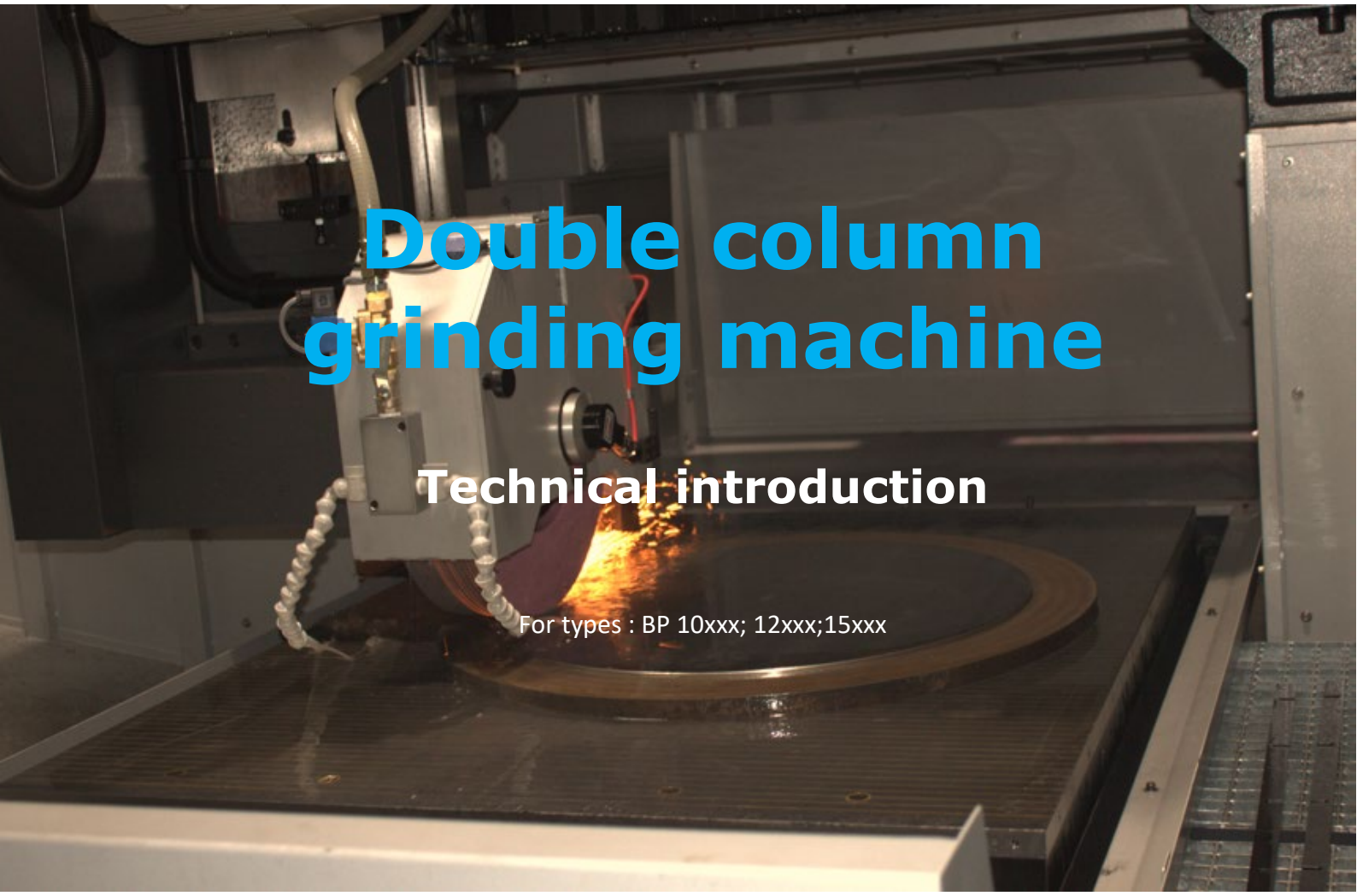
MOOS

Solution
smart&simple grinding



Double column grinding machine

Technical introduction

For types : BP 10xxx; 12xxx;15xxx

M-MOOS spol., s r.o.
Svatopluka Čecha 519/28, Lipník nad Bečvou
www.m-moos.cz

1 Machine introduction

The BP series portal grinders build on M-MOOS's long-standing experience in building and modernizing grinding machines for automatic production. They are designed for efficient and precise grinding of flat and shaped surfaces. The overall concept of the machine is based on the company's philosophy: To supply modern grinding machines and technologies that will meet the requirements of industrial production in the 21st century.

Thanks to the high degree of automation and precision, M-MOOS surface grinders find application in many branches of the automotive and aerospace industries, in the production of tools, molds and also in the global engineering industry. The variability of the system allows to create customer-oriented programs and to supply technologies according to the needs of each customer. Even when grinding more complex shapes, absolutely no programming basics or knowledge of ISO code are required.

Key features

+ Intuitive and simple operation
+ Fast dialog programming
+ Sophisticated and easy cycles
+ Fine-tuning function to exact dimensions
+ Comfortable machine operation and maintenance
+ Rigid cast iron machine construction
+ V-V guide surfaces guarantee high accuracy
+ Premium equipment and machine equipment

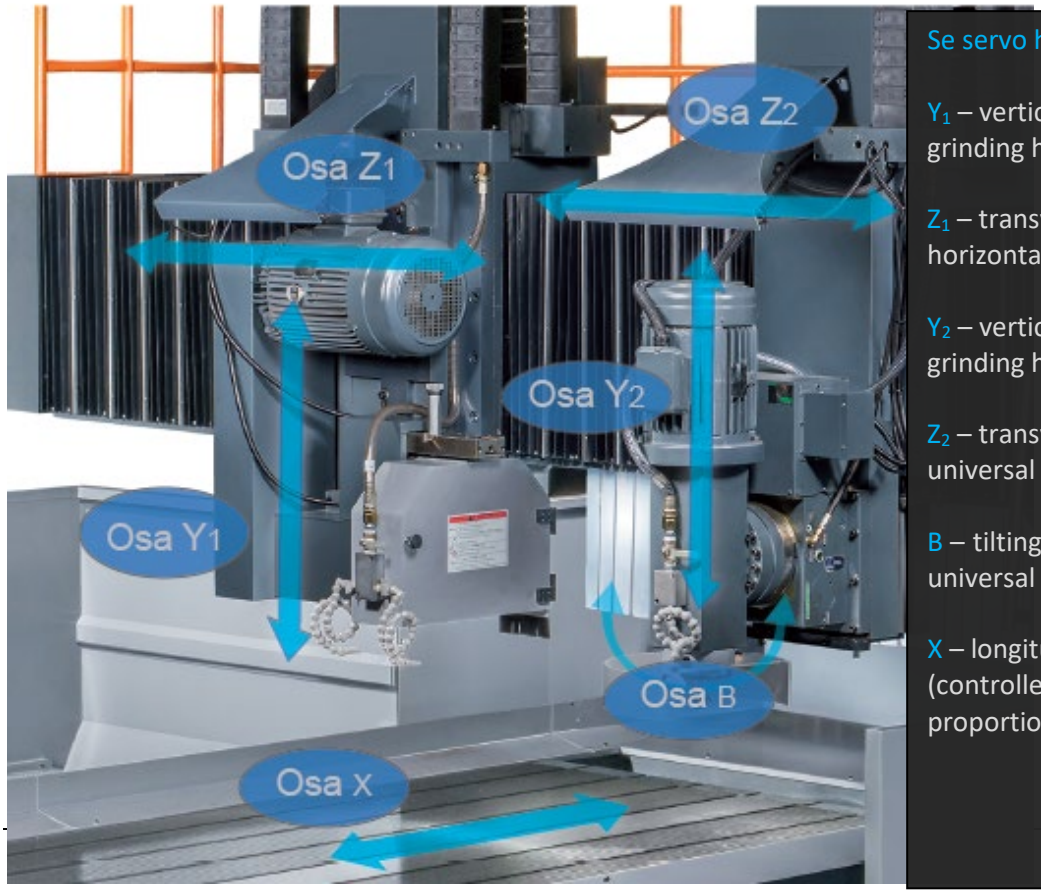
Machine marking- each types configuration

	Number of controlled axes	Longitudinal table travel	Leveling equipment	Function
BP XXXX 2AX (standard)	2	Hydraulically via proportional valve	3-point on the workbench	Automatic grinding of surfaces and shapes Automatic disc alignment during the work cycle including compensation
BP XXXX 1AX (basic option)	1 (Vertical axis)	Hydraulically without proportional valve	1-point on the workbench	Automatic surface grinding, automatic plunge grinding with manual positioning in the transverse axis. Manual adjustment of stops in the longitudinal axis

	Number of controlled axes	Longitudinal table travel	Leveling equipment	Function
BP XXXX 5AX (multi-tasking option)	3	Ball screw	3-point on the workbench	2 grinding heads, 1 of which is servo-controlled Automatic grinding of surfaces and shapes Automatic disc alignment during the work cycle including compensation
BP XXXX 3AX (option)	3	Timing belt		

Machine controls and capabilities

The axes Z1; Y1; Z2; Y2 and the B axis are controlled by Fanuc servomotors. This is a full CNC axis control enabling linear and circular interpolation. The position of the axes Z1; Y1; Z2 and Y2 is scanned by optical rulers from the Czech manufacturer ESSA Praha with a resolution of 0.0001 mm, which guarantees perfect positioning accuracy.



Se servo hlavou až 6 řízených os

Y_1 – vertical travel of horizontal grinding head

Z_1 – transverse travel of horizontal grinding head

Y_2 – vertical travel of universal grinding heads

Z_2 – transverse travel of universal grinding heads

B – tilting the headstock of the universal grinding head

X – longitudinal table movement (controlled hydraulically using a proportional valve)

2 Technical Specification

Type: BP 10XX 2AX; worktable width: 1000 mm

Model	BP-1015	BP-1020	BP-1025	BP-1030	BP-1040
Max. travel (transverse x longitudinal)	1200x1650mm	1200x2150mm	1200x2650mm	1200x3150mm	1200x4150mm
Distance between blade and worktable	0-750mm				
Height of spindle axis from table	1100mm				
Table work surface	1000x1500mm	1000x2000mm	1000x2500mm	1000x3000mm	1000x4000mm
Hydraulic table feed	1-25 m/min				
Distance between racks	1200mm				
Stepping cross feed	0.1 - 100 mm/feed				
Continuous cross feed	2600 mm/min				
Handwheel division	0.001/0.005/0.01/0.05mm				
Min. division	0.001mm				
Vertical rapid traverse 50Hz (option)	750 mm/min				
1 turn of the vertical handwheel	MPG - hand electronic wheel				
1 vertical handwheel section	MPG - electronic hand wheel				
Disc dimensions (H x W x IP) - standard	510x100x203 mm				
Spindle speed 50/60Hz	1150 rpm				
Horizontal head motor power	15 (18.5) kW				
Vertical head motor power	7.5 kW				
Hydraulic motor	7.5 kW				
Net weight	10000 kg	13500 kg	17500 kg	22000 kg	36500 kg
Gross weight of the machine	13000 kg	17000 kg	21500 kg	26500 kg	41000 kg

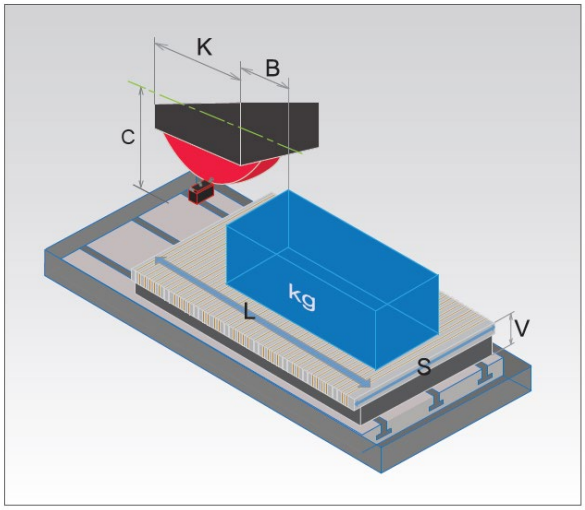
Type: BP 12XX 2AX; worktable width: 1200 mm

Model	BP-1215	BP-1220	BP-1225	BP-1230	BP-1240
Max. travel (transverse x longitudinal)	1400x1650mm	1400x2150mm	1400x2650mm	1400x3150mm	1400x4150mm
Distance between blade and worktable	0-750mm				
Height of spindle axis from table	1100mm				
Table work surface	1200x1500mm	1200x2000mm	1200x2500mm	1200x3000mm	1200x4000mm
Hydraulic table feed	1-25 m/min				
Distance between racks	1400mm				
Stepping cross feed	0.1 - 100 mm/feed				
Continuous cross feed	2600 mm/min				
Handwheel division	0.001/0.005/0.01/0.05mm				
Min. division	0.001mm				
Vertical rapid traverse 50Hz (option)	750 mm/min				
1 turn of the vertical handwheel	MPG - electronic hand wheel				
1 vertical handwheel section	MPG - hand electronic wheel				
Disc dimensions (H x W x IP) - standard	510x100x203mm				
Spindle speed 50/60Hz	1150 rpm				
Horizontal head motor power	15 (18.5) kW				
Vertical head motor power	7.5 kW				
Hydraulic motor	7.5 kW				
Net weight	14000 kg	14500 kg	18500 kg	23000 kg	37500 kg
Gross weight of the machine	17000 kg	18000 kg	22500 kg	27500 kg	42000 kg

Type: BP 15XX 2AX; worktable width: 1500 mm

Model	BP-1522	BP-1530	BP-1540	BP-1550	BP-1560
Max. travel (transverse x longitudinal)	1900x2350mm	1900x3150mm	1900x4150mm	1900x5150mm	1900x6150mm
Distance between blade and worktable	0-750mm				
Height of spindle axis from table	1100mm				
Table work surface	1500x2200mm	1500x3000mm	1500x4000mm	1500x5000mm	1500x6000mm
Hydraulic table feed	1-25 m/min				
Distance between racks	2000mm				
Stepping cross feed	0.1 - 100 mm/feed				
Continuous cross feed	2600 mm/min				
Handwheel division	0.001/0.005/0.01/0.05mm				
Min. division	0.001mm				
Vertical rapid traverse 50Hz (option)	750 mm/min				
1 turn of the vertical handwheel	MPG - electronic hand wheel				
1 vertical handwheel section	MPG - electronic hand wheel				
Disc dimensions (H x W x IP) - standard	510x100x203 mm				
Spindle speed 50/60Hz	1150 rpm				
Horizontal head motor power	15 (18.5) kW				
Vertical head motor power	7.5 kW				
Hydraulic motor	7.5 kW				
Net weight	34000 kg	39500 kg	45000 kg	50000 kg	56000 kg
Gross weight of the machine	37000 kg	43000 kg	49500 kg	55000 kg	62000 kg

Machine Workspace



Max. rozměr obrobku = rozměr magnetického stolu

Vzdálenost od osy vřetene po plochu pracovního stolu
C max = 1100 mm

Výška obrobku = 1100 – Poloměr kotouče – výška magnetické desky = 1100-255 – 85 = **760 mm**

Délka krytu kotouče : K = 540 mm

Při častém orovnání kotouče je nutné zohlednit bezpečnou vzdálenost **B** mezi obrobkem a krytem kouče, tak aby nedošlo ke kolizi během procesu orovnání kotouče. Nebo zvolit jiný typ orovnávacího zařízení.

Type	Load capacity				Magnetic table		
	Max. worktable load	Weight of the mag. table	Max. workpiece weight		Length (L)	Width (W)	Height (H)
BP-1015	3500 kg	895 kg	2605 kg	2 pcs	500mm	1500mm	81mm
BP-1020	4000 kg	1050 kg	2950 kg	4 pcs	500mm	1000mm	81mm
BP-1025	4500 kg	1490 kg	3010 kg	4 pcs	500mm	1250mm	81mm
BP-1030	5000 kg	1785 kg	3215 kg	4 pcs	500mm	1500mm	81mm
BP-1040	7200 kg	2100 kg	5100 kg	8 pcs	500mm	1000mm	81mm
BP-1215	3700 kg	1075 kg	2625 kg	2 pcs	600mm	1500mm	81mm
BP-1220	4200 kg	1260 kg	2940 kg	4pcs	600mm	1000mm	81mm
BP-1225	4800 kg	1782 kg	3018 kg	4 pcs	600mm	1250mm	81mm
BP-1230	5400 kg	2145 kg	3255 kg	4pcs	600mm	1500mm	81mm
BP-1240	8000 kg	2520 kg	5480 kg	8pcs	600mm	1000mm	81mm
BP-1522	5500 kg	1965 kg	3535 kg	4pcs	750mm	1100mm	81mm
BP-1530	7500 kg	2680 kg	4820 kg	4 pcs	750mm	1500mm	81mm
BP-1540	9200 kg	3580 kg	5620 kg	8 pcs	500mm	1500mm	81mm
BP-1550	10,500 kg	4475 kg	6025 kg	10 pcs	500mm	1500mm	81mm
BP-1560	10,500 kg	5365 kg	5135 kg	10 pcs	500mm	1500mm	81mm

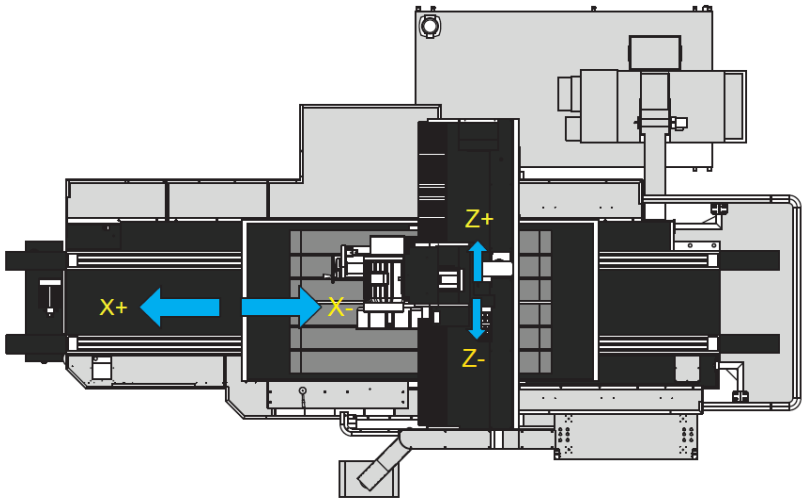
Specifications of main electrical components

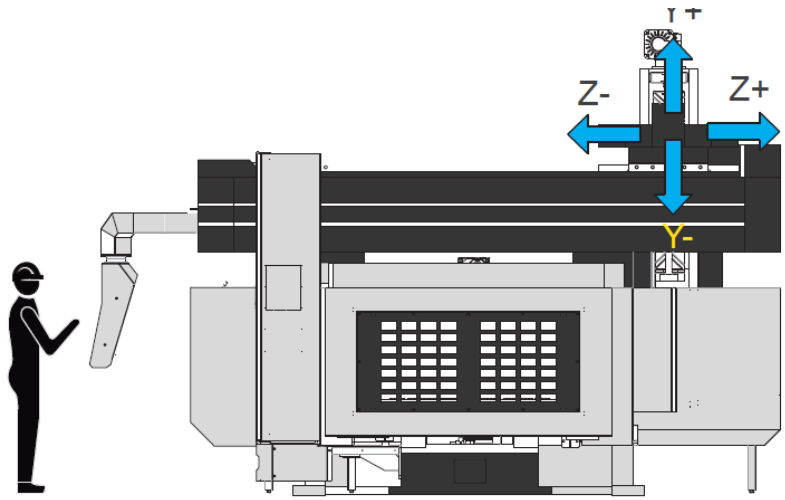
Type	Spindle motor	Hydraulic pump	Coolant pump	Cross feed servo motor	Vertical feed servo motor	Lubrication unit (capacity 2x 4l)	Lubrication unit (capacity 60l)
BP-10xx BP-12xx BP-15xx	18.5kW	15 kW + refrigerator 4.5 kW	0.55kW	3.9kW	3.9kW	0.003 kW	0.18 kW

Hydraulic system and lubrication unit

Model	Hydraulic motor	Oil tank capacity	Lubricant capacity
BP-series	15 kW	800L	2 /951x 4l

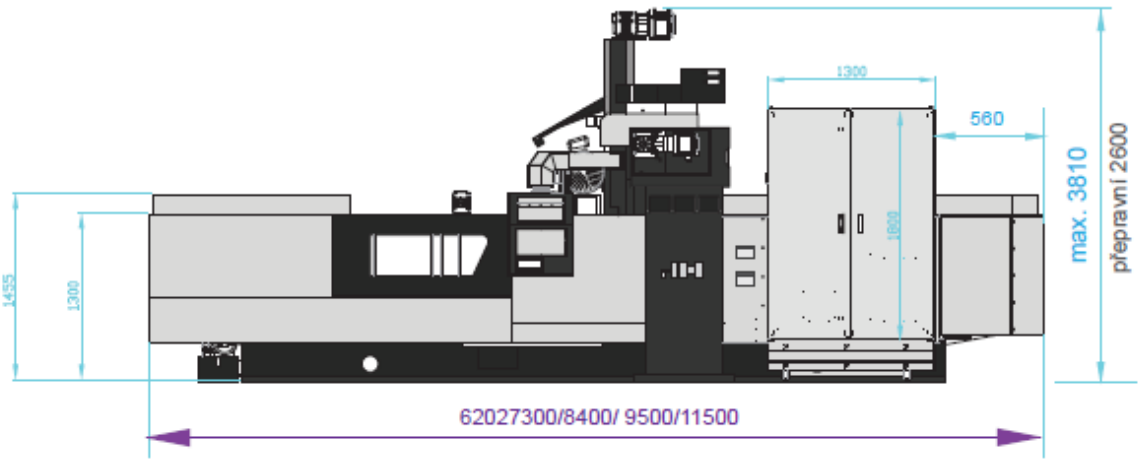
Machine control and working position

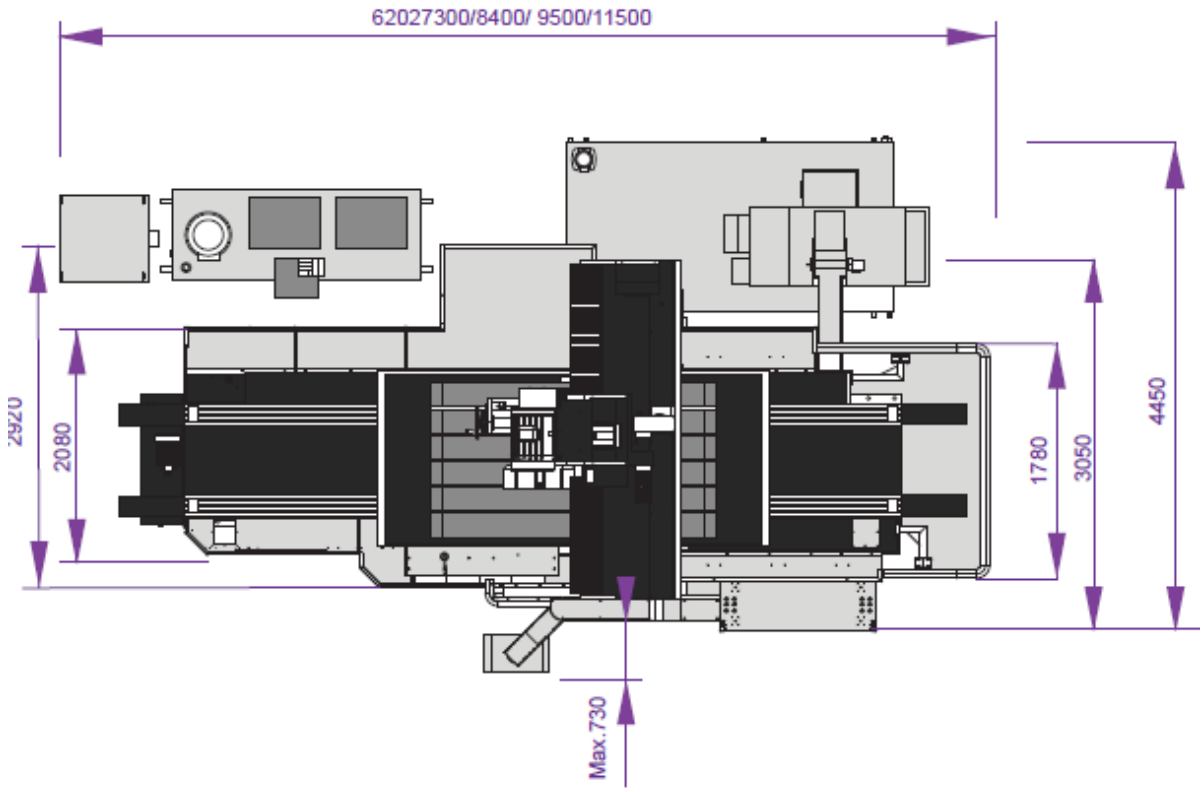




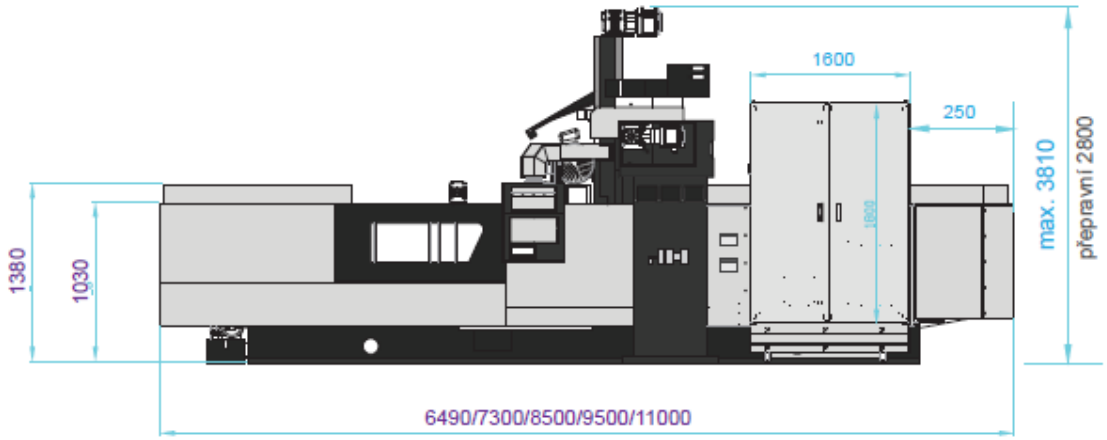
3 Instalation and machine dimension

BP-10xx-2AX
jednotky: mm

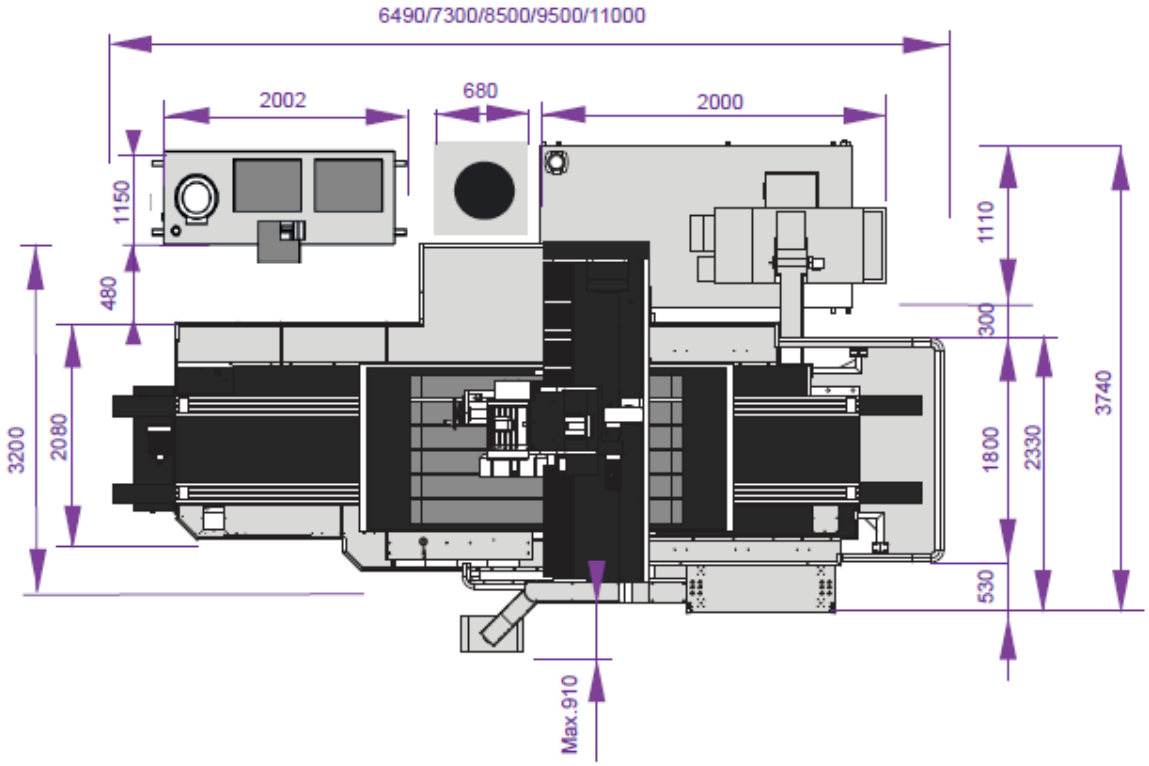




BP-12xx-2AX
jednotky: mm



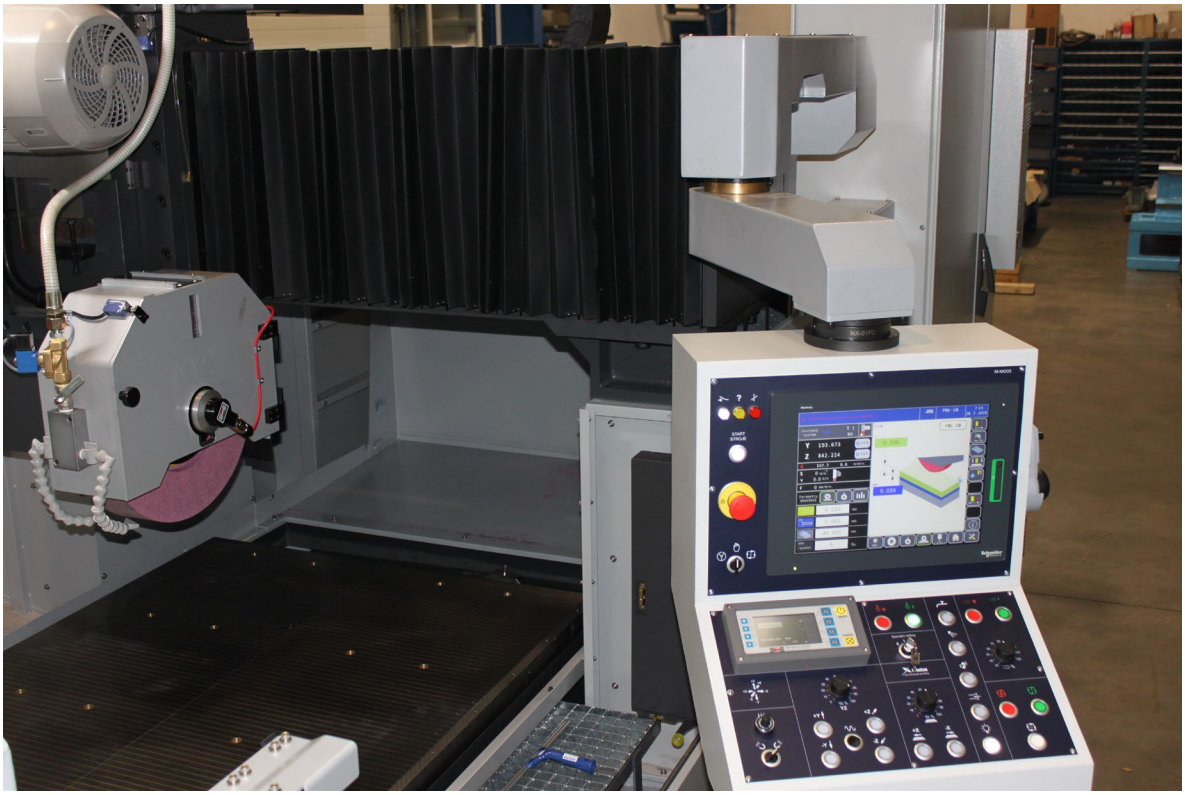
BP 12xx
rozměry: (mm)



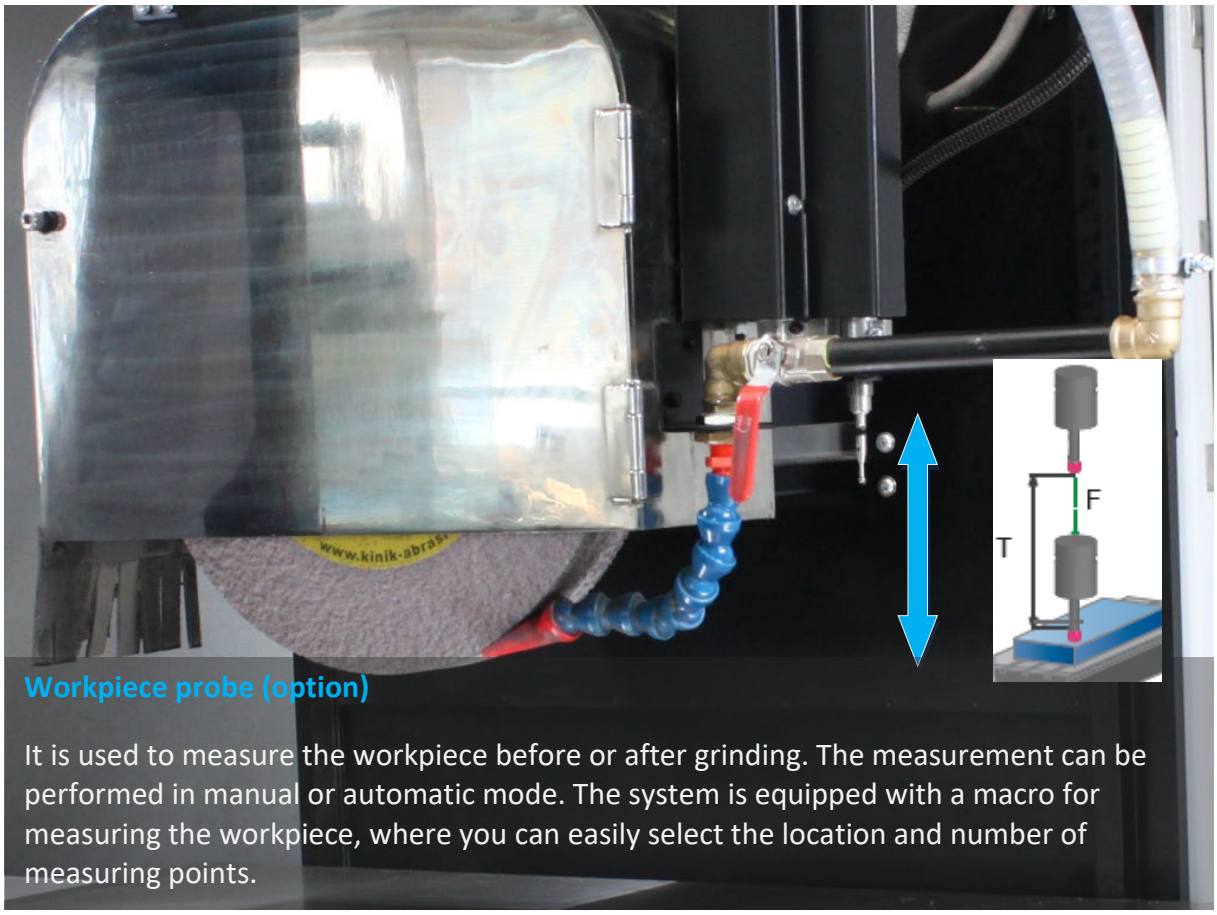
4 Standard design and optional machine accessories

BP-1215-2AX

BP-1215-2AX



Item	Standard equipment and machine design
1	X-Solution control system, 15" color touch screen, Z,Y axes, controlled by servo drive,
2	Transverse guide surfaces in the 2 V sliding surface design
3	Longitudinal guide surfaces in the 2 V sliding surface design
4	Automatic lubrication system controlled from PLC
5	Setting the range of longitudinal travel using software cues
6	Grinding wheel 500 x 100 mm + flange
7	Hydraulic aggregate with integrated refrigerator
8	Balance shaft
9	Wrench for removing and tightening the disc
10	Grinding wheel balancing stand
11	Tool Box and Maintenance Tool Set
12	Workpiece cooling system
13	Work area rinsing gun
14	Paper filtration with magnetic separator
15	Leveling device on the workbench
16	Water management tank capacity 300 l
17	Linear rulers ESSA Prague
18	2 pcs Dressing diamond
19	Semi-cabin covering
20	Work lighting, 1 x LED lamp
21	Automatic grinding wheel balancing system SB-5500

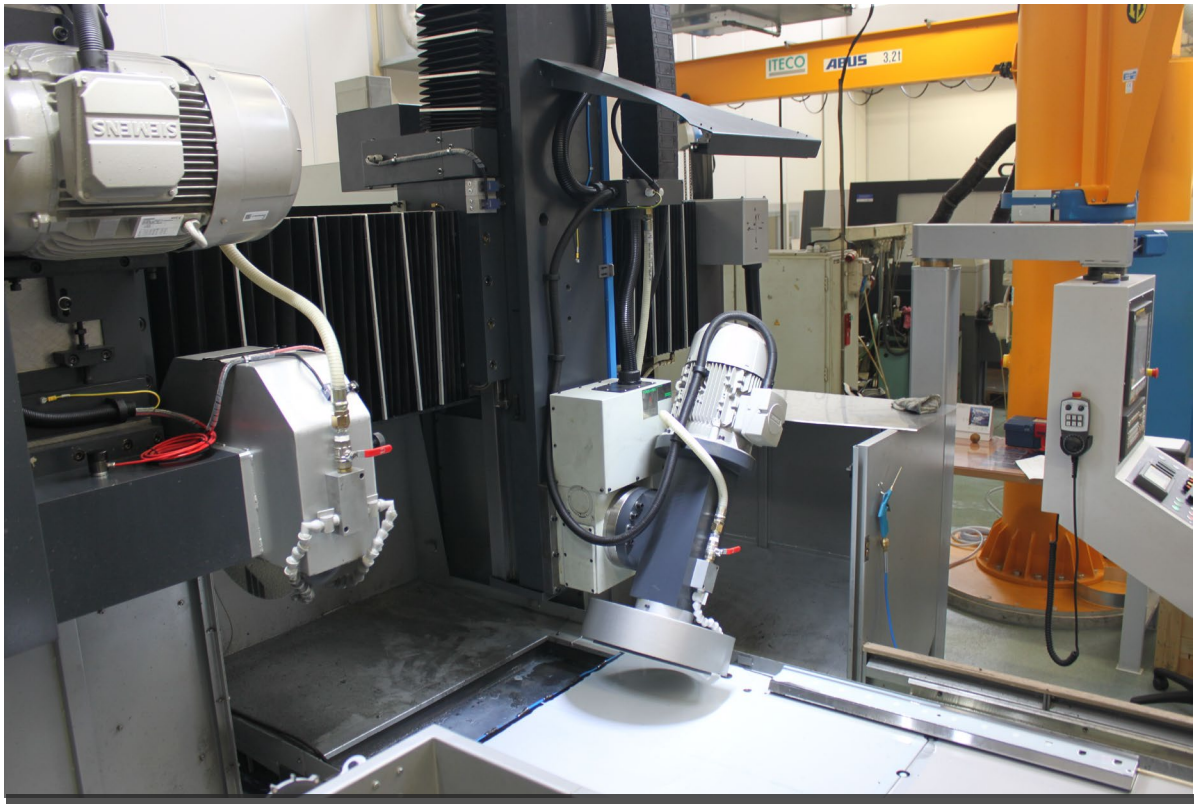


Workpiece probe (option)

It is used to measure the workpiece before or after grinding. The measurement can be performed in manual or automatic mode. The system is equipped with a macro for measuring the workpiece, where you can easily select the location and number of measuring points.

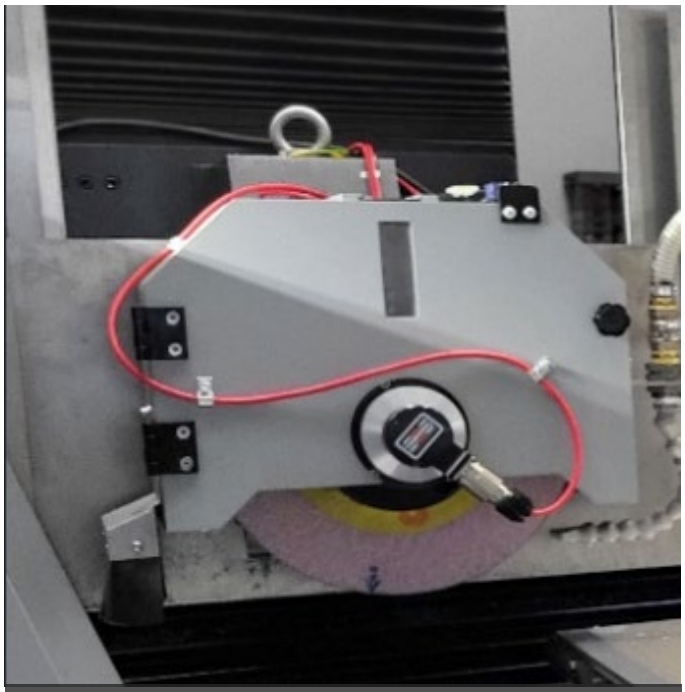
Control system Fanuc (option)

P For more complex shape grinding or workpieces requiring multi-axis interpolation, we recommend choosing the Fanuc control system. The comfortable 15" screen provides a perfect overview and orientation even in more extensive macros.



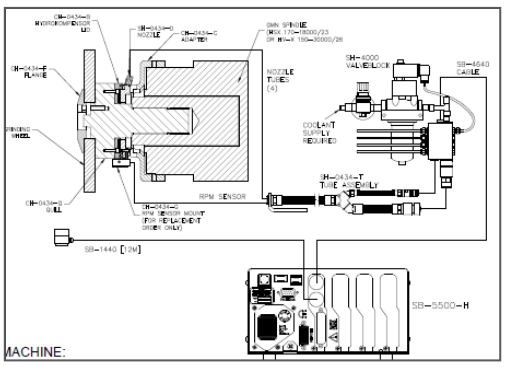
Automatická Univerzální brousící hlava – +/- 90° (opce)

Automatická servo řízená hlava je osazena přesným úhlovým enkoderem Heidenhain, který zajišťuje přesné natočení na požadovanou souřadnici. Broušení pod úhlem je tak mnohem přesnější a rychlejší.



Aut. Wheel Balancing systém SBS (opt. 1)

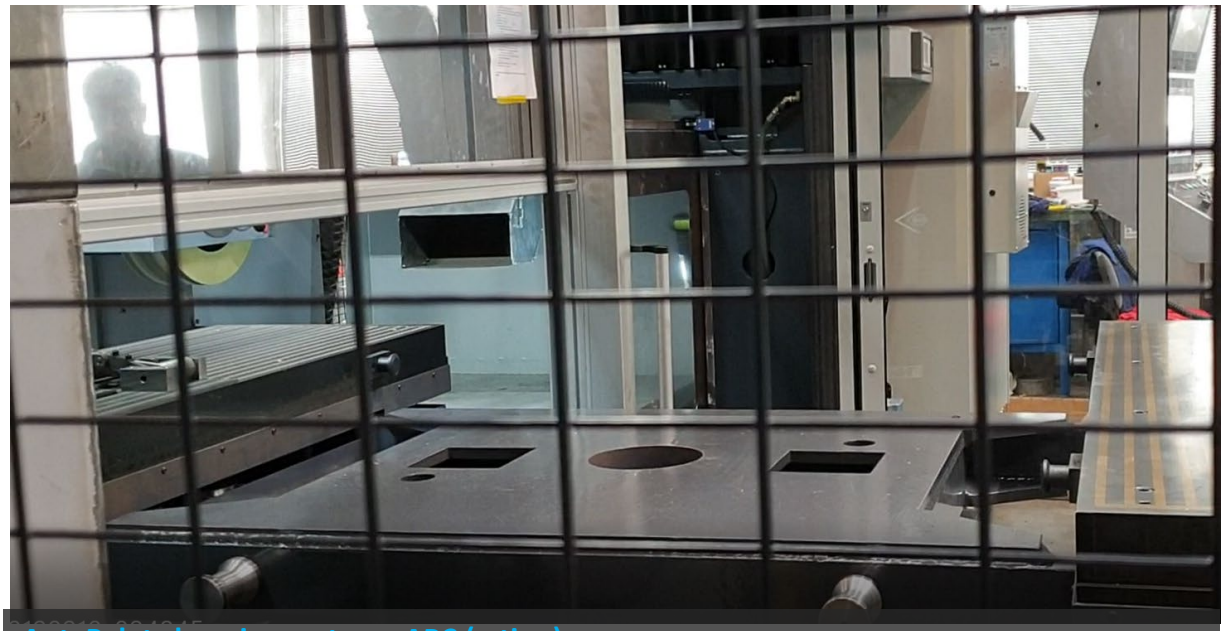
Improves workpiece quality with automatic balancing down to 0.02 microns.
Provides longer life for grinding wheels, dressing wheels and spindle bearings.



Aut. Wheel Balancing systém (opt. 2- type hydro)

Thanks to the direct-to-back mounting, it does not limit the stroke or the working space.

The Hydrokompenser system uses process coolant, water or other available liquids for balancing.
The four-chamber balancing disc is integrated into the disc holder or the grinding disc flange so that the correction medium can be injected through the nozzles



Aut. Palet changing system– APC (otion)

Automatic pallet changer in grinders replaces the fixed electromagnetic plate with a permanent one, but has the advantage of rapid workpiece change by allowing the preparation and positioning of another workpiece while one is being machined. This significantly speeds up the machining process.

ITEM	Optianal accessories
A	Magnetic table with fine pitch (1+1)
B	Pneumatic unloading system
C	Coolant tank capacity 600l
D	Coolant tank capacity 900l
E	Another coolant jets
F	Spare role of paper filtr
G	Oil mist Dust suction system Raven X-Cylone RJ-2; 250W,1000 m^3/hod
H	Oil mist Dust suction system Raven X-Cylone RJ-3; 500 W,1000 m^3/hod
I	Oil mist Dust suction system LOSMA DARWIN 1200; 1,5 kW, 1270 m^3/hod
J	Dressing over the wheel - type EM (cross electric, vertical manual)
K	Dressing over the wheel - type Auto (cross electric, servomotor vertical axis)
L	Rotary dresser DR-KAISER
M	Workpiece probe
N	Hydro type balancing system
O	Control system Fanuc 0i-TF plus, Windows base, touch screen 15“ panel iH Pro
Q	Spare flang of grinding wheel

R	Full sheet metal covers
S	Stainless stell wheel cover
T	Servouniversal head +/- 90°
U	APC – palet changing system

5 Main parts description

Main parts

Construction of machine is based on the classic concept of the double column machine, the cross displacement (Z axis) is performed by movement of grinding headstock slides along cross beam and longitudinal feed is performed by working table (X-axis). Vertical displacement of the headstock (Y axis), is implemented on the sliding guide surfaces.

All main parts of the machine such as, bed, table, stand, sleds are made of high quality certified část iron, column has a hexagonal ribs to ensure high rigidity. Castings pare are annealed twice with an emphasis on removing any metallurgical tensions. A characteristic feature of the casting base, which is made of one piece.

Bed

Undivided base made from one piece

The machine bed is made of one piece. This ensures maximum stiffness of the entire system of the machine and reduces unwanted twisting, which is typical for the bolted connections. Thanks to this concept can achieve high working accuracy.

Guidewys

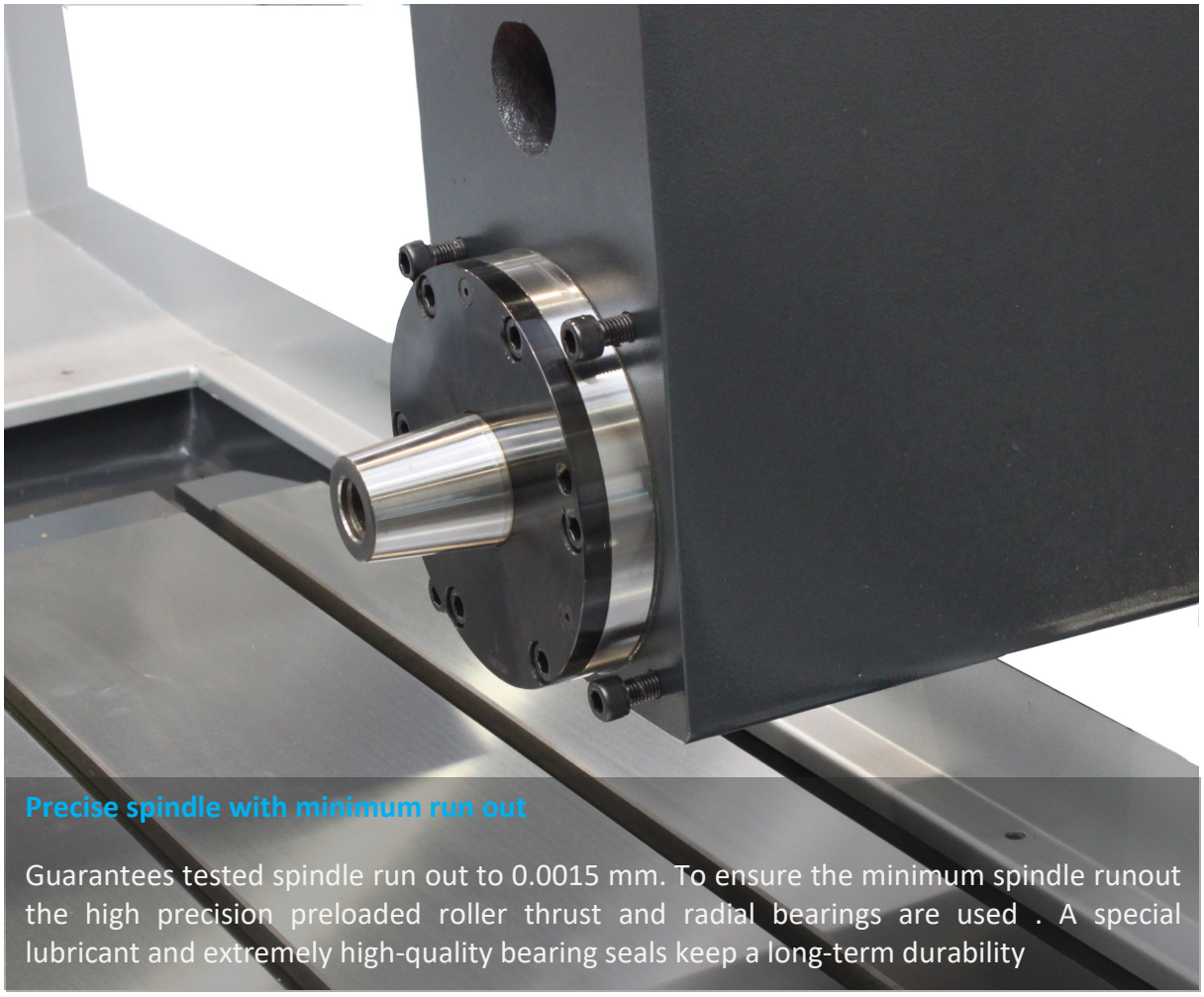
V-V guideways as a guaranteed perfect linear accuracy

Movement in the crossl and the longitudinal axis is implemented on the sliding guide surfaces of the V-V type. This prismatic guideways ensures perfect linear accuracy. Moreover, this concept provides a much longer life and working accuracy than when grinding e.g. with roller guidance or with one V.

Excellent abilities for absolutely precise grinding.

The surface of the guide surfaces of the table and slide is hand-scraped, thus ensuring high accuracy and achieve a perfect seating pattern between the contact surfaces. High rigidity of moving system, large loading capacity of table and the lowest possible value for warping and twisting - it is a guarantee for maximum productivity with high quality grinde surface and constant accuracy.

Headstock



The spindle is connected with the motor via a flexible coupling to ensure the transmission of rotary motion without vibration. The integrated frequency converter enables you to change the spindle speed continuously, thereby guaranteeing a constant circumferential speed

Spindle spped	Spindle change	Spindle motor	Driven	Spindle taper
2400 rpm	Steplees with frequency inverter	7,5 kW (option 11 kW)	Direct through clutch	6°1´38"

Grinding wheel (Standard)

Grinding wheel diameter: 500 mm
Grinding wheel width: 100 mm
Inner hole diameter of grinding wheel: 203,2 mm
Type: 32A 46J 11V 7NP1
Using: *grinding of semi-hard steel, no better than 0,4/0,6 Ra*

Hydraulic system – Longitudinal travel of working table

Two separate hydraulic cylinders are anchored at specific positions of the piston rod, whereby improved rigidity and stability. This creates a very stable and smooth movement of the table and eliminates its swimming. The speed of movement while damping in each reversal points is controlled proportional valve. Reverse limits are set on the operation screen. Temperature stability is guaranteed independent oil cooling equipment.

Hydraulic unit and pump are separated from the main part of the machine, which provides the following benefits:

a) Preventing superheated entry of oil into the machine, which causes stretching and distortion, which can affect the final accuracy of the workpiece.

b) prevents any vibrations and oscillations, which are produced by hydraulic pump and transmitted to the base of the machine and causing a flatter track on the workpiece.

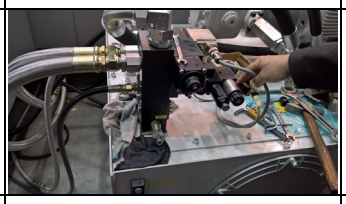
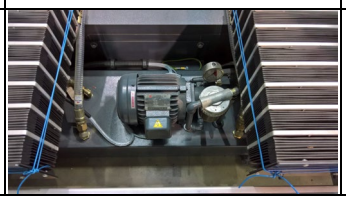
Hydraulic system filtration is necessary part, which keeps the oil without impurities and prolongs the life of the individual components of the hydraulic circuit.

Lubrication system of the machine.

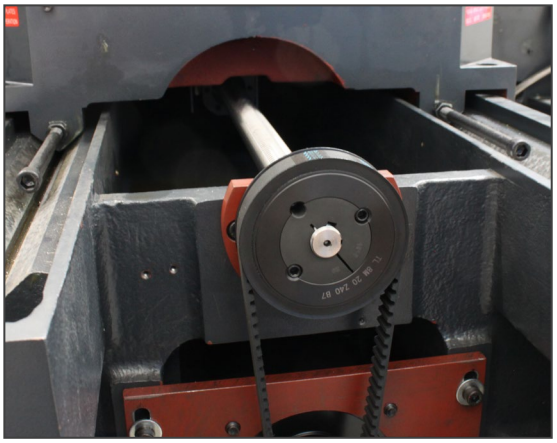
The machine is equipped with an automatic pressure lubrication system, which through a dispenser with a filter supplying important machine components: the sliding surface of the column, ball screws in the vertical and cross axis, and a guideways surface cross axis. The time interval is controlled by the PLC of the machine. Longitudinal guides have their own unit and the circuit. For the spindle bearings used special grease with exactly the given amount, which does not need to be supplemented. The oil level is controlled by the device. At a low state signal is issued in the form of error message is stopped and the machine operation. Oil supply is also controlled by the pressure sensor.

Mazací agregáty:

Model				
1		Power supply		3PE,400V/230V,50Hz, TN-C,Fuse 105 A
2		Air inlets		conection: 3 / 8“ ; 8x14 mm. 0,6 MPa
2a		Air reduction station		Filtr Heidenhain DA 400

3		Lubrication system I, II	Lubrication of vertical and transverse guide surfaces, ball screws and nuts in transverse and vertical feed	2 x 4l, Oil for guide surfaces, Paramo KV 68
4		Hydraulic tank		800 l, Hydraulic oil, Paramo HM 46
5		Coolant tank		600 l
6		Oil tank III	Mazání podélných vodících ploch	60 l, Olej na vodící plochy, Paramo KV 68

Vertical and cross travel



The machine is driven by servomotors in the cross and vertical axes. The individual axes are equipped with precision ball screws, which provide long-term working accuracy.

Cross and vertical axis is equipped with an optical linear scale with an accuracy of 0.0001 mm, which ensures high positioning accuracy. Perfect protection of rulers is ensured by supply of compressed air directly into the ruler. The air is filtered by a system Heidenhain DA 400 that ensures filter particles down to 0.01 microns

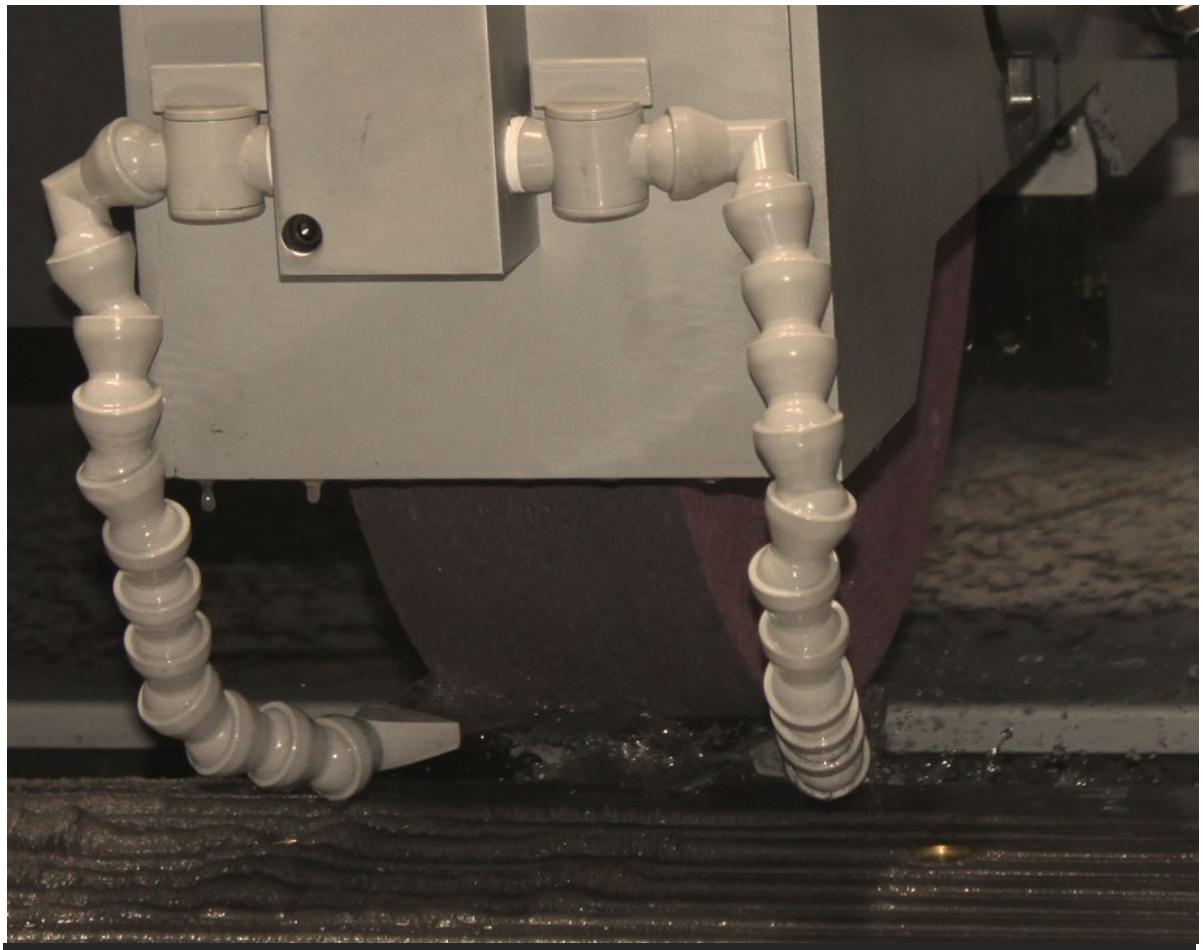
For the installation of the machine is required to supply clean compressed air with a pressure of 0.6 MPa. Supply is at the back of the machine

The machine is equipped with an electronic handwheel, which can perform a manual shift in each axis. Other Operations feed is via a button on the control panel in JOG

Elektromagnetic table

There is en electromagnetic table with the control unit for regulating the clamping force and the demagnetizer in standard equipment. Controls are mounted on the control panel. This system allows choose optimal force for clamping, so as to avoid distortion during the clamping process. Adjusting of clamping force is in the range from 0 to 100% of the nominal magnetic performance.

Orovnávací zařízení



3-point dressing attachement on the table (Standard)

The standard is a 3-point dressing device, which is located in the corner of the workbench. The replaceable base allows you to change the height as needed. The dressing cycle can be activated automatically from the program without interrupting the grinding process. The wheel moves onto the dressing device, the wheel is dressed with subsequent compensation.

Dressing attachement over the grinding wheel - type EM (option)

Cross travel (forward / reverse) of dresser is driven by a motor and controlled through the touch screen. Vertical displacement is controlled manually. Material removal is deducted on a scale with a resolution of 0.01 mm. After dressing, you can enter a compensation value actually removed from the wheel. It doesn´t allowed to dress shapes

Dressing attachement over the grinding wheel - type AUTO (option)

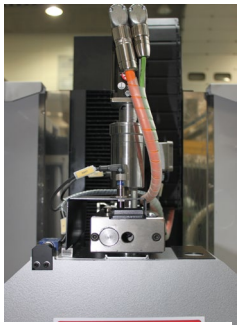
Cross travel (forward / reverse) of dresser is driven by a motor and controlled through the touch screen. Vertical displacement is driven by a servomotor and ball screw. It enables efficient and automatic wheel dressing as a part of the grinding cycle including automatic compensation.

Suitable for grinding plane surfaces, which require frequent wheel dressing. It doesn´t allowed to dress shapes.

Rotary disc Dr. Kaiser (option)

The device placed on a workbench. Dressing cycle can be activated automatically from the program without interrupting the grinding process. The wheel moves to the dressing device automaticly and wheels dressing with subsequent compensation is executed. The main advantage is a long-term accurate and efficient form dressing wheel.

Typ EM

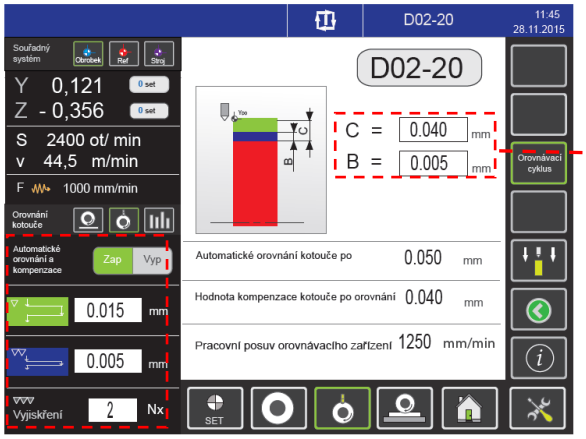


Typ AUTO

DR. KAISER

U

Example of dressing cycle D02-20.



Dressing cycle is consists of rought and fine dressing + travels to clean wheel

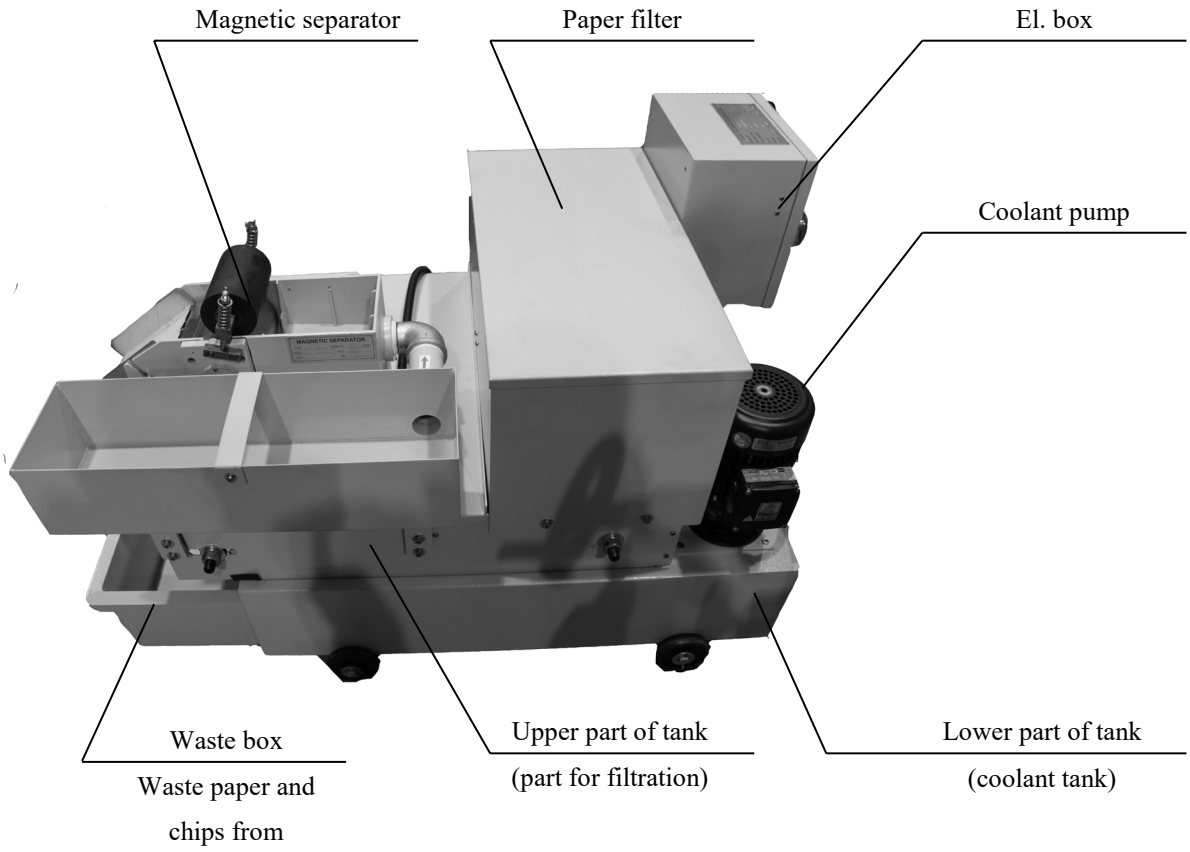
C = total removal of the wheel when dressing. Enters the removal mm in radius value. E.g. 0.040 mm - diameter of the wheel is thus reduced by 0.080 mm

B = The removal of the wheel for fine dressing. Enters the removal mm in radius value. E.g. 0.005 mm - diameter of the wheel is thus reduced by 0.01 mm

Removal during roughing = C-B = 0.040- 0.005 = 0.035. It is automatically calculated by the system

Coolant system

As standard, the workpiece cooling system comprises the pump, a nozzle and atank for the coolant with capacity 300 liters. For advanced filtration, there is a paper filter and magnetic separator. This ensures optimal filtering and roughness of the ground surface is not affected by impurities in the liquid. It also significantly extends the life of the fluid.



Coolant tank capacity	300 l/min
Flow	80 l/min
Papipr filter and magnetic separator capcity	40 l/min
Size filtered parts	50µ, 30µ, 15µ

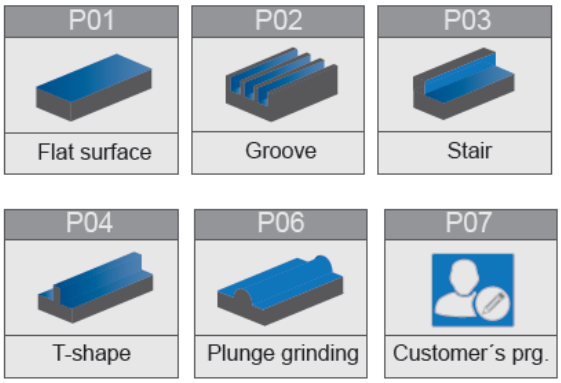
Capacity of tank can be extended to 600 or 900 liters

Coolant also provides cleaning channels. Also included is the pistol to clean the workpiece and working area.Pistol could be changed for a flow brush quickly by coupler. Control is via a solenoid valve and each function can be run separately using the buttons on the control panel

6 Control system

6.1 Control system X-Solution

This 3rd generation of our own control system comes from the previous systems developed for the purpose of modernization of grinding machines for automatic production. X-Solution means a lot of new options, which is reflected in the standard equipment of the whole system. It is based on a touch screen, intuitive interface and dialog type program making sophisticated grinding cycles for different workpieces



Program screen menu

+ Intuitive and easy operation
+ Reduction of the time delays
+ Faster program creation in a few steps
+ Possibility to add a new customer´s cycles
+ Reliable system with on-line diagnostic
+ Sophisticated system management

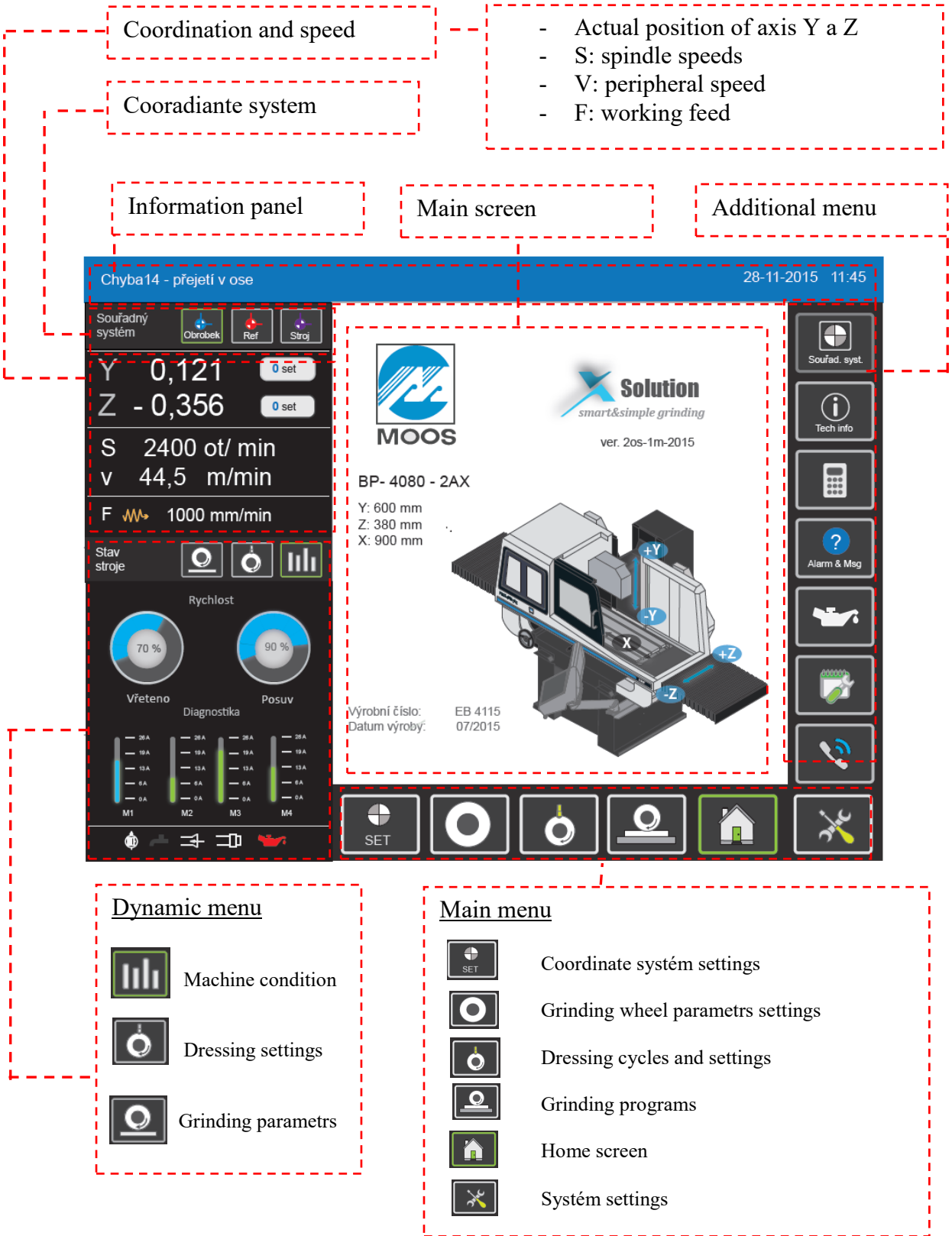
Standard functions

Dialog type program making
10“ touch screen
2 base grinding cycles for surface
4 base cycles for grooves grinding
3 cycles for grinding of stairs type workpieces
3 grinding cycles for T - shapes
Rough grinding
Fine grinding
Wheel spark-out
Re-grinding function to final precize dimension
Cycles for grinding wheel dressing
Automatic compensation after dressing
Tabular visualization during grinding
Displaying of speed, feed rate and cutting speed
Tool table with a direct selection and edit
3 operating modes: Jog, Manual, Auto
2 higher-level modes: operation and adjustment
Time and Date
Alarms and user reports
Technological information
Program control buttom CYKL START, HOLD, RESET

Informative screen about grinding process

6.2 Basic information about operation

The main element of communication between the operator and the machine is 10 " touch screen that is displayed when the machine is turned on. Below mentioned screen and procedures introduce you the procedure for programming elements and possibilities of the system.



Icon Color meaning

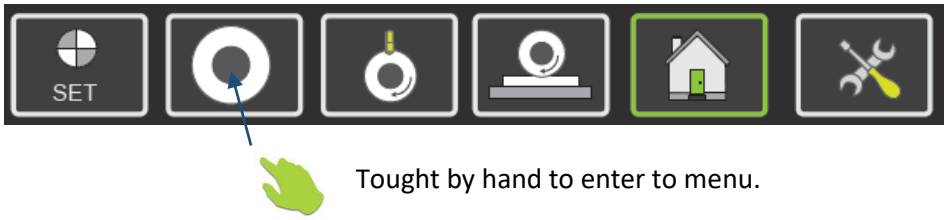
Example of **active** menu and icon  = green frame;

Example of **inactive** menu and icon  = gray frame

Some icons and menu are blocked when machine is running in automatic mode.

Example of **blocked** menu and icon  dný rámeček

How to enter to menu – operation of touch display



Tought by hand to enter to menu.

Information panel

Alarm and operator´s massage

It displays a number or user´s error messages and description of the fault or message. The list of instructions for removing you can find in manual or directly on the machine menu „Alarm a MSG“

Active program

Displays the currently selected program for grinding or dressing.

In handwheel mode is displayed elected jogging.

Mode selection

Displays the currently selected working mode.

JOG – perform a each travel, control by buttom

 - MPG mode – operation by manual hand wheel

 - automatic mode– program is performed

 - Upper right corner - detection hydraulic running , achieving the right or left dogs

Date and time

Displays current time and date

Example of additional menu in home screen

Software key	Function
	Viewing all three coordinate systems - the screen is only for a better view, there can not be adjusted coordinates
	Displays screen with technical data for grinding
	Calculator
	Displays history of alarms and error messages for the operator
	Displays the screen describing lube hubs
	Displays service intervals
	Displays contact and service information

6.3 Optional functions

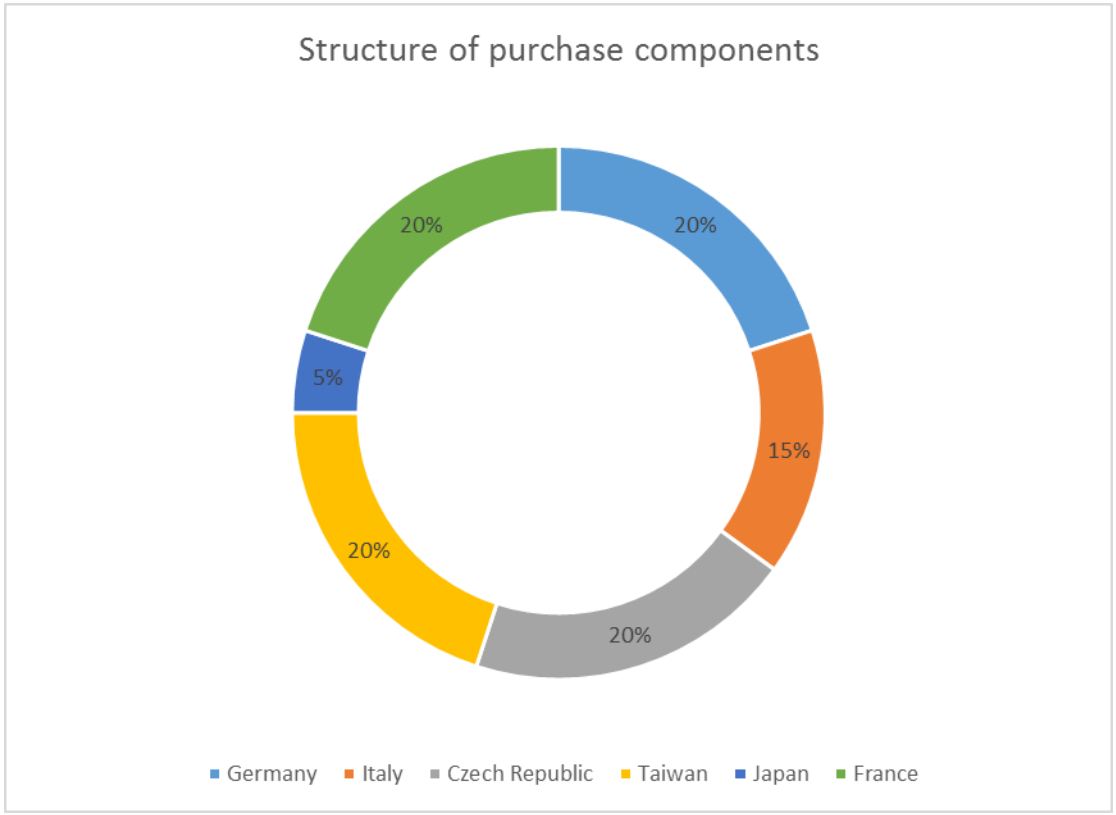
- remote diagnostics tools
- 12“ tough display
- production management
- customer´s macro
- tough probe and measuring cycles
- 4-th axis – totary table

7 Machine components

Our business and trade policy is based on honest work and fair dealing. We likes the things, which are absolutely clear and tidy. Suppliers play an important role in the whole process and have a major impact on reliability. Therefore, as the only manufacturer understandable by openly declaring the production process machines and origin of the individual components of the first contact with the customer.

Clearly declared production proces

Besides its own development, our company focuses on assembling a cast-iron machine skeleton, which is supplied by company Proth. Cast iron casting is machined for assembly purposes. Consequently, there is to complete each part of the machine (bed, stand headstock spindle) and scraped gently guiding surfaces into geometric precision with achieving optimal pattern. After reaching the geometry are installed, ball screws, linear scales, servo motors and all electrical components including custom made-up electrical switchboards and control system. In conclusion, there is a dynamic optimization tools, geometric and functional tests.



Item	Supplie
Ball screws	KSK Precise Motion, a.s, Czech Republic
Drivers and servomotors	Schneider Electric, France
Belt and pulley	Bea Ingranaggi S.P.A. , Italy
Linear Scales	ESSA Praha, Czech Republic
Clutch of vertical gear	Japan
DA 400 air filtration	HEIDENHAIN, Germany
Elektric components	Schneider Electric, France
Main motor	Siemens, Germany
Hydraulic pump	Berarma - Italy
Propotional valve	ATOS - Italy
Control system	Schneider Electric, France, PLC and displays : M-MOOS, Czech Republic
Bearings for vertical and cross axis	FAG, Germany
MPG panel	EUCHNER, Germany
Část iron parts and sceleton	Taiwan
Elektromagnetic table	Guang Dar Magnet Industrial, Taiwan
Spindle	Zakázková výroba, Taiwan
Coolant tank	Zakázková výroba, Taiwan
Lubrication tank	Chen YING, Taiwan
Oil Pressure gauge	TRIBOTEC, Czech Republic
Safety switches off end stops	Schneider Electric, France
Safety door lock	Pizzato, Italy

8 Foto and references of M - MOOS

Fotogalerie a reference brusek M - MOOS

BP-5010-2AX, zákazník: Honeywell Brno, instalation May 2016

BP-60120-2AX, zákazník: Kajometal Slovakia, instalation May 2018

BP-60120-2AX, zákazník: Purkert., instalation November 2018

BP-50100-2AX, zákazník: Antonín Joch. instalation January 2017

BP-4080-2AX, zákazník: AI LAB, Poland, instaltion September.2019

BP-4080-2AX, zákazník: ČZ a.s., , instalace 10.11.2019

BP-1020-2AX, zákazník: Soma Lanškroun, instalace 20.12.2018

BP-1020-2AX+APC zákazník: Schneider Electric, Slovakia instalation 20.12.2018

BP-60150-2AX with Fanuc zákazník: Panosonic CZ 20.12.2024

BP-4080-2AX, zákazník: ČZ a.s., , instalace 10.11.2019

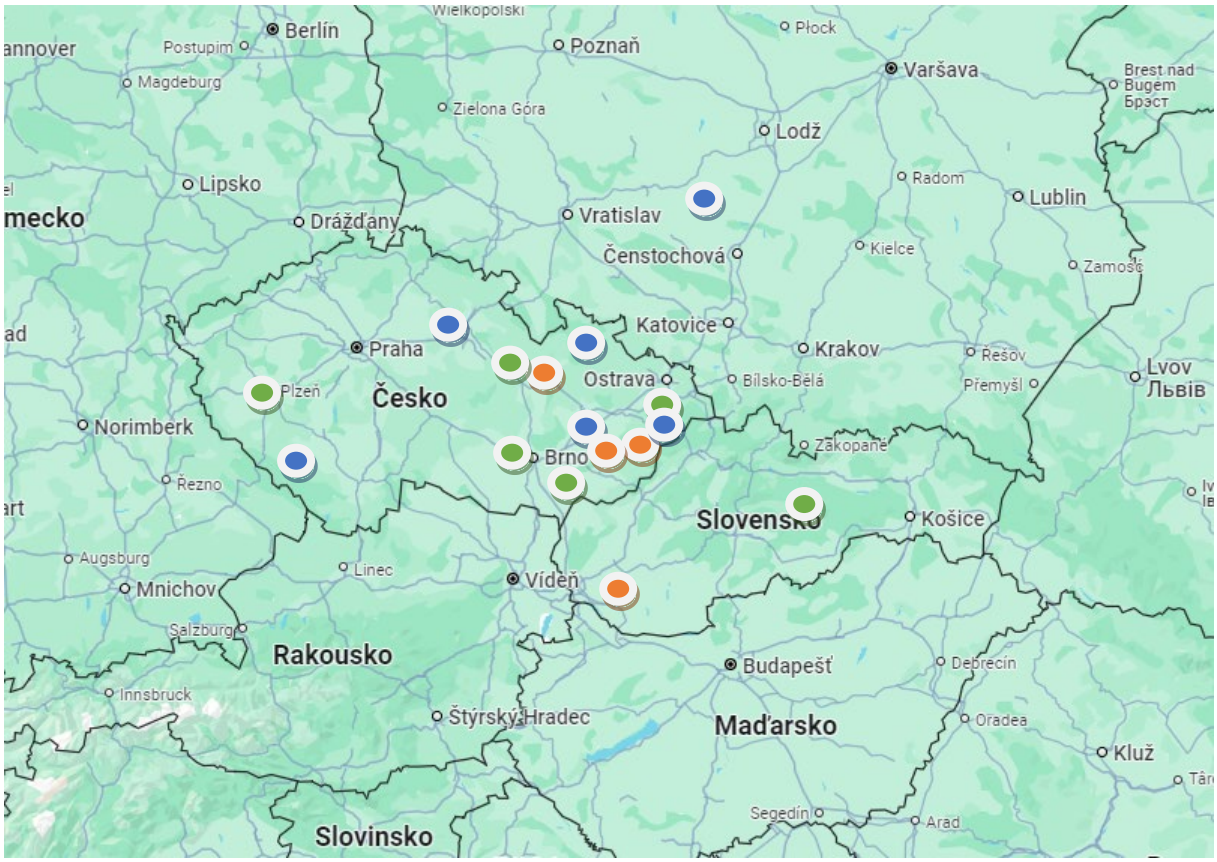
BP-1020-2AX, zákazník: Soma Lanškroun, instalace 20.12.2018

BP-1020-2AX+APC zákazník: Schneider Electric, Slovakia instalation 20.12.2018

BP-1520-2AX zákazník: TES Vsetiín a.s., instalation 07/2024

Customers reference FOR CNC version**: Czech Republic Slovakia, EU,**
In 2016 - 2024 : 15 instalací

Stolové BP 4080 Stojanové BP 50100-60200 Portálové BP



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