VSE/VHE

Vertical Milling Machines

FIDIA

VSE/VHE

VHE – Heavy Duty Machining Centres

High performance 3-axis machines with a moving table. The C-frame structure, with an extremely robust base and column, is generously proportioned to guarantee maximum rigidity, stability, lasting quality and accuracy.
VHE models are equipped with reinforced box-type guideways in hardened steel, specifically for heavy duty removal.

VSE – High Speed Machining Centres

Fast and accurate, VSE line vertical machining centres, also with a C-frame structure, are designed for the mould making industry and for the production of high quality parts in general.
Owing to their rigidity, stability and dynamic characteristics, VSE machining centres offer high speed roughing out and finishing.

VSE/VHE Machining Centers have application in different sectors:

Aerospace
- structural parts
- small engine components
- small structural parts
- titanium components
- aluminium components

Automotive
- plastic injection moulds
- stamping dies
- forging dies
- die-casting dies
- small and medium size components
- braking components
- tractors parts
- heavy vehicles small parts
- prototyping and styling models

General Mechanical
- energy power components
- machine tool
- transmission gears
- complex shaped parts
- components for automatic machines (packing - filling)
- fixing plates
- inox parts

Aluminium injection

Forging

Plastic injection mould

Rubber mould

VSE1066

Superior Components, Durable Performance

Optional: Continuous Rotary Table with tailstock

- Robust meehanite iron casting structure
- Pre-loaded C3 class-40mm diameter high precision ballscrews 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 ISO40 direct coupling. Designed to avoid vibrations, it combines heavy duty machining and high quality finishing.
- Optional 18.000 Rpm 26/32 kW 124/154 Nm HSK 63A Electrospindle.

VSE 1066: Generous Casting

The large machine basement, along with the oversized box-type column (width 1068mm, 42”) ensures maximum stability and rigidity.

Easy loading-unloading

840mm from the table to the shop floor facilitate set-up operations.

Spindle housing

The thermosymmetric design of high quality FC 35 casting minimize the thermal influences. Headstock balance is provided by oversized, powerful Z axis servo motor with mechanical brake, delivering the fast response requested by high speed cutting.

High Speed

The rigidity and stability of the VSE extend the machine capability from roughing to High Speed milling.
Fidia V5 Look-Ahead system allows the operator to set "on the fly" the best possible machine dynamics according to part geometry and tolerance.
24.000 Rpm Spindle (optional) allows accurate high speed finishing with smaller tools.

High quality components

High-resolution glass scales on X/Y/Z axis grant the best accuracy in milling.
German made four-row extra heavy duty roller guideway on X/Y/Z axis, combines fast & accurate feed with heavy work pieces allowance.
German made ball screws and direct motor coupling complete the set of high quality components aboard the machine.

Tool changer

Standard configuration include fast and reliable 24 positions arm-type tool changer.

4 Axis Milling

A selection of Continuous Rotary Table with tailstock, size ranging from Φ100mm to 400 mm (3.9" ÷ 15.7"), is available as optional.
Any size allows vertical or horizontal placement on the machine table.

Graphite and Resin Milling

Specific protections for guides and ball-screw, a powerful suction system and a 30.000 Rpm Spindle are available as options to make the VSE Machines very effective also in Graphite and Resin milling.

VHE1166

High Torque Vertical Machining Centers: long lasting quality and precision

4 guides to provide equal weight distribution

Pneumatic compensation on vertical axis with double cylinder grants excellent dynamic response.

VHE 1166

- Travels X Y Z : 1100 x 610 x 610 mm (43”x24”x24”)
- Table 1270x640mm (50”x25”), max. load 1200 kg.
- Rapid speed 30 m/min
- High Torque spindle ISO50 6000RPM 12kw/18.5kw, ZF 1:4, 2 speeds gear box, max. torque 708 Nm
- Swing arm ATC with 24 positions

Optional:

- 8000 and 10000/12000 rpm ISO40 with ZF 1:4, 2 speeds gear box
- 20 or 40 Bars tool lubrication through spindle

Machine characteristics:

- The structures are fully made of GGG40 cast iron with superior damping properties, engineered with FEM analysis.
- 3 axis high performance C-frame moving table architecture with high rigidity base and column.
- Column generously dimensioned (> 5500 kg net weight) to grant maximum rigidity and stability.
- Oversized Box Type reinforced guides made of hardened steel are properly positioned to bear the strongest roughing operation.
- Turcite-B and skilled hand scraping on the guides deliver minimum friction and the best milling quality in finishing.
- 4 guides installed on Y axis provide equal weight distribution along the entire X axis travel.
- Direct coupling and pre-loaded ball screws are sized for high torque operations and precise positioning.

nC19 Fidia Numerical Control

Simple and reliable machining

Fidia controls have always been appreciated for their high-level performance and comprehensive range of features supplied.

The nC19 Numerical Control features a double CPU PC-based architecture, to grant the best performances in both axis management and on-board programming.
The user interface environment allows operating with the maximum flexibility in any machining condition: programs coming from CAM systems, mechanical machining such as slots, threads and pullers programmed directly on board of the machine by using ISOGRAPH™.

nC19 FIDIA - Industrial PC-based Architecture:

- **WINDOWS 7** 32 Bit Professional
- CPU PC Intel i3, 4 GB RAM, SDD 128 Gb HD
- 19" TFT Touch Screen graphic monitor
- High performance integrated graphic interface
- 3 Ethernet Gigabit Lan (RJ45)
- USB 2.0 (+ 3.0 on back panel) and RS-232 Serial Interface
- **CPU7 FIDIA** with Power PC 64 Bits floating point axis control processor

nC19 FIDIA - Standard Software:

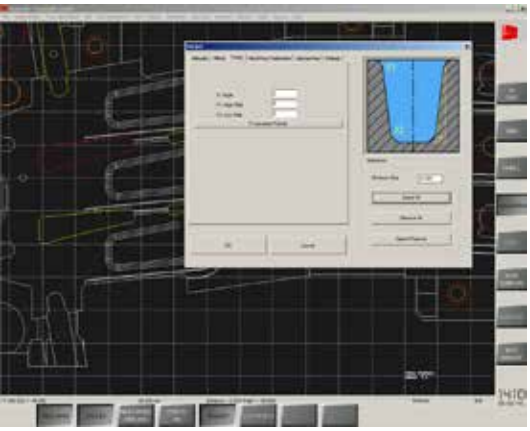
- Look-Ahead "VELOCITY 5™" with new "Dyna" parameter (machine dynamic advanced control)
- Interactive on-line Help (10 languages available)
- Log File: the log file records all events (messages, commands, etc.) sequentially to facilitate diagnostics, including remote diagnostics via Tele-Service.

X Power FIDIA Digital Drives:

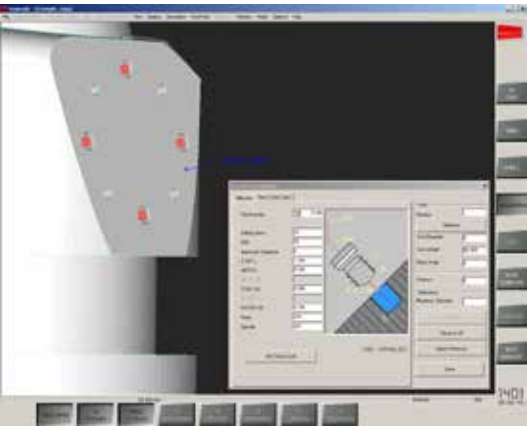
- Full digital with 32 bit DSP processing
- 90 Mbit/s FFB proprietary bus

Velocity 5™

The speed and quality of machining for sculptured surfaces are the most well known and appreciated features of Fidia controls.
The combination of Fidia controls with the Xpower technology drives increases more than ever milling performances bringing them even closer to excellence.
The direct access to all the drive's parameters enables to control the motors and, therefore, the axes, in the best possible way even in the most critical condition of use.



ISOGRAPH™: Easy pocketing



ISOGRAPH™: Easy Drilling, tapping, boring

ISOGRAPH™

ISOGRAPH™ is a 2½D CAD/CAM system developed by Fidia, suitable for workshop use with its highly innovative easy and intuitive user interface. The system is ideal when basic machining has to be quickly programmed and executed, such as: pocket milling, face milling, profiling, drilling, boring and similarly. The use of the softkeys and mouse makes the use of the system easily and immediately accessible to all operators, even to those with no specific programming knowledge.

With ISOGRAPH™, the operator can:

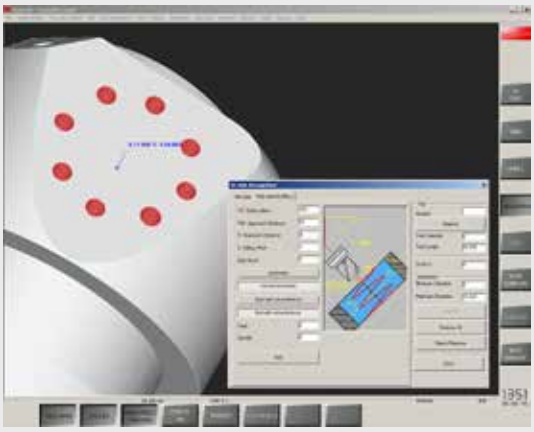
- Define geometric elements and profiles, thanks to the powerful and intuitive GRAPHICS EDITOR
- Use the ISOGRAPH™ programming language to generate even very complex machining cycles
- Import geometric elements in the DWG, DXF and IGES formats
- Generate tool paths with tool radius compensation on any plane;
- Generate paths for the automatic re-machining of residual material;
- Generate fixed drilling, tapping and boring cycles
- Generate complex cycles for the milling of pockets with rectangular, circular or generic profiles and slots
- Generate face milling cycles.

3D files graphical visualisation

With ISOGRAPH™ the operator can simulate machining programs while graphically visualizing the tool path before and during the machining process. An optimised visualisation of large files is available for a quick check of the tool path.

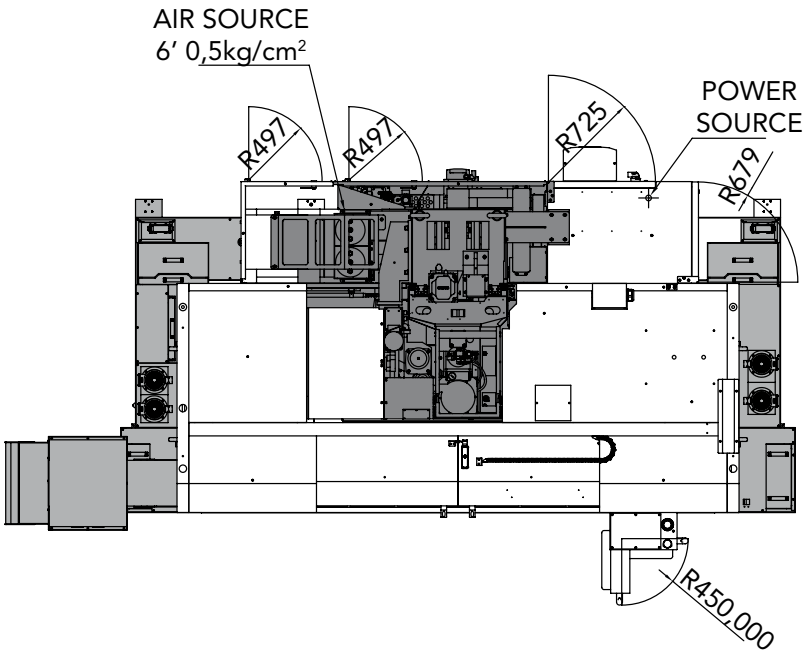
Main features are:

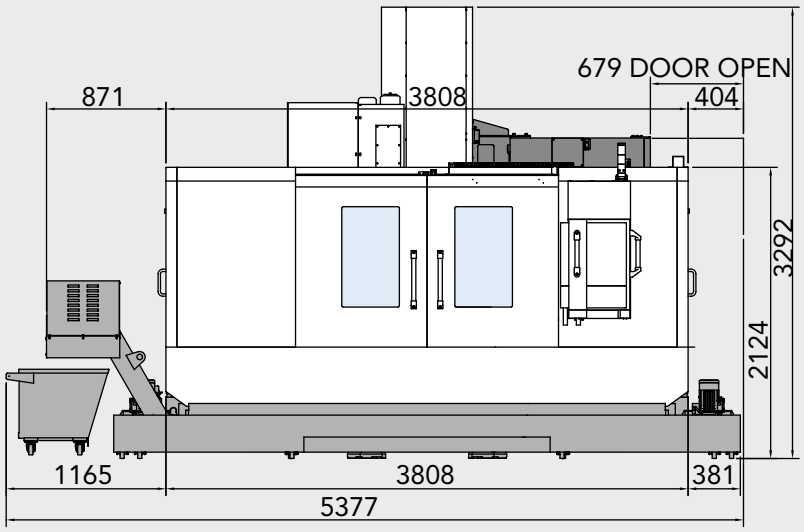
- Visualisation of the mathematical model overlapping the toolpath
- Visualization of several paths with different colours
- Single vertex coordinate measurement function
- Measurement of the distance between two points and of the angle between two segments for any loaded toolpath
- ISO, DXF/DWG, IGES, STL, VDA - FS, PRJ format management
- Detection of 2D holes and pockets in ISO, ISOGRAPH, DWG/DXF files
- Detection of 2D and 3D holes and pockets in IGES files

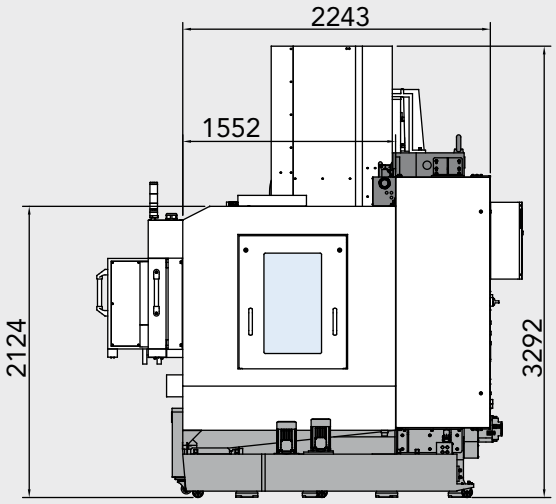


ISOGRAPH™: Easy complex cycles generation

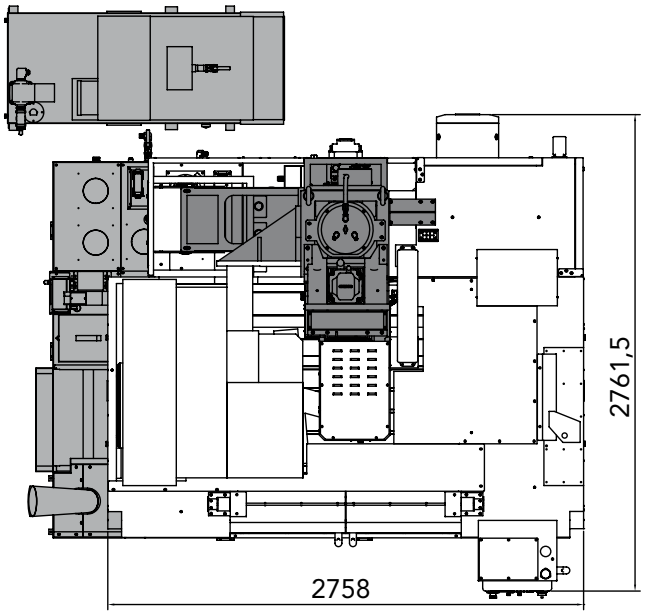
VSE Working Envelope

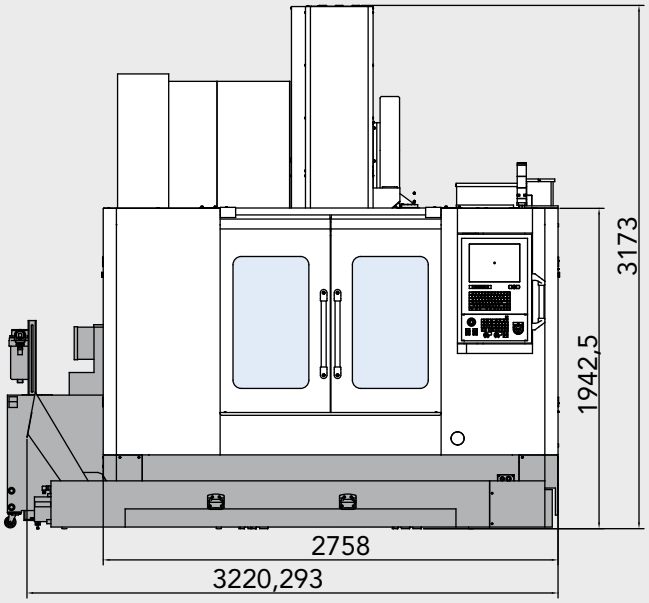


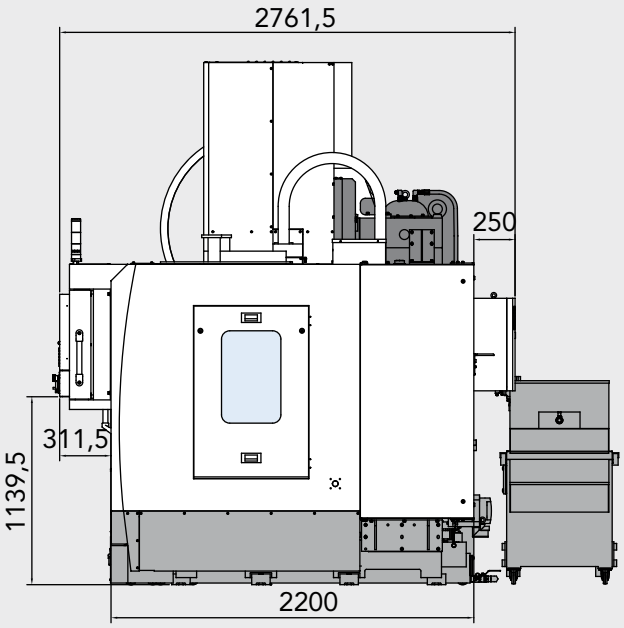




VHE Working Envelope







VSE Technical Characteristics

Model	VSE1066	VSE1468
	Table	
Overall size	1200mm × 610 mm (47.2"x 24")	1560mm × 620 mm (61.4"x 24.4")
T-slot (size x No. x pitch)	18mm × 6mm × 100 mm (.7" x .2" x 3.9")	
Maximum loading	850 kg (1873.9 lbs)	1200 kg (2645.5 lbs)
	Travel and feedrates	
X	1020 mm (40.1")	1350 mm (53.1")
Y	610 mm (24")	620 mm (24.4")
Z	610 mm (24") Opt. 810 mm (31.8")	810 mm (31.8")
Axis feed rate X/Y/Z	30/30/30 m/min	30/30/24 m/min
	Distances	
Spindle - Column	645mm (25.3")	
Spindle to table top (note 1)	80mm ~ 890mm (3.1" ~ 35")	
Floor to table top	820 mm (32.2")	900 mm (35.4")
	Spindle	
Motor	Direct Coupling 20/53kW 96/250Nm S1/S6 40%	
Toolholder	ISO 40 (OR BT#40)	
Speed	15000 Rpm (18000/24000/30000 optional)	
	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)	125/300 mm - 15 kg	
	Ballscrews	
Diam. x pitch (X/Y/Z axis)	40mm x 12mm / 40mm x 12mm / 50mm x 12 mm (1.5" x .4"/1.5" x .4"/1.9" x .4")	
Precision class	C3 - mm/300 mm : 0.008	
	Linear roller guides	
Width X/Y/Z	35mm / 35mm / 45 mm (1.3"/1.3"/1.7")	
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	200 liters / 20 liters/min	250 liters / 20 liters/min
Power required	20 KVA	25 KVA
Pneumatic required	7 kgf / cm3	
Machine floor space LxWxH (approx.)	4200mm x 2500mm x 3000 mm (165.3" x 98.4" x 118.1")	5500mm x 2700mm x 3200mm (216.5" x 106.2" x 125.9")
Machine net weight	7000 kg (15432.3 lbs)	13000 kg (28660 lbs)
Note 1: May change according to the spindle type		
Note 2: Values measured in air conditioned room		

Included in basic machine	VSE1066	VSE1468
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	VSE1066	VSE1468
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 Oil Built in, 27 kW / 64.5 Nm-S1	✓	✓
Others		
Z axis extended travel 810mm	✓	✓
Linear scales	✓	✓
Coolant through spindle 20 Bars	✓	✓
RMP60 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	✓	✓
Swing Arm ATC 32/40 positions	✓	✓
4th Axis rotary table with tailstock from Φ 100 mm (3.9") to Φ 400 mm (15.7")	✓	✓

VHE Technical Characteristics

Model	VHE1166	VHE1478	VHE1687
		Table	
Overall size	1270 × 640 mm (50"x 25")	1500 x 710 mm (59"x27.95")	1700 × 815 mm (67"x 32")
T-slot (size x No. x pitch)	3 x 18 mm (.7") pitch 125 mm (5")	6 x 18 mm (.7") pitch 125 mm (5")	5 x 18 mm (.7") pitch 150 mm (5,9")
Maximum loading	1200 kg (2640 lbs)	1500 kg (3399lbs)	2000 kg (4840 lbs)
		Travel and feedrates	
X	1100 mm (43")	1400 mm (55.11")	1600 mm (63")
Y	610 mm (24")	700 mm (27.6")	815 mm (32")
Z	610 mm (24")	760 mm (29.92")	700 mm (27,6")
Axis feed rate X/Y/Z	24 m/min (945 ipm)	20/20/15 m/min (787/787/590 ipm)	10 m/min (394 ipm)
		Distances	
Spindle - Column	660mm (26")	760 mm (29.92")	855mm (33.6")
Spindle to table top (note 1)	100mm ~ 710mm (3.93" ~ 28")	125 ~ 885 mm (4.92"~34.84")	200mm ~ 900mm (7.86" ~ 35.4")
Floor to table top	895 mm (35.2")	850 mm (33.4")	850 mm (33.4")
		Spindle	
Motor	12kw/18.5kw 115/177 Nm (S1-S6 40%) - ZF gear box 1:4 Max Torque 708Nm		
Toolholder	ISO 50 OR BT#50		
Speed	6000 RPM		
		Tool changer	
No. of positions	24 swing arm		
Tool to tool/chip to chip	5/10 sec		
Max tool diam./length/weight (note 1)	125/300 mm - 15 kg (4.9"/11.8" - 37.5lbs)	125/300 mm - 15 kg (4.9"/11.8" - 37.5lbs)	125/400 mm - 15 kg (4.9"/15.7" - 37.5lbs)
		Ballscrews	
Diam. x pitch (X/Y/Z axis) - Direct coupling	40-12/40-12/40-12 mm	45-10/45-10/50-10 mm	50-10/50-10/50-10 mm
Precision class	C3 - mm/300 mm : 0.008		
		Guides	
No. of box ways X/Y/Z	2 / 4 / 2		
		Accuracy	
Positioning VDI 3441 (note 2)	P 0.015mm (P 0.012mm with optical scales, optional)		
Repeatability VDI 3441 (note 2)	PS 0.01mm (Ps 0.008mm with optical scales, optional)		
		Miscellaneous	
Coolant tank capacity	200 liters / 66 liters/min		
Power required	25 KVA	28 KVA	30 KVA
Pneumatic required	7 kgf / cm3		
Machine net weight	8500 kg	13000 kg	15000 kg
Note 1: May change according to the spindle type			
Note 2: Values measured in air conditioned room			

Included in basic machine	VHE1166	VHE1478	VHE1687
Automatic tool changer 24 positions	✓	✓	✓
Full splash guard and Air conditioned electrical cabinet	✓	✓	✓
Chip conveyor	✓	✓	✓
Coolant system	✓	✓	✓
Working lamp	✓	✓	✓
Indication lamp for alarm/dwell & end of job	✓	✓	✓
Levelling bolt & pad	✓	✓	✓

Main options	VHE1166	VHE1478	VHE1687
Spindle options			
ISO40/BT#40, 10000RPM 9kw/13kw 57/83 Nm (S1-S6 40%). NO ZF gear Box	✓	✓	✓
ISO40/BT#40, 12000RPM 9kw/13kw 57/83 Nm (S1-S6 40%). NO ZF gear Box	✓	✓	✓
ISO50/BT#50 6000RPM, 17kw/25kw 162/239 Nm (S1-S6 40%). Max Torque 956Nm with ZF 1:4	✓	✓	✓
ISO50/BT#50, 10000RPM, 12kw/18.5kw 115/177 Nm (S1-S6 40%). Ceramic Bearings - NO ZF Gear Box	✓	✓	✓
Linear scales	✓	✓	✓
Coolant through spindle 20/40 Bars	extra tank 300 liters - 20 lt/min		
Chain type chip conveyor	✓	✓	✓
RMP60 Workpiece probe & Fidia MQR10 measuring cycles	✓	✓	✓
NC4/M&H 35.50 Laser Tool length&radius measurement TS27 contact tool lenght measurement	✓	✓	✓
ATC			
32 stations swing arm ATC (for ISO50/BT#50)			✓
40 stations swing arm ATC (for ISO50/BT#50)			✓
4th Axis			
4th Axis rotary table with tailstock from Φ125 mm (4.9") to Φ500 mm (19.6")	✓	✓	✓

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