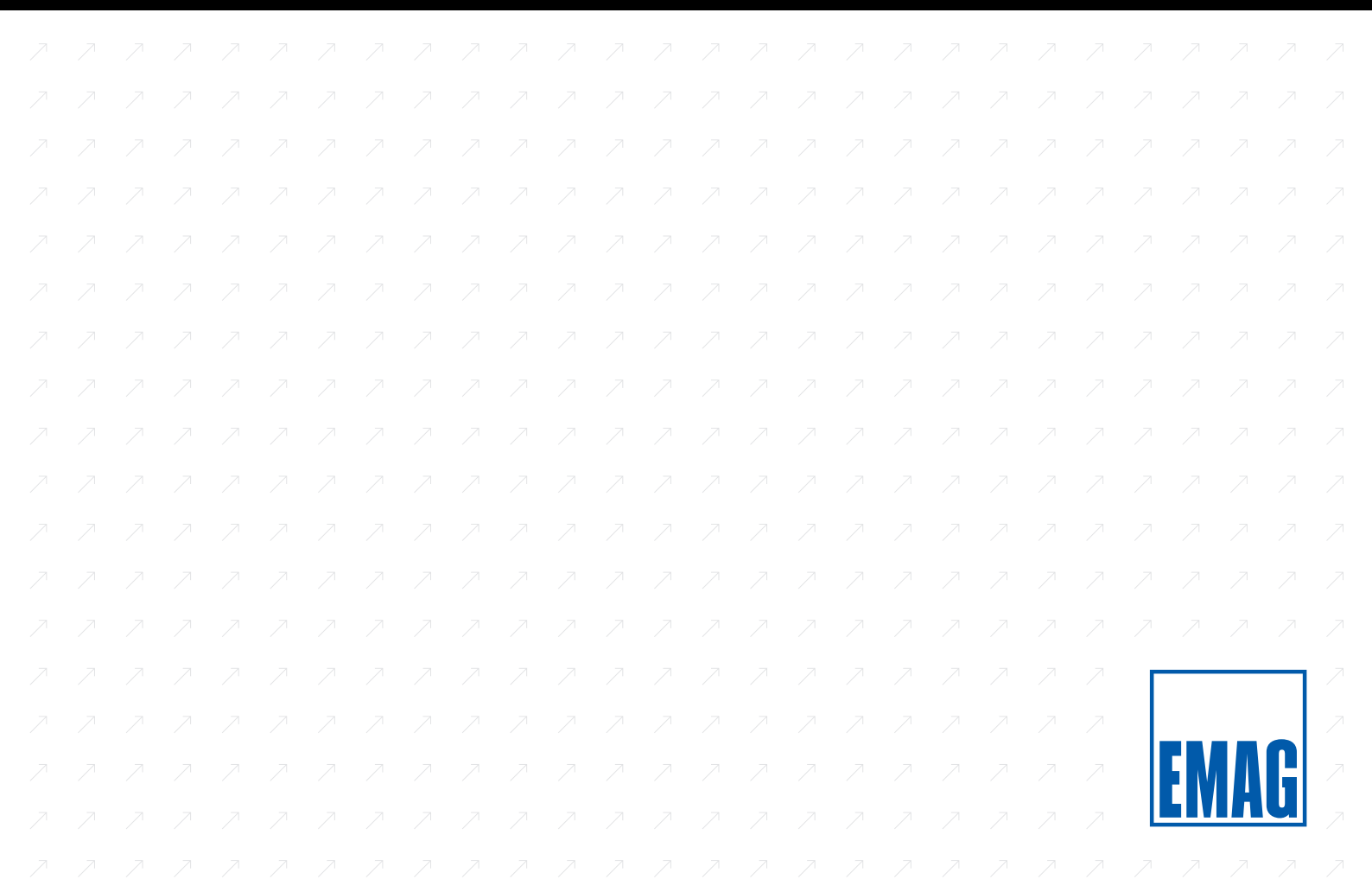
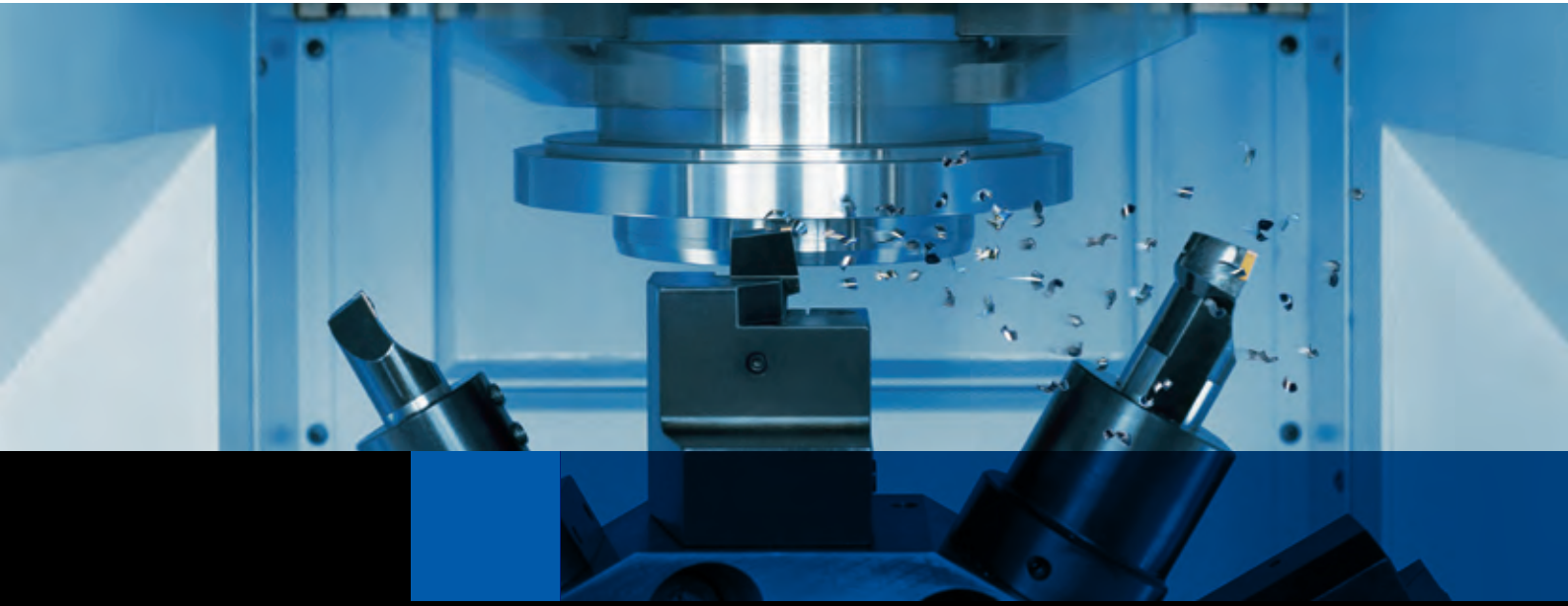


# Vertical Multifunctional Production Centers VSC 250 / 400 / 500



In 1992 EMAG was the first manufacturer to build a vertical turning machine with an inverted work spindle that traveled the main axes. EMAG continues to turn the traditional processes on their head! Every machine in the VSC series is a production cell where the pick-up spindle ensures the machine loads itself. Another advantage for the customer is that the machines of the VSC series can be customized to suit individual production requirements.

- V S C 2 5 0
- V S C 4 0 0
- V S C 5 0 0





VERTICAL PICK-UP TURNING MACHINES



## VSC – multifunctional production centers.

Machining + automation + measuring: the machines of the VSC series are configured for individual production requirements. The patented design of the VSC machines guarantees the shortest travel times between the pick-up station and the machining area, reducing idle times to a minimum. The MINERALIT® polymer concrete machine base and the twin-wall construction have an excellent vibration damping effect and offer outstanding thermal stability.



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V S C 5 0 0

A large selection of technology modules ensures the VSC machines can be configured for customer-specific production requirements, while the availability of a variety of automation components ensures easy integration into production lines.



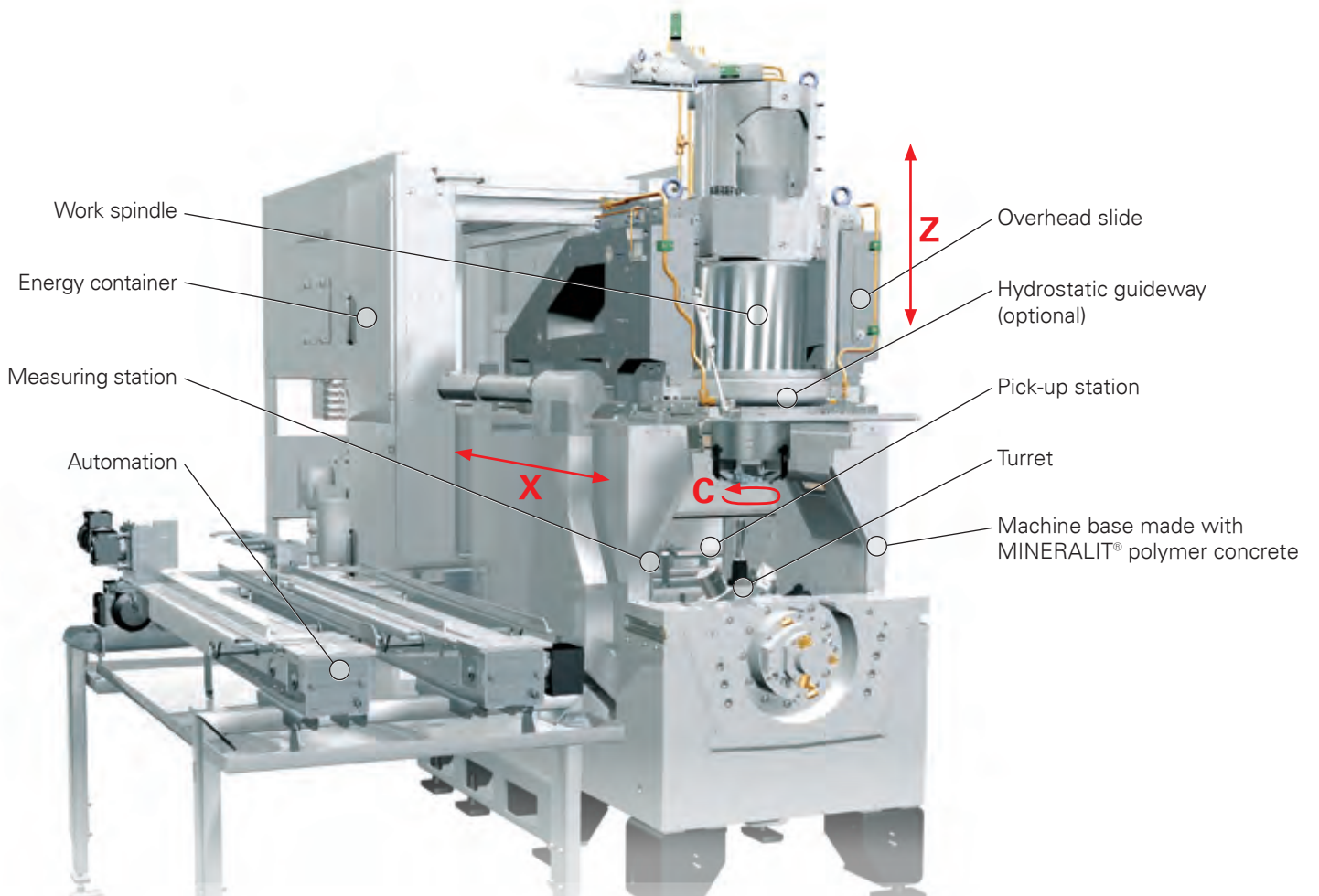


## The VSC Series – its advantages.

- Every machine is a production cell that utilizes its pick-up spindle to load itself
- Short machining travel times and equally short workhandling times
- Multifunctional production tool: turning, drilling, milling, grinding and other processes
- The workpiece travels, while the tooling systems remain stationary
- Ideal chip flow conditions, because the tools are located below the workpiece
- The work spindle with hydro-static guideway in Z-axis (optional) ensures outstanding component quality and a high tool life for soft and hard machining operations
- All accuracy defining machine assemblies are fluid-cooled
- Safe, wear resistant, maintenance free machining area envelope
- Dry machining is easy with the VSC, because work spindle and tools are perfectly positioned

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V S C 4 0 0  
V S C 5 0 0







V S C 2 5 0  
 V S C 4 0 0  
 V S C 5 0 0



The workpieces are transported to the pick-up station and inserted into the chuck jaws



Twin-track loading for a quicker workpiece change



The twin-gripper collects a raw part from each feeder band and places them on the conveyor belt

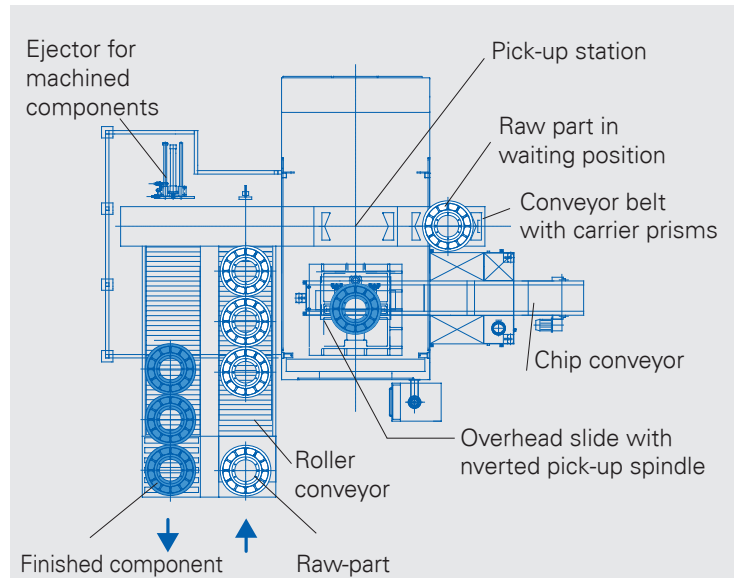


Automation for stand-alone machines: transport the workpieces to the pick-up position and remove the machined components



## A flexible workpiece flow reduces footprint and costs.

The pick-up spindle ensures that the machines of the VSC series load themselves. Whether the workpiece is loaded or unloaded from the left or the right, the direction of the workpiece flow – and thus the position of the machines in the production line – is optional. Advantages: the footprint is smaller and link-up costs are considerably lower. Integration into manufacturing systems is guaranteed by the availability of a variety of automation components.



Automating a machine for the handling of large, heavy workpieces could not be simpler



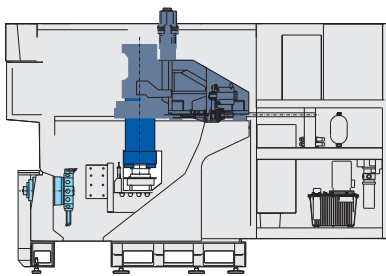
The machines of the VSC series are not exclusively for the machining of discoid workpieces

# All machine assemblies are extremely sturdy and vibration resistant.

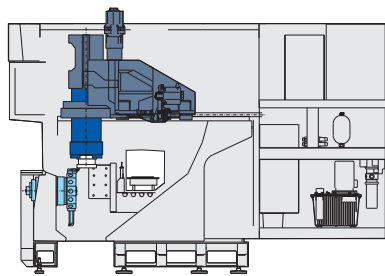
As the main spindle and its workpiece travel in the primary axes X, Y and Z, very sturdy tooling systems can be used to suit individual machining requirements. These tooling systems are fully integrated into the machine base, giving them great static and dynamic rigidity.

The inverted work spindle (with the inverted workpiece), with the tools being positioned below it, offers the best possible chip flow conditions.

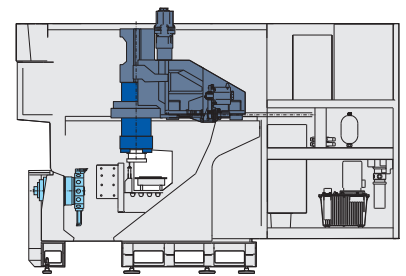
V S C 2 5 0  
V S C 4 0 0  
V S C 5 0 0



Pick-up position:  
workpiece automatically picked up  
and put down



Machining position:  
turning, drilling, milling



Measuring position:  
workpiece being measured

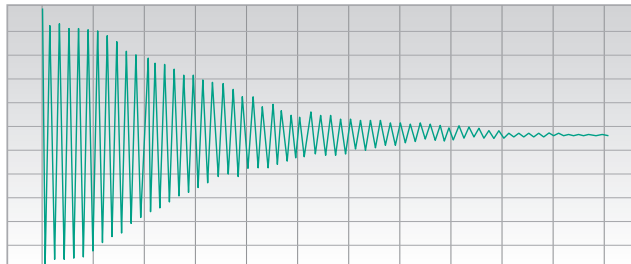
# MINERALIT® polymer concrete – the material that makes production dreams come true.

The machine base of all VSC vertical pick-up turning machines is made of MINERALIT® polymer concrete, a material that is characterized by damping properties eight times better than those of cast iron.

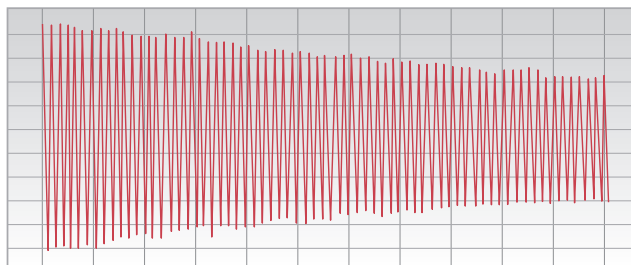
The advantages:

- Great vibration damping effect, resulting in extended tool life and superb surface finishes
- MINERALIT® polymer concrete is thermally stable which ensures constant production results.

The Vibration damping effect on EMAG machine bases due to the MINERALIT® polymer concrete base



In comparison to: Vibration damping effect on machine bases in cast iron



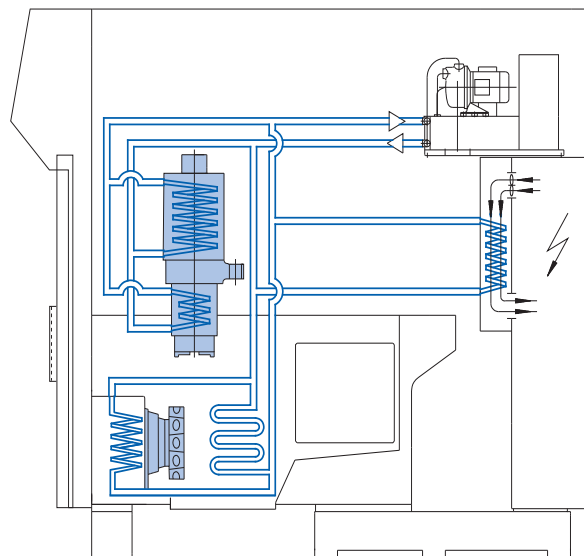
## Heavy machining made easy.

A constant temperature is required for consistent quality. The spindle motor, main spindle and quill, turret and machine base are all fluidcooled. A dual-circuit cooling unit holds the machine temperature within tight limits of the ambient temperature.



Even for jobs as hard as this one, the VSC is highly reliable in the application of its multifunctional operations: soft and hard machining, interrupted cuts, turning, drilling and milling

V S C 2 5 0  
V S C 4 0 0  
V S C 5 0 0



All accuracy defining machine components are connected to the fluid-cooling circuit

## The EMAG turret.

The fast acting 12-station disc-type turret is known for its short indexing times. All 12 stations can be equipped with driven drilling or milling tools. The EMAG turret's gearbox combines high speeds with great performance and minimal space requirement.

- Very high speed
  - Very fast indexing times
  - High speeds for driven tools
- High capacity
  - Small size and a high torque rate
- High precision
  - A high degree of rigidity is firmly embedded in the machine base
  - High degree of repeat accuracy due to indexing from tool position to tool position
- Maximum availability
  - Inured to collisions, owing to the use of torque motors
  - Turret does not lift off during indexing, thus preventing the ingress of dirt and chips

## Machine integral quality management.

Measuring also forms an integral part of these machines. On the way from the machining to the unloading position the workpiece is measured by a probe located outside the machining area. This ensures that the results are not affected by the presence of dirt or chip particles. The measurements are also taken with the component still in the chuck.



## Technical data.

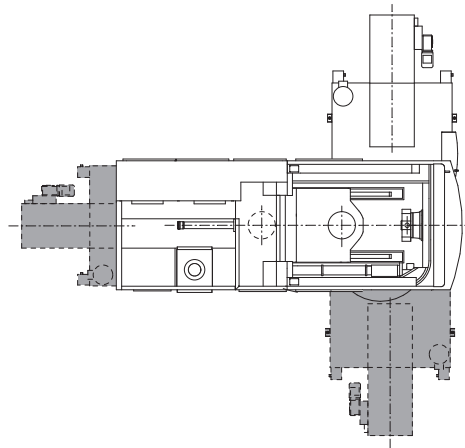
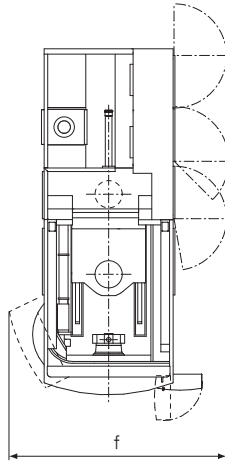
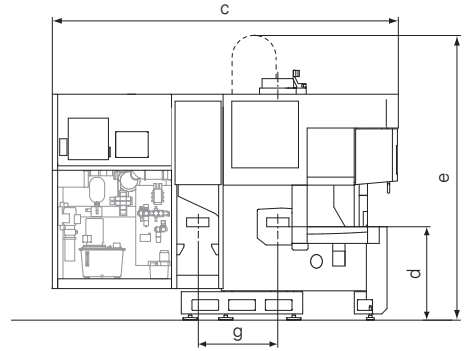
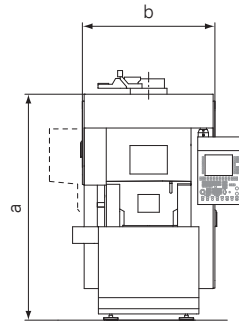
Capacity		VSC 250	VSC 400	VSC 400 DD	VSC 500	
Chuck diameter, max.	mm	250 / 315	315 / 400	315 / 400	400 / 500	
	in	9.8 / 12.4	12.4 / 15.8	12.4 / 15.8	15.8 / 19.7	
Swing diameter	mm	350	420	420	520	
	in	13.8	16.5	16.5	20.5	
Workpiece diameter max.	mm	250	340	340	440	
	in	9.8	13.4	13.4	17.3	
Travel in X, max.	mm	745	850	850	1,000	
	in	29.3	33.5	33.5	39.4	
Travel in Y	mm	–	–	315	–	
	in	–	–	12.4	–	
Travel in Z	mm	300	315	315	400	
	in	11.8	12.4	12.4	15.8	
Loading time						
Depending on workpiece		s	4 – 6	4 – 6	4 – 6	5 – 7
Main spindle						
Spindle nose to DIN 55 026	Size	6	11	11	11	
Spindle bearing, front	dia. in mm	110	160	140	160	
	dia. in inch	4.3	6.3	5.5	6.3	
Speed, max.	rpm	5,500	3,400	4,000	3,400	
Main drive						
Asynchronous motor						
Power rating, 40% / 100% duty cycle	kW	38 / 28	48 / 37	61 / 45	71 / 45	
	hp	51 / 38	64 / 50	82 / 60	95 / 60	
Torque, 40% / 100% duty cycle	Nm	460 / 330	760 / 600	650 / 480	750 / 480	
	ft-lb	340 / 243	560 / 443	480 / 354	553 / 354	
Full power at speed of	rpm	800	600	900	900	
Feed drive						
Rapid traverse speed X	m/min	60	45	45	45	
	ipm	2,362	1,771	1,771	1,771	
Rapid traverse speed Y	m/min	–	–	30	–	
	ipm	–	–	1,181	–	
Rapid traverse speed Z	m/min	30	30	30	30	
	ipm	1,181	1,181	1,181	1,181	
Feed force X / Y / Z	kN	10	11	11	11	
	lbf	2,248	2,473	2,473	2,473	
Ball screw X / Y / Z	dia. in mm	40	50 / – / 40	50 / 40 / 40	50	
	dia. in inch	1.57	2.0 / – / 1.6	2.0 / 1.6 / 1.6	2.0	

Disc-type turret		VSC 250	VSC 400	VSC 400 DD	VSC 500
<hr/>					
Tool receptors					
for cylindrical shanks to DIN 69 880	Qty	12	12	12	12
Shank diameter	mm	40	50	50	50
	in	1.6	2.0	2.0	2.0
Driven tools:					
Power rating, max.	kW	8.5	19	19	19
	hp	10	25	25	25
Speed, max.	rpm	6,000	6,000	6,000	6,000
Torque 40% duty cycle	Nm	23	40	40	40
	ft-lb	17	30	30	30
Torque, max.	Nm	40	60	60	60
	ft-lb	30	44	44	44
Full power at speed of	rpm	3,000	3,000	3,000	3,000
Turret indexing time	s	0.3	0.4	0.4	0.4
<hr/>					
Electrical equipment					
Operating voltage	V	400	400	400	400
Control voltage DC	V	24	24	24	24
Steuerspannung Wechselstrom	V	230	230	230	230
Frequency	Hz	50	50	50	50
Power consumption					
Min. equipment specification	kW	36	60	60	55
	hp	48	80	80	74
Max. equipment specification	kW	43	–	–	–
	hp	58	–	–	–
Lead fuse, min. / max.	A	80 / 100	100 / –	100 / –	125 / –
Electrics to		VDE 0113	VDE 0113	VDE 0113	VDE 0113
<hr/>					
Control system					
FANUC 31i / 32i					
SIEMENS SINUMERIK 840 D / Dsl					
Bosch Rexroth MTX					

# Technical data.

## Floor plan VSC 250

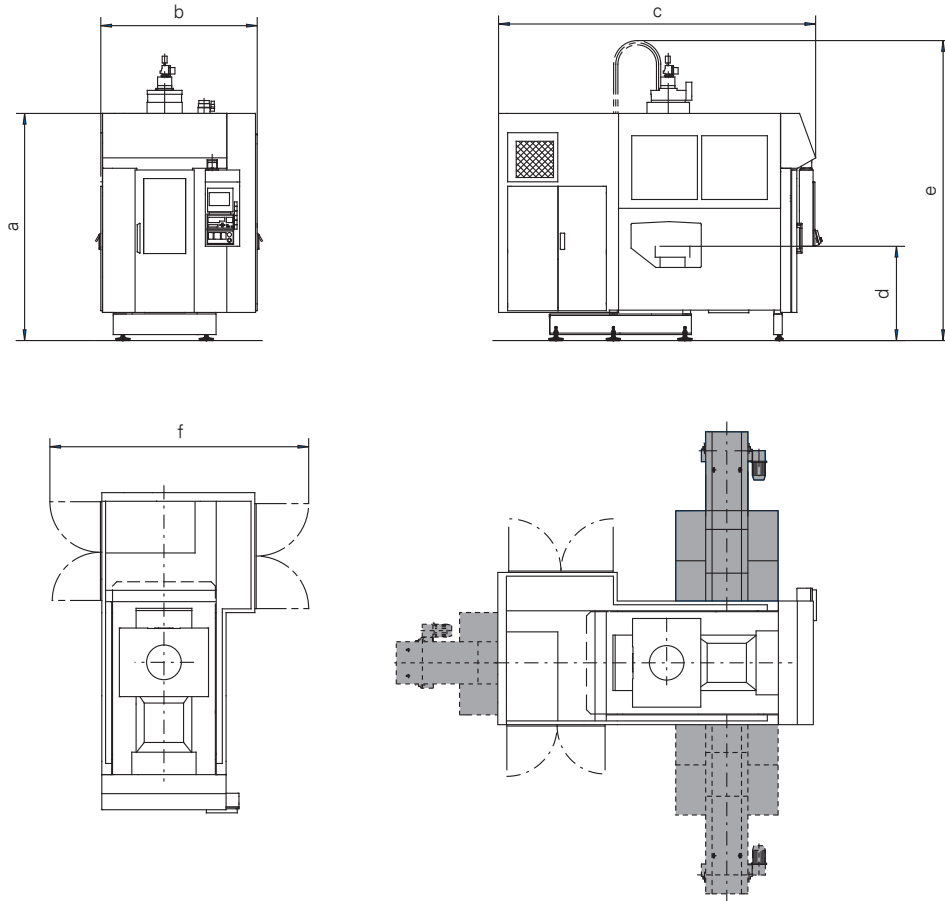
Dimensions in mm





## Floor plan VSC 400 / 500

Dimensions in mm



Measurements		VSC 250	VSC 400	VSC 400 DD	VSC 500
Dimension a	mm	2,450	2,650	2,650	3,200
	in	96.5	104.3	104.3	126.0
Dimension b	mm	1,500	1,825	2,000	1,960
	in	59.1	71.9	78.7	77.2
Dimension c	mm	3,800	3,700	3,990	4,050
	in	149.6	145.7	157.1	159.5
Dimension d	mm	1,050	1,100	1,100	1,100
	in	41.3	43.3	43.3	43.3
Dimension e	approx. mm	3,200	3,300	3,300	3,800
	approx. in	126.0	129.9	129.9	149.6
Dimension f	approx. mm	2,500	3,100	3,300	3,250
	approx. in	98.4	122.1	129.9	128.0
Dimension g	approx. mm	900			
	approx. in	35.4			

Subject to technical changes

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