VMP SERIES
VERTICAL MACHINING CENTER

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FEELER VMP SERIES

Vertical Machining Center Provides State-of-the-art Efficiency For Increased Profitability

Whether you require in high precision parts machining or general mold making, Fair Friend new VMP-Series Vertical Machining Centers offer unbeatable dependability. The VMP-Series is a well-engineered high precision unit, making it ideal for various precision industrial requirements. It promises dramatic productivity gains with many integrated features. Its rugged construction manufactured from high quality cast iron, assuring optimum rigidity and stability for years of dependable operation. Machine structure design is subject to ANSYS and NASTRAN Finite Element Analysis to achieve the highest standards of machine accuracy and reliability. Reinforced A-shape column bottom is combined with massive base for extra rigid support. 10,000 rpm spindle speed produces the fine surface effect required by precision mold. With the points above and more excellent features combination, you get the most competitive edge for your precision jobs.
Perfected structure design brings you lifetime accuracy, rigidity and stability!

RUGGED CONSTRUCTION ASSURES OPTIMUM RIGIDITY AND STABILITY

- The machine structure and major parts are manufactured from Meehanite cast iron for outstanding material stability and assures long-term deformation-free performance.
- The entire machine construction is subjected to ANSYS and NASTRAN Finite Element Analysis to achieve optimum rigidity and stability.
- The column bottom is specially designed with A-shaped structure. (Except VMP23.30)
- Outstanding machine structure, combined with high speed servo system, allows rapid traverse up to 40 m/min.
- Servomotor directly driven ball screw. Ball screws are pretensioned, ensuring rigidity and accuracy required for the feed transmission system.
- Boxways for Z axis are coated with low friction Turcite B, providing increased cutting rigidity. (Except VMP23.30)
- 634mm span of guideways on Y-axis and 370mm span on Z-axis guarantee superior stability for saddle and spindle head travel.

Carrousel Type ATC

The carrousel type tool changer with capacity of 22 tools to meet flexible machining requirements for molds and parts production.

Dependable, Efficient ATC

FEELERS ATC designs are all subjected to 1 million cycles of continuous tests for durability and stability to assure maximum dependability of operational performance.

10,000 RPM SPINDLE

The belt-drive spindle specially-designed bearing layout ensures maximum spindle rigidity. (Spindles at 10,000rpm and 12,000rpm are available as optional.)

FEM ANALYSIS

FEELERS machine structure is designed and analyzed using advanced Finite Element Analysis software for dynamic simulation and structural analysis. This design method assures optimum structural rigidity, machine accuracy and reliability.

PRECISION BALLSCREWS

Pretensioned ball screws on X, Y, Z axes ensure accuracy and eliminate positioning error.

Cutting Capacity Example

<table>
<thead>
<tr>
<th>Machining Types</th>
<th>Drilling</th>
<th>Tapping</th>
<th>Face Milling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Diam. (mm) x Feed (mm/rev)</td>
<td>Ø40 x 0.1</td>
<td>M34 x 3.0</td>
<td>308 c.c. 80 x 3.5 x 1100</td>
</tr>
<tr>
<td>Tool Diam. (mm) x Pitch (mm/rev)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width (mm) x Depth (mm) x Feed (mm/rev)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Workpiece Material: Medium Carbon Steel (S45C)
**SEE-THROUGH WINDOW**
The additional see-through window on the spindle head cover provides convenient checking and maintenance.

**CHIP CONVEYOR (opt.)**
- Various types of chip conveyors to choose from. Installing the chip conveyor is conveniently done without changing coolant tank. (apply to VMP32/40)
- The user may change from right to left chip removal without replacing any parts. (apply to VMP32/40)

**OIL / COOLANT SEPARATION DEVICE**
Mounted at the side of the base, the oil-coolant separation device does not require additional leveling adjustment.

VMP-30 Rear Side Coolant Tank

VMP-40 Coolant Tank
VARIOUS ADVANCED CNC CONTROLLERS TO CHOOSE FROM

FANUC 0i SERIES  
MITSUBISHI M70  
HEIDENHAIN TNC 530  
SIEMENS 802D/828D

SERVO SYSTEM ADJUSTMENT AND OPTIMIZATION

The servo system can be adjusted to an optimum condition according to the signals from each axis movement. This provides:
- Increased servo system rigidity.
- Reduced machine vibration.
- Reduced machining time.
- Optimization for acceleration/deceleration time before and after interpolation.

This function meets the rigorous requirements of surface roughness and smoothness for the mold-making industry. Also, it greatly reduces machining time for maximum efficiency.

- BLUE CURVE: Torque command
- RED CURVE: Position
- GREEN CURVE: Speed
- PURPLE CURVE: Acceleration

An Innovative Structural Design that Allows for Many Options

Mold Machining Package (OPT)
- 10,000 rpm spindle speed (Ceramic Bearing)
- 15/18.5 kW spindle power (Except VMP-23A/30A)
- 12 (24) m/min. rapid traverse on X / Y / Z-axis
- AICC + Data Server + Ethernet
- Servomotor upgrade

Precision Mold Machining Package (OPT)
- 10,000 rpm spindle speed (Ceramic Bearing)
- 15/18.5 kW spindle power (Except VMP-23A/30A)
- 12 (24) m/min. rapid traverse on X / Y / Z-axis
- 12,000 / 15,000 rpm DDS spindle (Except VMP-23A/30A)
- 2-axis roller type linear guide
- HPCC + Data Servo + Ethernet + Manual guide
- Jerk Control + Machining Conditions selection
- 10-step speed change
- Servomotor upgrade
- Rear cover
# VMP Machine Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>VMP-23A</th>
<th>VMP-23A APC</th>
<th>VMP-35A</th>
<th>VMP-32A APC</th>
<th>VMP-40A</th>
<th>VMP-45S(A)</th>
<th>VMP-45S(A)</th>
<th>VMP-55A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>X-axis travel</strong></td>
<td>mm</td>
<td>580</td>
<td>540</td>
<td>760</td>
<td>820</td>
<td>800</td>
<td>1,020</td>
<td>1,100</td>
</tr>
<tr>
<td><strong>Y-axis travel</strong></td>
<td>mm</td>
<td>420</td>
<td>420</td>
<td>420</td>
<td>520</td>
<td>520</td>
<td>700</td>
<td>610</td>
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<tr>
<td><strong>Z-axis travel</strong></td>
<td>mm</td>
<td>510</td>
<td>510</td>
<td>510</td>
<td>510</td>
<td>510</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td><strong>Spindle nose to table surface</strong></td>
<td>mm</td>
<td>80 - 590</td>
<td>135 - 645</td>
<td>80 - 590</td>
<td>100 - 605</td>
<td>148 - 653</td>
<td>80 - 585</td>
<td>200 - 800</td>
</tr>
<tr>
<td><strong>Spindle center to column surface</strong></td>
<td>mm</td>
<td>455</td>
<td>455</td>
<td>455</td>
<td>560</td>
<td>560</td>
<td>770</td>
<td>660</td>
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<tr>
<td><strong>Table surface to floor</strong></td>
<td>mm</td>
<td>820</td>
<td>820</td>
<td>820</td>
<td>1025</td>
<td>900</td>
<td>950</td>
<td>970</td>
</tr>
<tr>
<td><strong>Table center to column surface</strong></td>
<td>mm</td>
<td>245 - 665</td>
<td>245 - 665</td>
<td>245 - 665</td>
<td>300 - 820</td>
<td>300 - 820</td>
<td>300 - 820</td>
<td>300 - 820</td>
</tr>
<tr>
<td><strong>Spindle diameter</strong></td>
<td>mm</td>
<td>420 x 650</td>
<td>410 x 380</td>
<td>420 x 890</td>
<td>520 x 950</td>
<td>500 x 700</td>
<td>1,300 x 700</td>
<td>1,200 x 600</td>
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<tr>
<td><strong>Maximum load</strong></td>
<td>kg</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>200</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>T-dowel</strong></td>
<td>mm</td>
<td>14 x 4 x 100</td>
<td>14 x 4 x 100</td>
<td>14 x 4 x 100</td>
<td>18 x 5 x 100</td>
<td>18 x 5 x 100</td>
<td>18 x 5 x 125</td>
<td>18 x 5 x 100</td>
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<tr>
<td><strong>Spindle speed</strong></td>
<td>rpm</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td><strong>Spindle taper</strong></td>
<td>type</td>
<td>7/24 taper No.40</td>
<td>7/24 taper No.40</td>
<td>7/24 taper No.40</td>
<td>7/24 taper No.40</td>
<td>7/24 taper No.40</td>
<td>7/24 taper No.40</td>
<td>7/24 taper No.40</td>
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<tr>
<td><strong>Spindle power</strong></td>
<td>kw</td>
<td>7.5/11</td>
<td>7.5/11</td>
<td>7.5/11</td>
<td>7.5/11</td>
<td>7.5/11</td>
<td>7.5/11</td>
<td>7.5/11</td>
</tr>
<tr>
<td><strong>X-axis rapid traverse</strong></td>
<td>mm/min</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td><strong>Y-axis rapid traverse</strong></td>
<td>mm/min</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td><strong>Z-axis rapid traverse</strong></td>
<td>mm/min</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>36</td>
</tr>
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</table>

### Tool Changing Time

<table>
<thead>
<tr>
<th>Tool Type</th>
<th>Standard</th>
<th>Manual</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of tools</td>
<td>18 (200)</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Tapering</td>
<td>P-40T (45°)</td>
<td>P-40T (45°)</td>
<td>P-40T (45°)</td>
</tr>
<tr>
<td>Max. tool length</td>
<td>250</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Max. tool diameter</td>
<td>Ø100</td>
<td>Ø100</td>
<td>Ø100</td>
</tr>
<tr>
<td>Max. tool diameter (no added tool)</td>
<td>Ø110</td>
<td>Ø110</td>
<td>Ø110</td>
</tr>
<tr>
<td>Floor area</td>
<td>1,900 x 2,250</td>
<td>1,500 x 2,630</td>
<td>2,100 x 2,250</td>
</tr>
<tr>
<td>Machine weight</td>
<td>2,370</td>
<td>2,300</td>
<td>2,300</td>
</tr>
<tr>
<td>Max. machine height</td>
<td>2,950</td>
<td>2,800</td>
<td>2,800</td>
</tr>
</tbody>
</table>

### Air Source

- 6.8
- 6.8
- 6.8
- 6.8

### Machine Dimensions, Table Dimensions and Working Capacity

#### VMP-23

- **X-axis travel**: 580 mm
- **Y-axis travel**: 420 mm
- **Z-axis travel**: 510 mm
- **Spindle nose to table surface**: 80 - 590 mm
- **Spindle center to column surface**: 455 mm
- **Table surface to floor**: 820 mm
- **Table center to column surface**: 245 - 665 mm

#### VMP-32

- **X-axis travel**: 510 mm
- **Y-axis travel**: 420 mm
- **Z-axis travel**: 510 mm
- **Spindle nose to table surface**: 80 - 590 mm
- **Spindle center to column surface**: 455 mm
- **Table surface to floor**: 820 mm
- **Table center to column surface**: 245 - 665 mm

#### VMP-40

- **X-axis travel**: 510 mm
- **Y-axis travel**: 420 mm
- **Z-axis travel**: 510 mm
- **Spindle nose to table surface**: 80 - 590 mm
- **Spindle center to column surface**: 455 mm
- **Table surface to floor**: 820 mm
- **Table center to column surface**: 245 - 665 mm

#### VMP-45

- **X-axis travel**: 510 mm
- **Y-axis travel**: 420 mm
- **Z-axis travel**: 510 mm
- **Spindle nose to table surface**: 80 - 590 mm
- **Spindle center to column surface**: 455 mm
- **Table surface to floor**: 820 mm
- **Table center to column surface**: 245 - 665 mm

### Standard Accessories

- Heat exchanger
- 3 axes press-powered
- Clamping / unclamping device
- Automatic lubrication system
- Fully enclosed splash guard
- Dust-proof electrical cabinet
- Spindle air sealing
- 3-color signal light (VMP-23/30 opt)
- Rigid tapping
- Leveling blocks and plates
- Spindle coolant nozzle
- Operation and maintenance manual

### Optional Accessories

- 3 axes linear scales
- Coolant through spindle
- Workpiece measurement system
- Automatic tool length measurement
- Breakage detection
- Chip conveyor
- Chip screw
- Spindle oil cooler
- Pushing system + coolant gun
- Front flushing (VMP-45/50)
- Top roof
- 8th axis preparation or rotary table
- Deep hole adapter
- High pressure pump
- Auto power off
- Rear cover
- 12,000rpm Belt type spindle BT-40
- 10,000rpm DDS spindle
- 12,000~15,000rpm DDS spindle
- Gear box (Except VMP-23/30)

### Machine Dimensions, Table Dimensions and Working Capacity

- **VMP-23**
- **VMP-30**
- **VMP-32**
- **VMP-40**
- **VMP-45**
- **VMP-50**