VSE

High speed Vertical Milling Machines

FIDIA
Giving shape to design

VSE 1066

VSE LINE

Fast and accurate, VSE it's a line of Vertical C-Frame machining centers designed for die&mold industry and for the production of high-quality parts. The spindle delivers up to **250 Nm/S6 40%** for high metal removing still providing the higher **15.000 Rpm**'s for fine surface quality .

VSE 1066 : Generous Casting

The large machine base ensures machine maximum stability and rigidity performance and allows the oversized box type column width 1068mm.

Easy load-unloading of parts:

840mm from the table to the shop floor.

Extended Z Axis

On the VSE 1066 is possible to have optional higher Z axis with travel up to 810 mm.

Spindle head

Made of high quality FC 35 casting with thermo symmetric carefully designed thus the thermal influences are minimized.

Head stock balance is accurately provided by means of oversized and powerful Z axis servo motor with braking function, very fast response for high speed cutting.

High Performance, High Accuracy

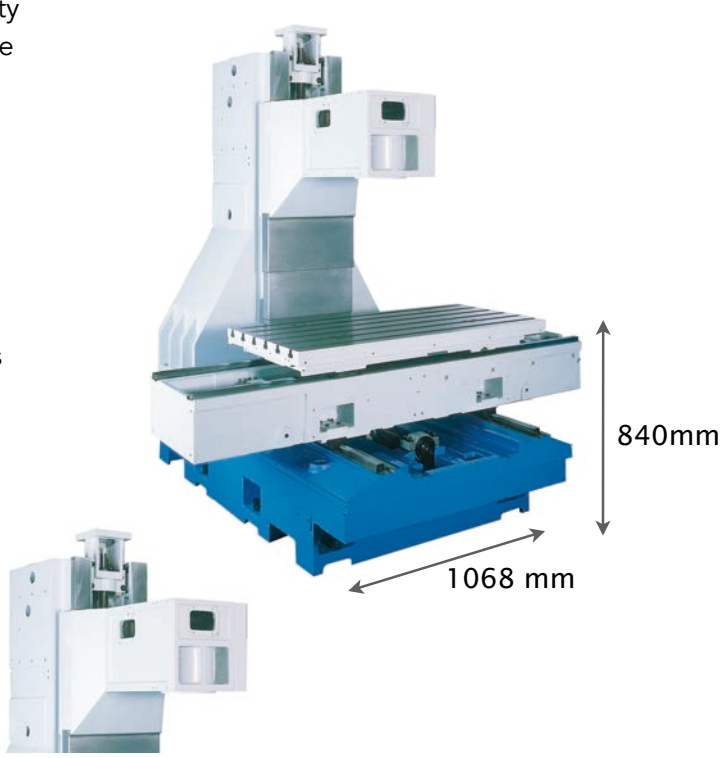
High quality meehanite castings without deformation.

3 axis per-loaded C3 class-40mm diameter high precision ballscrews wall pre-extensioned and directly coupled to AC servo motors to eliminate backlash and ensure highest rigidity.

High speed spindle, **15.000 Rpm 20/53 kW 96/250 Nm BT#40** direct coupling, designed with super low vibration concepts allows high removal toghether with high quality finishing.

Optional 18.000 Rpm 26/32 kW 124/154 Nm HSK 63A.

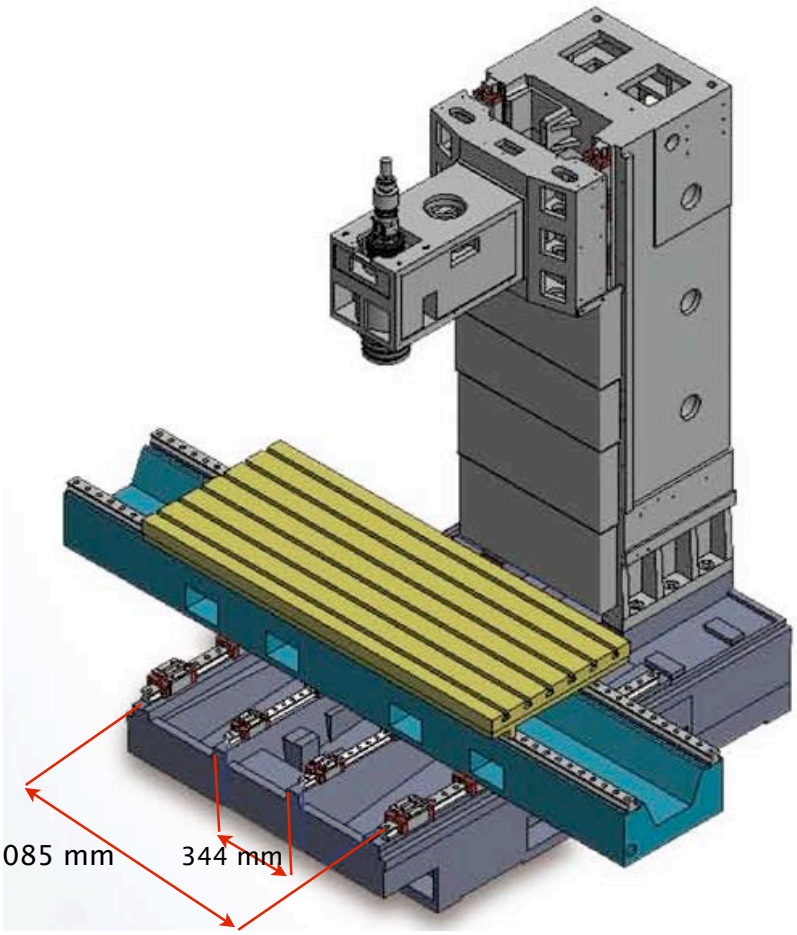
Fidia Digital axis drives and Fidia Look-Ahead V5 for high performance and high speed milling.



VSE 1378 1578

Long lasting Performance and Accuracy

VSE 1378 and VSE 1578 take advantage from the large size machine base design and from stress relieved and seasoned castings treatment to achieve stability, long term accuracy and long service life.



Generously dimensioned roller guideways allow low friction and steady movements even during heavy machining.

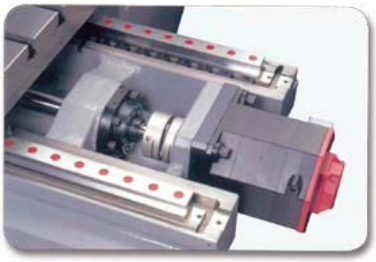
On Y axis are mounted 4 roller guideways at 1085mm super wide distance to support saddle and table greatly.

Large size roller guideways:

X : 45 mm x 2

Y : 45 mm x 2 + 35 mm x 2

Z : 45 mm x 2



Travels:

VSE 1378 : 1250 / 650 / 810 mm

VSE 1578 : 1500 / 650 / 810 mm

Large size motors on X / Y / Z

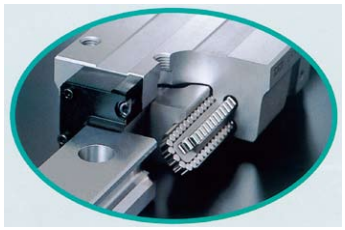
High rigidity axial coupling, fast response and backlash free.

VSE LINE

High speed

The rigidity and stability of the VSE allow the use of the machine in roughing and also in High speed milling .

With the Fidia V5 Look-Ahead system, the operator can easily program and obtain from the machine the best possible dynamics according to the job. The programming of quality-speed ratio, will be a new revolutionary way to work on the machine. **24.000 Rpm** Spindle is optional for accurate finishing in high speed applications.



High quality components

High resolution glass scales on X/Y/Z axis grant the best accuracy in milling .

German made four-row super heavy duty roller guideway on X/Y/Z axis, not only provides fast & accurate rapid feed but also the allowance of heavy work piece.

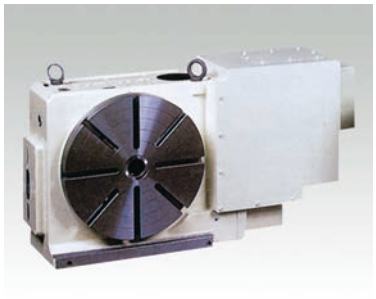
German made coupling direct connect motor & ball screw complete the set of high quality components on the machine.

Tool changer

A fast and accurate arm type Tool changer, 24 positions is standard.

4 Axis Milling

When complex milling is required a Rotary Table Φ 100 ~ 400 mm with tailstock can be supplied as an option.



The rotary table can be positioned vertically or horizontally on the machine table.

Grafite and Resin Milling

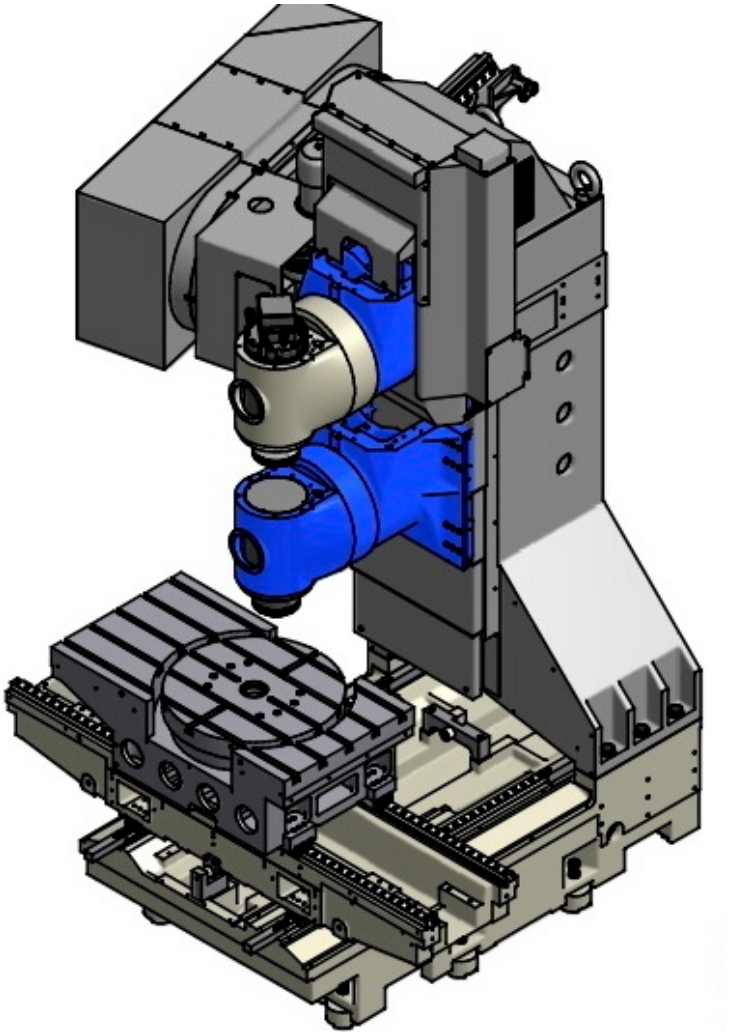
VSE Machines can be suitable for Grafite and Resin milling with guides and balls screw protections and a powerful suction system and a **30.000 Rpm** Spindle.

VSE* SH - SV - 5 AXIS MILLING

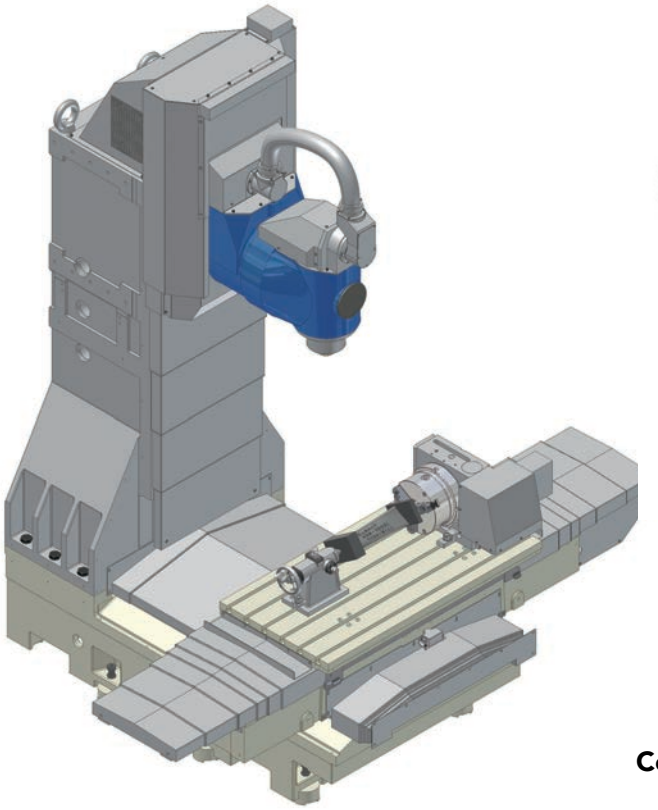
Two types of Rotary Table to fit all the applications

VSE - S* series is the VSE Version for universal applications. The perfect response to the increasing demand for CNC 5 axis & 5 face machining and the orientation of the work-piece in space in relation to the tool axis.

This machines line provides a vast range of applications for the machining of complex parts.



VSE *- SV



VSE* - SH

Configuration available on following models:

VSE 1066 / 1378 / 1578

VSE* SH – SV - 5 AXIS MILLING

B axis Swivel Head

The high dynamic swivel milling head with a large swivel range from -30° to +120°, rotates the tool tip according to the work piece.

This concept brings several advantages such as greater accuracy, exceptional stiffness and shorter cutting distances, compared to 2 axis tilting-rotary table systems.

B axis Torque Motor

The latest technology torque motor manages the B axis continuous swivel milling head , it guarantees maximum movement dynamic and linearity and thanks to the absence of those traditional mechanical kinematics parts, it results a much higher performance on finishing surface. The direct reading system by a high precision angular encoder is being integrated for maximum precision.

Powerfull motor spindle for the Swivel Head

The standard spindle with **14000/18000Rpm 26/32 kW 124/154 Nm HSK63A** satisfy most of various applications, from roughing to finishing even in very tough materials such as tool steels.

Optional 24.000 Rpm 21/27 kW 85/116 Nm HSK 63A

4° "C" axis table with torque motor on VSE – SV

Φ 610 mm / 50 Rpm Torque Table integrated into the linear table : 1.100 × 610 mm / 1.250 × 650 mm / 1.500 × 650 mm depending on the VSE 1066 / 1378 / 1578 model.

4° "A" axis on VSE – SH

Full range of optionals A axis + tailstock rotary tables starting from Φ 100mm to 400 mm.

Tool Changer

On VSE-S* models 32 positions "Arm type" tool changer is standard (3 sec. tool to tool).

VSE* SH - SV - 5 Axis Milling

5 Axis Machining - RTCP

The Fidia RTCP 5 axis management, allows the 5 axis programming in the best and easiest way.

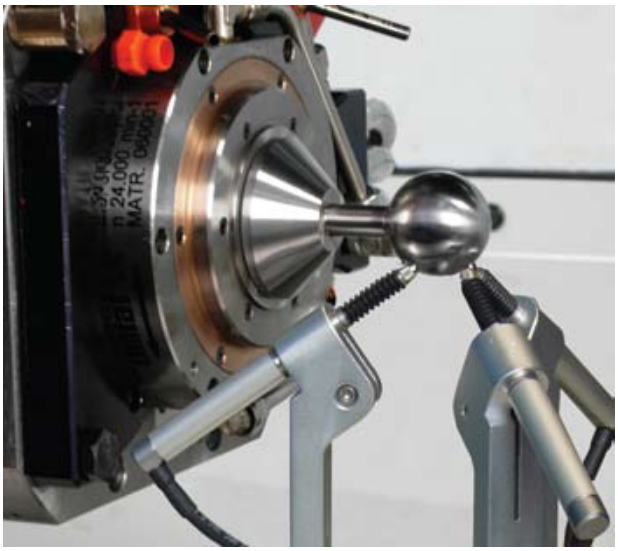
Applied to rotary heads and roto tables, the RTCP function manages tool length compensation in space, directly from the machine tool. A 5-axis tool path can therefore be programmed without having to consider the pivot that will be inserted in the NC tool table before the program is executed.

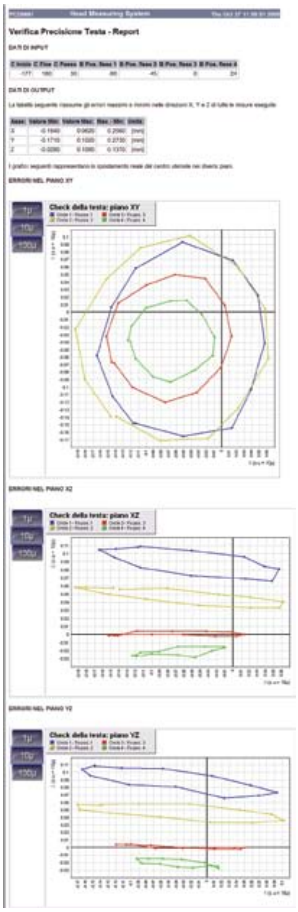
RTCP features:

- controlled feed at the tool tip
- "virtual quill": manages an axis oriented in the tool direction for
- executing drillings and release movements.-
- rotation and/or translation on 5 axis-
- rotation of the reference system (G194): applied to programmed movements and to those executed by jog and handwheel.
- Fidia V5 Look-Ahead, includes TCPhs-5 axis function (5 axis hyper smooth) which allows to reduce the sudden movements introduced from RTCP compensation in specific situations; the resulting machine movements are smoother, for the ben- efit of the work-piece surface quality and of the machine mechanical parts.

VSE * SV

FIDIA **HMS** : FULL AUTOMATIC 5 AXIS CALIBRATION





The **HMS** system is a device designed for measuring and checking continuous rotary heads and rotary tables. Equipped with 3 sensors connected to the CNC, the **HMS** system is managed by a specific measurement software. By processing incoming data in real time, the software is able to check and correct geometric error, positioning accuracy and the RTCP parameters for the heads and tables.

HMS is a high-precision instrument and provides an alternative to the traditional checking method using dial gauges. It has many advantages:

- drastic reduction in checking time (half an hour rather than an entire day)

- measurement of all head and/or table positions (not just orthogonal positions)

- measurement of RTCP parameters

- automatic insertion of correction values in the CNC.

Easy to install and use, **HMS** can also be used by operators with no particular expertise. This means head geometry checks can be performed whenever necessary, avoiding lengthy and costly service interventions and

Grafic Reporting

A full report is available at the end of the calibration cycle detailing the measurements made and the compensation values inserted.

The reports can be kept in the form of files and are a useful record for maintenance purposes.

Errors are also represented graphically for the best interpretation of axis conditions and to assess the suitability of scheduling a service intervention for the mechanical parts.

NC15 FIDIA NUMERICAL CONTROL

The nC15 Numerical Control operator panel is based upon a double CPU PC-based architecture (Intel Pentium M + Motorola PowerPC), the nC15 Fidia NC guarantees the best performances in both axis management and on-board programming.

nC15 FIDIA / XPOWER Digital Drives - Industrial based Architecture

- WINDOWS 7 32 Bit Professional O.S.
- Pentium M CPU - 1,8 GHz, 1 Gb RAM memory, 120 Gb HD
- 15" TFT Touch Screen graphic monitor
- High performance graphic board
- Control panel with electronic hand-wheel
- 10/100/1000MB/s Ethernet TCP/IP connection card
- Motorola Risc Power PC axes control CPU

Digital Drives:

- Full digital with 32 bit DSP processing
- 90 Mbit/s FFB proprietary bus
- Sampling 8 kHz for axis, 16 kHz for Spindle

nC15 FIDIA - Standard Software for HIGH SPEED MILLING

- Dynamic LOOK-AHEAD with tool path advanced control
- ACTIVE-TUNING and ACTIVE-DUMPING algorithms for better precision, surface quality and time execution
- G set of parameters adapted to both roughing, semi-finishing and finishing operations
- Acceleration variations management by means of the JERK-CONTROL algorithm
- Digital control for axes drives
- VIRTUAL QUILL management
- On line Help: all functions available on the numerical control, whether standard or optional, can be rapidly consulted by means of the on line Help.
- Log File: the log file records all events (messages, commands, etc.) sequentially to facilitate diagnostics, including remote diagnostics via Teleservice.
- Graphics: simulation of machining programs and graphic display of the tool path are available both before and during machining.

2 2½D ISOGRAPH CAD/CAM software

On-board programming: pocket milling, flattening, profiling, drilling, boring and so on.

- Define geometric profiles
- Manage ISO files
- Import geometric elements written in DWG/DXF formats
- Import files written in IGES format (optional)
- Employ a powerful programming language
- Generate contouring of both opened and closed profiles
- Generate paths for re-machining of residual material
- Generate fixed drilling, tapping and boring cycles
- Machine pockets with a rectangular, circular or general profile

VSE TECHNICAL CHARACTERISTICS

MODEL	VSE 1066	VSE 1378	VSE 1578
TABLE:			
OVERALL SIZE	1.200 × 610 mm	1.350 × 650 mm	1.600 × 650 mm
T-SLOT (SIZE x No. x PITCH)		18 × 6 × 100 mm	
MAXIMUM LOADING	850 kg	1300 kg	1500 kg
TRAVEL AND FEEDRATES:			
X	1.020 mm	1.250 mm	1.500 mm
Y	610 mm	650 mm	
Z	610 mm (810 mm Optional)	810 mm	
AXIS FEED RATE X / Y / Z	30/30/30 m/min	30/30/24 m/min	30/30/24 m/min
DISTANCES:			
SPINDLE - COLUMN	645mm	710	
SPINDLE TO TABLE TOP (Note 1)		80mm ~ 890mm	
FLOOR TO TABLE TOP	820 mm	900 mm	854 mm
SPINDLE:			
MOTOR	Direct Coupling 20/53kW 96/250Nm S1/S6 40%		
CONE	BT#40		
SPEED	15.000 Rpm (18.000/ 24.000/30.000 Opcional)		
SWING ARM AUTOMATIC TOOL CHANGER			
NO. OF POSITIONS	24		
TOOL TO TOOL / CHIP TO CHIP	3 / 10 Sec		
MAX TOOL DIAM./LENGTH/WEIGHT (Note 1)	125 mm / 250 mm / 7 kg		
BALLSCREWS			
DIAM. x PITCH (X/Y/Z AXIS)	40 x 12 / 40 x 12 / 50 x 12 mm		
PRECISION CLASS	C3 - mm/ 300 mm : 0.008		
LINEAR ROLLER GUIDES			
WIDHT X / Y / Z	35 / 35 / 45 mm	45 / 45 & 35 / 45 mm	
LINEAR GUIDES NO. X / Y / Z	2 / 2 / 2	2 / 4 / 2	
ACCURACY			
POSITIONING (Note 2)	VDI 3441: P 0.012 mm		
REPEATABILITY (Note 2)	VDI 3441: PS0.008 mm		
MISCELLANEOUS			
COOLANT TANK CAPACITY	200 liters / 20 liters / min	300 liters / 20 liters/min	300 liters / 20 liters/min
POWER REQUIRED	20 KVA	30 KVA	35 KVA
PNEUMATIC REQUIRED	7 kgf / cm3		
MACHINE FLOOR SPACE L x W x H	4200 x 2500 x 3000 mm	5500 x 2700 x 3200 mm	
MACHINE NET WEIGHT	7.000 kg	13.000 kg	15.000 kg
Note 1: May change according to the spindle type			
Note 2: Values measured in air conditioned room			

INCLUDED IN BASIC MACHINE	VSE 1066	VSE 1378	VSE 1578
Linear Scales	✔	✔	✔
Automatic tool changer 24 positions	✔	✔	✔
Full splash guard	✔	✔	✔
Chain type chip conveyor & bucket	✔	✔	✔
Coolant system	✔	✔	✔
Spindle air blast system	✔	✔	✔
Working lamp	✔	✔	✔
Indication lamp for alarm/dwell & end of job	✔	✔	✔
Levelling bolt&pad	✔	✔	✔

MAIN OPTIONS	VSE 1066	VSE 1378	VSE 1578
SPINDLE OPTIONS			
18000 Rpm HSK 63A Grease Built in, 26/32 kW 124/154 Nm	✔	✔	✔
24000 Rpm HSK 63A Air Oil Built in, 21/27 kW 85/116 Nm	✔	✔	✔
30000 Rpm HSK 50A Air Oi Built in 27 kW / 64.5 Nm-S1	✔	✔	✔
OTHERS			
Z axis extended Travel 810mm	✔		
Coolant through spindle 20 Bars	✔	✔	✔
RMP600 Workpiece probe & Fidia MQR10 measuring cycles	✔	✔	✔
NC4 Tool length&radius measurement	✔	✔	✔
Resin milling internal Kit	✔	✔	✔
Grafite (dry/wet) milling internal Kit	✔		
Suction Unit 5000 m3/h 5,5 kW / Water Curtain ext. system	✔	✔	✔
Working area mist collector 900m3/h 1.5 Kw	✔	✔	✔
Oil Skimmer	✔	✔	✔
4TH AXIS			
4th Axis rotary table with tailstock Φ 100 mm	✔	✔	✔
4th Axis rotary table with tailstock Φ 150 mm	✔	✔	✔
4th Axis rotary table with tailstock Φ 200 mm	✔	✔	✔
4th Axis rotary table with tailstock Φ 250 mm	✔	✔	✔
4th Axis rotary table with tailstock Φ 320 mm	✔	✔	✔
4th Axis rotary table with tailstock Φ 400 mm	✔	✔	✔

EMC / CE / ISO CERTIFIED

VSE - SH - SV TECHNICAL CHARACTERISTICS

MODEL	VSE 1066 / 1378 / 1578 - SH	VSE 1066 / 1378 / 1578 - SV
TABLE:		
OVERALL SIZE	1.200 × 610 mm / 1.350 × 650 mm / 1.600 × 650 mm	See rotary Table Spec.
T-SLOT (SIZE x No. x PITCH)	18 × 6 × 100 mm	See rotary Table Spec.
MAXIMUM LOADING	800 kg	See rotary Table Spec.
TRAVEL AND FEEDRATES:		
X	1.020 / 1.250 / 1500 mm	
Y	610 / 650 / 650 mm	
Z	810 mm	
AXIS FEED RATE X / Y / Z	30 / 30 / 24 m/min	
DISTANCES:		
SPINDLE TO ROTARY TABLE CENTER (Note 1)	0 - 780 mm	0 - 715 mm
TAIL STOCK HEIGHT TO PLAIN TABLE	160 mm	xxx
SPINDLE NOSE TO ROTARY TABLE TOP (Note 1)	xxx	105 - 715
SPINDLE TO PLAIN TABLE	130 - 940 mm	105 - 715
SPINDLE TO COLUMN COVER	629 mm	
FLOOR TO TABLE TOP	882 mm	947 mm
SWIVEL HEAD		
TRAVEL	-30° / +120°	
CLAMPING FORCE	3430 Nm	
FEED RATE	With cooled Torque motor, 20 Rpm	
POSITIONING (Note 2)	VDI 3441 P=10''	
REPEATABILITY (Note 2)	VDI 3441 PS=4''	
SPINDLE:		
MOTOR	Grease Built in, 26/32 Kw 124/154 Nm	
TAPER	HSK 63A	
FRONT BEARING DIAM.	70 mm	
SPEED	14.000 Rpm (18.000 / 24.000 Rpm Opcional)	
SWING ARM AUTOMATIC TOOL CHANGER		
NO. OF POSITIONS	32 (Option 40)	
TOOL TO TOOL / CHIP TO CHIP	3 / 7 Sec	
MAX TOOL DIAM./LENGTH/WEIGHT (Note 1)	150 mm / 300 mm / 7 kg	
BALLSCREWS		
DIAM. x PITCH (X/Y/Z AXIS)	40 x 12 / 40 x 12 / 50 x 12 mm	
PRECISION CLASS	C3 - mm/ 300 mm : 0.008	
LINEAR ROLLER GUIDES		
WIDHT X / Y / Z	35 / 35 / 45 mm	
LINEAR GUIDES NO. X / Y / Z	2 / 2 / 2	
ACCURACY		
POSITIONING (Note 2)	VDI 3441: P 0.012 mm	
REPEATABILITY (Note 2)	VDI 3441: PS0.008 mm	
MISCELLANEOUS		
COOLANT TANK CAPACITY	250 liters / 20 liters /min	
POWER REQUIRED	75 KVA	
PNEUMATIC REQUIRED	7 kgf / cm3	
MACHINE FLOOR SPACE L x W x H	4200 x 3500 x 3000 mm / 5500 x 2700 x 3200 mm / 5500 x 2700 x 3200 mm	
MACHINE NET WEIGHT	9000 kg / 15000 kg / 17000 kg	
Note 1: May change according to the spindle type		
Note 2: Values measured in air conditioned room		

4° AXIS " A" & "C"	VSE 1066 / 1378 / 1578 - SH	VSE 1066 / 1378 / 1578 - SV
Type	On the plain table	Integrated on plain table 1.100 × 610 mm / 1.250 × 650 mm / 1.500 × 650 mm
Diameter	Φ255mm	Φ610mm
Center bore diameter	Φ40mm H7	Φ50mm H8
Center Heigh	160mm	xxx
T slots size	12mm H7	18mm H8
Rotation speed	16.6 RPM	50 RPM by cooled Torque Motor
Positions	0.001° x 360.000	
Positioning accuracy	±4''	VDI 3441 P=10''
Repeatability	4''	VDI 3441 PS=4''
Clamping force	686 Nm	3332 Nm
Maximum load	250kg (350kg with tail stock)	500kg on Rotary table. 750 / 1200 / 1400 kg on plain table
Accessories	3 jaws & manual tail stock	-

INCLUDED IN BASIC MACHINE	VSE 1066 / 1378 / 1578 - SH	VSE 1066 / 1378 / 1578 - SV
Linear Scales	✔	✔
Automatic tool changer 32 positions	✔	✔
Full splash guard	✔	✔
Chain type chip conveyor & bucket	✔	✔
Coolant system	✔	✔
Spindle air blast system	✔	✔
Working lamp	✔	✔
Indication lamp for alarm/dwell & end of job	✔	✔
Levelling bolt&pad	✔	✔

MAIN OPTIONS	VSE 1066 / 1378 / 1578 - SH	VSE 1066 / 1378 / 1578 - SV
SPINDLE OPTIONS		
18000 Rpm HSK 63A Grease Built in, 26/32 Kw 124/154 Nm	✔	✔
24000 Rpm HSK 63A Air Oil Built in, 21/27 kW 85/116 Nm	✔	✔
OTHERS		
Coolant through spindle 20 Bars	✔	✔
RMP60 Workpiece probe & Fidia MQR10 measuring cycles	✔	✔
NC4 Tool length&radius measurement	✔	✔
HMS/02 Measuring and calibration system		✔
Working area mist collector 900m3/h 1.5 Kw	✔	✔
Oil Skimmer	✔	✔
ATC		
40 Arm ATC	✔	✔
4TH AXIS		
4th Axis rotary table with tailstock Φ 200 mm	✔	✔
4th Axis rotary table with tailstock Φ 250 mm	✔	✔
4th Axis rotary table with tailstock Φ 320 mm	✔	✔
4th Axis rotary table with tailstock Φ 400 mm	✔	✔
4th Axis rotary table with tailstock Φ 500 mm	✔	✔

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Att. n. SGQ 19C

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