

Performance Series

Vertical Machining Centers

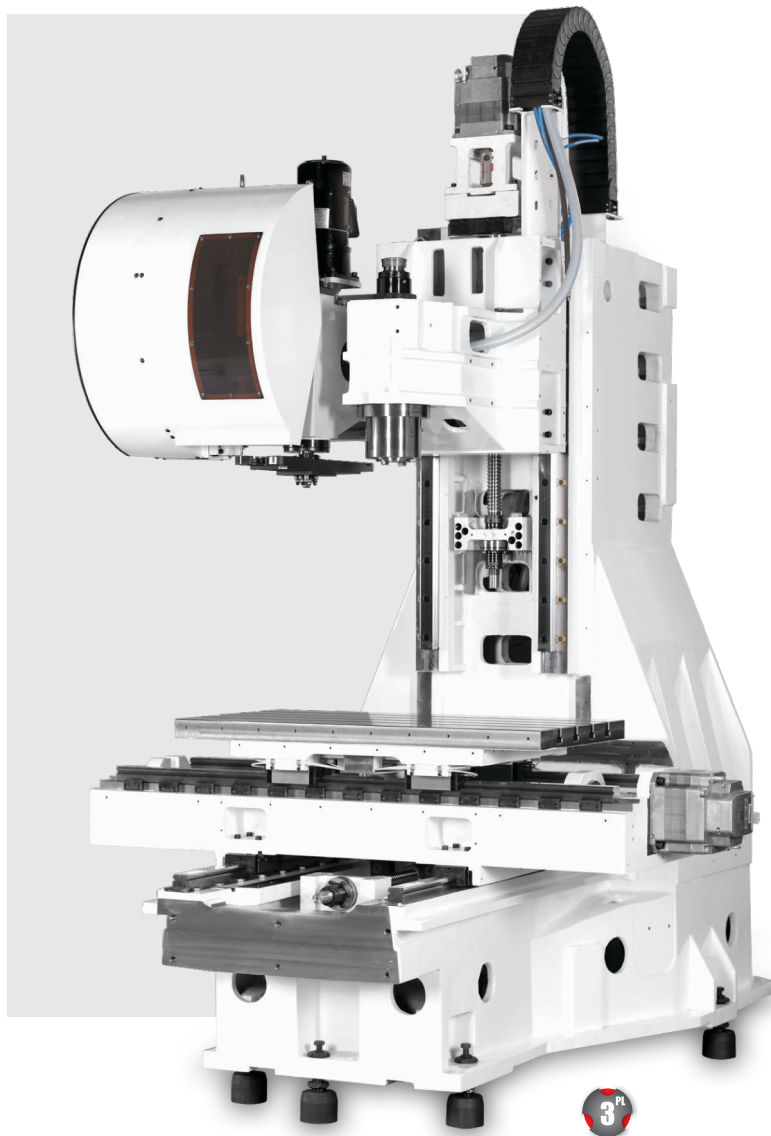


Performance Series

Vertical Machining Center

OVERVIEW

To match the demand of greater accuracy and total reliability at higher speed, JYOTI has developed special Performance Series Vertical Machining Centers. These rigid machines are broad based C frame structure machines, with a moving table for easy access. The high dynamic structure supports rapid axes takes-off with an acceleration of **5m/s²**.



STRUCTURE

The complete structure is made out of graded casting and heat treated for consistent accuracy for long time. Broad rigid base with heavy cross ribs dampens the effect of vibrations. The twin layer heavy column structure helps in balancing the whole machine while taking high cutting load. Table of the machine is made of modular casting with the addition of special alloys for consistent accuracy over a long period of time.

The complete structure is FEA (Finite Element Analysis) proven with stringent analysis done by JYOTI.

3 - POINT LEVELING

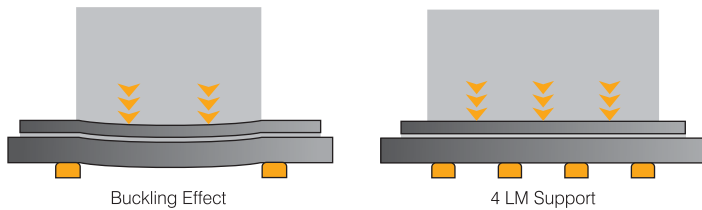
Twisting effect can be minimized with 3 point leveling support system. Also it facilitate easy and quick Installation and Relocation of machine with minimum leveling maintenance.



PRECISION LINEAR AXIS

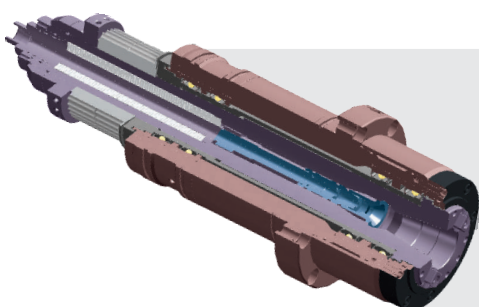
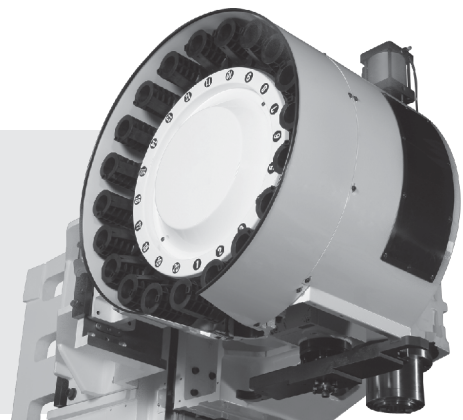
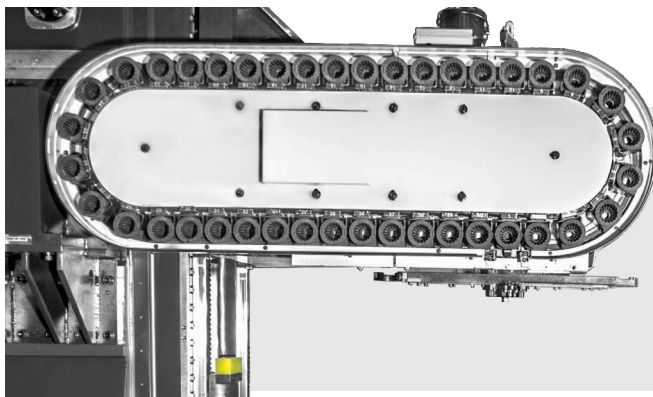
In heavy duty machines, VMC 1050, VMC 1060 and VMC 1260, Y-Axis saddle moving on bed (4-LM Guideways with 6-LM blocks). X-Axis supporting broad table movement on saddle (2-LM Guideways with 6-LM blocks). This drastically increases stability in full working area during dynamic as well as static load conditions with higher machining rates while enhancing geometrical accuracy and surface quality of the machined workpieces. Also this design avoids buckling effect for bigger table with heavy load.

The guideways are completely protected from dirt and dust by extremely flexible telescopic covers.



AUTO TOOL CHANGER

The auto tool changer is a Twin Arm Type with Disc Type tool magazine capable of storing 20 Tools at a time. The Tool change time is 2.4 seconds. An option of 24, 30 & 40 tool magazine is also available.



HIGH PERFORMANCE SPINDLE

For Die-Mould Series machines specially designed with Ceramic Bearing Spindles are used to work at higher rpm for better surface finishing. Due to ceramic bearing, less heat gets generated while continuously machining at higher rpm giving spindle better working life.

These spindles are manufactured in our dedicated clean room facility and then finally balanced and extensively tested for performance.

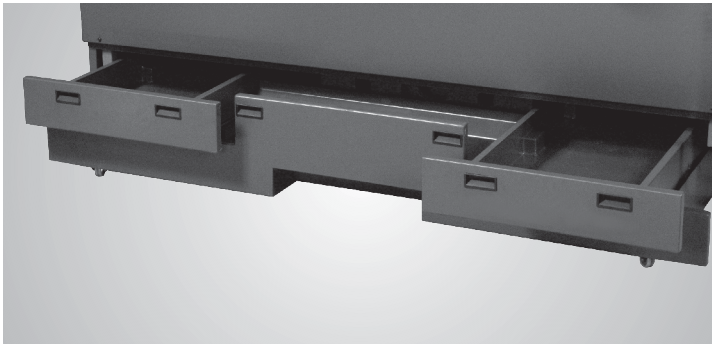
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EASY OPERATING AND MAINTENANCE

EASY CHIP REMOVAL

The accumulated chips in the chip tray can be removed easily by just removing the chip tray from the front side of the machine without disturbing production.



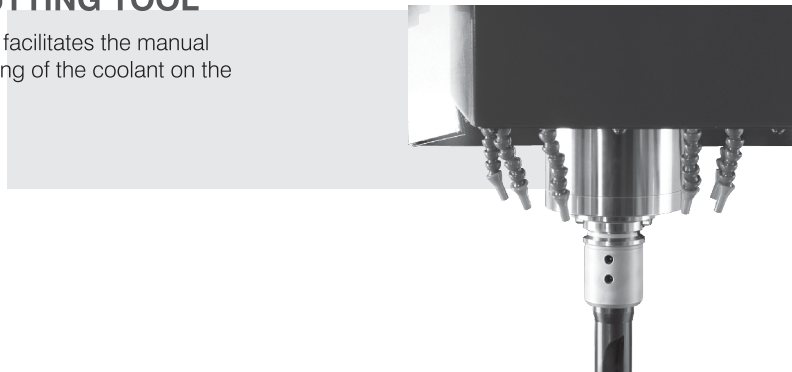
FLUSH COOLANT SYSTEM

High pressure coolant splash via flexible nozzles, such a system enhances reduction in machining down time giving peace of mind to operator and hence positively effecting productivity.



COOLANT NOZZLES FOR CUTTING TOOL

The Coolant nozzles around the Spindle face facilitates the manual adjustment of the nozzles for proper positioning of the coolant on the tool tip while machining.



OPERATOR PANEL POSITION

The Operator control panel is located on the right side of the operator. A 90° tilting movement helps the operator to view the machining area while handling the Machine Operating Panel.

TOTAL PRODUCTIVE MAINTENANCE

TPM assures longer working life of machine with maintained performance characteristics. Performance series machine are designed with special care for easy approach and access for preventive maintenance check points for lubrication, pneumatics and proximities which makes it operator friendly.

EASY ACCESSIBILITY FROM TOP SIDE

Due to large door opening heavy components can be easily loaded/unloaded from wide front door entry as well as from top of the machine with the help of crane.



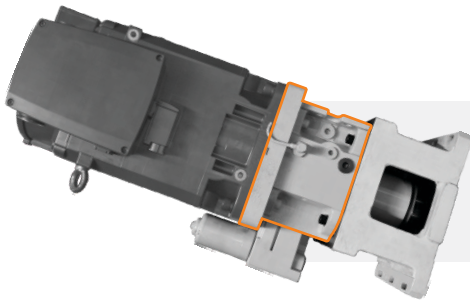
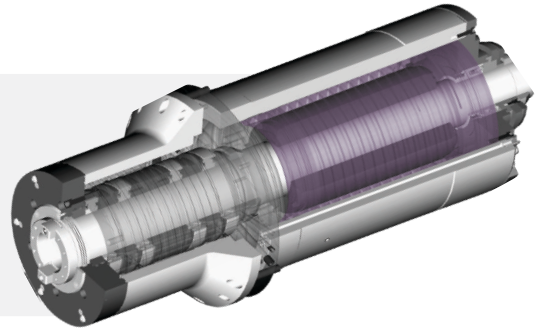


PRODUCTIVITY IMPROVEMENT OPTIONS

HIGH SPEED ELECTRO SPINDLE

High Speed High Torque Motorized Spindles with 15000 & 18000 rpm are available which are manufactured in-house for high speed machining.

The peak speed for such spindles reaches in 2.5 secs while deceleration time is only 2 secs.

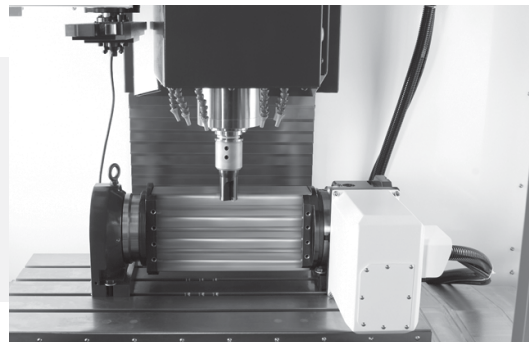


GEAR BOX

Gear Box option with auto shifting mechanism is available for special applications requiring high cutting torque at lower rpm for harder material.

4th AND 5th AXIS CAPABILITY

For maximum application & contouring flexibility, 4th & 5th axis table with high resolution feedback system can be used to avoid multiple set-up & do multiple side machining in single set-up to reduce the over-all cycle time.

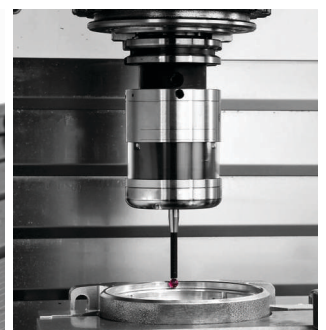


COOLANT THROUGH SPINDLE

CTS provides high pressure filtered coolant directly to the cutting edge minimizing heat distortion, ensuring maximum productivity with today's high performance tooling. Highly recommended for jobs with deep drilling and tapping operations.

TOOL PROBE AND JOB PROBE

A wide choice of spindle and surface-sensing probes as tool and job probes with infrared/radio/laser transmission technology are available for increased spindle utilization and reduce non productive time



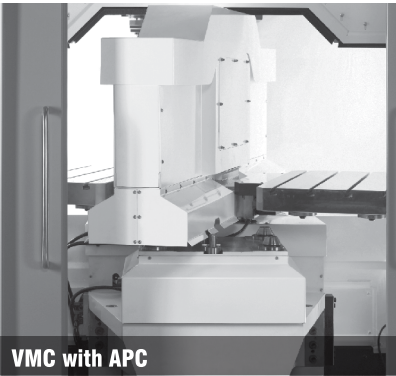
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AUTOMATIC PALLET CHANGER



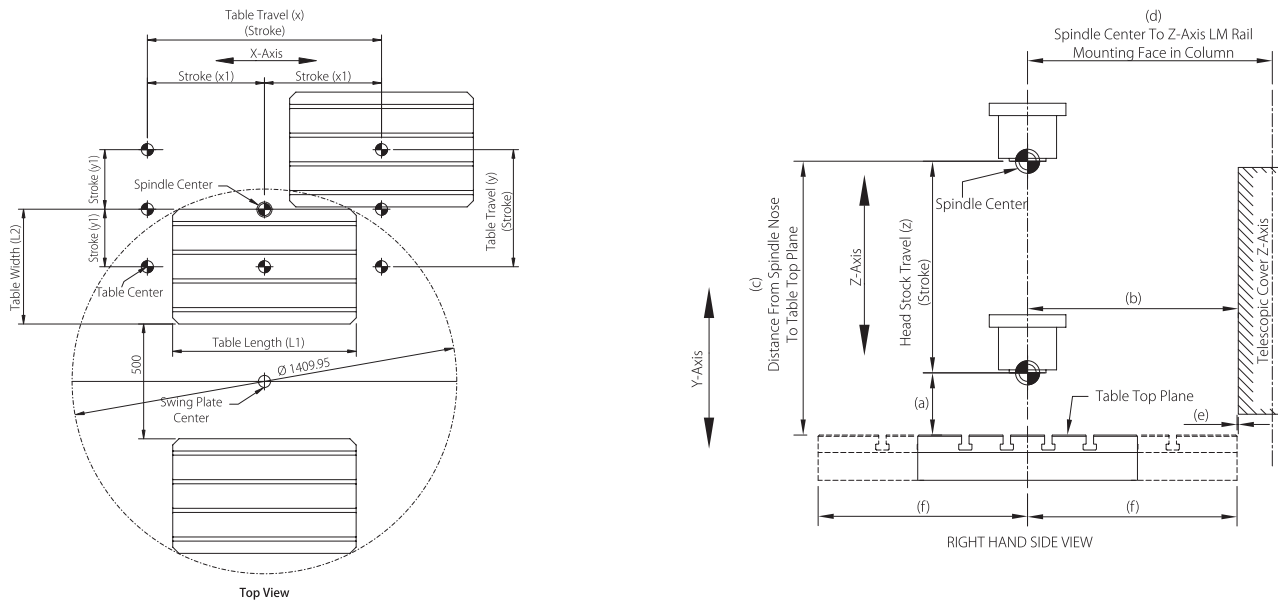
Automatic Pallet Changer is fast and accurate with hydraulically actuated 180° rotary indexing type. Such a system efficiently reduces setup change time drastically to deliver productivity in true sense.



		VMC 640 apc	VMC 1050 apc
Table Size	mm	600 x 400	800 x 500
T-Slot Dimension	mm	4 x18 x 100	4 x 14 x 125
Axis Stroke (X / Y / Z)	mm	600 / 400 / 510	800 / 510 / 510
Load Capacity Per Pallet	kg	200	400
Spindle Motor Power (Fanuc)	kW	11 / 7.5	11 / 7.5
Spindle Motor Power (Siemens)	kW	15.8 / 10.5	15.8 / 10.5
Pallet Indexing Time	Sec.	10	13
Pallet Positioning Repeatability	mm	0.015	0.015
Weight (Approx.)	kg	6500	9300
Dimension L x W x H (Approx.)	mm	3000 x 2200 x 2900	3400 x 2600 x 3100

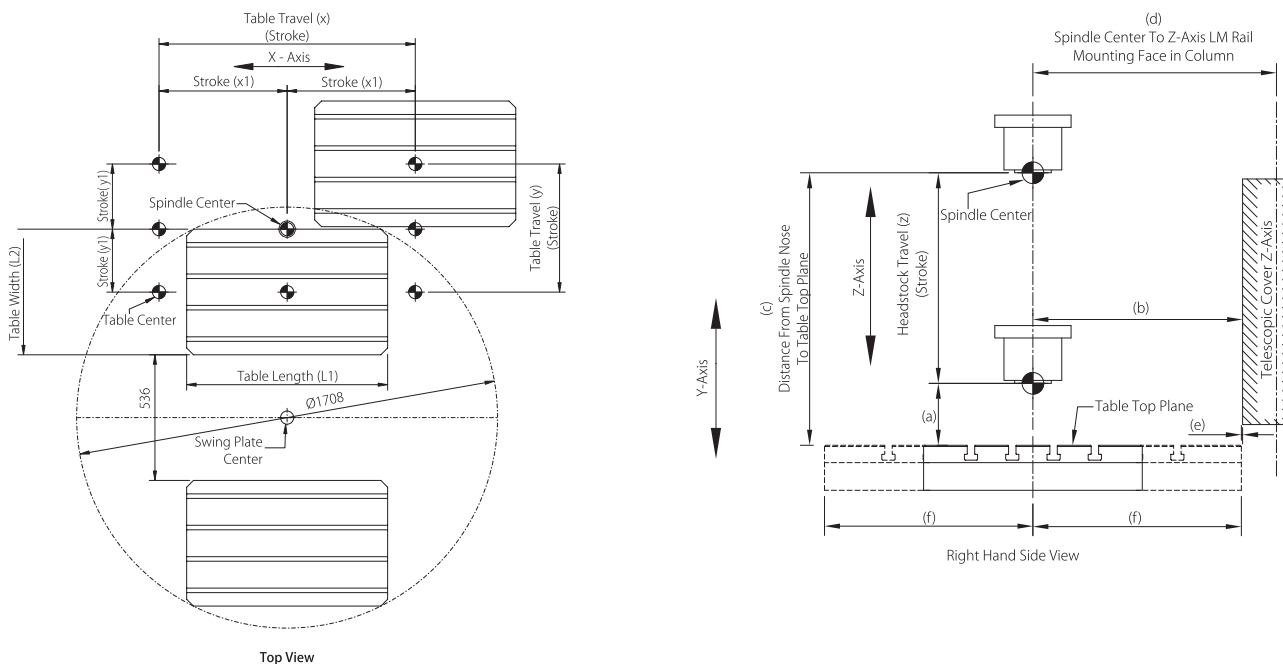


INTERFERENCE DIAGRAM FOR VMC-640 WITH APC



SIZES	a	b	c	d	e	f	x	y	z	x1	y1	L1	L2
VMC 640(APC)	177	458	687	540	53	405	600	400	510	300	200	600	400

INTERFERENCE DIAGRAM FOR VMC-1050 WITH APC

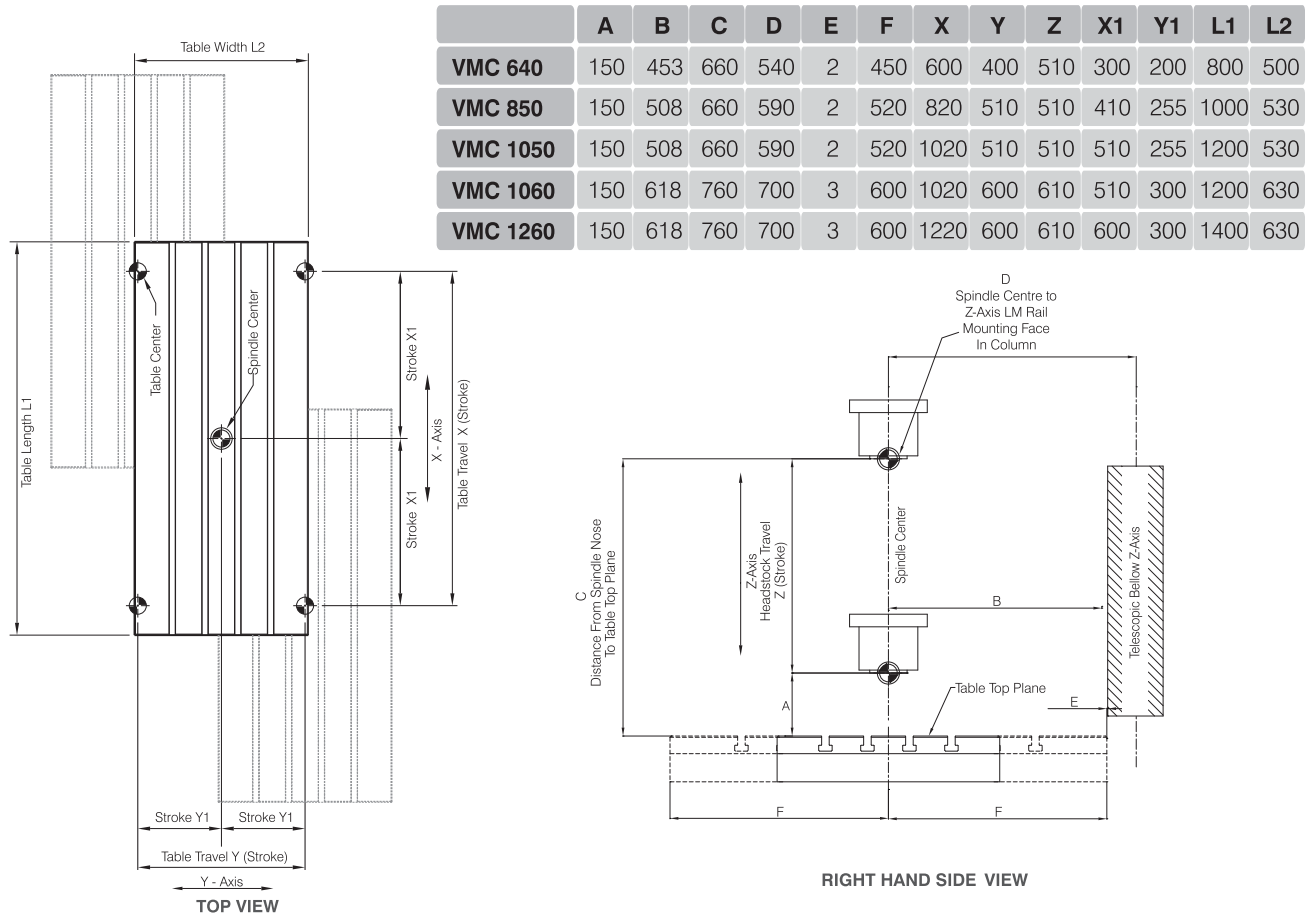


SIZES	a	b	c	d	e	f	x	y	z	x1	y1	L1	L2
VMC 1050(APC)	150	522	660	590	17	505	800	510	510	400	255	800	500

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INTERFERENCE DIAGRAM



SALIENT FEATURE OF CONTROLLER

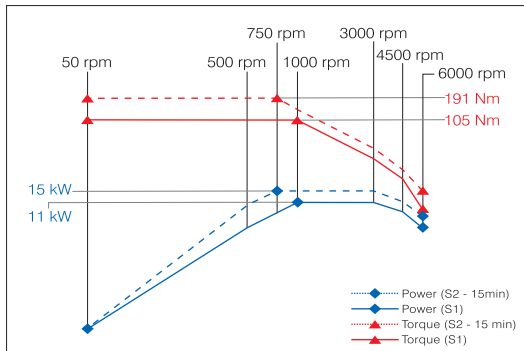
Machines from Jyoti are equipped with high performance latest CNC control unit from Fanuc & Siemens, that are easy to understand and operate. Selection of series of control for different models fully adhere to the application requirements. Ease of use is enhanced by a hand held unit allowing the operator to control the process from the best viewing position.

	DM Series		P Series	
Characteristics	Fanuc - Oi MF	Siemens 828D	Fanuc - Oi MF	Siemens 828D Basic M
Display	8.4" TFT	10.4" TFT	8.4" TFT	10.4" TFT
Data Transfer	USB / CF Card / Fast Ethernet	USB / CF Card / Ethernet	USB / CF Card / Embedded Ethernet	USB / CF Card
No. of Look Ahead Function Blocks	400	300	20	150
Maximum No. of Axis	11	6	6	5
No. of Simultaneous Axis	4	4	4	4
Part Program Storage Length	1 MB	5 MB	512 KB	3 MB
Softwares	Die Mould Package With AICC-II	- - -	Manual Guide Oi (Opt.)	Shop Mill (Opt.)
Tool Life Management	Available	Available	Available	Available

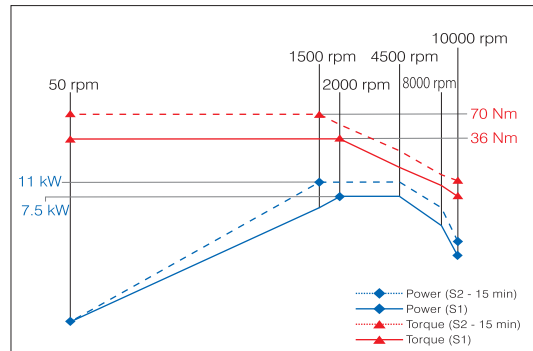


POWER TORQUE DIAGRAM

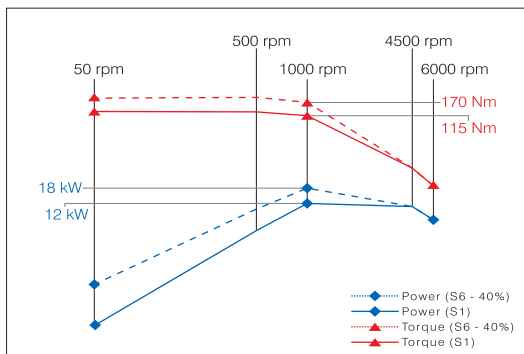
15 / 11 kW, 6000 rpm (Fanuc)



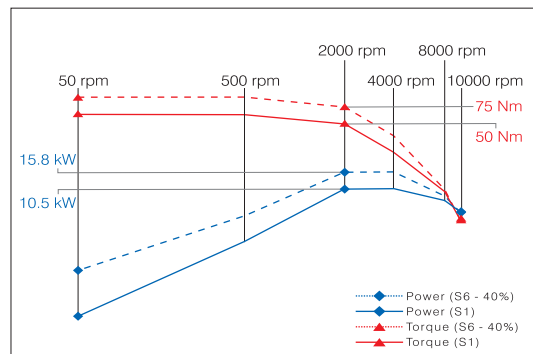
11 / 7.5 kW, 10000 rpm (Fanuc)



18 / 12 kW, 6000 rpm (Siemens)

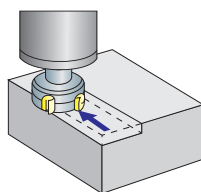


15.8 / 10.5 kW, 10000 rpm (Siemens)

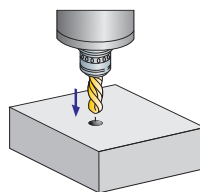


CUTTING CAPABILITIES

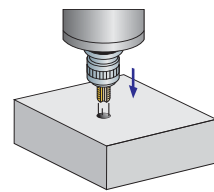
Face Milling



Drilling



Tapping



Siemens 18/12 kW Motor Power

Material	(Cutter Dia, Dept of Cut X MRR)	(Dia X Feed)	(Size X Pitch)
Steel	Ø80 mm, 4.5 mm X 240 cu.cm\min	Ø45 mm X 0.16 mm/rev	M22 X 2.5 mm
Cast Iron	Ø80 mm, 5.5 mm X 425 cu.cm\min	Ø52 mm X 0.20 mm/rev	M27 X 3 mm
Aluminium	Ø125 mm, 4.25 mm X 625 cu.cm\min	Ø60 mm X 0.20 mm/rev	M30 X 3.5 mm

Fanuc 15/11 kW Motor Power

Material	(Cutter Dia, Dept of Cut X MRR)	(Dia X Feed)	(Size X Pitch)
Steel	Ø80 mm, 4.25 mm X 212 cu.cm\min	Ø45 mm X 0.14 mm/rev	M22 X 2.5 mm
Cast Iron	Ø80 mm, 5.25 mm X 383 cu.cm\min	Ø52 mm X 0.18 mm/rev	M27 X 3 mm
Aluminium	Ø125 mm, 4 mm X 586 cu.cm\min	Ø58 mm X 0.20 mm/rev	M30 X 3.5 mm

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TECHNICAL SPECIFICATION

Table		VMC 640 P	VMC 640 DM	VMC 850 P	VMC 850 DM		VMC 1050 P	VMC 1050 DM	VMC 1060 P	VMC 1060 DM	VMC 1260 P	VMC 1260 DM
Table Size	mm	800 X 500	800 X 500	1000 X 530	1000 X 530		1200 X 530	1200 X 530	1200 X 630	1200 X 630	1400 X 630	1400 X 630
T-Slot Dimension	mm	4 X 18 X 100	4 X 18 X 100	4 X 18 X 100	4 X 18 X 100		4 X 18 X 100	4 X 18 X 100	5 X 18 X 125	5 X 18 X 125	5 X 18 X 125	5 X 18 X 125
Distance from Floor to Table	mm	965	965	965	965		990	990	1090	1090	1090	1090
Max. Load on Table	kg	400	400	500	500		800	800	900	900	1200	1200
Capacity												
X-Axis Travel	mm	600	600	820	820		1020	1020	1020	1020	1220	1220
Y-Axis Travel	mm	400	400	510	510		510	510	600	600	600	600
Z-Axis Travel	mm	510	510	510	510		510	510	610	610	610	610
Dis. From Spindle Face to Table Top (Min. - Max.)	mm	150 - 660	150 - 660	150 - 660	150 - 660		150 - 660	150 - 660	150 - 760	150 - 760	150 - 760	150 - 760
Feed												
Rapid Traverse (X, Y & Z Axis)	m/min	24	24	24	24		24	24	24	24	24	24
Cutting Feed	m/min	10	10	10	10		10	10	10	10	10	10
Main Spindle												
Spindle Speed	rpm	6000	10000	6000	10000		6000	10000	6000	10000	6000	10000
Spindle Motor Power - Fanuc	kW	15 / 11	11 / 7.5	15 / 11	11 / 7.5		15 / 11	11 / 7.5	15 / 11	11 / 7.5	15 / 11	11 / 7.5
Spindle Motor Power - Siemens	kW	18 / 12	15.8 / 10.5	18 / 12	15.8 / 10.5		18 / 12	15.8 / 10.5	18 / 12	15.8 / 10.5	18 / 12	15.8 / 10.5
Front Bearing Bore	mm	70	70	70	70		70	70	70	70	70	70
Spindle Nose		BT - 40	BT - 40	BT - 40	BT - 40		BT - 40	BT - 40	BT - 40	BT - 40	BT - 40	BT - 40
Automatic Tool Changer												
No. of Tools		20	20	20	20		20	20	20	20	20	20
Max. Tool Dia. Pockets (All/Adj. Empty)	mm	80 / 125	80 / 125	80 / 125	80 / 125		80 / 125	80 / 125	80 / 125	80 / 125	80 / 125	80 / 125
Max. Tool Weight	kg	7	7	7	7		7	7	7	7	7	7
Max. Tool Length	mm	250	250	250	250		250	250	250	250	250	250
Accuracy (as per VDI/DGQ 3441)												
Positioning Uncertainty (P)	mm	0.010	0.010	0.010	0.010		0.010	0.010	0.010	0.010	0.010	0.010
Repeatability (Ps Medium)	mm	0.005	0.005	0.005	0.005		0.005	0.005	0.005	0.005	0.005	0.005
Other Data												
Machine Weight # (Approx.)	kg	5425	5425	5700	5700		6700	6700	8300	8300	8560	8560
Machine Dimension # (Approx.):Length	mm	2500	2500	2500	2500		2600	2600	2830	2830	2830	2830
Width	mm	2100	2100	2100	2100		2500	2500	3140	3140	3140	3140
Height	mm	2800	2800	2800	2800		2850	2850	2990	2990	3150	3150

Refer Machine Detailed Layout for overall machine dimensions & space requirements.

STANDARD FEATURE

- AC Servo Spindle Drive
- AC Servo Axis Drive
- L.M. Guideways
- Work Light
- Auto & Manual Coolant System
- Centralized & Programmable Lubrication
- Laser Calibrated Axis for High Precise Positioning Accuracy
- 10,000 rpm with Ceramic Bearings Spindle for Die-Mould Series
- Fanuc Oi MF/ Siemens 828D for Die-Mould Series
- Fanuc Oi MF/ Siemens 828D Basic M for P - Series
- High Torque Spindle for P-Series
- Die-Mould Package for Die-Mould Series Model (Fanuc)
- Electricals with Quality Devices & Panel A.C.

PRODUCTIVITY IMPROVING OPTIONS

- Chip Conveyor
- 24, 30 & 40 Tool ATC
- 4th and 5th Axis Option
- Coolant Gun
- Flush Coolant System
- Extra Daylight Area (200 mm)
- Gear Box
- High Torque Spindle with BT-50 Taper for VMC 1050, VMC 1060 & VMC 1260
- High Speed Electro Spindle 15000 & 18000 rpm with chiller
- Coolant Through Spindle
- Tool Tip Air Nozzle (For Dry Cutting)
- Tool Probe & Job Probe
- Linear Glass Scale
- Oil Skimmer
- Machine Tower Light
- Visiport Window
- Manual Guide i (Fanuc)
- Easy SMS System (Siemens)
- Fully Toolled up Solutions to Meet the Customer Needs

JYOTI CNC AUTOMATION LTD.

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Note: Specified information are subject to change arising out of continuous product improvement without notice. The description standard accessories/feature conforms to its list; not the photo of machine show in the catalogue. Other controller will have different configuration. Machine images are shown with option.

