

OTMT

BELT DRIVE MILL/DRILL MACHINE



ITEM NO.87-115-929
MODEL NO.OT25020

Version date: 05/09/2017

Please Read These Instructions Before Operating Your Machine
Contents Subject To Change Without Notice

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Thank you for purchasing the Belt Drive Mill/Drill Machine, if properly cared for and operated, this machine can provide you with years of accurate service.
Please read this manual carefully before using your machine.

SPECIFICATION

Model #	OT25020	
Dimensions	34.64"L x 30.31"W x 44.88"H	
Drilling Capacity	0.78" (20mm)	
Face Milling Capacity	2.48" (63mm)	
End Milling Capacity	0.78" (20mm)	
Distance From Spindle Nose To Table	17.13" (435mm)	
Minimum Distance From Spindle Axis Top Column	7.15" (181.5mm)	
Spindle Travel	4.72" (120mm)	
Spindle Taper	R8	
Step Of Spindle	12	
Range Of Speed	60 Hz	120 ~ 2640 RPM
Swing Diameter Of Headstock	15.94" (405mm)	
Swivel Angle Of Headstock	360°	
Size Of Table	20.47" x 6.30" (520mm x 160mm)	
Forward & Backward Travel Of Table	5.51" (140mm)	
Left & Right Travel Of Table	11.42" (290mm)	
Power	3/4 HP	
Overall Height (Without Stand)	41.73" (1060mm)	
Quill Diameter	2.44" (62mm)	
Table Slot Size	0.64"	
Voltage	110V	
Power Engine	0.55KW / 1/2 HP	
Weight (Net/Gross)	330 lbs. / 406 lbs.	

FEATURES

1. This machine has several uses. Such as surface cutting, drilling, and tapping.
2. This machine is of fine quality, it can be operated easily, and it is not limited to skilled operators.
3. The drilling and milling operation can be performed by two methods:
 - 1) Hand operation----which makes quick drilling.
 - 2) Worm gear feed operation----which makes slow milling.
4. Bronze adjustable nuts which adjust the thread clearance and reduce to be worn. They also make screws rotated smoothly and increase the thread accuracy.
5. Whole column which makes this machine strong, stable, and also keep high accuracy.
6. The machine head is cast steel, and has been heat-treated, stress-relieved, and precision machined.
7. To adjust belt and change speed, pulley cover is easy to open.

MOUNTING MACHINE

1. Be sure to fix the head on the column and put the hanger on the base before moving machine. While moving machine, please keep it balanced for safty.
2. Do not mount machine directly under sunlight to avoid the deformity of machine and the loss of accuracy.
3. Check to see if the motor is turning in a clockwise direction before connecting the electric distribution line.
4. Mount machine to a sturdy table or base. It is advisable that the table you choose be well constructed to avoid any vibration during operation .
5. Four holes are provided on the machine base for mounting. Before tightening bolts make sure the work table on the machine is leveled lengthwise and crosswise. Use shims if necessary.

CLEANING AND LUBRICATING

1. Your machine has been coated with heavy grease to protect it while shipping. This coating should be completely removed before operating the machine. Commercial degreaser, kerosene or similar solvent may be used to remove the grease from the machine, but avoid getting solvent on belts or other rubber parts.
2. After cleaning, coat all bright work with a light lubricant, lubricate all points with a medium consistency machine oil.
3. Lubricating points as shown in arrows.

USE OF MAIN MACHINE PARTS

1. To raise and lower the head by head handle.
2. Forward –stop–reverse switch for tapping operation clockwise or counter–clockwise.
3. To adjust the quick or slow feeding by feeding handle.
4. To adjust the table left and right travel by the table handle wheel.
5. To adjust the table fore and back travel by the table handle wheel.
6. To operate the spindle handle wheel for micro feeding.
7. To adjust the scale size according to working need.

PRECAUTION FOR OPERATION

Check all parts for proper condition before operation. If normal safety precaution are proceed carefully, this machine can provide you with standing of accurate service.

1. Before Operation.

- (a) Fill the lubricant.
- (b) In order to keep the accurate precision the table must be free from dust and oil fouling.
- (c) Check to see that the tools are correct set and the workpiece is set firmly.
- (d) Be sure everything is ready before use.

2. After Operation

- (a) Turn off the electric switch.
- (b) Turn down the tools.
- (c) Clean the machine and coat it with lubricant.

3. Adjustment of Headstock

- (a) To raise and lower the headstock, loosen the two heavy duty lock nuts, use the handle on the left side of headstock to raise and lower the headstock on its rack and pinion mechanism. When the desired height is reached, tighten the bolts to avoid vibration.
- (b) Headstock can be rotated 360° by loosening the same bolts mentioned above. Adjust the headstock to the desired angle, then fix the heavy duty lock nuts.

4. Preparing for Drilling

Turn off the knob to loosen the taper body or worm gear and spring base, then we decide spindle stroke setting the positive depth stop gauge for drilling blind hole or free state for pass hole.

5. Preparing for milling

- (a) Move the position depth stop gauge to the top position
- (b) Tighten the knob to engage the find down feed handwheel. Then turn it according to what you want to move downward.
- (c) Lock the spindle at the desired height with fixed bolt.

ADJUSTING TABLE SLACK AND COMPENSATE FOR WEAR

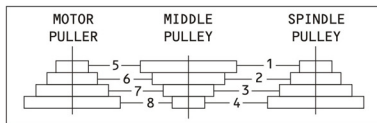
1. Your machine is equipped with gib strip adjustment to compensate for wear and excess slack on cross and longitudinal travel.
2. Clockwise rotation the gib strip bolt with a dog screw for excess slack otherwise a little counter clockwise if too tight.
3. Adjust the gib strip bolt until feel a slight drag then shifting the table.

CLAMPING OF TABLE BASE AND MACHINE BASE

1. When milling longitudinal feed. It is advisable to lock the cross feed table travel to insure the accuracy of your work. To do this, tighten the small leaf screw located on the right side of the table base.
2. To tighten the longitudinal feed travel of the table for cross feed milling, tighten the two adjusting screws on the front of the table base.
3. Adjustable travel stops are provided on the front of the table for control of cross travel and desired milling length.

SPEED CHANGING AND ADJUST BELT

1. Turn power off.
2. Open pulley cover by releasing side latches step.
3. Loosen leaf screw fixing motor mount.
4. Push motor in order to loosen belts.
5. Loosen two screws of base for speed change in the pulley cover, that also adjust the location of base for speed change in the pulley cover.
6. Select the suitable speed from speed chart, then place the belts on the desired pulley steps.
7. Tighten two screws of base in the pulley cover and lock the leaf screw fixing motor mount.
8. Close the pulley cover then turn power on.



SPINDLE SPEEDS		BELT	SPINDLE SPEEDS		BELT
50HZ	60HZ		50HZ	60HZ	
80	100	4-5	590	710	1-6
130	160	3-5	810	975	2-7
165	200	4-6	985	1185	3-8
200	245	2-5	1145	1375	1-7
275	335	3-6	1480	1780	2-8
325	395	4-7	2080	2500	1-8

BELT TO CHANGE TOOLS

1. Removing Face Mill or Drill Chuck Arbor Loosen the arbor bolt at the top of the spindle shaft approximately 2 turns with a wrench. Wrap the top of the arbor bolt with a mallet. After taper has been broken loose, holding chuck arbor on hand and turn out the arbor bolt with the other hand.
2. To install Face Mill or Cutter Arbor Insert cutter and cutter arbor into the taper of spindle. Tighten arbor bolt securely, but do not over-tighten.
3. Removing Taper Drills
 - (a) Turn down the arbor bolt and insert the taper drill into the spindle shaft.
 - (b) Turn the rapid handle down until the oblong hole in the rack sleeve appears, lock the rack sleeve, and insert wedge through holes and strike lightly with a mallet. This will force the taper drill out.

ORDERING REPLACEMENT PARTS

Complete parts list is attached. If parts are needed, contact your local distributor.

EXTRA TOOLING AND ACCESSORIES

Each of machine is equipped with a M.T.3 spindle taper or a R-8 spindle taper (examples below). Contact your local distributor or a mater cutting tool distributor to obtain any of these accessories. Taper Drill, Reamers, End Mills, Cutter Arbor, Taps, Collets, Adapters and Sleeves.

TAPPING EQUIPMENT

This machine can be equipped with an electric switch for tapping operation clockwise or counter clockwise, and the working depth can also be adjusted by the limit switch. (Electric switch will be installed according to your requirement, and you must pay the cost only.)

SPECIFICATION OF T-SLOT

The size of T-slot on table as **Figure 1**.

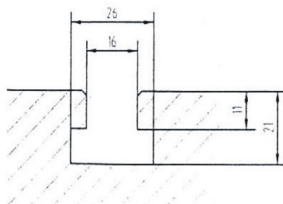


Figure 1

ELECTRICAL SYSTEM

1. WIRING

The standard wiring of the machine is single phase 220V/110V, 50HZ/60HZ or three phase 380V/220V, 50HZ/60HZ. For special request, please refer to the wiring diagram in the addendum.

2. ATTENTION

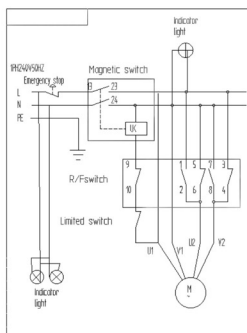
*A fuse as the following specifications must be connected between the machine and the proper power. The sectional area of main line of power must be greater than 4mm².

*The ground terminal of machine must be grounded firmly.

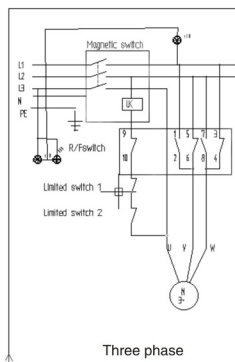
*Before cutting off electric current of machine, don't open the electrical protection covering. If something is wrong with electrical system, please ask repairman for help.

SPECIFICATIONS OF FUSE

Voltage	Phase	Single phase	Three phase
110V		30A	
220V		15A	7.5A
380V			5A



Single phase



Three phase

TROUBLE SHOOTING

1. Not running after its switched on:

- (a) Main switch interruption while volts irregular — Adjust input voltage and draw back the main switch.
- (b) Break down of fuse in switch box—Replace with new one.
- (c) In case of too much current, the overload relay jumps away automatically—Press the overload reply, and it will return to the correct position.

2. Motor Overheat and No Power:

- (a) Overload—Decrease the load of feeding.
- (b) Lower voltage—Adjust to accurate voltage.
- (c) Spoiled contact point of magnetic switch—Replace with new one.
- (d) Break down of overload relay—Connect it or replace with new one .
- (e) Motor is poor—Replace with new one.
- (f) Break down of fuse or poor contact with wire (it is easily to spoil motor while short circuit) —Switch off power source at once and replace fuse with new one.
- (g) The tension of pulley V-belt too tight—Adjust for proper tension of V-Belt.

3. The temperature of the spindle bearing is too hot:

- (a) Grease is insufficient—Fill the grease.
- (b) The spindle bearing is fixed too tight—Turning with no speed and feel the tightness with hand.
- (c) Turning with high speed for a long time—Turn it to lightly cutting.

4. Lack of power when main spindle revolving:

- (a) The tension of V-belt too loose—Adjust for proper tension of V-belt.
- (b) Motor has burned out—Change a new motor.
- (c) Fuse has burned out—Replace a new one.

5. Able feeding has not balanced:

- (a) The gap of spindle taper too wide—Adjust bolt in proper.
- (b) Loosening of leaf bolt—Turn and fasten in place.
- (c) Feeding too deep—Decrease depth of feeding.

6. Shake of spindle and roughness of working surface has taken place during performance:

- (a) The gap of spindle bearing too wide—Adjust the gap in proper or replace bearing with new one.
- (b) Spindle loosening up and down—Make two of inner bearing covers on the top tight each other.
Do not over tighten two inner bearing covers with the taper bearing; it is OK as long as no gap between them.
- (c) The gap of taper sliding plate too wide—Adjust the tension of bolt in proper.
- (d) Loosening of chuck—Fasten chuck.
- (e) Cutter is dull—Resharpen it.
- (f) Workpiece has not hold firmly—Be sure to tighten workpiece.

7. Micro feeding does not work smoothly:

- (a) Loosening of clutch—Be sure to tighten.
- (b) Worm and worm shaft has worn out—Replace with new one.
- (c) Loosening of screw fixing handwheel—Be sure to tighten it.

8. Without accuracy in performance:

- (a) Imbalance of heavy workpiece—Must be considerate of the principle of balance while holding workpiece.
- (b) Inaccurate horizontal table—Check and maintain table for keeping accurate horizontal after a period of use.

MAINTAINING

It is advised to keep machine in good condition or at its best performance by means of maintaining it as frequently as possible.

1. Daily Maintenance (by operator)

- (a) Fill the lubricant before starting machine everyday.
- (b) If the temperature of spindle caused overheating or strange noise, stop machine immediately to check it for keeping accurate performance.
- (c) Keep work area clean; release vise, cutter, workpiece from table; Switch off power source; take chip or dust away from machine and follow instructions lubricating or coating rust—proof oil before leaving.

2. Weekly Maintenance

- (a) Clean and coat the cross leading screw with oil.
- (b) Check to see if sliding surface turning parts lack of lubricant. If the lubricant is insufficient, fill it.

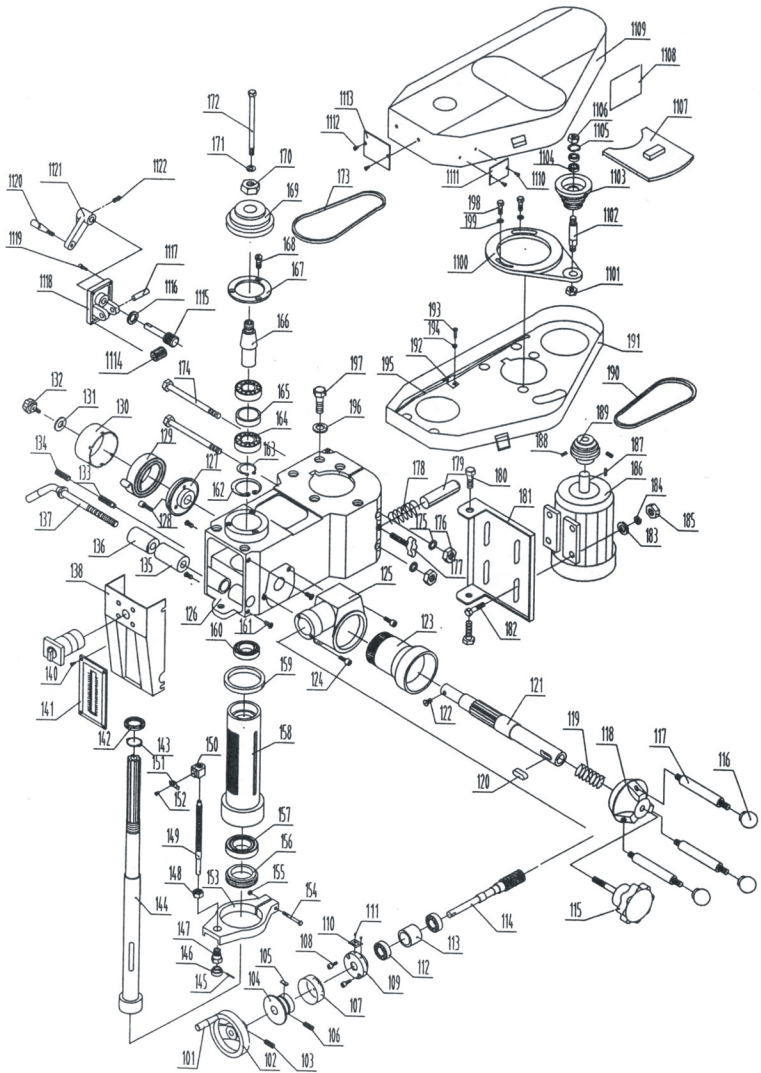
3. Monthly Maintenance

- (a) Adjust the accurate gap of slide both on cross and longitudinal feed.
- (b) Lubricate bearing, worm, and worm shaft to avoid wear.

4. Yearly Maintenance

- (a) Adjust table to horizontal position for maintenance of accuracy.
- (b) Check electric cord, plug, switches at least once a year to avoid loosening or wearing.

PARTS DRAWING I



PARTS LIST I

NO.	PART NO.	DESCRIPTION	QTY.
101	JB/T7270.4-94	Handle M6 × 32	1
102	JB/T7273.2-94	Handle wheel	1
103	GB/T77-85	Screw M6 × 10	1
104	ZX32-05-002	Dial base	1
105	ZX32-02-022(2)	Spring piece	1
106	GB/T77-85	Screw M5 × 8	1
107	ZX32-02-022	Dial	1
108	GB/T70-85	Screw M5 × 15	2
109	ZX32G-04-009	Cover	1
110	ZX32-02-022(1)	Indicating plate	1
111	GB/T827-86	Rivet Ø2.5 × 5	2
112	GB/T276-94	Bearing 6202	2
113	ZX32G-04-008	Bearing spacer	1
114	ZX32G-04-007	Worm	1
115	ZX32G-04-006	Lock screw with knob	1
116	JB/T7271.1-94	Knob	3
117	JB/T7271.6-94	Knob rod	3
118	ZX32G-04-004	Spring base	1
119	ZX32G-04-005	Spring	1
120	GB/T1096	Key 8 × 22	1
121	ZX32-05-001	Gear shaft	1
122	GB/T819-85	Screw M5 × 8	1
123	ZX32G-04-003	Worm gear	1
124	GB/T70-85	Screw M8 × 20	2
125	ZX32G-04-002	Feed cover	1
126	ZX32-02-001	Head body	1
127	ZX32G-02-040	Spring base	1
128	GB/T70-85	Screw M5 × 10	3
129	ZX32G-02-047	Spring	1
130	ZX32G-02-043	Spring cover	1
131	ZX32G-02-042	Washer	1
132	ZX32G-02-041	Screw knob	1
133	GB/T79-85	Screw M10 × 25	1
134	GB/T77-85	Screw M10 × 20	1
135	ZX32-02-003	Fixed tight collar A	1
136	ZX32-02-004	Fixed tight collar B	1
137	ZX32-02-005	Lock handle	1
138	ZX32-02-007	Front cover plate	1
140	GB/T845-85	Screw ST3.5 × 9.5	4
141	ZX32-02-018	Graduate dial	1
142	GB/T810-86	Nut M30 × 1.5	1
143	GB/T858-88	Stop washer 30	1

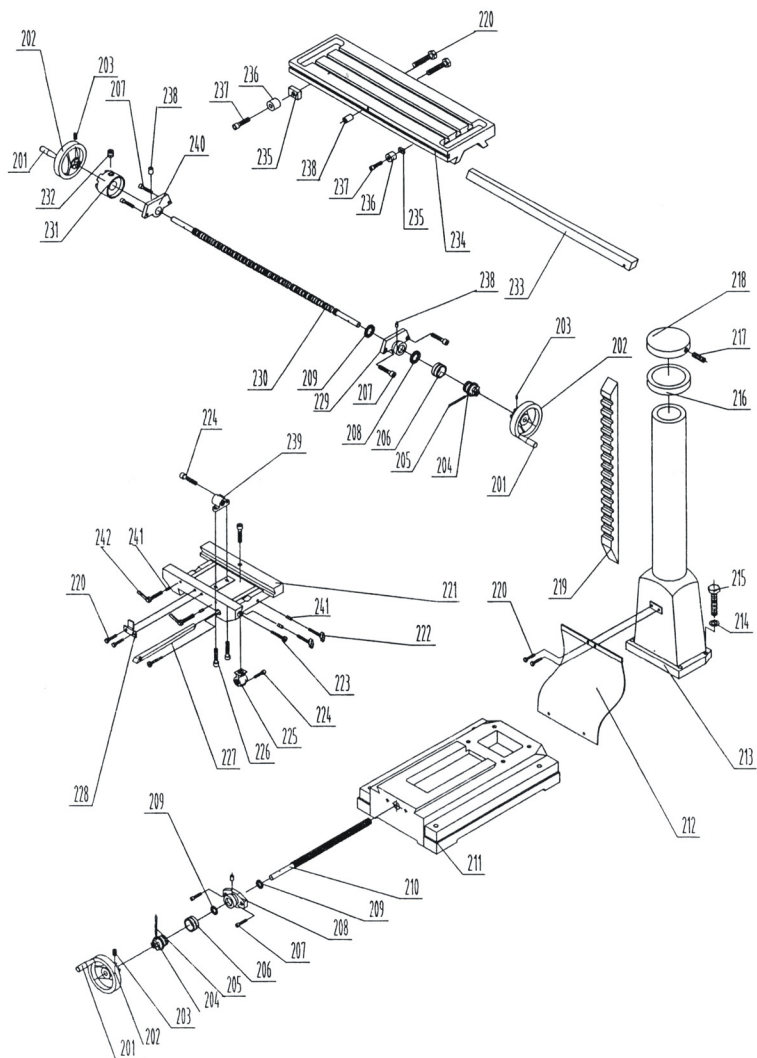
PARTS LIST I

NO.	PART NO.	DESCRIPTION	QTY.
144	ZX32-03-001	Spindle	1
145	GB/T879-86	Spring pin $\varnothing 3 \times 18$	1
146	ZX32G-03-010	Handle	1
147	ZX32G-03-010	Support	1
148	GB/T6172-86	Thin nut M16	1
149	ZX32G-03-006	Graduate rod	1
150	ZX32G-03-007	Set position block	1
151	ZX32G-03-008	Indicating plate	1
152	GB/T818-85	Screw M4 \times 6	1
153	ZX32G-03-003	Graduate rod base	1
154	GB/T5780-86	Bolt M6 \times 50	1
155	GB/T41-86	Nut M6	1
156	ZX32G-03-002	Anti-dust cover	1
157	GB/T297-94	Bearing 30207-P6	1
158	ZX32-03-002	Rack sleeve	1
159	ZX32G-03-004	Rubber flange	1
160	GB/T297-94	Bearing 30207/P6	1
161	GB/T818-85	Screw M5 \times 10	4
162	GB/T893.2-86	Retainer ring (external) B75	1
163	GB/T894.2-86	Retainer ring (external) 45	1
164	GB/T276-94	Bearing 6009-Z	2
165	ZX32-02-008	Bearing spacer	1
166	ZX32-02-010	Spindle taper sleeve	1
167	ZX32-02-012	Outer bearing cover	1
168	GB/T818-85	Screw M6 \times 10	3
169	ZX32-02-009	Spindle pulley	1
170	ZX32-02-011	Spindle lock nut	1
171	ZX32G-03T01-003	Washer	1
172	ZX32G-03T03-002	Chuck arbor bolt	1
173	GB/T1171-96	V-belt (42")	1
174	GB/T5780-86	Bolt M16 \times 150	2
175	GB/T95-85	Washer 16	2
176	GB/T6170-86	Nut M16	2
177	ZX32-01-020	Lock knob	1
178	ZX32-02-014	Spring	1
179	ZX32-02-015	Pin	1
180	GB/T5781-86	Bolt M10 \times 20	2
181	ZX32-02-002	Motor mount	1
182	GB/T5781-86	Bolt M8 \times 25	4
183	GB/T95-85	Washer 8	4
184	GB/T93-87	Spring washer 8	4
185	GB/T6170-86	Nut M8	4

PARTS LIST I

NO.	PART NO.	DESCRIPTION	QTY.
186		Motor	1
187	GB/T1096-79	Key 8 × 32	1
188	GB/T73-85	Screw M8 × 15	2
189	ZX32-02-017	Motor pulley	1
190	GB/T1171-96	V-belt (32")	1
191	ZX32-06-003	Belt bottom cover	1
192	ZX32-06-005	Cable gripper	3
193	GB/T5780-86	Belt M6 × 10	3
194	GB/T6170-86	Nut M6	3
195		Cable	2meter
196	ZX32-02-013	Rubber washer	5
197	GB/T5781-86	Bolt M10 × 20	5
198	GB/T5781-86	Bolt M8 × 35	2
199	GB/T95-85	Washer 8	2
1100	ZX32-04-001	Middle pulley base	1
1101	GB/T6170-86	Nut M16	1
1102	ZX32-04-003	Middle pulley shaft	1
1103	ZX32-04-002	Middle pulley	1
1104	GB/T276-94	Bearing 60204	2
1105	GB/T893.1-86	Retainer ring (internal) 47	1
1106	GB/T6170-86	Nut M16	1
1107	ZX32-06-004	Observing cover	1
1108	ZX32-00-003	Speed plate	1
1109	ZX32-06-001	Bolt cover	1
1110	GB/T845-85	Screw Ø3.5 × 9.5	2
1111	ZX32G-00-002	Warning plate	1
1112	GB/T845-85	Screw Ø3.5 × 9.5	2
1113	ZX32-00-001	Name plate	1
1114	ZX32G-02-035	Worm gear	1
1115	ZX32G-02-034	Worm	1
1116	ZX32G-02-033	Set washer	1
1117	ZX32G-02-036	Shaft	1
1118	ZX32G-02-032	Head raise bracket	1
1119	GB/T70-85	Screw M6 × 10	4
1120	JB/T7270.4-94	Handle M10 × 50	1
1121	ZX32G-02-046	Handle	1
1122	GB/T77-85	Screw M8 × 10	1

PARTS DRAWING II



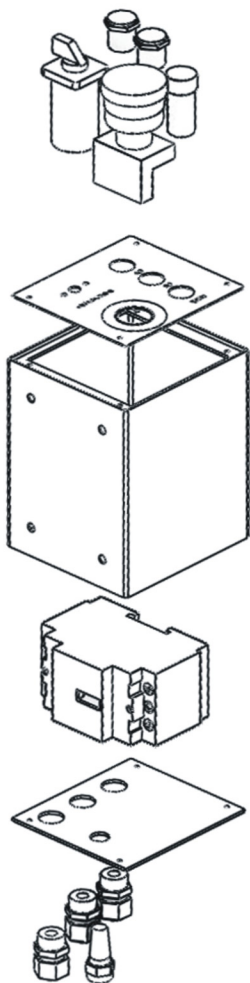
PARTS LIST II

NO.	PART NO.	DESCRIPTION	QTY.
201	GB/T7270.4	Handle M10 × 80	3
202	ZX32-01-028	Handle wheel	3
203	GB/T77-85	Screw M6 × 10	3
204	ZX32-01-023	Dial clutch	2
205	GB/T879-86	Spring pin 5 × 40	2
206	ZX32-01-022	Dial ring	2
207	GB/T70-85	Screw M8 × 16	6
208	ZX32-01-027	Square flange C	1
209	GB/T301-94	Thrust bearing 51103	4
210	ZX32-01-024	Table lead screw	1
211	ZX32-01-016	Base	1
212	ZX32-01-010	Anti-dust plate	1
213	ZX32-01-008	Column	1
214	GB/T93-87	Spring washer 16	4
215	GB/T5780-86	Bolt M16 × 60	4
216	ZX32-01-009	Column ring	1
217	GB/T77-85	Screw M10 × 8	1
218	ZX32-01-007	Column cap	1
219	ZX32-01-006	Rack	1
220	GB/T5781-86	Bolt M8 × 12	2
221	ZX32-01-015	Center base	1
222	ZX32-01-020	Lock screw	4
223	ZX32-01-004	Set screw	2
224	GB/T70-85	Screw M5 × 14	1
225	ZX32-01-025	Cross nut	1
226	GB/T70-85	Screw M8 × 16	2
227	ZX32-01-019	Gib (short)	1
228	ZX32-01-005	Moveable fixed block	1
229	ZX32-01-002	Square flangeA	1
230	ZX32-01-021	Dial clutch	1
231	ZX32-01-014	Longitudinal lead screw	1
232	GB/T77-85	Screw M10 × 10	1
233	ZX32-01-003	Gib (long)	1
234	ZX32-01-001	Table	1
235	ZX32-01-012	Fixed block	2
236	ZX32-01-011	Moveable fixed ring	2
237	GB/T70-85	Screw M6 × 12	2
238	JB/T7940.1	Oil ball	5
239	ZX32-01-026	Longitudinal nut	1
240	ZX32-01-013	Square flange B	1
241	ZX32-01-020(3)	Clamping block	4
242	JB/T7270.12	Adjusted set handle Bm10 × 32	2

PACKING LIST

NO.	DESCRIPTION	SPECIFICATIONS	QTY.
1	Belt Drive Mill/Drill Machine		1
2	STANDARD ACCESSORIES		
	ALLEN WRENCH	4mm,5mm	4
	SCREW DRIVER(-)	6"	1
	DRILL STOCK	M.T.3 or M.T.4 or R8	1
	WEDGE		1
	DRAW BAR		1
	DRAW BAR WASHER		1
3	OPTIONAL ACCESSORIES		
	DRILL CHUCK	16mm	
	FACE MILLING CUTTER	Ø76mm	
	PARALLEL VISE	90mm or 125mm	
	MILL CHUCK		
	BORING HEAD		
	MACHINE STAND		
	END MILLING CUTTER	Ø2-Ø20mm	
TWIST DRILL	Ø1-Ø31.5mm		
4	Operating manual		1
5	Packing list		1

ELECTRIC BOX





OTMT