

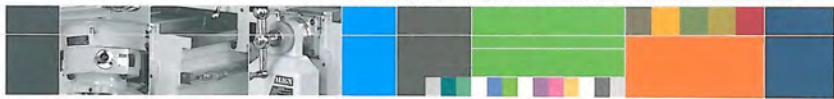
FREJOTH

Turret Type Vertical Milling Machine



Since 1973

THE LEADER IN QUALITY AND RELIABILITY



CONSTRUCTION



Double-lock Devices

The knee, arm, table & saddle are each equipped with a pair of locks to firmly clamp each axis and to eliminate the possibility of lateral movement.



Backlash Adjustment

The double nut arrangement utilized on the table and saddle allows backlash to be nearly eliminated and can be adjusted in a matter of minutes.



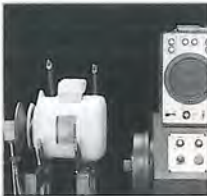
PRECISION HAND SCRAPING

The upper & lower surface of the saddle are laminated with TURCITE-B and precisely hand scrapped to provide a smooth, accurate and wear resistant sideway surface.



Meehanite Cast Iron

All essential castings are made of high grade Meehanite cast iron which has been stress relieved to provide a rigid machine structure.



Low Vibration Vari. Speed Head

The quietest head you ever used, with dynamically balanced pulleys and chrome-plated motor shaft for smooth speed changing free of noise and vibration.



Solid Quill-feed

The quill-feed mechanism utilizes a one-piece pinion gear and shaft as well as a one-piece worm and wormshaft both providing strength, rigidity and less maintenance.



High Precision Spindle

The spindle is supported by super precision class 7 (p4) angular contact ball bearings which have been accurately measured, selected and preloaded, then assembled in a temperature controlled room to ensure accuracy and rigidity throughout the full RPM range.



Accurately Ground Quill & Housing

Hardened and ground spindle backgears. The hard chromed quill is ground to mirror finish and fitted to the quill housing to ensure smooth movement, excellent rigidity and offers extreme high spindle accuracy.

INSPECTION

Standard

Manufactured to exact tolerances:

| | | | |
|--------------|-------------|---------------------|-------------|
| Parallelism | | | |
| X Axis | 0.0008"/20" | Y Axis | 0.0008"/20" |
| Knee | 0.0008"/12" | Ram | 0.0008"/12" |
| Quill Travel | 0.0005"/5" | Spindle Bore Runout | 0.00015" |



Spindle Bore Runout

Attach the base of a test indicator to the table surface. Touch the stylus of the indicator to conical bore surface of the spindle. Rotate the spindle and the variation of readings shall be within 0.004mm (0.00015").



Squareness Of Table Surface To Knee Travel

Touch the stylus of the test indicator, which is mounted on fixed part of machine, to the surface of square gauge which is placed on the table surface. Move knee up and down and the indicator variation shall be within 0.02/305mm (0.0008"/12").



Parallelism Of Table Surface To Table Longitudinal Movement

Attach the base of a test indicator to the column. Touch the stylus of the indicator to the table surface. Move the table left and right. The indicator variation shall be within 0.015/500mm (0.0006"/20").



Spindle Running Noise Measuring

Place noise meter 1m (3.3') in front of machine and at the same height as the quill to measure the spindle running noise. The measurement shall be less than 72 dB.



Squareness Of Table Surface To Quill Travel

Attach the base of a test indicator to the spindle. Touch the stylus of the indicator to surface of the cylinder gauge which is placed on the table surface. Move spindle up and down and the indicator variation shall be within 0.01/127mm (0.0004"/5").



Parallelism Of Table Surface To Ram Cross Transverse Movement

Attach the base of a test indicator to the ram. Touch the stylus of the indicator to the table surface. Traverse the ram in and out. The indicator variation shall be within 0.02/305mm (0.0008"/12").



Parallelism Of Table Surface To Table Cross Transverse Movement

Attach the base of a test indicator to the column. Touch the stylus of the indicator to the table surface. Traverse the table in and out. The indicator variation shall be within 0.018/305mm (0.0007"/12").



Stiffness Of Head And Quill Combination

Move quill down to its lowest position. Attach the base of a test indicator to the table surface. Apply 7kgf (15 lbs) force with a thrust meter to the lowest edge of the quill. The maximum displacement shall be less than 0.02mm (0.0008").



Meehanite Cast Iron

All essential castings are made of high grade Meehanite cast iron which has been stress relieved to provide a rigid machine structure.

MILLING MACHINE

FM-2S



**FM-2S
STEP PULLEY**

Hand Scraped
Turret-Column Ways

Dust Cover for Knee and
Crossfeed Ways

Precision Hardened and
Ground Ways

Built-in Coolant Tank in
Base



2HP

Class 7 Angular
Contact Bearings

Certified Meehanite Casting

Precision Hardened
And Ground Table
With Turotle

Hand Scraped
Turret-Column Ways

Certified Meehanite Casting

Precision Hardened
And Ground Table
With Turotle

FM-3V

VARIABLE



FM-4V

VARIABLE SPEED

5HP

SPEED



3HP

Class 7 Angular Contact Bearings

#40 NST STD W/ Erickson Thread

Hand Scraped Turret Column Ways

Certified Meehanite Casting

Dust Cover for Knee and Crossfeed Ways

Square Y & Z Ways

Precision Hardened And Ground Table With Turcote

Class 7 Angular Contact Bearings

Dust Cover for Knee and Crossfeed Ways

Square Y & Z Ways



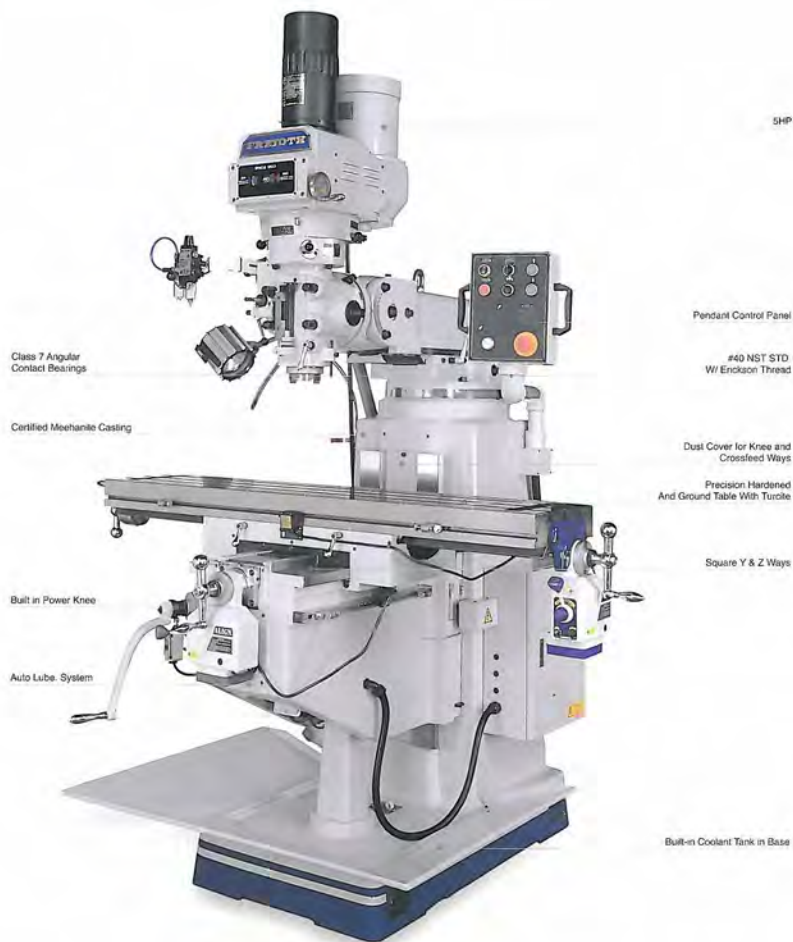
Built-in Coolant Tank in Base



Built-in Coolant Tank In Base

FM-5V

VARIABLE SPEED





Outstanding Features:

- Built in coolant tank in base, all base machined.
- Ground and hardened column slide ways
- Table T-slots precision machined.
- Ram slide ways ground.
- Hardened and ground on X and Y slideways.
- High precision angular contact ball bearing p4. (class 7)
- All quill are precision hardened, ground and chrome plated.
- Turcite B on X axis
- Table are hardened and ground.
- Precision scrapping jobs for all keyway and saddle, guarantee contacted surface more than 50-60 percent.

Specification:

| MODEL | FM-2S/2V | FM-3V | FM-4V | FM-5V |
|--|---|-----------------------------------|------------------------------------|------------------------------------|
| Table Size | 230 x 1067 (1219 mm optional) 9 x 42" (9 x 48" optional) | 254 x 1370 mm (10 x 54") | 254 x 1370 mm (10 x 54") | 315 x 1470 mm (12-1/2" x 58") |
| Long Travel | 750 / 880 mm (29-1/2" / 34-1/2") | 860 mm (34") | 860 mm (34") | 960 mm (38") |
| Cross Travel | 305 mm (12") | 390 mm (15-3/8") | 400 mm (15-3/4") | 390 mm (15-1/2") |
| Over Arm Travel | 305 mm (12") | 550 mm (21-5/8") | 550 mm (21-5/8") | 550 mm (21-5/8") |
| Vertical Knee Travel | 406 mm (16") | 380 mm (15") | 430 mm (16-7/8") | 430 mm (16-7/8") |
| Min. / Max. Spindle Nose to table surface | 42 ~ 469 mm (1-5/8" ~ 18-1/2") | 40 ~ 420 mm (1-5/8" ~ 16-1/2") | 25 ~ 485 mm (1" ~ 19") | 25 ~ 485 mm (1" ~ 19") |
| Min. / Max. Spindle Center to column | 171 ~ 476 mm (2-3/4" ~ 18-3/4") | 102 ~ 652 mm (4" ~ 25") | 150 ~ 670 mm (5-7/8" ~ 27-1/2") | 150 ~ 670 mm (5-7/8" ~ 27-1/2") |
| No. of T-slot | 3 | 3 | 3 | 3 |
| Size of T-slot | 16 mm (5/8") | 16 mm (5/8") | 16 mm (5/8") | 16 mm (5/8") |
| Max. Table Loading | 340 kgs / 749 lbs | 430 kgs / 947 lbs | 410 kgs / 903 lbs | 550 kgs / 1212 lbs |
| Spindle Motor | 2HP / 3HP | 3HP | 5HP | 5HP |
| Vertical elevating motor | OPTION | OPTION | OPTION | 1/2HP |
| Number Speeds | 16 steps / inf.variable | inf.variable | inf.variable | inf.variable |
| Spindle Speeds | 60Hz 60 ~ 4200 rpm, 50Hz 50 ~ 3750 rpm | | | |
| Spindle Taper | R8 or NT30 | R8 or NT30 | NT40 | NT40 |
| Quill Diameter | 85 mm (3-3/8") | 85 mm (3-3/8") | 105 mm (4") | 105 mm (4") |
| Quill Travel | 125 mm (5") | 125 mm (5") | 125 mm (5") | 125 mm (5") |
| Quill Feeds | 3 steps 0.0015, 0.003, 0.006" (0.04, 0.08, 0.14 mm) | | | |
| Head Swivel | 90 degree | 90 degree | 90 degree | 90 degree |
| Head Tilling | 45 degree | 45 degree | 45 degree | 45 degree |
| Net Weight | 900 kgs / 1983 lbs | 1300 kgs / 2865 lbs | 1500 kgs / 3306 lbs | 1700 kgs / 3746 lbs |
| Machine Height | 2100 mm (82-5/8") | 2150 mm (84-5/8") | 2375 mm (93-1/2") | 2375 mm (93-1/2") |
| Machine Width * Length | 1468 / 1622 mm x 1600 mm (57-7/8 / 63-7/8 x 63") | 1780 x 2000 mm (70x 79") | 1780 x 2300 mm (70 x 90-1/2") | 1880 x 2350 mm (74 x 92-1/2") |

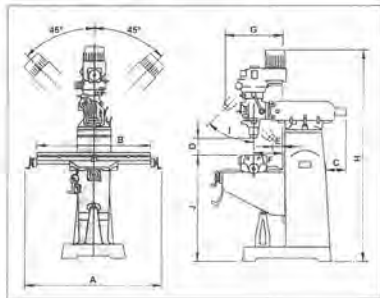
The design and specification of machine are subject to changes without further notice.

Special Execution On Request:

- Hardened and ground leadscrew available.
- Chrome vanadium steel leadscrew available.
- Y axis turcite B coating available.
- Special colour than our standard beige and blue lines available-please send us your colour sample or DIN numbers.
- CE marks on request.

MILLING MACHINE

Overall Dimension



| | 2S / 2V | 3V / 4V | 5V |
|---|-----------------------------------|--|------------------------------------|
| A | 1468 / 1620 mm (58" - 64") | 1780 mm (70") | 1840 mm (72-1/2") |
| B | 1067 / 1220 mm (42" - 48") | 1370 mm (54") | 1740 mm (58") |
| C | 75 - 310 mm (3" - 12-1/4") | 75 - 450 mm (3 - 18") | 75 - 508 mm (3 - 20") |
| D | 70 - 476 mm (2-3/4" - 18-3/4") | 70-520 mm / 70-540 mm (2-3/4"-21-1/2" / 2-3/4"-21-1/4") | 80 - 530 mm (2-3/8" - 20-3/4") |
| E | L - 90° | | |
| F | 127 - 415 mm (5" - 16-1/4") | 128-507 mm / 128-537 mm (5"-19-7/8" / 5"-21") | 185 - 580 mm (7-1/4" - 22-3/4") |
| G | Q - 45° | | |
| H | 2100mm (82-5/8") | 2150 mm / 2375 mm (84-5/8" / 93-1/2") | 2375 mm (93-1/2") |

Standard Accessories:

- Mechanical draw bar
- Mechanical one-shut lubrication pump
- Necessary tools and toolbox
- Operation manual and spare part list

Optional Accessories:

- X,Y,Z feed unit.
- Delux electrical switch box.
- Cooling system-includes pump and fittings.
- 7 pcs or 15 pcs metric or imperial OZ milling collet chuck set.
- 160 mm (6 inch) angle lock milling vice with swivel base.
- 160 mm (6 inch) hydraulic milling vice with swivel base.
- 160 mm (6 inch) or 200 mm (8 inch) super spacers (rapid dividing head.)
- Semi-universal dividing head B & S No.0/1 or Universal dividing head CM-2/B&S No. 2.
- ER Collet in set-
- Simple execution boring head with shank - 50mm/75mm/100mm-(2/3/4 inch)
- Narex universal boring and facing head with shank in box. (made in Czech Rep.)
- Drill chuck with key or Keyless drill chuck with shank & arbor.
- Air operated power draw bar.
- Horizontal/Vertical rotary table-160/200/250/300mm (6/8/10/12 inch)
- Digital readout for Longitunal travers or Ram movement or Cross movement.
- Slotting head.
- Raizer blocks-75/100/160mm (3/4/6 inch) with spider and bolts. (please advice your machine color.)
- Horizontal milling attachment.
- Right angle milling attachment.
- Edge finder-electronic type.
- Z-axis setter. (50mm height only)
- 3 ways milling vise.
- Other accessories as required!



FREJOTH INTERNATIONAL LTD.

8F #501, SEC.2, WU CHUAN W. RD., TAICHUNG 408, TAIWAN, R.O.C.

TEL:886-4-23816977 FAX:886-4-23813584.23813769

E-mail:mail@frejoth.com.tw web-site http://www.frejoth.com.tw

www.acra.com.tw