

Manufacturing systems for the batch production of precise metal components.



VL Series Standard vertical turning machine Machining of chucked components



SN Series Camshaft grinder



VSC TWIN Series Vertical multi-spindle machine, simultaneous machining of 2 chucked components



P 320 Crankshaft grinder

EMAG GROUP



VSC 200 TRIO Vertical multi-spindle machine, simultaneous machining of 3 chucked components



VTC Series Vertical 4-axis machining of shafts



VSC DS Series Vertical turning and grinding machine for chucked components



VTC 315 DS Vertical turning and grinding machine for shafts



BA 400 Horizontal machining centers



BA W06 Horizontal machining centers

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VSC 400 WF Turning + hobbing of gears



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EMAG VL 3 / VL 5i / VL 7 EMAG VL Y

The standard vertical turning machine for chucked components: turning + automation on a single machine, implemented on the smallest possible footprint.





What distinguishes the VL series of machines are high productivity levels, extremely high and constantly maintained precision, exceptional process integrity and a high degree of operator friendliness. The pick-up spindle forms part of the overhead slide and serves as a workhandling unit. Short traverses and the machine's compact design make for exceptionally short loading and cycle times.

Capacity		VL 3	VL 5i	VL 7	VL Y
Chuck dia.	mm	170	250	400	170
Swing dia.	mm	210	270	420	210
X-axis travel	mm	400	660	850	570
Y-axis travel	mm	_	_	_	± 25
Z-axis travel	mm	200	300	315	200

EMAG VSC 250 / 400 / 500

EMAG VLC 250

The vertical pick-up turning machine for chucked components of up to 500 mm diameter. Optimal use of the VSC series of machines through technology integration for soft and hard machining.

The VLC 250 is a cross-operated, vertical manufacturing system, with its main asset being its universal application.



Turning, drilling, grinding, milling, gear profiling, honing – everything on a single machine. Workpiece measuring by probe or plug gauge is accurate, fast and achieved without detours as part of the same setup.

The application dictates the number and position of turrets and the kind of automation needed. The machine concept also accommodates different machining technologies, such as turning, drilling, grinding, milling and the use of multi-technology units with tool changer.

Capacity			`	VSC
Chuck dia.	mm	250	to	500
Swing dia.	mm	350	to	520
Workpiece dia. (nominal)	mm	250	to	440
X-axis travel	mm	745	to 1,	000
Z-axis travel	mm	300	to	400

Capacity		VLC 250
Chuck dia.	mm	250/315
Swing dia.	mm	350
Workpiece dia. (nominal)	mm	250
Z-axis travel	mm	1.600
Y-axis travel	mm	±100
Z-axis travel	mm	300

EMAG VLC 500 / 630 / 800 / 1200

These multi-functional production centers in gantry design have a high chip capacity and are ideal for the completemachining of large workpieces.





Technology integration allows for complete-machining in a single setup. Soft and hard machining, interrupted cuts, turning, drilling, milling, grinding, ... heavy-duty machining at the highest precision.

Capacity				VLC
Chuck dia.	mm	500	to	1,250
Swing dia.	mm	820	to	1,500
X-axis travel	mm	2,350	to	2,960
Z-axis travel	mm	700	to	1,000

EMAG VSC 250 / 400 DUO

The economical solution to the machining of small and medium size components in two operations.

EMAG VSC 160 / 250 TWIN EMAG VSC 200 TRIO

These are high-performance, high-precision machines for mass production – vertical multi-spindle automatics for the simultaneous machining of two or three workpieces.



The DUO has two separate machining areas with independently programmable overhead slides. Both machining areas feature, in its front wall, an EMAG disc-type turret that is also independently programmable.

The VSC TWIN and VSC TRIO series combine high-yield production with a minimal footprint.

Capacity		DUO 250	DUO 400
Chuck dia.	mm	200 / 250	315 / 400
Swing dia.	mm	260	420
Workpiece dia. (nominal)	mm	200	340
X-axis travel	mm	850	850
Z-axis travel	mm	200	315

Capacity		VS	C 160) / 250 TWIN
Chuck dia.	mm	130 / 160	to	200 / 250
Swing dia.	mm	180	to	260
Workpiece dia. (nominal)	mm	130	to	200
X-axis travel	mm			850
Z-axis travel	mm	160	to	200

Capacity		VSC 200 TRIO
Chuck dia.	mm	160 / 200
Swing dia.	mm	210
Workpiece dia. (nominal)	mm	160
X-axis travel	mm	850
Z-axis travel	mm	200

REINECKER VG 110

The vertical machine for small chucked components. Hard pre-turning, internal and external grinding, loading and unloading – workpiece-specific and with great flexibility – all on a single machine.





VG 110 – for classic combination machining: Internal grinding with

- one or two grinding spindles
- one grinding spindle and one turning tool
- one face-grinding spindle and one turning tool

Capacity		VG 110
Chuck dia.	mm	100 to 190
Machining dia., max	mm	30
Grinding length, max	mm	60
X-axis travel	mm	460
Z-axis travel	mm	225

REINECKER VSC 250 DS REINECKER VSC 400 DS / DDS

KOPP SK 204

These turning and grinding centers combine the advantages of vertical hard turning with those of grinding – in a single machine and in a single setup.

The all-rounder for the grinding of round and out-of-round workpieces.



The machine for process stream consolidation. With all its advantages for the user: low capital outlay, low unit production costs, reduced throughput times, improved component quality and a high degree of process integrity.

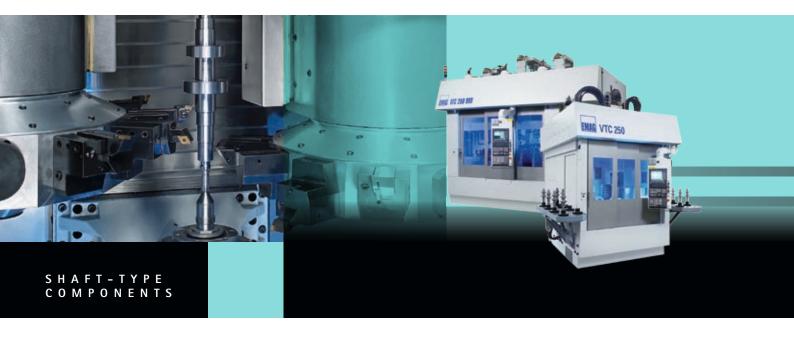
With the SK series you can carry out internal as well as external grinding work: out-of-round grinding, cylindrical grinding (internal and external) and polishing.

Capacity	VSC	C 250 DS	VSC 400 DS / DDS
Chuck dia., max	mm	250	400
Swing dia., max	mm	260	420
X-axis travel	mm	680	850
Z-axis travel	mm	200	315
Y-axis travel (DDS)	mm	_	315

Capacity		SK 204
Workpiece dia., max	mm	250
X-axis travel	mm	1,000
Z-axis travel	mm	380

EMAG VTC 250 / VTC 250 DUO EMAG VTC 315 / VTC 315 DUO

Complete-machining of shafts and shaft-type workpieces on a single machine, including automation.





High drive power, high speeds and sturdy turrets make the machines of the VTC series high-yield turning centers for 4-axis machining, including loading and unloading.

Capacity		VTC 250	VTC 315
Chuck dia.	mm	250	315
Workpiece dia., max	mm	140	250
Workpiece length, max	mm	630 / 1,000*	700
X-axis travel	mm	300	390
Z-axis travel	mm	740 / 1,100*	950

^{*}Special length

EMAG VTC 315 DS

The production tool for the machining of demanding shaft-type components. Turning and grinding vertically.

KARSTENS HG 2 KARSTENS HG 204 KARSTENS HG 208

The machine platform for the external cylindrical grinding of shaft-type precision components.



Whether turning, drilling, milling, grinding, synchronous support grinding or combination turning + grinding – the VTC caters for all the variants of process integration in the machining of shaft-type components.

Capacity	VTC	315 DS
Chuck dia.	mm	315
Workpiece dia., max	mm	240
Workpiece length, max, incl. workholding unit	mm	700
X-axis travel	mm	390
Z-axis travel	mm	950

This series of grinding machines is designed for the external cylindrical grinding of shaft-type components. An optional center drive on the HG 208 makes it possible to machine shafts and hollow shafts simultaneously.

Capacity		HG 2	HG 204	HG 208
Workpiece dia., max	mm	200	200	200
Workpiece length, max	mm	400	650	1,200
X-axis travel	mm	380	380	380
Z-axis travel	mm	1,000	1,000	1,800

KOPP SN 204 / 208 KOPP SN 310 / 320

The machine series for all the requirements in the out-ofround grinding of camshafts and external contours in both prototype and batch production.







The machines of the SN series are adapted to suit the requirements of individual component geometries.

They can be equipped with one, two or three wheels for external cylindrical and/or external out-of-round grinding.

Capacity	SN 204	SN 208	SN 310 / 320
1 ,			
Workpiece dia., max mm	380	380	360 / 640
Workpiece length, max mm	600	950	2,000
X-axis travel mm	380	380	500 / 500
Z-axis travel mm	1,000	1,600	1,700 / 2,700

EMAG HL 1000

EMAG HSC 800 / 1500

The single-spindle machine that drills oil holes into crankshafts and utilises the pick-up spindle to load itself.

The machines to drill oil holes into crankshafts. With one or more spindles. The HSC uses the pick-up spindle to load itself.



The ideal solution to drill oil holes into crankshafts. Complete-machining in a single setup: pilot drilling, oil hole drilling, deburring and chamfering. Pilot drilling, oil hole drilling, deburring and chamfering – these operations can all be carried out in a single setup, using one or more spindles

Capacity		HL 1000	Capacity		HSC 800	HSC 1500
			Workpiece dia., max			
single-spindle			single-spindle	mm	_	330
Workpiece dia., max	mm	265	2-spindle	mm	330	330
Workpiece length, max	mm	1,000	3-spindle	mm	195	_
X-axis travel	mm	420	Workpiece length, max			
Y-axis travel	mm	325	single-spindle	mm	_	1,500
Z-axis travel	mm	1,785	2-spindle	mm	950	1,500
			3-spindle	mm	950	_

PM Series

NAXOS-UNION PM 2

Crankshaft grinders with CBN technology or conventionally equipped either in single-wheel configuration with one spindle, or with two wheel heads and two spindles, or as an angular infeed grinder.





Capacity		PM 2
Swing dia., max	mm	200
Workpiece length, max	mm	500
Grinding wheel dia.	mm	500
Workpiece weight, max	kg	30





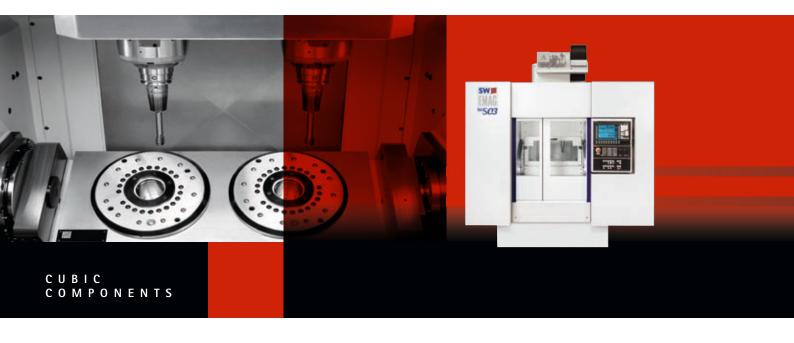


Capacity		PM 310	PM 320	Capacity		PM 430	PM 460
Swing dia., max	mm	300	300	Swing dia., max	mm	750	750
Workpiece length, max	mm	1,000	1,500	Workpiece length, max	mm	3,000	5,500 / 6,800
Grinding wheel dia.	mm	650	700	Grinding wheel dia.	mm	900 - 1,400	900 - 1,400
Workpiece weight, max	kg	80	180	Workpiece weight, max	kg	5,000	5,000



SW BA S03

Vertical machining center with one or two motor spindles for four- and five-axis machining respectively; also for five-axis simultaneous machining.





Cycle time concurrent loading of the fixture plates, using double-swivel trunnions with integrated A-axes for the twin-table version. Direct-driven rotary tables, designed to accommodate single or multiple clamping fixtures. Well suited for dry machining.

Capacity		BA S03-11	BA S03-12
		single-spindle	single-spindle
X-axis travel	mm	600	600
Y-axis travel	mm	400 (650*)	400 (650*)
Z-axis travel	mm	400	400
Distance between	mm	_	_
spindles			
Capacity			BA S03-22
			2-spindle
X-axis travel	mm		300
Y-axis travel	mm		400 (650*)
Z-axis travel	mm		400
Distance between	mm		300
spindles			
(*Alternative)			

SW BA W04 / W04-42 SW BA W06 / W06-2W

Horizontal machining center with one, two or four motor spindles for, in particular, the four- and five-axis machining of light alloy components with high idle time content; also for five-axis simultaneous machining. Cycle time concurrent loading of the fixture plates, using double-swivel trunnions with integrated direct-drive rotary axes.

SW BA 321 / BA 322

BA 321. Compact machining center for the 3- and 4-axis machining of smaller workpieces in steel, cast iron and aluminium. With one rotary axis, of compact construction and still the option of cycle time-concurrent loading and unloading of the workpieces.



The BA W06-2W: a horizontal, two-spindle machining center with integrated loading, using the pick-up principle or a gantry loader. With the Y-axis travel extended by 200 mm, and providing a swing diameter of 800 mm to accommodate workpiece lengths of up to 550 mm.

Capacity		BA W04-22	BA W04-42
		2-spindle	4-spindle
X-axis travel	mm	400	200
Y-axis travel	mm	500 (775*)	500 (775*)
Z-axis travel	mm	425	425
Distance	mm	400	200
between spin	dles		

Capacity		BA W06-12	BA W06-22	BA W06-2W	
	5	single-spindle	2-spindle	2-spindle	
X-axis travel	mm	1,150	600	600	
Y-axis travel	mm	600 (875*)	600 (875*)	600 (875*)	
Z-axis travel	mm	500	500	500	
W-axis travel	mm	_	_	225 (1,000)	
Distance	mm	_	600	600	
between spindles					

(*Alternative)

BA 322. Compact, two-spindle, horizontal machining center with the option of cycle time-concurrent loading and unloading of workpieces. For the 4- and 5-axis as well as the 5-axis simultaneous machining of small and medium-size workpieces in steel, cast iron and light alloys.

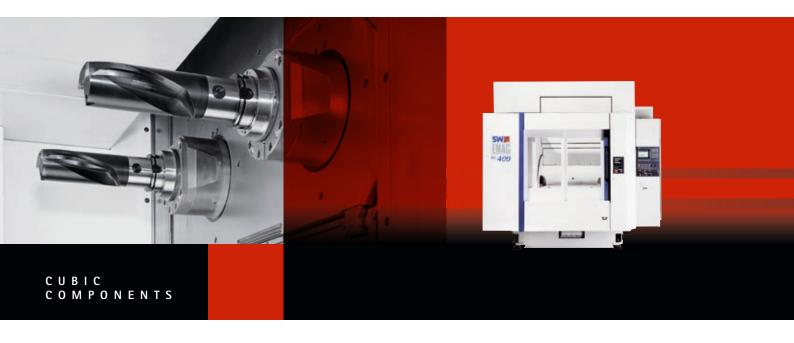
	BA 321	BA 322
	2-spindle	2-spindle
mm	300	300
mm	500 (750*)	450 (725*)
mm	375	375
mm	300	300
	mm mm	2-spindle mm 300 mm 500 (750*) mm 375

(*Alternative)

BA 321: Single workstation BA 322: Two workstations

SW BA 400

Horizontal machining center with two or four synchronous, fluid-cooled motor spindles – ideally suited for multispindle, five-axis simultaneous machining.





Main spindle bearing in hybrid technology. Cycle time concurrent workpiece changeover, three NC linear axes and up to four NC rotary axes.

Capacity		BA 400-2	BA 400-4
		2-spindle	4-spindle
X-axis travel	mm	400	200
Y-axis travel	mm	450 (700*)	450 (700*)
Z-axis travel	mm	400	400
Distance between	mm	400	200
spindles			
(*Alternative)			

SW BA 600

Horizontal machining center with two or four synchronous, fluid-cooled motor spindles – ideally suited for multispindle, five-axis simultaneous machining.

SW BM 1250

Reconfigurable multi-spindle cutter head machine, on which the fixture moves and not the horizontally mounted cutter heads that contain the tools.



Main spindle bearing in hybrid technology. Cycle time concurrent workpiece changeover. Three NC linear axes and up to four NC rotary axes. five-sided machining in a single setup. The machine is ideally suited for automatic loading.

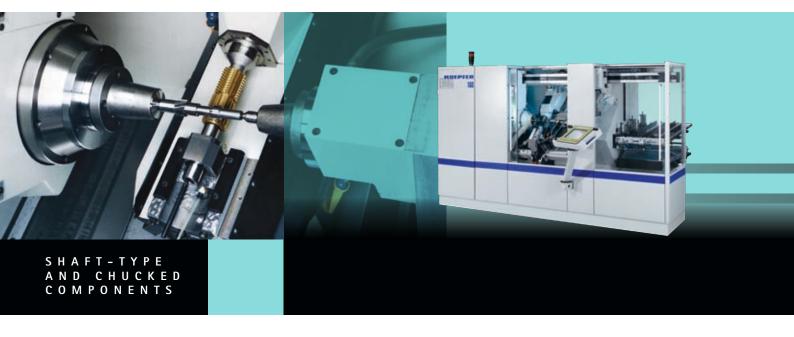
Capacity		BA 600-2	BA 600-2G	BA 600-4	
		2-spindle	2-spindle	4-spindle	
X-axis travel	mm	600	600	300	
Y-axis travel	mm	600 (975*)	550 (975*)	600 (975*)	
Z-axis travel	mm	500	360	500	
Distance	mm	600	600	300	
between spindles					
(*Alternative)					

A three-axis workholding unit uses the pick-up principle to collect the workpieces from the loading station and to convey them from one multi-spindle drilling or milling head to the next. The monobloc design offers maximal rigidity, whilst the stationary drilling and milling units guarantee optimal component quality, even under maximum feed force.

Capacity		BM 1250
X-axis travel	mm	1,900
Y-axis travel	mm	1,250
Z-axis travel	mm	500
Rapid traverse up to	m/min	60
Axis acceleration up to	m/s ²	10
Feed force up to	kN	28

KOEPFER Gear Hobbing Machine 160

The gear hobbing machine 160 is equipped with the latest generation eight-axis control system and offers high speeds for both hobbing head and main spindle.





In conjunction with a fast loading device the 160 ensures that even shafts and pinions with a minimal number of teeth can be machined at high cutting speeds and correspondingly short cycle times.

Capacity		KOEPFER 160
Module, max		2.5
Workpiece dia., max	mm	60 / 90 / 140
Hobbing length, max	mm	200 / 480
Workpiece length, max	mm	300 / 600
Hob width, max	mm	130 / 250
Shift travel	mm	100 / 160
Main spindle speed	rpm	1,000
Hob speed	rpm	5,000

KOEPFER Gear Hobbing Machine 200

The machine combines cutting edge technology with the highest degree of universality and flexibility in both machining and automation.

KOEPFER Gear Hobbing Machine 300

The fully automated Type 300 Gear Hobbing Machine features nine activated CNC axes and can machine gears up to module 4 with great flexibility.



The production tool to machine a large range of modules and diameters of pinions and gears, worms and worm gears.

The combination of slant bed design and closed-loop framework construction offers the highest degree of stability for both dry and wet machining.

Capacity		KOEPFER 200
Module, max		3
Workpiece dia., max	mm	120 / 180
Hobbing length, max	mm	200
Workpiece length, max	mm	300
Hob width, max	mm	130 / 100 / 63
Shift travel	mm	100 / 70 / 40
Main spindle speed	rpm	270 / 450 / 1,000
Hob speed	rpm	2,000 / 3,000 / 5,000

Capacity		KOEPFER 300
Module, max		4
Workpiece dia., max	mm	140 / 195
Hobbing length, max	mm	300
Workpiece length, max	mm	300 / 500
Hob width, max	mm	200
Shift travel	mm	160
Main spindle speed	rpm	800
Hob speed	rpm	2,000 / 4,000

KOEPFER VSC 400 WF

This gear profiling center, based on the design of the VSC series, is used to soft finish the gearing complete, employing turning, hobbing and deburring operations.







Capacity		VSC 400 WF
Workpiece dia., max	mm	230
X-axis travel	mm	930
Y-axis travel	mm	315
Z-axis travel	mm	315
Setting angle for hobs	degrees	+ / - 35
Speed, max	rpm	3,000
Standard module, max		4

KOEPFER Hob Sharpener KFS 100 / 250

The KFS series is designed to sharpen straight and helix fluted gear hobs in high-speed steel or carbide.



Capacity		KFS 100	KFS 250
Hob dia., max	mm	100	250
Hob length, max	mm	200	300
Grinding wheel dia., min	mm	50	50
Grinding wheel dia., max	mm	150	300

LASER TEC ELC 160

The space-saving solution to the laser welding of gearwheels.





The ELC laser welding machine meets stringent standards for productivity, quality and availability. Modern laser beam sources and optimal workholding technology ensure minimum welding distortion. The space-saving, compact design increases the integrity of the process capability and the flexibility of the machine.

Workpiece dimensions		ELC 160
O/D, max	mm	160
Workpiece height, max	mm	60

LASER TEC ELC 250 DUO

LASER TEC ELC 200 H

The extraordinarily compact twin-spindle laser-welding machine for transmission components and other rotationally symmetrical workpieces.

The laser-welding machine with horizontal workpiece positioning is designed to weld shaft-type components.



The ELC 250 DUO with fixed beam-focusing. All optical components remain stationary throughout the machining process. The clamped / compressed component can be welded axially and radially. An integrated compression unit ensures that welding distortion is reduced to a minimum.

Even very demanding material pairings are safely welded by using filler material. A seam tracer ensures that all quality requirements are adhered to.

Workpiece dimensions	ELC	C 250 DUO	Workpiece dimensions		ELC 200 H
O/D, max	mm	250	O/D, max	mm	200
Workpiece length, max	mm	600	Workpiece length, max	mm	1,000

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