	Y-AXIS Wedge		1
25	JMDX1-25	Screw	M6X 25	2
26	JMDX1-26	Saddle		1
27	JMDX1-27	Ruler		1
28	JMDX1-28	Rivet	2X3	10
29	JMDX1-29	Nut		1
30	JMDX1-30	Screw	M6X10	2
31	JMDX1-31	Guide Finger		2
32	JMDX1-32	Bearing Seat		1
33	JMDX1-33	Bearing	8200	2
34	JMDX1-34	Y-AXIS Feeding Screw		1
35	JMDX1-35	Working Table		1
36	JMDX1-36	End Cover		1
37	JMDX1-37	Screw	M6X10	2
38	JMDX1-38	Screw	M6X20	3
39	JMDX1-39	Wedge		1
40	JMDX1-40	Key	8X12	1
41	JMDX1-41	Shaft		1
42	JMDX1-42	Bracket		1
43	JMDX1-43	Washer	10	3
44	JMDX1-44	Spring Washer	M10	3
45	JMDX1-45	Screw	M10X30	3

**PART LIST FOR JMD-X1 MILLING DRILLING CENTER**

<b>No.</b>	<b>Part no.</b>	<b>Description</b>	<b>Size</b>	<b>Qty.</b>
46	JMDX1-46	Screw	M6X16	5
47	JMDX1-47	Connect Tray		1
48	JMDX1-48	Ruler		1
49	JMDX1-49	Screw	M6X12	3
50	JMDX1-50	Gear		1
51	JMDX1-51	Fixed Sleeve		1
52	JMDX1-52	Screw	M3X8	4
53	JMDX1-53	Bracket		1
54	JMDX1-54	Ruler		1
55	JMDX1-55	Shaft		1
56	JMDX1-56	Key	4X8	1
57	JMDX1-57	Spring		1
58	JMDX1-58	Ferrule		2
59	JMDX1-59	Spring Seat		1
60	JMDX1-60	Screw	M5X8	3
61	JMDX1-61	Cover		1
62	JMDX1-62	Bearing shank		1
63	JMDX1-63	Washer	12	1
64	JMDX1-64	Cover		1
65	JMDX1-65	Nut	M8	1
66	JMDX1-66	Screw		1
67	JMDX1-67	Support Series# 13061262 and down		1
	JMDX1-67A	NUT Series#13091263 and up	M24	1
68	JMDX1-68	Limit Block		1
69	JMDX1-69	Small Wedge		1
70	JMDX1-70	Washer		1
71	JMDX1-71	Nut Series# 13061262 and down	M24	1
	JMDX1-71A	Support Series#13091263 and up		1
72	JMDX1-72	Screw	M5X6	1
73	JMDX1-73	Tighten Ring		1
74	JMDX1-74	Fuselage		1
75	JMDX1-75	Coping		1
76	JMDX1-76	Soft tube		2
77	JMDX1-77	Electric Box		1
78	JMDX1-78	Screw	M4X8	7
79	JMDX1-79	power line		1
80	JMDX1-80	B16 Shank		1
81	JMDX1-81	Screw	M5X10	6
82	JMDX1-82	Oil Cover		2
83	JMDX1-83	Bearing	80206	2
84	JMDX1-84	Spindle		1
85	JMDX1-85	Key	6X18	1
86	JMDX1-86	Dustproof		1
87	JMDX1-87	Screw Series# 13061262 and down		2
		CANCEL Series#13091263 and up		
88	JMDX1-88	Control Box		1
89	JMDX1-89	Screw	M5X8	3
90	JMDX1-90	Pully		1
91	JMDX1-91	Fixed Sleeve		1

**PART LIST FOR JMD-X1 MILLING DRILLING CENTER**

<b>No.</b>	<b>Part no.</b>	<b>Description</b>	<b>Size</b>	<b>Qty.</b>
92	JMDX1-92	Nut		1
93	JMDX1-93	Draw Bar	M12	1
94	JMDX1-94	Dustproof		1
95	JMDX1-95	Brushless motor		1
96	JMDX1-96	Key	5X20	1
97	JMDX1-97	Pully		1
98	JMDX1-98	Washer	IV	1
99	JMDX1-99	Pully	70T	1
100	JMDX1-100	Screw	M6X18	1
101	JMDX1-101	Connect Board		1
102	JMDX1-102	Cover		1
103	JMDX1-103	Spindle box		1
104	JMDX1-104	Screw	M6X25	1
105	JMDX1-105	Indicator		1
106	JMDX1-106	Spindle Box		1
107	JMDX1-107	Wedge		1
108	JMDX1-108	Screw	M8X80	4
109	JMDX1-109	Bolt Series# 13061262 and down		1
		CANCEL Series#13091263 and up		
110	JMDX1-110	Spring Series# 13061262 and down	Y II	1
		CANCEL Series# 13091263 and up		
111	JMDX1-111	Small Handle Series# 13061262 and down		1
		CANCEL Series# 13091263 and up		
112	JMDX1-112	Screw Series# 13061262 and down	M6*10	1
		CANCEL Series# 13091263 and up		
113	JMDX1-113	Worm		1
114	JMDX1-114	Key	4X20	1
115	JMDX1-115	Gear		1
116	JMDX1-116	Gear		1
117	JMDX1-117	Worm Support		1
118	JMDX1-118	Pin	B4X16	1
119	JMDX1-119	Spring		1
120	JMDX1-120	Screw	M6X8	1
121	JMDX1-121	Steel Ball		1
122	JMDX1-122	Handle		3
123	JMDX1-123	lever Cap	M8X40	3
124	JMDX1-124	Check Ring	12	1
125	JMDX1-125	Handle Seat		1
126	JMDX1-126	Screw	M5X20	2
127	JMDX1-127	Cover		1
128	JMDX1-128	Screw	M4X6	2
129	JMDX1-129	Sleeve		1
130	JMDX1-130	Pin	A3X12	1
131	JMDX1-131	Pin	B3X12	2
132	JMDX1-132	Universal Joint		1
133	JMDX1-133	Universal shaft		1
134	JMDX1-134	Screw	M5X25	2
135	JMDX1-135	Bracket		1
136	JMDX1-136	Scale Dial		1

**PART LIST FOR JMD-X1 MILLING DRILLING CENTER**

<b>No.</b>	<b>Part no.</b>	<b>Description</b>	<b>Size</b>	<b>Qty.</b>
137	JMDX1-137	Screw	M4X12	1
138	JMDX1-138	Small Handle		1
139	JMDX1-139	Spring Series# 13061262 and down		1
		CANCEL Series#13091263 and up		
140	JMDX1-140	Screw	M6X35	4
141	JMDX1-141	Screw	ST4.2X9.5	8
142	JMDX1-142	PC Board		1
143	JMDX1-143	Cover		1
144	JMDX1-144	Filter	XMT-2305L	1
145	JMDX1-145	Button		1
146	JMDX1-146	Green Lamp		1
147	JMDX1-147	Yellow Lighting Pipe		1
148	JMDX1-148	Cover Series# 13061262 and down		1
	JMDX1-148A	Cover Series#13091263 and up		
149	JMDX1-149	Screw	ST2.9X9.5	8
150	JMDX1-150	Switch Series# 13061262 and down		1
	JMDX1-150A	Switch Series# 13091263 and up		
151	JMDX1-151	Fuse		1
153	JMDX1-153	Connector Series# 13091263 and up		1
154	JMDX1-154	lock connector Series# 13091263 and up		1
155	JMDX1-155	Soft tube Series# 13091263 and up		1
156	JMDX1-156	Switch label Series# 13091263 and up		1
157	JMDX1-157	Cross recessed countersunk head screws Series# 13091263 and up	M4X16	2
158	JMDX1-158	Hose fitting Series# 13091263 and up	AD21.2 M20B	4
160	JMDX1-160	Hexagon socket set screws with cone point Series# 13091263 and up	M6X8	1
162	JMDX1-162	Plate Series# 13091263 and up		1
163	JMDX1-163	Emergency stop switch Series# 13091263 and up		1
164	JMDX1-164	Connctet plate Series# 13091263 and up		1
165	JMDX1-165	screw Series# 13091263 and up	M4x20	1
166	JMDX1-166	Nut Series# 13091263 and up	M6	1
167	JMDX1-167	washer Series# 13091263 and up		1
168	JMDX1-168	support board Series# 13091263 and up		1
169	JMDX1-169	screw Series# 13091263 and up	M4x12	2
170	JMDX1-170	Spacer Series# 13091263 and up		1
171	JMDX1-171	screw Series# 13091263 and up	M4X6	1
172	JMDX1-172	shaft Series# 13091263 and up		1
173	JMDX1-173	washer Series# 13091263 and up		2
174	JMDX1-174	screw Series# 13091263 and up	M5X20	1
175	JMDX1-175	outside cover Series# 13091263 and up		1
176	JMDX1-176	inner protecting cover (sets) Series# 13091263 and up		1
177	JMDX1-177	Transition board Series# 13091263 and up		1
178	JMDX1-178	limit switch Series#shaft Series# 13091263 and		1
179	JMDX1-179	screw Series#shaft Series# 13091263 and up	M4X30	2
180	JMDX1-180	screw Series# 13091263 and up	M4X10	3
181	JMDX1-181	magnet block Series# 13091263 and up		1
182	JMDX1-182	stop block Series# 13091263 and up		1

**PART LIST FOR JMD-X1 MILLING DRILLING CENTER**

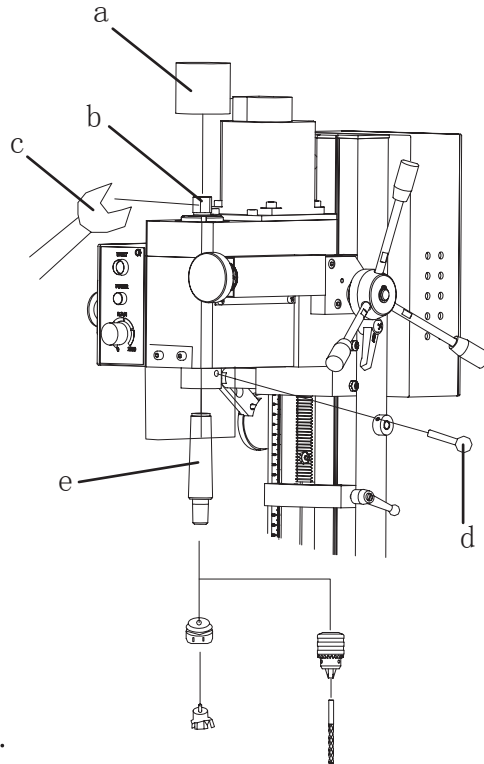
<b>No.</b>	<b>Part no.</b>	<b>Description</b>	<b>Size</b>	<b>Qty.</b>
183	JMDX1-183	screw Series# 13091263 and up	M4x16	1
184	JMDX1-184	lock connector Series# 13091263 and up		1

## CHAPTER 5 MECHANISMADJUSTMENT

### 5-1 Installation and Removal of Taper shank

#### □ Installation

- (1) Turn off the main power before you replace the cutter.
- (2) Pull out the protective cover(a).
- (3) Wipe the spindle sleeve and taper shank.
- (4) Put the taper shank(g) into spindle sleeve. Cutter should be matted with oil cloth to keep the safety of machine and fingers.
- (5) Insert fixing Pin(d) right on spindle sleeve.
- (6) Use #14 open end wrench(c) to tight(clockwise) spindle draw bar(b) for fixing taper shank.
- (7) Pull out the fixing pin!
- (8) Install the protective cover(a).



#### □ Removal

- (1) Turn off the main power before you replace the cutter.
- (2) Pull out the protective cover(a).
- (3) Insert fixing pin(d) right on spindle sleeve.
- (4) Use #14 open end wrench(c) to loose (counter clockwise) the spindle draw bar(b).
- (5) Knock the taper shank(e) gently by plastic hammer to loose it in spindle sleeve. Then take off the taper shank(e).
- (6) Cutter should be matted with oil cloth to keep the safety of machine and fingers.
- (7) Install the protective cover(a).

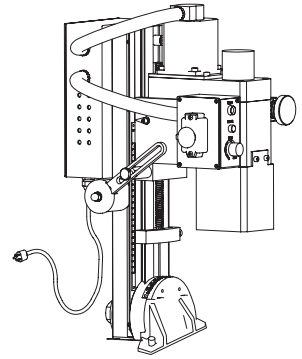
**※ For your safety,  
any adjustment on machine  
should be operated  
under no electricity. ※**



## 5-2 Travel Adjustment

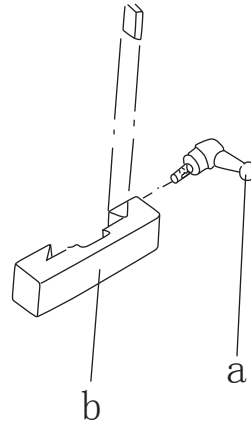
Using the limit block can control the traveling of spindle box.

- (1) Loosen the handle(a) beside of the limit block(b).
- (2) Adjust the limit block(b) in position.
- (3) Tighten the handle.
- (4) Travel position can refer to the ruler on the fuselage rotary.



## 5-3 Adjust Tip Angle of Fuselage

- (1) Turn off the main power before adjustment.
- (2) Hold the fuselage by hands to avoid the fuselage falling.
- (3) Loosen the locked nut(a) with large wrench(b).
- (4) Adjust the fuselage tip angle as you need.  
(Max is 45° both lefts and right)
- (5) Tighten it!



## 5-4 Miter Wedge Adjustment

After a long-term contact motion to the machine function error occurs due to relative surface motion. Miter wedge act as an interface on each slide face. In order to eliminate this error this machine make use of adjusting screw making pressure between two machine parts (ex. Spindle Box and Fuselage) Adjust and keep up the contact pressure for maintain its mechanical precision.

In order to ensure the precision, the pressure between the two elements needs to be adjusted appropriately because of abrasion which the machine produced from the contact motion for same time (about one year).

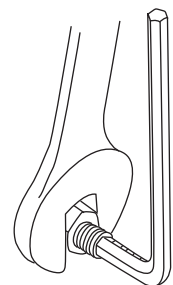
### The following items need to make Miter Wedge pressure adjustment

1. Basement and saddle seat slide face.
2. Saddle seat and working table slide face.
3. Fuselage seat and connecting strut slide face.
- 4. Fuselage and spindle box slide face.**

**<Notice: Let the spindle box at the highest position when not using>**

#### The way to adjust:

- (1) Loosen the locked nuts.
- (2) Adjust the foremost pressure of the miter wedge by locked nut. If necessary, please all adjusting screw has to be the same.
- (3) Tighten and loosen the adjusting screws and keep in mind that the pressure of each adjusting screw has to be the same.
- (4) Tighten the locked nut uniformly.
- (5) When lock the locked nut, please use the #3 interior hexagonal wrench to fix the adjusting screw from rotating to cause the unbalance pressure.
- (6) Please adjust the middle portion first and then go to toward the interior from two sides uniformly while you are adjusting the screw in order to ensure an uniform pressure.



## CHAPTER 6 OPERATION AND NOTICE FOR USE

### 6-1 Method of Operation

#### **Drilling or Deep Milling**

1. According to Chp5, replacement of chuck and tool. Install appropriate adjustment and tighten it certainly.
2. Select appropriate speed level. **[ ATTENTION: When spindle is running, don't change the HIGH/LOW speed ! ]**
3. Use press cake or fixture set the workpiece on the working table.
4. Adjust working table(Longitudinal Axis(Y))and Saddle seat(Cross Axis(X))in position.
5. Loosen the limit block handle, adjust the blocks in position. Note don't let tool meet the workpiece.
6. Put Adjusting tools in order and remove all obstacles which are around the machine.
7. Turn on the main power. Adjust appropriate spindle speed and drilling or deep milling.
8. Refer the ruler on fuselage can know drilling or milling depth.
9. Finish working, turn off power and take the spindle to upper position.
10. Clean the machine.

#### **Face Milling**

1. According to Chp5, replacement of chuck and tool. Install appropriate adjustment and tighten it certainly.
2. Select appropriate speed level. **[ ATTENTION: When spindle is running, don't change the HIGH/LOW speed!! ]**
3. Use press cake or fixture set the workpiece on the working table.
4. Adjust working table(Longitudinal Axis(Y))and Saddle seat(Cross Axis(X))in position.
5. Release limit block on fuselage, adjust the depth of cut, then fixed.
6. Arrange all tools in proper place.
7. Turn hand wheel of working table(Y-axis)and saddle seat(X-axis)to do face milling.
8. Finishing all steps, turn off power and make spindle return to upper position, release workpiece.
9. Clean the machine.

#### **Drilling or Milling Speed**

Before any operation, set the spindle to a correct speed of running.

The operating speed range for working is 0 to 2500 rpm, For most part, the correct speed may consider the size of working face and the material. Generally, you can use higher speed for softer material or small holes. Use lower speed for harder material or bigger holes.

A good rule of thumb is: Smaller hole and the softer material, use higher speed.

But don't drill too fast(above 2300 rpm) if your workpiece is wood, you may burn it. For metal, the speed can from 0 to 2500 rpm.

## **6-2 Attend for Operation**

**Please attend the following items as you operate in order to ensure the operation safety and maintain the capacity of machine.**

### **Inspection before turn on**

1. Before turn on power, you must check the tool chuck and cutter tighten it certainly.
2. Inspect whether each machine part has loosen.
3. Check the rod of speed adjustment at correct position certainly.
4. Workpiece is fixed with press cake or fixture certainly.
5. Clean and remove the obstacles around the machine.

### **During Operation**

1. Drinking alcohol or being worse spirited is absolutely forbidden to operate the machine.
2. Wearing gloves or necktie is absolutely forbidden to operate the machine.
3. Select and install appropriate cutter, no loosen.
4. The machine will shaking as follows condition:
  - a. The depth of cut is too deep.
  - b. The feeding speed is too fast.
  - c. The rotation speed is too fast.
  - d. The machine and stock plane is not fixed firmly.
  - e. The vice and workpiece is not fixed firmly.

### **Protection and Maintenance**

1. Please perform the maintenance on each level and make a record.
2. Please turn off the power perform maintenance or projection.
3. Please inform our dealer to assign professional person to deal with the action beyond extent of individual maintenance and protection.

## CHAPTER 7 GENERAL SAFETY INSTRUCTION

Warning! When using electric tools, basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury, including the following. Read all these instructions before operating this product and save these instructions.

1. Keep work area clean.
  - Cluttered areas and benches invite injuries.
2. Consider work area environment.
  - Do not expose power to rain. Do not use power tools in damp or wet locations. Keep work area well lit. Do not use power tools where there is risk to cause fire or explosion.
3. Guard against electric shock.
  - Avoid body contact with earthed or grounded surfaces (e.g. pipes, radiators, ranges, refrigerators.)
4. Keep children away.
  - Do not let visitors touch the tool or extension cord. All visitors should be kept away from work area.
5. Store idle tools.
  - When not in use, tools should be stored in a dry, high or locked up place, out of reach of children.
6. Do not force the tools.
  - It will do the job better and safer at the rate for which it was intended.
7. Use the right tools.
  - Do not force small tools or attachments to do the job of a heavy duty tool. Do not use tools for purposes not intended; for example, do not use circular saws to cut three limbs or logs.
8. Dress properly.
  - Do not wear loose clothing or jewelry, they can be caught in moving parts. Rubber gloves and non-skid footwear are recommended when working outdoors. Wear protecting hair covering to contain long hair.
9. Use safety glasses.
  - Also use face or dust mask if the cutting operation is dusty.
10. Connect dust extraction equipment.
  - If devices are provided for the connection of extraction and collection facilities, ensure these are connected and properly used.
11. Do not abuse the cord.
  - Never carry the tool by cord or yank it to disconnect it from the socket, keep the cord away from heat, oil and sharp edges.
12. Secure work
  - Use clamp or a vice to hold the work. It is safer than using your hand and it frees both hands to operate the tool.

13. Do not overreach.
  - Keep proper footing and balance at all times.
14. Maintain tools with care.
  - Keep cutting tool sharp and clean for better and safer performance. Follow instructions for lubrication and changing accessories. Inspect tool cord periodically and if damaged have it repaired by an authorized serviced facility. Inspect extension cords periodically and replace, if damaged. Keep handle dry, clean and free from oil and grease.
15. Disconnect tools.
  - When not in use, before servicing and when changing accessories such as blade, bits and cutters.
16. Remove adjusting keys and wrenches.
  - Form the habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it on.
17. Avoid unintentional starting.
  - Do not carry a plugged-in tool with a finger on the switch. Ensure switch is off when plugging in.
18. Use outdoor extension leads.
  - When tool is used outdoors, use only extension cords intended for outdoor use.
19. Stay alert.
  - Watch what you are doing. Use common sense. Do not operate tool when you are tired.
20. Check damaged parts.
  - Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, free running of moving parts, breakage of parts, mounting and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated in this instruction manual. Have defective switches replaced by an authorized service facility. Do not use the tool if the switch does not turn it on and off.
21. Warning.
  - The use of any accessory or attachment, other than those recommended in this instruction manual, may present a risk of personal injury.
22. Have your tool repaired by a qualified person.
  - This electric tool is in accordance with the relevant safety requirements. Repairs should only be carried out by qualified persons using original spare parts, otherwise this may result in considerable danger to the user.

# CHAPTER 8 POWER CONNECTION & ELECTRICITY

## 8-1 Power Connection/disconnection & Operation

1. The connection, disconnection, and grounding is carried out through the plug, equipped on the machine.
2. For the protection of control device, we recommend the operator to supply a fuse with current rating and the total length between fuse and connection terminal shall be according

### “EXTENSION LEAD CHART”

**EXTENSION LEAD CHART**

Ampere rating	3A	6A	10A	13A
Extension Cable Length	Wire Size mm <sup>2</sup>			
7.5m	0.75	0.75	1.0	1.25
15m	0.75	0.75	1.0	1.5
22.5m	0.75	0.75	1.0	1.5
30m	0.75	0.75	1.25	1.5
45.5m	0.75	1.25	1.5	2.5

3. The exact power source is 110V or 230V, single phase, 50/60Hz. (see label in front of the machine)
4. Disconnect tools from power source with plug before servicing and when changing accessories such as guard.

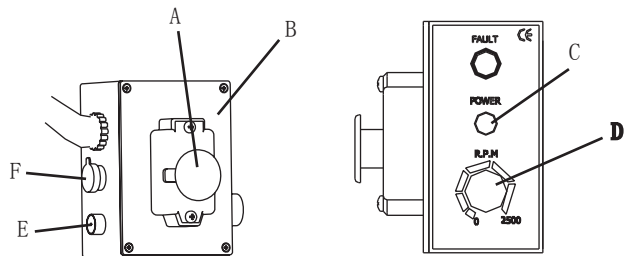
### Operation

#### 1. INITIAL START

Taking all precautions stated. Insert the electric plug into the socket.

Release the Emergency Stop Switch (A) by pushing down on the red knob slightly and pushing it up, as indicated by the arrow on the top of the red knob. Press the green switch, the green lamp (C) will light.

Switch on the machine by GENTLY turning the Variable Speed Control



- A. Emergency stop switch
- B. Electric control box
- C. Green lamp
- D. Variable speed control knob
- E. Fuse box
- F. photoelectricity connector

knob(D), clockwise. A click will be heard as motor power is turned on, but the spindle will not rotate until the knob is turned clockwise a little further. Speed will increase progressively the further the knob is turned. Run for a total of 5 minutes during which time gradually increase spindle speed to its maximum. Run for at least 2 minutes at this speed before stopping the machine and disconnecting from the mains supply.

Check that all components are still secure and working freely and correctly.

Check also to ensure the mountings are secure.

## **2. STARTING UNDER NORMAL CONDITIONS**

- 1) Take all necessary precautions previously stated, and ensure the workpiece is fixed firmly.
- 2) Proceed to start the machine as described in Section 1. Above.

**ATTENTION:** The power supply system of this machine has an auto over-load protective function. If the feeding is too fast or drilling is too deep, the system will stop working, a yellow lamp (B) lights. Just turn off the Variable Speed control knob (D) and then turn on again.

The system will work again and the yellow lamp will go off automatically.

### ***8-2 Electrical Circuit Diagram***

