



Your partner for
the companies

ACCURATE
Partnering Quality



BalTec

BENZINGER
PRÄZISIONSMASCHINEN



-FEHLMANN-



Henninger
we create precision



KELLENBERGER



SCHNEEBERGER



WEILER

ALFLETH

ENGINEERING



Machine Catalogue

Our potential for success

Customer focus

We offer competent consultation and provide solutions which fulfil customer requirements. We consider the customer to be a partner and work together to achieve the objective:

to increase capability and productivity

Know-how

Due to long-standing experience in our market sectors as well as good relationships with our local partners we are able to provide our customers with the optimal solution for production, research and development.

Quality

Quality is our highest maxim. We only sell high-value products of perfect quality.

Service

Through the proximity to customers afforded by our local branches we are able to provide a reliable, efficient and flexible **AFTER SALES SERVICE**.

We are a Swiss engineering and trading company with our own subsidiaries in several countries and represent the following associated companies:

Company	Place	Products	Exclusive	Project	Page
ACCURATE <small>Partnering Quality</small>	Accurate Sales and Services Pvt Ltd IN - Pune	Manufacturer of 3D coordinate measuring machines	-	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	4 - 7
	Affolter Technologies SA CH - Malleray	Manufacturer of gear hobbing and micro machining centres	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	8 - 9
BalTec	Baltec AG CH - Pfäffikon	Manufacturer of radial riveting machines and servo presses	AM, AZ, BG, BY, GE, RU, HU, RO, UA	-	10 - 11
BENZINGER <small>PRÄZISIONSMASCHINEN</small>	Carl Benzinger GmbH D - Pforzheim-Büchenbronn	Manufacturer of high-precision turning machines	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	12 - 17
	Bergamini s.r.l. I - 41037 Mirandola - Modena	Surface grinding machines	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	18 - 19
	DELTA s.r.l. I - 27010 Cura Carpignano (PV)	Surface grinding machines	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	20 - 21
-FEHLMANN-	Fehlmann AG CH - Seon	Manufacturer of milling / drilling machining centres and high-speed milling machines	AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	22 - 25
	Ghirighelli S.p.A. I - Luino	Manufacturer of centreless circular grinding machines	AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	AT	26 - 27
	L.Kellenberger & Co.AG CH-2500 Biel-Bienne 8	Manufacturer of high precision coordinate grinding machines	BY, RU, PL, UA	AM, AZ, BG, BA, GE, HR, MD, MK, ME, RO, RS, SI	28 - 29
	Hembrug Machine Tools NL - Haarlem	Manufacturer of hard turning machines	AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	30 - 33
	Henninger GmbH & Co KG D - Straubenhhardt	Manufacturer of centre grinding machines and high-speed spindles	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	34
	Huron Graffenstaden S.A. F - Illkirch Cedex	Manufacturer of vertical and gantry milling machines with high rigidity and maximum precision for high-speed machining	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	36 - 41
	I.M.S.A. s.r.l. I - Barzago	Manufacturer of deep drilling machines	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	42 - 45
	JYOTI CNC Automation PVT. LTD. IN - Rajkot	Manufacturer of vertical and horizontal machining centres as well as CNC and vertical turning machines	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	46 - 47
	L.Kellenberger & Co.AG CH - St. Gallen	Manufacturer of precision grinding machines and systems	BY, RU, PL, UA	AM, AZ, BG, BA, HR, MD, MK, ME, RO, RS, SI	48 - 49
	Klein Maschinenbau GmbH & Co KG D - Straubenhhardt	Manufacturer of centre hole grinding machines for plunge grinding and linear grinding	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	35
	PRECITRAME MACHINES SA CH - Tramelan	Manufacturer of rotary transfer machines and finishing machines	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	50 - 51
	Rihs Maschinenbau AG CH - Pieterlen	Manufacturer of 3 axes controlled universal grinding machines	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	52 - 53
	Robbi s.a.s. I - Veronella (Verona)	Manufacturer of external and internal universal grinders in manual, teach in and CNC versions	AT, AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	54 - 55
	J. Schneeberger Maschinen AG CH - Roggwil	Manufacturer of tool and cutter grinding machines for production and regrinding from 2 - 5 axes	AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	AT	56 - 61
	STÄHLI Lapp Technik AG CH - Pieterlen/Biel	Manufacturer of machines for flat honing, lapping and polishing	AM, AZ, BG, BA, BY, EE, GE, RU, HR, HU, LT, LV, MK, ME, PL, RO, RS, SI, SK, UA	SK	62 - 63
	Star Micronics AG CH - Olten	Manufacturer of CNC-Swiss type machines	AM, AZ, BG, BA, BY, CZ, RU, HR, MK, ME, RO, RS, SI, SK, UA	-	64 - 67
	L.Kellenberger & Co.AG CH - St. Gallen	Manufacturer of grinding machines	BY, RU, PL, UA	-	68 - 69
	L.Kellenberger & Co.AG CH - St. Gallen	Manufacturer of universal internal and external cylindrical grinding machines for ultimate productivity and flexibility	BY, RU, PL, UA	-	70 - 71
	WEILER Werkzeugmaschinen D - Emskirchen	Cycle-controlled and CNC precision lathes and automation engineering systems	AM, AZ, BG, BA, BY, CZ, EE, GE, RU, HR, HU, LT, LV, MD, MK, ME, PL, RO, RS, SI, SK, UA	-	72 - 75

Complete 3D Measuring Solutions

CMM - Bridge type

This innovative series with power packed features for 3D measurement of small parts as well as for training purpose. Designed for ease of operation and safety ensuring optimum performance.

Model		TUTOR	SPECTRA
Measuring range	X axis	mm	500
	Y axis	mm	500
	Z axis	mm	400
Mode of operation	CNC		
Max. Workpiece weight	kg	250	
Accuracy MPEE (as per ISO 10360 - 2 with TP200)	µm	3.5 +L /250	2.2 +L /350 1.9 +L /350*
Resolution	µm	0.5	
Guidance	Air bearings on all axes		
Linear Velocity	mm/s	300	400
Volumetric Velocity (3D)	mm/s	520	700
Measuring table (Material)	Granite		
Probing option	TP 20, TP200, SP 25M		
Probe heads	TP8, MH20, MH20i		

*Custom Built Range / *Enhanced accuracies in Spectra Models

Features

- Elevated Bridge construction for enhancing dynamic strength
- All granite guide ways ensuring uniform thermal stability
- Increased protection for guide ways and measuring scales
- Choice for various probing system
- Machine ready for plug & play



Features

- Proven design with all granite construction for stable performance. Wrap around air bearing construction for high acceleration and stability
- Zero hysteresis belt drive for smooth repeatable movement
- X & Z axis guide ways made hollow reducing mass to achieve high acceleration
- In built Y axis for better homogeneity of material
- High resolution reader head for better accuracy

SPECTRA



Large measuring range bridge type CMM. Using special techniques for machining and grinding of granite guides, we are able to achieve accelerations similar to lighter construction machines with further benefit of naturally stabilised material.

CORDIMEASUR



Model		CORDIMEASUR	MEGA	MEGA Plus
Measuring range	X axis	mm	1000	1200
	Y axis	mm	1500 - 2000	1500 - 2000
	Z axis	mm	800	1000
Mode of operation	Motorised / CNC			
Clearance under bridge		750	950	1600
Max. weight	kg	800	1000	4000
Accuracy MPEE (as per ISO 10360 - 2 with TP200)	µm	2.5 +L /350	2.9 +L /350	4 +L /350
	µm	2.5 +L /350*	2.9 +L /350*	
Resolution	µm	0.5 / 0.1		
Guidance	Air bearings on all axes			
Linear Velocity	mm/s	400	350	300
Volumetric Velocity (3D)	mm/s	692	600	520
Measuring table (Material)	Granite			
Probing option	TP 20, TP200, SP 25M, Revo			
Probe heads	MH8, MIH, PH10, PH20, SP80			

*Custom Built Range / *Enhanced accuracies in Spectra Models

Designed for inline measuring application on modern shop floor. All aluminium construction with active temperature compensation. Unique design for easy movement of parts from automated conveyors.



Features

- Elevated moving bridge gives open access for inline applications
- Full protection for guide ways and measuring scales
- High acceleration and speed
- Free floating scales suitable for shop floor application
- Efficient foot print
- FEA for structure and CAA for enhanced performance

ARIA

Model		ARIA
Measuring range	X axis	mm
	Y axis	mm
	Z axis	mm
Mode of operation	CNC	
Max. Workpiece weight	kg	200
Accuracy MPEE	µm	3 + L /250
Resolution	µm	0.1
Guidance	Air bearings on all axes	
Linear Velocity	mm/s	300
Volumetric Velocity (3D)	mm/s	520
Measuring table (Material)	Granite	
Probing option	TP 20, TP200	
Probe heads	TP8, MH20, MH20i, RTP20, MH8, MIH, PH10, PH20, SP80	

Complete 3D Measuring Solutions

CMM - Gantry type

Model		ACCORD
Measuring range	X axis	mm 2000 - 2500
	Y axis	mm 2000 - 6000
	Z axis	mm 1500 - 2000
Mode of operation		CNC
Max. Workpiece weight	kg	250
Accuracy MPEE (as per ISO 10360 - 2)	µm	5 +L / 200
Resolution	µm	0.1
Guidance		Air bearings
Linear Velocity	mm/s	250
Volumetric Velocity (3D)	mm/s	430

Precision inspection of large components.
A machine is designed and developed with advanced patented technology. Stable mechanical structure offered with wide range of probing options including 5-axis probing technology.

ACCORD



Features

- For inspection of large components with high accuracy performance
- Open access structure enable easy inspection of large scale parts
- High precision air bearings in all axes
- Zero hysteresis drive in all axes
- Can be interfaced with rail system for loading and unloading of large components

ARMMAX



Model		ACCORD
Measuring range	X axis	mm 600 - 1200
	Y axis	mm 400
	Z axis	mm 500
Mode of operation		CNC
Accuracy MPEE (as per ISO 10360 - 2)	µm	5 +L / 200 < 9
Resolution	µm	0.5
Guidance		Linear Guide ways
Compatible with Renishaw probing systems		

Features

- Fit to operate in shop floor environment
- Available in single or double machine configuration
- High precision linear guide ways in all axis
- New generation composite material in Y axis reducing drop of arm
- Advance spring balance system for Z axis counter balancing



SEAGULL

Model		SEAGULL
Measuring range	X axis	mm 2000 - 10000
	Y axis	mm 1200 - 1600
	Z axis	mm 1600 - 2500
Mode of operation		Motorised/CNC
Accuracy MPEE* (as per ISO 10360 - 2)	µm	25 L + / 50 < 75 40 L + / 50 < 100
Resolution	µm	0.5
Guidance		Linear Guide ways
3D Velocity	mm/s	700
3D Acceleration	mm/s ²	1200

*Custom Built Range

*Enhanced accuracies with high accuracy probing options

ACCUFLEX



Features

- Six axis completely balanced equipment used with single hand
- Preset for interchangeable probes
- Certification as per ISO 10360-2
- Laser probe compatibility
- CAD based software
- Accuracy at 2 sigma

Model		ACCUFLEX Plus				ACCUFLEX	
		2500 CNC	3200	4000	2500	3200	4000
Measuring range	mm	2500	3200	4000	2500	3200	4000
Volumetric accuracy	mm	0.032	0.045	0.058	0.048	0.060	0.080

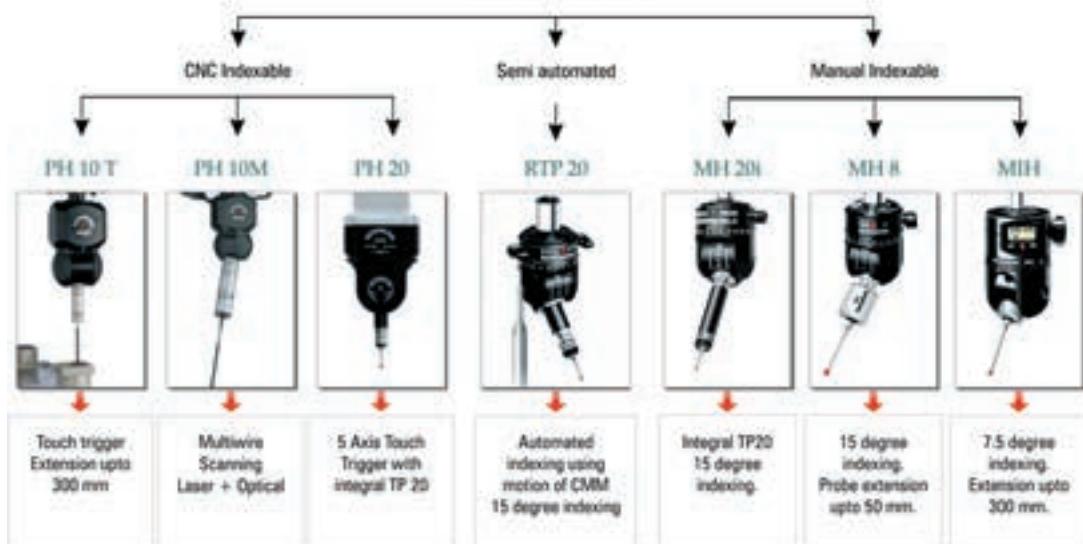
Large arm available up to 9000 mm

Complete 3D Measuring Solutions

Probing system

Our CMMs support full range of advanced Renishaw probe Systems

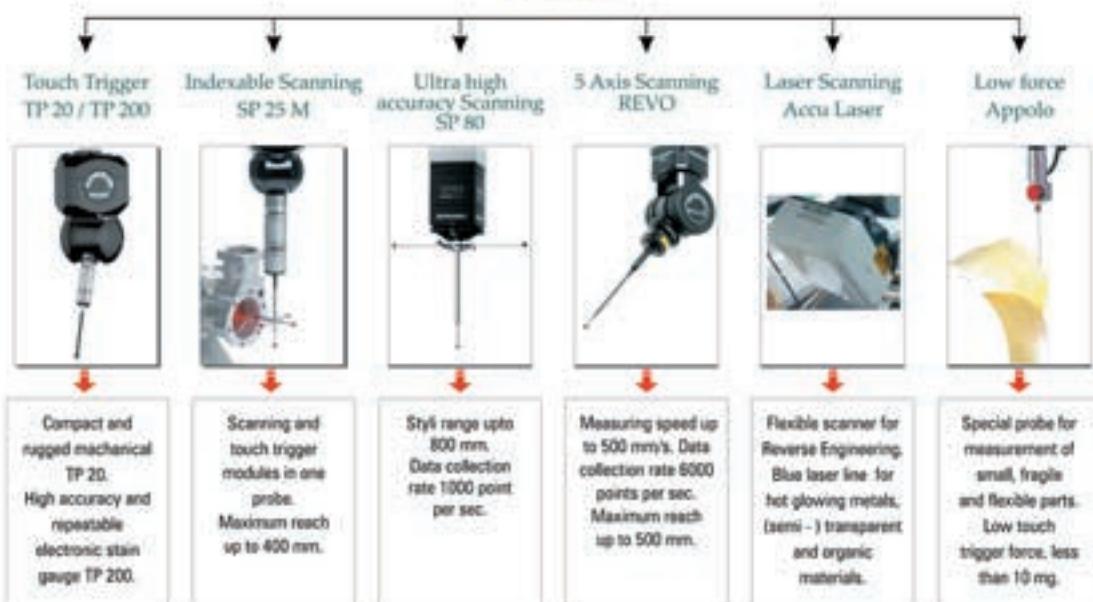
PROBE HEADS



STYLUS CHANGE RACKS



PROBES



Full range of stylus is available from 0.3 mm rubyball upto 18 mm ceramic hemisphere

Complete 3D Measuring Solutions



Advantage Accurate CMM

Accurate CMMs are powered with features like,

- In-house infrastructure for CMM Design, Manufacturing, Software Development and Application Support to provide homogeneous solutions.
- Integrated design features like thermally stable materials, Vibration dampers and online temperature compensation to overcome the variation in temperature, dust level, vibrations, light intensity, etc. in shop floor environment.
- The special granite construction ensures same coefficients of expansion for different machine parts.
- Reduced thermal sensitivity by fixing the gold plated metallic scales from Renishaw on the granite itself.
- CNC controllers with I++ protocol to enable customers to tailor the machine with different software applications.
- Provides complete library of probing options from global leaders to include Touch Trigger, Non contact and Continuous scanning probes along with Laser scanners and probe with very low measuring force (< 10 gm).

Team Accurate

Accurate has strong team of Application support Engineers, Service Engineers and Training experts in customer support department, providing prompt and economical solutions to every customer. Our team of 45 qualified Engineers assists their customers whenever there is need for any change in measuring application. We have network of service centers spread across in major metros to ensure prompt response by our engineers to attend customer calls on short notice. The team is experienced and has multifunctional knowledge to provide timely solutions.

Applications

- Power train
- Sheet metal & BIW
- Engineering
- Rail Bogies
- Aerospace
- Dies & Moulds
- Gears

CMM Software

CMM Software

Software for reliable measurement in three dimensions. The software is simple to use and can be easily upgraded. The software packages are available best for your environment. The software options for Geometrical Measurement, CAD Comparison and Reverse Engineering Applications.

An advanced measuring system is completely integrated with a powerful CAD engine.

- Import of native CAD formats. Group management.
- Alignment on free forms.
- Measuring surface edges in real time.
- Measuring and creating profiles.
- Graphical outputs
- Implementation of the native DMIS language
- Total solution for both prismatic and free form measurement
- Powerful solution for single and dual arm CMM
- Off line graphical programming tools with simulation on the program
- Complete GD & T, geometric dimension and tolerances, as per ASME Y14.5 M 1994
- Extracting geometrical elements from CAD.
- Optimisation of an existing reference.
- Graphical outputs
- Geometrical engine supporting neutral IGES format or native CAD interfaces.
- Export and import of CAD files in UNIGRAPHICS, VDA, CATIA, STEP etc.
- Integrated with articulated arms
- CNC controller and measuring instruments
- I⁺⁺ compliant & PTB Certified algorithm
- Complete compensation of the CMM errors, Textual, graphical and statistical output representation.

Prismatic Part Measurement



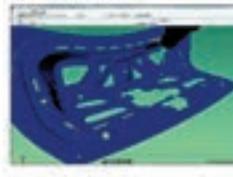
Air foil Measurement



CAD Comparison



Sheet Metal Measurement



Gear hobbing and micro machining centres

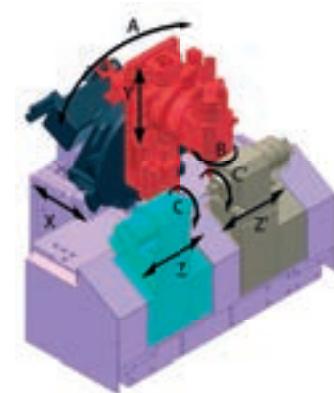
GEAR AF90 - Gear hobbing machine



CNC gear hobbing machine with highest productivity and precision thanks to unique combination of Affolter Leste CNC control and Affolter motor spindle

Technical data	AF90
Workpiece data	
Max. workpiece diameter	mm 30
Max. machining length	mm 40
Max. rpm of headstock and tailstock	min ⁻¹ 5 000
Smallest possible module	mm 0.02
Maximum module (dependent upon material and number of cuts)	mm 0.5 - 0.8
Tool data	
Max. diameter of hob cutter	mm 24
Max. width of hob cutter	mm 20
Angle of inclination of cutter (manual)	+/- 10°
Max. spindle rpm	min ⁻¹ 16 000

GEAR AF100plus Gear hobbing center



The AF100plus combines quality, productivity and flexibility:
CNC hobbing for wheels and shafts; straight, helical and crowned cuts
as well as hobbing of bevel gear wheels.

Technical data	AF100plus
Workpiece data	
Max. workpiece diameter	mm 36
Max. machining length	mm 50
Max. rpm of headstock and tailstock	min ⁻¹ 5 000
Smallest possible module	mm 0.02
Maximum module (dependent upon material and number of cuts)	mm 0.5 - 1.0
Tool data	
Max. diameter of hob cutter for gear hobbing	mm 24
Max. width of hob cutter	mm 20
Angle of inclination of cutter (B axis NC controlled)	+30° / -30°
Max. spindle rpm	min ⁻¹ 16 000

Gear hobbing and micro machining centres

GEAR AF101 - automated gear hobbing center



Gear hobbing center with robot automation and various feed systems such as palletizing system, feeder bowl, conveyor belt and image recognition etc.

Technical data	AF101
Workpiece data	
Max. workpiece diameter	mm 36
Max. machining length	mm 50
Max. rpm of headstock and tailstock	min ⁻¹ 5 000
Smallest possible module	mm 0.02
Maximum module (dependent upon material and number of cuts)	mm 0.5 - 0.8
Tool data	
Max. diameter of hob cutter for gear hobbing	mm 24
Max. width of hob cutter	mm 20
Angle of inclination of cutter (B axis NC controlled)	+30° / -30°
Max. spindle rpm	min ⁻¹ 16 000

GEAR AF110 - powerful gear hobbing center



High precision gear hobbing center with high stability and high spindle performance with or without automation

Technical data	AF110
Workpiece data	
Max. workpiece diameter	mm 60
Max. machining length	mm 90
Max. rpm of headstock and tailstock	min ⁻¹ 2 000
Smallest possible module	mm 0.02
Maximum module (dependent upon material and number of cuts)	mm 0.5 - 1.25
Tool data	
Max. diameter of hob cutter	mm 38
Max. width of hob cutter	mm 50 (2 x 25)
Angle of inclination of cutter (automatic)	+30° / -45°
Max. spindle rpm	min ⁻¹ 12 000

Radial riveting and cold forming for joining

BalTec radial riveting and forming technology is considered to be the most modern riveting and forming principle worldwide. Where high-quality joints are in demand there is currently no comparable process. Even joints which hitherto could only be accomplished with non-rivet technologies are now possible using BalTec radial riveting and forming technology.

A selection of applications:

Home



Window hinges



Moving hinges



Kitchen furniture hardware



Electric connectors

Automobile industry



Steering forks



Hinge for luggage



Seatbelt buckle



Seat adjuster

Radial riveting machines:

An autonomous workstation



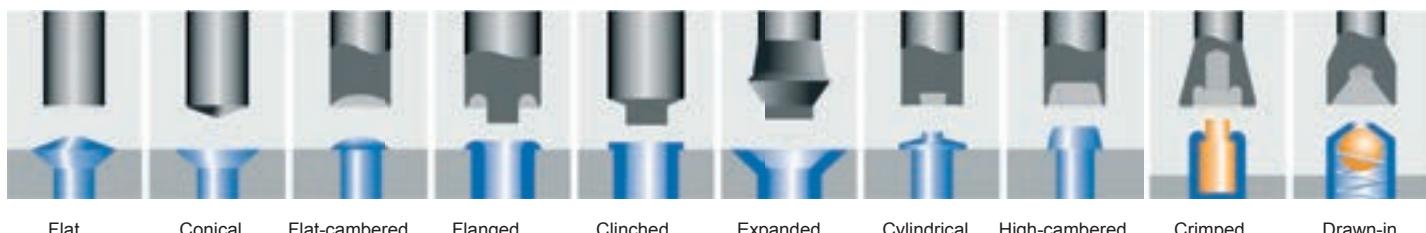
Riveting machine
RN 281 with HPP-25



Riveting units - various sizes

Riveting shank max. Ø 4 mm to 30 mm
Max. riveting force 1.5 kN to 100 kN

The most important tool profiles

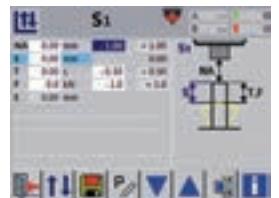
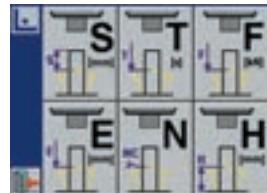


Radial riveting and cold forming for joining

Control systems with/without process monitoring

YOUR decisive competitive edge:

HPP25 Process control with integrated process monitoring



*Proof of quality through continuous analysis and documentation of the riveting process.

- 6 different control parameters
- Windows diagnostic software
- USB and Ethernet interfaces

Control systems



HPP25



RC30



HPP25 - with process monitoring

control variable selectable: Time, force, rivet head height, spindle distance, forming distance and external signal

RC30 - without process monitoring

variable: Time

More riveting machine models



CNC coordinate riveting machine with round indexing table as a complete and autonomous workstation



CNC coordinate riveting machine with transfer system for integrating into a transfer line



RNS pedestal model



RND double riveting



RNE with side motor

High-precision - lathes

GOFuture



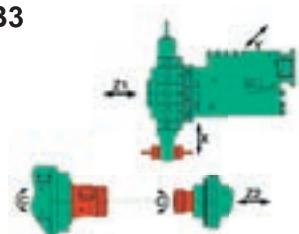
Technical data		GOFuture	B1	B2	B3	B4	B6	BX
X-axis	mm	370 (180 / B2, B3, B4, B6)	●	○(●)	(●)	(●)	(●)	●
X2-axis	mm	195	-	-	-	-	●	-
Z1-axis	mm	260 (294.5 BX)	●	●	●	●	●	(●)
Z2-axis	mm	290	-	-	●	●	●	-
Y-axis	mm	80(-42.5/48 BX)	○	○	○	○	○	(●)
Main spindle		Water-cooled motor spindle	●	●	●	●	●	●
Bar capacity	mm	26 / 32 / 42	●/○/○	●/○/○	●/○/○	●/○/○	●/○/○	●/○/○
Spindle speed	rpm	6000 / 8000	●/○	●/○	●/○	●/○	●/○	●/○
Driving power (S1)	kW	12 / 15.5	●/○	●/○	●/○	●/○	●/○	●/○
Chuck size	mm	to 160	●	●	●	●	●	●
C-axis resolution	°	0.01 / 0.001	○/○	○/○	○/○	○/○	○/○	○/○
Opposed spindle		Water-cooled motor spindle	-	●	-	●	-	-
Spindle bore	mm	26	-	-	●	-	●	-
Spindle speed	rpm	to 8000	-	-	●	-	●	-
Driving power (S1)	kW	12	-	-	●	-	●	-
Chuck size	mm	to 130	-	-	●	-	●	-
C-axis resolution	°	0.01 / 0.001	-	-	○	-	○	-
Tool carrier		Linear system BENZINGER	●	○	-	-	●	○
Turret		Star turret VDI 25 DIN 69880	-	●	●	●	●	-
Number of tool places		12 / 16	-	●/○	●/○	●/○	(●) / (○)	-
Single motor drive	rpm	6 000	-	○	●	●	●	-
Max. driving power	kW / Nm	6 / 12.5	-	○	●	●	●	-
Tailstock								
Quill stroke/travel	mm	110 / 270	-	-	-	-	●	-
Control		Siemens 840D sl / Fanuc 31i-B	●/●	●/●	●/●	●/●	●/●	●/●

● Standard ○ Option

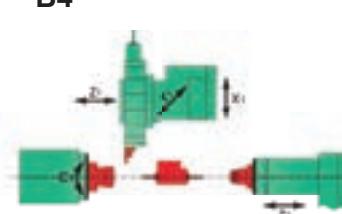
Precision lathe for complete machining, 1 or 2 spindle

The **GOFuture** combines maximum precision with a compact footprint. The modular design plus numerous additional options such as rotary tables, milling, drilling and grinding units as well as automatic loading and unloading systems mean that customer-specific adaptations can be made even better and more efficiently than previously.

B3



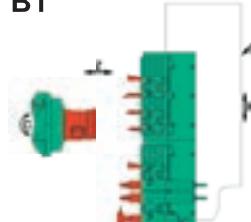
B4



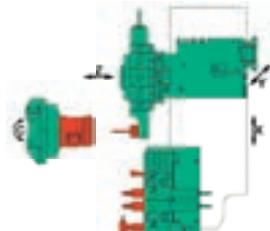
Variant B4 with manual tailstock, optionally on NC-axis

Variant B3 with opposed spindle (traversable in Z-direction) for complete machining in sequence, star turret VDI 25 on compound rest with 12 or optionally 16 tool places and single place drive, optionally with Y-axis

B1



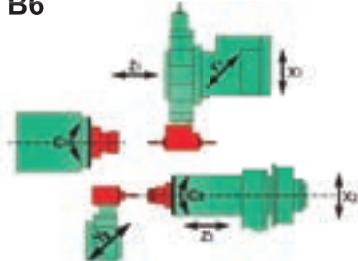
B2



Variant B1 with linear tool setup for or the shortest cycle times, optionally with Y-axis

Variant B2 with VDI 25 turret with 12 or optionally 16 stations, constructed on the X-axis slide, optionally with single place drive, optionally with Y-axis

B6



2 work spindles with C-axis, 2 VDI 25 turrets with 12 or 16 tool places, each with a single place drive, Y-axis for both spindles, turret 1 and opposing spindle on separate compound rest, stationary turret 2, simultaneous complete machining



High-precision - lathes

CNC-precision turning-milling centre with 3 expansion stages

For simultaneous complete machining from bar up to maximum Ø 42 mm or for chuck components, optionally with Y-axis

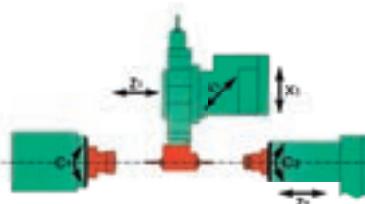
TNI



Technical data		TNI	B2	B6	B10
X1-axis	mm	180	●	●	●
X2-axis	mm	195	-	●	●
X3-axis	mm	170	-	-	●
Z1-axis	mm	340	●	●	●
Z2-axis	mm	440	●	●	●
Z3-axis	mm	180	-	-	●
Y1-axis	mm	+40 / -40	○	○	○
Y2-axis	mm	+40 / -25	-	-	○
Main spindle					
Capacity	mm	32 / 42	●/○	●/○	●/○
Spindle speed	rpm	6 000 / 8 000	●/○	●/○	●/○
Driving power (S1)	kW	15.5	●/○	●/○	●/○
Chuck size	mm	to 160	●	●	●
C-axis	°	0.01 / 0.001	●/○	●/○	●/○
Tool systems					
Star turret		VDI 25 DIN 69880	●	●	●
Number of tool places		12 / 16	●/○	●/○	●/○
Speed, single drive	rpm	6 000	●	●	●
Opposed spindle					
Bar capacity	mm	26	●	●	●
Spindle speed	rpm	6,000 / 8,000	●/○	●/○	●/○
Driving power (S1)	kW	12	●	●	●
Chuck size	mm	to 130	●	●	●
C-axis resolution	°	0.01 / 0.001	●/○	●/○	●/○
Control					
Siemens 840Dsl, Fanuc 31 i-B					

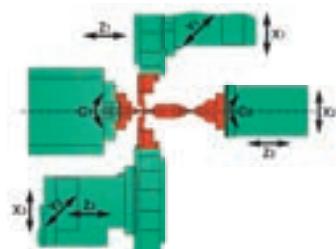
● Standard ○ Option

TNI-B2

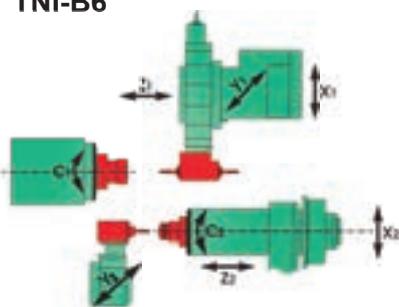


2 work spindles with C-axis,
1 turret VDI 25 on compound rest with
12 or 16 tool places, each with single
place drive, Y-axis for both spindles,
complete machining in sequence

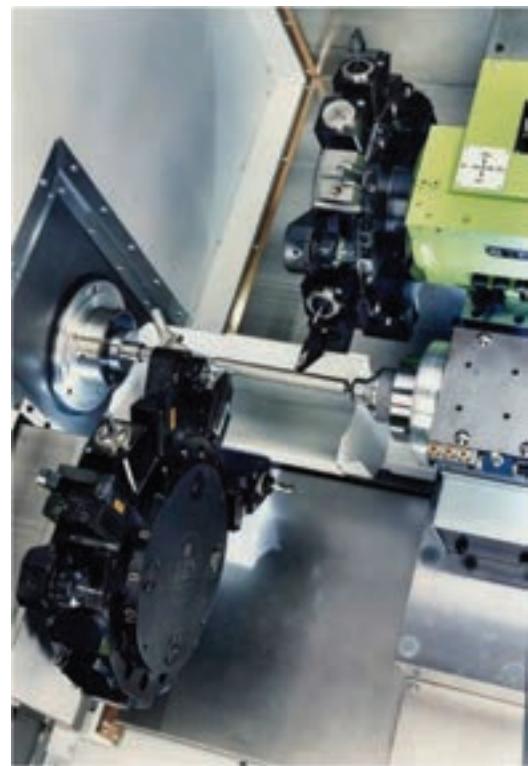
TNI-B10



TNI-B6



2 work spindles with C-axis,
2 VDI 25 turrets each with 16 tool places, each with
a single place drive, Y-axis for both spindles, turret
1 and turret 2 on separate compound rest,
Opposed spindle/tailstock with separate Z-axis,
simultaneous machining with turret 1 and turret 2 on
main spindle or opposed spindle



2 work spindles with C-axis,
2 VDI 25 turrets each with 16 tool places, each with
a single place drive, Y-axis for both spindles, turret
1 and turret 2 on separate compound rest,
Opposed spindle/tailstock with separate Z-axis,
simultaneous machining with turret 1 and turret 2 on
main spindle or opposed spindle

High-precision - lathes

5-axis precision turning and milling centre

With 2 machining spindles for 5-axis and simultaneous 3-axis milling or turning - for complete machining of complex workpieces with the lowest possible set-up times

Take5

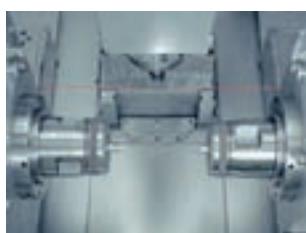
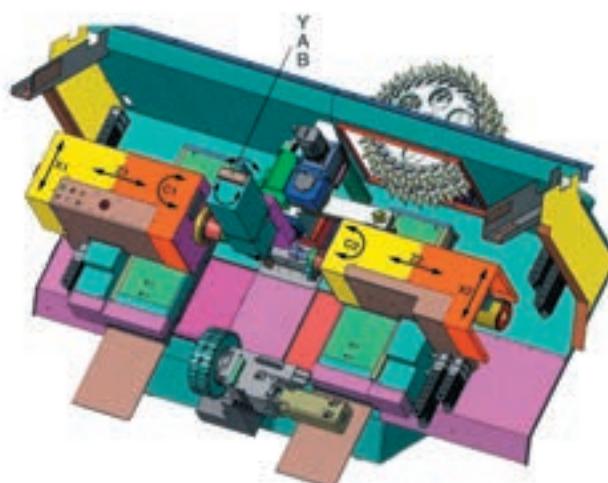


Star turret VDI25 with 16 tool places, each with a single place drive

The respective working spaces of the main spindle and opposed spindle are spatially serially separated from each other in the X-direction so that a collision during machining is not possible.

Technical data		Take5	
Travel X-axis	mm	370	●
Travel Z-axis	mm	190	●
Travel Y1-axis	mm	-40 / +85	●
Travel Y2-axis	mm	-25 / +25	●
Main spindle		Water-cooled motor spindle, indexable for milling operation	●
Bar capacity	mm	26, 32, 42	○/○/○
Spindle speed	rpm	6 000 / 8 000	●/○
Driving power (S1)	kW	15.5	●
Chuck size	mm	to 130	●
C-axis resolution	°	0.01 / 0.001	●/○
Opposed spindle		Water-cooled motor spindle, indexable for milling operation	●
Bar capacity	mm	26, 32, 42	○/○/○
Spindle speed	rpm	6 000 / 8 000	●/○
Driving power (S1)	kW	12	●
Chuck size	mm	to 130	●
C-axis resolution	°	0.01 / 0.001	●
Turning turret		VDI 25 DIN 69880	●
Number of tool places		16	●
Single drive 16x	rpm	6 000	●
Max. driving power	kW/Nm	6 / 12.5	●
Milling spindle		Water-cooled milling spindle, indexable for turning	●
Maximum spindle-speed	rpm	30 000	●
Driving power (S1)	kW	10	●
Tool holder		HSK-T40	●
Tool changer			
Magazine places / expansion		52 internal /	●/○
Tool measurement		Laser ¹	○
Control		Siemens 840Dsl	●

● Standard ○ Option



High-precision - lathes

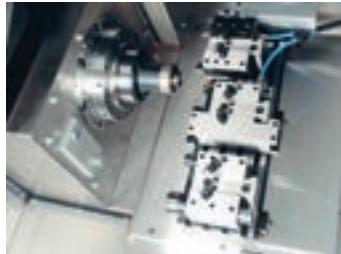
Technical data		mpFuture	B1	B5
X-axis	mm	470	●	-
X1/X2-axis	mm	Each 200 (independent)	-	●
X1/X2-axis	mm	Each 320 (coupled movement)	-	●
Z1-axis	mm	210	●	●
Z2-axis	mm	210	-	●
Main spindle	Water-cooled motor spindle			
Bar capacity	mm	26, 32, 42	●/○/○	●/○/○
Spindle speed	rpm	6 000 / 8 000	●/○	●/○
Driving power (S1)	kW	12	●/○	●/○
Chuck size	mm	to 160	●	●
C-axis resolution	°	0.01 / 0.001	●/○	●/○
Tool carrier	Linear system BENZINGER		○	○
	Third-party machinery		○	○
Turret	Disc-type turret VDI 25 DIN 69880		●	●
Number of tool places		12 / 12 powered	●/○	●/○
Single motor drive	rpm	6 000	○	○
Max. driving power	kW/Nm	6 / 12.5	○	○
Control		Siemens 840D		●

● Standard ○ Option

High-precision machine, 1 or 2 spindle in conjunction with various automation techniques!

Maximum precision when turning by separation of X-axis and Z-axis - paired with minimum cycle times!

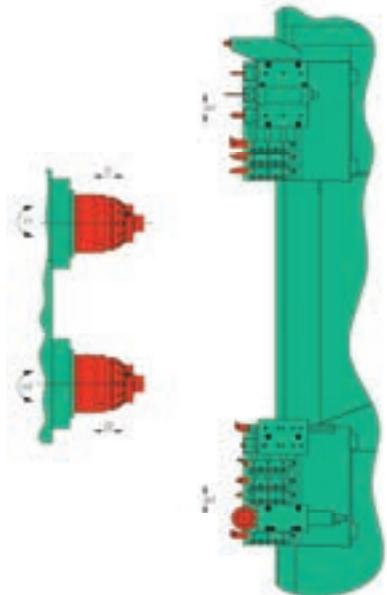
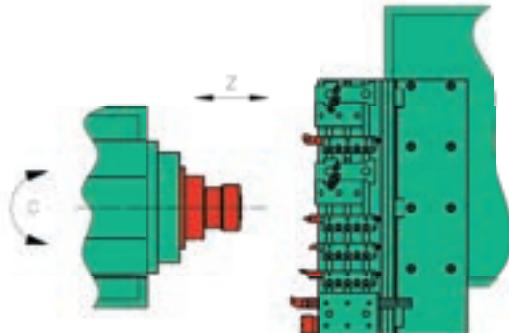
mpFuture



Expansion stage B1:
Optionally with NC-swivel loader for shortest possible workpiece changeover times, linear tool setup, optionally with grinding spindle



Expansion stage B5:
2 spindle with swivel loader for shortest possible workpiece changeover times, Linear tool setup



New machining options by combination of hard turning and grinding Plus outstanding surface quality by polish turning!

High-precision - lathes

DOLittle



Technical data	DOLittle		B1	B2	B3	B5
X-axis	mm	320	●	●	●	-
X1/X2-axis	mm	140	-	-	-	●
Z1-axis	mm	145 (opt.185) (185 / B5)	●	●	●	(●)
Z2-axis	mm	90 (185 / B5)	-	-	●	(●)
Y-axis	mm	80	●	●	●	○
Main spindle	Water-cooled motor spindle		●	●	●	●●
Bar capacity	mm	16 / 26	●/●	●/●	●/-	●●/○○
Spindle speed	rpm	15 000 / 6 000 (8 000)	●/●/(○)	●/●/(○)	●/-	●●/○○(○○)
Driving power (S1)	kW	13 / 12	●/●	●/●	●/-	●●/○○
Chuck size	mm	to 65	●	●	●	●●
C-axis resolution	°	0.001	○	○	○	○○
Opposed spindle	Water-cooled motor spindle		-	-	●	-
Bar capacity	mm	16	-	-	●	-
Spindle speed	rpm	15 000	-	-	●	-
Driving power (S1)	kW	13	-	-	●	-
Chuck size	mm	to 65	-	-	●	-
C-axis resolution	°	0.001	-	-	○	-
Tool carrier	Linear system BENZINGER		●	○	●	●
Turret	Disc-type turret VDI20/VDI16		-	(●)/(○)	-	-
Manufacturer		Sauter Company	-	●	-	-
Tool places / powered		(12/ 6) / (12/ 6)	-	(●)/(○)/(●)/(○)	-	-
Milling installation						
Number of tools		max. 6	○	-	○	-
Spindle speed	rpm	2x6 000 / 4x18 000	○	-	○	-
		Swivelling up to fixed stop	○	-	○	-
		Swivelling via NC axis	○	-	○	-
Control	Siemens 828D / 840 Dsl		●/○	●/○	-/●	-/●

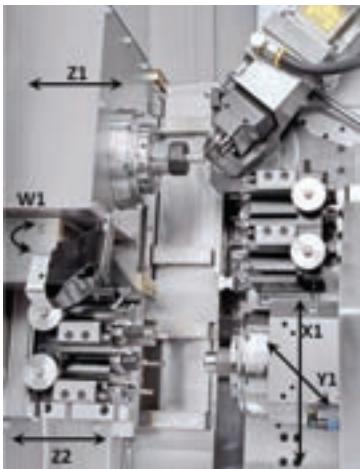
● Standard ○ Option

DOLittle B1

Maximum precision for small turned parts in space-saving and compact format; optionally with opposed spindle, Y-axis as standard



DOLittle B5



DOLittle B2

DOLittle B3

Automation

Automation solutions

- Benzinger has a lot of experience with additional automation solutions for different systems so that our customers can configure their production technology even more efficiently and effectively.

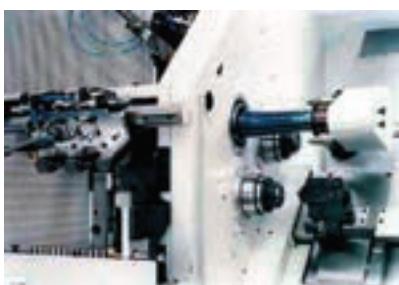
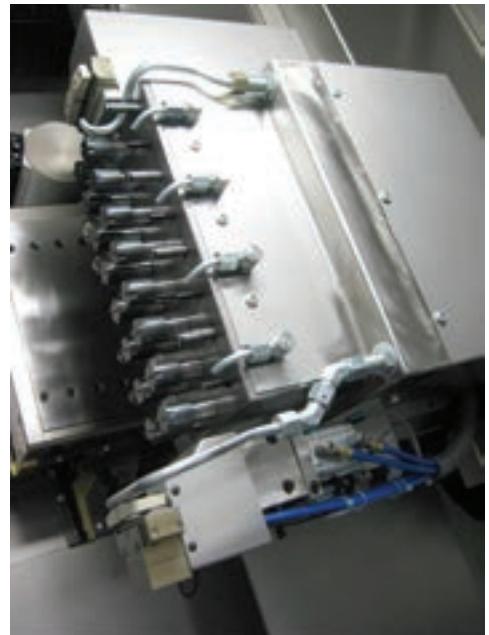


Gantry solution

- Compact design integrated into the machine enclosure
- Complete system controlled via a control (Sinumerik 840D), no external interfaces used
- Gantry space flexibly positionable in 3D
- High positioning accuracy
- Other operations, e.g. washing, cleaning, measuring and fitting can be performed without affecting the production time
- Proven automation concept already used multiple times

Integrated loading

- Shortest possible workpiece changeover times from about 3 seconds
- Individual design to match customer parts
- Lots of standard solutions already available
- Perfect integration into the machine concept



Swivel loader special solution

- Quick automation for single and double spindle machines
- CNC controlled



Robotic solution

- Fully automated production solution
- Also suitable for a wide range of workpieces and special workpiece types
- Shortest possible workpiece changeover times and short non-productive times
- Complete production processes possible including part handling, clean-up, measuring and packaging of parts
- High precision and repeatability results in optimum parts quality
- Enables 24h production resulting directly in increased production and ensuring deadlines are always met

Surface grinding machines

BERMI 500 Matic



Technical data		Bermi 500 Matic
Usable table surface	mm	500 x 180
Maximum longitudinal movement in manual and automatic mode	mm	505
Lateral movement in manual and automatic mode		200
Vertical path between spindle axis and work surface	mm	350
Speed of automatic longitudinal table	m/min	0 – 20
Cross feed scale for impulse operation	mm	0 – 15
Cross feed scale for continuous operation	m/min	0 – 5
Jog wheel for cross feed 1 scale line	mm	0.02
Jog heel with fine adjustment 1 scale line	mm	0.002
Vertical jog wheel with graduation 1 scale line	mm	0.002
Grinding wheel dimensions	mm	220x20 ÷ 40x50
Power grinding wheel motor with 3000 revolutions (with inverter optional from 1500 to 4800 revolutions)	kW	2.2
Motor power hydraulic system with 1400 revolutions	kW	1.1
Net weight of the machine	mm	1150

BERMI 500 C



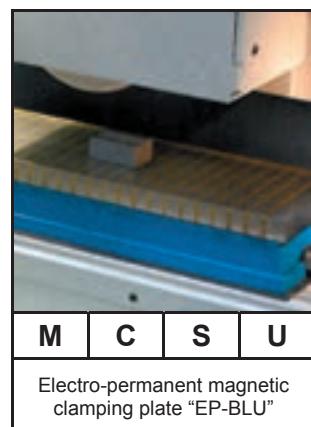
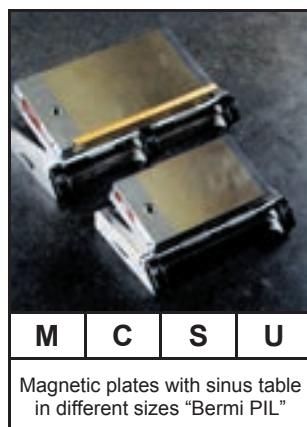
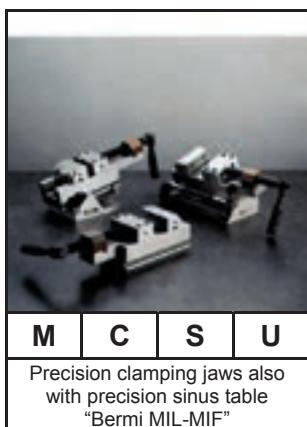
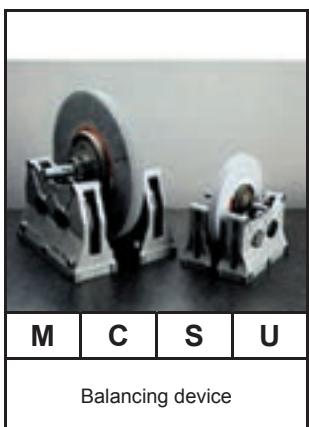
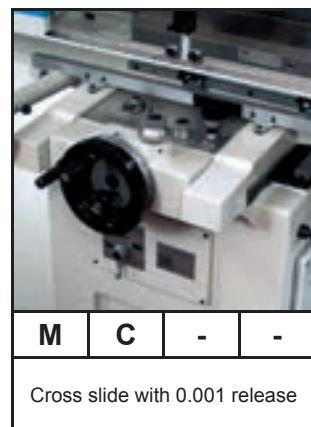
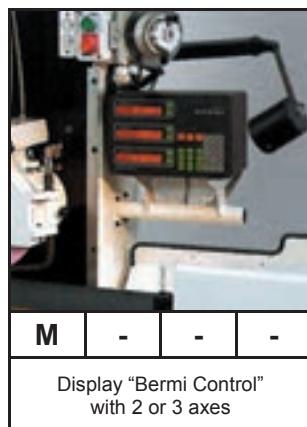
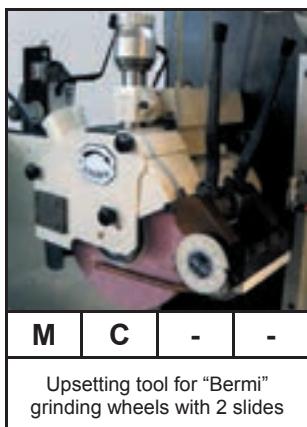
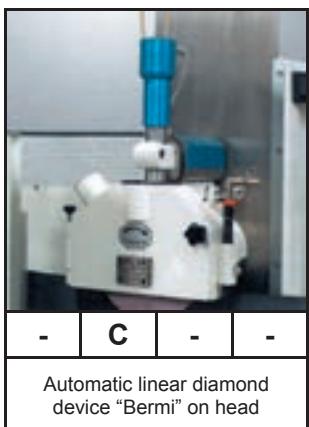
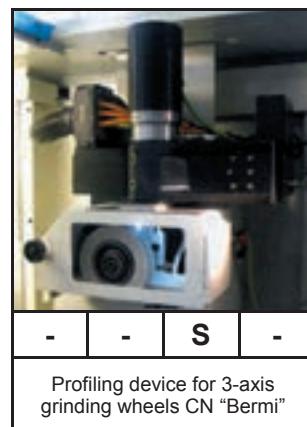
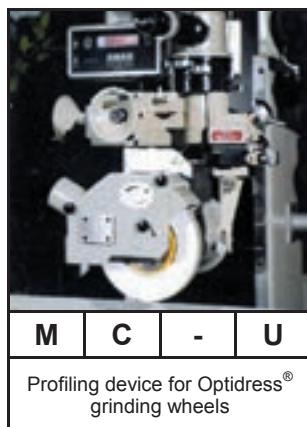
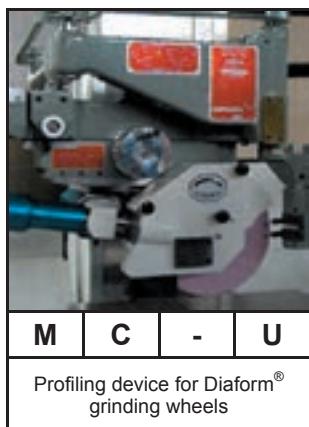
Technical data		Bermi 500 C
Usable table surface	mm	500 x 180
Maximum longitudinal movement in manual and automatic mode	mm	505
Lateral movement in manual and automatic mode		200
Vertical path between spindle axis and work surface	mm	400
Speed of automatic longitudinal table	m/min	0 – 25
Cross feed scale for impulse operation	mm	0 – 15
Cross feed scale for continuous operation	m/min	0 – 5
Jog wheel for cross feed 1 scale line	mm	0.02
Jog heel with fine adjustment 1 scale line	mm	0.002
Electronic jog wheel for manual movement of the vertical axis with selectable value	mm	0.001 – 0.010
Grinding wheel dimensions	mm	220x20 ÷ 40x50
Power grinding wheel motor with 3000 revolutions (with inverter optional from 1500 to 4800 revolutions)	kW	2.2
Motor power hydraulic system with 1400 revolutions	kW	1.1
Net weight of the machine	mm	1250

BERMI 505 S



Technical data		Bermi 505 S
Usable table surface	mm	500 x 180
Maximum longitudinal movement in manual and automatic mode	mm	505
Lateral movement in manual and automatic mode		200
Vertical path between spindle axis and work surface	mm	400
Speed of automatic longitudinal table	m/min	0 – 25
Cross feed scale for impulse operation	mm	0 – 15
Cross feed scale for continuous operation	m/min	0 – 5
Electronic jog wheel for manual movement of the vertical axis with selectable value	mm	0.001 – 0.100
Grinding wheel dimensions	mm	220x20 ÷ 40x50
Grinding wheel dimensions (option)	mm	250x20 ÷ 50x76
Power grinding wheel motor with 3000 revolutions (with inverter optional from 1500 to 4800 revolutions)	kW	3
Motor power hydraulic system with 1400 revolutions	kW	1.5
Net weight of the machine	mm	1600

Accessories



M
Bermi 500 Matic

C
Bermi 500 C

S
Bermi 505 S

U
Generally

Supplied accessories	Matic	C	S
Hydraulic diamond device grinding wheel holding head with 1 diamond	●	○	-
Fixed table – diamond device	●	●	●
Cooling unit with container	●	○	○
Blocking of the cross slides	●	○	-
3 pcs. disc flange and 1 pc. universal disc	●	●	●

Supplied accessories	Matic	C	S
Balancing bolt	●	●	●
Halogen lighting machine 24 V	●	●	●
Disc remover and tool wrench	●	●	●
Levelling plates	●	●	●
Spare oil, air filter and spare halogen lamp	●	●	●



DELTA s.r.l.
Strada Paiola 5/7
I - 27010 Cura Carpignano (PV)

Surface grinding machines

Swing frame grinding machines with fixed table, rotary table and oscillating table



Technical data		LB 300	LF 350	LC 400	LC 500	LP 500/200
Axis - distance between grinding wheel and column	mm	300		315		
Max. distance between table level and grinding level	mm	280	280	-	-	-
Max. distance between magnetic clamping plate and grinding wheel	mm	-	-	205	205	200
Max. grinding area	mm	140 x 330	155 x 360	Ø 400	Ø 500	500 x 200
Infeed per revolution of the jog wheel	mm			2		
Fine feed through the micrometer	mm			0,01		
Face wheel - dimensions	mm	178 x 78 x 78		200 x 80 x 78		
Segments - dimensions	mm	50 x 16 x 90		50 x 20 x 90		
Grinding wheel speed	min ⁻¹			2 840		
Table vibration	°	-	-	-	-	90
Rotating table speed	min ⁻¹	-	-	20-40 (2-30)	15-30(2-30)	-
Spindle motor power	kW	2,2	3	3	3	3
Table vibration motor power	kW	-	-	0,33 - 0,48	0,15 - 0,48	-
Machine weight	kg					
Machine - dimensions	mm	850x850x1650		1050 x 950 x 1750		

ROTAx with rotary table



ROTARY TABLE

- Rotax 7 with one pair of preinstalled high precision ball bearings with a contact angle of 25°
- Rotax 9 and 12 with a hydrostatic bearing

Driven by a torque servo motor. Can be equipped with a permanent electromagnetic clamping plate

Technical data		Rotax 7	Rotax 9	Rotax 12
Max. grinding diameter	mm	700	900	1 200
Rotary table - diameter	mm	400	700	1 100
Max. grinding height with new grinding wheel	mm	330 (530)*	530	600
Rotary table speed	min ⁻¹	0 - 180	0 - 180	0 - 70
Permissible table load	kg	500	700	1 500
Traversing path - lateral axis	mm	450	550	900
Max. distance between table and spindle axis	mm	530 (730)*	730	850
Max. advance - vertical axis	m/min		1,5	
Smallest positioning	mm		0,001	
Spindle motor - power	kW	7,5 (11)*		18,5 (30)*
Grinding wheel speed	min ⁻¹		1450 (1 000 - 2 000)*	
Grinding wheel dimensions	mm	400 x 50 x 127 (400 x 100 x 127)*		450 x 100 x 127 (500 x 100 x 127)*
Machine weight	kg	3 500	4 200	9 000



DELTA s.r.l.
Strada Paiola 5/7
I - 27010 Cura Carpignano (PV)

Surface grinding machines

Design features

HYDROSTATIC SUPPORT IN ALL MACHINE AXES WITH GUIDE RAILS ACROSS THE FULL LENGTH

All machine axes have hydrostatically supported guides over the full length of the machine, i.e. the table rests on the base during the entire longitudinal movement; the same applies to the column and the grinding head. The advantages:

- Lack of low-friction materials (turcite)
- No friction (optimal utilisation of system performance)
- No wear (over a long period of time guarantees constant geometry)
- Stick-slip-free operation – especially smooth movements



SIMPLE CONTROL

Available in three levels of automation (CN, CN PLUS and CNC) with DELTA's proprietary software. All versions are highly user-friendly:

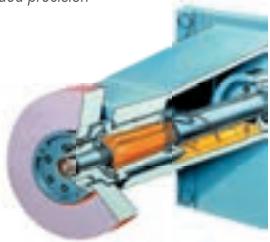
- Guaranteed full operability at the machine after only half a day of training
- Self-diagnosis and alarm messages also allow unattended processing

Technical data			Mini 7	Mini 12	Mini 15
Max. grinding area	mm		800 x 550	1 300 x 650	1 600 x 650
Table dimensions	mm		700 x 400	1 200 x 500	1 500 x 500
Longitudinal operating speed	m/min			0 - 40	
Max. longitudinal stroke movement of the table	mm		900	1 400	1 700
Transverse operating speed	m/min			0 - 3	
Min. programmable lateral movement	mm			0,001	
Spindle rotations	min ⁻¹			1450 (1 000 - 2 000)*	
Vertical axis – speed	m/min			1,5	
Min. programmable vertical movement	mm			0,001	
Spindle motor power	kW			7,5 (11)*	
Max. table load	kg		800	1 200	1 500
Machine weight	kg		5 200	6 000	6 500



MACKENSEN HYDRODYNAMIC SPINDLE

The spindle line has a Mackensen hydrodynamic bearing on the front and a pair of preloaded precision ball bearings on the rear.



The result:

- No wear and therefore maximum durability
- Zero friction (super accurate surface quality)
- High geometric and mechanical precision

Technical data		1200/750	1500/750	2000/750	2000/1000	2500/1000	3000/1000	2000/1100	2500/1100	3000/1100
Largest grinding area	mm	1200x775	1500x775	2000x775	2000x1000	2500x1000	3000x1000	2000x1100	2500x1100	3000x1100
Table dimensions	mm	1200x600	1500x600	2000x600	2000x800	2500x800	3000x800	2000x800	2500x800	3000x800
Longitudinal operating speed	m/min	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40	0 - 40
Max. longitudinal stroke movement of the table	mm	1500	1800	2300	2300	2800	3300	2300	2800	3300
Transverse operating speed	m/min					0 - 5				
Min. programmable lateral movement	mm					0,001				
Spindle rotations	min ⁻¹					1450 (1 000 - 2 000)*				
Vertical axis – speed	m/min					2				
Min. programmable vertical movement	mm					0,001				
Spindle motor power	kW					18,5 (30)*				
Max. table load	kg	1800	2300	3000	4000	5000	6000	4000	5000	6000
Machine weight	kg	9000	10000	11500	13000	14000	15000	13500	14500	15500

High precision machine tools / machining centres

Precision coordinate milling and drilling machines

PICOMAX 21-



Technical data	PICOMAX 20-D	PICOMAX 21-M
Travel	KS 323 D	KS 323 M
Travel X mm	450	450
Travel Y mm	260	260
Travel Z mm	110	110
Max. head movement W mm	450	450
Working area		
Clamping area L x W mm	770x320	770 x 320
Clearance table - spindle nose mm	77 - 527	77 - 527
Permissible table load kg	200	200
Work spindle		
Drive power kW	2.9	2.9
Torque Nm	40	40
Speed infinitely variable min ⁻¹	50 - 6 300	50 - 6 300
Toolholder	SF 32	SF 32
Feed drive		
Feed rate X mm/min	-	1 - 2 000
Feed rate Y mm/min	-	1 - 2 000
Feed rate Z mm/min	manual	manual
Tool magazine		
Number of magazine compartments	8 /12	12
Digital display/control	ND780	POSITIP 8013
Weight		
Incl. base/control box kg	850	930

Precision milling machines of vertical design

PICOMAX 56 TOP



Technical data	PICOMAX 56 TOP	PICOMAX 56L TOP
Travel		
Travel X mm	500	800
Travel Y mm	400	400
Travel Z mm	400	400
Working area		
Clamping area L x W mm	908 x 480	1 400 x 480
Clearance table - spindle nose mm	120 - 520	120 - 520
Permissible table load kg	250	350
Work spindle		
Drive power kW	9.5	9.5
Torque Nm	60	60
Speed infinitely variable min ⁻¹	50 - 12 000	50 - 12 000
Toolholder	SK 30	SK 30
Feed drive		
Feed rate X mm/min	1 - 20 000	1 - 30 000
Feed rate Y, Z mm/min	1 - 20 000	1 - 20 000
Positioning accuracy (ISO 230-2)		
Position tolerance A mm	0.006	0.006
Position scatter band R mm	0.004	0.004
Tool changer		
Number of magazine compartments	- (20 / 30)	- (20 / 30)
Digital display/control	TNC 620	TNC 620
Connectable axis (optional)	A	A
Weight		
Incl. base/control box kg	3 250	4 000

High precision machine tools / machining centres

HSC vertical machining centres from 3 to 5 axes

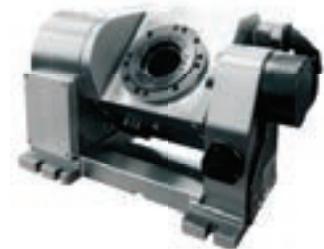
PICOMAX 75



Technical data	PICOMAX 75		PICOMAX 95	
Travel				
Travel X	mm	600	800	
Travel Y	mm	400	500	
Travel Z	mm	610	610	
Working area				
Clamping area L x W	mm	1 160 x 475	1 600 x 550	
Clearance table - spindle nose	mm	125 - 735	160 - 770	
Permissible table load	kg	400	600	
Work spindle	SK 30	HSK-E50	HSK-A63	HSK-A63
Drive power	kW	10.5	12 (17,8)	24
Torque	Nm	74	30 (14,6)	120
Speed infinitely variable	min ⁻¹	50 - 14 (20 000)	50 - 30 (36 000)	50 - 14 (20 000)
Feed drive				
Feed rate X, Y, Z	mm/min	1 - 30 000	1 - 30 000	
Positioning accuracy (ISO 230-2)				
Position tolerance A (X/Y/Z)	mm	0.005 (0,003)	0.005 (0,003)	
Position scatter band R (X/Y/Z)	mm	0.003 (0,002)	0.003 (0,002)	
Tool changer				
Number of magazine compartments		50 (80)	48 (80)	
Digital display / control	TNC 640	TNC 640		
Connectable axis (optional)	B / C	B / C		
Weight				
with standard coolant system	kg	5 300	9 400	



**Automatic CNC dividing/
swivelling unit ATS 200 DD**



PICOMAX 95



Technical data	ATS 200	
Centre height	mm	200
Travel		
Travel B	Degrees	-10 / +120
Travel C	Degrees	360
Working area		
Clamping diameter	mm	300
Permissible table load	kg	30
Feed drive		
Feed rate B	Degrees/min	7 600
Feed rate C	Degrees/min	10 000
Clamping		
Clamping torque B	Nm	1 000
Clamping torque C	Nm	600
Positioning accuracy (ISO 230-2)		
Position tolerance A (B/C)	Degrees	0.005 (0.003)
Position scatter band R (B/C)	Degrees	0.003 (0.002)
Weight		
Incl. base/control box	kg	150

High precision machine tools / machining centres

HSC vertical machining centres in portal design

VERSA 645 linear



VERSA 825



Technical data		VERSA 640 linear	
Travel		VERSA 643	VERSA 645
Travel X	mm	350	
Travel Y	mm	500	
Travel Z	mm	300	
Travel A	Degrees	-	+ / - 120
Travel C	Degrees	-	360
Working area			
Clamping area L x W	mm	620 x 500	320 x 320
Clearance table - spindle nose	mm	100 - 400	
Permissible table load	kg	400	150
Work spindle		HSK-E50	HSK-E40
Drive power	kW	12	17
Torque	Nm	30	6.3
Speed infinitely variable	min ⁻¹	50 - 30 000	50 - 42 000
Feed drive			
Feed rate X, Y, Z	mm/min	1 - 50 000	
Feed rate A	rpm	-	60
Feed rate C	rpm	-	120
Positioning accuracy (ISO 230-2)			
Position tolerance A (X/Y/Z)	mm	0.005 (0.003)	
Position scatter band R (X/Y/Z)	mm	0.003 (0.002)	
Position tolerance A (A/C)	Degrees	-	0.003 (0.002)
Position scatter band R (A/C)	Degrees	-	0.002 (0.0015)
Tool changer (Number of magazine)		50 (86,200, 225)	
Digital display / control		TNC 640	
Weight with standard coolant system	kg	7 500	

Technical data		VERSA 820	
Travel		VERSA 823	VERSA 825
Travel X	mm	875	
Travel Y	mm	700	
Travel Z	mm	450	
Travel A	Degrees	-	+ / - 115
Travel C	Degrees	-	360
Working area			
Clamping area L x W	mm	1 200 x 750	460 x 460
Clearance table - spindle nose	mm	150 - 600	120 - 570
Permissible table load	kg	1 000	350
Work spindle		HSK-A63	HSK-E50
Drive power	kW	24 (25.5)	12
Torque	Nm	120 (74)	30
Speed infinitely variable	min ⁻¹	50 - 20 (24 000)	50 - 30 000
Feed drive			
Feed rate X, Y, Z	mm/min	1 - 30 (48 000)	
Feed rate A	rpm	-	30
Feed rate C	rpm	-	60
Positioning accuracy (ISO 230-2)			
Position tolerance A (X/Y/Z)	mm	0.005 (0.003)	
Position scatter band R (X/Y/Z)	mm	0.003 (0.002)	
Position tolerance A (A/C)	Degrees	-	0.003 (0.002)
Position scatter band R (A/C)	Degrees	-	0.002 (0.0015)
Tool changer (Number of magazine)		44 (80,186, 218, 346)	
Digital display / control		TNC 640	
Weight with standard coolant system	kg	10 400	

Standard solutions for automated production



VERSA 825 with Robot Easy

	Pallets	Transfer weight	Pos. / level
Robot Easy	ITS 50 / holder 72	20 kg	60
	ITS 115 / ITS 148	40 kg	24
	PC210	130 kg	12
	UPC	130 kg	10
	MTS400	250 kg	6
Auto gripper changeover	not possible	Number of magazine levels	1
Loading station	not possible	with max component height	400 mm
2 machine solution	not possible	Suitable for	VERSA 820/640

VERSA 645 with Robot Compact 80

Automation	Pallets	Transfer weight	Pos. / level
Robot Compact 80	ITS 50	20 kg	11
	PM85	30 kg	9
	ITS148	40 kg	5
	PC210	80 kg	3
	UPC	80 kg	2
Auto gripper changeover	possible	Number of magazine levels	2 x 6
Loading station	possible	with max component height	130 mm
2 machine solution	possible	Suitable for	VERSA 820/640 PICOMAX 75 / 95

2 x PICOMAX 75 with Robot Multi

Automation	Pallets	Transfer weight	Pos. / level
Robot Multi	ITS 50	20 kg	30
	PM85	30 kg	30
	ITS148	40 kg	15
	PC210	80 kg	10
	UPC	80 kg	5
Auto gripper changeover	possible	Number of magazine levels	8
Loading station	possible	with max component height	100 mm
2 machine solution	possible	Suitable for	VERSA 820/640 PICOMAX 75 / 95

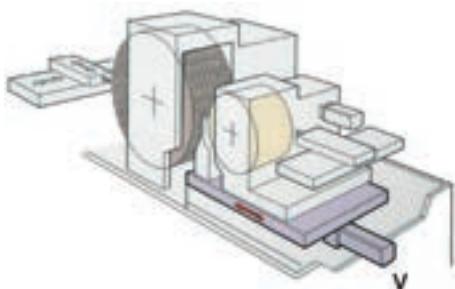


Centreless cylindrical grinding machines



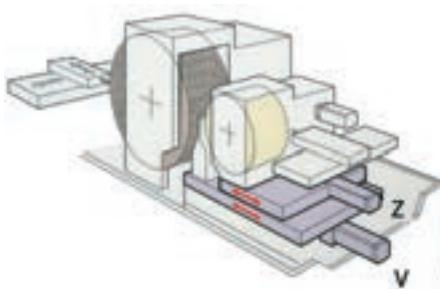
1 axis

Possibility of controlling the upper or lower regulator wheel slide



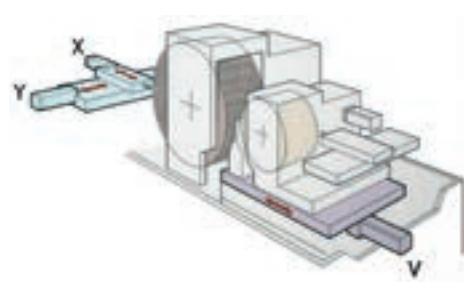
2 axes

The combined control of the two regulator wheel slides provides the highest flexibility for an automatic grooving cycle



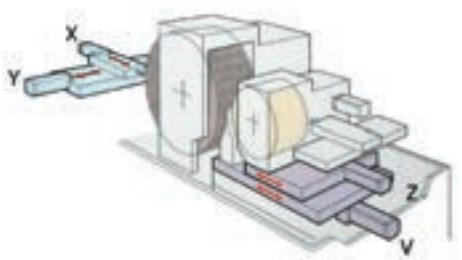
3 axes

3 axes CNC dressing with interpolation of the grinding wheel and CNC controlled lower slide



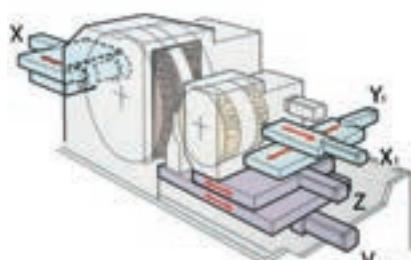
4 axes

CNC controlled lower and upper slides and dressing with interpolation of the grinding wheel



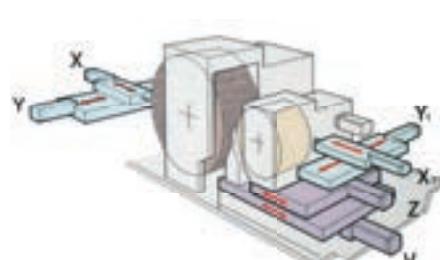
5 axes

- 1 axis for dressing the grinding wheel with profiled diamond roll
- 2 axes for dressing the regulator wheel
- 2 axes for movement of the lower and upper slides



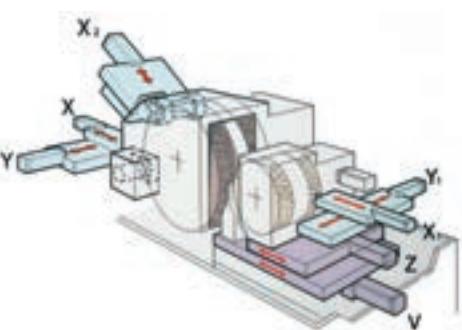
6 axes

- 2 axes for dressing with interpolation of the grinding wheel
- 2 axes for dressing the regulator wheel
- 2 axes for movement of the lower and upper slides



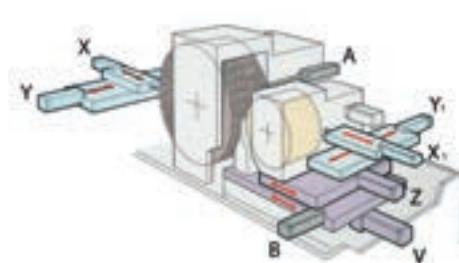
7 axes

- 2 axes for dressing with interpolation of the grinding wheel
- 2 axes for dressing the regulator wheel
- 2 axes for movement of the lower and upper slides



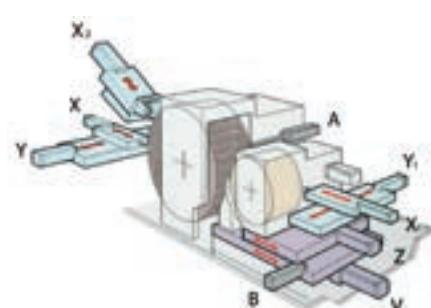
8 axes

- 2 axes for dressing with interpolation of the grinding wheel
- 2 axes for dressing the regulator wheel
- 2 axes for movement of the lower and upper slides
- 1 axis for the axial movement of the grinding wheel spindle
- 1 axis for taper correction



9 axes

- 2 axes for dressing with interpolation of the grinding wheel
- 2 axes for dressing the regulator wheel
- 2 axes for movement of the lower and upper slides
- 1 axis for the axial movement of the grinding wheel spindle
- 1 axis for taper correction
- 1 axis for dressing the grinding wheel with profiled diamond roll





Centreless cylindrical grinding machines



APG-S

TECHNICAL DATA		APG-S		
Operating range				
Min. grinding diameter	mm	1.5		
Max. grinding diameter	mm	70		
Max. grinding length	mm	150 200 250		
Grinding wheel				
Max. width of grinding wheel	mm	154 205 254		
Grinding wheel diameter	mm	610/508		
Grinding wheel bore	mm	304.8		
Regulator wheel				
Max. width of regulator	mm	154 205 254		
Regulator wheel diameter	mm	305		
Regulator wheel bore	mm	152.4		
Weight	kg	8 100 8 650 8 800		

TECHNICAL DATA		M100		
Operating range				
Min. grinding diameter	mm	1.5		
Max. grinding diameter	mm	20		
Max. grinding length	mm	100		
Grinding wheel				
Max. width of grinding wheel	mm	120		
Grinding wheel diameter	mm	406		
Grinding wheel bore	mm	203.2		
Drive power	kW	7.5 (10)		
Regulator wheel				
Max. width of regulator wheel	mm	120		
Regulator wheel diameter	mm	205		
Regulator wheel bore	mm	127		
Weight	kg	2 800		



M100



APG-M

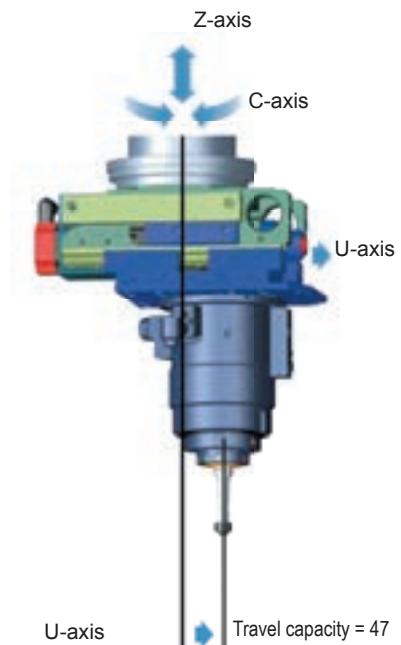
TECHNICAL DATA		APG-M		
Operating range				
Min. grinding diameter	mm	2		
Max. grinding diameter	mm	70		
Max. grinding length	mm	300		
Grinding wheel				
Max. width of grinding wheel	mm	305		
Grinding wheel diameter	mm	610		
Grinding wheel bore	mm	304.8		
Regulator wheel				
Max. width of regulator wheel	mm	305		
Regulator wheel diameter	mm	355		
Regulator wheel bore	mm	203.4		
Weight	kg	9 050		



CF-400

TECHNICAL DATA		CF-400		
Operating range				
Min. grinding diameter	mm	3		
Max. grinding diameter	mm	80		
Max. grinding length	mm	400		
Grinding wheel				
Max. width of grinding wheel	mm	406		
Grinding wheel diameter	mm	610		
Grinding wheel bore	mm	304.8		
Regulator wheel				
Max. width of regulator wheel	mm	406		
Regulator wheel diameter	mm	350		
Regulator wheel bore	mm	203.4		
Weight	kg	9 500		

High-precision jig grinding machines


HAUSER
H35


Technical data		H35	
Operating range			
Adjustment range X, Y		mm	500 x 300
Vertical adjustment of the grinding head (W)		mm	450
Clearance between table surface and carrier plate for U axis grinding motor		mm	700
Distance between spindle axis and upright columns		mm	365
Diameter ground in planetary mode, with grinding wheel Ø 50 mm / 70S:			
• Grinding motor 70S in U-axis center position, automatic grinding mode		mm	max. 144
• Grinding motor 70S with extension plates, semi-automatic mode		mm	max. 360
Diameter ground in planetary mode, with grinding wheel Ø 100 mm/40S:			
• Grinding motor 40S in U-axis center position, automatic grinding mode		mm	max. 194
• Grinding motor 40S with extension plates, semi-automatic mode		mm	max. 360
Taper grinding, included angle (divergent or convergent)		Degrees	max. 120
Table			
Usable surface		mm	600 x 380
6/7 T-slots, width		mm	10
Permissible load		kg	max. 300
Feeds			
Table saddle and vertical slide X, Y, W			
• Machining speed		mm/min	0 - 2,000
• Traversing speed		mm/min	2,000
Grinding spindle Z, C, U			
Diameter of the spindle sleeve		mm	125
Basic machine is prepared for use of the following grinding spindle speeds:			
• Electric grinding motor 40S, infinitely adjustable & programmable		min ⁻¹	4,000 - 40,000
• Electric grinding motor 22S, infinitely adjustable & programmable		min ⁻¹	4,500 - 22,500
• Electric grinding motor 45S, infinitely adjustable & programmable		min ⁻¹	9,000 - 45,000
• Electric grinding motor 70S, infinitely adjustable & programmable		min ⁻¹	9,000 - 70,000
• System to allow use of grinding turbine T13		min ⁻¹	up to 130,000
C-axis planetary speed:			
• Planetary speed, infinitely adjustable and programmable		min ⁻¹	5 - 350
• Follow-up mode, AC servo drive		min ⁻¹	up to 10
Z-axis as alternating stroke:			
• Z stroke movement, infinitely adjustable from		mm/min	V min. 0.500
• Z stroke movement, infinitely adjustable up to		mm/min	V max. 22,000
• Z-stroke frequency		Hz	max. 8
• Z-stroke length, infinitely adjustable		mm	0.1 mm to 170
U axis radial travel capacity in CNC-mode		mm	from -3 mm to +47
Accuracies			
Position uncertainty of axes X, Y and W, according to VDI/DGQ 3441		mm	0.0020

Grinding motor

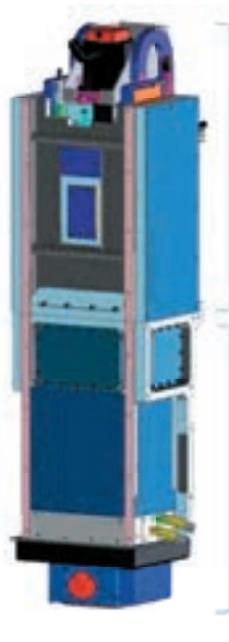


Dressing



High-precision jig grinding machines

HAUSER H45 - 400



Drive part

Precision part



Grinding mandrel



Multi-sensor system



Technical data	H45	H55	
Operating range			
Adjustment range X, Y	mm	700 x 500	1 300 x 800
Vertical adjustment of the grinding head (W)	mm	500	635
Clearance between table surface and carrier plate for U axis grinding motor	mm	max. 785	max. 905
Distance between spindle axis and upright columns	mm	750	970
Diameter ground in planetary mode, with grinding wheel Ø 50 mm / 70S:			
• Grinding motor 70S in U-axis center position, automatic grinding mode	mm	max. 144	max. 144
• Grinding motor 70S with extension plates, semi-automatic mode	mm	max. 360	max. 360
Diameter ground in planetary mode, with grinding wheel Ø 100 mm/40S:			
• Grinding motor 40S in U-axis center position, automatic grinding mode	mm	max. 194	max. 194
• Grinding motor 40S with extension plates, semi-automatic mode	mm	max. 360	max. 360
Taper grinding, included angle (divergent or convergent)	°	max. 120	max. 120
Table			
Usable surface	mm	770 x 630	1 440 x 860
6/7 T-slots, width	mm	14	14
Permissible load	kg	max. 500	max. 800 (1500)
Feeds			
Table, saddle and vertical slides X, Y, W			
• Machining speed	mm/min	0 - 2 000	0 - 2 000
• Traversing speed	mm/min	4 000	4 000
Grinding spindle Z, C, U			
Diameter of the spindle sleeve	mm	125	125
Basic machine is prepared for use of the following grinding spindle speeds:			
• Electric grinding motor 40S, infinitely adjustable & programmable	min ⁻¹	4 000 - 40 000	4 000 - 40 000
• Electric grinding motor 22S, infinitely adjustable & programmable	min ⁻¹	4 500 - 22 500	4 500 - 22 500
• Electric grinding motor 45S, infinitely adjustable & programmable	min ⁻¹	9 000 - 45 000	9 000 - 45 000
• Electric grinding motor 70S, infinitely adjustable & programmable	min ⁻¹	9 000 - 70 000	9 000 - 70 000
• System to allow use of grinding turbine T13	min ⁻¹	Up to 130 000	Up to 130 000
C-axis planetary speed:			
• Planetary speed, infinitely adjustable and programmable	min ⁻¹	5 - 350	5 - 350
• Follow-up mode, AC servo drive	min ⁻¹	up to 10	up to 10
Z-axis as alternating stroke:			
• Z stroke movement, infinitely adjustable from	mm/min	V min. 0.500	V min. 0.500
• Z stroke movement, infinitely adjustable up to	mm/min	V max. 22 000	V max. 22 000
• Z-stroke frequency	Hz	max. 8	max. 8
• Z-stroke length, infinitely adjustable	mm	0.1 to 170	0.1 to 170
U axis radial travel capacity in CNC-mode	mm	from -3 to +47	from -3 to +47
Accuracies			
Position uncertainty of axes X, Y and W, according to VDI/DGQ 3441	mm	0.0025	0.0025

Hard turning machines

Hembrug Hard turning

Hard turning is concerned with the process of single point cutting of hardened workpieces within the 2 micron range with hardnesses between 58 and 70 HRC.



All Mikroturn® hard turning machines have a hydrostatic main spindle and guideways

High demands on the accuracy of precision components can only be fulfilled with suitable machine concepts. Requirements are an excellent static and dynamic stiffness, a true running accuracy of the main spindle in the sub-micrometre range and high thermal stability. The hydrostatic components in the Mikroturn® machine series are superior to all other conventional bearing systems and provide immense advantages.

- A new continuous oil film over the total length h of the guideways and bearing elements are a guarantee for excellent damping characteristics and a high static and dynamic stiffness.
- The avoidance of metal contact and resultant wear guarantees a long and reliable service life of the machine and low operating costs.
- The temperature regulated oil flow ensures thermal stability.
- Due to the absence of any stick-slip effect the smallest increments of movement of $0.01 \mu\text{m}$ are possible.

Cost saving

With hard finish-turning hardened workpieces can be repeatedly machined on one hard finish-turning machine in one and the same chucking operation. By this means conventional multi-stage grinding in two or three operations can be dispensed with.

Tight tolerances

Hard finish turning enables complex machining of even complex workpieces in one chucking operation. As a result extremely high accuracies of concentricity, angularity and roundness can be achieved.



More flexibility

Using standard CBN indexable inserts and a single chucking operation a huge variety of workpieces with differing contours and sizes can be machined. This ensures greater flexibility in production and reduces changeover times.

High productivity

Hard finish turning guarantees greater material removal per operation in comparison to grinding. As a result hard turning is 3 to 4 times faster than cylindrical grinding.

Hard turning machines

Mikroturn® Horizontal Series



Mikroturn® 100



Tools, forms



Spindle nuts



Mikroturn® 100 XLS



Mikroturn® 500 XL



Automotive



Bearing roller



Hydraulic components



Mikroturn® Twin Spindle

Technical data		Base Line	100	100 XLS	500 XL	Twin
Max. turning diameter	mm	380	380	350	500	100
Max. turning length	mm	350	350	1000	500	50
Max. weight of workpiece incl. clamping	kg	50	50	50	300	1
Max. spindle speed	rpm	4 000	2 000 / 4 000 / 8 000	4 000	2 000 / 1 200	8 000 / 10 000
Nominal torque	Nm	50 / 100	50 / 100	50 / 100	249 / 300	50
True running accuracy of main spindle	µm	0.15	0.1	0.1	0.1	0.1
Z axes travel	mm	350	350	890	750	350
X axes travel	mm	240	240	240	400	260
Max. travel speed	m/min	10	10	12	30	30
Max. feed rate	m/min	0 - 10	0 - 10	0 - 12	0 - 30	0 - 30
Positioning accuracy	µm	1	1	1	1	1
Reproducibility of the slideways +/-	µm	0.1	0.1	0.1	0.1	0.1
Resolution of control system	µm	0.1	0.01	0.01	0.01	0.01

Hard finish turning machines

Mikroturn® Vertical series



Mikroturn® 650



Mikroturn® 800 V



Mikroturn® 1000 V



Mikroturn® 1500 V4



Mikroturn® 1000 V4

Technical data		650 V	800 V	1000 V	1000 V4	1500 V4
Max. turning diameter	mm	650	800	1000	1000	1500
Max. turning length	mm	350	350	350	350	350
Max. weight of workpiece incl. chuck	kg	800	800	2000	2000	3000
Max. table speed	rpm	1200	600	200	200	200
Nominal torque	Nm	270	300	800	800	1200
True running accuracy of main spindle/rotary table	µm	0.2	0.2	0.2	0.2	0.2
Z axes travel	mm	400	400	400	400	400
X axes travel	mm	700	700	700	750	750
Reproducibility of the sideways +/-	µm	0.1	0.1	0.1	0.1	0.1
Max. travel speed	m/min	10	10	10	10	10
Max. feed rate	m/min	0 – 10	0 – 10	0 – 10	0 – 10	0 – 10
Resolution of control system	µm	0.01	0.01	0.01	0.01	0.01
Positioning accuracy	µm	1	1	1	1	1

Hard finish turning machines

Hembrug combi process



Mikropolisch® / Mikrogrind® / Mikrofinisch®

As far as the development of industrial processing machinery is concerned we are increasingly witnessing the development of multifunctional and all-in-one processing machines because demands on productivity and precision are increasingly more stringent. Mikroturn® machines can be equipped with grinding,

so that for every part of the surface to be machined the most suitable technology can be applied. This leads to shorter machining times, superior quality of workpieces and lower costs per workpiece.

Combi process with high-precision hard turning

Mikropolisch®

**Hard turning
+ polishing**

Ra 0.05 µm

Mikrogrind®

**Hard turning
+ grinding**

Ra < 0.1 µm

Mikrofinisch®

**Hard turning
+ band finishing**

Ra 0.02 – 0.05 µm



Centre - Grinding machines

Centre - grinding machines ZS 102 / 202 / 1000

ZS 102/202 CNC



ZS 102/202



ZS 1000



Technical data		ZS 102	ZS 202		ZS 1000		
		1 200	1 200	1 500	1 000	2 000	3 000
Max. workpiece length	mm	1 100	1 150	1 500	1 000	2 000	3 000
Centre	mm	Ø 1 - 58	Ø 2 - 90		Ø 2 - 120		
Clamping range - Ø	mm	5 - 100	5 - 105 (95 - 160)		30 - 275		
Special clamping range - Ø	mm	-	140 - 225		-		
Max. workpiece weight	kg	100	500		1 000		
Grinding spindle speed	rpm	16 000 - 40 000	9 600 - 24 000		30 000 - 60 000		

Double-sided horizontal centre - grinding machine ZS 2000



Technical data	ZS 2000		
	800	1200	
Max. workpiece length	mm	800	1 200
Max. workpiece weight	kg	20	50
Max. workpiece diameter	mm	5 - 100	5 - 150
Workpiece clamping		Two centrally clamping, electrically driven vices	
Number of grinding heads	Piece	2	
Grinding area of the centre holes	mm	2 - 60	
Grinding spindle speed	rpm	10 000 - 30 000	

Horizontal centre grinding unit ZS251 installable for example on a lathe



Technical data	ZS 251	
Travel path of the eccentric	mm	20
Eccentric speed	rpm	approx. 30
Grindable centre		
- With stationary workpiece	mm	80
- With rotating workpiece	mm	150
Grinding spindle speed	rpm	10 000 - 30 000



Centre - Grinding machines

ZSS I - II

Immersion grinding of centre holes



Immersion grinding



Linear grinding



ZSU S, L, SL, SF

For linear and immersion grinding of centre holes



Technical data		ZSS I	ZSS II	ZSU S	ZSU L	ZSU SL	ZSU SF
Max. workpiece length type I	mm	1 000	1 000	1 000	1 000	1 000	1 000
Max. workpiece length type II	mm	-	-	1 500	1 500	1 500	1 500
Max. workpiece length type III	mm	-	-	2 000	2 000	2 000	2 000
Centre height	mm	165	165	160	160	160	160
Largest workpiece Ø	mm	325	325	320	320	320	320
Lapping area centring Ø	mm	1 - 120	1 - 120	-	-	-	-
Centring Ø	mm	-	-	1 - 150	1 - 120	1 - 150	1 - 150
Cone angle	Degrees	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90
Infinitely adjustable grinding spindle							
Speed I	rpm	30 - 440	30 - 440	60 000	30 - 440	60 000	60 000
Speed II	rpm	430 - 3450	430 - 3450	-	430 - 3450	430 - 3450	-
Power	kW	0.75	0.75	0.45	0.45	0.45	0.45
Stroke	mm	60	60	60	60	60	60
Clamping Ø grinding spindle	mm	2 - 10	2 - 10	2 - 10	2 - 10	2 - 10	2 - 10
Tailstock							
Morse taper	MK	2	2	4	4	4	4
Load capacity	kg	50	50	160	160	160	160
Dressing spindle							
Dressing wheel Ø	mm	120	120	120	120	120	120

CNC - precision machining centres


VX 6 to 18

**CNC vertical machining centres
of 3 to 5 axes design**


Technical data	VX 6	VX 8	VX 10	VX 12	VX 15	VX 18
Travel distances X/Y/Z	mm	600 / 400 / 460	820 / 510 / 510	1020 / 510 / 510	1220 / 600 / 610	1 510 / 810 / 810
Usable table surface	mm	800 x 500	1 000 x 530	1 200 x 530	1 400 x 630	1 700 x 810
Permissible table load	kg	400	500	800	1 200	2 000
Toolholder		SK 40 - HSK 63A			SK 40 - SK50 - HSK 63A	
Spindle performance S1/S6	kW			10.5 / 14.5		
Spindle torque S1/S6	Nm			50 / 69		
Spindle speed	min ⁻¹	10 000 (8 000 - 15 000 - 18 000)		10 000 (6 000 - 8 000 - 15 000 - 18 000)		
Clearance table - spindle nose	mm	150 - 610	150 - 660	150 - 660	150 - 760	150 - 960
Rapid traverse X,Y,Z	m/min			24		
Magazine capacity		24 - 40 (SK40 - HSK63A)		24 - 40 (SK40 - HSK 63A)	24 - SK50	40 (SK40 - HSK 63A - SK50)

K2X 8 to 20
KX 30
**CNC gantry machining centres
of 3 to 5 axes design**


Technical data	K2X 8	K2X 10	K2X 20	KX 30
Travel distances X/Y/Z	mm	700 / 600 / 450	1000 / 800 / 500	1200 / 1000 / 500
Usable table surface	mm	800 x 600	1150 x 800	1400 x 1000
Permissible table load	kg	500	1000	2000
Toolholder		HSK 63A HSK 63A HSK 50E HSK 40E	HSK 63A	HSK 63A SK50 HSK 100A HSK 63A
Spindle performance S1/S6	kW	20 / 25 22/36 24/32 10	25 / 35 30/40 24/32	25 / 35 40/50 40/50 30/40
Torque S1/S6	Nm	32 / 40 60/98 15.5/20.6 6.5	86 / 120 50/67 15.5/20.6	86 / 120 160/200 160/200 50/67
Spindle speed	min ⁻¹	24 000 16 000 36 000 42 000	18 000 24 000 36 000	18 000 10 000 12 000 24 000
Rapid traverse X,Y,Z	m/min	40 / 40 / 40	60 / 60 / 60	50 / 60 / 60
Positioning accuracy P	mm	0.004	0.004	0.005
Repeat accuracy Ps	mm	0.002	0.002	0.003
Magazine capacity		24 (30)	24 (30, 40, 60)	24 (30, 40, 60)

CNC gantry machining centres of 3 axes design
K MILL 8 and 10


Technical data	KMILL 8	KMILL 10	
Travel distances X/Y/Z	mm	700 / 600 / 500	1 000 / 700 / 600
Usable table surface	mm	800 x 600	1 250 x 700
Permissible table load	kg	500	1 500
Toolholder		SK40	
Spindle performance	kW		26.4
Torque	Nm		84 - 110
Spindle speed	min ⁻¹		15 000
Rapid traverse X,Y,Z	m/min	40, 40, 40	30, 30, 18
Positioning accuracy P	mm	X/Y/Z: 0.010	X/Y: 0.015 Z: 0.007
Repeat accuracy Ps	mm	X/Y/Z: 0.005	X/Y: 0.007 Z: 0.005
Magazine capacity			30

CNC - precision machining centres

CNC gantry machining centres of 3 axes design with greater travel distances


NX 40 to 70


Technical data		NX40	NX50	NX60	NX70
Travel distances X/Y/Z	mm	2200 / 1500 / 800(1000)	3200 / 1500 / 800(1000)	3200 / 2200 / 800 (1 000)	4 200 / 2 200 / 800 (1 000)
Usable table surface	mm	2200 x 1250	3000 x 1250	3000 x 2000	3 500 x 2 000
Permissible table load	kg	6 000	8 000	10 000	
Toolholder (option)			ISO 50		
Spindle performance S1/S6	kW		21.5 / 32.3		
Spindle torque S1/S6	Nm		117 / 170		
Spindle speed	min ⁻¹		6 000		
Rapid traverse X,Y,Z	m/min	20 / 20 / 15	15 / 20 / 15		15 / 15 / 15
Magazine capacity				24	
Accuracy P/Ps	mm			0.02 / 0.008	

CNC horizontal machining centres with twin pallet systems


HSX 540 to 860


Technical data		HSX 540	HSX 650	HSX 860
Travel distances X/Y/Z	mm	630 / 600 / 600	800 / 730 / 750	1 100 / 900 / 1 000
Pallet size	mm	400 x 500	500 x 630	630 x 800
Permissible load	kg	400	700	1 100
Toolholder		SK40	SK50	
Spindle power / spindle torque	kW / Nm	26 / 125		41 / 170
Spindle speed	min ⁻¹	12 000		10 000
Rotary table - minimum indexing	°		1	
Rapid traverse X,Y,Z	m/min	50		40
Magazine capacity		40 (60, 120)		40
Accuracy P/Ps	mm	0.01 / 0.005		0.015 / 0.007



CNC precision machining centres

CNC travelling column machining centres with integrated swivelling head of 4 to 5 axes design

Head P standard

EX 20 und 30


Technical data		EX 20	EX 30
Travel distances X/Y/Z	mm	1600 / 800 / 800	2400 / 800 / 800
Usable table surface	mm	2000 x 750	2800x750
Permissible table load	kg	3 500	4 500
Toolholder		HSK 63A	
Spindle power S1	kW	26.0	
Spindle rpm	min ⁻¹	15 000	
Spindle torque S1	Nm	84 - 110	
Rapid traverse X,Y,Z	m/min	30	
Magazine capacity		36	
Accuracy P/Ps	mm	0.01 / 0.006	

5 axes high-performance machining centres


MU Tech 6


Technical data		MU Tech 6
Linear axes		
Travel distances X/Y/Z	mm	750 / 560 / 560
Rapid traverse	m/min	30
Acceleration per axis	m/s ²	5
Head/ B (rotational axis)		
Speed	rpm	35
Spindle axis/column	°	+30 / -120
Table / C (rotational axis)		
Type		Fixed table with integrated rotary table
Fixed table	mm	1 000 x 600
Rotary table	mm	Ø 600
Speed	rpm	40
Permissible table load	kg	500

Technical data		MU Tech 6
Spindle		
Speed	rpm	15 000
Toolholder		SK 40
Power (S1)	kW	23.6
Torque(S1/S6)	Nm	84 / 110
Tool changer		
Pockets		24
Tool		
Length	mm	300
Diameter	mm	75
Weight	kg	7
Accuracy (VDI/DGQ 3441)		
Positioning accuracy P	mm	0.010
Repeat accuracy Ps	mm	0.005

CNC precision machining centres

High-performance 5 axes gantry machining centre with great versatility

U mill⁶



Technical data		
Travel distances X/Y/Z	mm	700 / 740 / 550
Rapid traverse X,Y,Z	m/min	40
Table – A/C axes		
A-axis: Swivel	°	+20 / -110
A axis: Swivelling speed	min ⁻¹	20
C axis / rotation	°	360
C axis / rotary speed	min ⁻¹	35
Surface	mm	Ø630
Permissible table load	kg	600
Max. clearance spindle nose / table surface	mm	750
Spindle		
Spindle speed	min ⁻¹	10 000
Toolholder		SK 40
Drive power	kW	12
Torque	Nm	115
Accuracy of linear axes (VDI DQG 3441)		
Position uncertainty P	µm	15
Position scatter band (Ps mean)	µm	5
Tool changer		
Pockets		30



HSC gantry machining centre of 5 axes design

K3X **8Five** **K2X** **10Five**



Technical data		K3X 8FIVE		K2X 10FIVE	
Travel distances X/Y/Z	mm	780 / 700 / 500		900 / 900 / 500	
A axis / speed	° / min ⁻¹	-45 / +110 (on 55° plane) / 50		-45 / +180 (on 45° plane) / 40	
C axis / rpm	° / min ⁻¹	360 / 50		360 / 90	
Table diameter	mm	Ø 500		Ø 630	
Workpiece size	mm	Ø 700		Ø 800	
Permissible table load	kg	250 (300)		500 (750)	
Spindle					
Spindle power S1/S6	kW	20 / 25	22 / 36	24 / 32	10 / 12
Torque	Nm	32 / 40	60 / 98	15 / 20	6.5 / 9
Spindle speed	min ⁻¹	24 000	16 000	36 000	42 000
Toolholder		HSK 63A	HSK 63A	HSK 50E	HSK 40E
Rapid traverse X,Y,Z	m/min			50	
Magazine capacity		24 (30, 40, 60, 90) - for HSK 40E 28		30 (40, 60) - for HSK 40E 28 only	
Accuracy P/Ps		X, Y, Z: 0.004/0.002 mm		A, C: 7.2/3.6 arcsec	

CNC precision machining centres

5 axes high-performance gantry machining centres with linear drive



Technical data

		MX4
Travel distances X/Y/Z	mm	750/700/500
Rapid traverse X,Y,Z linearaxes	m/min	60/120/120
A - C rotary axes on the palletized table		
A axis - table swivel angle on cross 45°	°	-45 / +180
C axis - table rotation	°	360
Working position (Spindle axis / table)	°	from horizontal plane = 0° to vertical plane = 90°
Speed	min ⁻¹	100
Table surface	mm	400 x 400
Permissible table load	kg	250
Spindle		
Speed	min ⁻¹	24 000 (HSK 63-A)
Drive power – torque S1/S6	kW/Nm	20 / 25 – 32 / 40
Positioning accuracy P		0.004 mm lin. / 7 arcsec rot.
Tool changer	Pockets.	36(42, 84)
Options		
Spindle		
Speed	min ⁻¹	16 000 (HSK 63-A)
Drive power – torque S1/S6	kW/Nm	22 / 36 – 60 / 98

CNC gantry machining centres of 5 axes design with rotary functions and twin pallet systems

MX 8 to 20



Configuration MX12 with pallet

Technical data	MX8 M	MX8 MT	MX10 M	MX10 MT	MX12 M	MX12 MT	MX20 M
Travel distances X/Y/Z	mm	1160 / 1000 / 900		1200 / 1200 / 1000		1200 / 1600 / 1000	3000 / 3100 / 1600
Rapid traverse X,Y,Z linearaxes	m/min		40 / 40 / 40				20
A axis - universal head	°		-45 / +180				45
Speed	min ⁻¹		100				
C axis - rotary table	°		360				
Speed	min ⁻¹	50	500	65	500	50	250
Table surface	mm	Ø 1000 x 800	Ø 800	Ø 1250 x 900	Ø 1000	Ø 1600 x 1250	Ø 1400
Permissible table load	kg	2 000		2 500		4 000	12 000
Spindle							
Speed	min ⁻¹	18 000			10 000		
Toolholder		HSK 63-A			HSK 100-A		
Spindle power S1/S6	kW	20 / 30			32 / 50		
Torque S1/S6	Nm	160 / 240			180 / 280		
Positioning accuracy P			0.007 mm lin.	10 arcsec rot.			
Tool changer	Pocket	60(96, 120)	48(96)	48(60,96,120)	48 (96)	48(60,96,120)	48 (96)
Variants							40
Rotary axis A - fork head							-
Positioning of B axis	°	-	-	-110 / +10	-	-110 / +10	-
C axis - rotary palletizing table							-
Speed	min ⁻¹	50	500	65	500	50	250
Table surface	mm	Ø 800 x 630	Ø800	Ø 1000 x 800	Ø 1000	Ø 1400	Ø 1400
Permissible table load	kg	1 200		1 500		2 500	
Spindles		12000-HSK 100-A	-	18 000-HSK 63-A (8 000-HSK 100-A)	-	18 000-HSK 63-A (8 000-HSK 100-A)	-
Spindle power S1/S6	kW	70/86	-	20 / 30 (70 / 86)	-	20 / 30 (70 / 86)	-
Torque S1/S6	Nm	190/235	-	160 / 240 (190 / 235)	-	160 / 240 (190 / 235)	-

CNC precision machining centres

CNC high gantry machining centres with high performance and high precision of 5 axes design with fork head

Fork head

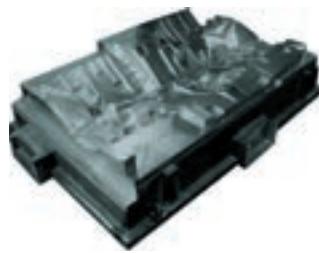
KX 50 to 300



Technical data	KX50 M	KX50 L	KX100	KX200	KX300
Travel distances X/Y/Z	mm	2 000 / 1 700 / 900	3 000 / 1 700 / 900	2 300 / 2 300 / 1 000	3 300 / 2 300 / 1 000
B axis	°			- 105 / +105	
C axis	°			-190 / +190	
Usable table surface	mm	2 200 x 1 250	3 300 x 1 250	2 500 x 1 250	3 500 x 1 250
Permissible table load	kg	4 000		6 000	9 000
Toolholder		HSK 63A		HSK 63A	HSK 100A
Spindle power S1/S6	kW	60 / 75 (56 / 70)		20 / 30	70 / 86
Torque S1/S6	Nm	60 / 75 (56 / 70)		160 / 240	190 / 235
Spindle speed	min ⁻¹	20 000 (15 000)		18 000	12 000
Rapid traverse X,Y,Z	m/min	40 / 40 / 40		25 / 40 / 40	20 / 20 / 20
Positioning accuracy P			0.007 mm linear axes, 0.010 arcsec rotary axes		0.02 mm (X), 0.007 mm (Y/Z) 0.010 arcsec rotary axes
Repeat accuracy Ps			0.004 mm linear axes, 0.005 arcsec rotary axes		0.005 mm (X), 0.004 mm (Y/Z) 0.005 arcsec rotary axes
Magazine capacity		30 (40, 60, 100)			40 (60, 100)



KXG 45 to 90



Technical data	KXG45-14	KXG45-23	KXG60-23	KXG90-23
Travel distances X/Y/Z	mm	4 500 / 1 400 / 800	4 500 / 2 300 / 800	6 000 / 2 300 / 800
B axis	°		- 105 / + 105	
C axis	°		- 190 / + 190	
Table dimensions	mm	4 700 x 1 390	4 700 x 2 480	6 200 x 2 480
Max. table load	kg	18 000	25 000	30 000
Toolholder		HSK 63A		
Spindle speed (option)	min ⁻¹		20 000 (15 000)	
Spindle power S1/S6	kW		60 / 75 (56 / 70)	
Torque S1/S6	Nm		60 / 75 (89 / 111)	
Rapid traverse X,Y,Z linear axes	m/min		60 / 60 / 45	
Speed B, C rotary axes	min ⁻¹		100	
Positioning accuracy P		0.025 / 0.010 / 0.010 mm linear axes	0.010 arcsec rotary axes	0.035 / 0.010 / 0.010 mm linear axes
Magazine capacity				0.010 arcsec rotary axes
			40 / 60 / 100	

Deep drilling machines for moulds and component parts

Technical data			MF 800 C	MF 1000 C
Max. drilling depth in one operation	axis V	mm	800	1000
Column horizontal travel	axis X	mm	800	1000
Vertical stroke	axis Y	mm	500	520
Approach travel of drill unit	axis Z	mm	300	300
Drilling spindle				
Optimal drilling diameter		mm	4 - 18	4 - 25
Drilling spindle speed		min ⁻¹	5000	4200
Drilling spindle motor power		kW	7	7
Milling spindle				
Milling spindle			ER32	ISO40
Table (load)				
Standard fixed table	800x800 mm	kg	4000	-
(Option) CNC rotary table	600x600 mm	kg	2000	-
Standard fixed table	600x700 mm	kg	-	2500
(Option) CNC rotary table	800x900 mm	kg	-	4000
(Option).CNC rotary tilting table	800x800 mm / 25° -20°	800x900 mm	kg	2000

MF 800, 1000 C



MF 1000AF



Technical data		MF 1000 AF
Max. drilling depth in one operation	axis V	mm
Column horizontal travel	axis X	mm
Vertical stroke	axis Y	mm
Approach travel of drill unit	axis Z	mm
SK40 drilling and milling spindle		
Optimal drilling diameter (solid material)		mm
Spindle motor power S1		kW
Drilling spindle speed		min ⁻¹
Max. torque		Nm
Thread cutting in steel 2311/2312		"
Table		
Standard fixed table - dimensions/table load		mm/kg
(Option) CNC infinitely variable 360 000 pos. dimensions/table load		mm/kg
(Option) CNC infinitely variable 360 000 pos. dimensions/table load		mm/kg



MF 1000/2F



Technical data		MF 1000/2F Rotary table	MF 1000/2F Rotary tilting table	MF 1250/2F Rotary tilting table
Max. drilling depth in one operation	axis V	mm	1000	1 250
Column longitudinal movement	axis X	mm	1400	1 700
Vertical stroke (gun drilling and milling)	axis Y	mm	700	935
Approach travel of drilling/milling unit	axis Z	mm	500	600
Table rotation control infinitely variable	Pos/circum		360 000	
Drilling unit				
Drilling diameter min. max., in solid material	mm		4 - 25	
Drilling diameter max., with pilot drilling	mm		32	
Drilling spindle motor power (S1) / speed	kW/ min ⁻¹		7 / 6000	9 / 6 000
ISO40 Milling spindle				
Milling spindle motor power (S1) / speed	mm/ min ⁻¹		7 / 4000	9 / 4 000
Max. torque	Nm		108	-
Thread cutting in steel 2311/2312			M25	M24
Rotary table				
Standard rotary table dimensions / load-bearing	mm/kg	800 x 1000 / 4000	-	-
(Option) Rotary table dimensions / load-bearing	mm/kg	1000 x 1200 / 6500	-	-
Rotary tilting table				
Rotary tilting table dimensions / load-bearing	mm/kg	-	1000 x 1000 / 5000	1000 x 1000 / 6000
Tilt axis	°	-	+22.5 / -22.5	



Gun-drilling machines for moulds and component parts

MF 1200 BB, BBL, BBLL



MF 1450 BB



Technical data		MF 1200 BB	MF 1200 BBL	MF 1200 BBLL	MF 1300 BB/4P	MF 1450 BB
Column longitudinal movement	axis X	mm	1 250	1 650	2 200	2 250
Drilling slide vertical movement	axis Y	mm		1 000		1 500
Approach travel of drilling/milling unit	axis W	mm		500		650
Tilting of drilling/milling unit	axis A	°			± 20 resolution 0.001	600
Drilling spindle						
Max. drilling depth in one operation	axis V	mm		1 200		1 300
Optimal drilling diameter without pilot drilling		mm			5 - 40	1 450
Drilling spindle motor power (S1) / speed		kW/min ⁻¹		9 / 4200		11 / 4200
Milling spindle						
Milling axis independent travel	axis Z	mm		360		450
Maximum travel	axes Z+W	mm		860		1 100
Drilling spindle motor power (S1) / speed		kW/min ⁻¹		9 / 4 000		29 / 6 000
Maximum torque on milling spindle		Nm		226		130
CNC rotary table system IMSA						
Version			Rotary tilting table	Rotary table	Rotary table	Traversing/rotary table
Dimensions		mm	800 x 1 000	1 000 x 1 200	1 200 x 1 500	1 200 x 1 500
Table load		kg	4 000	6 500	12 000	12 000
Max. diameter of drilling part during table rotation		mm	1 700	2 100	2 600	1 700
Angular resolution of rotary table	axis B	°			0.001	
Table traverse (approach to workpiece)	axis U	mm		-		500
Table tilting		°	+20/-20		-	

MF 1500 BB, 2000 BB



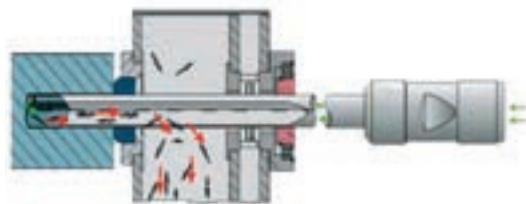
MF 1500 BB-6P



Technical data		MF 1500 BB -6P	MF 1500 BB	MF 1600 S	MF 1750 BB	MF 2000 BB
Column longitudinal movement	axis X	mm	3 250	3 000	3 250	
Drilling slide vertical movement	axis Y	mm	1 500	1 600	1 500	
Approach travel of drilling/milling unit	axis W	mm	500	-	600	500
Drilling spindle						
Max. drilling depth in one operation	axis V	mm	1 500	1 600	1 750	2 000
Optimal drilling diameter without pilot drilling		mm	5 - 40	5 - 50	5 - 25	5 - 50
Drilling spindle motor power (S1) / speed		kW / min ⁻¹	15 / 4200	9 / 4 200	17 / 4 500	15 / 4 200
Tilting of drilling/milling unit	axis A	°	± 20	+30 / -15	± 20	
Milling spindle						
Milling axis independent travel	axis Z	mm	500	1 500	500	500
Maximum travel	axes Z+W	mm	1 000	-	1 100	1 000
Milling spindle motor power (S1)/speed		kW / min ⁻¹	37 / 4 500	17 / 2 500	17 / 4 500	45 / 4 500
Maximum torque on milling spindle		Nm	300	680	324	430
CNC rotary table system IMSA						
Table traverse (approach to workpiece)	axis U	mm	1 000	-	1 000	1 000
Table rotation	axis B	Pos/circumf			360 000	
Extensible rotary table - Standard	Table load 20 t	mm	-	1 600 x 1 800	1 600 x 1 800	-
Extensible rotary table - Option	Table load 30 t	mm	2 000 x 2 000	2 000 x 2 000	-	1600x1800 / 2000x2000 / 2000x2500
Extensible rotary table - Option	Table load 35 t	mm	-	2 200 x 2 200	-	2 200 x 2 200
Extensible rotary table - Option	Table load 40 t	mm	-	2 500 x 2 500	-	2 500 x 2 500
Tool changer						
ISO SK-50 - capacity		Pc	40	-	-	-
Max. tool diameter/length		mm	100 / 350	-	-	-

Deep drilling machines for cylindrical workpieces

Single lip



MFT 750 / 6 CR



MFT 250 / 2Ti CR



MFT 1000 CR



MFT 750 / 12 CR



MFT 500 CR



MFT 1500 CR



Technical data MFT	750 / 6 CR	750 / 12 CR	250 / 2Ti CR	500 CR	1000 CR	1500 CR
Drilling diameter min. - max.	mm 1.5 - 6.0	2.5 - 12.0	4.0 - 16.0	4.0 - 25.0	4.0 - 25.0	4.0 - 25.0
Drilling depth	mm 750	750	250	500	1000	1500
Number of drilling spindles		1	2		1	
Speed of counter headstock	min ⁻¹			150		
Flange version				Pneu/ opt. CNC		
Speed of spindle	min ⁻¹ 11/16000	7500			6000	
Pressure max.	bar 210	180			90 / Opt.120	

MFT 500 / 2Ti CR



MFT 1500 / 2Ti CR



MFT 1000 / 42



MFT 1000 / 2Ti CR



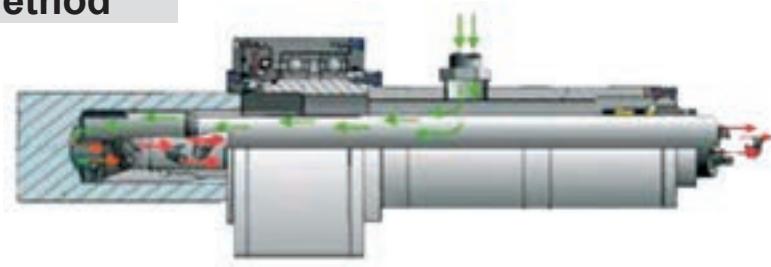
MFT 1000 / 32 CR



Technical data MFT	500 / 2Ti CR	1000 / 2Ti CR	1500 / 2Ti CR	1000 / 32 CR	1000 / 42
Drilling diameter min. - max.	mm 500	1000	1500	6.0 - 32.0	12.0 - 42.0
Drilling depth	mm 500	1000	1500		1000
Number of drilling spindles		2		1	
Speed of counter headstock	min ⁻¹		150		80
Flange version			Pneu/ opt. CNC	CNC	hydraulic
Speed of spindle	min ⁻¹	6000		4000	3000
Pressure max.	bar 90				50

Deep drilling machines for cylindrical workpieces

BTA / STS method



Special solutions with the MFT / MFTB series are standard for IMSA



MFT B 1000 / 51 CR



MFT B 1500 / 2000 / 65 CR



MFT B 1000 / 200 CR



MFT B 1000 / 2000 / 110

Technical data		MFT B 1000 / 51 CR	MFT B 1000 / 2000 / 76 CR	MFT B 1000 / 2000 / 110	MFT B 1000 / 2000 / 200
Drilling diameter min. - max.	mm	18 - 51	18 - 76	25 - 110	50 - 200
Drill out option	mm	65	80	135	-
Drilling depth	mm	1000	1000 / 2000	1000 / 2000	1000 / 2000
Number of drilling spindles		1	1	1	1
Counter headstock		Yes	Yes	No	No
Spindle speed	min ⁻¹	2000	1500	1500	1500
Pressure max.	bar	50	35	30	25

CNC turning centres with/without driven tools

DX 150 to 350



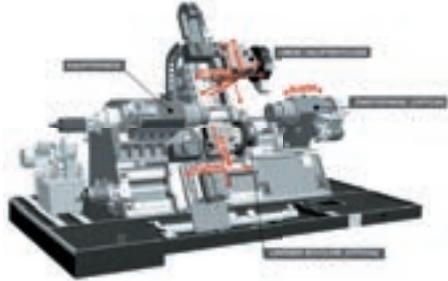
TMC 250 and 350



Technical data		DX150	DX200	DX250	DX350	TMC250	TMC350
Feeds							
Turning diameter over bed	mm	375	500	600	700	600	700
Max. turning length	mm	350	500	700	1000	700	1000
Max. turning diameter	mm	250	350			470	
X axis	mm	150	200			250	
Z axis	mm	350	500	700	1000	700	1000
Rapid traverse	m/min				24		
Spindle							
Spindle nose	Size	A25		A26		A28	
Drive power S1/S6	kW	7 / 10.5	9 / 13.5	12 / 18	18.5 / 27.8	12 / 18	18.5 / 27.8
Material feed through	mm	38		52	65	52	65
Speed	min ⁻¹	50 - 4500	50 - 4000	50 - 3500	50 - 2500	50 - 3500	50 - 2500
Turret							
Number of tools/driven	Pcs			8 / -		12 / 12	
Toolholder	Size			-		VDI 30	
Speed	min ⁻¹			-		5000	
Drive power	kW			-		4.1	
Tool size	mm	20 x 20		25 x 25		32 x 32	
Max. boring bar diameter	mm	32		40		50	
Tailstock							
Tailstock quill - diameter	mm	75		85		130	
Tailstock quill stroke	mm	100		120		150	
Control system					Siemens		

CNC turning centres with/without driven tools

TMX 200



AX 200 to 300



Technical data		AX200	AX200M	AX200MY	AX200MSY	AX300	AX300M	AX300MY	AX300MSY
Feeds									
Turning diameter over bed	mm		550				650		
Max. turning diameter	mm	370		330		480		420	
Max. turning length*	mm		325 / 625*		625			600	
X axis	mm		200				250		
Y axis	mm	-	-	± 40		-	-	± 50	
Z axis	mm		325 / 625*		625			625	
Rapid traverse	m/min	24 / - / 35		24 / 24 / 35		24 / - / 30		24 / 24 / 30	
Main spindle (motor spindle)									
Spindle nose	Size		A ₂ 6				A ₂ 8		
Drive power	kW		10				20		
Material feed through	mm		52				65		
Speed	min ⁻¹		5000				4000		
Opposed spindle (motor)									
Spindle nose	Size	-	-	-	A ₂ 5	-	-	-	A ₂ 6
Drive power	kW	-	-	-	7	-	-	-	10
Spindle travel	mm	-	-	-	630	-	-	-	620
Speed	min ⁻¹	-	-	-	5000	-	-	-	5000
Turret									
Number of tools/driven	Pcs	12 / -		12 / 12		12 / -		12 / 12	
Toolholder	Size	-		VDI30/BMT45		-		VDI40/BMT55	
Speed	min ⁻¹	-		4500		-		4000	
Drive power (Siemens/Fanuc)	kW	-		4.8		-		4.8	
Tool size	mm			25 x 25					
Max. Ø boring bar	mm		40				50		
Tailstock (type)									
Tailstock quill stroke	mm		330 / 630		-	620 / 1220		620	
Diameter	mm		85		-		130		-
Control						Siemens			

Precision grinding machines and systems

KEL-VERA



The innovative grinding system

VARIA – evolution not revolution

Systematically optimized proven elements, e.g. the hydrostatic guide concept, combined with newly developed components such as the automatic cylinder correction system and synchronous tailstock provide a contemporary platform for flexibly satisfying all the varied requirements of our customers.

Technical data			VARIA
Specifications			
Distance between centres	mm	1000 / 1600	
Z axis			
Stroke	mm	1170 / 1670	
Rapid traverse	m/min	20	
X axis			
Stroke	mm	365	
Rapid traverse	m/min	10	
B axis			
Swivelling range	°	240	
Rapid traverse	1/sec	0.5	
Power external grinding	kW	10	
Power internal grinding	kW	15	
Centre height	mm	200 / 250 / 300	
Workpiece weight between centres	kg	150 / 300	
Load on chucked work	Nm	160 / 320 / 750	
Space requirement / length x width	mm	3700 x 2200 / 4700 x 2200	

VARIA

Technical data			KEL-VERA
		Universal	URF
Specifications			
Control system		GRINDplusIT / GE FANUC 3 I Ols	
Distance between centres	mm	400	
Centre height with TDC	mm	175	
Centre height without TDC	mm	250	175
Input voltage		3x400V 50Hz / 3x460V 60Hz	
Power requirement dependent on equipment	A	35 - 80	
Space requirement	mm	2700 x 2100	
Workpiece weights			
Between centres	kg	150	150
Chucking work	Nm	160	320
Longitudinal cuts Z axis			
Travel	mm	600	
Rapid traverse	m/min	30	
Resolution	µm	0.1	
Upper table			
Table swivelling	°	9	
Cross slide X axis			
Travel	mm	350	
Rapid traverse	m/min	15	
Resolution	mm	0.1	
Turned parts			
Swivelling range	°	240	240
Resolution B axis	sec	0.1	0.1
Grinding head			
Versions		Universal/diagonal/tandem	Production
Power	kW	10	15/20
Peripheral speed	m/s	45	< 80
Grinding wheels	mm	Ø 400 / 500	Ø 500 / 600
Workpiece headstock			
Speed range	min⁻¹	1 - 1000	
Drive torque	Nm	60	
Mounting shank		MK 5 / ASA 5	
Lower parts		Fixed / rough adjustment / precision adjustment lower parts	
Tailstock			
Mounting shank		MK 4	
Stroke	mm	50	
Lower parts		Fixed / precision adjustment	
Clamping surface upper table			
Table mountings	mm	195 x 1100	
Clamping surface lower table			
Table mountings	mm	195 x 1300	
BDC front	mm	90 x 1300	
Clamping surface carriage			
Carriage plate	mm	430 x 710	



VARIA – for complex grinding applications

Precision grinding machines and systems

KEL-VITA



The perfect CNC universal grinder

VISTA



The competitive CNC universal grinder

Technical data	KEL-VITA	VISTA
Overall length	1000	1000
Specifications		
Distance between centres	mm	1000
Grinding length RS//URS	mm	800
Grinding length R//UR	mm	1000
Centre height	mm	175
Workpiece weight between centres	kg	100
Load - chucked work	Nm	100
Mains voltage requirement		3x400V 50Hz / 3x460V 60Hz
Power consumption dependent on equipment	A	35 - 80
Space requirement / length x width	mm	3000 x 2000
Table / slide: Z axis		
Travel	mm	1150
Rapid traverse	m/min	20
Resolution	µm	0.1
Swivelling range upper table		9
Cross slide: X axis		
Travel	mm	350
Rapid traverse	m/min	10
Resolution	mm	0.1
Swivel devices		
B axis		
Resolution	°	0.00002
Automatic indexing / 1° Hirth coupling		1
Automatic indexing / 2.5° Hirth coupling		2.5
Swivelling range	°	240
Grinding head general		
Drive motor water-cooled	kW	10
Peripheral speed	m/s	35 / 45
Grinding head R / UR		
Grinding wheel dimensions left-hand side	mm	450 x 63 x 127
Option	mm	450 x 80 x 203
Grinding wheel dimensions right-hand side opt.	mm	300 x 40 x 127
Grinding wheel dimensions left-hand side	mm	400 // 500
with different options	mm	other dimensions on request
Grinding wheel Dimensions right-hand side	mm	300 // 400
with different options	mm	other dimensions on request
Grinding head RS		
Grinding wheel Dimensions right-hand side	mm	450 x 80 x 203
Grinding head RS // URS		
Grinding wheel Dimensions right-hand side	mm	400 // 500
with different options	mm	other dimensions on request
Grinding wheel dimensions left-hand side	mm	400
with different options	mm	other dimensions on request
Internal grinding attachment only for UR // URS		
Locating bore	mm	80 / 120
Rotational spindle motor infinitely variable	min ⁻¹	6000 - 28000
Drive power Motor	kW	3
HF spindle options	kW	5.2 / 8
Workpiece headstock		
Speed range	min ⁻¹	1 - 1000
Drive torque spindle	Nm	24
Mounting shank		MK 5 / ISO 702-1
Swivelling range Option	°	110
Tailstock		
Mounting shank		MK 4
Stroke	mm	48
Fine adjustment Option	µm	+/- 60
CNC control system		
GE Fanuc		310is-A
Measuring systems		
GAP Control		KEL-TOUCH
Active longitudinal positioning		Movomatic / Marposs
Passive longitudinal positioning		Movomatic / Marposs
Diameter measurement control system		Movomatic / Marposs
Balancing		KEL-BALANCE

Innovative, high-precision machining solutions

CNC - Rotary transfer machines



MTR200

3 axis machining above and below

MTR300

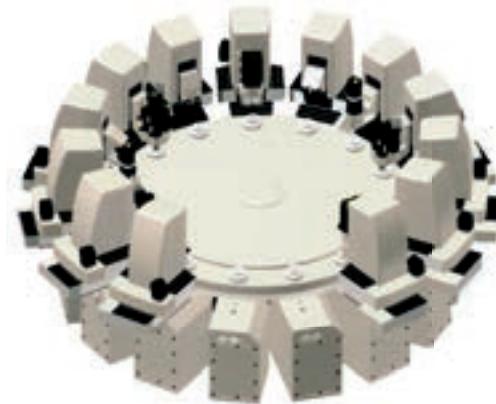
3 axis machining from above

MTR400

Machining on 5 faces with C axis

MTR400HR

Machining on 5 faces with C axis and horizontal spindles



PRECISION

- Workpiece machining in one clamping operation
- Numerically controlled round table
- Innovative PRECITRAME palletisation system
- Repeat accuracy in μ range

FLEXIBILITY

- Full latest generation CNC control system
- Up to 62 axes and more than 50 tools are simultaneously available
- Short changeover times; workpiece pallets and tools quickly changeable
- Machining concept for parts families and high-volume production
- Batch sizes from 500 to several million

MODULARITY

- Sophisticated modular machine design with 4 to 20 stations
- Modular stations for milling and turning
- Compatible with all Precitrame machining units
- Easy configuration changing and high upgrade flexibility

ECONOMY

- Designed for the highest productivity
- Long-term safeguarding of investment thanks to dynamic configuration (possibility of adapting the system to requirements)

Innovative, high-precision machining solutions

Precitrame machining units

UV160-3



UV160-4



UH160-3



UH200-3



Spindle speed from 2500 to 40,000 min⁻¹

- Drive power 0.5 kW to 5.5 kW
- Spindle nose HSK25, HSK32 und HSK40
- Internal coolant feed to max. 150 bar
- Minimum quantity lubrication air/oil

Technical data

	UV160-3
X axis	120 mm
Y axis	160 mm
Z axis	130 mm
A axis	-
Rapid traverse	20 m/min
Max. number of spindles	4
Precision	0,001 mm

UV160-3

	UV160-4
X axis	120 mm
Y axis	160 mm
Z axis	130 mm
A axis	0 - 30°
Rapid traverse	20 m/min
Max. number of spindles	2
Precision	0,001 mm

UV160-4

	UH160-3
X axis	120 mm
Y axis	160 mm
Z axis	130 mm
A axis	-
Rapid traverse	20 m/min
Max. number of spindles	1 bis 2 horizontal 1 bis 4 vertical
Precision	0,001 mm

UH160-3

	UH200-3
X axis	200 mm
Y axis	200 mm
Z axis	120 mm
A axis	-
Rapid traverse	15 m/min
Max. number of spindles	1 bis 3 horizontal 1 bis 6 vertical
Precision	0,001 mm

UH200-3

Precitrame offers a complete range of spindles equipped with pneumatic quick change system

AUTOMATED TRANSFER FINISHING

900T series



900T SERIES

Type	
Stations	
Number of tools per station	2 / 4
Type of tool	1 to 2
Loading	Abrasive belt, abrasive wheel, felt disc, polishing disc, lapping disc
Fields of application	Manual or automatic
Max. part dimensions	Watchmaking, electronics, medical engineering, aerospace engineering and power industry
Max. part weight	Ø 160 mm ball
Robot	4 kg
Software	Stäubli TX90
Power supply	CyberMotion 5
Supply pressure	3x400V PE+N, 50/60 Hz, 32A
Sound level	6-8 bar
Cell dimensions with 4 stations	< 75dB
Weight	3 100 x 2 900 x 2 600 mm / 4 000 x 4 550 x 2 700 mm
Safety	2 500 kg / 4 000 kg

Options and accessories

920T / 940T

Type	Belt grinding, lapping, polishing, felting and precision machining
Stations	2 / 4
Number of tools per station	1 to 2
Type of tool	Abrasive belt, abrasive wheel, felt disc, polishing disc, lapping disc
Loading	Manual or automatic
Fields of application	Watchmaking, electronics, medical engineering, aerospace engineering and power industry
Max. part dimensions	Ø 160 mm ball
Max. part weight	4 kg
Robot	Stäubli TX90
Software	CyberMotion 5
Power supply	3x400V PE+N, 50/60 Hz, 32A
Supply pressure	6-8 bar
Sound level	< 75dB
Cell dimensions with 4 stations	3 100 x 2 900 x 2 600 mm / 4 000 x 4 550 x 2 700 mm
Weight	2 500 kg / 4 000 kg
Safety	The machine incorporates cutting edge safety technologies for safe and at the same time user-friendly operation

Automated loading cell
NC rotation spindle with position and speed control
Numerically adjustable station base (7th axis)
Integrated measurement
Carding and wireless measuring
Spray cooling or minimum quantity lubrication
ATEX extraction
Intermediate cleaning station
Preparation, editing and simulation on offline station
Automatic calibration of tools and stations
Production monitoring by batch and MO management
Two advanced traverse tracking modes

Universal tool grinding machine

USM3

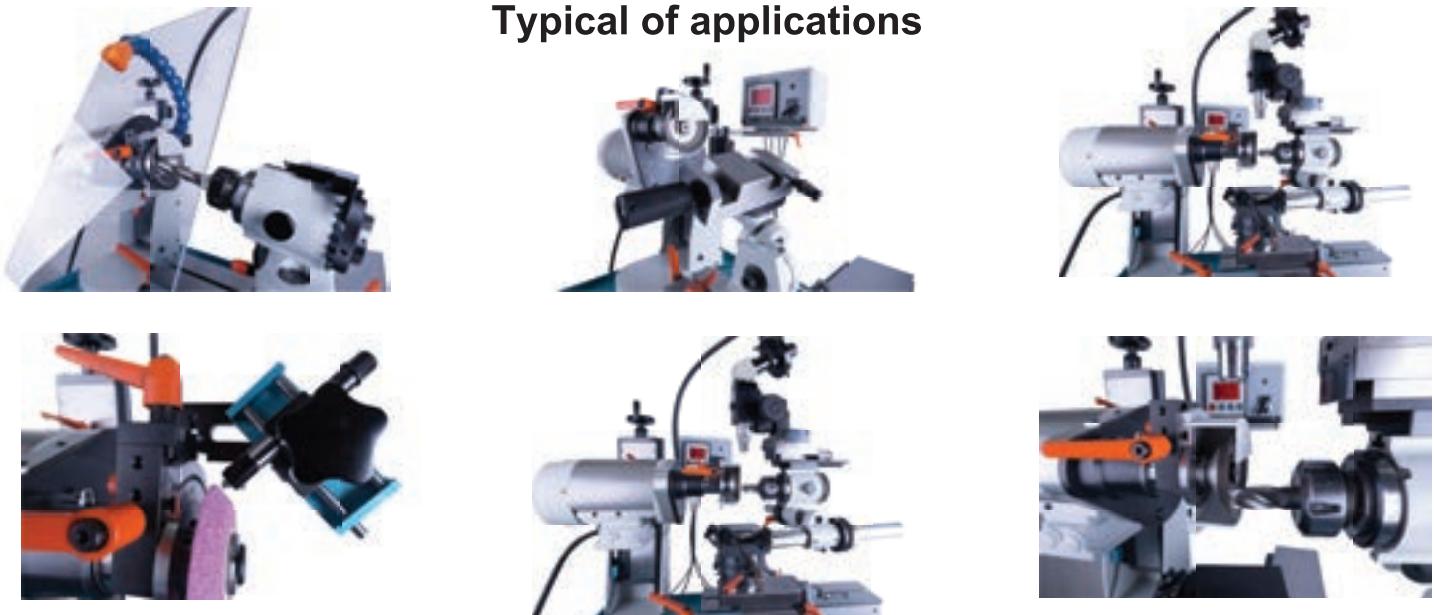


Grinding operations	
Roughing cutters, end mills, shell end mills, dis mills with staggered teeth, Centre cutter end mills	Face: Clearance or cutting angle circumference: Chamfer or radius
Reamers	Cut, clearance angle (three-dimensional)
Twist drill, High-performance HM drills	Surface cut, reduction of cutting edge in one chucking and special finishing
Step drills	Round grind step, Relief grind step, Relief grind step to 180°, release of cylindrical section
Countersinks	Rake grinding, relief grinding
Taps	Peel grinding, grinding relief grinding
Threading die	Internal peel grinding relief grinding
Turning tools and shaping tools	Clearance and rake, radii and profile grinding

Technical data		USM3 Type 14
Operating range	mm	430 x 400 x 400
Coarse adjustment range X	mm	300
Y	mm	360
Z	mm	200
Fine adjustment range Y _f	mm	40
Z _f	mm	125
Stroke length l _{Hx}	mm	150
Swivel range A		+/- 90°
B		+/- 90°
C		+/- 180°
Spindle speed (infinitely variable)	min ⁻¹	1 000 - 12 000
Max. grinding disc diameter	mm	80
Spindle head holder		MK4, ISO40
Max. tool diameter	mm	0.5 - 250
Max. tool length	mm	400
Drive power	kW	0.45
Machine dimensions	mm	680 x 850 x 1 700
Machine weight	kg	175

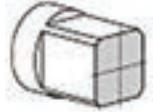
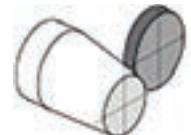


Typical of applications



Universal tool grinding machine

Equipment package	Light	Standard	Convenience	Luxury
Cylinder shaft	up to Ø 20 mm	up to Ø 20 mm	up to Ø 26 mm, MK1-4	up to Ø 34 mm, MK1-4

 End mills and bevelled cutters up to Ø 6 mm: face only up to Ø 6 mm: plus spirals incl. relief grinding	 Roughing cutter Face hobbing and grinding acute spiral grooves: possible with experience	 End mills, step drills, cylindrical cutters, disc mills Radius / edge rounding R0.5 up to R5	
 Ball-nose cutters from Ø 6 mm radius and spiral with radius grinding unit	 Angular mill complete	 Grooving cutter complete	
 Twist drills Cutter (surface cut) incl. reduction of cutting edge also drills with taper MK1, MK2, MK3 and MK4	 Step drills Cutting edge on the drill bit, relief grind step, can be made from standard drill (round grinding pins), measurement of steps and angles.	 Taps relief grinding on cut and peel grinding with 3, 4, 5, and 6 cutting edges	
 Reamers First grind also between centres (distance between centres 400mm)	 Counterbores complete	 Countersinks Relief grinding of groove and circumference	
 Form cutters Grooves, and radius with radius grinding unit	 Engraving cutters from Ø 2	 Cylindrical cutters Face hobbing and grinding Spiral grinding incl. relief grind 2	
 Crossed tooth hobbing cutters and disc cutters complete incl. chip space	 Prism milling cutters and angular cutters complete incl. chip space	 Module milling cutters and form cutters cutting face only	
 Turning tools Workpieces of all types up to a clamping width of 50 mm	 First facing cuts First cut on polyhedrons	 External round grinding	 Internal round grinding

Universal external and internal cylindrical grinding machines

OMICRON 1000 R



OMICRON 600 E T6



OMICRON CNC 3615



OMICRON 2000 P T6



OMICRON 600 E



OMICRON M T6



OMICRON

	R	E	P	M											
600 R	600 E	2000 E T6	3000 E T6	4000 M T6											
600 R T6	600 E T6	CNC 6010	CNC 6030	CNC 8030											
CNC 3206	CNC 3606	CNC 6015	CNC 6020	CNC 8040											
1000 R	1000 E	1000 P T6	3000 E T6	5000 M T6											
1000 R T6	1000 E T6	CNC 6010	CNC 6030	CNC 8060											
CNC 3210	CNC 3615	CNC 6015	CNC 6020	CNC 8060											
Max. distance between centres	mm	600	1 000	630	1 030	1 530	2 030	1 350	1 750	2 250	3 150	3 000	4 000	5 000	6 000
Max. grinding length	mm	600	1 000	630	1 030	1 530	2 030	1 100	1 600	2 100	3 000	3 000	4 000	5 000	6 000
Max. centre height	mm	160		180 / 230*				300 / 350*				400 / 500*			
Max. swing	mm	315		355 / 455*				595 / 695*				795 / 995*			
Max. workpiece weight between the tips	kg	120		250 / 300*				1 200				4 000			
Table															
Max. automatic table movement	mm	680	1 080	780	1 180	1 680	2 180	1 150	1 650	2 150	3 050	3 200	4 200	5 200	6 200
Table speed	m/min	0 - 5		0 - 5				0 - 4				0 - 4			
Swivel table	°	+ 9 /- 5	+ 8 /- 4	+ 9 /- 5	+ 8 /- 4	+ 7 /- 3	+ 6 /- 2	+8/-3	+7/-2	+6/-2	+5/-1	+5/-1	+4/-1	+3/-1	+2/-1
Headstock															
Headstock speed range	rpm	0 - 300		0 - 300				0 - 300				0 - 150			
Max. spindle bore	mm	26		31				44				70			
Internal cone	MK	4		5				6				80			
Headstock, swivelling	°	90		90				90				90			
Tailstock															
Stroke	mm	25		35 - 70**				70				100			
Spindle diameter	mm	43		48				80				120			
Internal cone	MK	4		4				5				6			
Grinding spindle															
Grinding wheel (D x d)	mm	450 x 127		450 x 127				610 x 203				760 x 305			
Grinding wheel width	mm	20 - 50		20 - 80				50 - 120				50 - 120			
Grinding spindle head, swivelling	°	+ 45 /- 45		+ 45 /- 45				+45 /- 45				90			
Internal grinding								Option							

*Upon request

** for hydraulic tailstock

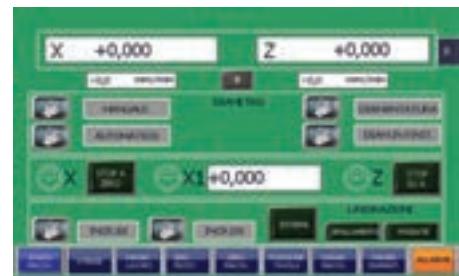
Universal internal cylindrical grinding machine IGR-250

OMICRON IGR-250, 450 – (PLC, CNC)

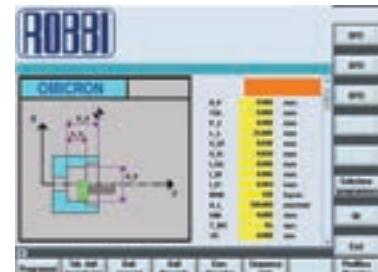
Max. grinding diameter	mm	250	450
Centre height	mm	180 / 230*	
Max. distance headstock - grinding spindle	mm	1 000	
Internal grinding spindle - diameter	mm	100	
Table speed	mm/min	0 - 6000	
Swivel table	°	8	
Headstock speed range	rpm	0 - 600	
Chuck diameter	mm	160	
Grinding spindle - motor	kW	3	
Headstock - motor	kW	0.75	
Front side - grinding apparatus			
Max. grinding diameter	mm	355	
Grinding wheel diameter	mm	125	
Inclination	°	10	
Grinding spindle - motor	kW	1.1	

*Upon request

PLC



CNC



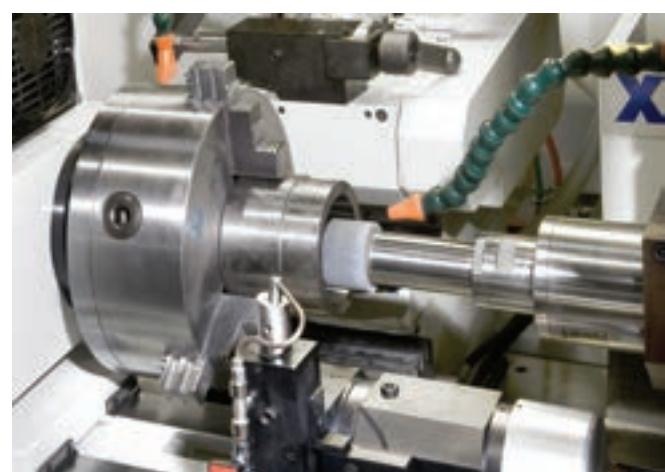
OMICRON IGR 250



Face grinding

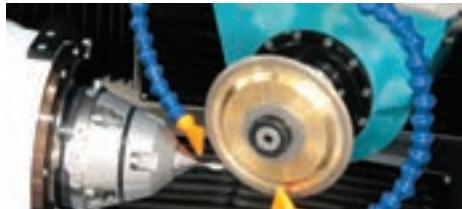


Internal grinding



Precision CNC grinding machines

Super flexible 5-axis machine for finish-grinding and production Complete machining contour and face up to 250 mm cutting length, diameter up to 250 mm



aries NGP



aries NGP		
Axes		
X - longitudinal slide	mm	420 (CNC)
Y - cross slide	mm	360 (CNC)
Z - vertical column	mm	260 (CNC)
A - workpiece carrier	°	Free (CNC)
C - rotation of the grinding head	°	320 (CNC)
Workpiece carrier		
Centre height	mm	151
Interface		HSK 80
Max. speed	rpm	96
Grinding head		
Grinding motor (100%)	kW	5
Double grinding spindle, direct drive		HSK 50 - (2 + 2 grinding wheels)
Max. grinding spindle speed	rpm	12 000
Grinding wheel diameter	mm	50 - 200
Handling* - integrated parts loader		
Workpiece loader	1 pallet 200 x 200 mm, 25 - 100 workpieces	
Weight		
	kg	1 700

*Option

The ideal grinding machine for finish-grinding on flutes, contour and tooth face

aries ENP2, ENP4



aries	ENP2	ENP4
Axes		
X - longitudinal slide	mm	400 (CNC)
Y - cross slide	mm	260 manual
Z - vertical column	mm	300 manual
A - workpiece carrier	°	Free (CNC)
C - rotation of the grinding head	°	±180 manual
Workpiece carrier		
Centre height	mm	210
Steep cone		ISO50
Grinding head		
Grinding motor (100%)	kW	2.2 / 7.5*
Double grinding spindle		HSK 50 - (2 + 2 grinding wheels)
Max. grinding spindle	rpm	9 000
Grinding wheel diameter	mm	50 - 200
Weight		
	kg	2500

*Option

Precision CNC grinding machines

Super flexible 5-axis machine for production and finish-grinding Complete machining, contour and face up to 300 mm cutting length, diameter up to 400 mm, maximum clampable workpiece length 500/800 mm

norma NGC, NGC750



norma	NGC	NGC750
Axes		
X - longitudinal slide	mm	470
Y - cross slide	mm	390
Z - vertical column	mm	325
A - workpiece carrier	°	Free
C - rotation of the grinding head	°	365
Workpiece carrier		
Centre height	mm	210
Interface		ISO50
Max. speed for cylindrical	rpm	800
Grinding head		
Grinding motor (100%)	kW	10
Double grinding spindle, direct drive		HSK 50 (3 + 3 grinding wheels)
Max. grinding spindle speed	rpm	12 000
Grinding wheel diameter	mm	50 - 250
Loader for grinding wheel packages and coolant tubes*		
Wheel package	Pc	7
Max. number of grinding wheels	Pc	21
Handling* - integrated parts loader		
Workpiece loader		1 pallet 300 x 300 mm 49 - 400 workpieces
Weight		
	kg	5 000

*Option

Precision 6-axis CNC grinding machine for the production of highly precise cutting inserts, micro-tools and workpieces

siriusNGS



siriusNGS		
Axes		
X - longitudinal slide	mm	400
Y - vertical column	mm	350
Z - cross slide	mm	280
A - workpiece carrier	°	Free
B - swivel axis	°	270
C - rotation of the grinding head	°	270
Workpiece carrier		
Interface		HSK 80
Grinding head		
Grinding motor	kW	5, 10*
Double grinding spindle		HSK50, HSK 80* (3 + 3 grinding wheels)
Max. grinding spindle speed	rpm	12 000
Grinding wheel diameter	mm	50 - 300
Handling* - robots		
Pallets	Pc	2, 10*
Pallet dimensions	mm	300 x 300 49 - 400 places
Loader for grinding wheel packages and coolant tubes*		
Wheel package	Pc	7
Max. number of grinding wheels	Pc	21
Weight		
	kg	4 000

*Option

Precision CNC grinding machines

Production 5-axis CNC grinding machine for production grinding and tool grinding.

gemini NGM



<i>gemini</i> NGM			
Axes	NGM	GHP	
X - longitudinal slide	mm	500	
Y - cross slide	mm	400	
Z - vertical column	mm	380	
W - oscillating axis	mm	-	20
A - workpiece carrier	°	Free	
C - rotation of the grinding head	°	365	
Workpiece carrier			
Centre height	mm	210	
Interface		ISO50	
Cylindrical grinding*	rpm	800	
Grinding head			
Grinding motor (100%)	kW	10, 24*	10
Double grinding spindle, direct drive		HSK 50, HSK 80* 3 + 3 grinding wheels	Replaceable head
Max. grinding spindle	rpm	12 000	40 000
Grinding wheel diameter	mm	50 - 250	25 - 120
Loader for grinding wheel packages and coolant tubes*			
Wheel package	Pc	8, 14, 24	
Max. number of grinding	Pc	24, 42, 72	
Handling* - robots			
Pallets	Pc	2, 4, 10	
Pallet dimensions	mm	300 x 300 49 - 400 places	
Weight	kg	7 000 <td data-kind="ghost"></td>	

*Option

The revolutionary production machine for the manufacture of threaded tools in a single clamping

gemini TAP



<i>gemini</i> TAP			
Axes			
X - longitudinal slide	mm	400	
Y - cross slide	mm	360	
Z - vertical column	mm	200	
A - workpiece carrier	°	Free	
W - oscillating axis (stroke)	mm	5	
C - rotation of the grinding head	°	290	
Workpiece carrier			
Interface		HSK 80	
Grinding head - thread grinding			
Grinding motor (100%)	kW	24	
Grinding spindle		HSK 190	
Max. grinding spindle speed	rpm	6 000	
Grinding wheel diameter	mm	300 - 400	
Grinding head - flute grinding			
Grinding motor	kW	24	
Double grinding spindle		HSK 50	
Max. grinding spindle speed	rpm	10 000	
Grinding wheel diameter	mm	100 - 225	
Handling* - robots			
Pallets	Pc	2, 4, 10	
Pallet dimensions	mm	300 x 300 49 to 400 places	
Weight	kg	7 000 <td data-kind="ghost"></td>	

Precision CNC grinding machines

Precision 5 (6)-axis CNC grinding machines

for broaching tools, tooth cutters, toothed racks

corvus BBA

corvus GDS

corvus GDS, BBA, BPP, C360, C500

Axes

X - longitudinal slide	<i>gds</i>	mm	650	1100	1700	3000
	<i>bba, bpp, c360, c500</i>	mm	-	1100	1700	3000
Y - vertical column	<i>gds</i>	mm	300		300	
	<i>bba, bpp, c360, c500</i>	mm	-		300	
Z - cross slide	<i>gds</i>	mm	280		280	
	<i>bba, bpp, c360, c500</i>	mm	-		300	
W -vertical - oscillating axis	<i>gds, bba, c360, c500</i>	mm	-	-	-	-
	<i>bpp,</i>	mm	-		100	
A - workpiece carrier	<i>gds, bba, bpp, c360,</i>	°	Free		Free	
C - rotation of the grinding head	<i>gds, bpp, c360, c500</i>	°	240		240	
	<i>bba</i>		-		325	
B - swing of the grinding head	<i>bba</i>	°	-		220	

Workpiece carrier

Steep cone	<i>gds, bba, bpp, c360, c500</i>	ISO 50
------------	----------------------------------	--------

Grinding head

Grinding motor (100%)	<i>gds</i>	kW	15, 20, 26*		
	<i>bba, bpp</i>	kW	-	14	
	<i>c360</i>	kW	-	26	
	<i>c500</i>	kW	-	40	
Double grinding spindle	<i>gds</i>		HSK 50.80		
	<i>bba, bpp</i>		-	HSK 50	
	<i>c360</i>		-	HSK 80	
Grinding spindle	<i>c500</i>		-	HSK 190	
Max. grinding spindle speed	<i>gds, bpp, c360</i>	rpm	10 000	10 000	
	<i>bba</i>	rpm	-	18 000	
	<i>c500</i>	rpm	-	6 000	
Grinding wheel diameter	<i>gds, bba</i>	mm	50-250	50 - 250	
	<i>bpp</i>	mm	-	50 - 200	
	<i>c360</i>	mm	-	to 360	
	<i>c500</i>	mm	-	to 500	
Weight	<i>gds</i>	kg	11000	12500	14500 19000
	<i>bba</i>	kg	-	14000	18500 22000
	<i>bpp</i>	kg	-	12500	14500 19000
	<i>c360, c500</i>	kg	-	12500	14500 19000

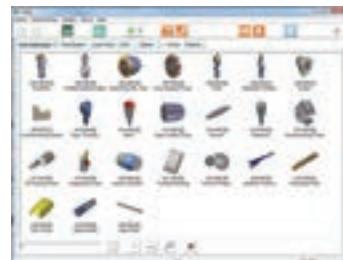
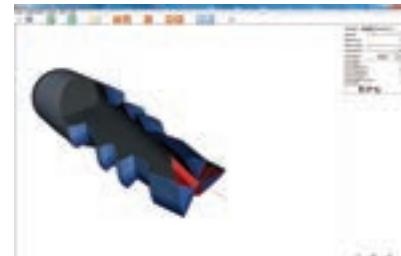
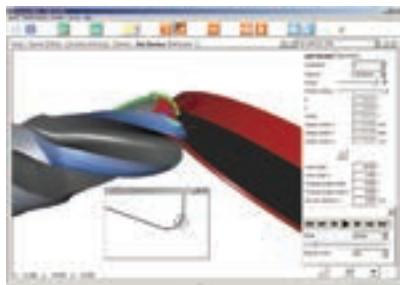
corvus BPP

corvus C500


*Option

Precision CNC grinding machines

The ideal solution for every tool is “Qg1”



Years of experience and innovation in the field of tool grinding and production grinding have been integrated in the Qg1 software and represent the strongest argument for purchasing a grinding machine from J. Schneeberger Maschinen AG



GALILEO

X - axis	vertical column	300 mm
Y - axis	longitudinal slide	250 mm
A - axis	rotation free	ISO 50
Weight	600 kg	



3-axis measuring machine with two cameras and optional 3D probe for measuring shaft tools and cutting inserts and presetting of grinding wheels

Precision CNC grinding machines

Automation



Loader *ariesNGP*



Loader *normaNGC*



**Robot *geminiNGM*
2 pallets**



Robot *geminiNGM Stack*



**Robot *geminiNGM*
4 pallet**



Robot *siriusNGS*



Robot *siriusNGS Stack*



Loader *corvus max Robot*

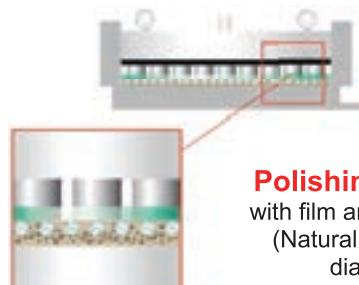


Loader *corvus Arbor Arena Robot*

Flat honing, lapping, polishing



Lapping process
with transfer liquid and
rolling grit
(SiC, Al₂O₃, B₄C)



Polishing process
with film and upright grit.
(Natural or synthetic
diamond)

Flat lapping machines

FLM 500 - 550



Technical data		FLM 500	FLM 550
Outside Ø of lapping plate	mm	500	550
Inside Ø of the 3 conditioning rings	mm	190	220
Speed of the lapping plate infinitely variable	min ⁻¹	0 - 75	0 - 75
Timer		digital	digital
Motor main drive	kW	2.2	2.2
Weight	kg	480	480
Compressed air supply	bar	6	6
Cooling system, capacity of coolant reservoir	L	150	150

FLM 750 - 1000 - 1250 - 1500



Technical data		FLM 750	FLM 1000	FLM 1250	FLM 1500
Outside Ø of lapping plate	mm	750	1000	1250	1500
Inside Ø of the 3 conditioning rings	mm	300	400	500	600
Speed of lapping wheels infinitely variable	min ⁻¹	0 - 70	0 - 60	0 - 50	0 - 35
Timer		digital	digital	digital	digital
Motor main drive	kW	4	7.5	15	22
Weight	kg	1 500	2 500	3 950	5 850
Compressed air supply	bar	6	6	6	6
Cooling system, capacity of coolant reservoir	L	150	150	150	150

FLM 500-R

Cylindrical lapping and polishing machines



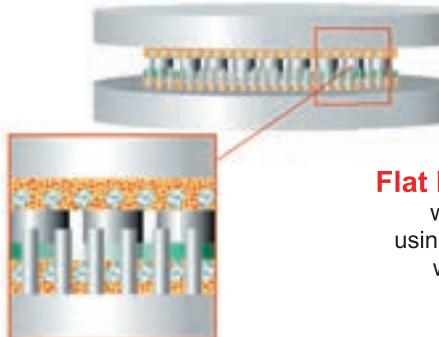
Technical data	FLM 500-R
Outside Ø of the working wheel	mm 500
Pneumatic lift 6 bar	daN 0 - 110
Timer	Touchscreen
Speed of the lapping plate, infinitely variable	min ⁻¹ 0 - 75
Motor main drive	kW 2.2
Dimensions L x W x H	cm 85 x 100 x 200
Weight	kg approx. 350
Workpiece dimensions	mm Ø 0.7 - 30 length 5 - 200

Technical data	CLM 150-2	CLM 500
Lapping roll pairs	2	1
Roll length	mm 150	500
Workpiece Ø	mm 6 - 150	6 - 150
Motor main drive	kW 0.55	1.1
Dimensions LxWxH	cm 100 x 60 x 110	100 x 60 x 110
Weight	kg 480	550

CLM 150 - 500



Flat honing, lapping, polishing



Flat honing process

with bonded grit
using diamond or CBN
working wheels



1 - sided flat honing machine

FH 602-H



Technical data		FH 602-H
Working wheels Ø	mm	550 - 600 / 190
Workpiece cage Ø	mm	180
Achievable switch-off accuracy	µ	1
Drive power	kW	4
Speeds of working wheels	min ⁻¹	0 - 140
Rotational direction of all drives		freely selectable
Working power		pneumatic
Working power/ ramps		programmable
Workpiece height	mm	0.1 - 50
Spray liquid		monitored
Operating voltage		24 V DC
Weight	kg	approx. 1100



2 - sided flat honing machine



DLM 705 - 805 - 1005 - 1205 - 1405



Technical data		DLM 705 - 805	DLM 1005 - 1405
Outside Ø of the working wheels	mm	650 - 870	1020 - 1360
Number of carriers		4 - 8	
Distance between working wheels	mm	<390	
Workpiece load infinitely variable	daN	0 - 2000 (3000)	0 - 3500 (5000)
PC operated control system		freely programmable	
Switch-off accuracy	µ	0.1	
Cooling of working wheel		yes	
Speeds of upper and lower working wheels infinitely variable			
Flat honing and fine grinding	min ⁻¹	0 - 250, 300, 400, 600	0 - 210, 300
Centre drive	min ⁻¹	0 - 125, 220	0 - 100, 150
Rotational direction of all drives		freely programmable	
Weight	kg	8000	from 13000

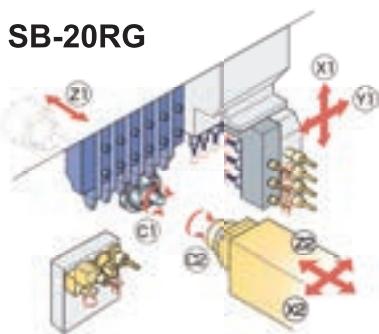
CNC Swiss type automatic lathe



SB-12/20RG

Technical data	SB-12RG	SB-20RG
Number of axes		7
MAIN SIDE		
Main spindle (headstock)		Z1 / C1 axis
Linear slides		X1 / Y1
Max. turning diameter	mm	12 20 (23)
Max. headstock stroke long / short turning	mm	205 / 30 205 / 50
Max. drive power	kW	3.7
Max. speed	min ⁻¹	15 000 10 000
Tools linear slides		
Turning tools	Pc	6 (Ø 12 mm)
Drilling tools (4 spindle drilling apparatus)	Pcs	4 x ER16
Cross working tools	Pcs	5 (7)
Speed	min ⁻¹	8 000
REAR SIDE		
Counter spindle		X2 / Z2 / C2 axis
Max. gripping diameter	mm	12 20 (23)
Drive power	kW	1.2
Max. speed counter spindle	min ⁻¹	12 000 9 000
Tools rear side machining		
Drilling tools (4 fold tool holder)	Pcs	4 (holder Ø 22)
Drive (standard)	Pcs	4 x ER16
Max. speed rear side machining	min ⁻¹	8 000
GENERAL DATA		
Rapid traverse	m/min	up to 35
Dimensions (W x D x H)	mm	2 070 x 1 177 x 1 760
Weight	kg	1 750

SB-20RG



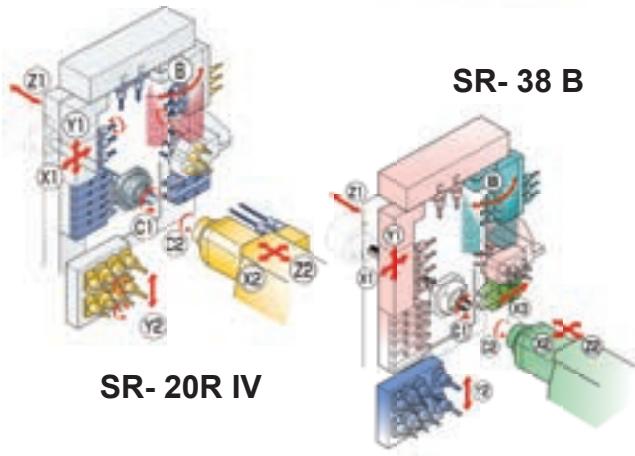
SR-20R IV A,B

SR-38 A,B



Technical data	SR-20R IV	SR-38 A, B
Number of axes	8 / 9	9 / 10
MAIN SIDE		
Main spindle (headstock)	Z1 / C1 axis	Z1 / C1 axis
Linear slides	X1 / Y1 / B axis	X1 / X3 / Y1 / B axis
Max. turning diameter	mm	20 (23) 38 (42)
Max. headstock stroke long / short		205 / 50 320 / 95
Max. drive power	kW	3.7 11.0
Max. speed	min ⁻¹	10 000 7 000
Tools linear slides		
Turning tools head 1	Pcs	7 (Ø 12 mm) 5 (Ø 16 mm)
Turning tools head 3	Pcs	- 2 (Ø 16 mm)
Drilling tools	Pcs	4 x ER16 3 x ER16, 2 x ER20
Cross working tools	Pcs	5 x ER16 6 x ER20
B axis (e.g. for angled holes)	Pcs	3 x ER16 main side 3 x ER16 main side
	Pcs	3 x ER11 rear side 3 x ER16 rear side
Speed	min ⁻¹	8 000 6 000
Tools gun drilling unit		
Number of tools	Pcs	2 -
Holder	mm	Ø 22 -
Max. drilling depth	mm	100 -
REAR SIDE		
Gripping spindle		X2 / Z2 / C2 axis X2 / Z2 / C2 axis
Max. gripping diameter	mm	20 (23) 38 (42)
Drive power	kW	3.7 5.5
Max. speed counter spindle	min ⁻¹	10 000 7 000
Tools rear side machining		
Height axis		Y2 Y2
Number of tools	Pcs	8 (fixed or driven) 8 (fixed or driven)
Max. speed	min ⁻¹	8 000 6 000
GENERAL DATA		
Rapid traverse	m/min	up to 35 up to 36
Dimensions (W x D x H)	mm	2 334 x 1 200 x 1 695 2 740 x 1 315 x 2 120
Weight	kg	2 600 4 300

SR- 38 B



SR- 20R IV

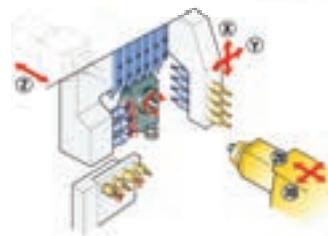
CNC Swiss type automatic lathe

SR-10J SR-32J II B

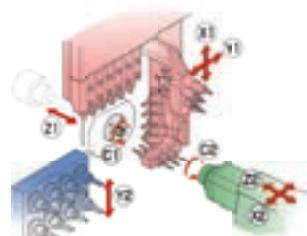
Technical data		SR-10J	SR-32J II- A,B
Number of axes		7	8
MAIN SIDE			
Main spindle (headstock)		Z1 / C1 axis	Z1 / C1 axis
Linear slides		X1 / Y1	X1 / Y1
Max. turning diameter	mm	10	32 (35)
Max. headstock stroke long / short turning:	mm	105 / -	320 / 80
Max. drive power	kW	3.7	11.0
Max. speed	min ⁻¹	15 000	8 000
Turning tools	Pc	6	6
Drilling tools (front-/rear)	Pc	4	5
Driven tools	Linear holder	Pcs	3
	for rear side machining	mm	2
	Max. speed	min ⁻¹	10 000
	Drive motor	kW	0.5
Rear side machining			
Counter spindle		Z2 / X2 / C2 axis	Z2 / X2 / C2 axis
Height axis rear side machining		-	Y2
Max. gripping diameter	mm	10	32 (35)
Gripping spindle motor	kW	1.1	5.5
Max. gripping spindle speed	min ⁻¹	10 000	8 000
Tools (driven)	Number	Pcs	2 fixed + 2 driven
	Max. speed	min ⁻¹	8 000
GENERAL DATA			
Rapid traverse	m/min	35	35
Dimensions (W x D x H)	mm	1 865 x 775 x 1 695	2 690 x 1 345 x 1 780
Weight	kg	1 400	3 900



SR-32J II B



SR-10J

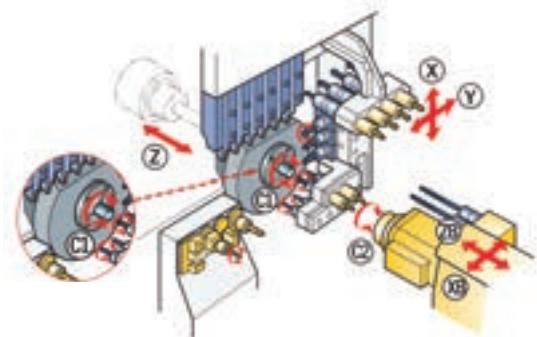


SR-20J / JN

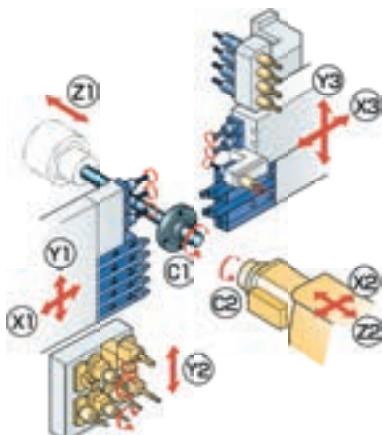
Technical data		SR-20J / JN
Number of axes		7
MAIN SIDE		
Main spindle (headstock)		Z1 / C1 axis
Linear slides		X / Y
Max. turning diameter	mm	20 (23)
Max. headstock stroke long / short turning	mm	205 / 55
Max. drive power	kW	3.7
Max. speed	min ⁻¹	10 000
Tools linear slides		
Turning tools	Pcs	6
Drilling tools (4 spindle drilling apparatus)	Pcs	4
Cross working tools	Pcs	5
Speed	min ⁻¹	8 000
REAR SIDE		
Counter spindle		X2 / Z2 / C2 axis
Max. gripping diameter		20 (23)
Drive power		2.2
Max. speed counter spindle		8 000
Tools rear side machining		
Drilling tools (4 fold tool holder)	Pcs	4
Drive (standard)	Pcs	4
Max. speed rear side machining	min ⁻¹	8 000
GENERAL DATA		
Rapid traverse		35
Dimensions (W x D x H)	mm	2 200 x 1 200 x 1 700
Weight	kg	2 200



SR-20J/JN

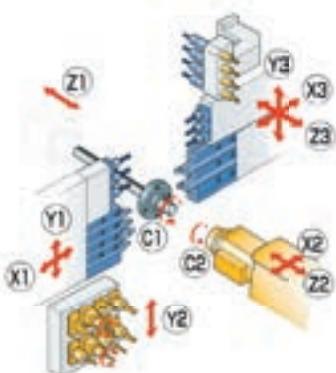


CNC Swiss type automatic lathe



SW-12R II

Technical data		SW-12R II
Number of axes		10
MAIN SIDE		
Main spindle (headstock)		Z1 / C1 axis
Linear slides		X1 / Y1 / X3 / Y3 axis
Max. turning diameter	mm	13
Max. headstock stroke long / short turning		135 / 30
Max. drive power	kW	3.7
Max. speed	min ⁻¹	15 000
Tools linear slides		
Turning tools	Pcs	5+2 (□ 10 mm)
Drilling tools (4 spindle drilling apparatus)	Pcs	4 x ER11
Cross working tools	Pcs	6 x ER11
Speed	min ⁻¹	12 000
REAR SIDE		
Counter spindle		X2 / Y2 / Z2 / C2 axis
Max. gripping diameter	mm	12
Drive power	kW	3.7
Max. speed counter spindle	min ⁻¹	15 000
Tools rear side machining		
Drilling tools (4 fold tool holder)	Pcs	4 (holder Ø 22)
Drive (standard)	Pcs	8
Max. speed rear side machining	min ⁻¹	12 000
GENERAL DATA		
Rapid traverse	m/min	up to 35
Dimensions (W x D x H)	mm	1 995 x 920 x 1 700
Weight	kg	2 100



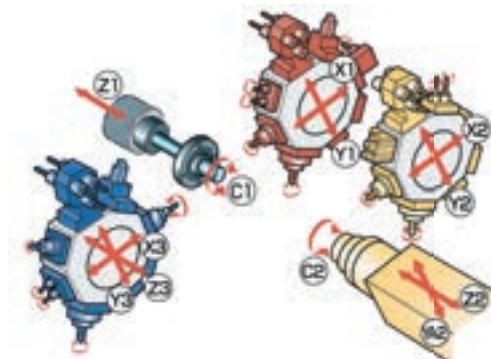
SW-20

Technical data		SW-20
Number of axes		11
MAIN SIDE		
Main spindle (headstock)		Z1 / C1 axis
Linear slides		X1 / Y1 / X3 / Y3 / Z3 axis
Max. turning diameter	mm	20 (23)
Max. headstock stroke		205
Max. drive power	kW	3.7
Max. speed	min ⁻¹	10 000
Tools linear slides		
Turning tools	Pcs	6 (□ 12 mm / □ 16 mm)
Drilling tools (4 spindle drilling apparatus)	Pcs	4 x ER16
Cross working tools	Pcs	6 x ER16
Speed	min ⁻¹	8 000
REAR SIDE		
Gripping spindle		X2 / Y2 / Z2 / C2 axis
Max. gripping diameter	mm	20 (23)
Drive power	kW	3.7
Max. speed counter spindle	min ⁻¹	10 000
Tools rear side machining		
Drilling tools (4 fold tool holder)	Pcs	4 (holder Ø 22)
Drive (standard)	Pcs	6 driven + 2 fixed
Max. speed rear side machining	min ⁻¹	8 000
GENERAL DATA		
Rapid traverse on all linear axes	m/min	35
Dimensions (W x D x H)	mm	2 558 x 1 150 x 1 765
Weight	kg	3 400

CNC Swiss type automatic lathe

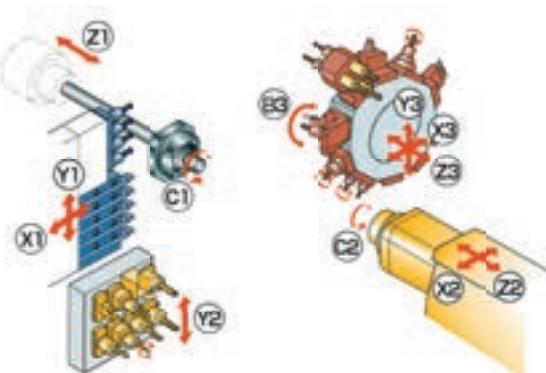
ST-20, ST-38

Technical data		ST-20	ST-38
Number of axes		12	
Number of stations turrets 1, 2, 3		8	10
MAIN SIDE			
Main spindle (headstock)		Z1 / C1 axis	
Turret 1		X1 / Y1 axis	
Turret 3		X3 / Y3 / Z3 axis	
Max. turning diameter	mm	20 (23)	38 (40)
Max. headstock stroke	mm		350
Max. drive power	kW	5.5	11
Max. speed	min ⁻¹	10 000	7 000
Drive power turrets 1 and 3	kW	2.5	4
Speed turrets 1 and 3	min ⁻¹	5 750	5 700
REAR SIDE			
Gripping spindle		Z2 / C2 / Y4 axis	
Turret 2		X2 / Y2 axis	
Max. gripping diameter	mm	20 (23)	38 (40)
Drive power	kW	5.5	7.5
Max. speed counter spindle	min ⁻¹	10 000	7 000
Drive power turret 2	kW	2.5	4
Speed turret 2	min ⁻¹	5 750	5 700
GENERAL DATA			
Rapid traverse	m/min	up to 30	
Dimensions (W x D x H)	mm	2 988 x 1 720 x 1 845	3 477 x 1 859 x 1 865
Weight	kg	4 850	6 250



SV-20R SV-38R

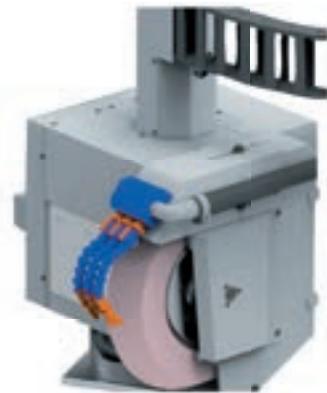
Technical data		SV-20R	SV-38R
Number of axes		12	12
MAIN SIDE			
Main spindle (headstock)		Z1 / C1 axis	
Linear slides		X1 / Y1	
Turret		B3 / X3 / Y3 / Z3 axis	
B axis on the turret		freely programmable	
Max. turning diameter	mm	20 (23)	38 (42)
Max. headstock stroke long / short		205 / 50	350 / 95
Max. drive power	kW	5.5	11.0
Max. speed	min ⁻¹	10 000	7 000
Tools linear slides			
Turning tools	Pc	7 (dia 12 mm)	4 (dia 16 mm) / 1 (dia 20)
Cross working tools	Pc	4 x ER20	
Max. speed	min ⁻¹	8 000	5 000
Drive power	kW	2.2	2.2
Tools turret			
Number of tool stations		8 (all driven)	10 (all driven)
B axis e.g. for angled holes)		4 stations	5 stations
Max. speed	min ⁻¹	5 700	
Drive power	kW	2.7	4
REAR SIDE			
Counter spindle		X2 / Z2 / C2 axis	
Max. gripping diameter	mm	20 (23)	38 (40)
Drive power counter spindle	kW	3.7	7.5
Max. speed counter spindle	min ⁻¹	10 000	7 000
Tools rear side machining			
Height axis		Y2	Y2
Tool stations	Pcs	8 (6 driven 2 fixed)	
Max. speed	min ⁻¹	8 000	5 000
GENERAL DATA			
Rapid traverse	m/min	up to 30	
Dimensions (W x D x H)	mm	2 730 x 1 350 x 1 865	3 420 x 1 440 x 1 865
Weight	kg	4 150	4 300



The efficient production grinding machines

TSCHUDIN

T25

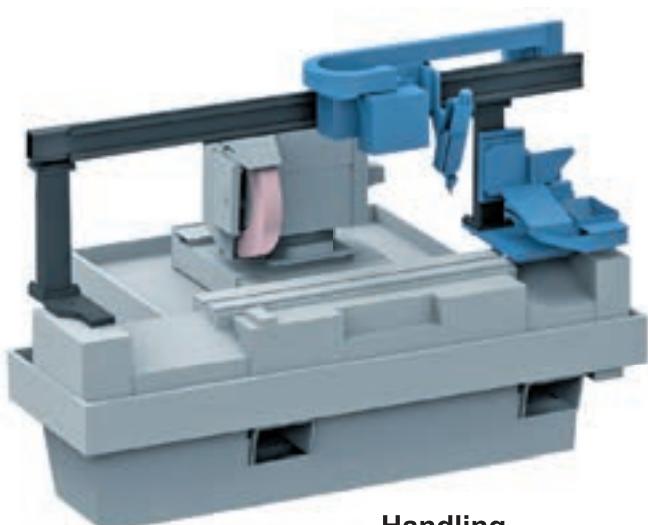
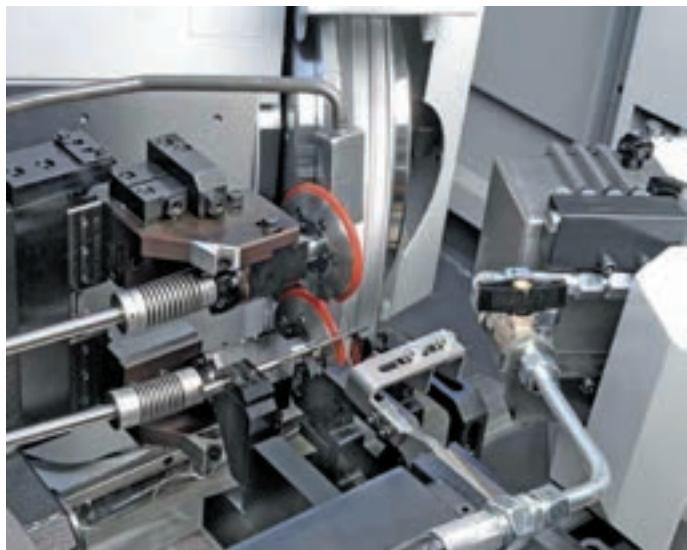


RS/R grinding head

Technical data			T25
Operating range			
Distance between centres	mm	400 / 600	
Z axis travel	mm	500 / 750	
Rapid traverse	m/min	20	
Resolution	µ	0.1	
X axis travel	mm	365	
Rapid traverse	m/min	10	
Resolution	µ	0.1	
Grinding wheel	mm	550 x 80 (100)	
Peripheral speed with anti-friction bearing	m/s	45 (63)	
Power	kW	10	
Control system		Fanuc 31i	



CNC control system Fanuc 31i



Handling

The modular production external grinding machine

TSCHUDIN

T35



Technical data		T35
Specifications		
Distance between centres	mm	400
Grinding length	mm	400
Centre height	mm	125 / 175
Max. workpiece diameter	mm	249
Workpiece weight		
between centres	kg	150
Traversing axes		
Z axis	mm	600
Rapid traverse	m/min	15
Resolution	µm	0.1
Upper table		
Table swivelling	Degrees	+/- 6
Cross slide:		
X axis	mm	350
Rapid traverse	m/min	7.5
Resolution	µm	0.1
Grinding head		
Grinding wheel (special apps)	mm	400 – 500 x 80 x 203.2
Diameter	mm	up to 600
Width	mm	up to 120
Peripheral speed with anti-friction bearing	m/s	0 - 120
Peripheral speed hydrodynamic	m/s	45 / 60
Speed	min ⁻¹	V const (opt.)
Power	kW	10 (opt. up to 20)
Workpiece headstock		
Speed	min ⁻¹	5 – 1500 (opt. 3000)
Power	kW	2.1
Mounting shank		MK5 / Ø 70 mm // MK6 / Ø 90 mm
Spindle bore	mm	34
Drive torque	Nm	20
Tailstock		
Stroke	mm	80
Mounting shank		MK3
Control system		Bosch / Siemens

Universal internal / external circular grinding machines

VOUMARD VM 110



Technical data	VOUMARD 110	
Internal diameter to be ground	mm	up to 150
Maximum dimensions of workpieces		
Manual chucking	mm	160 x 80
Automatic chucking	mm	120 x 80
In centreless	mm	160 x 50
Chuck equipment		
Max. outside diameter of chuck	mm	250
Max. weight of workpiece and cutting tool	daN / 100 mm	50
Programmable speeds	min ⁻¹	0 - 1 500
Axial clamping force	daN	600
Axes X and Z		
Available stroke X	mm	220
Available stroke Z	mm	300
Resolution	µm	0.1
Max. speed	m/min	20
Centre height		
Over workpiece table	mm	130
Over grinding table	mm	245
Machine dimensions L x W x H	mm	2 000 x 1 560 x 2 100
Weight approx.	kg	2 800

4 spindle turret



External grinding



Die VOUMARD VM 110 is a universally deployable internal and external circular grinding machine which is equally suited for one-off machining or series production of workpieces with small and intermediate dimensions

Typical areas of application include the machining of one-off components for the manufacture of

- Hydraulic components
- Ball bearings
- Fuel injection systems

Universal internal / external circular grinding machines

VOUMARD VM 150



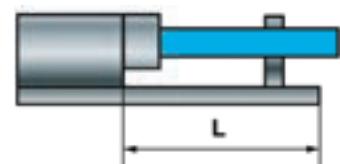
		VOUMARD VM 150	VOUMARD VM 300
Grinding range			
Internal diameters up to	mm	200 + Ø grinding wheel	500
External diameters max.	mm	260 - Ø grinding wheel	640
Recommended grinding depth	mm	250	300
Maximum dimensions of workpiece or chuck (swing diameter)			
Under protective hood	mm	380	
Over workpiece table	mm	350	550
Over gap	mm	500	830
Chuck equipment dependent on model			
Programmable speeds	min ⁻¹	0 - 850 or 560	dependent on model
Max. weight of chuck and workpiece	daN / 100mm	200 or 250	500
Axial clamping force	daN	750 or 1 200	
X and Z axis			
Gap stroke X	mm	230	300
Available stroke Z	mm	500	600 / 1000
Resolution	µm	0.1	0.1
Max. speed	m/min	X=10 / Z=20	20
Centre height			
Over workpiece table	mm	200	200 / 300
Dimensions of the machine L x W x H			
Model L7	mm	3 500 x 2 000 x 2 150	5518 x 3965 x 2179
Model L13	mm	4 450 x 2 000 x 2 150	6474 x 4115 x 2179
Model L15	mm	4 450 x 2 000 x 2 150	-
Weight dependent on model			
	kg	5 000 to 6 000	6 000 to 8 000

Grinding of short workpieces on all versions



Machine model	VM 150		VM 300	
	Length L	Swivelling range B axis	Length L	Swivelling range B axis
L7	700	max. 15°	750	max. 20°
L13	1 300	max. 10°	1300	max. 15°
L15	1 500	max. 10°	-	-

Grinding of long workpieces with steady rest



The VOUMARD VM 150 and VM300 are universally deployable internal and external circular grinding machines which are equally suited for one-off machining or series production of workpieces with medium to large dimensions

- Typical areas of application include the machining of one-off components for the manufacture of
- Hydraulic components
 - Machine tool spindles
 - Ball bearings
 - Transmissions

Conventional precision engine lathes

PRIMUS VC^D

CONDOR VC^{Plus}
PRAKTIKANT GS^D
PRAKTIKANT VC^D
PRAKTIKANT VC^{Plus}

COMMODOR 180 GS^D
COMMODOR 180 VC^D
COMMODOR 180 VC^{Plus}


TECHNICAL DATA		PRIMUS VC ^D	PRAKTIKANT			CONDOR VC ^{Plus}	COMMODOR		
			GS ^D	VC ^D	VC ^{Plus}		180GS ^D	180VC ^D	230VC ^D
Operating range									
Distance between centres	mm	500	650	650	650	800	1 000	1 000	1 000
Centre height	mm	140	160	160	160	180	180	180	230
Swing diameter over bed	mm	280	320	320	320	360	380	380	475
Swing diameter over cross slide	mm	150	190	190	190	190	215	215	270
Main spindle									
Spindle head according to DIN 55027	Size	5	5	5	5	6	6	6	6
Spindle diameter in the front bearing	mm	70	70	70	70	90	90	90	90
Spindle bore	mm	43	43	43	43	57	56	56	56
Internal taper according to DIN 228	MK	meters 50	meters 50	meters 50	meters 50	6	6	6	6
Main drive									
Drive power	kW	4	2.6 / 3.1	7.5	8	10.5	4	5.5	12.5
Speed range	min ⁻¹	30-4 000 (30-5 000)	48-2 500	30-4 000 (30-5 000)	25-5 000	25-4 000	25-2 000	25-2 000	25-2 000
Number of gear speeds		1	8	1	1	9	4	4	
Speed levels		infinitely variable	16	infinitely variable	infinitely variable	18	infinitely variable	infinitely variable	
Feed range									
Number of feeds		24	24	24	infinitely variable	infinitely variable	200	200	320
longitudinal	mm/rev.	0.02-0.63	0.02-0.63	0.02-0.63	0.01-6	0.01-6	0.026-0.9	0.026-0.9	0.026-7.4
level	mm/rev.	0.006-0.2	0.006-0.2	0.006-0.2	0.003-2	0.003-2	0.013-0.45	0.013-0.45	0.013-3.7
Thread pitches									
Metric threads	mm	0.25-8	0.25-8	0.25-8	0.1-20	0.1-20	0.3-10	0.3-10	0.3-80
Inch thread	G/"	80-2	80-2	80-2	80-2	80-2	80-2.75	80-2.75	80-0.75
Tailstock									
Tailstock quill stroke	mm	85	85	85	85	110	150	150	150
Tailstock quill diameter	mm	40	40	40	40	50	60	60	70
Location taper DIN 228	MK	3	3	3	3	3	4	4	4
Weight	kg	850	1 050	1 050	1 100	1 500	1 800	1 900	2 000

Engine lathes and servo engine lathes

**DA 210
DA 260**

**C30
C50**


TECHNICAL DATA	DA	210	210AC	260	260AC
Operating range					
Distance between centres	mm	1 000, 1 500		1 000, 1 500, 2 000	
Centre height	mm	210		260	
Swing diameter over bed	mm	435		535	
Swing diameter in the bed recess	mm	470		560	
Swing diameter over cross slide	mm	245		345	
Bed width	mm	330		330	
Travel of cross slide	mm	330		330	
Travel of upper support	mm	130		130	
Turning tool cross section	mm	25x25			
Main drive					
Drive power 100% ED	kW	5.5		7.5	5.5
Main spindle					
Spindle head according to DIN 55027	Size	6			
Spindle diameter in the front bearing	mm	83		100	
Spindle bore	mm	52		71	
Internal taper of main spindle	mm	Metr. 57		Metr. 71	
Speed range	min ⁻¹	44-2 000	20-2 500	33-1 500 (44-2 000)	20-2 500
Speed levels		12	2	12	2
Feeds					
Longitudinal feed	mm/r	0.072-4	0.072-2	0.072-4	0.072-2
Cross feed	mm/r	0.036-2	0.036-1	0.036-2	0.036-1
Tailstock					
Tailstock quill diameter	mm	65			
Tailstock quill stroke	mm	120			
Internal taper of tailstock quill	MK	4		5	
Thread cutting range					
Metric threads	mm	0.5-28	0.5-14	0.5-28	0.5-14
Inch threads	G/1"	56-1	56-2	56-1	56-2
Permissible workpiece					
Overhung	kg	150		200	
With tailstock	kg	500		800	
With steady	kg	700		1 000	
Weight					
	kg	1 300 1 550	1 450 1 700	1 510 1 760 2 050	1 650 1 900 2 200

Parat system

Multi Suisse system

Precision engine lathes with cycle control


E30

E175

V90

E50^{HD}

TECHNICAL DATA	E series (2-way bed)												V series (4-way)	
	E30	E40	E50 ^{HD}	E60	E70	E80	E90	E110	E120	E150	E175	E200	V90	V110
Distance between centres	mm	750	1 000	1 000 2 000	1 000 2 000	1 000- 6 000	1 000- 6 000	2 000- 12 000	2 000- 12 000	2 000- 12 000	2 000- 12 000	2 000- 15 000	3 000- 12 000	3 000- 12 000
Swing diameter over bed	mm	330	435	570	650	720	800	900	1 100	1 200	1 500	1 750	2 000	940
Swing diameter over cross slide	mm	160	200	340	400	430	510	530	730	830	1 030	1 280	1 530	590
Travel of cross slide	mm	180	260	340	380	410	410	590	590	590	790	790	580	580
Bed width	mm	240	330	350	380	480	480	600	600	600	830	830	900	900
Drive power 60/100% ED	kW	11/9	20/17	20/17	25/20	37/30	37/30	45/37	45/37	45/37	65/51	65/51	45/37	45/37
Max. torque on the spindle	Nm	165	450	1 300	1 700	3 150	3 150	6 000	6 000	8 000	10 700	10 700	12 000	8 000
Spindle head according to DIN 55027	Size	5	6	8	8	11	11	11	11	15	15	15	20	15(20)
Spindle bore	mm	40.5	66	83*	83	128**	128**	128***	128***	165****	165****	165****	262*****	165****
Spindle diameter in the front bearing	mm	70	110	120	120	150	150	178	178	235	235	235	330	235
Speed range	min ⁻¹	1 - 4 500	1 - 3 500	1 - 2 500	1 - 2 500	1 - 1 800	1 - 1 800	1 - 1 120	1 - 1 120	1 - 900	1 - 900	1 - 900	1 - 500/30 0	1 - 900
Longitudinal feed force	N	6 000	10 000	12 000	12 000	20 000	20 000	20 000	20 000	20 000	30 000	30 000	30 000	20 000
Feed range	mm/rev.	0.001-50												
Thread pitch range	mm	0.1-2 000												
Tailstock quill diameter	mm	50	65	80	100	115	115	140	140(180)	140(180)	180	180	180	140(180)
Internal taper of tailstock quill	Mk	3	4	5	5	6	6	6	6	Metr.100	Metr.100	Metr.100	6	6/Metr.100
Machine weight approx.	kg	1 600	3 400	3 800 4 300	5 200 6 400	4 500 9 000	5 000 9 500	8 500 14 500	9 500 15 500	10 500 16 500	16 000 32 000	18 000 34 000	20 000 34 000	15 000 27 000
Acceptance accuracy	DIN	8605	8605	8605	8605	8605	8605	8606	8606	8606	8607	8607	8606/8607	8606/8607

* Spindle bores 128, 165 mm on request

**** Spindle bores 262, 362 mm on request

** Spindle bores 165, 216 mm on request

***** Spindle bores 262, 362, 450 mm on request

*** Spindle bores 165, 262, 362 mm on request

***** Spindle bores 362, 450 mm on request

8 tool disc-type turret

4 tool head-type turret

Turning, drilling and milling unit

CNC precision lathes



DZ45 CNC
DZ65 CNC



TECHNICAL DATA	DZ45 CNC				DZ65 CNC			
	AR	ARY	AG	AGY	AR	ARY	AG	AGY
Operating range								
Max. turning diameter	mm	240			240			
Travel X	mm	207.5	205		207.5	205		
Travel Z	mm	530			530			
Main spindle -spindle motor								
Spindle head according to DIN 55026	Size	5			6			
Max. chuck size	mm	160			200			
Spindle bore	mm	53			77			
Feed-through in draw/thrust tube	mm	42			66			
Max. speed	min ⁻¹	6 000			5 000			
Torque at 60% ED	Nm	128			260			
Drive performance at 60% ED	kW	21.5			27			
Feed drive								
Feed force X/Z/Q	daN	530			530			
Rapid traverse speed X/Z/Q	m/min	30/30/30			30/30/30			
Tailstock								
Clamping of live centre	MK	4	-		4	-		
Thrust force max.	daN	530	-		530	-		
Counter spindle-spindle motor								
Spindle head according to DIN 55026	Size	-	5		-	5		
Max. chuck size	mm	-	160		-	160		
Feed-through in draw/thrust tube	mm	-	42		-	42		
Max. speed	min ⁻¹	-	6 000		-	6 000		
Torque at 60% ED	Nm	-	85		-	85		
Drive performance at 60% ED	kW	-	17		-	17		
Tools turret								
Not AGW / AGW		12/12	16/16		12/12	16/16		
Toolholder shaft cross section	mm	20x20	16x16		20x20	16x16		
Shaft diameter according to DIN 69880	mm	30	25		30	25		
Drive performance at 60% ED	kW	4.5			4.5			
Speed of tool drive max.	min ⁻¹	4 000			4 000			
Tool turret with Y axis								
Y travel	mm	-	+ 45/- 35	-	+ 45/- 35	-	+ 45/- 35	-
Control system								
Sinumerik 840D sl								
Weight	kg	6 100	6 500	6 300	6 700			



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