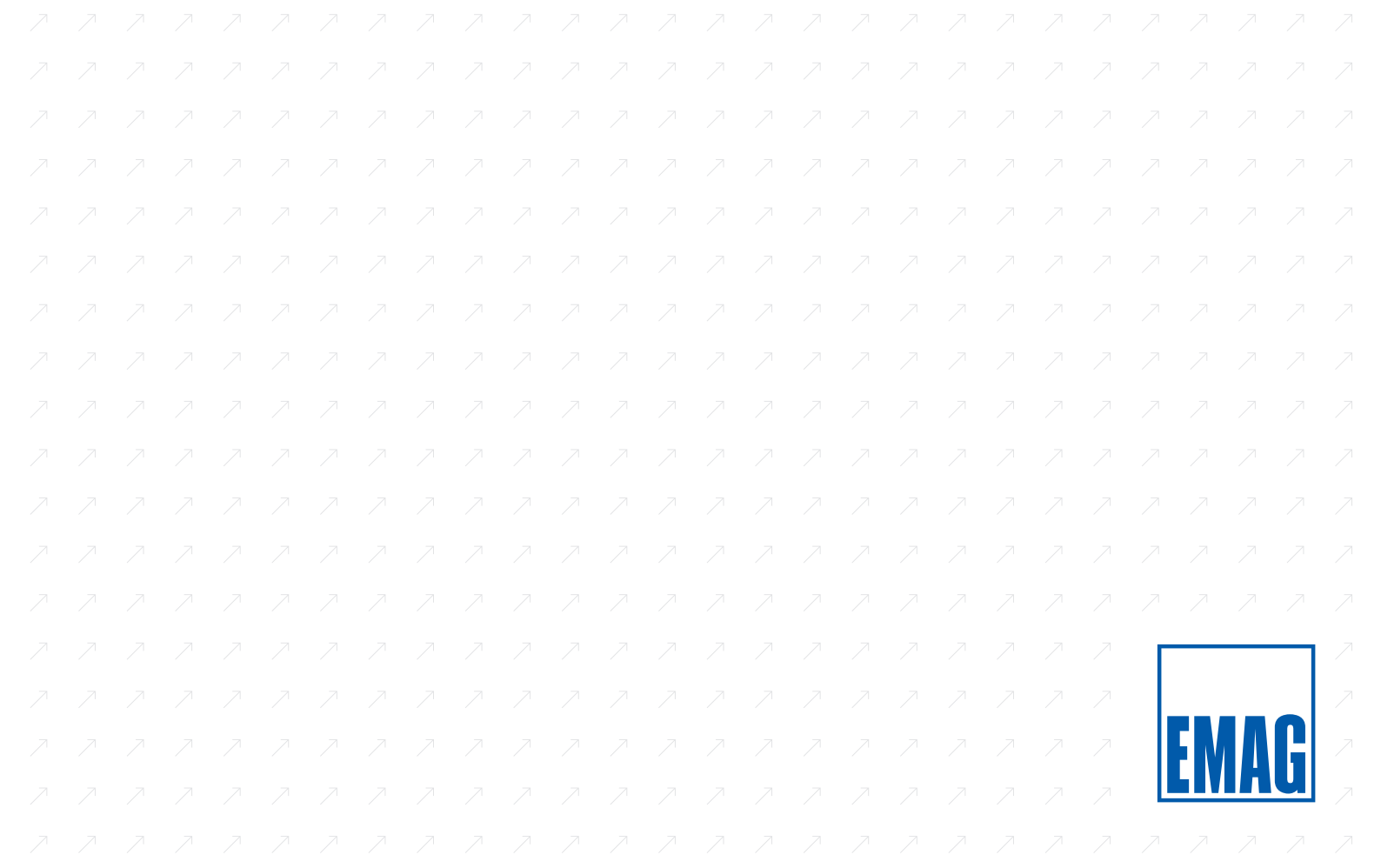


Vertical Multi-Spindle Machines

VSC 250 / 400 DUO

VSC 160 / 250 TWIN

VSC 200 TRIO



The powerful and compact multispindle, vertical pick-up turning machines from EMAG are predominantly used in medium and large batch production of precise components and are known for their high output rates.

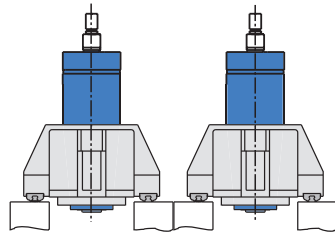
VSC 250/400 DUO
VSC 160/250 TWIN
VSC 200 TRIO



VERTICAL MULTI-SPINDLE MACHINES

Productivity – the ultimate benchmark.

VSC DUO

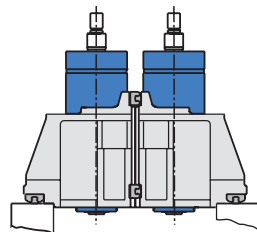


For identical or different machining cycles

- two separate machining areas
- two independently programmable overhead slides
- two independently programmable disc-type turrets
- to accommodate sequential operations (OP 10 + OP 20)

VSC 250/400 DUO
VSC 160/250 TWIN
VSC 200 TRIO

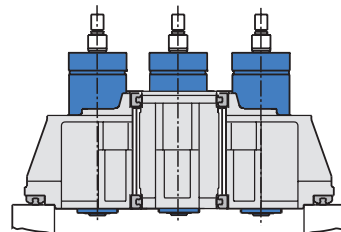
VSC TWIN



For the simultaneous machining of two workpieces

- a single machining area with two work spindles
- for the simultaneous machining of two workpieces with identical operational sequences
- the machining operations for workpiece diameter and length can be corrected for each work spindle individually

VSC TRIO



For the simultaneous machining of three workpieces

- a single machining area with three work spindles
- for the simultaneous machining of three workpieces with identical operational sequence
- the machining operations for workpiece diameter and length can be corrected for each work spindle individually



VSC DUO – the two-spindle machine for sequential operations.

The DUO two-spindle machines are a very economical solution for the machining of larger batches for small and medium-size components. The DUO has the smallest footprint of the machines for the machining of components in first and second operation.

The DUO design offers two separate machining areas with independently programmable overhead slides. Each machining area also features an independently programmable disc-type turret in the front wall.

VSC 250/400 DUO
VSC 160/250 TWIN
VSC 200 TRIO



Both turrets accommodate not only stationary tools but also driven drilling and milling tools. This allows for either identical or different operations to be carried out in the two work spindles:

- After the first set of operations have been carried out on the workpiece, using the first spindle, the back of the component is machined in the second one; or the second spindle could be used to finish-machine the workpiece in a second setup.
- The alternative option is to machine two workpieces with identical operational sequence in the two spindles.



VSC 250 DUO: Separate, sturdy machine bases made of polymer concrete MINERALIT®. The two overhead slides are independently programmable



VSC TWIN – twice the number of components on the same footprint.

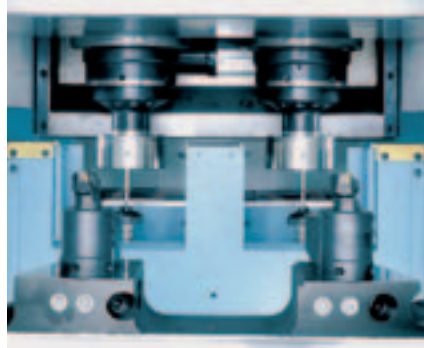
TWIN-type VSCs are used to simultaneously machine large batches of workpiece pairs that have identical operating cycles on a minimum footprint. This also applies to components when the back side has to be machined too – this process is done on a second VSC TWIN linked to the first by a turnover station.

VSC 250/400 DUO
VSC 160/250 TWIN
VSC 200 TRIO



The overhead slides are separate entities. Both slides and their spindles feature separate X- and Z-axis drives and separate measuring systems with linear scales in all axes.

This way the TWIN ensures that workpiece diameter and length can be corrected for each spindle individually – this is a requirement for achieving the kind of precision demanded by today's production environment.



Measuring two workpieces simultaneously can be a time saving measure. However, workpiece diameter and length are measured in each spindle individually. (Shown with protective guard between probe and machining area open)



VSC 200 TRIO – single-spindle programming, three-spindle machining.

The VSC 200 TRIO is the most productive and economical solution when large batches of workpieces have to be machined on the smallest possible footprint. Two-track loading reduces loading times considerably. Three vertical spindles collect the workpieces from conveyor belt 1 and loads them – after the machining cycle has been completed – on belt 2 for removal.

The VSC 200 TRIO Turning Center is a multi-spindle machine that is easy to upgrade with future developments in metal-cutting technologies. Implementing technological improvements is easy. The VSC 200 TRIO is a stand-alone solution, but it can also be integrated into existing manufacturing concepts.

VSC 250/400 DUO
VSC 160/250 TWIN
VSC 200 TRIO

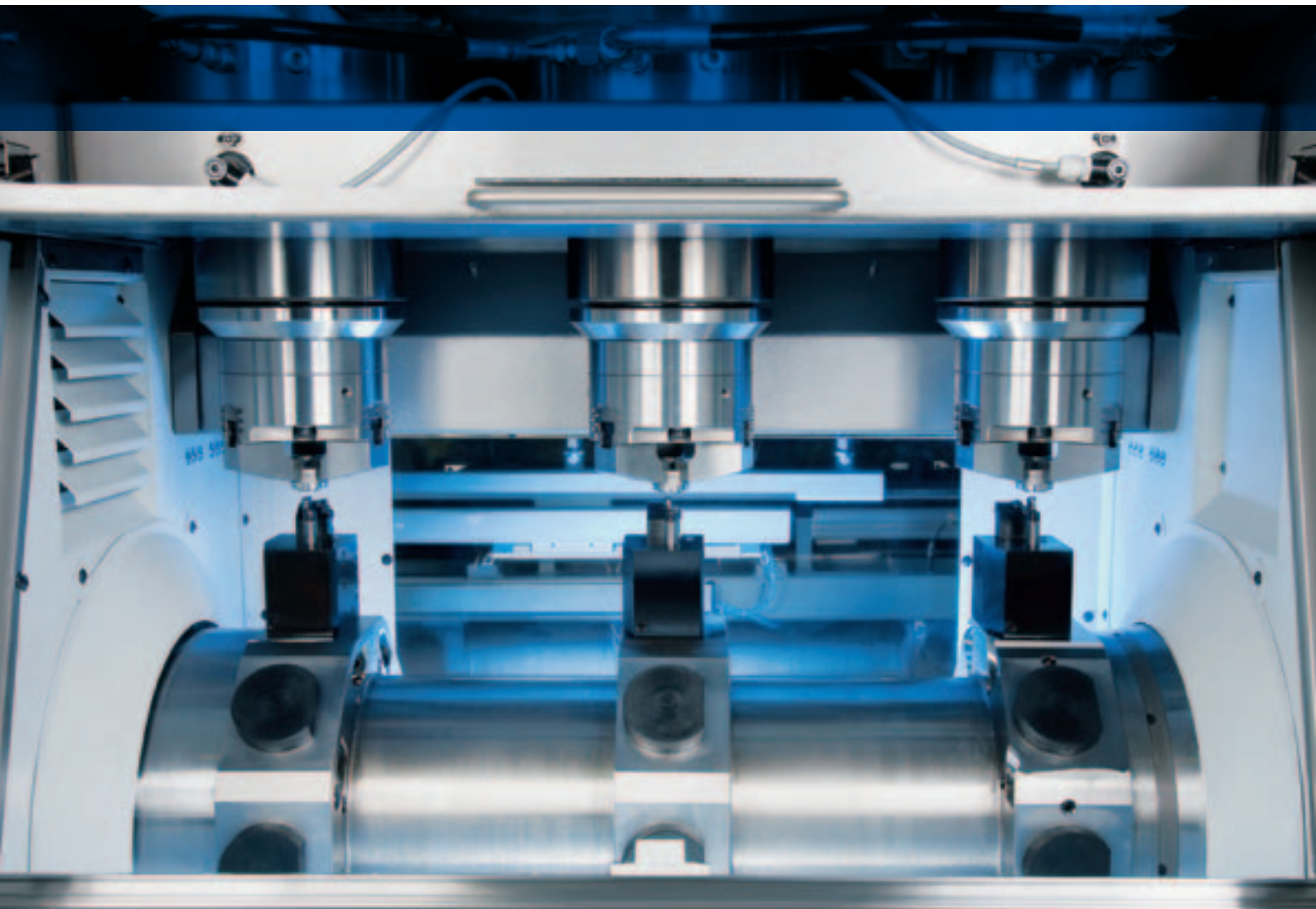


The tooling systems – one for each of the three work spindles – accommodate eight tools each and are embedded in the machine base. A direct servo drive ensures that individual tool stations index at great speed.

On the VSC 200 TRIO the control system carries out all tool offsets separately. This machine also features the direct position feedback systems that are required to achieve μ -range precision.



Measuring with three probes

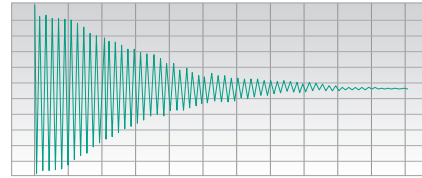


MINERALIT® polymer concrete – the material that makes production dreams come true.

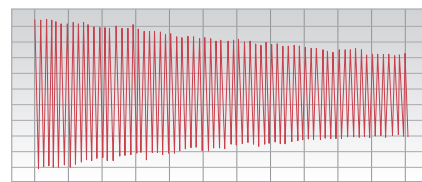
All vertical pick-up turning machines of the VL, VSC and VLC series have a MINERALIT® polymer concrete machine base, MINERALIT® damping properties are 8 times better than cast iron.

The advantages are:

- Exceptional vibration damping effects, which lead to extended tool life and fantastic surface finishes
- MINERALIT® polymer concrete is thermally stable which ensures constant production results



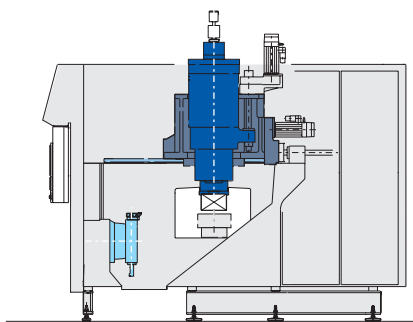
Vibration damping effect on EMAG machine bases made of MINERALIT® polymer concrete



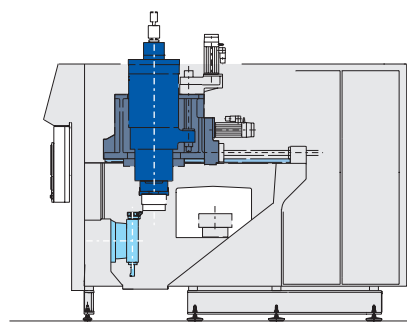
In comparison to: Vibration damping effect on machine bases in cast iron

VSC 250/400 DUO
VSC 160/250 TWIN
VSC 200 TRIO

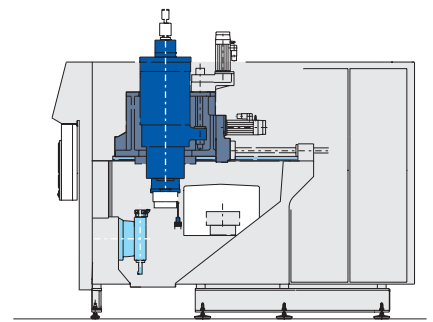
Three functions with the smallest footprint.



Loading
Automatic loading and unloading of the workpiece

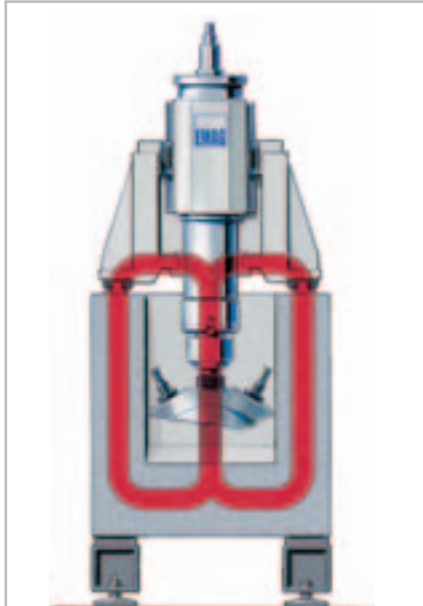


Machining
Turning, drilling, milling, grinding, laser applications...

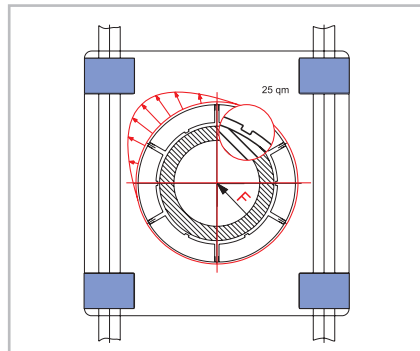


Gauging
The workpiece is gauged and necessary offsets are executed

Precision high volume production.



The closed- loop machine design has an extremely sturdy, U-shaped base which is a requirement for short, symmetrical, closed-loop force distribution and, consequently, for a high degree of static and dynamic rigidity.

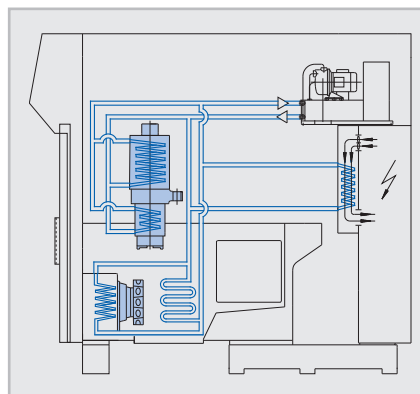


The thin oil film has an excellent damping effect – which is a requirement for a great surface finish and extended tool life, even where interrupted cuts are applied

Constant temperature: A requirement for constant quality.

The fluid- cooled spindle motors, turrets, electrical cabinet and machine base, are combined with the thermo-symmetrical machine design, which will increase precision.

A twin- circuit cooling system keeps the machine temperature in a close range of the ambient temperature. The electrical cabinet is kept at a constant temperature.



Task orientated material handling.

Simple, flexible workpiece handling:

On all VSC series machines, as well as the two spindle machines loading and unloading can be done from either the right or the left.

Another advantage is reconigzed during the turning of the workpiece for the second operation work:

The turning takes place outside the machining area and therefore is easy to access and monitor.

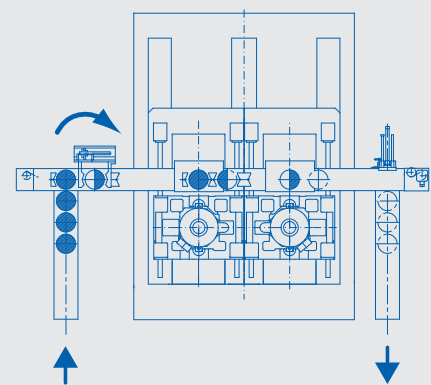
Depending on the machine specifications, during the component changeover the automation equipment can be adjusted through the software program, rather than manually.



The machine can be integrated and freely positioned in production lines, saving space and reducing linkup costs

VSC 250/400 DUO
VSC 160/250 TWIN
VSC 200 TRIO

The machine can be integrated and freely positioned into production lines, this will save on the footprint and will reduce linkup costs.



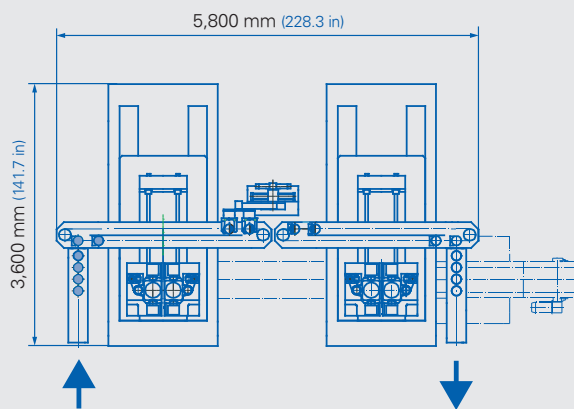
Example: VSC 250 DUO. Where components requiring two operations have to be machined in larger quantities, the DUO two-spindle machine does this on a minimal footprint



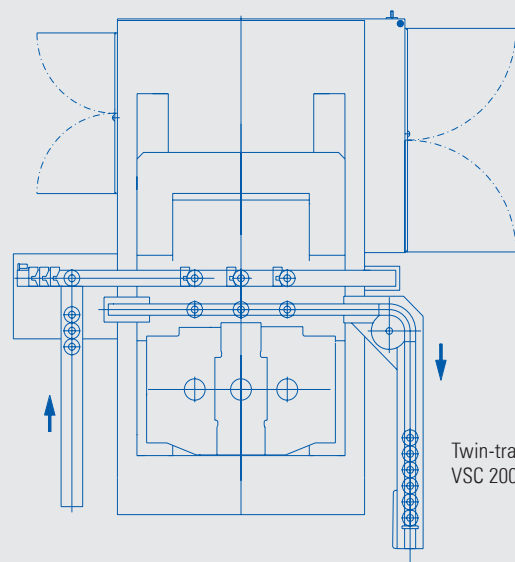
Just one example of many: two raw-parts are collected simultaneously from the workpiece magazine, ...



... deposited on the conveyor belt and transported to the pick-up position of the two spindles on the VSC 160 TWIN



Two VSC 160 TWINs, linked by a workpiece turn-over station – an example of a highly efficient piece of production equipment. Four spindles machine the front and rear of the workpiece. The result: large batch production at lowest possible manufacturing cost



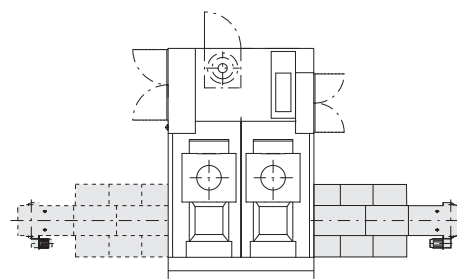
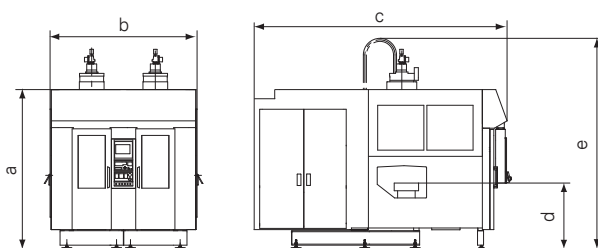
Twin-track loading of a VSC 200 TRIO

Technical Data.

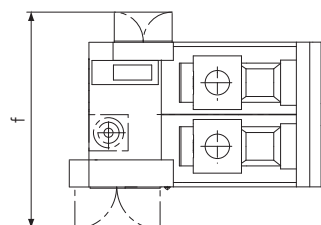
Capacity		VSC 250 DUO	VSC 400 DUO
Chuck diameter, max.	mm in	200 / 250 7.9 / 9.8	315 / 400 12.4 / 15.7
Swing diameter	mm in	260 10.2	420 16.5
Workpiece diameter max.	mm in	200 7.9	340 13.4
Travel in X, max.	mm in	850 33.5	850 33.5
Travel in Z	mm in	200 7.9	315 12.4
Loading time			
Depending on workpiece	s	4 – 6	4 – 6
Main spindles			
Quantity		2	2
Spindle nose to DIN 55 026	Size	6	11
Spindle bearing, front	dia. in mm dia. in inch	100 3.9	160 6.3
Speed, max.	rpm	6,000	3,400
Main drive, per spindle			
Asynchronous motor			
Power rating, 40% / 100% duty cycle	kW hp	38 / 28 51 / 38	48 / 37 64 / 50
Torque, 40% / 100% duty cycle	Nm ft-lb	460 / 330 339 / 243	775 / 600 572 / 443
Full power at speed of	rpm	800	600
Feed drive			
Rapid traverse speed X	m/min ipm	45 1,772	45 1,772
Rapid traverse speed Z	m/min ipm	30 1,181	30 1,181
Feed force X / Z	kN lbf	11 2,473	11 2,473
Ball screw X / Z	dia. in mm dia. in inch	50 / 40 2.0 / 1.6	50 / 40 2.0 / 1.6
Disc-type turret			
Tool receptors for cylindrical shanks to DIN 69 880	Quantity	2 x 12	2 x 12
Shank diameter	mm in	40 1.6	50 2.0
Driven tools	Quantity	2 x 12	2 x 12
Power rating, max.	kW hp	8.5 11	19 25
Speed, max.	rpm	6,000	6,000
Torque 40% duty cycle	Nm ft-lb	23 17	40 30
Torque, max.	Nm ft-lb	40 30	60 44
Full power at speed of	rpm	3,000	3,000
Turret indexing time	s	0.3	0.4

Electrical equipment		VSC 250 DUO	VSC 400 DUO
Operating voltage	V	400	400
Control voltage DC	V	24	24
Control voltage AC	V	230	230
Frequency	Hz	50	50
Power consumption			
Min. equipment specification	kW hp	66 89	100 134
Max. equipment specification	kW hp	103 138	– –
Lead fuse, min. / max.	A	125 / 200	200 / –
Electrics to		UL 508 A	UL 508 A
Control system			
FANUC 31i / 32i		yes	yes
SIEMENS SINUMERIK 840 D		no	yes
SIEMENS SINUMERIK 840 Dsl		yes	yes
Bosch Rexroth MTX		yes	yes
Weight			
Weight	approx. kg approx. lb	14,000 30,865	20,000 44,092

Floor plan VSC 250 / 400 DUO



Variations in the positioning of chip conveyors



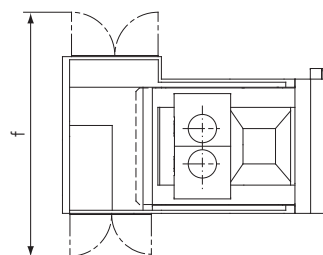
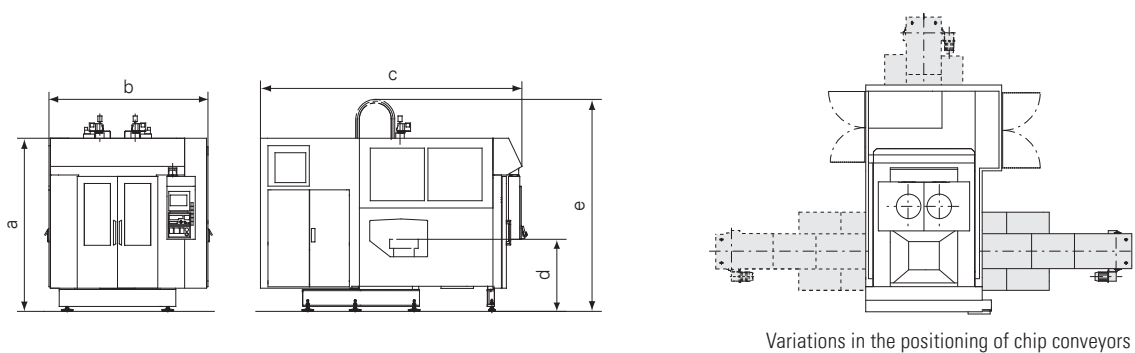
Measurements		VSC 250 DUO	VSC 400 DUO
a	mm in	2,540 100.0	2,700 106.3
b	mm in	2,450 96.5	2,440 96.1
c	mm in	3,800 149.6	4,300 169.3
d	mm in	1,050 41.3	1,100 43.3
e	approx. mm approx. in	3,200 126.0	3,300 129.9
f	approx. mm approx. in	3,400 133.9	3,700 145.7

Technical Data.

Capacity		VSC 160 TWIN	VSC 250 TWIN
Chuck diameter, max.	mm in	130 / 160 5.1 / 6.3	200 / 250 7.9 / 9.8
Swing diameter	mm in	180 7.1	260 10.2
Workpiece diameter max.	mm in	130 5.1	200 7.9
Travel in X, max.	mm in	850 33.5	850 33.5
Travel in Z	mm in	160 6.3	200 7.9
Loading time			
Depending on workpiece	s	2 – 4	2 – 4
Main spindles			
Quantity		2	2
Spindle nose to DIN 55 026	Size	5	6
Spindle bearing, front	dia. in mm in	80 3.2	100 3.9
Speed, max.	rpm	6,500	6,000
Main drive, per spindle			
Asynchronous motor			
Power rating, 40% / 100% duty cycle	kW hp	23 / 17 31 / 23	39 / 28 52 / 38
Torque, 40% / 100% duty cycle	Nm ft-lb	71 / 53 52 / 39	460 / 340 339 / 251
Full power at speed of	rpm	3,000	800
Feed drive			
Rapid traverse speed X	m/min ipm	45 1,772	45 1,772
Rapid traverse speed Z	m/min ipm	30 1,181	30 1,181
Feed force X / Z	kN lbf	11 2,473	11 2,473
Ball screw X / Z	dia. in mm dia. in inch	50 / 40 2.0 / 1.6	50 / 40 2.0 / 1.6
Disc-type turret			
Tool receptors for cylindrical shanks to DIN 69 880	Quantity	2 x 4	2 x 8
Shank diameter	mm in	30 1.2	40 1.6
Driven tools	Quantity	–	2 x 8
Power rating, max.	kW hp	– –	8.5 11
Speed, max.	rpm	–	6,000
Torque 40% duty cycle	Nm ft-lb	– –	23 17
Torque, max.	Nm ft-lb	– –	40 30
Full power at speed of	rpm	–	3,000
Turret indexing time	s	–	0.3

Electrical equipment		VSC 160 TWIN	VSC 250 TWIN
Operating voltage	V	400	400
Control voltage DC	V	24	24
Control voltage AC	V	230	230
Frequency	Hz	50	50
Power consumption	kW hp	40 54	66 89
Supply line fuse	A	100	160
Electrics to		UL 508 A	UL 508 A
Control system			
FANUC 31i / 32i		yes	yes
SIEMENS SINUMERIK 840 D		yes	yes
Bosch Rexroth MTX		yes	yes
Weight			
Weight	approx. kg approx. lb	9,600 21,164	12,000 26,455

Floor plan VSC 160 / 250 TWIN



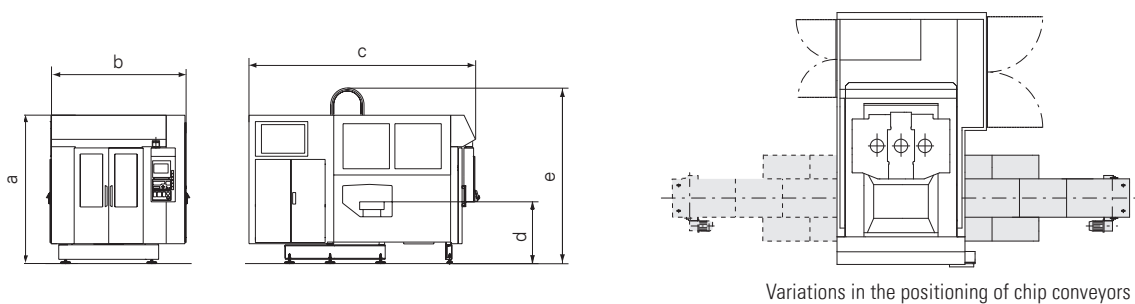
Measurements		VSC 160 TWIN	VSC 250 TWIN
a	mm in	2,950 116.1	2,600 102.4
b	mm in	1,500 59.1	2,250 88.6
c	mm in	3,600 141.7	3,700 145.7
d	mm in	1,100 43.3	1,020 40.2
e	approx. mm approx. in	3,000 118.1	3,000 118.1
f	approx. mm approx. in	2,700 106.3	3,500 137.8

Technical Data.

Capacity		VSC 200 TRIO	
Chuck diameter, max.	mm in	160 / 200 6.3 / 7.9	
Swing diameter	mm in	210 8.3	
Workpiece diameter max.	mm in	160 6.3	
Travel in X, max.	mm in	850 33.5	
Travel in Z	mm in	200 7.9	
Loading time			
Depending on workpiece	s	2 – 4	
Main spindles			
Quantity			3
Spindle nose to DIN 55 026	Size		5
Spindle bearing, front	dia. in mm dia. in inch	80 3.2	
Speed, max.	rpm	6,500	
Main drive, per spindle			
Asynchronous motor			
Power rating, 40% / 100% duty cycle	kW hp	24 / 16 32 / 21	
Torque, 40% / 100% duty cycle	Nm ft-lb	125 / 85 92 / 63	
Full power at speed of	rpm	1,800	
Feed drive			
Rapid traverse speed X	m/min ipm	45 1,772	
Rapid traverse speed Z	m/min ipm	30 1,181	
Feed force X / Z	kN lbf	11 2,473	
Ball screw X / Z	dia. in mm dia. in inch	50 / 40 2.0 / 1.6	
Drum-type turret			
Tool receptors for cylindrical shanks to DIN 69 880	Quantity	3 x 8	
Shank diameter	mm in	40 1.6	

Electrical equipment		VSC 200 TRIO	
Operating voltage	V		400
Control voltage DC	V		24
Control voltage AC	V		230
Frequency	Hz		50
Power consumption	kW		70
	hp		94
Supply line fuse	A		160
Electrics to			UL 508 A
Control system			
SIEMENS SINUMERIK 840 D			yes
SIEMENS SINUMERIK 840 Dsl			yes
Weight			
Weight		approx. kg	12,000
		approx. lb	26,455

Floor plan VSC 200 TRIO



Measurements		VSC 200TRIO	
a	mm		2,500
	in		98.4
b	mm		2,250
	in		88.6
c	mm		3,750
	in		147.6
d	mm		1,020
	in		40.2
e	approx. mm		3,000
	approx. in		118.1
f	approx. mm		3,700
	approx. in		145.7

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