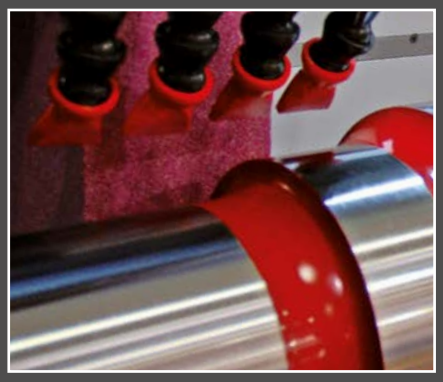
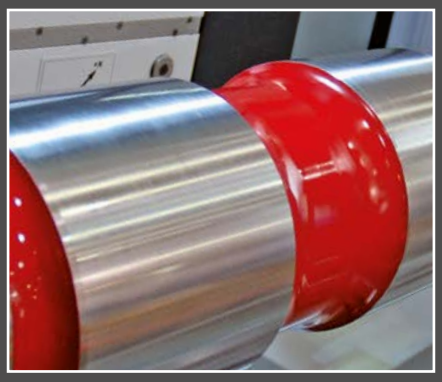
FERMAT

GRINDING MACHINES


www.fermatmachinetool.com

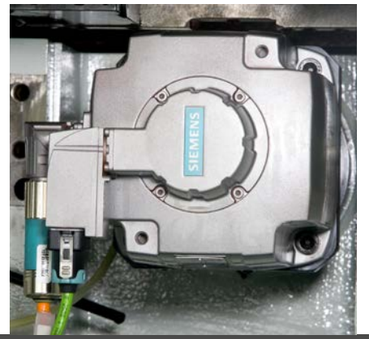
CYLINDRICAL GRINDING MACHINES

FERMAT FAST FACTS

FERMAT MACHINE TOOL LTD

650
Number of employees

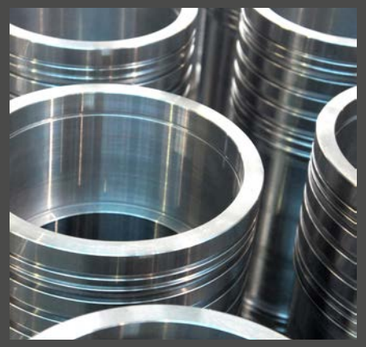
TOP
SIEMENS Seller



78€ mill.
Annual sales in 2016

1901
Oldest member of FERMAT Group

8
Branches in Czech Republic



100+
Annual production/sold machines

1
Micron (1 µm) has the most accurate production machine from our machining shop

5
Football playgrounds would fit in floor space of FERMAT Production facilities

CONTENT

CYLINDRICAL GRINDING MACHINES

ABOUT THE COMPANY

FERMAT MACHINE TOOL LTD

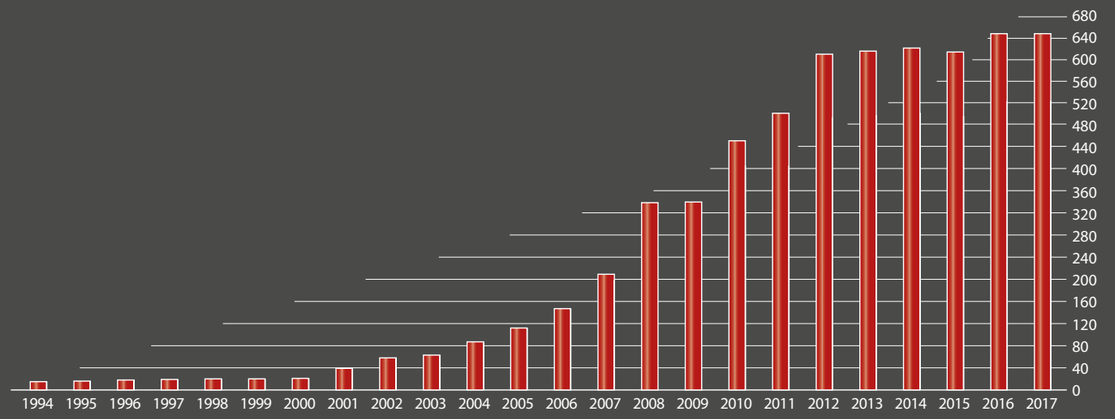
The FERMAT Group is a traditional Czech manufacturer of machine tools. The product portfolio consists primarily of grinding machines as well as horizontal boring and milling machines. FERMAT is led by its owners, which allows us to be a stable and long-term partner for our clients.

The history of the oldest FERMAT Group member goes back to 1901. We are very proud of this tradition, which also creates a strong commitment to deliver the highest quality of products as well as services in the future. Besides the numerous years of experience with machine tools, the success of FERMAT is based on principles such as comprehensive solutions according to customer's needs, innovation, prompt reacting time and delivery, flexibility and continuous improvement of our products and processes. Last but not least, we offer excellent customer support, both pre-sales (for example logistic and financial support services) as well as after-sales customer care. As a result, the FERMAT Group belongs to the top machine tool manufacturers around the globe.

After a successful growth in Europe, FERMAT continues to increase its global footprint. The FERMAT operations currently reach from USA over numerous locations and partners in Europe to growing markets in Asia. During the last major crisis 2008 to 2009, FERMAT not only held its leading position, but even acquired several traditional manufacturing companies, proving its long-term focus along with a strong financial position.

Today, our experienced engineers and technicians produce over 100 machines annually. FERMAT also has broad experience with upgrading of grinders and horizontal boring and milling machines. You can find us at the leading international machinery fairs around the world.

FERMAT NUMBER OF EMPLOYEES:



ABOUT THE COMPANY

FERMAT MACHINE TOOL LTD

Manufacturing, servicing, upgrading or complete overhauling of grinding machines are the key activities of the FERMAT Machine Tool Ltd. In 2006, dynamically growing operations concerning grinders were united under a common roof of FERMAT Machine Tool Ltd., a company based in the heart of Europe, in Prague.

After the fall of the Iron Curtain, one of the leading European grinder manufacturers of the communist era, TOS Hostivař, went out of business. FERMAT Machine Tool offered unemployed workers jobs and thus, the vast majority of these experts joined FERMAT. Therefore, we are able to upgrade and overhaul grinders from TOS Hostivař. Building on a long-term and fruitful cooperation with the company ZeVo Praha Ltd Co., FERMAT Machine Tool decided to acquire this traditional company focused on supply and upgrading of grinders since 1992.

As a result, FERMAT Machine Tool gained exceptional know-how over the past decades. Together with in-house development, design and construction within the strong FERMAT Group led to extraordinary quality of our modern CNC grinding machines. Some of the key parts for our grinders are sourced within our Group, which implies reliable planning and shorter manufacturing cycles. Components of grinders made by FERMAT are produced by thoroughly selected top companies in their respective fields, for instance Siemens, ABB, or Schneider Electric.

Today, FERMAT Machine Tool serves customers around the world: from USA and Canada, over European countries such as Germany, Switzerland, Holland, Russia and Scandinavian markets, to India, China and Australia. Our production facilities cover an area of 5300 m^2.

Please, do not hesitate to visit our stand at leading international fairs or contact us via phone, email, Facebook or Linkedln. We look forward to know you better and find out, how we can help you and possibly start a mutually beneficial long-term business relationship.

FERMAT PRODUCTION PLANTS CZECH REPUBLIC

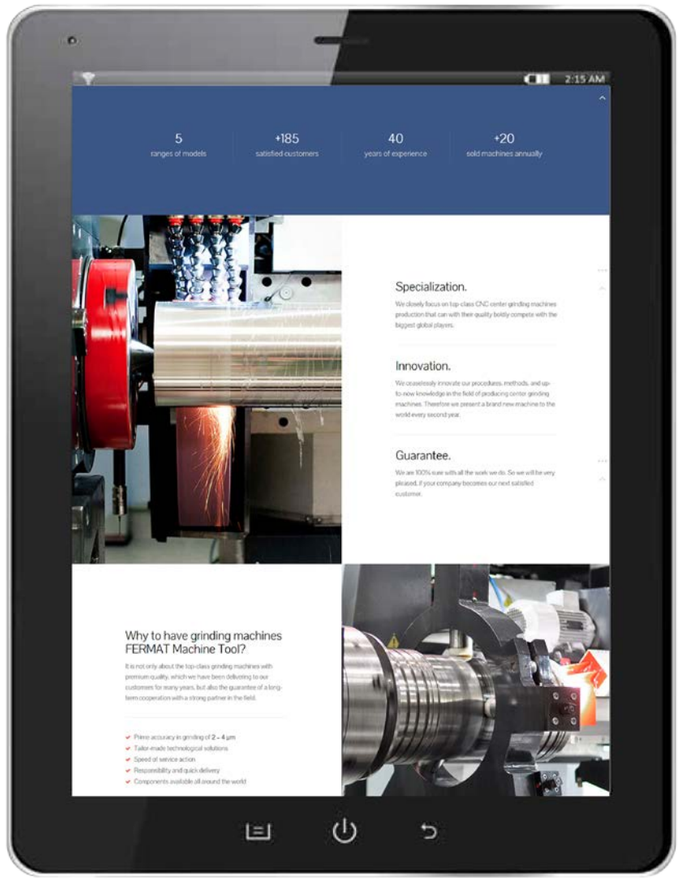
FERMAT occupies 33 200 m^2 (357 362 sq ft) of production and assembly halls. The most important centers are located in Prague and Brno (Prague 5 300 m^2 / 57 049 sq ft, Brno 4 800 m^2 / 51 667 sq ft + 3 600 m^2 / 38 750 sq ft + 3 700 m^2 / 39 826 sq ft).

As the FERMAT's sales continue to grow, FERMAT was able to acquire several traditional manufacturers. Thus, our production facilities in Prague and Brno were expanded, adding for instance Pressl in Pilsen and Strojtos in Lipnik to the FERMAT global network.

PRAGUE ↔ BRNO 2h
BRNO ↔ LIPNIK 1h
BRNO ↔ VIENNA 2h

PRAGUE ↔ LIBEREC 1h
PRAGUE ↔ ROKYCANY 1h
AIRPORT ↔ PRAGUE 20 min

FOR MORE
INFORMATION,
SEE OUR WEBSITE



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INDUSTRIAL APPLICABILITY

BHC / BHC HD

BHC IS A FULLY CNC CONTROLLED CYLINDRICAL GRINDING MACHINE DESIGNED FOR LONGITUDINAL AND PLUNGE-CUT GRINDING OF CYLINDRICAL AND CONICAL EXTERNAL SURFACES, OR WITH INTERNAL GRINDING ATTACHMENT FOR GRINDING OF CYLINDRICAL AND CONICAL INTERNAL SURFACES.

Grinding of face surfaces can by performed by the side of grinding wheel or its circumferential surface with using work head swivel.

See BHC video

Grinding machine series BHC can be used particularly in single-part and series production for grinding of workpieces up to **4000 kg (optionally 5000 kg - HD)**. The machine is produced with higher accuracy to enable grinding of single diameters in the tolerance of IT 4 and higher. The standard version of the machine is equipped with a Siemens 840D sl or Siemens 828D sl control system. The standard machine meets CE standards and is supplied with essential accessories and a guarantee of 1 year.

BHC / BHC HD

MACHINE DESIGN:

- ✓ highly stable bed with reinforcement,
- ✓ excellent friction characteristics of Teflon,
- ✓ according to the CE standard,
- ✓ CNC control systems (SIEMENS, B&R),
- ✓ digital AC servomotors,
- ✓ controlled axis X (grinding wheelhead in-feed), Z (table feed),
- ✓ hand-wheels for axis X and Z setting,
- ✓ equipped with fully covering and automatic controlled doors,
- ✓ telescopic covers,
- ✓ cooling with filtration and pneumatic system,
- ✓ robust and rigid duo table.

The machines are additionally equipped and designed according to specific needs of the customer and taking into account the materials to be ground or the selected machining technology.

BHC / BHC HD

CYLINDRICAL GRINDING MACHINES TYPE

PARAMETERS	Units	Design version
Working range		
Swing diameter	mm (in)	630 (24,8) / 850 (33,5) / 1000 (39,4)
Distance between centers	mm (in)	2000 (78,7) / 3000 (118,1) / 4000 (157,5) / 5000 (196,9) / 6000 (236,2)
Max. weight of workpiece - between centers	kg (lb)	4000 (8800)
Max. weight of workpiece - between centers - heavy duty machine	kg (lb)	5000 (11000)
Max. weight of workpiece-with live spindle (incl. clamp)	kg (lb)	300 (660) / HD: 400 (880)
Grinding unit – Axis X		
Minimum programmable feed	mm (in)	0,0005 (0,00002)
Maximum speed	$m.min^{-1}$ (in/min)	10 (393,7)
Table – Axis Z		
Minimum programmable table feed	mm (in)	0,001 (0,00004)
Maximum speed	$m.min^{-1}$ (in/min)	10 (393,7)
Grinding Wheel head		
Grinding wheel dimensions (dia. x width x bore)	mm (in)	Ø 750 x 100 x Ø 305 (Ø 29,5 x 3,9 x Ø 12)
Diameter of worn-out wheel	mm (in)	Ø 570 (Ø 22,4)
Maximum grinding wheel width	mm (in)	125 (4,92)
Grinding wheel peripheral speed	m/s	10 - 50
Wheel head swivel	°	+30/–30
Wheel head motor power	kW (hp)	18,5 (24,8)
Work head		
Work head swivel	°	0 - 90
Work head swivel – heavy duty	°	0
Work head spindle taper bore	-	Morse 6 ISO 296-1991
Work head spindle nose	-	A 2-6 ISO 702-1-1992
Tailstock		
Tailstock barrel taper bore	-	Morse 6 ISO 296-1991
Tailstock barrel stroke	mm (in)	70 (2,8)
Cross motion of tailstock center – cylindrical correction	mm (in)	±0,8 (0,031)
Tailstock clamping force	N	300-20000
Other specifications		
Length of machine	mm (in)	8500 (335) / 10600 (417) / 13000 (512) / 15500 (610) / 18000 (709)
Width of machine	mm (in)	4400 (173)
Height of machine	mm (in)	2550 (100)
Weight of machine	kg (lb)	17000 (37400) / 20000 (44000) / 23700 (52140) / 26000 (57200) / 28000 (61600)
Control system	-	Siemens 840D sl Siemens 828D sl
Drives	-	Sinamics
Ball screws	-	KSK Kuřim Shuton
Cooling and filtration	-	Astos Aš UMT LEHMANN
Lubrication	-	Tribotec
Pneumatic equipment	-	FESTO
Machine working accuracy according to ISO 2433 (depending on grinding materials and machining technology)		
Machine working accuracy (without in-process gauge)	-	IT 4
Surface roughness	Ra	0,2 (0,05)
Roundness of workpiece	mm (in)	0,002 (0,0001)

BHCR / BHCR HD

BHCR (HD) IS A FULLY CNC-CONTROLLED CYLINDRICAL GRINDING MACHINE WITH AUTOMATIC POSITIONING OF THE GRINDING WHEEL HEAD, DESIGNED FOR GRINDING CYLINDRICAL AND CONICAL EXTERNAL SURFACES OR, WITH EQUIPMENT FOR INTERNAL GRINDING, FOR GRINDING OF INTERNAL SURFACES WITH THE PLUNGE CUT OR LONGITUDINAL GRINDING METHOD.

Grinding of face surfaces can be performed by the side of the grinding wheel or its circumferential surface with inclined drive headstock. The automatic positioning grinding head on the vertical axis B can be equipped with up to 3 tools.

BHCR (HD) CNC grinder can be used particularly in the single-part and series production for grinding workpieces weighing up to **4000 kg (optionally 5000 kg - HD)**.

On this machine customers typically achieve an accuracy of up to 0,004 mm, or the machine can be produced with an increased accuracy of up to 0,002 mm.

The standard version of the machine is equipped with a Siemens 840 D sl control system.

The machine meets CE standards and is supplied with basic equipment and a guarantee of 1 year.

The machine is additionally equipped and designed according to specific needs of the customer and taking into account the materials to be ground or the selected machining technology.

BHCR / BHCR HD

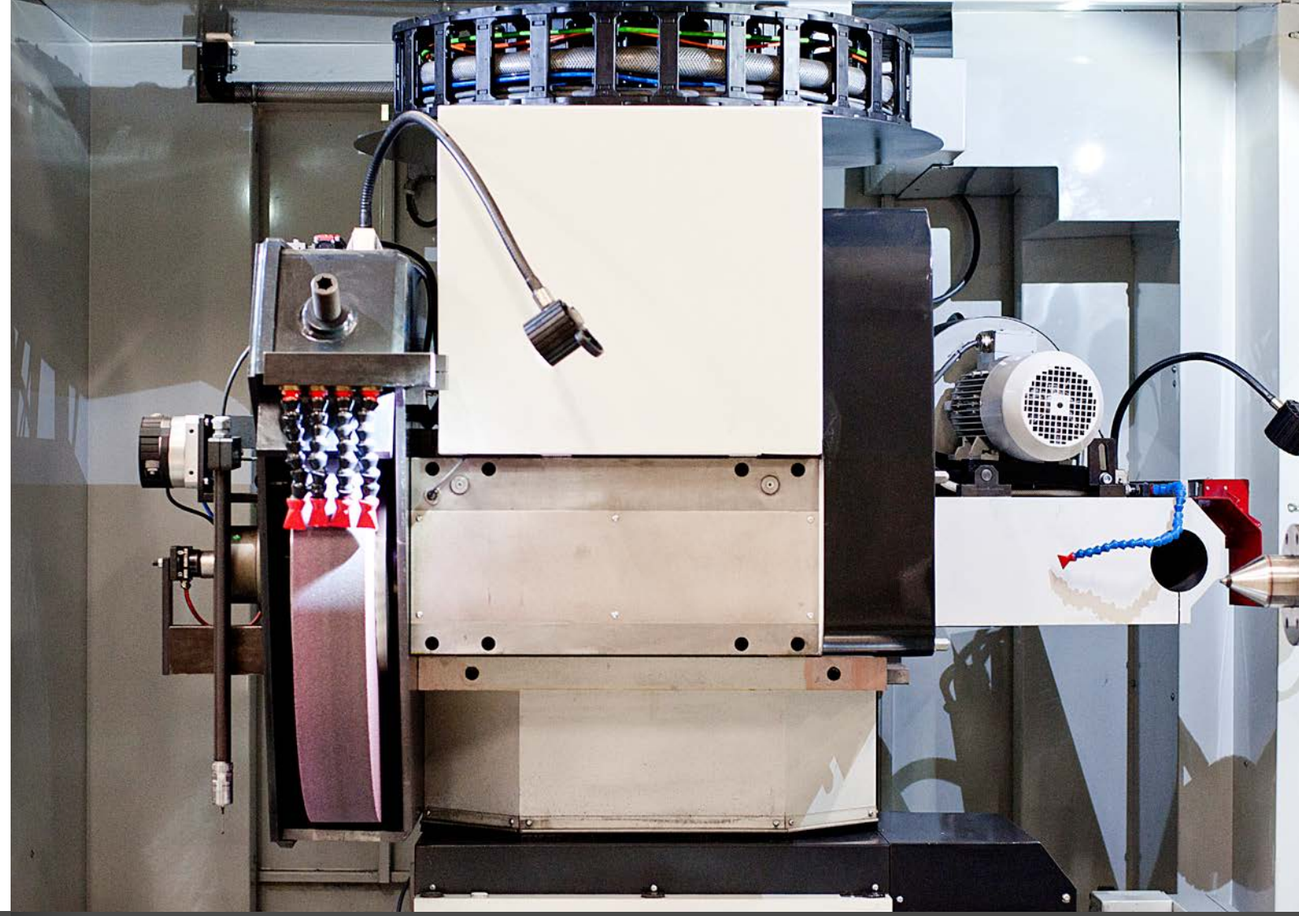
MACHINE POSSIBILITIES:

- ✓ program controlled rotation of the B axis - grinding wheel head along the vertical axis,
- ✓ external and internal grinding of workpieces clamped between centers or by using a chuck in work head,
- ✓ sequential plunge grinding or longitudinal grinding with a moving table, and plunge grinding with a stationary or oscillating table,
- ✓ wheel head can be equipped with up to three tools (grinding wheel/ spindle for internal grinding/ superfinish attachment),
- ✓ significantly expands the technological possibilities of the grinding machine,
- ✓ this design increases the ability to grind with more tools in one clamping arrangement,
- ✓ precise and efficient grinding of complex workpieces in both serial and small-lot production.

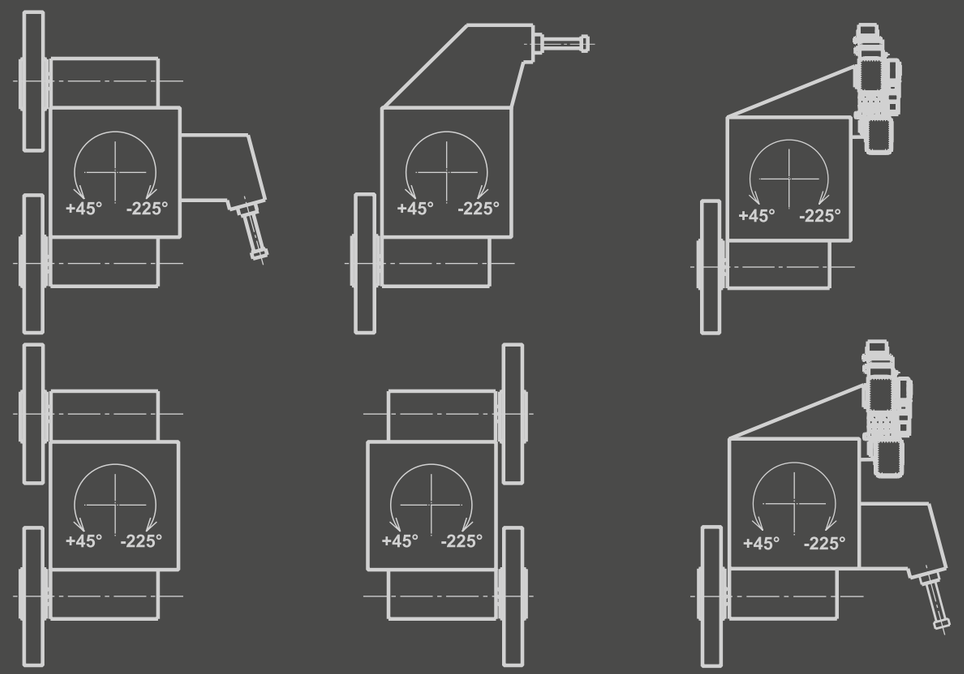
BHCR / BHCR HD

CYLINDRICAL GRINDING MACHINES TYPE

PARAMETERS	Units	Design version
Working range		
Swing diameter	mm (in)	630 (24,8) / 850 (33,5) / 1000 (39,4)
Distance between centers	mm (in)	2000 (78,7) / 3000 (118,1) / 4000 (157,5) / 5000 (196,9) / 6000 (236,2)
Max. weight of workpiece - between centers	kg (lb)	4000 (8800)
Max. weight of workpiece - between centers – heavy duty machine	kg (lb)	5000 (11000)
Max. weight of workpiece-with live spindle (incl. clamp)	kg (lb)	300 (660) / HD: 400 (880)
Grinding unit – Axis X		
Minimum programmable in-feed	mm (in)	0,0005 (0,00002)
Maximum speed	$m.min^{-1}$ (in/min)	10 (393,7)
Table – Axis Z		
Minimum programmable table feed	mm (in)	0,001 (0,00004)
Maximum speed	$m.min^{-1}$ (in/min)	10 (393,7)
Grinding Wheel head - Axis B		
Grinding wheel dimensions (dia. x width x bore)	mm (in)	Ø 750 x 100 x Ø 305 (Ø 29,5 x 3,9 x Ø 12)
Diameter of worn-out wheel	mm (in)	Ø 570 (Ø 22,4)
Maximum grinding wheel width	mm (in)	125 (4,92)
Grinding wheel peripheral speed	m/s	10 - 50
Wheel head swivel	°	+45/–225
Minimum programmable rotation feed	°	0,0001
Wheel head motor power	kW (hp)	18,5 (25)
Work head		
Work head swivel	°	0 - 90
Work head swivel – heavy duty	°	0
Work head spindle taper bore	-	Morse 6 ISO 296-1991
Work head spindle nose	-	A 2-6 ISO 702-1-1992
Tailstock		
Tailstock barrel taper bore	-	Morse 6 ISO 296-1991
Tailstock barrel stroke	mm (in)	70 (2,8)
Cross motion of tailstock center - cylindrical correction	mm (in)	±0,8 (0,031)
Tailstock clamping force	N	300-20000
Other specifications		
Length of machine	mm (in)	8500 (335) / 10600 (417) / 13000 (512) / 15500 (610) / 18000 (709)
Width of machine	mm (in)	4400 (173)
Height of machine	mm (in)	2550 (114)
Weight of machine	kg (lb)	17000 (37400) / 20000 (44000) / 23700 (52140) / 26000 (57200) / 28000 (61600)
Control system	-	Siemens 840D sl
Drives	-	Sinamics
Ball screws	-	KSK Kuřim / Shuton
Cooling and filtration	-	Astos Aš / UMT LEHMANN
Lubrication	-	Tribotec
Pneumatic equipment	-	FESTO
Machine working accuracy according to ISO 2433 (depending on grinding materials and machining technology)		
Machine working accuracy (without in-process gauge)	-	IT 4
Surface roughness	Ra	0,2 (0,05)
Roundness of workpiece	mm (in)	0,002 (0,0001)



ROTARY AXIS B WITH POSSIBLE TOOLS



BHM

BHM IS A FULLY CNC CONTROLLED GRINDING MACHINE DESIGNED FOR LONGITUDINAL AND PLUNGE-CUT GRINDING OF CYLINDRICAL AND CONICAL EXTERNAL SURFACES, OR WITH INTERNAL GRINDING ATTACHMENT FOR GRINDING OF CYLINDRICAL AND CONICAL INTERNAL SURFACES.

Grinding of face surfaces can by performed by the side of grinding wheel or its circumferential surface using work head swivel.

Grinding machine series BHM can be used particularly in single-part and series production for grinding of workpieces up to 850 kg between centers and 1000 kg between centers in rests. The machine is produced with higher accuracy to enable grinding of single diameters in the tolerance of IT 4 and higher. Standard version of the machine is equipped with a Siemens 840D sl or Siemens 828D sl control system, alternatively B&R. The standard machine meets CE standards and is supplied with essential accessories and a guarantee of 1 year.

BHM

MACHINE DESIGN:

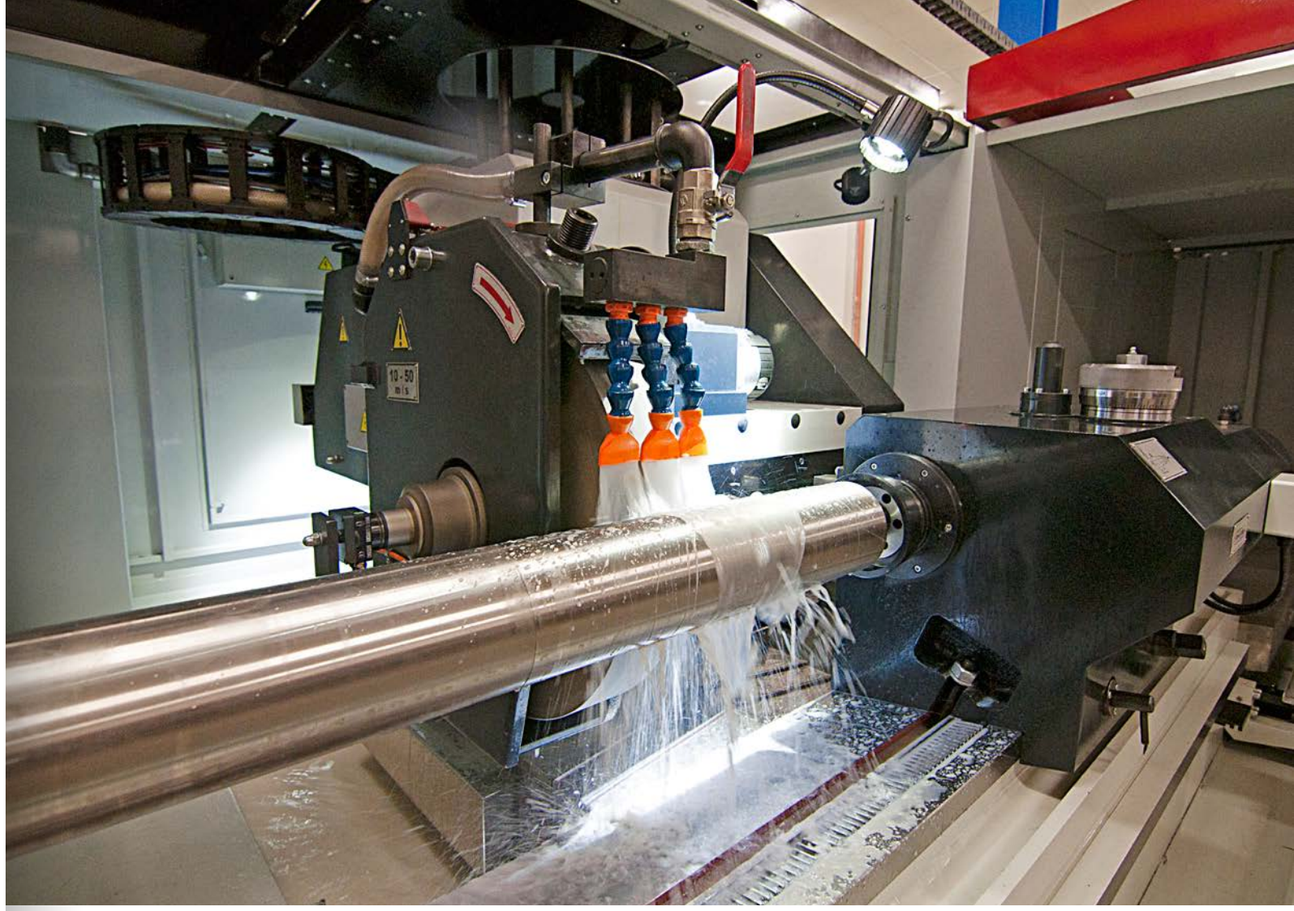
- ✓ highly stable bed with reinforcement,
- ✓ excellent friction characteristics of Teflon,
- ✓ according to the CE standard,
- ✓ CNC control systems (SIEMENS, B&R),
- ✓ digital AC servomotors,
- ✓ controlled axis X (grinding wheelhead in-feed), Z (table feed),
- ✓ hand-wheels for axis X and Z setting,
- ✓ equipped with fully covering and manually controlled doors,
- ✓ telescopic covers,
- ✓ cooling with filtration and pneumatic system,
- ✓ robust and rigid duo table.

The machines are additionally equipped and designed according to specific needs of the customer and taking into account the materials to be ground or the selected Machining technology.

BHM

CYLINDRICAL GRINDING MACHINES TYPE

PARAMETERS	Units	Design version
Working range		
Swing diameter	mm (in)	500 (19,7)
Distance between centers	mm (in)	2 000 (78,7) / 3 000 (118,1)
Max. weight of workpiece - between centres	kg (lb)	850 (1 874)
Max. weight of workpiece - between centres – in rests	kg (lb)	1 000 (2 205)
Max. weight of workpiece-with live spindle (incl. clamp)	kg (lb)	120 (265)
Grinding unit – Axis X		
Minimum programmable in-feed	mm (in)	0,0005 (0,00002)
Maximum speed	m.min-1 (in/min)	8 (0,31)
Table – Axis Z		
Minimum programmable table feed	mm (in)	0,001 (0,0004)
Maximum speed	m.min-1 (in/min)	8 (0,31)
Grinding Wheel head		
Grinding wheel dimensions (dia. x width x bore)	mm (in)	Ø 500 x 80 x Ø 203 (Ø 19,7 x 3,1 x Ø 8)
Diameter of worn-out wheel	mm (in)	Ø 380 (Ø 15)
Maximum grinding wheel width	mm (in)	125 (4,9)
Grinding wheel peripheral speed	m/s	10 – 50
Wheel head swivel (manually)	°	+15 / –180
Minimum programmable rotation feed	°	0,0001
Wheel head motor power	kW (hp)	11 (15)
Other specifications		
Length of machine	mm (in)	7400 (291) / 8300 (327) / 10000 (394)
Width of machine	mm (in)	3900 (154)
Height of machine	mm (in)	2400 (95)
Weight of machine	kg (lb)	10000 (394) / 12000 (473) / 14000 (551)
Control system	-	Siemens 840D sl / Siemens 828D sl
Drives	-	Sinamics
Ball screws	-	KSK Kuřim / Shuton
Cooling and filtration	-	Astos Aš / UMT LEHMANN
Lubrication	-	Tribotec
Pneumatic equipment	-	FESTO
Machine working accuracy according to ISO 2433 (depending on grinding materials and machining technology)		
Machine working accuracy (without in-process gauge)	-	IT 4
Surface roughness	Ra	0,2 (0,05)
Roundness of workpiece	mm (in)	0,002 (0,0001)



BHMR

BHMR IS A FULLY CNC-CONTROLLED CENTER GRINDER WITH AUTOMATIC POSITIONING OF THE GRINDING SPINDLE, DESIGNED FOR GRINDING CYLINDRICAL AND CONICAL EXTERNAL SURFACES OR, WITH EQUIPMENT FOR INTERNAL GRINDING, FOR GRINDING OF INTERNAL SURFACES WITH THE RECESS OR LONGITUDINAL GRINDING METHOD.

Grinding of face surfaces can be performed by the side of the grinding wheel or its circumferential surface with inclined drive headstock. The automatic positioning grinding head on the vertical axis B can be equipped with up to 3 tools.

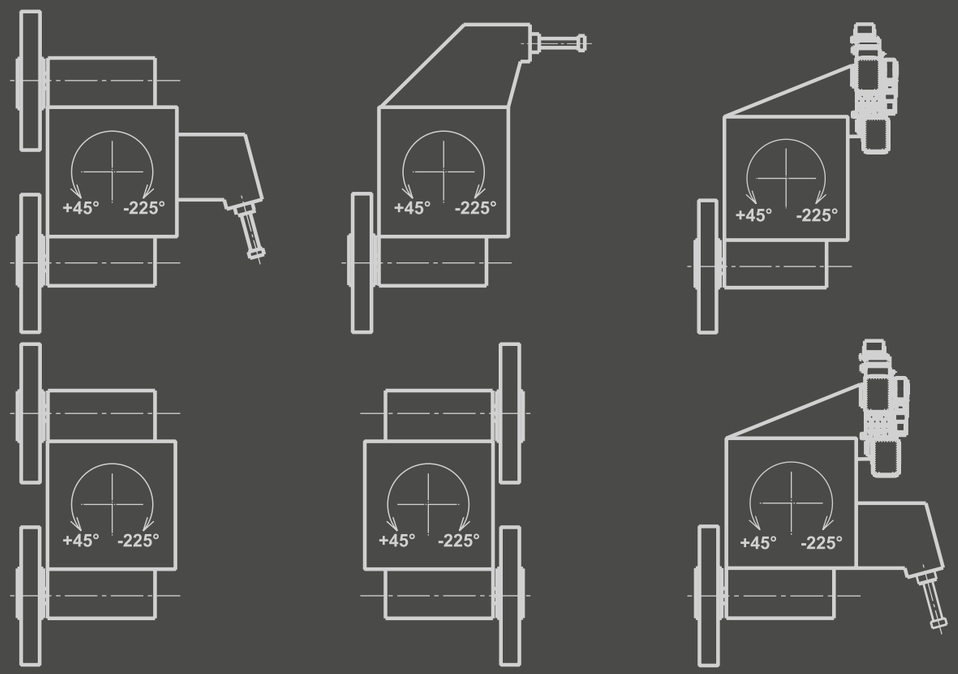
BHMR CNC grinder can be used particularly in the piece and series production for grinding workpieces weighing up to 850 kg between centers and 1000 kg between centers in rests.

Customers typically achieve an accuracy of 0,004 mm on this machine. It can also be produced with an increased accuracy up to 0,002 mm. The standard version of the machine is equipped with a Siemens 840 D sl control system.

The machine meets CE standards and is supplied with basic equipment and a guarantee of 1 year.

The machine is additionally equipped and designed according to specific needs of the customer and taking into account the materials to be ground or the selected machining technology.

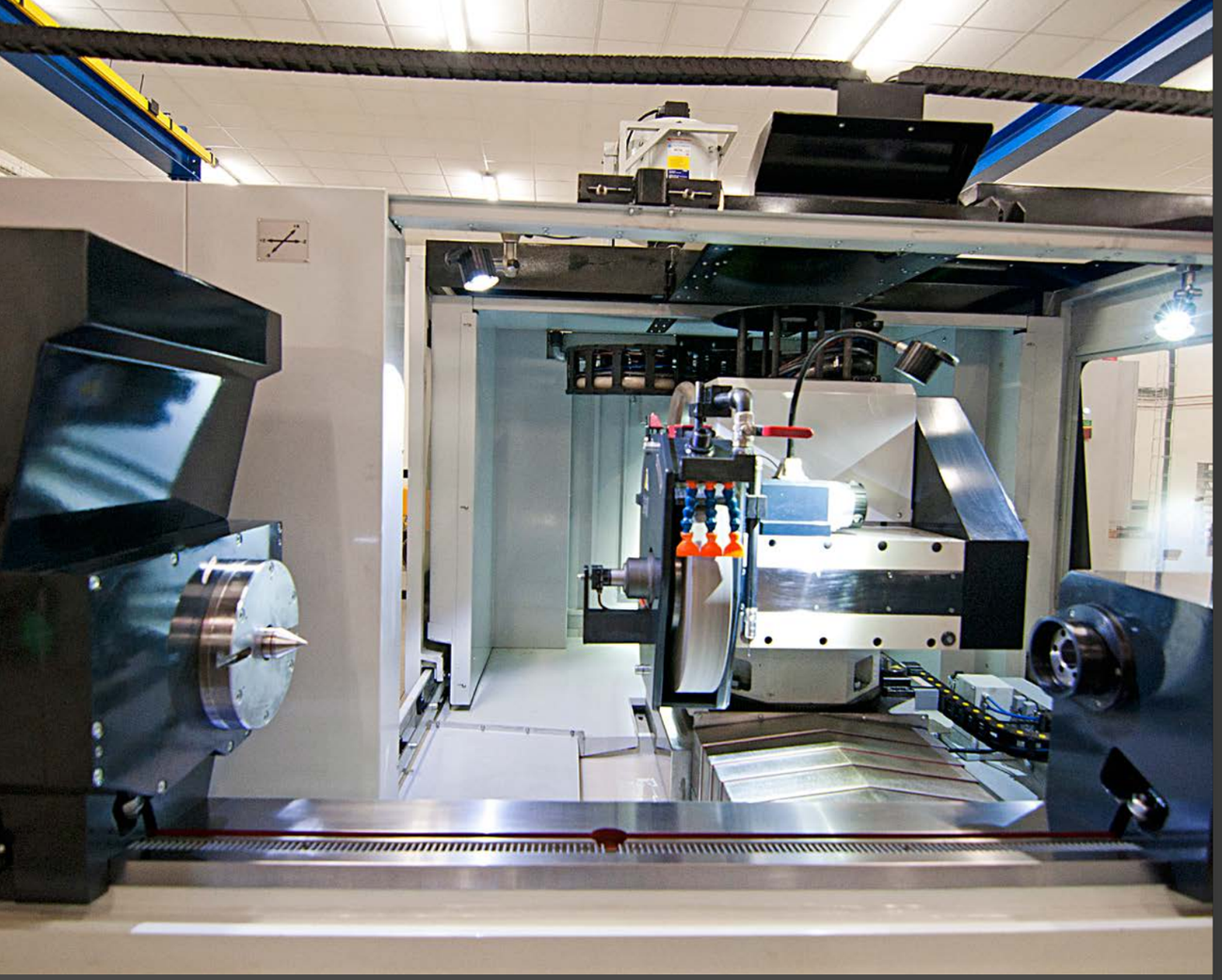
ROTARY AXIS B WITH POSSIBLE TOOLS

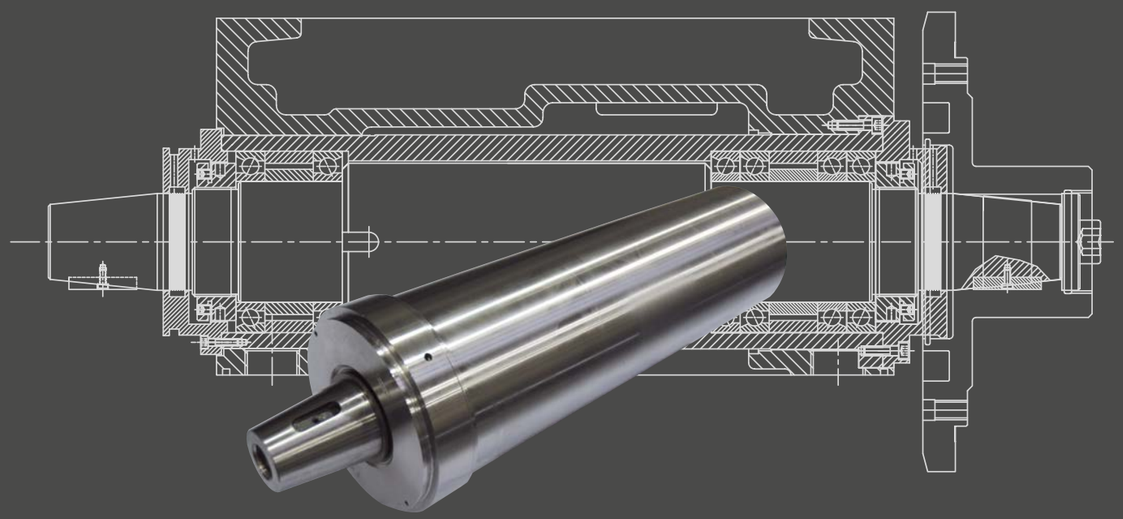


PARAMETERS	Units	Design version
Working range		
Swing diameter	mm (in)	500 (19,7)
Distance between centers	mm (in)	2 000 (78,7) / 3 000 (118,1)
Max. weight of workpiece - between centres	kg (lb)	850 (1 874)
Max. weight of workpiece - between centres – in rests	kg (lb)	1 000 (2 205)
Max. weight of workpiece-with live spindle (incl. clamp)	kg (lb)	120 (265)
Grinding unit – Axis X		
Minimum programmable in-feed	mm (in)	0,0005 (0,00002)
Maximum speed	m.min-1 (in/min)	8 (0,31)
Table – Axis Z		
Minimum programmable table feed	mm (in)	0,001 (0,0004)
Maximum speed	m.min-1 (in/min)	8 (0,31)
Grinding Wheel head		
Grinding wheel dimensions (dia. x width x bore)	mm (in)	Ø 500 x 80 x Ø 203 (Ø 19,7 x 3,1 x Ø 8)
Diameter of worn-out wheel	mm (in)	Ø 380 (Ø 15)
Maximum grinding wheel width	mm (in)	125 (4,9)
Grinding wheel peripheral speed	m/s	10 – 50
Wheel head swivel (Manually)	°	+45 / –225
Wheel head motor power	kW (hp)	11 (15)
Other specifications		
Length of machine	mm (in)	7400 (291) / 8300 (327) / 10000 (394)
Width of machine	mm (in)	3900 (154)
Height of machine	mm (in)	2400 (95)
Weight of machine	kg (lb)	10000 (394) / 12000 (473) / 14000 (551)
Control system	-	Siemens 840D sl / Siemens 840
Drives	-	Sinamics
Ball screws	-	KSK Kuřim / Shuton
Cooling and filtration	-	Astos Aš / UMT LEHMANN
Lubrication	-	Tribotec
Pneumatic equipment	-	FESTO
Machine working accuracy according to ISO 2433 (depending on grinding materials and machining technology)		
Machine working accuracy (without in-process gauge)	-	IT 4
Surface roughness	Ra	0,2 (0,05)
Roundness of workpiece	mm (in)	0,002 (0,0001)

MACHINE POSSIBILITIES:

- ✓ program controlled rotation of the B axis - grinding head along the vertical axis,
- ✓ external and internal grinding of workpieces clamped between centers or by using a chuck in work head,
- ✓ sequential plunge grinding or longitudinal grinding with a moving table, and plunge grinding with a stationary or oscillating table,
- ✓ wheel head can be equipped with up to three tools (grinding wheel/ spindle for internal grinding/ superfinish attachment),
- ✓ significantly expands the technological possibilities of the grinding machine,
- ✓ this design increases the ability to grind with more tools in one clamping arrangement
- ✓ precise and efficient grinding of complex workpieces in both serial and small-lot production.





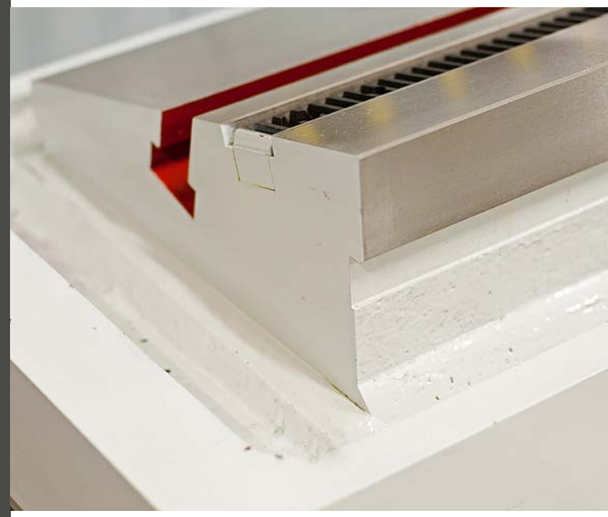
BASIC DESIGN ELEMENTS OF THE MACHINE

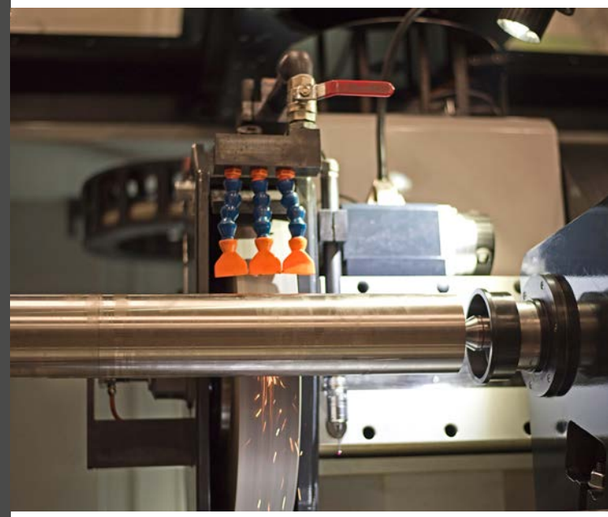
MACHINE BEDS AND TABLES

The machine beds as well as the table are made from high quality gray cast iron. Casting is always followed by an aging process and by roughing. The finishing process then continues with grinding of all guide-ways surfaces of the machine bed and table on a special slide-way grinding machine, and scraping for better sliding quality and more accurate guide-ways. Hand scraping is always with the done manually in accordance with a Protocol of accuracy, using precision templates for hand scraping the guide-ways of the table, beds, back plate and the grinding wheel-head. The bottom and top table is also ground in accordance with the Protocol of accuracy.

GRINDING WHEEL HEAD

To achieve high radial and axial stiffness in the headstock, FKS 180 x 610 L spindle angular contact bearings series 70 with increased rigidity (series EX) are used. The grinding wheel spindle has a group of four paired and preloaded bearings and spacers. The driving pulley also has a pair of preloaded bearings and spacers. Bearings are preloaded with a force 1.000 N. The circumferential speed range of 10 – 50 m/s is ensured by suitably selected components. The replaceable body of grinding wheel head is designed to provide minimum of 12 000 maintenance free working hours with peripheral runout less than 2 µm.





WORK HEAD

The spindle of the work head is mounted in a high-precision paired bearings, fitted in the body of the headstock.

The shaft of spindle is heat-treated and ground for circumferential error of the outer centering surface and inner Morse cone for less than 5 µm.

The design of the work head provides smooth speed control range from 4 to 250 rpm (4 - 560 rpm BHM / BHMR) using frequency converters and servomotors. Using a servomotor provides precise positioning.

TAILSTOCK

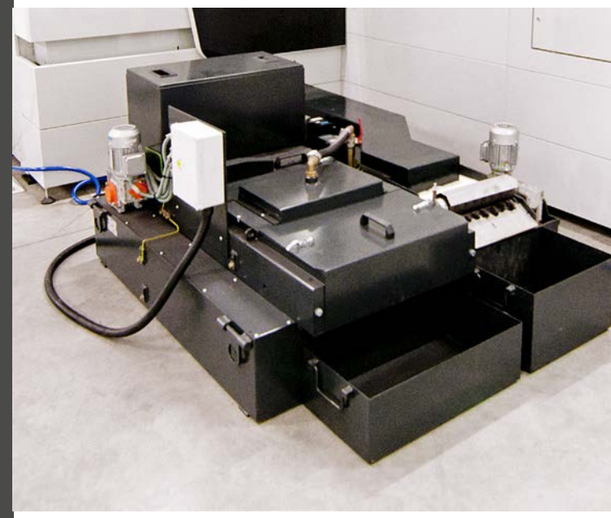
Tailstock sleeve is mounted in the body of tailstock using circular ball bearings with angular contact. This allows cross motion of tailstock centre and use of clamping force up to 12.000 N (4.000 N BHM / BHMR). Opening the tailstock sleeve is accomplished through hydraulic systems provided by well-known manufacturers. The tailstock clamp is released by compressed shop air.

BALL SCREWS

Feed for X and Z axes is provided by high precision ball screws from the reputable Czech manufacturer (KSK Kuřim), or from abroad (Spain, Shuton). Ball screws are made in precision accuracy IT 1 for axis X and IT 3 for axis Z. Screws are mounted in accurate pillow blocks using preloaded INA radial-axial bearings. The usage of high quality ball screws ensures smooth and quiet running of the machine with the possibility of 1µm increment in both axes.

COOLING AND FILTRATION

Equipment for filtration of the coolant is always supplied, and is selected according to the material to be ground. It is possible to supply equipment with a magnetic separator, belt filter, or a combination of both. The supplier of the cooling and filtering devices is ASTOS AŠ. Cooling is provided by a pump (100 l / min) and bathing of the machine to provide thermal stabilization of the machine bed by another pump (25 l / min). Other types of cooling and filtration can be provided for specific applications.



LUBRICATION

Lubrication of the guide-ways is provided by a pressure lubrication system. Other parts of the machine are lubricated by a TriboTec lubricating unit through the feeders. Lubricating of each axis is independent with the option to set according to traveled distance.

PNEUMATIC COMPONENTS AND WIRING

The compressed air system of the machine serves to release the tailstock and to provide other functions (probe, cover of the internal grinding, cleaning of feedback spars). The machine is fitted with components provided by FESTO.

GUIDE-WAY COVERS

Telescopic guide-way covers are used to ensure cleanliness of guide-ways, which are mostly metal (stainless steel), or alternatively for reasons of economy of space, rubber textile folded bellows are used instead.

The machine is fitted with components from HESTEGO or Tecnimetal.

PROTECTION ENCLOSURE

According to customer requirements, the machine can be fitted with a protection enclosure provided with sliding door to the working space and at the rear section of the machine with a partially enclosing cover, with an exhaust hood, or alternatively with a complete exhaust system.

SURFACE FINISHES

The inner surface of the grinding machine is provided with an oil resistant, corrosion proof coat of paint. The external surface is filled with a filler paste, sanded down and covered with a polyurethane coat in the color shade RAL 5010 combination with RAL 7035. In the case of a special customer request, we are prepared to change the standard color scheme to suit the customer's requirements.

SINUMERIK

With over 50 years of experience in CNC technology, SINUMERIK CNCs guarantee maximum machining performance. Solution line offers the latest CNC system architecture as well as proven CNC features.

ELECTRIC EQUIPMENT

All elements and components used meet all safety standards applicable in the EU and come from the world's leading manufacturers, such as Rittal (switchboard cabinets and control panels), Siemens (frequency converters), Schneider Electric, LAPPKABEL Schrack, and more.

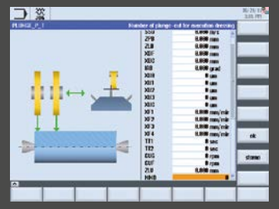
SINAMICS S120 AND DRIVE – CLiQ

The motors can be easily connected to the digital drives via DRIVE-CLiQ. In combination with the modular structure of the SINAMICS S120 drive system, this design is conceived to ensure very simple and rugged installation with minimum wiring overhead.

SINUMERIK 840D SL

SINUMERIK® 840D SL PROVIDES AN OPEN, FLEXIBLE AND POWERFUL CNC SYSTEM WITH THE SINAMICS S120 DESIGN FOR UP TO 93 AXES.

Being decentralized, scalable, open, inter-connectable and with a wide range of functionality, the SINUMERIK 840D sl is suitable for use in almost every machining technology and it sets the standard in dynamics, precision and network integration. The SINUMERIK 840D sl offers you uniformity in its programming, operation and machining cycles. With its efficiency in programming, installation and commissioning, this CNC system platform is characterized by its optimum design, innovative NC functionality, communication and openness. The SINUMERIK 840D sl, available in several performance variants, can be perfectly customized to practically every machine and machining technology in the manufacturing industry.



SINUMERIK 840D sl AT A GLANCE:

- ✓ Standard 10,4“ TFT flat screen OP10C
- ✓ Number of axis and spindles is variable
- ✓ Language optionality
- ✓ Drives SINAMICS S120 connect via DRIVE – CLiQ
- ✓ Machine control Panel MCP 483
- ✓ Memory medium: USB
- ✓ DRIVE – CLiQ: ensures communication drives – controller
- ✓ Openness for bus PROFIBUS, (PROFINET)
- ✓ Ethernet RJ45: for service purposes, remote control and diagnostic or TeleService
- ✓ Remote control with handwheel HT2

TECHNOLOGY CYCLES:

- ✓ Longitudinal grinding with options for convex and concave grinding
- ✓ Plunge cut grinding
- ✓ Multiple plunge cut grinding with option taper grinding
- ✓ Ball grinding
- ✓ Dressing

SPECIAL CHARACTERISTICS OF CYCLES

Other hardware devices allow the use of special properties of grinding cycles.

- ✓ Measurement control, correction of final diameter possible
- ✓ Asynchronous dressing of grinding tool
- ✓ Touch trigger probe
- ✓ Grinding acoustic sensor
- ✓ Automatic compensation of grinding tool
- ✓ Manual activation stroke to workpiece
- ✓ Inside and outside grinding is possible

SIEMENS SINUMERIK 828D SL

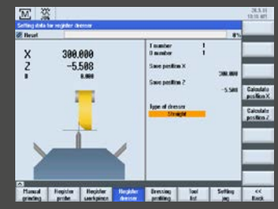
CONTROL SYSTEM 828D SL OFFERS HIGH MODULARITY, OPENNESS, AND FLEXIBILITY. IT IS INTEGRATED INTO THE DRIVE SYSTEM SINAMICS S120. TOGETHER WITH THE INTEGRATED PLC SYSTEM S7-200 IT IS CUSTOMIZED FOR MEDIUM AND HIGH REQUIREMENTS.

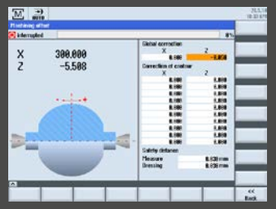
BASIC CHARACTERISTICS:

- ✓ Control system for medium and highly complex tasks
- ✓ High performance and flexibility
- ✓ Compact control system for series conception of machines

PARAMETERS:

- ✓ Flat screen 10,4“ with definition 800x600
- ✓ Maximum axis number 6
- ✓ User memory for programs c. 5 MB
- ✓ Drive system and motors SINAMICS S120, PLC S7-200
- ✓ Software version V04.07 SP3
- ✓ Support for scales Heidenhain for axis X and Z
- ✓ Ethernet X130 remote diagnostic
- ✓ USB, CF interface





SPECIAL TECHNOLOGICAL CYCLES

- ✓ Measurement control, correction of contour and final diameter
- ✓ Asynchronous dressing of grinding wheel
- ✓ Automatic compensation of grinding tool
- ✓ Manual activation sparking - out stroke

TECHNOLOGICAL CYCLES:

- ✓ Longitudinal grinding
- ✓ Plunge-cut grinding
- ✓ Multi plunge-cut grinding
- ✓ Cone grinding
- ✓ Convex, concave grinding
- ✓ Plunge-cut in Z axis
- ✓ Ball grinding
- ✓ Automatic dressing
- ✓ Dressing in optional shape
- ✓ Axial probe
- ✓ Longitudinal grinding in X axis
- ✓ Radius internal

B&R AUTOMATION POWER PANEL 900

CONTROL SYSTEMS AND DRIVES

The new drive generation from B&R provides a universal solution for any automation task in machine manufacturing. A new milestone on the path to „Perfection in Automation“.

The ACOPOSmulti drive system was developed exclusively by B&R and is produced in-house. The shortest path between development and production has proven to be the best solution over the years and makes up one of the pillars of our outstanding quality. There is just one company behind the entire palette of hardware and software, who carries sole responsibility - B&R.

An ACOPOSmulti drive system consists of a regeneration choke, line filter and three device groups - supply voltage modules, auxiliary voltage modules and inverter modules.

THE MOST SUITABLE SOLUTION FOR GRINDING IS POWER PANEL 900:

- ✓ Cost-effective solutions
- ✓ Controller was developed directly for grinding machines
- ✓ Openness and flexibility for customer requirements
- ✓ Easy to use, support for fully automatic and manual work
- ✓ Human machine interface was developed exactly for our machines with the intention for easy and effective control
- ✓ Touch panel for fast and effective work !

POWER PANEL 900 AT GLANCE:

- ✓ 18,5 TFT C HD flat screen
- ✓ Touch screen (capacitive)
- ✓ 4x USB 2.0, (1x on front panel)
- ✓ 2x RS-232, 2x Ethernet 1/100/1000 and Power-Link for communication with drives
- ✓ Drives: AcoposMulti
- ✓ IP65
- ✓ Intel Atom

TECHNOLOGY CYCLES:

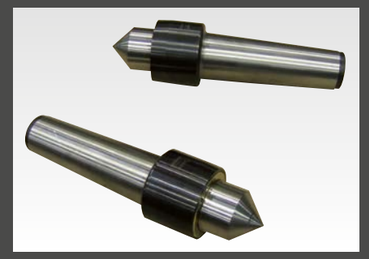
- ✓ Longitudinal grinding
- ✓ Plunge cut grinding
- ✓ Multiple plunge cut grinding
- ✓ Taper grinding (cone)
- ✓ Convex/concave grinding
- ✓ Dressing

SPECIAL CHARACTERISTICS OF CYCLES

Other hardware devices allow the use of special properties of grinding cycles.

- ✓ Measurement control, correction of contour and final diameter
- ✓ Asynchronous dressing of grinding tool
- ✓ Touch trigger probe
- ✓ Grinding acoustic sensor
- ✓ Automatic compensation of grinding tool
- ✓ Manual activation sparking – out stroke
- ✓ Manual activation stroke to workpiece
- ✓ Inside and outside grinding is possible

Open rest



Centers

Anchoring material

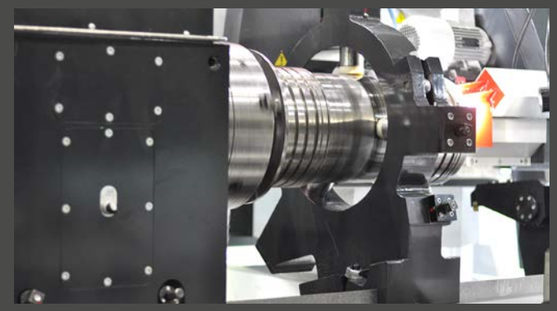
Carrier

Balancing arbor

Wheel flange

Dresser

Internal grinding attachment



Close rest

Ancillary restraints

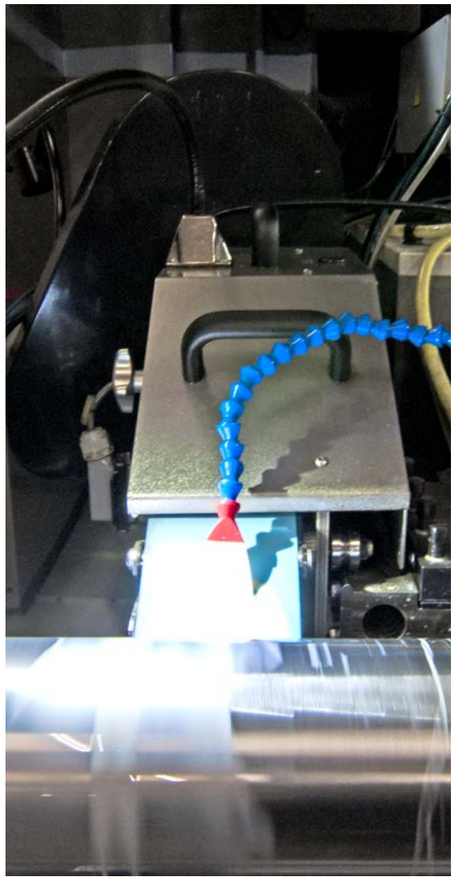
Dresser

SPECIAL ACCESSORIES

SUPERFINISHING ATTACHMENT

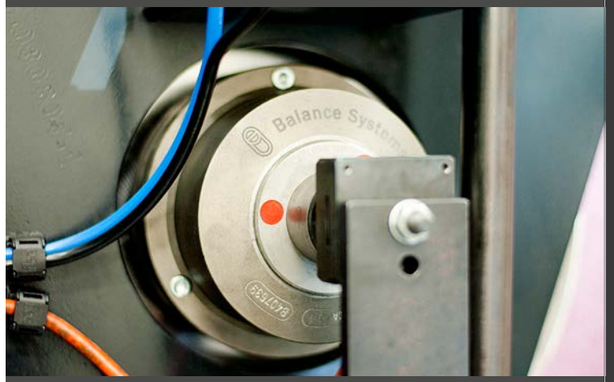
Electrically powered tape finishing attachment for mounting onto medium and large carrier machines to enable superfinishing of ground and fine-turned surfaces. Well-suited for machining workpiece collars with radii or very small relief cuts. Apart from cylindrical workpieces, flat surfaces can also be machined.

Usually 0,05 Ra



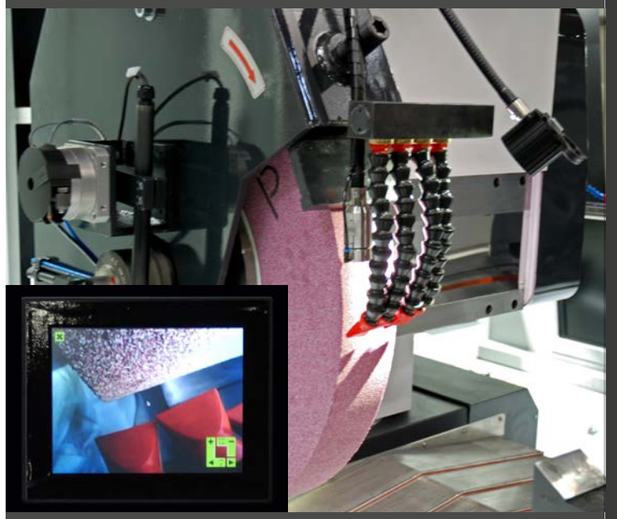
AUTOMATIC BALANCE SYSTEM

The VM25 is a modular multifunction system for grinding processes. It is a single integrated unit for automatic balancing during grinding. Automatic balance system is placed on the grinding wheel cover and the process of automatic balancing is controlled at the screen on the control system panel.



CAMERA

The machine can be equipped with a special camera, which is used for working space scanning. The view is displayed at the screen of control panel.



MEASURING SYSTEMS

Axial probe Heidenhain TS 249

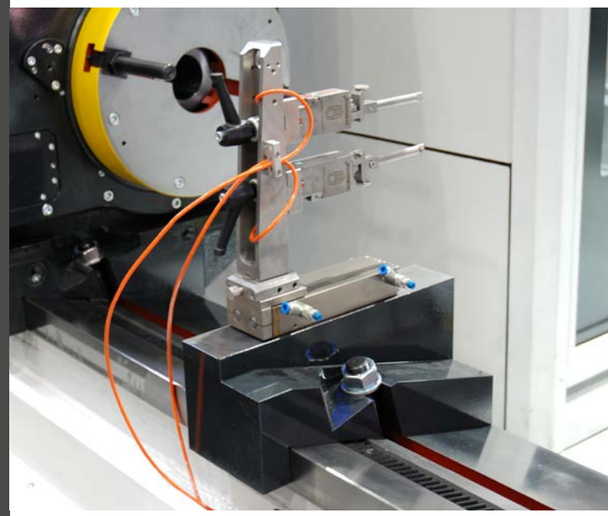
We recommend to equip the machine with the axial probe Heidenhain. It is used for setting of workpieces in serial production.

MEASURING SYSTEMS

Absolute Gauge system TGA 200 or TGA 300

By using Absolute Gauge system TGA 200 or TGA 300 on the cylindrical grinding machine, you can achieve the control of the workpiece´s diameters. Features:

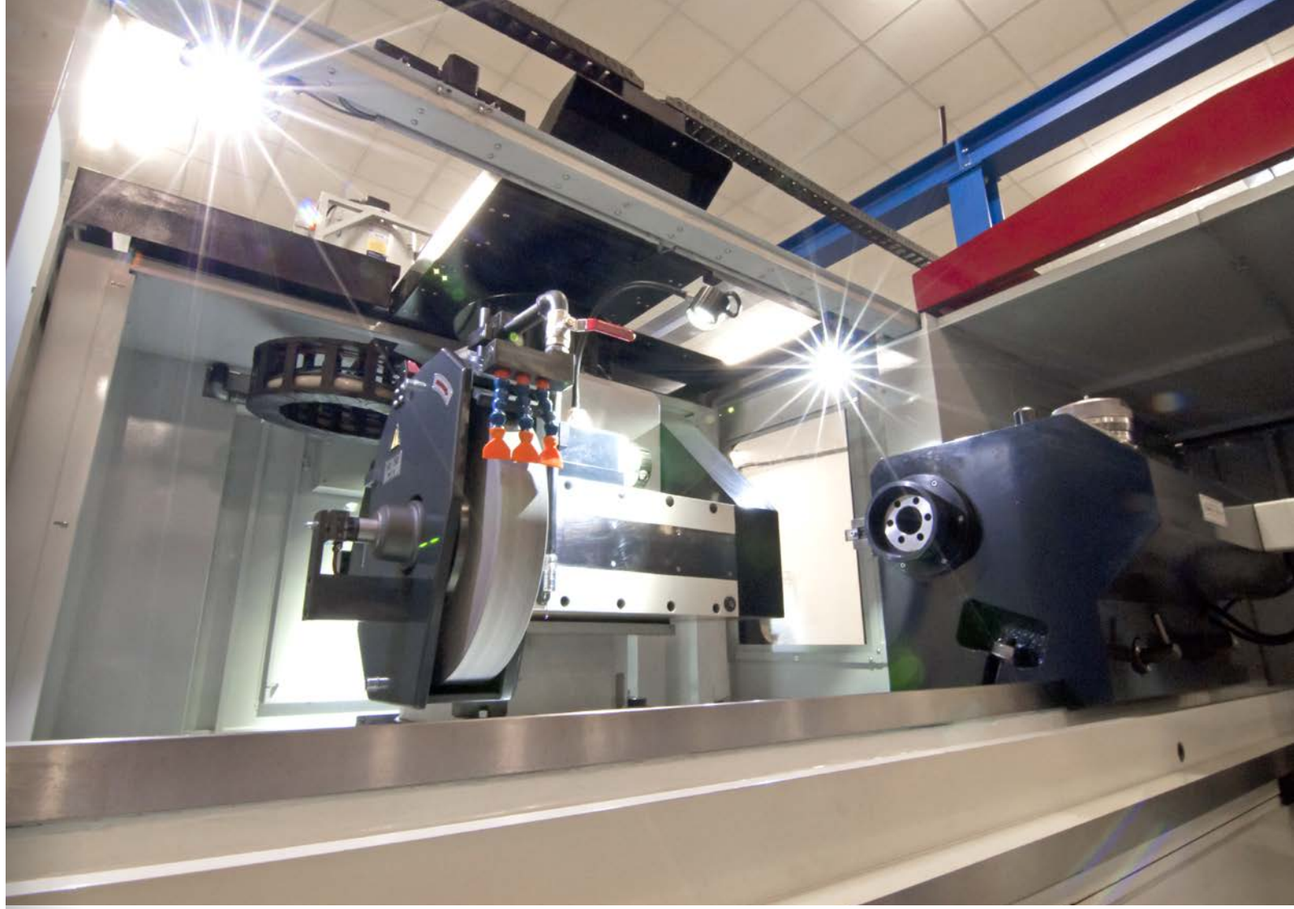
- Incremental measurement in a 200 or 300 mm field
- Micrometric accuracy and repeatability with periodic calibration on a single master
- In-Process / Post-Process diameters check

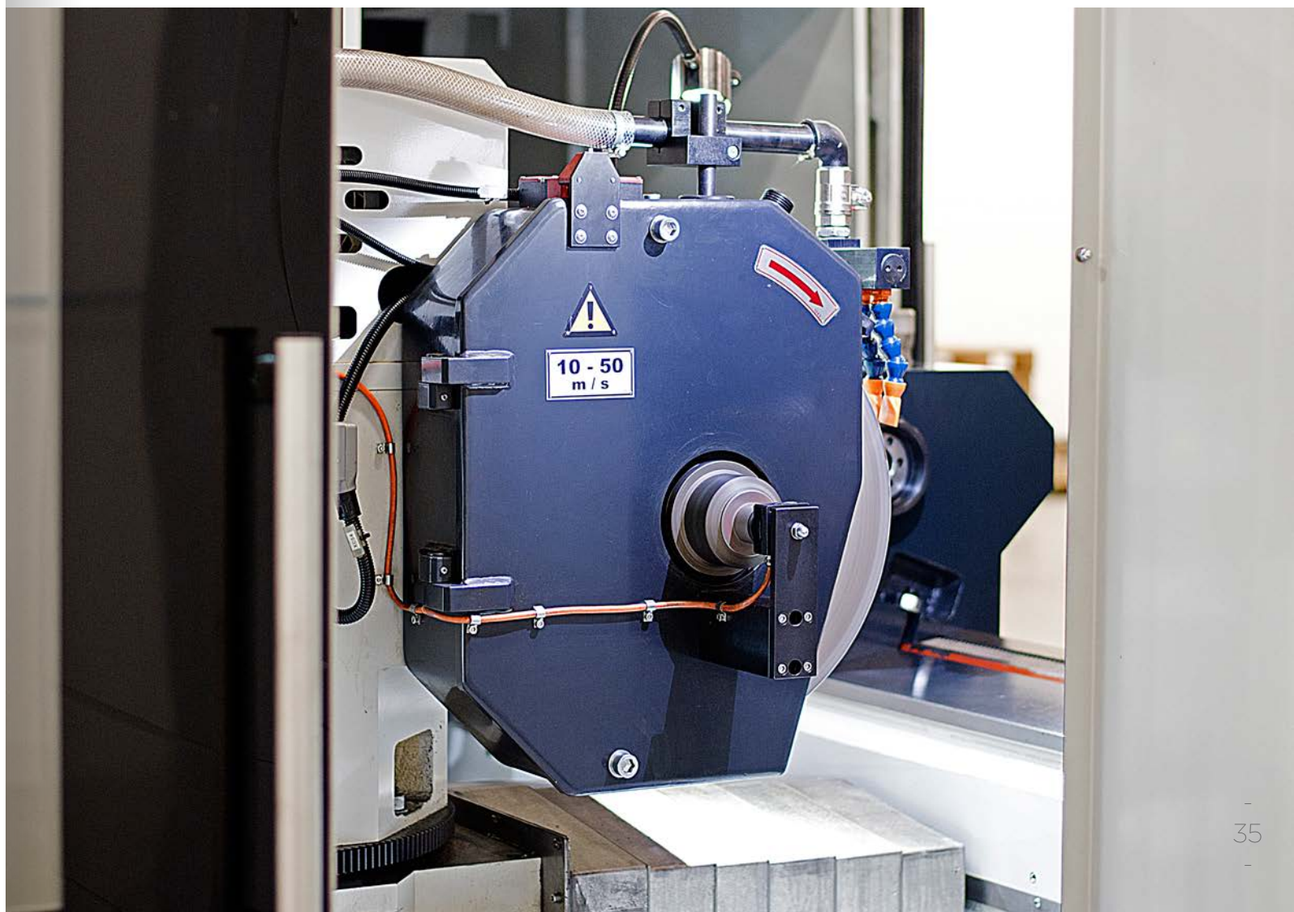


COMPONENTS

MANUFACTURER	
SIEMENS	
B&R	
HEIDENHAIN	
RITTAL	
TriboTec	
FESTO	
LAPP GROUP	
MPM	
KSK KURIM	

MANUFACTURER	
HESTEGO PROTECTION SYSTEMS	
FOINIJA SPOL. S R.O. STRAKONICE	
SKF	
ASTOS CHIP CONVEYORS AND FILTRATION	
INA FAG	
TYROLIT	
TRATEC	
Balance Systems	
FILTERMIST	





BUC E

BUC E IS A FULLY CNC CONTROLLED GRINDING MACHINE DESIGNED FOR LONGITUDINAL AND PLUNGE-CUT GRINDING OF CYLINDRICAL AND CONICAL EXTERNAL SURFACES, OR WITH INTERNAL GRINDING ATTACHMENT FOR GRINDING OF CYLINDRICAL AND CONICAL INTERNAL SURFACES.

Grinding of face surfaces can by performed by the side of grinding wheel or its circumferential surface using work head swivel.

Grinding machine series BUC E can be used particularly in single-part and series production for grinding of workpieces up to 3000 kg. The machine is produced with higher accuracy to enable grinding of single diameters in the tolerance of IT 4 and higher. Standard version of the machine is equipped with Siemens 840D sl or B&R control systems. The machine meets CE standards and is supplied with essential accessories and a guarantee of 1 year.

BUC E

PARAMETERS	Units	Design version
Swing diameter	mm (in)	630 (24,8) / 850 (33,5)
Distance between centers	mm (in)	2000 (78,7) / 3000 (118,1) / 4000 (157,5) / 5000 (196,8)
Max. weight of workpiece-between centers	kg (lb)	3000 (6600)
Max. weight of workpiece-with live spindle (incl. clamp)	kg (lb)	300 (660)
Minimum programmable in-feed – Axis X	mm (in)	0,0005 (0,00002)
Maximum speed	m.min-1 (in/min)	10 (393,7)
Minimum programmable table feed – Axis Z	mm (in)	0,001 (0,00004)
Maximum speed	$m.min^{-1}$ (in/min)	10 (393,7)
Table indexing	°	+6/-5, +5/-5, +4/-4, +3/-3
Grinding wheel dimensions (dia. x width x bore)	mm (in)	Ø 750 x 100 x Ø 305 (Ø 29,5 x 3,9 x Ø 12)
Maximum grinding wheel width	mm (in)	125 (4,92)
Grinding wheel peripheral speed	m/s	25 - 45 (10 - 50 option)
Wheel head swivel	°	+30/–10
Wheel head motor power	kW (hp)	18,5 (24)
Tailstock barrel stroke	mm (in)	80 (3,1)
Cross motion of tailstock center - cylindrical correction	mm (in)	±0,8 (0,031)
Tailstock clamping force	N	300-12000
Other specifications		
Length of machine	mm (in)	8500 (335) / 10600 (417) / 13000 (512) / 15500 (610)
Width of machine	mm (in)	4400 (173)
Height of machine	mm (in)	2888 (100)
Weight of machine	kg (lb)	14000 (30800) / 16000 (35200) / 19000 (41800) / 22000 (48400)
Machine working accuracy according to ISO 2433 (depending on grinding materials and machining technology)		
Machine working accuracy (without in-process gauge)	-	IT 4
Surface roughness	Ra	0,2 (0,05)
Roundness of workpiece	mm (in)	0,002 (0,0001)

BUB E

BUB E IS A FULLY CNC CONTROLLED GRINDING MACHINE DESIGNED FOR LONGITUDINAL AND PLUNGE-CUT GRINDING OF CYLINDRICAL AND CONICAL EXTERNAL SURFACES, OR WITH INTERNAL GRINDING ATTACHMENT FOR GRINDING OF CYLINDRICAL AND CONICAL INTERNAL SURFACES. GRINDING OF FACE SURFACES CAN BY PERFORMED BY THE SIDE OF GRINDING WHEEL OR ITS CIRCUMFERENTIAL SURFACE WITH USING WORK HEAD SWIVEL.

Grinding machine series BUB E can be used particularly in series and large series production for grinding of workpieces up to 500 kg. The machine is produced with higher accuracy to enable grinding of single diameters in the tolerance of IT 4 and higher. The standard version of the machine is equipped with Siemens 840D sl or B&R control systems. The machine meets CE standards and is supplied with essential accessories and a guarantee of 1 year.

See BUB video

BUB E

PARAMETERS	Units	Design version
Swing diameter	mm (in)	320 (12,6) / 400 (15,7) / 500 (19,7)
Distance between centers	mm (in)	1000 (39,4) / 1500 (59) / 2000 (78,7)
Grinding wheel dimensions	mm (in)	Ø 500 x 80 x Ø 203 (Ø 19,7 x 3,1 x Ø 8)
Maximum grinding wheel width	mm (in)	125 (4,92)
Grinding wheel peripheral speed	$m.s^{-1}$	25 - 45 (10 - 50 option)
Grinding wheel head swivel	°	+45/–15
Minimum programmable in-feed - Axis X	mm (in)	0,0005 (0,00002)
Minimum programmable in-feed - Axis Z	mm (in)	0,001 (0,00004)
Table maximum speed	$m.min^{-1}$ (in/min)	8 (314,9)
Max. weight of workpiece – between centers	kg (lb)	500 (1100)
Max. weight of workpiece-with live spindle (incl. clamp)	kg (lb)	80 (176)
Main electric motor power output	kW (hp)	11 (15)
Machine dimensions		
- Length	mm (in)	4900 (193) / 6600 (260) / 7700 (303)
- Width	mm (in)	3100 (122)
- Height	mm (in)	2200 (87)
Machine weight	kg (lb)	5800 (12760) / 6300 (13860) / 6800 (14960)
Ball screws		KSK Kuřim / Shuton
Cooling and filtration		Astos Aš / UMT LEHMANN
Lubrication		Tribotec
Pneumatic equipment		FESTO

OTHER PRODUCTS

TABLE TYPE HORIZONTAL BORING MILLS

WFC 10, WFT 11, WFT 13 and WRFT 130 (150, 160) represent the table type of horizontal boring mills. Chief machine characteristics are a powerful milling and drilling chip removal rate (even with top Y-axis stroke) and higher precision than other machines available on the market. A modular concept allows great operational variability in configuration, built according to the client's requirements. Modern control systems provide very easy operation of the machine and many useful functions for the user. Horizontal Boring Mills WRFT and WFT 13 offer 5 linear axes travel (X, Y, Z, V, W) and 2 rotary axes (B and C) while WFC 10 and WFT 11 adopt the movement on 4 total axes. Given additional optional accessories, it is possible to increase the number of controlled axes. During the metal processing, the column of the machine adopts Z-axis movement (with the exception of the WFC model) and the workpieces are clamped on a rotary table that travels in the X-axis.

WFT 13

WFT 13 + robot

WRFT 150

"There are many features of the FERMAT machine that allowed us to improve our efficiency. Value for money was an important consideration and Fermat machines are excellent value for money. The features of the machine, for example: large box ways, planetary gear boxes between the servo motor and each of the ball screws, choice of CNC controls and well known, high quality purchased components all influenced my decision to purchase Fermat WFT 13 CNC machine. Sales support from the Fermat Factory as well as from the local dealer was excellent, the company responded with information quickly any time it was needed."

Jerry Decker,
President of Precision Boring Company, USA

WFT 11

WFC 10

TECHNICAL PARAMETERS Metric System | Inch System		Units	WFC 10	WFT 11	WFT 13	WFT 13R	WFT 15R-730	WFT 15-1000	WRFT 150	WRFT 150
Diameter of Spindle		mm | in	100 | 3,94 / 110 | 4,33	100 | 3,94 / 110 | 4,33	130 | 5,12	130 | 5,12	150 | 5,91	150 | 5,91*	130 | 5,12	150 | 5,91*
Taper of Spindle			ISO50 / BT50 / CAT50							
Range of Spindle Speed		rpm	3000 *	3000 *		3000 *		2800 *	3000 *	2800 *
Main Power Max. Torque	CNC Heidenhain or SIEMENS CNC**	kW | HP Nm	19,5 | 26,1 / 31 | 41,5 951 / 1416	19,5 | 26,1 / 31 | 41,5 951 / 1416		41 | 54,9 * 2099		58 | 77,7* 2625	41 | 54,9 * 2099	58 | 77,7 * 2625
Main Power Max. Torque	CNC FANUC CNC**	kW | HP Nm	22 | 29,5 / 30 | 40,2 823 / 1370	22 | 29,5 / 30 | 40,2 823 / 1370		37 | 49,6 * 2362		60 | 80,4 * 2263	37 | 49,6 * 2362	60 | 80,4 * 2263
X cross travel of table		mm | in	1250 | 49,7 / 2000 | 78,7	2000 | 78,7 / 3000 | 118,1		2000 | 78,7 / 3000 | 118,1 / 4000 | 157,5 / 5000 | 196,9			2400 | 94,5 - 9500 | 374,0	
Y vertical travel of headstock		mm | in	1250 | 49,7 / 1700 | 66,9 / 2000 | 78,7	1250 | 49,7 / 1700 | 66,9 / 2000 | 78,7		2000 | 78,7 / 2500 | 98,4 / 3000 | 118,1 / 3500 | 137,8			2000 | 78,7 / 2500 | 98,4 / 3000 | 118,1 / 3500 | 137,8 / 4000 | 157,5 / 4500 | 177,2 / 5000 | 196,9	
Z longitudinal travel of column		mm | in	1250 | 49,7	1250 | 49,7 / 1700 | 66,9		1500 | 59,1 / 2000 | 78,7*			2100 | 82,7 / 3300 | 129,9 *	
W spindle travel		mm | in			730 | 28,7 *			1000 | 39,4	730 | 28,7	1000 | 39,4
V ram travel		mm | in	x	x	x	700 | 27,6		x	900 | 35,4 *	1200 | 47,4
Rapid feed X, Y		mm/min | in min	8000 | 315	8000 | 315		12000 | 472		12000 | 472	15000 | 591	
Rapid feed Z, W, V		mm/min | in min	8000 | 315	8000 | 315		8500 | 335, 10000 | 394, 12000 | 474			15000 | 591, 10000 | 394, 10000 | 394	
Rapid feed B		rpm				2 *			1,7	
Table max. load		kg | lb	3000 | 6600 / 5000 | 11000	10000 | 22000		20000 | 44000			25000 | 55000 / 40000 | 88000 / 50000 | 110000	
Table size		mm | in	1000 x 1120 | 39,4 x 44,1 1250 x 1400 | 49,2 x 55,1 1400 x 1600 | 55,1 x 63,0 1250 x 1800 | 49,2 x 70,9	1200 x 1200 | 47,2 x 47,2 1200 x 1400 | 47,2 x 55,1 1400 x 1600 | 55,1 x 63,0 1600 x 1600 | 63,0 x 63,0 1400 x 1800 | 55,1 x 70,9		1600 x 1800 | 63,0 x 70,9 / 1800 x 2200 | 70,9 x 86,6 1800 x 2600 | 70,9 x 102,4 / 2000 x 2400 | 78,7 x 94,5*** 2500 x 2500 | 98,4 x 98,4 / 2000 x 3000 | 78,7 x 118,1			2000 x 2000 | 78,7 x 78,7 4000 x 4000 | 157,5 x 157,5 and special 2500 x 5000 | 98,4 x 196,9	

* customizable, must be discussed ** S1/S must be specified for each CNC system / motor power
*** also available with a special design for 25000 kg max. load **** WFC 10, WFT 11 and WFT13/15 model can be with linear roller guideways

For more information see our FERMAT HORIZONTAL BORING MILLS CATALOGUE

OTHER PRODUCTS

FLOOR TYPE HORIZONTAL BORING MILLS

One of the main characteristic of the FERMAT floor type horizontal boring and milling machines is their powerful milling and drilling chip removal (even at the top of the Y axis stroke) and higher precision than is offered by other machines available on the market. The large variation of selectable parameters is combined with its broad range of operating functions. The main feature is a modular concept that allows for greater production variables and rapid set-up through the use of peripheral tools and accessories. The machine moves in 3 or 4 different axes (X, Y, Z and W for borers). An additional B and/or V-axis is added when the machine is equipped with the rotary table. Several clamping plates can be joined together, or combined with a rotary table to achieve specialized configurations easily and quickly. Work pieces can be clamped either on the additional rotary table, on the clamping plates, or using both these possibilities. The main working purpose of the machines is chip removal from large and heavy steel, cast steel, or cast iron work pieces. The machine's technology allows a wide utilization in milling, boring, reaming, and threading processes. FERMAT machines stand out thanks to their capacity to achieve higher precision than those of their competitors.

TECHNICAL PARAMETERS Metric System | Inch System	Units	WF 13R	WF 15R	WRF 130	WRF 150	WRF 160	WRF 160 Heavy	WRF MILL
Diameter of Spindle	mm | in	130 | 5,1	150 | 5,9	130 | 5,1	150 | 5,9	160 | 6,3	160 | 6,3	x
Taper of Spindle		ISO50 / BT50 / CAT50						
Range of Spindle Speed	rpm	3000 *	2800 *	3000 *	2800 *	2500 *	2 500 *	5000
Main Power CNC Heidenhain or SIEMENS CNC**	kW | HP	41 | 54,9 *			58 | 77,7 *		74 | 99,2 *	41 | 54,9 *
Max. Torque CNC Heidenhain or SIEMENS CNC**	Nm	2099			2625		3349	2099
Main Power CNC FANUC CNC**	kW | HP	37 | 49,6 *			60 | 80,4 *		x	x
Max. Torque CNC FANUC CNC**	Nm	2362			2263		x	x
X cross travel of column	mm | in	4000 | 157,5 - 22000 | 866,1		1800 | 70,9 - 27500 | 1082,7			2400 | 94,5 - 28100 | 1106,3	18000 | 708,7 - 27500 | 1082,7
Y vertical travel of headstock	mm | in	2000 | 78,7 / 2500 | 98,4 / 3000 | 118,1 / 3500 | 137,8		2000 | 78,7 / 2500 | 98,4 / 3000 | 118,1 / 3500 | 137,8 / 4000 | 157,5 / 4500 | 177,2 / 5000 | 196,9 / 5500 | 216,5 / 6000 | 236,2				2000 | 78,7 - 10000 | 393,7	2000 | 78,7 - 6000 | 236,2
Z ram travel	mm | in	700 | 27,6		900 (35,4) *	1200 (47,2)		1600 (63,0)	1150 (45,3)
W spindle travel	mm | in	730 | 28,7 *		730 (28,7)	1000 (39,4)			x
Rapid feed X, Y	mm/min | in min	20000 | 787,4 12000 | 472,4		20000 | 787,4 15000 | 590,6				
Rapid feed Z, W	mm/min | in min	8500 | 334,6 10000 | 393,7		15000 | 590,6 10000 | 393,7			10000 | 393,7 8000 | 315	15000 | 590,6 , x
ROTARY TABLE - optional accessory								
table max. load	kg | lb	20 000 | 44 000		20 000 | 44 000, 25 000 | 55 000, 40 000 | 88 000, 50 000 | 110 000, 60 000 | 132 000, 80 000 | 176 000				
Table size	mm | in	1600 x 1800 | 63,0 x 70,9 1800 x 2200 | 70,9 x 86,6 1800 x 2600 | 70,9 x 102,4 2000 x 2400 | 78,7 x 94,5		T20 (left) plus, 2000 x 2000 | 78,7 x 78,7 3500 x 3500 | 137,8 x 137,8 4000 x 4000 | 157,5 special tilting with 0-8°				
V longitudinal travel of ttable	mm | in	2000 - 5000 | 78,7 - 196,9		2000 - 5000 | 78,7 - 196,9, 2400 - 9500 | 94,5 - 374 and special				
Rapid feed V axes	mm/min | in min	12000 | 472,4		12000 | 472,4, 20000 | 787,4				
Rapid feed B axes	rpm	2		2 | 1,7				

For more information see our FERMAT HORIZONTAL BORING MILLS CATALOGUE

WRF

WRF 130
Portable

WF 13

"We have now seen that big boring mill on linear guideway works very well. Also when working with spindle and ram out, and the machine is economical compared to hydrostatic machines. Also, Fermat machines have long stroke on spindle 1000 mm/39.37". We find the service well with quick response as well, and also the technicians in Fermat help us to improve smart solutions where we save cost. After 8 years of using FERMAT Horizontal Boring Mills in Sæby we decided to order the 14th floor type WRF boring mill as we got a new order for heavy parts subcontracting for the wind power industry."

Michael Jacobsen,

President of Nordmark Maskinfabrik A/S, Denmark

WRF 160
Heavy

REFERENCES

CYLINDRICAL GRINDING MACHINES

FUDY moving & INDUSTRY services, s.r.o., Czech Republic

BHCR 85/4000 CNC

FUDY moving & INDUSTRY services, s.r.o., Czech Republic

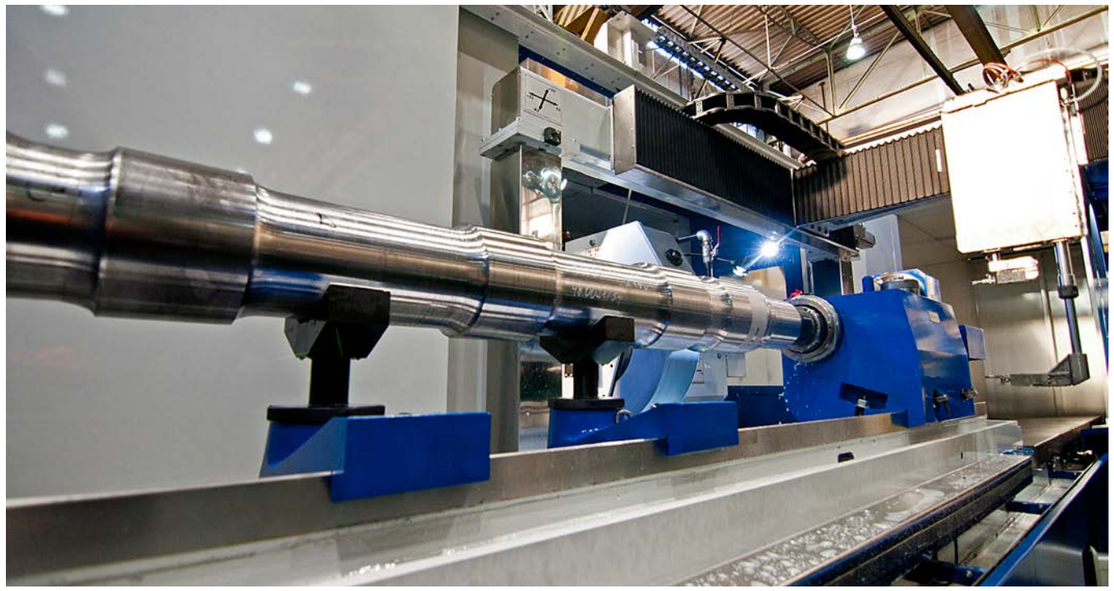
BHM 50/2000 CNC

REFERENCES

CYLINDRICAL GRINDING MACHINES

BONATRANS GROUP, a.s., Czech Republic

BHC 63/3000 CNC



TeroLab Surface GmbH, Germany

BHC 63/4000 CNC

REFERENCES

CYLINDRICAL GRINDING MACHINES

Jansen & Zühlke GmbH Oberflächentechnik, Germany

BHCR 100/4000 CNC

AO Tyazhmash, Russian Federation

BHC 63/4000 CNC

REFERENCES

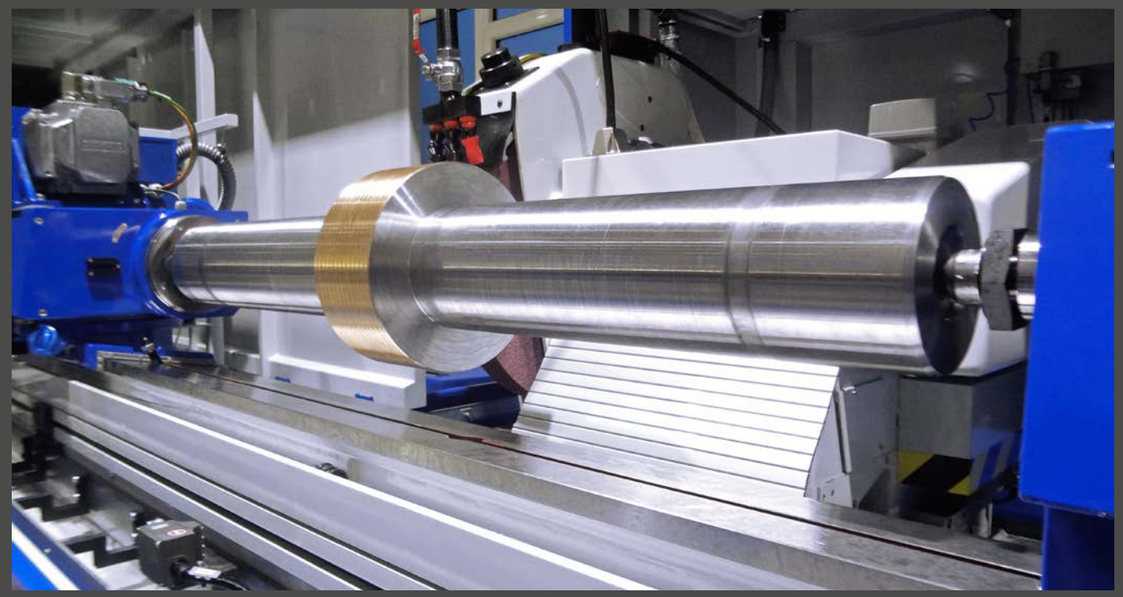
CYLINDRICAL GRINDING MACHINES

KONŠTRUKTA-Industry, a.s., Slovakia

BUB E 40/2000 CNC

Herbert Hänchen GmbH & Co., Germany

BUB E 40/2000 CNC



FERMAT

GRINDING MACHINES

FERMAT Machine Tool, s.r.o.
Zitavskeho 496
156 00 Praha
Czech Republic

Production hall:

FERMAT Machine Tool, s.r.o.
Business Park Prumyslova 11
102 00 Prague 10
Czech Republic

Customer Service Department

E-mail: grind@fermatmachinery.com
Phone: +420 277 009 611

www.fermatmachinetool.com
www.fermatmachinery.com