COMPLEX MACHINE

MODEL RF-30

INSTRUCTION MANUAL

Two heavy duty head locks
Rapid speed for drilling
3 Fine feed engagement control
360°
6 Drill fine feed control – calibrated
7 Positive depth stop gauge
head handle 1
2
Forward/stop/reverse switch
5 Cross feed control – calibrated
4
Longitudinal feed -calibrated
Longitudinal travel table lock
Two table stops
30 B2

Fig. 1

WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY

As with all machinery there are certain hazards involved with operation and use of the machine. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for certain applications only. We strongly recommends that this machine NOT be modified and/or used for any application other than for which it was designed. If you have any questions relative to its application DO NOT use the machine until you contact with us and we have advised you.

SAFETY RULES FOR ALL TOOLS

A. USER:

1. **WEAR PROPER APPAREL.** No loose clothing, gloves, rings, bracelets, or other jewelry to get caught in moving parts.
Nonslip foot wear is recommended. Wear protective hair covering to contain long hair.

2. **ALWAYS WEAR EYE PROTECTION.** Refer to ANSLZ87.1 standard for appropriate recommendations.
Also use face or dust mask if cutting operation is dusty.

3. **DON'T OVERREACH.** Keep proper footing and balance at all times.

4. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.

5. **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.

6. **DRUGS, ALCOHOL, MEDICATION.** Do not operate tool while under the influence of drug, alcohol or any medication.

B. USE OF MACHINE:

1. **DON'T FORCE TOOL.** It will do the job better and be safer at the rate for which it was designed.

2. **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not designed.

3. **SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand frees both hands to operate tool.

4. **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.

5. **AVOID ACCIDENTAL STARTING.** Make sure switch is in "**OFF**" position before plugging in power cord.

C. ADJUSTMENT:

MAKE all adjustments with the power off. In order to odtain the machine. precision and correct ways of adjustment while assembling, the user should read the detailed instrudtion in this manual.

D. WORKING ENVIRONMENT:

1. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.

2. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well-lighted.

3. **KEEP CHILEREN AND VISITIORS AWAY.** All children and visitors should be kept a safe distance from work area.

E. MAINTENANCE

1. **DISCONNECT** machine from power source when making repairs.

2. **CHECK DAMAGED PARTS.** To read every details of trouble shoting, repair it very carefully and make sure the operator won't get injurt and damage the machine.

Thank you for purchasing the **RF-30 COMPLEX** 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.

1.

SPECIFICATION

MODEL			RF-30 (PF)
Drilling capacity			32mm(1¼")
Face mill capacity			76mm(3")
End mill capacity			20mm(3/4")
Swing			405mm(15-7/8")
Max. distance spindle nose to table			480mm(18")
Spindle taper			M.T.3 R-8
Spindle stroke			130mm(5")
Diameter of Spindle sleeve			75mm(3")
Head swivel			360°
Diameter of column			115mm(4-1/2")
Overall height (w/o stand)			1100mm(43-1/2")
Machine stand height			760mm(30")
Length			1080mm(42-1/2")
Width			1010mm(39-3/4")
Motor			1-1/2HP – 2HP
Spindle speed (r.p.m.)	12S	50Hz	100-2080(4 pole)(75-1685 6 pole)
		60Hz	120-2500(4 pole)(95-2020 6 pole)
Standard accessories			3"-cutter 1/2" chuck 3½" angle vise
Forward and backward travel of Table			175mm(7")
Right and left travel of table			500mm(19-3/4")
Working area of table			730mm × 210mm(28¾" × 8¼")
Gross weight			300kgs (660 lbs)
Measurement			27.2 Cuft
Extra accessories			Power down (spindle) feed Power longitudinal (table) feed Tapping switch Forward & Reverse switch Magnetic switch Emergency switch Collet chuck Work light Cabinet stand 23 speeds (2 speed motor). Extension column Clamping kits
Noise			80 dB MAX

2. FEATURES:

(1) This machine has, several uses, such as surface cutting, drilling, milling, and also can be equipped with an electric switch for tapping.
(2) This machine is of fine quality, can be operated casily, 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 the wear. They also make screws rotated smoothly and increase the thread accuracy.
(5) Whole column which makes this machine strong, stable, and also keep the high accuracy.
(6) Head of tough cast ensures its accuracy lasting and enduring through the treatment of precise boring cylinder, grinding, and internal stress relief.
(7) To adjust belt and change speed, new pulley cover is easy to open the cover.

3. DELIVERY & INSTALLATION:

(1) BE SURE all locks of headstock & column are tighten before operation.
(2) ALWAYS Keep proper footing & balance while moving this 300kgs machine. and only use heavy duty fiber belt to lift the machine as per Fig. A.
(3) KEEP machine always out from sun, dust, wet, raining area.
(4) POSITION & tighten 4 bolts into base holes properly after machine in balance.
(5) TURN OFF the power before wiring, & be sure machine in proper grounding. Overload & circuit braker is recommended for safety wiring.
(6) CHECK carefully if main shaft in clockwise direction while running test., if not, reverse the wiring then, repeat the test till spindle direction is correct.

Fig. A

4.CLEANING & LUBRICATING

(1) Your machine has been coated with a heavy grease to protect it in 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 in Fig.1. with a medium consistency machine oil.
(3) Lubricating points as shown in arrows.

5. USE OF MAIN MACHINE PARTS (See Fig.1)

(1) To ralse and lower the head by head handle.
(2) Equipped with an electric switch for tapping operation clockwise or counterclockwise.
(3) To adjust the quick or slow feeding by feed handle.
(4) To adjust the table left and right travel by table handle wheel.
(5) To adjust the table fore and aft travel by table handle wheel.
(6) To operate the spindle handle wheel for micro feed.
(7) To adjust the scale size according to working need.

6. PRECAUTION FOR OPERATION

Check all parts for proper condition before operation; if normal safety precautions are notice carefully, this machine can provide you withstanding 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 deposits.
(c) Check to see that the tools are corrcetly set and the workpiece is set firmly.
(d) Be sure the speed is not set too fast.
(e) 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.
(d) Cover the machine with cloth to keep out the dust.

(3) Adjustment of Head

(a) To raise and lower the head, loosen the two heavy duty head lock nuts shown in Fig.1. Use the left side head handle to raise and lower the head on its rack and pinion mechanism. When the desired height is reached, tighten the bolts to avoid vibration.
(b) Head may be rotated 360° by loosening the same bolts mentioned above. Adjust the head to the desired angle, then fix the heavy duty head locknuts. It is Tighten the same time to fix the head if drilling & milling too much.

Fig.2.

(4) Preparing for Drilling (see fig. 2)(Except addition power feed system).
Turn of the knob make loose the taper body of 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 (see fig. 2)(Except addition power feed system).
(a) Adjust the positive depth stop gauge to highest point position.
(b) Turn tight of the knod be use to taper friction force coupling the worm gear and spring base. Then turning the handle wheel by micro set the sprindle of work piece machining height.
(c) Lock the rack sleeve at the desired height with fixed bolt.

7. ADJUSTING TABLE SLACK AND COMPENSATE FOR WEAR(see fig. 3)

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

8. CLAMPING, TABLE BASE, AND MACHINE BASE (see Fig. 3)

(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 small leaf screw 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 the desired milling length.

Fig.3.

9. SPEED CHANGING AND ADJUST BELT (Step See Fig. 4)

(1) Turn power off.
(2) Open belt cover by releasing side latches step see(a)(b)(c)
(3) Loosen motor mount leaf screw.
(4) Push motor in order to loosen belts(head side of motor mount is set fixed, two motor's ear side with motor screw to tighten or loosen of belts.)
(5) Loosen two screws for base of speed change inter pulley that also adjust the location of base for speed change inter pulley.
(6) Select the suitable R.P.M. from speed charts of Fig. 5 Then place the belts on the desired pulley steps.
(7) Tighten two screws of base for speed change pulley and the bolt of motor mount lock.
(8) Cover the belt cover with counter step (2) after turn power on;

12 SPEEDS		BELT	12 SPEEDS		BELT
50~	60~		50~	60~	
100	120	4-5	640	770	1-6
160	190	3-5	865	1040	2-7
190	230	4-6	1010	1220	3-8
235	285	2-5	1205	1450	1-7
305	370	3-6	1500	1800	2-8
365	440	4-7	2080	2500	1-8

Fig.5.

Fig.4.

10. TO CHANGE TOOLS

(1) Removing Face Mill or Drill Chuck Arbor
Loosen the arbor bolt (see fig. 4) at the top of the spindle shaft approximately 2 turns with a wrench. Rap the top of the arbor bolt with a mallet.
After taper has been broken loose, holding chuck arbor on hand and turn detach the arb 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 detach securely, but do not overtighten.

(3) Removing Taper Drills
(a) Turn down the arbor bolt and insert the taper drill into the spindle shaft.
(b) Turn the rapid down handle rod down until the oblong hole in the rack sleeve appears. Line up this hole with the hole in the spindle. Insert key punch key through holes and strike lightly with a mallet. This will force the taper drill out.

11. ORDERING REPLACEMENT PARTS

Copmlete parts list is attached. if parts are needed, contact your local distributor.

12. EXTRA TOOLING AND ACCESSORIES

Each of machine is equipped with a MT#3 spindle taper or a R-8 spindle taper (examples below). Contact your local distributor or a major cutting tool distributor to obtain any of these accessories: Taper drills, Reamers, Taps Collects, Adapters and Sleeves.

Deluxe Stand	Power Table Feed	52 Pcs Clamping Kit
Cooling System	Emergency Switch	Magnetic Switch
Work Lamp	Collect Chuck	3 1/2" Angle Vise
3" Face Mill Cutter	3-Way Angle Milling Vise	1/2" Drill Chuck
Face Milling Cutter	7 Pcs Milling Chuck	K-Type Milling Vise
NT#30 Spindle Taper		

13. TAPPING EQUIPMENT

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

14. SPECIFICATION OF T-SOLT

The size of T-Solt on table as Fig 6:

RF-30 Fig.6.

15. TROUBLE SHOOTING

(1) No running after switch 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 relay, and it will return to the correct position.

(2) Motor Overheat and No Power:
- (a) Overload - Decrease the load of feed.
- (b) lower voltage - Adjust to accurate voltage.
- (c) Spoiled contact point of magnetic switch -Replace with new one.
- (d) Breakdown 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.
- (h) If this machine with the tapping attachment, there is an aid plum screw fix on the motor mount in order to avoid the motor pulleys shake while turning.

(3) The temperature of spindle bearing is too hot:
- (a) Grease is insufficient - Fill th grease.
- (b) The spindle beating 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 with 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 with new one.

(5) table travel 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) Feed too deep -Decrcase dcpth of feed.
(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 inncr bearing covers on the top tight each other. Do not ovcrtighten two inncr bearing covers with the taper bearing; it is ok as long as no gap bctween them.
  (c) The gap of tapcr sliding loate 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 feed does not work smoothly:
  (a) Loosening of clutch - Be sure to tighten it.
  (b) Worm and worm shaft has worn out - Replace with new one.
  (c) Loosening of handwheel fixed screw - Be sure to tighten it.
(8) Without accuracy in performance:
  (a) I'mbalance of heavy workpiece - Must be considerate of the principle of balance while holding workpiece.
  (b) Often use of hammer to strike workpiece - Forbidden to use hammer to strike workpiece.
  (c) Unaccurate horizontal table - Cheek and maintain table for keeping accurate horizontal after a period of use.

16. MAINTAINING

That's easier ot keep machine in good condition or best performance by means of maintaining it at any time than remedy it after it is out of order.

(1) Daily Maintenance (by operator)
  (a) Fill the lubricant before starting machine cveryday.
  (b) If the temperature of spindle caused overhcating or strange noise, stop machine immediately to cheek it for keeping accurate performance.
  (c) Keep work area clean; release vise, cutter, workpiece from table; switeh off power source; take chip or dust away from machine and follow instructions lubricantiong or coating rust-proof oil before lcaving.
(2) Weekly Maintenance
  (a) Clean and coat the cross leading screw with oil.
  (b) Check to see if sliding surface and turning parts lack of lubricant. If the libricant is insufficant, 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, plugs, switches at least once a year to avoid loosening or wearing.

HEAD PARTS

Part No.	Description	Number Required
3-01	Chuck Arbor Bolt	1
3-02	Spindle Lock Nut	1
3-03	Spindle Pulley	1
3-04	Belt Bottom Cover	1
3-05	Outer Bearing Plate	1
3-06	Spindle Taper Sleeve	1
3-07	Ball Bearing (6009ZZ)	2
3-08	Bearing Spacer	1
3-09	C-Retainer Ring	1
3-10	C-Retainer Ring	1
3-11	Head Body	1
3-12	Rubber Flange	1
3-13	Feed Base	1
3-14	Lock Nuts	2
3-15	Taper Roller Bearing (30206J)	1
3-16	Rack Sleeve	1
3-17	Spindle Shaft	1
3-18	Taper Roller Bearing (E30207J)	1
3-19	Bearing Cap	1
3-20	Cutter Arbor	1
3-21	Chuck Arbor	1
3-22	Lever	1
3-23	Fixed Ring	1
3-24	Handle Rod	1
3-25	Fixed Tight Collar	1
3-26	Fixed Tight Collar (Thread)	1
3-27	Screw Key	1
3-35	Bearing Spacer	1
3-38	Lock Bolt With Knob	1
3-39	Handle Rod	3
3-40	Knob	3
3-42	Handle Wheel	1
3-44	Micro Adjusting Indicator	1
3-45	Worm Cover	1
3-46	Ball Bearing (6202Z)	2
3-47	Worm Shaft	1
3-50	Lock Handle	1
3-51	Leaf Screw	1
3-52	Head Body Fixed Bolt	2
3-54	Graduated Rod	1
3-55	Graduarted Dial	1
3-56	Switch	1
3-57	Speed Chart	1
3-58	Head Handle	1
3-59	Worm Shaft	1
3-60	Worm Gear	1
3-61	Worm Gear Shaft	1
3-62	Compression Spring	1
3-63	Pin	1
3-66	Motor Mount	1
3-67	Motor	1
3-68	Punch Key	1
3-69	Belt Cover	1
3-69-1	Spindle Cover	1
3-69-2	Shelf	1
3-70	Motor Pulley	1
3-71	V-Belt (B34)	1
3-72	Ball Bearing (6204Z)	2
3-73	Inter Pulley	1
3-74	V-Belt (B41)	1
3-75	Inter Pulley Shaft	1

Part No.	Description	Number Required
3-76	Speed Change Inter Pulley Base	1
3-77	Clip Plate	1
3-79	Rubber Collar	1
3-85	Plum Screw	1
3-92	Set Position Block	1
3-93	Fixed Nut	1
3-94	Support Base	1
3-95	Handle	1
3-96	Front Cover Plate	1
3-97	Push Switch Protection Piece	1
3-101	Head Raise Bracket	1
3-102	Limit Plate	1
3-103	Spring Cover	1
3-104	Spring	1
3-105	Spring Base	1
3-106	Pinion Shaft	1
3-107	Worm Gear	1
3-108	Feed Cover	1
3-110	Spring base	1
3-114	Bushing	1
3-115	Spring	1
3-130	Hexagon Socket Headless Screw	1
3-131	Hexagon Head Screw	5
3-132	Washer	12
3-133	Cross Round Head Screw	3
3-134	Hexagon Head Screw	1
3-135	Hexagon Nut	1
3-136	Spring Pin	1
3-137	Star Washer	1
3-139	Cross Round Head Screw	3
3-140	Spring pin	2
3-141	Hexagon Nut	1
3-142	Key	1
3-143	Hexagon Socket Head Screw	2
3-144	Washer	1
3-145	Hexagon Socket Headless Screw	3
3-146	Hexagon Socket Headless Screw	1
3-147	Hexagon Socket Head Screw	2
3-148	C-Retainer Ring	1
3-150	Hexagon Nut	4
3-151	Washer	2
3-152	Cross-Recess Round Head Screw	4
3-153	Hexagon Socket Headless Screw	1
3-154	C-Retainer Ring	2
3-155	Hexagon Socket Head Screw	4
3-156	Hexagon Head Screw	4
3-157	Hexagon Head Screw	2
3-158	Hexagon Nut	4
3-159	Key	1
3-160	Hexagon Head Screw	2
3-161	Washer	2
3-162	Outline Bush	2
3-163	Cross Round Head Screw	4
3-164	Cross-Recess Round Head Screw	2
3-184	Cross-Recess Round Head Screw	1
3-185	Washer	1
3-187	Spring Washer	2
3-188	Flat Cross Head Screw	1
3-190	Graduated Rod	1
3-191	E-Retainer Ring	1
3-208	Hexagon Nut	1

TABLE BASE PARTS

Part No.	Description	Number Required
4-01	Table handle Wheel	3
4-01-1	Hexagon Socket Head Screw	3
4-01-2	Handle	3
4-01-3	Hexagon Nut	3
4-02	Dial Clutch	2
4-02-1	Graduated Dial (Metric)	2
4-02-1	Graduated Dial (Inch)	2
4-03	Thrust Bearing (51103)	4
4-04	Square Flange	1
4-04-2	Rivet	4
4-05	Table Screw	1
4-06	Base	1
4-07	Gib Strip	1
4-08	Column Base	1
4-09	Column Flange Ring	1
4-10	Rack	1
4-11	Column Head	1
4-12	Gib Strip Bolt	2
4-13	Leaf Screw	4
4-14	Movable Fixed Block	1
4-15	Table Base Nut	1
4-16	Center Base	1
4-17	Antidust Plate	1
4-19	Antidust Plate	1
4-20	Table Clutch	1
4-22	Left Flange	1
4-23	Table Nut	1
4-24	Table Screw	1
4-26	Right Flange	1
4-27	Gib Strip	1
4-28	Table	1
4-29	Fixed Block	2
4-30	Movable Fixed Ring	2
4-121	Limit Plate	2
4-131	Hexagon Head Screw	6
4-145	Hexagon Socket Headless Screw	1
4-156	Hexagon Socket Head Screw	2
4-166	Spring Pin	3
4-167	Link Screw	2
4-168	Oil Ball	5
4-172	Hexagon Head Screw	4
4-173	Spring Washer	4
4-174	Hexagon Socket Head Screw	2
4-175	Hexagon Socket Head Screw	1
4-176	Haxagon Socket Head Screw	2
4-182	Hexagon Socket Head Screw	6
4-189	Hexagon Socket Headless Screw	3

STAND PARTS (OPTION)

Part No.	Description	Number Required
S-01	Stand (Left)	1
S-02	Stand (Right)	1
S-03	Support Plate (Front)	1
S-04	Support Plate (Rear)	1
S-05	Built in Shelf	1
S-06	Door	1
S-07	Chip Pan	1
S-08	Door Lock	1
S-09	Plastic Washer	4
S-10	Hex. Head Screw	4
S-11	Washer	2
S-12	Cross Round Hd. Screw	2
S-13	Plate	1
S-14	Cross Round Hd. Screw	2
S-15	Washer	18
S-16	Cross Round Hd. Screw	18
S-17	Washer	4

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