FAIR FRIEND • ENGINEERING • EXCELLENCE • LEADERSHIP • EXPERTISE • RELIABILITY

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FFG FEELER®

VMP SERIES

Vertical Machining Center

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's new VMP-Series Vertical Machining Centers offers unbeatable dependability.

The VMP-Series is a well-engineered high precision unit, ideal for various precision industrial requirements. It promises dramatic productivity gains with many integrated features. Its rugged strucuture, manufactured from high quality cast iron, assures optimum rigidity and stability for years of dependable operation. The 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 a massive base for extra rigid support. The 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.

■ VMP-23Aapc

■ VMP-32Aapc

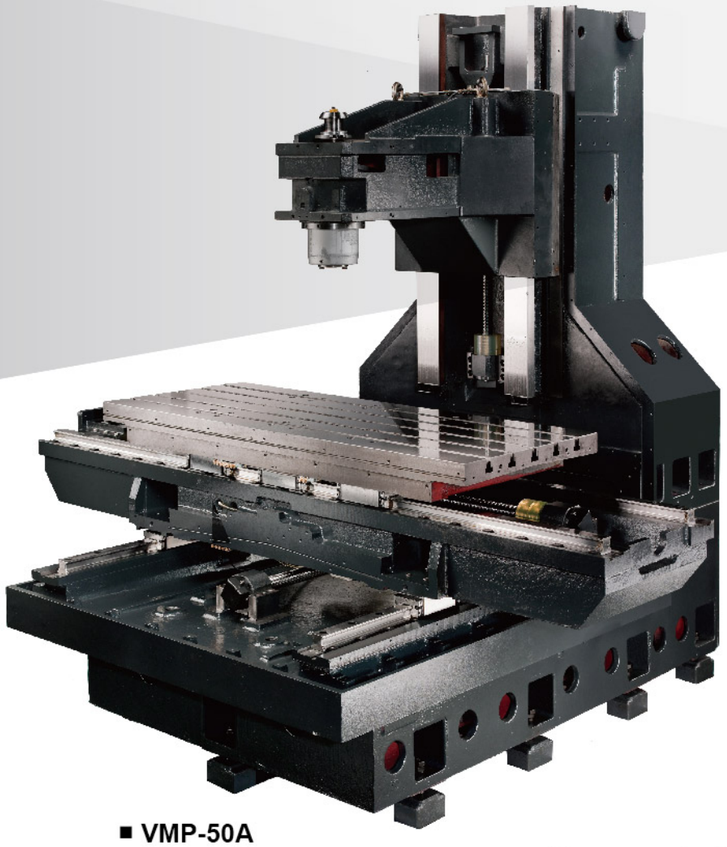
■ VMP-30A

■ VMP-40A

■ VMP-50A

■ VMP-65A

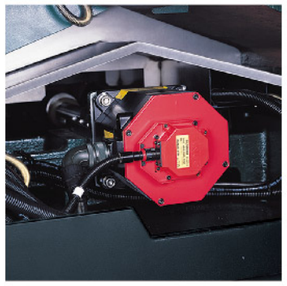
Perfected structure design brings you lifetime accuracy, rigidity and stability !



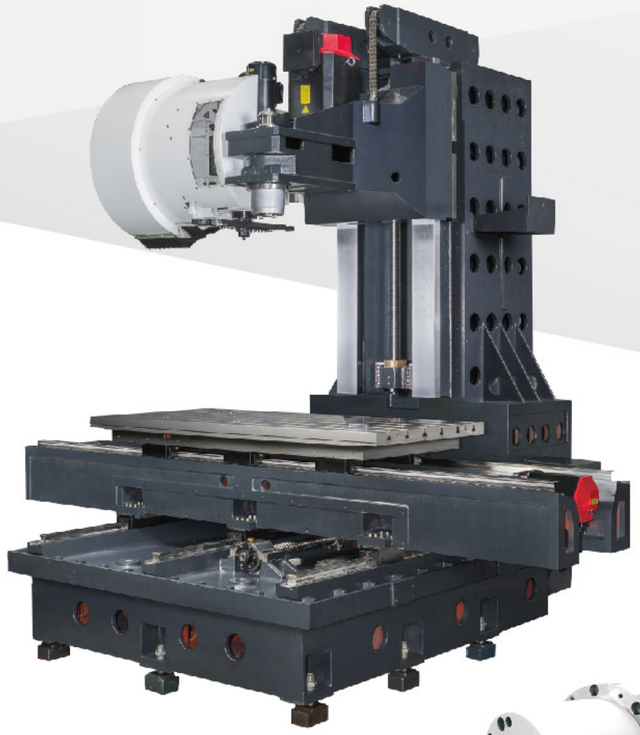
■ VMP-50A

RUGGED CONSTRUCTION ASSURES OPTIMUM RIGIDITY AND STABILITY

- The machine structure and major parts are manufactured from Meehanite cast iron for outstanding material stability and guaranteed 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 drives ballscrew. Ballscrews 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.



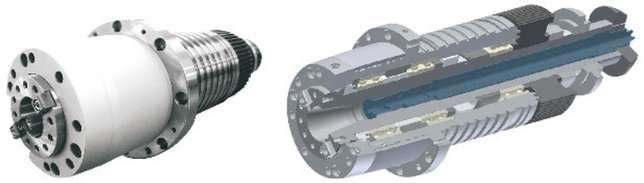
Rear mounted Y-axis servo motor for increased maintenance space.

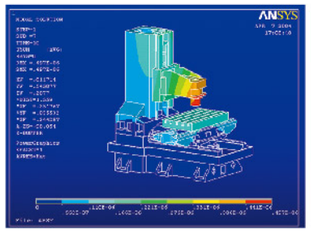


■ VMP-65A
(3 linear guide ways)

Dependable, Efficient ATC

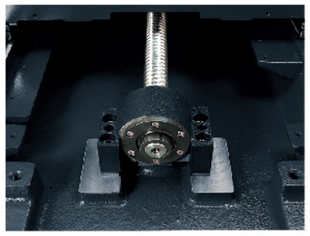
FEELER'S ATC designs are all subjected to 1 million cycles of continuous tests for durability and stability to assure maximum dependability of operational performance.





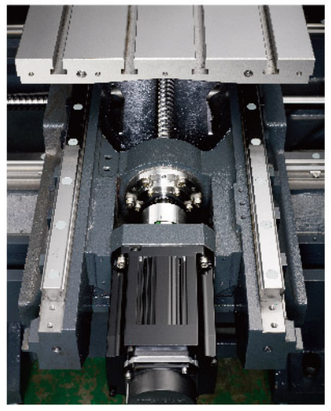
FEM ANALYSIS

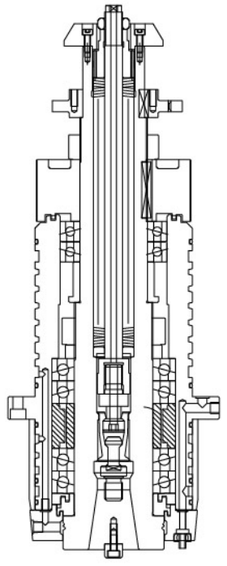
FEELER'S machine structure is designed and analyzed using advanced Finite Element Analysis software for dynamic simulation and structural analysis. This design method assures optimum structural rigidity, machine accuracy and reliability.



PRECISION BALLSCREWS

Pretensioned ballscrews on X, Y, Z axes ensure accuracy and eliminate positioning errors.



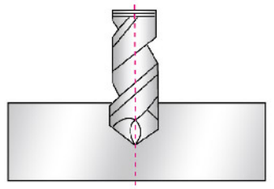
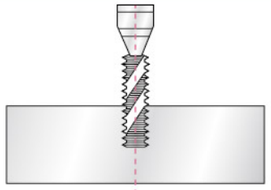
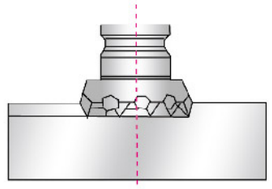


10,000 RPM SPINDLE

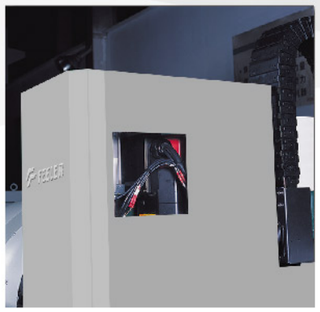
The belt-drive spindle specially-designed bearing layout ensures maximum spindle rigidity. (Spindles at 10,000rpm and 12,000rpm are available as optional.)

Cutting Capacity Example

Workpiece Material: Medium Carbon Steel (S45C)

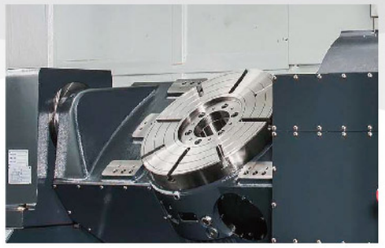
Machining Types		
Drilling	Tapping	Face Milling
		
Tool Diam. (mm) x Feed (mm/rev)	Tool Diam. (mm) x Pitch (mm/rev)	Width (mm) x Depth (mm) x Feed (mm/min)
Ø40 x 0.1	M24 x 3.0	308 c.c. 80 x 3.5 x 1100

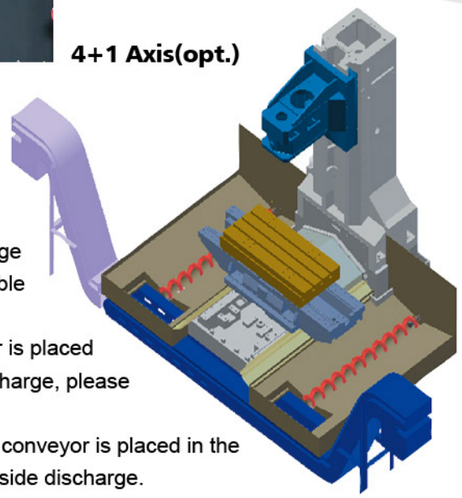
Pragmatic Operational Features



SEE-THROUGH WINDOW

The additional see-through window on the spindle head cover provides convenient checking.





4+1 Axis(opt.)

CHIP CONVEYOR (opt.)

* Chip conveyor of VMP series is with left side discharge (right side discharge is available upon request).
* VMP32A/40A's chip conveyor is placed in front side with left side discharge, please refer to above drawing.
* VMP23A/30A/45A/50A's chip conveyor is placed in the rear side of machine with left side discharge.

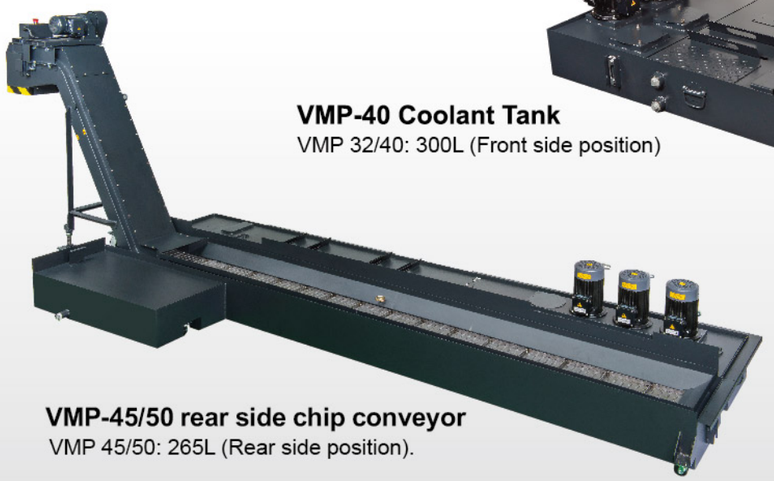
OIL / COOLANT SEPARATION DEVICE

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

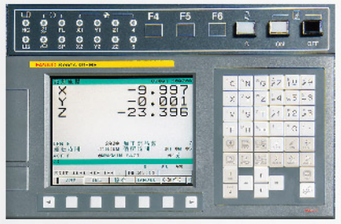
VMP 32/40: 300L (Front side position)



VMP-45/50 rear side chip conveyor

VMP 45/50: 265L (Rear side position).

VARIOUS ADVANCED CNC CONTROLLERS TO CHOOSE FROM



FANUC 0i MF

MITSUBISHI M80

HEIDENHAIN TNC 640

SIEMENS 828D

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 I+ Data Server + Ethernet

Precision Mold Machining Package (OPT)

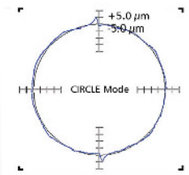
- 10,000 rpm spindle speed (Ceramic Bearing)
- 15/18.5 kW spindle power (Except VMP-23A/30A)
- 12 (24) m/min. rapid traverse on X / Y / Z-axis
- 12,000 / 15,000 rpm DDS. spindle (Except VMP-23A/30A)
- Z-axis roller type linear guide
- AICC II+ Data Servo + Ethernet + Manual guide i
- Jerk Control + Machining Conditions selection: 10-step speed change + NaNo smoothing
- Rear cover

INTELLIGENT PARAMETER ADJUSTMENT FUNCTION

The NC automatically evaluates and executes parameter compensation according to the machining condition.

1. BEFORE COMPENSATION

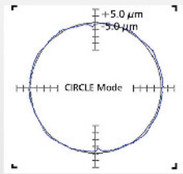
Sharp point occurs during quadrant change.



R:30.000
X:-62.7703
Y:-133.439
G:200.0
Z:1.0

2. DURING COMPENSATION

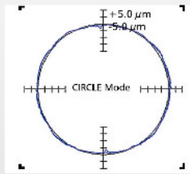
The intelligent parameter adjustment function eliminates the sharp points on quadrants.



R:30.000
X:-82.4318
Y:-100.6711
G:200.0
Z:1.0

3. AFTER COMPENSATION

Circularity accuracy is greatly elevated.



R:30.000
X:-3.7881
Y:-172.7606
G:200.0
Z:1.0

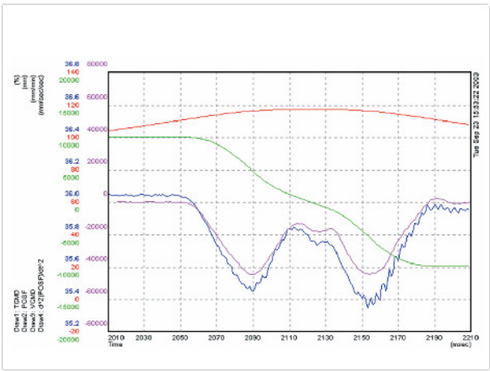
SERVO SYSTEM ADJUSTMENT AND OPTIMIZATION

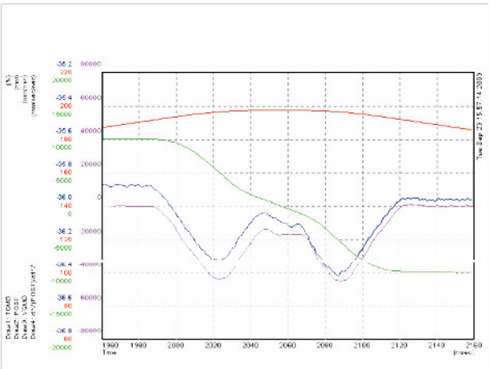
The servo system can be adjusted to an optimum condition according to the signals from each axis movement. This provides:

- Increased servo system rigidity.
- Reduced machine vibration.
- Reduced machining time.
- Optimization for acceleration/deceleration time before and after interpolation.

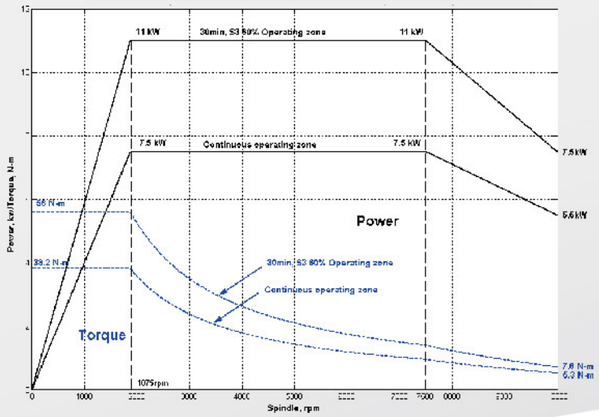
This function meets the rigorous requirements of surface roughness and smoothness for the mold-making industry. Also, it greatly reduces machining time for maximum efficiency.

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

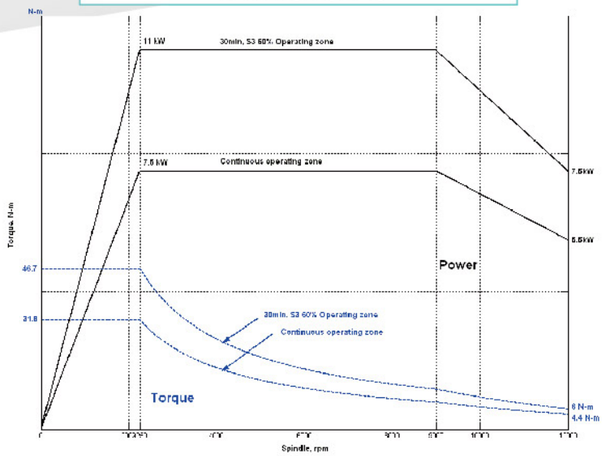




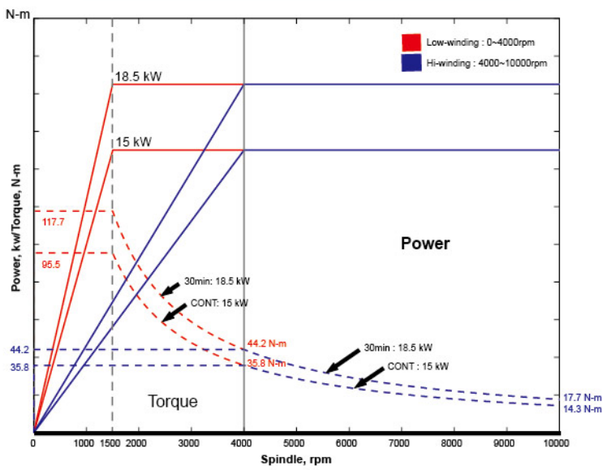
FANUC α8/8000i for belt type spindle 10000rpm(1:1.25)



FANUC α8/8000i for belt type spindle 12000rpm(OPT)

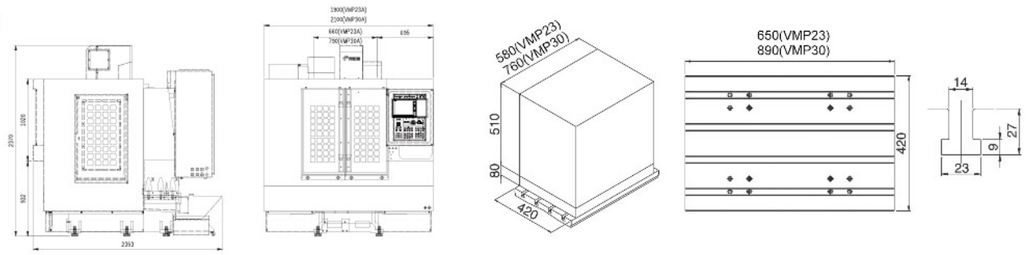


FANUC α15/10000i for belt type / DDS spindle 10000rpm(OPT)

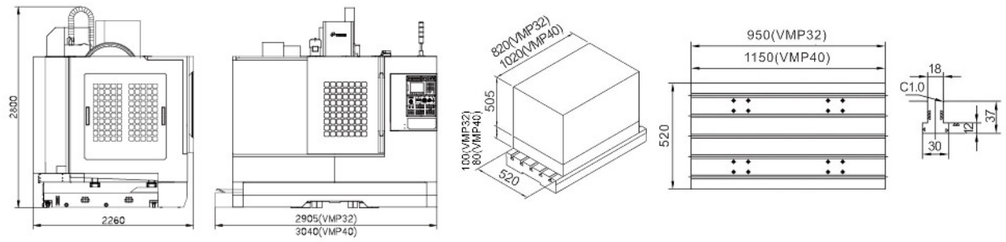


Machine Dimensions, Table Dimensions and Working Capacity

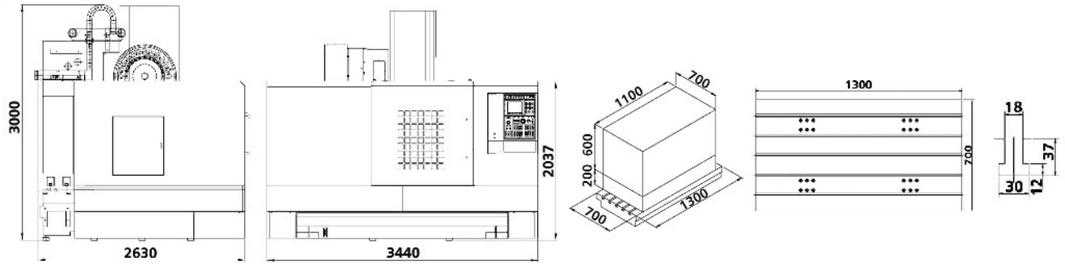
VMP-23
VMP-30



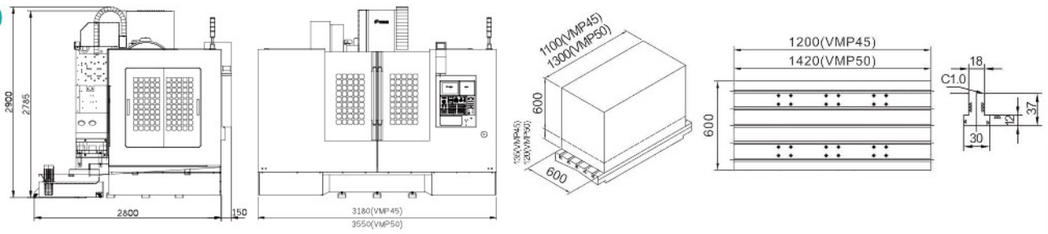
VMP-32
VMP-40



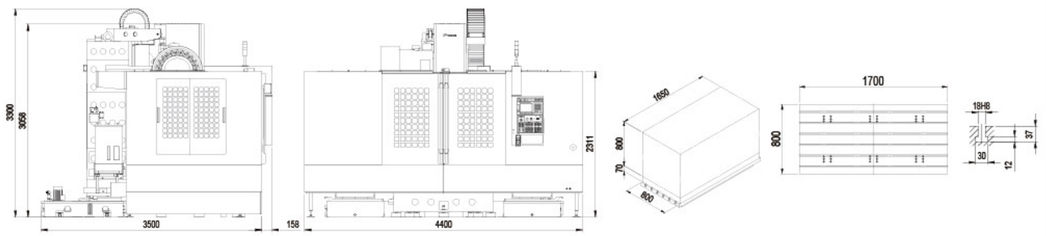
VM-45S



VMP-45
VMP-50



VMP-65



VMP MACHINE SPECIFICATIONS

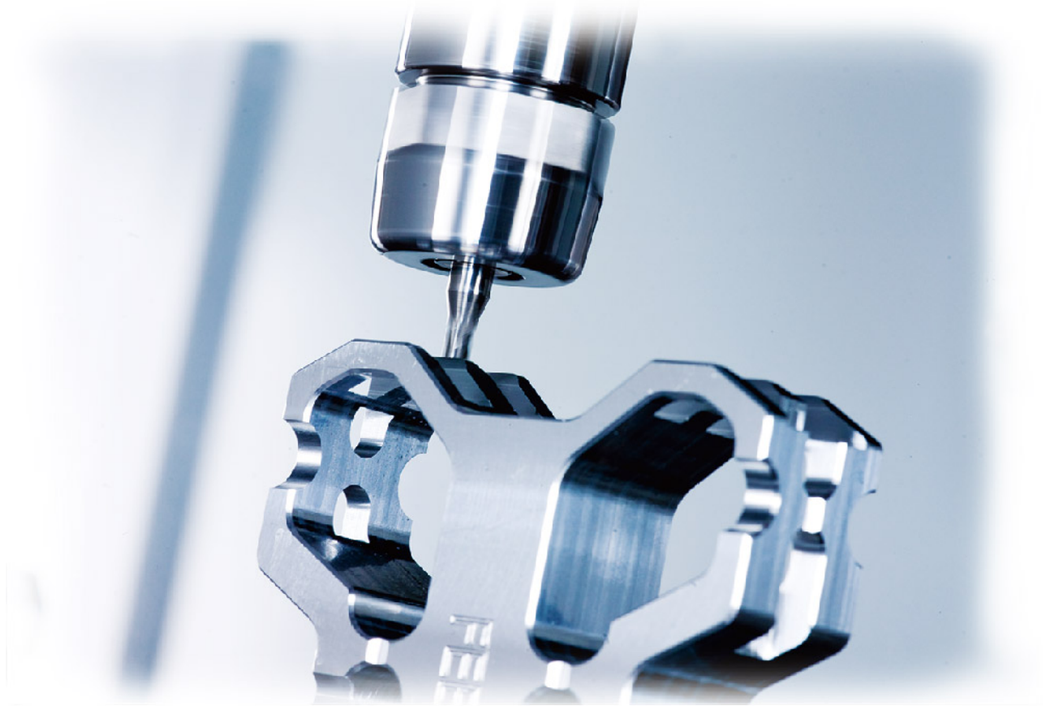
MODEL	Unit	VMP-23(A)	VMP-23A-APC	VMP-30(A)	VMP-32(A)	VMP-32A-APC	VMP-40(A)	VM-45S(A)	VMP-45(A)		VMP-50(A)		VMP-65(A)
TRAVEL									BT40	BT50	BT40	BT50	BT-40
X - axis travel	mm	580	580	760	820	800	1,020	1,100	1,100		1,300		1,650
Y - axis travel	mm	420	420	420	520	520	520	700	610		610		800
Z - axis travel	mm	510	510	510	505 (OPT:635)	505	505(OPT:635)	600	600		600		800
Spindle nose to table surface	mm	80 ~ 590	135 ~ 645	80-590	100 ~ 605 (OPT:80~715)	148 - 653	80 ~ 585 (OPT:80~715)	200 ~ 800	135 ~ 735		120 ~ 720		70~870
Spindle center to column surface	mm	455	455	455	560	560	560	770	660		660		850
Table surface to floor	mm	820	915	820	920	1025	940	950	960		975		1,080
Table center to column surface	mm	245 ~ 665	245 ~ 665	245 ~ 665	300 ~ 820	300 - 820	300 ~ 820	420 ~ 1,120	355 ~ 965		355 ~ 965		450~1,250
TABLE													
Table dimensions	mm	650 x 420	580 x 410	890 x 420	950 x 520	700 x 500	1,150 x 520	1,300 x 700	1,200 x 600		1,420 x 600		1,700×800
Maximum load	kg	300	120	300	800	200	800	1,000	1,500		1,500		1.500
T - slot	mm	14 x 4 x 100	35-M12 x P1.75	14mm x 4 x 100	18 x 5 x 100	35-M16 x P2.0	18 x 5 x 100	18 x 5 x 125	18 x 5 x 100		18 x 5 x 100		18×6×125
SPINDLE													
Spindle speed	rpm	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	4,000	10,000	4,000	10,000
Spindle taper	type	7/24 taper No.40	7/24 taper No.40	7 / 24 taper No.40	7/24 taper No.40	7/24 taper No.40	7/24 taper No.40	7/24 taper No.40	7/24 taper No.40	7/24 taper No.50	7/24 taper No.40	7/24 taper No. 50	7/24 taper No.40
Spindle power	kW	7.5 / 11	7.5 / 11	7.5 / 11	7.5 / 11	7.5 / 11	7.5 / 11	6 / 11	15 / 18.5		15 / 18.5		15/18.5
FEEDRATE													
X - axis rapid traverse	m / min	36	36	36	40	40	40	24	36		36		36
Y - axis rapid traverse	m / min	36	36	36	40	40	40	24	36		36		36
Z - axis rapid traverse	m / min	36	36	36	30	30	30	15	24		24		24
ATC													
Tool changing time (tool-to-tool) Carrousel type		7 sec / 60 Hz, 7.1 sec / 50 Hz	No	7sec / 60Hz, 7.1sec / 50Hz	7 sec / 60 Hz, 7.1 sec / 50 Hz	7 sec / 60 Hz, 7.1 sec / 50 Hz	7 sec / 60 Hz, 7.1 sec / 50 Hz	7 sec (No.40)	7 sec / 60 Hz, 7.1 sec / 50 Hz		7 sec / 60 Hz, 7.1 sec / 50 Hz		7sec / 60 Hz, 7.1 sec / 50Hz
Tool changing time (tool-to-tool) Arm type		1.7 sec / 60 Hz, 2.0 sec / 50 Hz	1.7 sec / 60 Hz, 2.0 sec / 50 Hz	1.7 sec / 60 Hz, 2.0 sec / 50 Hz	1.7 sec / 60 Hz, 2.0 sec / 50 Hz	1.7 sec / 60 Hz, 2.0 sec / 50 Hz	1.7 sec / 60 Hz, 2.0 sec / 50 Hz	1.7 sec (No.40)	1.7 sec / 60 Hz, 2.0 sec / 50 Hz		1.7 sec / 60 Hz, 2.0 sec / 50 Hz		1.7sec / 60 Hz,2.0 sec / 50Hz
Tool changer		Carrousel (Arm)	Arm	Carrousel (Arm Type)	Carrousel (Arm)	Carrousel (Arm)	Carrousel (Arm)	Carrousel (Arm)	Carrousel (Arm)		Carrousel (Arm)		Carrousel(Arm)
No. of tools	type	18 (20)	20	18 (20)	22 (24)	22 (24)	22 (24)	22 (24)	22(24)		22(24)		22(24)
Pull stud		P-40T (45°)	P-40T (45°)	P - 40T (45°)	P-40T (45°)	P-40T (45°)	P-40T (45°)	P-40T (45°)	P-40T (45°)	P-50T (45°)	P-40T (45°)	P-50T (45°)	P-40T(45°)
Max. tool weight	kg	7	7	7	8	8	8	8	8	15	8	15	8
Max. tool length	mm	250	250	250	300	300	300	300	300	350	300	350	300
Max. tool diameter	mm	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80	ø100	Ø80	ø100	ø80
Max. Tool diameter (no adjacent tool)	mm	Ø130	Ø130	Ø130	Ø150	Ø150	Ø150	Ø150	Ø150	ø200	Ø150	ø200	ø150
OTHERS													
Floor space	mm	1,900 x 2,255	1,900 x 2,630	2,100 x 2,255	2,905 x 2,260	3,300 x 3,175	3,040 x 2,260	3,440 x 2,630	3,180 x 2,800		3,550 x 2,800		4,400×3,500
Machine weight	kg	3,000	3,900	3,300	5,800	7,500	6,300	9,000	6,800		7,300		11,000
Max. machine height	mm	2,370	2,520	2,370	2,800	2,950	2,800	3,000	2,900		2,900		3,300
Power capacity	KVA	25	25	25	35	35	35	25	25		25		25
Air source	kg/cm²	6-8	6-8	6-8	6-8	6-8	6-8	6-8	6-8		6-8		6-8

(Controller : Fanuc / Mitsubishi) (Controller : Fanuc / Mitsubishi)

* APC changing time: 6 seconds/ VMP-23A-APC, 10 Seconds/ VMP32A-APC.
* Specifications and design characteristics are subject to change without prior notice.

STANDARD ACCESSORIES

- Heat exchanger
- 3 axes pretensioned ballscrews
- Clamping / unclamping device
- Automatic lubrication system
- Fully enclosed splash guard
- Dust-proof electrical cabinet
- Spindle air sealing
- 3-color signal light
- 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 and breakage detection
- Chip conveyor
- Chip screw
- Spindle oil cooler
- Flushing system + coolant gun
- Front flushing (VMP45/50)
- Top roof
- 4th axis preparation or rotary table
- High presure pump
- Auto power off
- Rear cover
- 12,000rpm Belt type spindle BT-40
- 10,000rpm DDS spindle
- 12,000/15,000rpm DDS spindle
- Z axis travel Travel 635mm (VMP-32/40)