



**OPEN JSC MACHINE-TOOL PLANT
«KRASNY BORETS»**



**CATALOGUE
2022**

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OPEN JSC MACHINE-TOOL PLANT

«KRASNY BORETS»



“Collective of the plant is proud of its history and production, and first of all of its quality and reliability...”

“Krasny borets” started its history in 1900. On the territory the plant is occupying now the mechanical shops were founded, which produced stock of agriculture, kettles, barrels, repaired mill’s and distillery’s equipment.

During next years the plant has been producing jointing and mortising-milling machines, wall fasten-drilling machines, brick-make machines, peat extraction complexes.

In 1959 the plant began a new reconstruction to master the production of surface grinding machines with high and very high precision. Since this time the enterprise and its products have become famous all over the world.

The first metal-cutting machine-tool in the USSR the high precision surface grinding machine mod. 3711 produced by the plant “Krasny borets”, was adjudged with state “Quality Symbol” in 1967,

The group of workers of the plant was awarded with State Prize in the field of engineering for creation and development of complex-mechanized production of precision machines, the high level of production technology in 1971.

The plant is well-equipped for producing precision equipment of high quality which meets the requirements of the world market.

There are about 570 workers and engineering staff work at the plant, who have rich experience in production, adjustment and testing of the equipment.

The plant has been exporting its machine-tools since 1960 and now they operate in more than 110 countries of the world. Main trade partners of the plant are the organizations and firms of Russia, Germany, Turkey, Poland, Czech Republic, Spain, Syria, France, Egypt, Italy, Finland, Iran, Greece and others.

In 2000 the plant was the first of the machine-tool building enterprises of Belarus to pass successfully certification on conformity of the Quality System for producing machine tools and forging-pressing equipment with requirements of ISO-9001-96.

In 2003 and 2006 system of management of production quality was confirmed in German system of certification DAR-TGA (ISO 9001-2000) and in National system of certification STB ISO 9001-2001.

In 2009 the repeated certification of the quality management system on accordance with the requirements of STB ISO 9001-2009 in National system of confirmation and in German system of accrediting DIN-EN-ISO 9001:2008 was conducted.

In 2006 National system of certification of the Republic of Belarus certified the management of environment and production on conformity with ecological requirements in accordance with STB ISO 14001-2005.

In 2009 the validity of the environment management certificate on conformity with requirements of STB ISO 14001-2005 was prolonged. Since 2015, in JSC Machine-tool plant «Krasny Borets» an integrated management system that combines the quality management system (QMS), environmental management system (EMS) and occupational health management system (OSS) has been operating. In 2018, the transition to the new standards STB ISO 9001-2015 and STB ISO 14001-2017 was made, after which the specialists of NP RUP “BelGISS”, Minsk, conducted the certification audit, the outcome of which was the presentation of JSC machine-tool plant “Krasny Borets” certificates of conformity in the National system of conformity and the German accreditation system (certificate No BY/112 05.01.002 00044, BY/112 06.01.002 00345, BY/112 05.04.002 01400, QMS-00065). The integrated management system covers the development, production and maintenance of metal-cutting machines and forging equipment, aimed at further ensuring high quality and competitiveness of products under safe working conditions and minimal impact on the environment.

According to the results of work in the field of quality the plant and the range of articles were awarded by prestigious awards:

- The Republic of Belarus Government Bonus for achievements in the field of quality (2000, 2003, 2006);
- The Republic of Belarus Ministry of Industry Bonus for achievements in the field of quality (2003, 2006);
- Machine mod. 3D711AF10-1, machine mod. 3D711VF11, OSH-400, Orsha-F32SH, Orsha-60120 — award “The Best goods of the Republic of Belarus in the market of the Russian Federation”;
- Machine mod. OSH-400, Orsha-F32SH, Orsha-F32U, OSH-550 3D711VF11, OSH-636 F3, TSH-2 are the prize-winners of the contest “The Best goods of the Republic of Belarus”;

-According to results of participation in specialized exhibitions the plant is awarded with diplomas.

We are pleased to report that in 2014 JSC Machine-tool plant «Krasny borets» won the prestigious award «Exporter of the Year 2014», received a certificate from the «International Rating Union National Business Rating» for the first place in the top 3 (Gold) ranking among the exporters of the Republic of Belarus for the sum of 4 indicators of foreign economic activity:

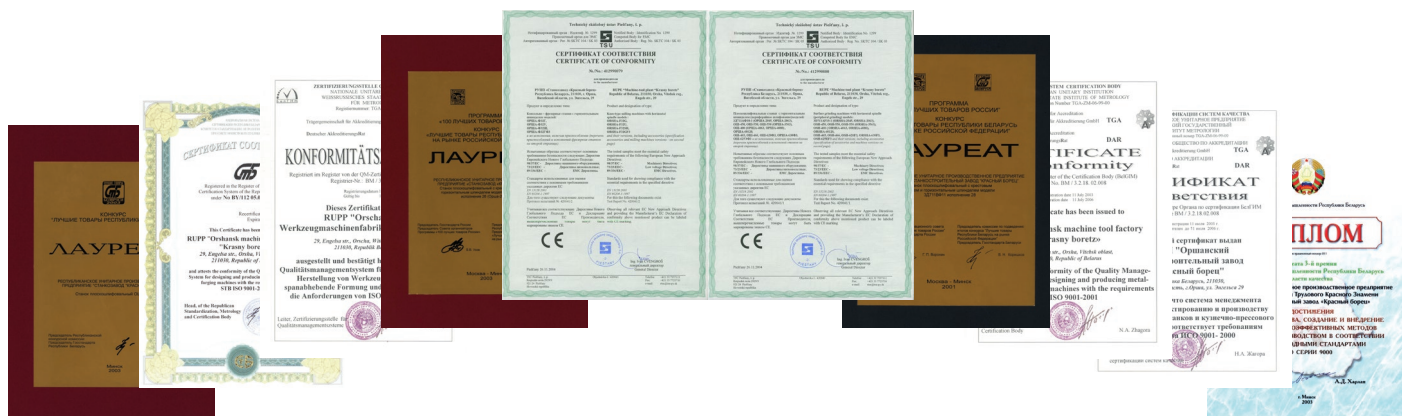
«The volume of exports / imports»

«The dynamics of growth compared to previous periods»

«Diversification, as the number of headings»

«The number of counterparties»

We are always willing to accommodate your requests and are pleased to invite you to cooperation.



PRODUCT CLASSIFICATION

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Grinding machines modernization and major repairs.....	60

Plant renders the following services:

- major repairs and modernization of surface grinding and milling equipment: restoration of accuracy parameters and polymeric coating of guide ways; replacement of ball screw pairs; replacement of ball bearings and seals; replacement of cooling system and coolant-lubricant feed pumps; replacement of working zone guards; replacement of limit switches; replacement of low-voltage equipment; replacement of CNC control system; replacement of hydraulic equipment; replacement of feedback transducers onto converters; replacement of all electric communications of machines; installation and commissioning; warranty and post-warranty service; personnel training;
- works on machining of parts according to customer's drawings.

Technological capabilities of OJSC Machine-tool plant "Krasny borets" are laser processing, gas-plasma treatment, sheet metal bending, metalware fabrication, body parts foundry production with subsequent machining.

SURFACE GRINDING MACHINES

HORIZONTAL - SPINDLE COMPOUND - TABLE SURFACE GRINDING MACHINES MOD. 3D711AF10-1, 3D711VF11, OSH-550, OSH-400, OSH-400AF2, OSH-40110AF2

The machines have been designed for high-precision grinding of flat surfaces of various articles, and when the grinding wheel periphery profiling and installation of attachments are used — for machining of profile surfaces, slots, shoulders, and also grinding with wheel face.

Specific features of design:

- The rational design of the base, compound slide, column, table and wheel head ensures the machine high rigidity and vibration-free operation providing stable precision and purity of machining.
- The use of ball-screw pairs in the feed units ensures smooth, high precision, backlash free positioning.
- All working travels on machines are automatic.

The machines are equipped with the electric components of leading world producers.

- Basic parts made from cast iron.

* Machines are produced in two different versions:

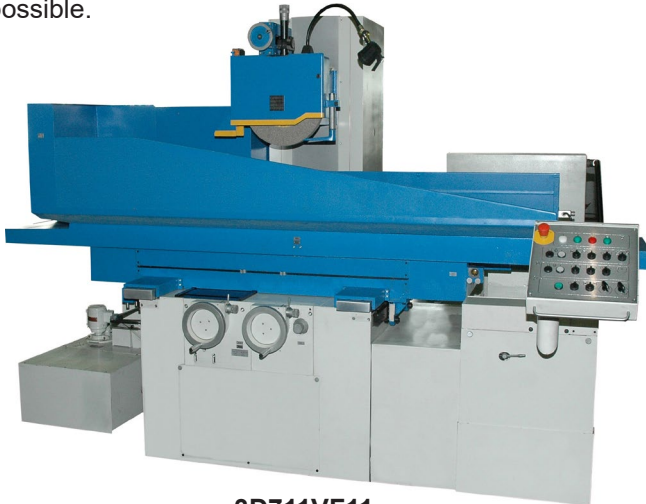
- version 30 — with manual control without digital read-out device;
- version 31 — with manual control with digital read-out device over 2 axes;

- version 20 — with control from programmable logic controller.

- Production of machines with cabinet/semi-cabinet protection is possible.



OSH-450



3D711VF11

Delivery set :

- Cooling system with lubricant — coolant feed pump and magnetic separator of coolant-lubricant refinement.
- Lubrication and table drive hydraulic station.
- Arbor for grinding wheel static balancing.
- Grinding wheel with flanges.
- Set of mounting pads.
- Quick-wearing spare parts, tools and attachments.

- Accessories for wheel dressing

The following attachments are delivered at extra price:

Electromagnetic chuck, grinding wheel dressing mechanism, accessories for profile grinding.

MACHINE MODEL	3D711AF10-1 (Orsha-2045) version 38	OSH-450 (3D711VF11) version 36	OSH-550 version 36	OSH-400 (Orsha-4080) version 38	OSH-400AF2	OSH-400 version 36	OSH-40110AF2
Machine accuracy class	High precision	High precision	High precision	High precision	Special high	High precision	Special high
Table surface dimensions (BxL), mm	200 x 450	200 x 630	320 x 630	400 x 800		400 x 1100	
Accuracy parameters achieved on workpiece:				400 x 150 x 120		400 x 150 x 120	
Workpiece dimension, mm	210 x 120 x 80	380 x 120 x 80	380 x 120 x 80	400 x 150 x 120		400 x 150 x 120	
Flatness, mkm	4	4	4	4	2,5	4	2,5
Parallelism, mkm	5	5	5	5	3	5	3
Roughness of surface machined by the wheel periphery, Ra	0,16	0,16	0,16	0,16	0,08	0,16	0,08
Working feeds range:				1...40		1...40	
table, m/min	1...40	1...40	1...40	1...40		1...40	
slide, mm/stroke	0,3...40	0,3...40	0,3...40	0,3...40		0,3...40	
wheelhead, mm/stroke	0,001...0,08	0,001...0,08	0,001...0,08	0,001...0,08		0,001...0,08	
Maximum travels, mm :							
of table	520	670	670	810		1160	
of compound slide	237	245	385	445		445	
Maximum distance between table mirror and spindle axis, mm	460	550	650	650		650	
Dimensions of grinding wheel (DxdxH), mm	250x32x76	300x40x76	300x40x127	400x40...80x127		400x40...80x127	
Main drive power, kW	2,2	4,0	7,5	7,5		7,5	
Overall dimensions, mm:							
length	1600	2715	2715	3200	3200	3800	
width	1680	1788	2105	2540	3030	2540	
height	1540	2035	2140	2140	2340	2140	
Mass, kg	1800	2950	3400	3600	3650	4150	

SURFACE GRINDING MACHINE WITH MANUAL CONTROL MODEL OSH-2030

The machine is designed for performing grinding operations (grinding of flat and inclined surfaces, as well as cylindrical ones) in conditions of single and small-scale production.

The machine has manual control on three axes by means of flywheels (longitudinal-X, transverse-Z and vertical-Y). The base of the machine is a cast bed, along the longitudinal guides of which the table moves. The table is moved by means of a pinion and a toothed rack. The machine has a column, along the guides of which a carriage carrying a wheel head with a horizontal spindle moves in the vertical direction.

The wheel head moves along the carriage in the transverse direction.

The table moves along the X-coordinate and the grinding wheel moves along the Z-and Y-coordinates using linear ball guides, and the wheel head can be manually rotated in the vertical plane. The machine is equipped with a magnetic chuck, a removable device for round external grinding, a stationary lamp and a pedestal.

The machine includes:

- machine assembly;
- cone mandrel for the grinding wheel static balancing;
- grinding wheel dressing device;
- operator's manual in Russian.

For a fee, the following products are available:

- pedestal,
- cooling system,
- magnetic chuck,
- devices for round grinding.



Machine OSH-2030 with a pedestal

Machine OSH-2030 with a pedestal and a device for round grinding

MACHINE MODEL	OSH-2030
Accuracy class of the machine according to GOST 8-82	High
Table mirror dimensions (B x L), mm	200 x 300
Accuracy parameters achieved on the product sample:	
product sample size, mm	300 x 200 x 80
flatness, mm	4
parallelism, mm	5
surface roughness, processed by the wheel periphery, Ra	0,32
Working feeds	Manual control
The maximum height of the workpiece to be installed on the table mirror, mm	235
The maximum mass of the workpiece to be installed (together with the magnetic chuck), kg	50
Maximum travel, mm:	
of table	310
of compound slide	215
Maximum distance from the table mirror to the spindle axis, mm	300
Grinding wheel dimensions (DxHxd), mm	150 x 16 x 32
Main drive power, kW	1,1
Overall dimensions, mm:	
length	910
width	780
height	920
Weight/ weight with pedestal and fixture, kg	360/440

SURFACE GRINDING MACHINE MODEL OSH-4080, OSH-40110, OSH-40125

The machines are designed for grinding flat surfaces of various parts, and with the use of a dressing mechanism for profiling the grinding wheel and installing parts-profile surfaces, grooves, ledges, as well as grinding the end of the wheel within the limits allowed by the grinding wheel casing.

The machines have a layout with a moving table in the longitudinal direction and a movable column moving in the transverse direction.

The base of the machines is a bed on which linear guides are installed for moving the column in the transverse direction and longitudinal sliding guides for moving the rectangular table.

The column provides vertical movement of the wheel head, the longitudinal movement of the table is carried out by means of a hydraulic cylinder.

The machine is controlled by a command controller (NC) with a touch control panel of leading companies with the display of three coordinates on the screen (X, Y, Z).



OSH-4080

MACHINE MODEL	OSH-4080	OSH-40110	OSH-40125
Table surface dimensions (BxL), mm	400 x 800	400 x 1100	400 x 1250
The largest mass of the workpiece to be installed (together with the device and the electromagnetic chuck), kg	400		
The greatest distance from the table mirror to the spindle axis, mm	650		
Maximum travels, mm :			
of table	860	1220	1400
of compound slide	450	450	450
Limits of working feeds:			
- of table, m/min	1...35		
- of compound slide, mm/stroke	0,3...40		
- of wheel head, mm/stroke	0,001...0,08		
Dimensions of grinding wheel (DxdxH), mm	400x40...80x127		450x40...80x203
Main drive power, kW	7,5		
Spindle rotation frequency, rpm	1500		
Overall dimensions, mm:			
length	3300	4260	4910
width	2420	2420	2420
height	2710	2710	2710
Mass, kg	4100	4700	5500

HORIZONTAL - SPINDLE COMPOUND - TABLE SURFACE - PROFILE GRINDING MACHINE WITH CNC MODEL OSH-620.F3

Machines are designed for machining flat as well as profile surfaces, representing combinations of segments, straight lines, arcs, circles and other precisely set curves in right-angled or polar coordinate system. Profiling of grinding wheel is realized by a special device by means of diamond roller rotation and grinding wheel head travel over coordinates Y and Z according to program from CNC system.

Specific features of machine mod. OSH-620.F3 construction:

- Rigid construction of bed, compound slide, column, table and wheel head
- Travel of work members over coordinates Y and Z by means of high precision backlash rolling ball screw pairs.
- Linear and circular interpolation over coordinates Y and Z.
- Table travel (coordinate X) from hydraulic cylinder or ballscrew assembly.
- Automatic lubrication of guide ways.
- CNC system.
- Feedback by means of pulse converters.

Surface-profile grinding machines can have different versions depending on number of controllable coordinates.

According to order the following extra options are possible:

- indexing device controlled from CNC with horizontal or vertical axis ;
- table travel controlled from CNC by means of ball screw pair and electric motor



OSH-620.F3

MACHINE MODEL	OSH-620.F3
Table surface dimensions (BxL), mm	400 x 800
Accuracy parameters achieved on workpiece:	
Workpiece dimension, mm	500x150x120
Flatness, mkm	4
Parallelism, mkm	5
Roughness of surface machined by the wheel periphery, Ra	0,16
Maximum working feeds	
-longitudinal table travel (axis X), m/min	2...25
-vertical travel of wheel head (axis Z), mm/stroke	0,001...0,3
-cross travel (axis Y), mm/stroke	0,3...20
Maximum dimensions of machined surfaces, mm	
-length	700
-width	400
-height	385
Controllable number of coordinates	3
Maximum distance between table mirror and spindle axis, mm	650
Grinding wheel dimensions (D x H x d), mm	400x25...63x127
Main drive power, kW	5,5... 11,0
Overall dimensions, mm :	
- length	3220
- width	3100
- height	2140
Mass, kg	3600

HORIZONTAL - SPINDLE COMPOUND - TABLE SURFACE - PROFILE GRINDING MACHINES WITH CNC OR MASTER CONTROLLER (NC) MOD. OSH-60120, OSH-60150, OSH-60200, OSH-60240, OSH-60300

Machines are designed for machining flat as well as profile surfaces, representing combinations of segments, straight lines, arcs, circles and other precisely set curves in right-angled or polar coordinate system.

Profiling of grinding wheel is realized by a special device by means of diamond roller rotation and grinding wheel head travel over coordinates Y and Z according to program from CNC system.

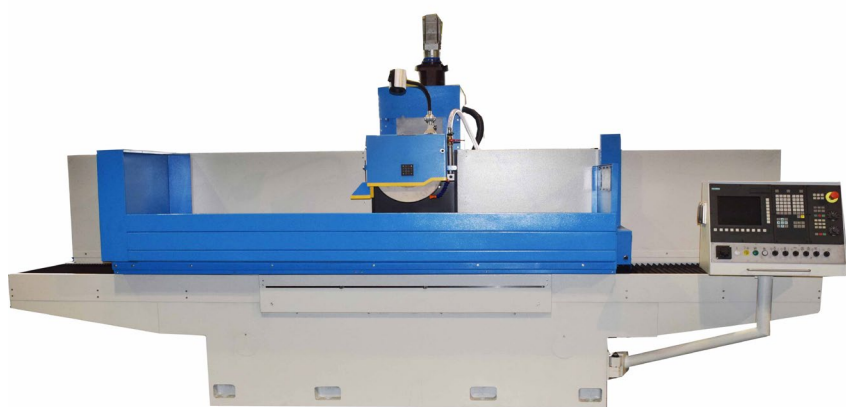
Specific features of machine mod. OSH-60120, OSH-60150, OSH-60200, OSH-60240, OSH-60300 construction:

- Rigid construction of bed, compound slide, column, table and wheel head
- Travel of work members over coordinates Y and Z by means of high precision backlash rolling ball screw pairs.
- Linear and circular interpolation over coordinates Y and Z.
- Table travel (coordinate X) from hydraulic cylinder and ballscrew assembly.
- Automatic lubrication of guide ways.
- CNC system or master controller.
- Feedback by means of pulse converters.

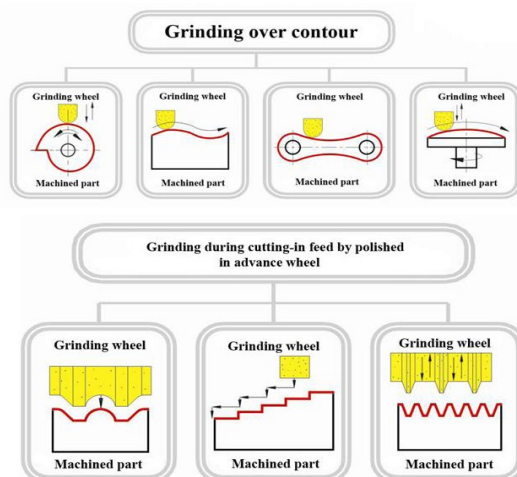
Surface-profile grinding machines can have different versions depending on number of controllable coordinates.

According to order the following extra options are possible:

- indexing device controlled from CNC with horizontal or vertical axis ;
- table travel controlled from CNC by means of ball screw pair and electric motor



ORSHA-60120



MACHINE MODEL	OSH-60120	OSH-60150	OSH-60200	OSH-60240	OSH-60300
Table surface dimensions (BxL), mm	600 x 1200	600 x 1600	600 x 2000	600 x 2400	600 x 3000
Accuracy parameters achieved on workpiece:	710x300x200 6 8 0,32				
Workpiece dimension, mm					
Flatness, mkm					
Parallelism, mkm					
Roughness of surface machined by the wheel periphery, Ra	0,32				
Maximum working feeds	2...28 0,001...0,3 0,3...20				
-longitudinal table travel (axis X), m/min					
-vertical travel of grinding wheel head (axis Z), mm/stroke					
-cross travel (axis Y), mm/stroke	0,3...20				
Maximum dimensions of machined surfaces, mm	3 640 (790) 400x20...100x127 11,0 15,0				
-length					
-width					
-height					
Controllable number of coordinates	3				
Maximum distance between table mirror and spindle axis, mm	640 (790)				
Grinding wheel dimensions (D x H x d), mm	400x20...100x127				
Main drive power, kW	11,0				
Overall dimensions, mm :	15,0				
- length					
- width					
- height					
Mass, kg	8900 (9100)	9100 (9300)	10200 (10400)	13000 (13200)	15000 (15200)

Machines model Orsha-60150, Orsha-60200, Orsha-60240 can be equipped with additional vertical spindle.

SPECIAL CNC SURFACE-GRINDING MACHINE WITH A VERTICAL SPINDLE WITH A RECTANGULAR MOVABLE TABLE AND TWO ROTARY DIVIDING TABLES MODEL OSH-665F3

The machine is designed for grinding grooves of parts of turning chucks with a diameter of 210, 250, 315, 400, 450 mm.

SPECIFIC FEATURES OF DESIGN OF MODEL OSH-665F3 :

- The machine has a box-shaped bed with longitudinal guides (flat and prismatic). On the back wall of the bed, a base is fixed, along the guides of which the column moves in the transverse direction.
- A wheel head with a vertical spindle (electric spindle) moves vertically along the vertical guides of the column.
- The movement of all bodies in the longitudinal, transverse and vertical direction is carried out automatically by means of screw-nut rolling gears.
- On the longitudinal guides of the bed there is a rectangular table with a rotary indexing table $\varnothing 400$ mm and sloped sine fixture with indexing rotary table $\varnothing 200$ mm mounted on its working surface. The machine is equipped with numerical control system and touch sensor.
- Maximum dimensions of the installed part: diameter-450 mm, height-200 mm.



OSH-665F3

- Electric spindle power is 7.5 kW, rotation frequency of internal grinding spindle is 5000...45 000 rpm. Accuracy of rotation of indexing table $\varnothing 400$ and 200 mm is 2.5 seconds

MACHINE MODEL	OSH-665F3
Maximum dimensions of the installed part:	
- diameter, mm;	450
- height, mm;	200
Maximum dimensions of the processed grooves, width of the groove, mm	8...60
Dimensions of the work surface of the table:	
- width, mm	600
- length, mm	1200
Travels, mm	
- longitudinal position of the table (the largest by stops)	1330
- cross-section of column, not less than	500
- vertical to the end of the vertical spindle	680
Grinding wheel spindle speed, min-1	4000...45000
Limits of working feeds	
- longitudinal travel of the table, m/min	1-8
- cross-section of the column, mm/stroke	0,3-20
- vertical travel of wheel head, mm	0,001...0,3
Rotation accuracy of the dividing table $\varnothing 200$, $\varnothing 400$ mm, sec	2,5
The number of T-shaped grooves in the precision indexing round tables:	
- diameter of the faceplate 200	4
- diameter of the faceplate 400	6
Dimensions of the grinding wheel to be installed:	
- outer diameter, mm	8...63
- height, mm	4...32
Power of the wheel head electric spindle of, kW	7,5
Overall dimensions of the machine with auxiliary equipment	
- length, mm	4560
- width, mm	3500
- height, mm	2700
Mass, kg	9500

PORTAL SURFACE GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-125300

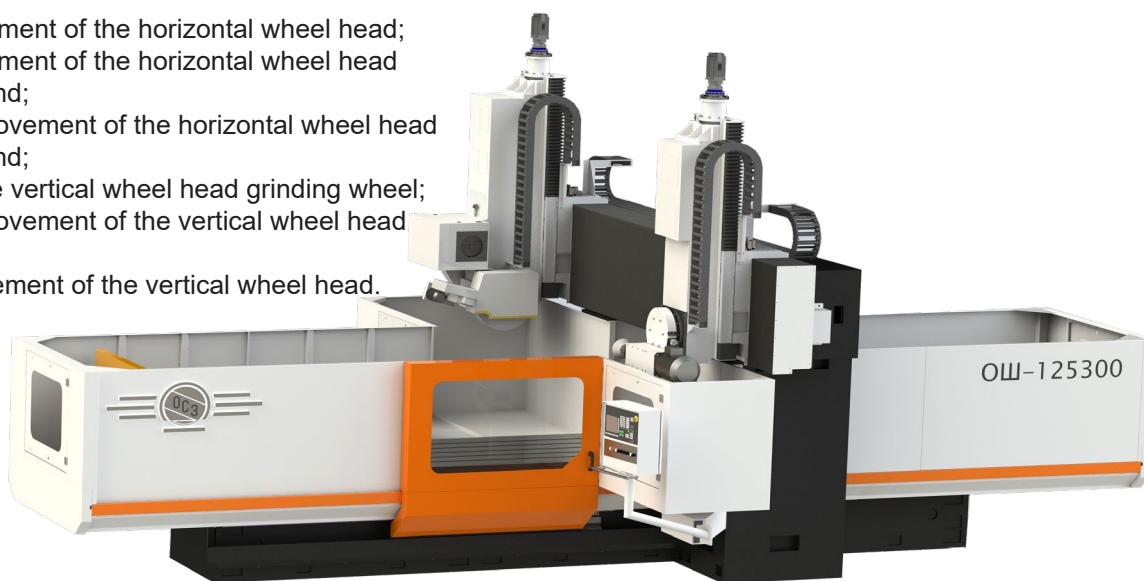
The machine is designed for high-precision grinding of flat surfaces of ferrous and non-ferrous metals by pendulum and mortise grinding.

The machine has a two-post portal layout with a movable table moving in the longitudinal direction along the bed on the sliding guides hydraulic cylinder.

Surfaces grinding, the grinding wheel dressing, moving machine components is carried out by the control program in an automatic cycle or manually. The machine is equipped with CNC system.

The kinematic scheme of the machine should provide the following movements:

- rotation of the grinding wheel of the horizontal wheel head;
- longitudinal movement of the table;
- cross movement of the horizontal wheel head carriage;
- vertical movement of the horizontal wheel head;
- vertical movement of the horizontal wheel head dresser diamond;
- transverse movement of the horizontal wheel head dresser diamond;
- rotation of the vertical wheel head grinding wheel;
- transverse movement of the vertical wheel head carriage;
- vertical movement of the vertical wheel head.



OSH-125300

MACHINE MODEL	OSH-125300
Accuracy class	High
Table mirror size, mm	1250x3000
Maximum dimensions of the workpiece to be installed, mm;	
-length	3000
-width	1250
-height	750
The maximum distance between the axis of the horizontal grinding wheel and the table surface, mm	1015
Cutting speed, m/s	35-50
Grinding wheel dimensions (D x H x d), mm	500x100x203
Main drive power, kW	15
Grinding wheel spindle rotation frequency, rpm	1350...2300
Limits of working feeds:	
-longitudinal of table m/min	2...20
-cross of carriage (coordinates Z and Y1), mm/stroke	0,3...20
-vertical of grinding wheel (coordinates Y and Z1), mm/stroke	0,001...0,5
-vertical of dresser diamond (coordinate V), mm/stroke	0,001...0,2
Discreteness of movement by coordinates, mm	
-Z; Y1	0,001
-Y; Z1	0,001
-V	0,005
Overall dimensions, mm :	
- length	9500
- width	5900
- height	4200
Mass, kg	23000

*Dimensions according to the customer's request

SURFACE GRINDING MACHINE WITH ROUND ROTARY TABLE AND HORIZONTAL SPINDLE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-644

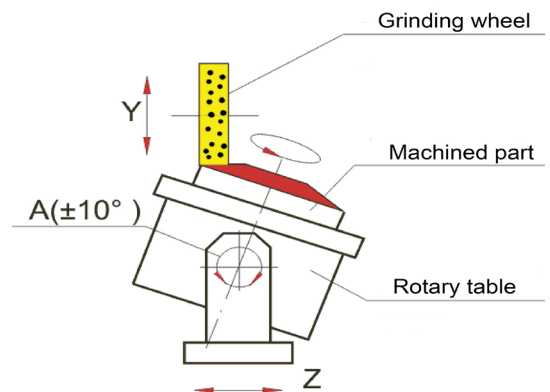
The machine is designed for abrasive processing (grinding) by the periphery of the grinding wheel of flat surfaces of parts fixed on the end of a round table rotating faceplate (or on an electromagnetic chuck fixed on the faceplate end). The machine is equipped with a digital display for three coordinates.

On the wheel head body, the mechanism for grinding wheel dressing along the periphery with a single-point diamond is installed on top.



OSH-644

Machining scheme:



MACHINE MODEL	OSH-644
Table diameter, mm	400
Grinding wheel dimensions as per GOST 2424, mm	
- type	1(straight profile)
- external diameter	300
- internal diameter	76
- height	40
Angle of the table inclination, deg.	±10
Main drive power, kW	4,0
Grinding wheel rotation frequency, rpm	1900
Round table rotation frequency, rpm	2...90
Working feed limits:	
- compound slide, mm	05...20
-wheel head, mm / stroke	0,002...0,04
Speed of installation movements:	
- compound slide transversely, m / min	2
-wheel head vertically, m / min	0,6
Overall dimensions of the machine, including strokes and attachments, mm (approximate)	
length x width x height	1650x1890x1800
Weight of the machine with auxiliary equipment, kg	1800

SURFACE GRINDING MACHINE WITH ROUND TABLE AND HORIZONTAL SPINDLE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-641

The rational design of the base, column, table and wheel-head made of cast iron ensures the machine high rigidity and vibration-free operation providing stable precision and purity of machining.

- CNC or NC system
- Circular travels converters
- Wheel-head bearings
- Linear guide ways
- At extra price the machine can be equipped with magnetic or electromagnetic chuck

The use of high precision backlash-free ball-screw pairs in the feed units ensures smooth, high precision, backlash-free positioning.

All working travels on machines are automatic. There is an electronic handwheel for travel over coordinates Y and Z with discreteness 1 mkm.

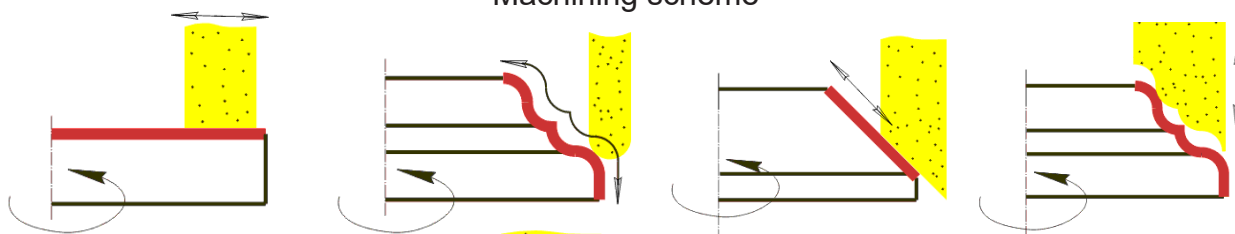


OSH-641*18



OSH-641*16

Machining scheme



MACHINE MODEL	OSH-641*16	OSH-641*18	OSH-641
Table diameter, mm	600	800	1200
Maximum dimensions of machined work piece, mm:			
- diameter	600	800	1200
- height (with installation on the table mirror)	230	450	450
Rotary table incline angle, degrees	±5	-	-
Grinding wheel dimensions (DxHxd), mm	400x50x127	400x80x127	400x20...100x127
Ranges of work members travel speeds (stepless regulation):			
- of table faceplate rotation, min-1 (coordinate B)	1...95	2,5...30	2...30
- of cross travel of column, mm/min (coordinate Z)	10...400	10...630	10...630
- of vertical travel of wheel-head, mm/min (coordinate Y)	0,001...0,03	0,001...0,3	0,001...0,3
Main drive power, kW	7,5	11,0	11,0
Spindle rotation frequency, min-1	1450	1450	1450
Overall dimensions of machine , mm : length x width x height	2900x2540x2140	2900x3500x2250	3750x3500x2250
Mass, kg	4000	6000	9000

SURFACE GRINDING MACHINE WITH ROUND ROTARY TABLE AND VERTICAL SPINDLE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-623, OSH-642

Grinding machine is designed for high precision grinding of outward and inward cylindrical surfaces and also faces in multi – step parts - a kind of body of revolution.

Sphere of use of semiautomatic machine is enterprises with large-scale and mass production.

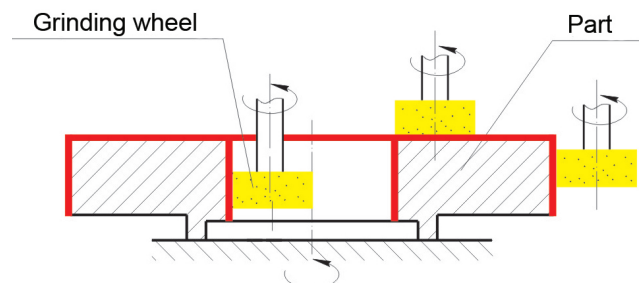


OSH-642.1.F3



OSH-642*16

Machining scheme



MACHINE MODEL	OSH-623	OSH-642*16	OSH-642*18	OSH-642
Table mirror diameter, mm	400/600	600	800	1200
Maximum dimensions of the machined work piece, mm				
- outward maximum diameter	400/600	600	800	1200
- inward minimum diameter	20	90	90	100
- maximum height	110/-	250	250	450
Rotary table incline angle, degrees	-	±5	±5	-
Dimensions of grinding wheel installed on semiautomatic machine, mm				
- outward diameter	25...80	80...125	80...125	80...150
- inward diameter	10...20	20...32	20...32	20...32
Spindle rotation frequencies ranges, min -1	6000...30000	2000...12000	2000...16000	5000...30000
Article table rotation frequencies ranges, min -1	5...110/1...95	1...95	1...95	5...60
Discreteness over controllable coordinates Y / Z, mkm	0,001	0,001	0,001	0,001
Speed of quick adjustment travels, mm/ min				
- of wheel- head	1600	1600	1600	1000
- of column	4000	4000	4000	3000
Main drive power, kW	22,0 (electric spindle)	4,1 (fortuna)	5,5 (fortuna)	30,0 (electric spindle)
Overall dimensions of machine , mm : length x width x height	2900x3000x2500	2800x3000x2650	2950x3200x2650	4000x4500x3200
Mass, kg	4500	4300	5300	12000

SEMIAUTOMATIC ROTARY GRINDER WITH VERTICAL SPINDLE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-642 VERSION 11

Semiautomatic rotary grinder with vertical spindle with CNC mod. OSH-642 version 11 is designed for grinding the outer and inner diameter of parts type “chisel” from tungsten alloys. The scope of the machine is small-scale and mass production.

The machine has two grinding spindles. Grinding is carried out with special diamond wheels.



OSH-642*11

MACHINE MODEL	OSH-641 version 11
Table mirror diameter , mm	500
Maximum dimensions of the workpiece:	
- height, mm	700
- outer diameter, mm	500
- the maximum weight of the workpiece, kg	750
Dimensions of the outer grinding wheel, mm	
- outer diameter	500
- rim diameter	203
- height.	30
Dimensions of the inner grinding wheel, mm	
- outer diameter	50...125
- rim diameter	20/32
- height	10...30
Grinding wheel spindle drive for external grinding:	
- power, kW	40
- the spindle rotation frequency, rpm	700...1900
Grinding wheel spindle drive for internal grinding:	
- power, kW	2,2
- the spindle rotation frequency, rpm	3000...12000
Discreteness by controlled coordinates X/ Z, μ m	1,0
Overall dimensions: length x width x height, mm	4200x3000x4000
Mass, kg	8300

UNIVERSAL GRINDING MACHINE WITH ROUND TABLE AND VERTICAL SPINDLE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-652F3

The machine is designed for grinding external, internal and flat surfaces of parts such as the bodies of rotation. The machine has a portal arrangement, with a rotary round table and traveling wheelhead in longitudinal and vertical direction. Wheel head has a capacity of turn in vertical plane from controllable drive. Reversible rotation of table is foreseen. Grinding wheel dressing is realized by dressing mechanism diamond roller due to the grinding wheel travel over two coordinates.



OSH-652F3

MACHINE MODEL	OSH-652F3
Diameter of working surface of round table, mm	1700/2000
Parameters of machined articles:	
-maximum height, mm	600
-maximum diameter, mm	1700/2000
-mass, kg	1500
Dimensions of grinding wheel (D x H x d), mm	350x76x20...50
Turning angle of grinding spindle axis in vertical plane, degrees	+30
Grinding wheel rotation frequency, min-1	1000...4500
Table faceplate rotation frequency, min-1	0,1...30
Discreteness of cross, vertical travels, mm	0,001
Discreteness of wheel-head turn, degree	0,001
Main drive power, kW	15
Overall dimensions: length x width x height, mm	5700x3600x3720
Mass, kg	12000

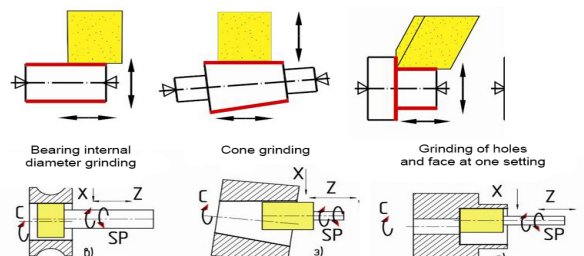
CIRCULAR GRINDING MACHINES

UNIVERSAL CIRCULAR GRINDING MACHINES WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-510, OSH-518

Machine has the arrangement with traveling table on which the machined part is installed and with traveling of wheelhead perpendicularly to machined part centres axis. Work head with electric drive and tailstock are fastened on working surface of upper table. Internal grinding operations are realized with folding grinding spindle. Grinding wheels dressing is produced by mounted diamond installed on table. The machine can be manufactured with or without cabinet-type protection.

The semiautomatic machine is designed for outward and inward grinding of cylindrical, conic and face surfaces in chuck and centres.

Machining schemes



OSH-510



OSH-518

MACHINE MODEL	OSH-510	OSH-518	OSH-518 version 07
Maximum dimensions of installed work piece:			
- in centres: diameter / length, mm	100/250	150/400	200/580
- in chuck: diameter / length, mm	70/150	100/150	125/150
Dimensions of grinding, max			
- in centres: diameter / length, mm	100/225	150/400	200/560
- in chuck for outward grinding: diameter / length, mm	70/160	100/150	125/150
- in chuck for inward grinding: diameter / length, mm	4...40/50	4...40/50	-
The angle of rotation, max, deg:			
- Upper table clockwise / counter-clockwise;	+/- 3	+/- 3	+10/- 3
- Workhead during processing in chuck clockwise / counter-clockwise;	- 30/+ 90	- 30/+ 90	- 30/+ 90
- Wheelhead :	±15	±15	+15/-15
Main drive power, kW	2,2	2,2	3,0
Spindle power for internal processing, kW	1,1	1,1	-
Rotational speed of internal grinding spindle, rpm	4000...24 000		-
Mass with attached equipment, kg	2000	2200	3000
Overall dimensions: length x width x height, mm	1760x2140x1520	1800x2140x1520	3000x2400x1750
Grinding wheel dimensions (DxHxd), mm	250x76x25		3000x76x10...40

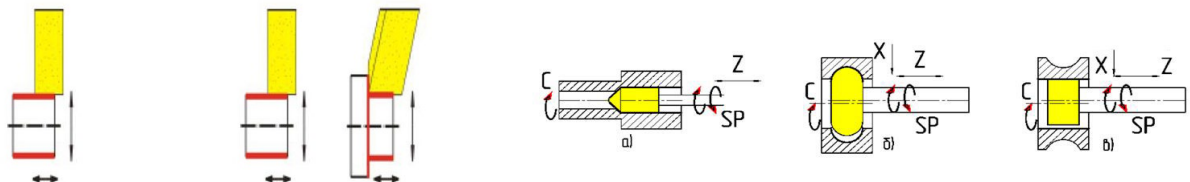
MULTI-PURPOSE CIRCULAR GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-525

The machine is designed for outward and inward grinding of cylindrical, conic and shaped surfaces of parts fastened in chuck and centres. The semiautomatic machine has the arrangement with traveling in longitudinal direction table on which the machined part is installed and with travel of wheel-head perpendicular to the axis of the machined part centres.



OSH-525

Machining schemes



MACHINE MODEL	OSH-525	OSH-525 version 01	OSH-525 version 06	OSH-525 version 10
Maximum dimensions of installed work piece:				
- in centres: diameter / length, mm	220/500	220/700	220/500	270/500
- in chuck: diameter / length, mm	200/250	200/250	150/160	270/250
Dimensions of grinding wheel, max				
- for outward grinding: (D x H x d), mm	500x50x203	500x50x230	500x40x127	400x40x127
- for inward grinding: (D x h), mm	32x20			
Maximum turning angle , degrees:				
- of upper table clockwise / anticlockwise	6/6	6/6	6/6	6/6
- of article wheel-head when machining in chuck clockwise / anticlockwise	30/90	30/90	-	30/90
- of wheel-head clockwise	180	-	180	30...180
Rotation internal grinding spindle (electric spindle), rpm	60000	-	4000...60000	4000...60000
Main motion drive power, kW	5,5	5,5	5,5	5,5
Electric spindle for inward machining power, kW	3,2...17	-	3,2...17	3,2...17
Circular grinding spindle rotation speed, rpm	1600...2800	1600...2800	1600...2800	1450
Overall dimensions: length x width x height, mm	3800x3850x1900			3800x3900x2200
Mass, kg	4820	4320	4500	5500

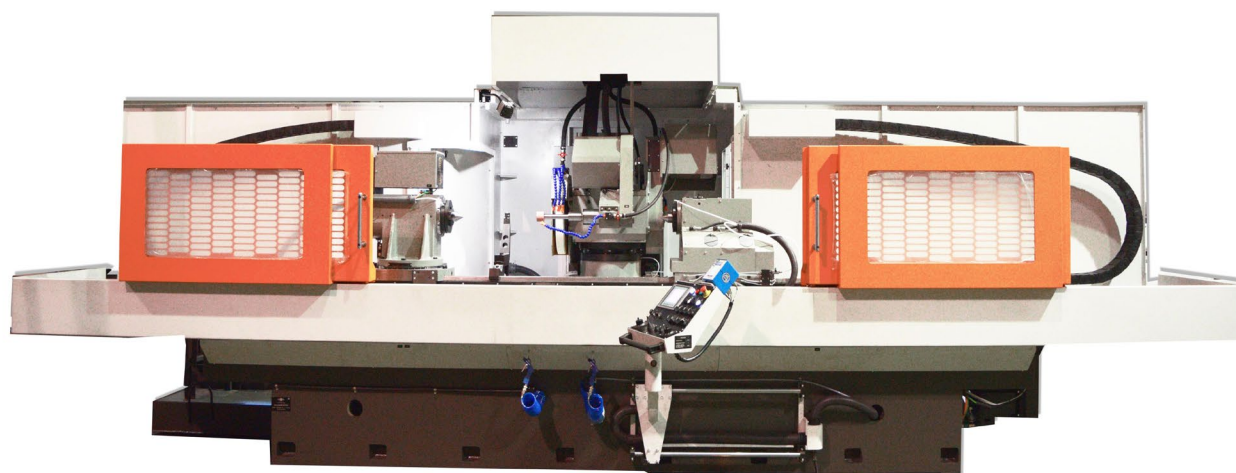
UNIVERSAL CIRCULAR GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) MODELS OSH-660(OSH-530), OSH-535, OSH-661

Designed for external grinding by abrasive CBN of outer diameters and adjacent ends and also for grinding of internal holes and adjacent ends by internal grinding spindle.

The machine is equipped with program control system: master controller or CNC.

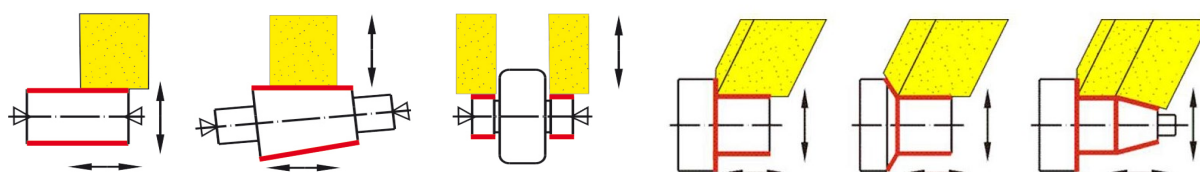


OSH-660.1.F2



OSH-661AF-2

Machining schemes



MACHINE MODEL	OSH-660 (OSH-530)	OSH-535	OSH-661
Grinding length /grinding diameter , mm	1000/400	1500/400	2000/400
Grinding wheel DxdxH, mm	500x203x50		
Grinding wheel drive power, kW	4...7,5		
Spindle speed for external processing, kW	1200...2800		
Linear coordinates controlled from the master controller (NC)	X,Z		
Internal grinding spindle speed (electric spindle), rpm	4000...60000		
Spindle power (electric spindle), for internal processing, kW	3,2...17		
Table rotation angle, degree	+9...-9	+9...-9	+9...-3
Machine overall dimensions, mm			
-length	4370	5200	6900
-width	3400	3600	4200
-height	1900	1900	2480
Mass, kg	7000	8000	13000

UNIVERSAL CIRCULAR GRINDING MACHINE OF HIGH PRECISION WITH CNC OR MASTER CONTROLLER (NC) WITH A ROTARY WHEEL HEAD AND A MOVABLE RECTANGULAR TABLE OSH-660.3.AF3

The machine is designed for external and internal grinding of cylindrical and conical surfaces with end faces of rotation bodies made of tool steels with stepped and curved profiles.

Specific features of machine mod.OSH-660.3.AF3 construction:

- The wheel head has three spindles: two spindles for external grinding and end grinding, and one for internal grinding. For internal grinding operations, a high-speed electric spindle at 63,000 rpm is used.
- Rotation of the wheel head in the horizontal plane and longitudinal movement of the table is carried out by linear actuators.
- Processing parameters: grinding length - up to 1000 mm, maximum external diameter-340 mm, internal grinding processing length-200 mm, maximum diameter – 250 mm.
- Processing of parts on the machine is carried out in automatic mode with control from CNC system.
- The machine is equipped with an active control device to ensure accurate measurement of the workpiece diameter to be processed.
- The machine is equipped with two grinding wheel balancers for external grinding and two workpiece orientation mechanisms with touch sensors.



OSH-660.3.AF3

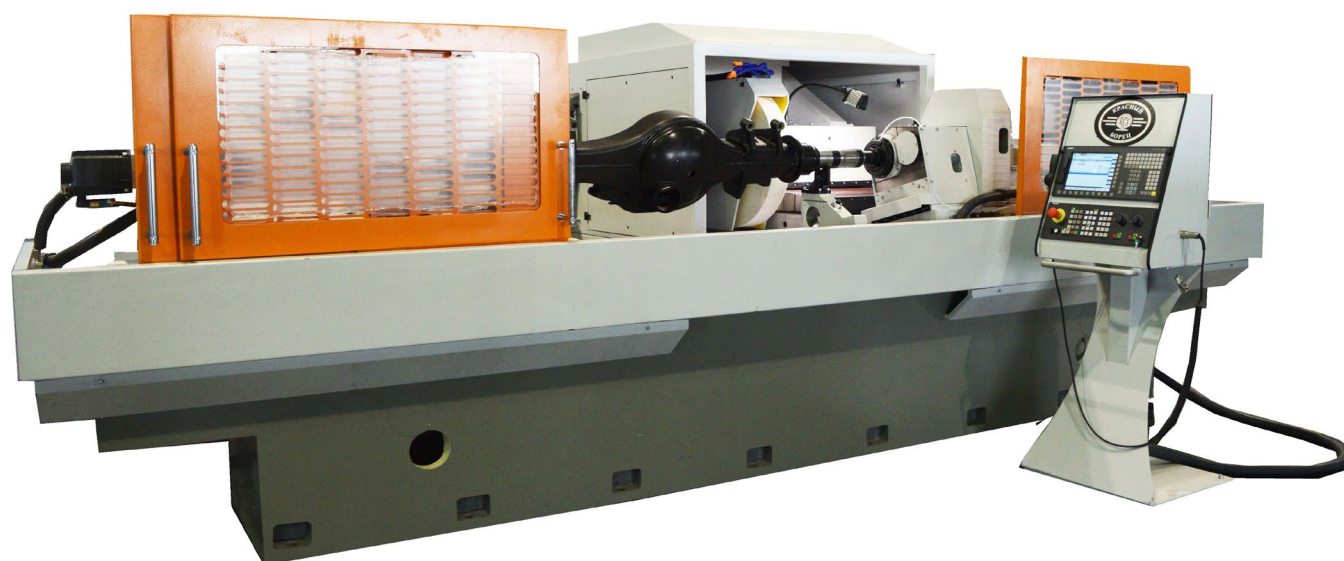
MACHINE MODEL	OSH-660.3.AF3
Maximum dimensions of the workpiece to be installed, mm: - length, min/max; - outer diameter, min/max;	30/1000 4/350
Machined surfaces dimensions external grinding, mm - length; - diameter; internal grinding - length; - diameter;	50...950 4...340 10...200 8...250
The sizes of the installed grinding wheels (grinding the face/outer grinding), mm: - outer diameter; - inner diameter; - height	500 / 400 203 / 127 63 / 63
Main drive power, kW	7,5
Rotation speed of the wheel head round-grinding spindle, rpm	1400...4000
Processed part rotation frequency, rpm	30...1000
Speed of adjustment movements, m/min: - cross of wheel head; - longitudinal travel of the table.	10 10
Maximum travels, mm : - cross; - longitudinal	520 1930
Rotation speed of the internal grinding spindle, rpm	10000...63000
Angle of rotation of the wheel head, degree	-90...+180
Angle of rotation of the work head, degree	-30...+90
Centers of work head and tailstock	KM4
Discreteness of moving along the X and Z coordinates (resolution), mkm	0.1
Range of external diameters controlled by the active control device, mm	6...200
Overall dimensions of the machine with auxiliary equipment (length x width x height),mm	6510x3620x2800

SEMI-AUTOMATIC CYLINDRICAL GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-660F3*28

Semi-automatic cylindrical grinding machine with CNC mod. OSH-660F3 version 28 is designed for external grinding of smooth cylindrical and conical surfaces of the rotation body type.

The following equipment is applied on the machine:

- CNC system;
- Linear feedback sensor over the X-coordinate;
- Electric cabinet equipped with a refrigeration unit;
- Closed roller linear guides over X-coordinate;
- High-precision, backlash-free ball screw transmissions in feed drives mechanisms;
- High precision angular contact ball bearings for wheel head spindle, headstock spindle;
- Device for dynamic balancing of the grinding wheel for external grinding with GAP function;
- Inprocess gage of external grinding;
- Guarding of the working area of the open type.



OSH-660F3*28

MACHINE MODEL	OSH-660F3*28
Accuracy class of the machine according to GOST 8-82	P
Maximum dimensions of the installed workpiece, mm:	
- length when processing the outer diameter	2800
- outer diameter	50...560
Maximum dimensions to be processed, mm:	
- outer diameter	50...560
- length	2700
Dimensions of the installed grinding wheel for external grinding, mm:	
- outer diameter	750
- inner diameter	305
- height	100
Main drive power, kW	18,5
Main drive spindle rotation frequency, rpm:	1100...2800
Workpiece rotation frequency, rpm:	20...280
The speed of longitudinal adjustment travel, m/min:	
-longitudinal	6
-cross	6
Discreteness of travels along controlled coordinates, pm:	1
Maximum displacement, mm:	
- longitudinal of wheelhead (coordinate Z);	2900
- transverse of wheelhead (coordinate X).	400
Overall dimensions of the machine with additional equipment: length x width x height, mm:	5500 x 4200 x 2480
The mass of the machine with attached equipment, kg:	22 000

SEMIAUTOMATIC CIRCULAR GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-651.2.F3

Semiautomatic circular grinding machine with CNC model OSH-651.2.F3 (hereinafter referred to as the machine) is designed for external grinding of cylindrical necks and pre-step parts and ends of pre-step parts of carriage axles as part of an automatic line.

The scope of application of the machine is enterprises of serial and large-scale production.

Installing the machine in an automatic line.

The total number of machines of model OSH-651.2.F3 is used in the automatic line – two units. The machines are installed in series, facing each other. To ensure the removal and installation of the workpiece, each machine is equipped with a portal manipulator with hydraulic and electrical equipment.

The machine has an arrangement with a movable table moving in the longitudinal direction and a wheel head moving in the transverse direction.

On the upper table are installed: the headstock, the tailstock, pusher, the mechanism for the grinding wheel dressing with a diamond roller, and the inprocess gage mechanism.

The machine is equipped with a CNC system, an inprocess gage, a device for the grinding wheel dynamic balancing, and a mechanism for orienting the workpiece. The axis of the wheel head spindle is turned to the right at an angle 120. The work head with an electric drive and the tailstock are mounted on the upper working surface of the movable table. Movement of all working bodies is carried out by means of ball-screw gears.

The workpiece is based in the centers of the headstock and tailstock, the axial orientation of the part is performed using a touch sensor on the table.

Grinding of the part is performed by rotating the workpiece and moving the wheel head perpendicular to the center axis.

Surface treatment and grinding wheel dressing are performed automatically according to the control program. The machine automatically compensates for the amount of removal of the grinding wheel profile when dressing. The grinding wheel dressing mechanism is installed on the machine table.



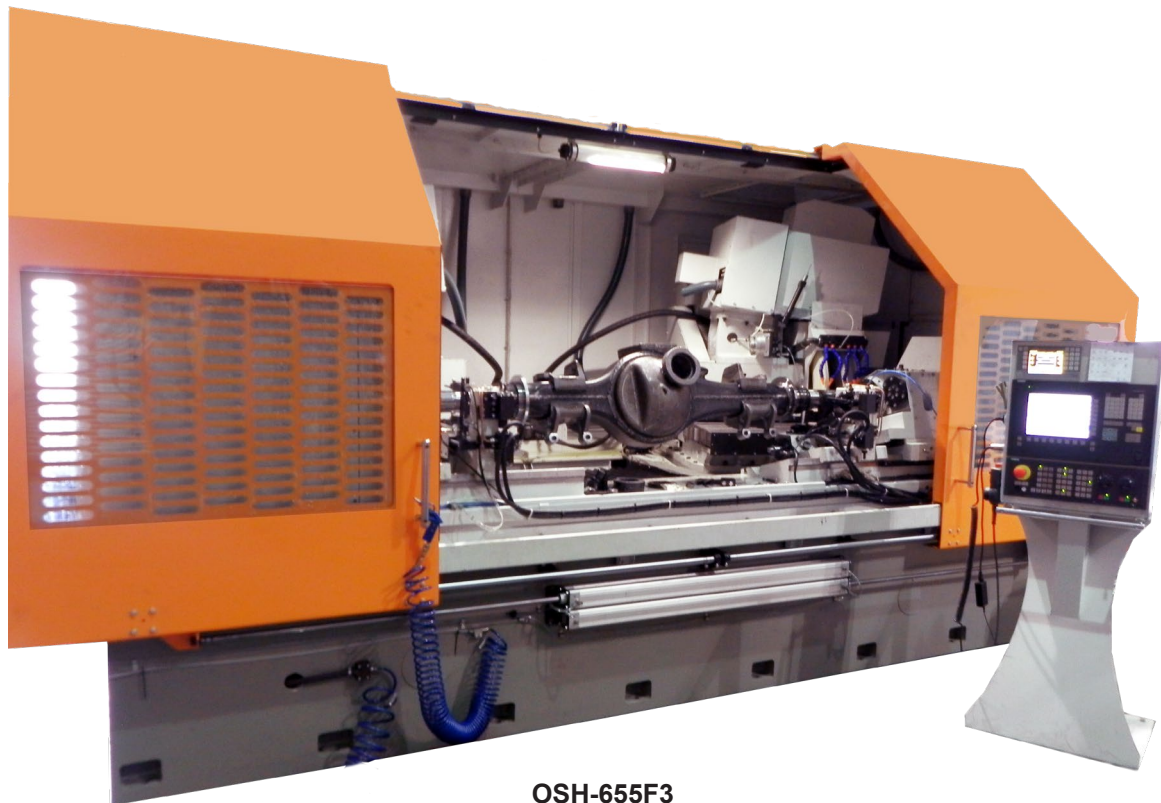
OSH-651.2.F3

MACHINE MODEL	OSH-651.2.F3
Maximum dimensions of the workpiece to be installed, mm: outer diameter/ length	210/2250
Maximum mass of the workpiece to be installed, kg	500
Grinding wheel according to GOST 2424, mm:	
- outer diameter: the maximum (new)/ the minimum (worn)	750/480
- internal diameter	305
- height for grinding the neck and pre-step part, mm	258
Travels, mm:	
- cross travel of the wheel head	420
- longitudinal travel of the table	400
Feed rate, mm:	
- cross feeds of wheel head	0,001
- longitudinal feeds of the table	0,001
Rotation speed, min ⁻¹ :	
- grinding wheel spindle	1280...2130 stepless regulation
- work head spindle	20...300 stepless regulation
Cutting speed, m/s	30...50
Limits of working feeds, mm/min.:	
- cross feeds of wheel head	0,1...2000
- longitudinal feeds of the table	10...4000
Speed of installation movements, m / min.	
- cross travels of wheel head	5
- longitudinal travel of the table	8
Main drive power, kW	30
Overall dimensions of the machine without a manipulator, mm	
- length (from left to right)	5800
- width (front-back)	3850
- height	2480
Weight of the machine with additional equipment, kg/ without auxiliary equipment, kg	15000/ 13000

SEMI-AUTOMATIC SPECIAL CIRCULAR GRINDING MACHINE WITH CNC MODEL OSH-655F3

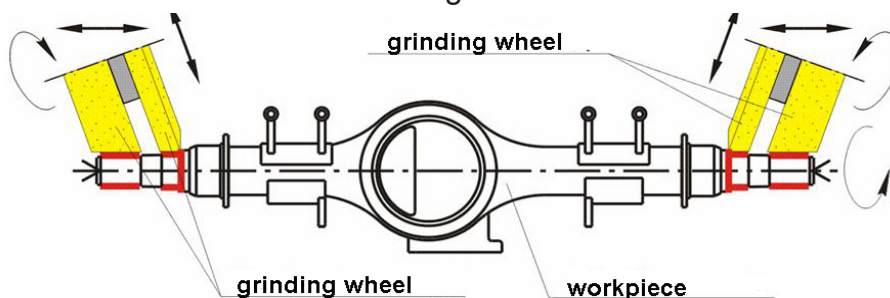
Semiautomatic machine is designed for finish grinding of external cylindrical surfaces and ends of parts: housing of middle and rear axle of KAMAZ.

The processing is carried out by two wheel heads at the same time.



OSH-655F3

Machining schemes



MACHINE MODEL	OSH-655F3
Maximum dimensions of installed workpiece ,mm:	
- length	2400
- diameter	500
Machine spindle indicators:	
- Diameter of the external cone of the spindle of the grinding wheel, mm	125
- The size of the inner cone in the headstock spindle	Morse cone 6
- The size of the inner cone in the tailstock spindle	Morse cone 6
Main drives, kW	22
Accuracy parameters of machined parts:	
- Radial runout tolerance of machined surfaces relative to the centers, mm	0,01
- Face runout tolerance of machined surfaces relative to the centers, mm	0,01
- Roughness of machined surfaces, Ra	0,63... 1,25
Overall dimensions: length x width x height, mm	4800x4450x3300
Mass, kg	20000

CIRCULAR GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-660.4.F2

The machine is designed for external grinding of cylindrical and conical surfaces of parts of the «body of rotation» type.

MACHINE DESIGN FEATURES:

The machine layout uses the principle of a circular grinding machine with the presence of longitudinal and transverse movements of the wheel head relative to the rotating workpiece mounted in the centers of the headstock and tailstock. The headstock, tailstock, lunette and supports for basing the workpiece are fixed rigidly on the upper surface of the cast bed. The movement of the wheel head in the longitudinal and transverse directions is carried out along linear rolling guides by means of ball-screw gears.

The dressing of the grinding wheel periphery is carried out using a dresser diamond mounted on the headstock, due to the longitudinal and transverse movement of the grinding wheel along two coordinates.

The machine is equipped with a command controller software control system.



OSH-660.4.F2

MACHINE MODEL	OSH-660.4.F2
Maximum dimensions of the workpiece to be installed, mm:	
- length when processing the outer diameter min/max	200/4000
- outer diameter min/max	50/560
Dimensions of the grinding wheel installed on the machine mm:	
- outer diameter (largest)	750
- outer diameter (smallest)	420
- inner diameter	305
- height	150
Main drive power, kW:	30
Rotation speed of the wheel head spindle, rpm:	800...2200
Rotation speed of the workpiece, rpm:	5...100
Speed of installation movements, m/min:	
- transverse (X) of the wheel head;	6
- longitudinal (Z) of the slide	6
The maximum travel, mm:	
- transverse (X);	250
- longitudinal (Z)	4200
Overall dimensions of the machine with auxiliary equipment: length x width x height, mm:	7500 x 6000 x 2400
Weight of the machine with auxiliary equipment, kg:	30 000

INTERNAL GRINDING MACHINES, INTERNAL FACE GRINDING MACHINES

HIGH SPEED INTERNAL PROFILE GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-636F3, INTERNAL GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) MODEL OSH-686F3

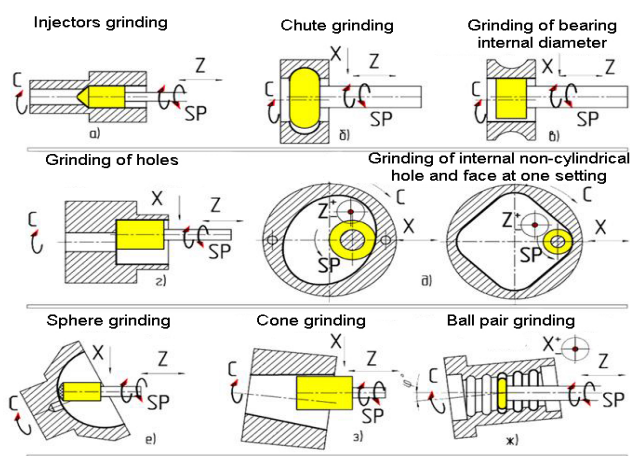
Machine model OSH-636F3 is designed for profile grinding of holes, grinding of cone holes is possible. Sphere of semiautomatic machine use is enterprises with large - series and mass production.

Machine model OSH-686F3 is designed for grinding of holes and grinding of adjoining faces. Sphere of use is enterprises with small - series and serial production.

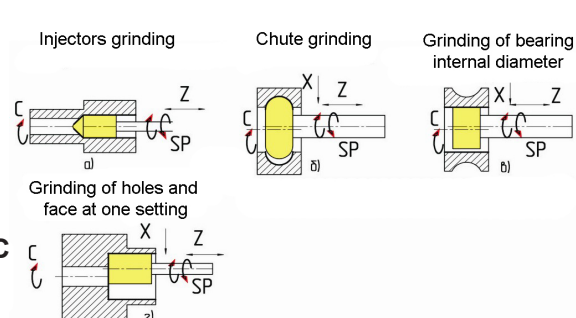


OSH-686F3

Machining schemes of OSH-636F3



Machining schemes of OSH-686F3



Axis C

Axis B

MACHINE MODEL	OSH-636F3	OSH-686F3	OSH-686.3F3	OSH-686.5F3
Maximum dimensions of machined surfaces, mm				
-length	150	150	380	650
-internal diameter	200	200	100	600
-external diameter	180	180	180	600
Grinding wheel dimensions installed on machine, mm				
-external diameter	10...63	10...63	20...50	50...125
-internal diameter	6...20	6...20	6...20	13...32
Electric spindle rotation frequencies limits, min-1 (max)	24000...45000	75000...105000	4000...20000	Equipped with removable electric spindles
Work head spindle rotation frequency, min-1	20...800	20...800	20...200	10...500
Overall dimensions: length x width x height, mm	3500x3700x2000	3500x3700x2000	3500x2600x1820	4400x2500x1820
Mass, kg	4000		4000	8500
Axis C	+			
Axis B		+		

INTERNAL-FACE GRINDING MACHINE WITH CNC OR MASTER CONTROLLER (NC) WITH TWO FIXED SPINDLES AND A MOVABLE WORK HEAD MODEL OSH-586.1.F3

The machine is designed for grinding cylindrical and conical through and blind holes and adjacent external ends in parts of the «bushing» and «body» type.

The machine has an arrangement with the work head moving in the longitudinal and transverse directions relative to the fixed position on the bed of the internal grinding headstock and the end grinding spindle.

The workpiece is installed in the work head in a three-cam chuck. For processing conical holes, the work head is mounted on a swivel bracket that can be rotated at an angle of $+60^{\circ} \dots -10^{\circ}$.

The machine is controlled by CNC system. The machine has 5 controlled coordinates and axes. The machine is equipped with a 24 000 or 10 500 rpm electric spindle and a touch sensor.



OSH-586.1.F3*02

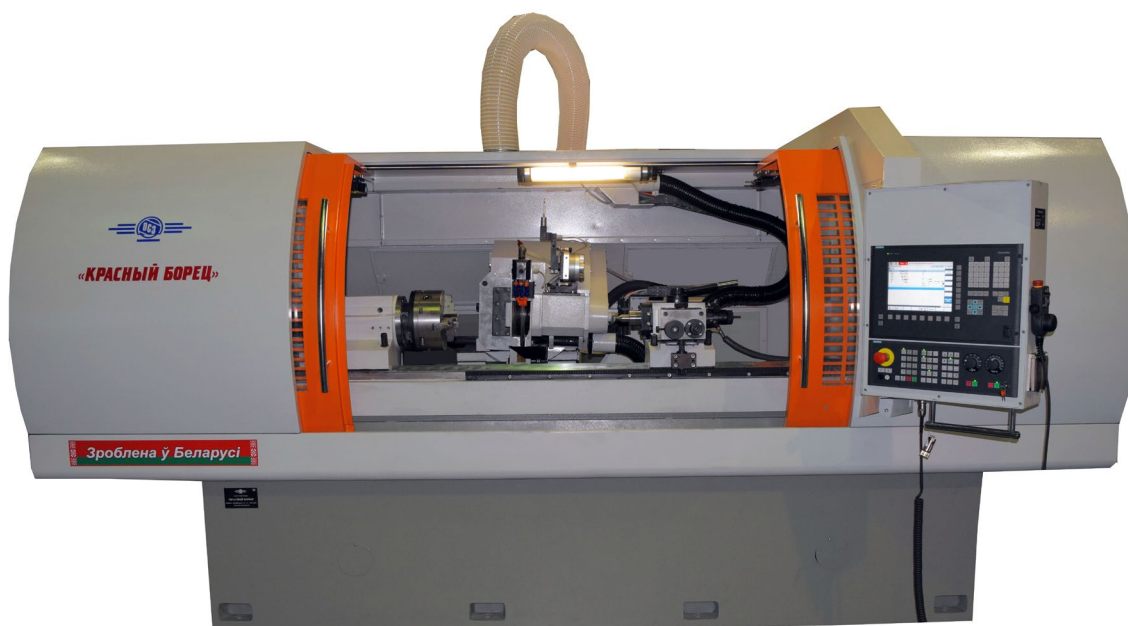
MACHINE MODEL	OSH-586.1F3*02	OSH-586.1F3*03
Maximum dimensions of the workpiece to be installed, mm:		
- length, max;	250	220
- outer diameter, max	300	110
Dimensions of the surfaces to be processed, mm:		
- inner diameter;	12...150	3...25
- outer diameter;	150	80
- length	140	70
Dimensions of the grinding wheels to be installed:		
No. 1 internal grinding spindle, mm		
- outer diameter;	20...63	2,5...20
- height	20...50	10...20
No. 2 face grinding spindle, mm		
- outer diameter;	250	250
- height	20	20
Spindle №1 / №2 power, kW	7,5/1,5	2/1,5
Spindle №1 rotation frequency, rpm	5000...24000	9000...10500
Spindle №2 rotation frequency, rpm	2300	2300
Processed part rotation frequency, rpm	50...800	50...800
Speed of adjustment longitudinal movements m/min:		
- cross;	7	7
- longitudinal	7	7
Maximum travels, mm:		
- cross;	450	450
- longitudinal	220	220
Angle of the work head rotation, degree	-10...+60	-10...+60
Discreteness of moving along the X and Z coordinates (resolution), mkmm	1	1
Overall dimensions of the machine with auxiliary equipment (length x width x height)	3150x2300x2600	3150x2300x2600
Weight of the machine with auxiliary equipment, kg	4000	4000

THREAD-GRINDING MACHINES

THREAD-GRINDING MACHINE WITH CNC MODEL OSH-633F3

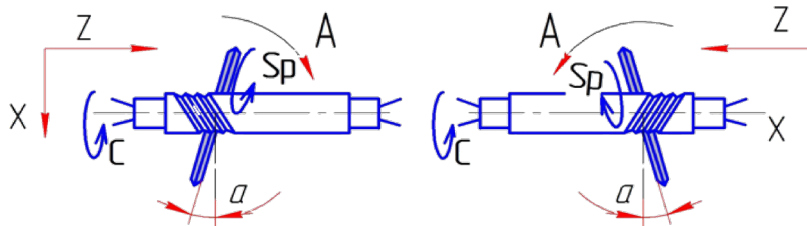
The machine is designed for outward grinding of cylindrical and conic left and right, single- and multistart threads of different profile.

The machine can have an arrangement with movable (in the longitudinal direction) or stationary table and wheelhead moving in the transverse or transverse and longitudinal directions. Wheel-head has the opportunity of turning to the left and right sides relative to the axis of machined part in vertical plane on the lifting angle of helical groove.



OSH-633F3

Machining schemes



MACHINE MODEL	OSH-633F3*06	OSH-633F3*04	OSH-533F3
Maximum dimensions of installed work piece: diameter x length, mm	150x530	320x1300	100x470
Diameter of ground thread, mm	3...150	3...320	3...100
Maximum angle of ascent of ground thread helical curve, degrees	±30	±15	±30
Main drive power, kW	7,0	7,0	4,0
Spindles rotation frequency, rpm	1600...2800	1600...2800	1000...1700
Overall dimensions: length x width x height, mm	3600x3000x2000	4600x3400x2450	2800x3500x2600
Machined part rotation frequency, rpm	0,4...120	0,4...120	0,1...100
Mass, kg	6500	8000	4200

CNC THREAD GRINDING MACHINE MODEL OSH-633F3 VERSION 09

The machine is designed for finishing external grinding (single-thread abrasive wheel) of metric threads, it is possible to grind the threads in whole.

The machine has a layout with a table moving longitudinally, on which the workpiece is mounted, and a wheel head moving in the transverse direction. The headstock, the tailstock, are mounted on the upper surface of the table, the processed part is based in the centers of the headstock and the tailstock.

For thread grinding, the wheel head has the ability to rotate to the left and right sides relative to the axis of the workpiece in a vertical plane.

The movement of the table (coordinate «Z») and the wheel head (coordinate «X») is carried out by means of ballscrews by servo motors, and the rotation of the grinding wheel from a synchronous electric motor with an adjustable drive to maintain a constant cutting speed as the wheel wears out.

The machine is equipped with a touch sensor and a contouring mechanism with a rotating diamond roller mounted on the headstock. Control of the machine is from the CNC system.



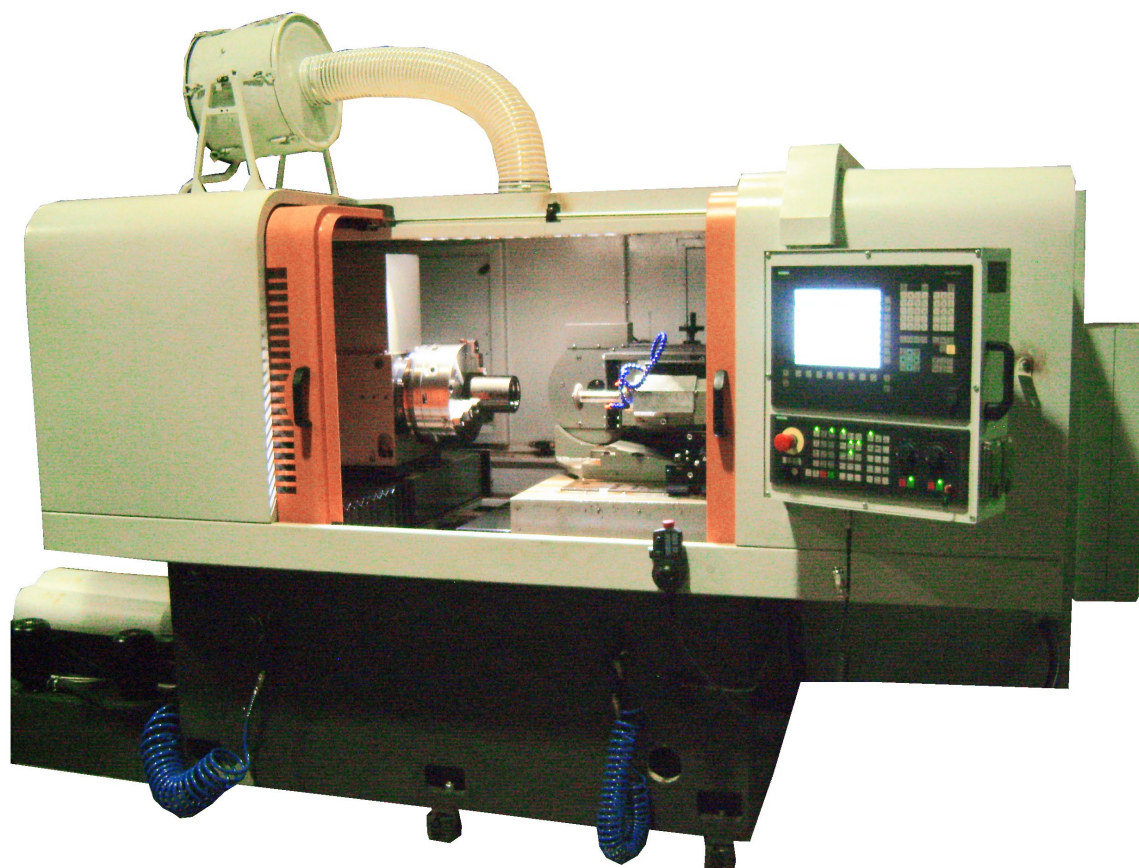
OSH-633F3*09

MACHINE MODEL	OSH-633F3*09
Maximum dimensions of the workpiece to be installed, mm: - diameter max - length min/max	2/150 530
Dimensions of the grinding wheel to be installed, mm: - outer diameter - inner diameter - height	400 203 6...25
Main drive power, kW	7,0
Spindle speed, rpm	1500...2800
Speed of installation movements m/min: - longitudinal / transverse	6/6
The maximum longitudinal table travel, mm	550
The maximum wheel head transverse travel, mm	325
Discreteness of movement: - by programmable linear coordinates X, Z, mm; - by the circular coordinate A, deg;	0,001 0,001
Overall dimensions: length x width x height, mm	3700x3600x2000
Weight of the machine with auxiliary equipment, kg	7000

INTERNAL THREAD-GRINDING MACHINE WITH CNC MODEL OSH-635.1.F3

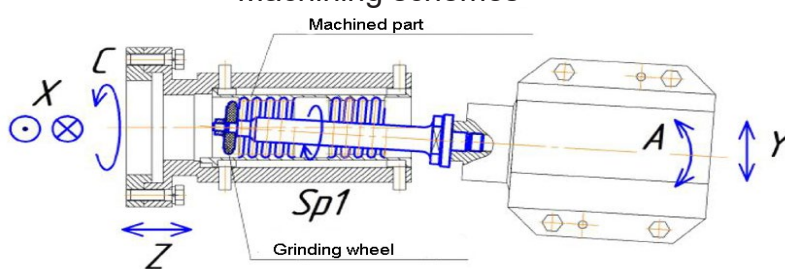
Machine is designed for grinding of internal thread of nuts and ball-screw pair beckets and has the traveling in cross direction slides (coordinate X) with the workhead and in the longitudinal direction (coordinate Z) with wheel-head. The machine is equipped with CNC system, electric spindle, touch sensor for detection of part location on machine, diamond roller for grinding wheel profile dressing.

The wheel-head is mounted on swivel head, which tilts the grinding wheel axis at the angle of thread rise (coordinate A).



OSH-635.1.F3

Machining schemes



MACHINE MODEL	OSH-635.1F3
Maximum dimensions of installed workpiece in chuck: outward diameter x length, mm	300x300
Parameters of machining:	
-inside maximum diameter	255
-inside minimum diameter	25
-grinding length	300
Dimensions of grinding wheel Dmax x H:	22...100x20
Number of controllable coordinates	4
Wheel-head turning angle (rotary angle), degrees	-15;+15
Grinding wheel rotation frequency, rpm	6000...45000
Machined part rotation frequency, rpm	1...200
Overall dimensions: length x width x height, mm	3800x3200x2100
Mass, kg	5000

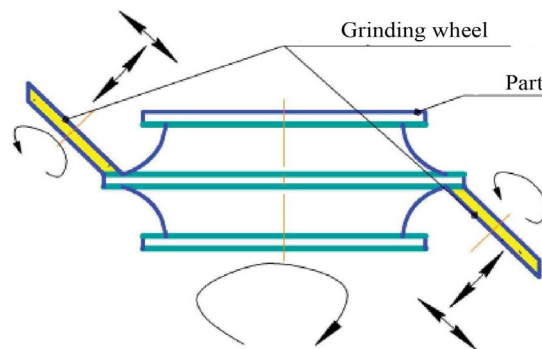
MACHINES FOR GRINDING OF RINGS OF ROLLER SPHERICAL BEARINGS WITH CNC

MACHINE FOR GRINDING THE FACES OF MIDDLE SUPPORTING SKIRTING OR EXTREME SKIRTINGS OF ROLLER-SPHERICAL BEARINGS INWARD RING WITH CNC MODEL OSHP-8



OSHP-8

Machining schemes



MACHINE MODEL	OSHP-8
Maximum dimensions of installed work piece, mm: -outward diameter of middle skirting -outward diameter of extreme skirting - rings width	350...570 360...540 150...245
Grinding wheel dimensions (DxHxd), mm	400x127x10
Grinding wheel drive power, kW	5.5
Number of controlled coordinates	8
Discreteness over coordinates, mm	0,001
Overall dimensions: length x width x height, mm	3950x3900x1970
Mass, kg	8500

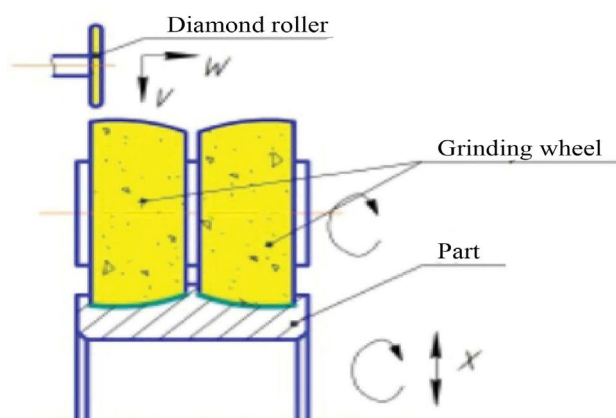
MACHINE FOR GRINDING THE ROLLER – SPHERICAL BEARINGS INWARD RING ROLLING TRACKS WITH CNC MODEL OSHP-226

Machine is designed for simultaneous grinding both roller-spherical bearings inward ring rolling tracks by two grinding wheels. The machined part is installed in a special electromagnetic chuck with support on two shoes. Profiling of grinding wheels is realized by rotating diamond roller.



OSHP-226

Machining schemes



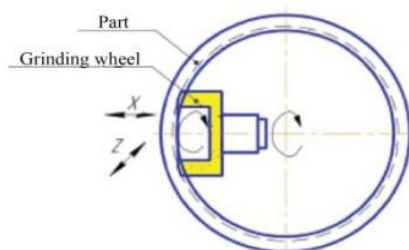
MACHINE MODEL	OSHP-226
Maximum dimensions of installed work piece, mm	
- rolling track radius;	200...370
- outward diameter of middle skirting;	350...570
- rings width	130...245
Machining parameters, mm	
- rolling tracks diameter;	320...520
- stock removal	1,25...2,3
Main drive power, kW	30,0
Controlled by CNC linear coordinates	X, W, V
Discreteness of coordinates X, W, V, mm	0,001
Overall dimensions: length x width x height, mm	3500x3500x2200
Mass, kg	7000

MACHINE FOR GRINDING THE ROLLER – SPHERICAL BEARINGS OUTWARD RING ROLLING TRACK SPHERE WITH CNC MODEL OSHP-259

The machine is designed for grinding of surfaces of rolling tracks of outward rings of roller radial spherical bearings by the method of crisscross axes.



OSHP-259
Machining schemes



MACHINE MODEL	OSHP-259
Maximum dimensions of installed work piece, mm:	
- diameter of machined rings rolling track	390...560
- outward diameter of machined rings	450...600
- rings width	120...210
Grinding wheel drive power, kW	20,0
Controlled by CNC linear coordinates	X, Z
Discreteness of coordinates X, Z mkm	1
Overall dimensions: length x width x height, mm	3100x2200x1950
Mass, kg	5500

SPLINE GEAR - GRINDING MACHINES WITH CNC

SPLINE GRINDING MACHINE WITH CNC MODEL OSH-628.1.F3

Spline grinding machine with CNC model OSH-628.1.F3 is designed for grinding straight and involute slots, as well as special profiles on parts such as «Slotted shaft», «Broach» by abrasive or CBN tool by method of mortise grinding. The design of the machine has a high rigidity, which ensures high-quality and productive processing of slotted surfaces. The machine uses high-quality components. The machine CNC system has special software and mathematical support and a set of programs for processing slotted surfaces and profile slots.

The basic set of the machine includes:

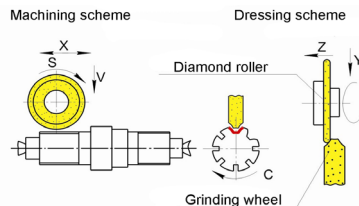
- fencing of the working area of the open type;
- touch sensor;
- driving headstock and tailstock with axis height adjustment (for processing conical spline surfaces);
- dressing mechanism with diamond roller;
- high-speed belt-driven grinding wheel spindle;
- cooling tank complete with pump and magnetic separator;

Optionally, the machine can be equipped with:

- cabinet fencing of the working area;
- aerosol suction unit;
- filter conveyor for the coolant tank;
- lunette, special leashes and supports for the customer's workpieces.

- Spare part and attachments kit, including:

- radius diamond roller R-2.5 mm;
- mandrels for grinding wheels – 2 sets;
- center in the headstock and tailstock – 2 sets;
- supporting 2 support lunette-1pc;
- leashes for blanks – 1 set;
- adjustable supports for installing the machine on the foundation – 1 set.



MACHINE MODEL	OSH-628.1.F3*00	OSH-628.1.F3*01	OSH-628.1.F3*02	OSH-646F3
Maximum dimensions of the workpiece to be installed, mm: - length x outer diameter	600x180	1000x250	1600x250	3500x400
Maximum mass of the workpiece to be installed, kg	40	80	80	500
Dimensions of the surface to be processed, mm - length x diameter; - depth of the processed groove	550x5...180 1...25	950x10...250 1...25	1550x10...250 1...25	100...1550x35...200 2...20
Grinding wheel type 1 according to GOST R 52781-2007 - outer diameter, min...max, mm - height, min...max, mm	63...150 6...20(2x6...12)	63...150 6...20(2x6...12)	63...150 6...20(2x6...12)	63...200 10...50
Main drive power, kW	4,0	4,0	4,0	7,0
Cutting speed, m/s	20...50	25...50	25...50	25...50
Frequency of rotation of the grinding wheel min-1	2500...18000	2500...18000	2500...18000	1500...4000
The frequency of rotation of the workpiece min-1	0,01...30	0,01...30	0,01...30	0,01...50
Diamond roller of the grinding wheel dressing mechanism - outer diameter x profile radius, mm	125x2,5	125x2,5	125x2,5	125x2,5
Travel speed - longitudinal of table sleds (coordinate X), mm/min - cross of wheel head (Z coordinate), mm/min - vertical of wheel head (Y coordinate), mm/min - rotation of the wheel head spindle (coordinate A), min-1	0,1...8000 0,01...4000 0,01...1600 0,01...30	0,1...8000 0,01...4000 0,01...1600 0,01...30	0,1...8000 0,01...4000 0,01...1600 0,01...30	0,1...10000 0,01...5000 0,01...800 0,01...30
Discreteness of moving by coordinates: -X,Y,Z, mm -A, degree	0,001 0,001	0,001 0,001	0,001 0,001	1 0,1
The maximum travel: - longitudinal of table (X coordinate), mm - cross of wheel head (Z coordinate), mm - vertical of wheel head (Y coordinate), mm - rotation of the headstock spindle (coordinate A), degree	800 160 350 Notlimited	1200 160 450 Notlimited	1200 160 450 Notlimited	1600 150 550 Notlimited
Overall dimensions of the machine with auxiliary equipment: length x width x height, mm	2500x1900x1900	3600x2200x2150	4600x2200x2150	6300x5000x2400
Weight of the machine with auxiliary equipment, kg	3600	5100	6700	22500
		Notlimited		

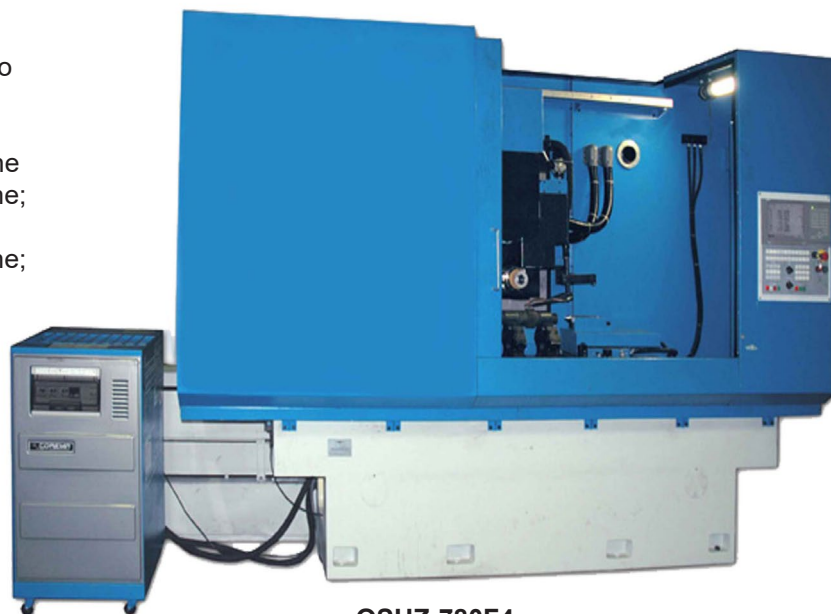
CNC MACHINE FOR BROACHES GRINDING (SHARPENING) MODEL OSHZ-780F4

CNC machine for broaches is made according to the Customer's technical specification.

The machine is designed for sharpening, forming a profile and chip grooves on flat and round broaches. The surface treatment of the broaches can be carried out with abrasive or CBN wheels, depending on the operation being performed. To ensure high quality indicators of the treated surfaces of the broaches, grinding is carried out with the use of coolant.

The design features of the machine in combination with the software allow you to perform the following main technological transitions:

- binding of the processed broach to the machine coordinate system of the machine;
- binding of the grinding wheel to the machine coordinate system of the machine;
- the grinding wheel forming;
- formation of chip grooves on round and flat broaches;
- forming a profile on round and flat broaches;
- sharpening of the round and flat broaches front surfaces;
- sharpening of the flat broaches back surfaces.



OSHZ-780F4

Surface treatment is carried out with grinding wheels of various profiles with manual change of them on a semiautomatic machine.

MACHINE MODEL	OSHZ-780F4	OSHZ-780F4*01	OSHZ-780F4*02
The maximum dimensions of the installed workpiece:			
length, mm	400	1000	1800
diameter, mm	250	250	250
Dimensions of the surfaces to be treated:			
maximum length, mm	350	900	1700
maximum diameter, mm	200	200	200
minimum diameter, mm	10	10	10
Maximum weight of the processed part, kg	50	100	200
Dimensions of the grinding wheel to be installed:			
maximum diameter, mm		150	
minimum diameter, mm		70	
Grinding wheel rotation speed min-1		0...24000	
Dimensions of the dressing roller to be installed:			
Diameter, mm		125	
Speed of rotation of the diamond roller min-1		1500...3000	
Number of controlled axes		5	
Maximum working travel:			
longitudinal, mm	600	1200	2000
vertical, mm	320	320	320
transverse, mm	320	320	320
work head, degree	unlimited	unlimited	unlimited
wheel head, degree	±90	±90	±90
Maximum speed of movement of working bodies:			
longitudinal, m / min		10	
vertical, m/min		5	
transverse, m/min		5	
work head, rpm		40	
wheel head, rpm		40	
Discreteness of setting the movements along the coordinate axes:			
linear, mm		0,001	
circular, deg.		0,001	
Roughness of the surface to be treated		Ra 0,80	
Power of the main movement electric motor, kW		10,0	
Overall dimensions of the machine LxBxH* mm	2450x4500x2650	3600x4500x2650	5310x4500x2650
Weight, kg	6000	6250	7050

SHARPENER WITH CNC FOR HOBGING CUTTERS MODEL OSHZ-721F4

The machine is manufactured according to the performance specification approved by the Buyer. The machine is designed for sharpening on the front surface with an abrasive grinding wheel with cooling of single-thread nozzled hobbing cutters in accordance with GOST 9324-80, as well as multiple-thread nozzled and tail hobbing cutters, including those with closed chip grooves.



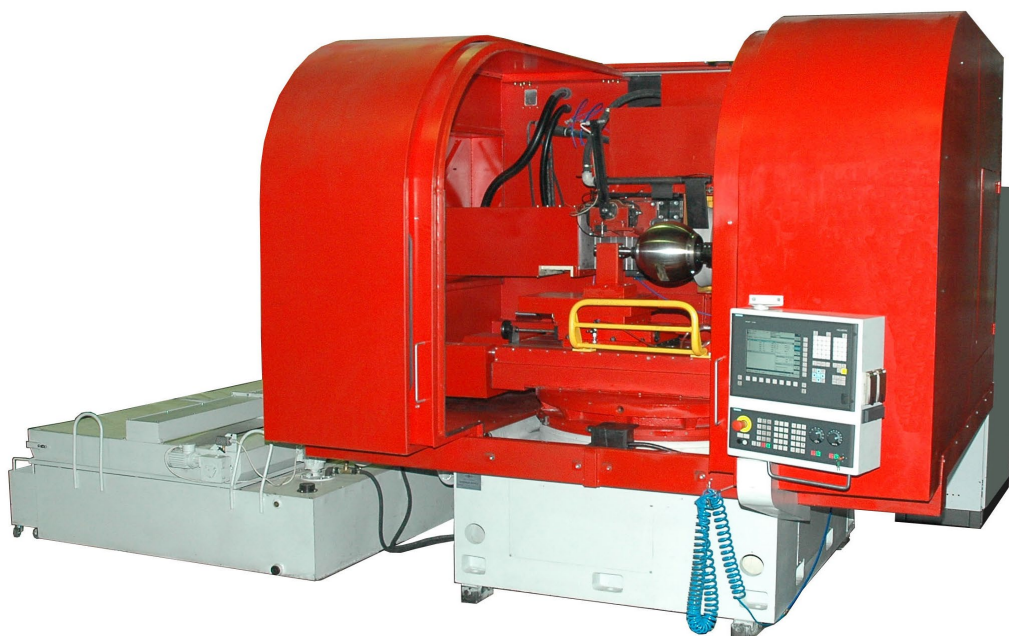
OSHZ-721F4

MACHINE MODEL	OSHZ-721F4
Maximum/minimum hobbing cutters diameter, mm	40/250
Maximum depth of the ground chip groove /module, mm	50/14
Nozzled hobbing cutters maximum length, mm	240
Tail hobbing cutters maximum length, mm	800
Screw chip grooves lifting angles limits /left and right/, degree	±30
Cutter front angle, degree	0...10
Chip grooves number	1...99
The largest diameter of the grinding wheel to be installed, mm	350
Grinding wheel speed, rpm	2000...4500
Number of controlled coordinate axes	5
Travel setting discreteness along the coordinate axes: linear, mm circular, degree.	0,001 0,001
Main movement electric motor power, kW	4
Overall dimensions: length x width x height, mm	4700x3600x2360
Mass, kg	6500

SPHERICAL GRINDING MACHINE WITH CNC

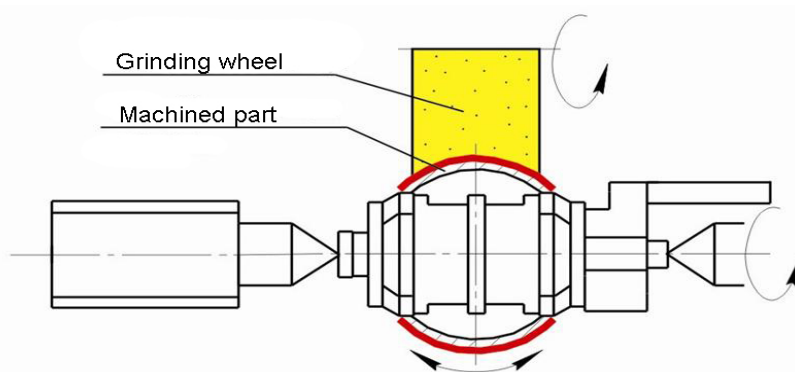
SPECIAL SPHERICAL GRINDING MACHINE WITH CNC MODEL OSH-643F3

Machine is designed for grinding of spherical surfaces of plugs of ball cocks made from stainless heat-resistant steels also with metal-ceramic coating and hardness 50...60 HRC by means of grinding wheel periphery. Sphere of use of machine is single and small-lot production, repair and restoration of ball cock plugs.



OSH-643F3

Machining schemes



MACHINE MODEL	OSH-643F3
Limited dimensions of the machined work piece, - outward diameter, mm	80...900
Machining parameters: - roughness of machined surface, not less than Ra, mkm - accuracy of machining, mm	0,32 ± 0,002 on 100 mm of sphere diameter
Grinding wheel dimensions (D x H x d), mm	500 x 60...100 x 203
Main drive power, kW	20,0
Overall dimensions: length x width x height, mm	4500x3800x2900
Mass, kg	10000

MACHINES FOR HARD-TO-PROCESS MATERIALS CREEP FEED GRINDING WITH CNC

SPECIAL MACHINE WITH CNC FOR CREEP FEED PROFILE GRINDING OSH-680F3

Machine has an arrangement with wheel head movable in longitudinal, cross and vertical direction.

Machine is equipped with cooling system including pumps of coolant-lubricant feed into cutting zone, zone of grinding wheel dressing and to the device of parts washing and slime washout inside of enclosure, of coolant feed into wheel head body.

Machine is equipped with CNC system with drives and feedback sensors over coordinates Z, Y, V.

On the body of the wheel-head, a continuous dressing mechanism is installed with a rotating profile diamond roller. The machine is equipped with a refrigeration unit to maintain a constant coolant temperature.



OSH-680F3

MACHINE MODEL	OSH-680F3
Maximum dimensions of installed workpiece (L x B x H), mm	800x500x500
Dimensions of grinding wheel D x h x d, mm	250/500x10...110x127/203
Maximum diameter of grinding spindle cone, mm	28,0
Main drive power, kW	80
Grinding spindle rotation frequency(infinite variation) min-1	800...8000
Overall dimensions: length x width x height, mm	6000x4300x3100
Mass, kg	16000

2-SPINDLE SURFACE & PROFILE GRINDING MACHINE WITH CNC MODEL OSH-233

The machine is designed for two-sided processing by deep grinding of precision profile surfaces of the shank blades of gas turbine engines.



OSH-233

MACHINE MODEL	OSH-233
Grinding limit dimensions (length x width x height)	600x100x160
Dimensions of the working surface of the table (length x width)	1800x400
Drive power of the main upper and lower motion, kW	2x28,0
Number of spindle rotations min ⁻¹	1000-2000
Grinding wheels, mm	500x10...100x203
Number of controlled coordinates and axes (X, Y1,Y2, Q1,Q2, W1, W2)	7
Control system	CNC
Diameter of dressing roller ,mm	100...140

CREEP FEED SURFACE PROFILE GRINDING MACHINES WITH CNC MODEL OSH-220, OSH-221F3

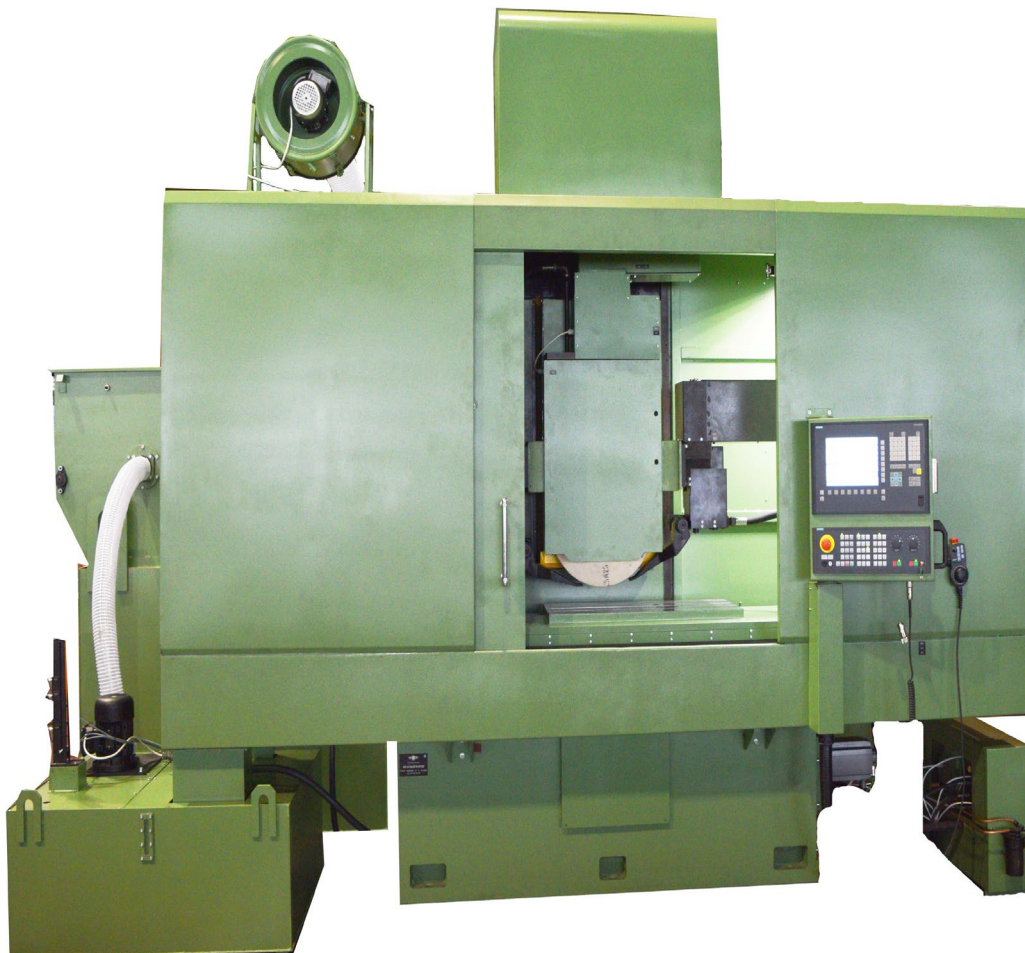
Machine is designed for abrasive machining by creep feed grinding the parts of machines from hard to machine materials including elements of motors blades and has an arrangement with traveling in cross direction table and movable column traveling in cross direction bearing wheel head with mechanism of continuous dressing by diamond roller.

Machine OSH-220 has six programmable coordinates.

Machine OSH-221F3 has eight programmable coordinates.

Machine OSH-221F3 version 04 has eight programmable coordinates with the possibility to install globe table.

Grinding of profile surfaces and also continuous dressing of grinding wheel are produced according to CNC controllable program in automatic mode with use of creep feed method of grinding.



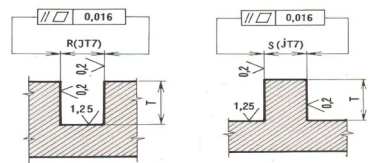
OSH-221F3

MACHINE MODEL	OSH-220	OSH-221F3	OSH-221F3*04
Maximum dimensions of installed workpiece (L x B x H), mm	800x400x480	800x400x500	800x400x500
Dimensions of grinding wheel D x h x d, mm	500x10...100x203	500x10...100x203	500x10...100x203
Maximum diameter of grinding spindle cone, mm	80	80	80
Main drive power kW	28,0	28,0	28,0
Grinding spindle rotation frequency(infinite variation) min-1	800...2000	800...2000	800...6000
Overall dimensions (length x width x height), mm	5000x5000x3230	5000x5000x3230	5100x3900x3230
Mass, kg	12000	12000	12000

MACHINE FOR CREEP FEED SINGLE-PASS GRINDING WITH CNC OR NC MODELS OSH-465, OSH-466

The OSH-465 and OSH-466 machines are quite simple in design and easy to use. They provide efficient processing of pre-milled grooves and spikes in parts made of various structural materials using the single-pass creep feed grinding method. Solid material processing is possible. The volume of the removed allowance is 100 ... 200 mm/s.

Machining schemes



OSH-465F3

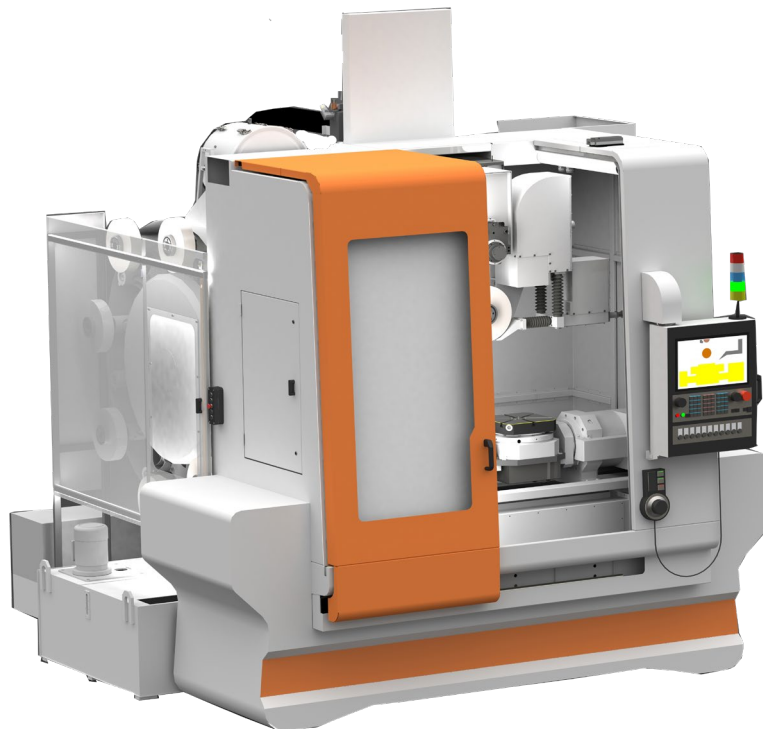
MACHINE MODEL	OSH-465	OSH-466
Maximum dimensions of installed workpiece (L x B x H), mm	840x290x400	840x395x500
Maximum dimensions of processed surface (LxB), mm	620x290	630x395
Maximum dimensions of grinding groove or pin (TxR) or (TxS), mm	40x40	40x40
Dimensions of the working surface of the table (LxB), mm	630x200	630x320
Stroke value, mm	790	790
Working/setting speed range, mm / min	30...1000 600...6000	30...1000 600...6000
Transverse stroke value, mm	250	350
Feed	manual	manual
Distance from the axis to the table surface, mm	125...550	140...650
Speed range of grinding head adjustment travels, mm / min	15...240	15...240
The value of vertical feed (for wheel dressing), mm	0,02	0,02
Dimensions of the grinding wheel on request, mm	300x63x76	300x80x127 400x80x127
The rotation frequency of grinding spindle, rpm	1510	1510
Overall dimensions including moves and equipment (LxBxH), mm	4000x2050x2040	4000x2200x2200
Weight of the machine with auxiliary equipment, kg	3700	4200

CNC GRINDING CENTER FOR COMPLEX INTEGRAL PROCESSING OF STRUCTURAL MATERIALS

The CNC grinding center is designed for complex integral processing of workpieces made of various structural materials in the conditions of single, small-scale and serial production.

Performs operations of grinding, drilling, core drilling, and reaming in one installation of the product. It can be used for processing the surfaces of the gas turbine engine working blades by creep feed grinding

High speed of movement on the axes, minimal auxiliary time and fast tool change guarantee high productivity, simple operation, unlimited freedom of movement and precise positioning.



OSHC

MACHINE MODEL	OSHC
Working space dimensions:	
Max. distance from the globe table rotation axis to the grinding spindle axis, mm	620
Distance from the dressing spindle axis to the grinding wheel spindle axis, mm	130-300
Distance from the longitudinal table mirror to the globe table faceplate mirror, mm	430
Longitudinal table working surface dimensions (LxB), mm	800x600
Globe table faceplate diameter, mm	250
Tool mounting	HSK-B80
Tool magazine capacity	30
X-axis-longitudinal stroke, mm	500
Travel speed, m / min	0,1...30
Y-axis-vertical stroke, mm	650
Travel speed, m / min	0,001...30
Z-axis-transverse stroke, mm	650
Travel speed, m / min	0,001...30
Grinding spindle drive power, kW	28...50
Speed range, min-1	10000
Grinding wheel circumferential speed, m / s	30...50
Grinding wheel dimensions (D x B x d), mm	300x60x76,2
Machine overall dimensions (L x B x H), mm	4000x2250x3040

MACHINES FOR GRINDING OF MOTOR CAMSHAFTS CAMS WITH CNC

SEMI-AUTOMATIC SPECIAL CIRCULAR GRINDING MACHINES WITH CNC FOR GRINDING OF CAMSHAFTS CAMS MODEL OSH-600F3, OSH-669F3

Semiautomatic machine is designed for rough and finish grinding of camshafts cams with convex profile and also for machining of parts of the similar type with fixing in centres or chuck and for grinding of outer cylindrical and conic surfaces of flat and stepped workpieces.

The forming of cam profile is realized by means of programming, and change of cam profile dimensions – by means of re-programming of CNC system.

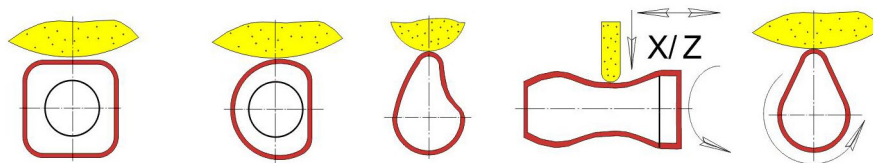
The special semi-automatic circular grinding machine with CNC model OSH-669F3 is designed for external grinding of the crankshafts main and rod journals in one installation, as well as grinding of the camshafts bearing journals and cams after changeover.

The machine performs alternate processing of the main and rod journals, as well as crankshafts bearing journals and cams.

The scope of machine application is enterprises with serial and small-scale production.



OSH-600F3
Machining schemes



MACHINE MODEL	OSH-600F3	OSH-600F3.1	OSH-669F3
Treated surfaces dimensions, mm:			
-length	870	1450	1000
-diameter of the journals to be processed	10...300	10...330	25...130
Speed of setting movements of the grinding wheel m / min	5	5	5
Dimensions of the grinding wheel to be installed, mm:			
spindle №1/ spindle №2			
- outer diameter	500	500	600/600
- inner diameter	203	203	203/203
- height	25	30...80	32...55
Main drive power of spindle №1/ spindle №2, KW	15	15	7,5/7,5
Machine overall dimensions with attached equipment, mm:			
-length	4440	5550	6200
-width	3800	4300	4000
-height	2460	1820	2400
Machine weight with attachments, kg	6400	7200	11500

MACHINES FOR SIMULTANEOUS GRINDING OF FLAT PARTS FACES WITH CNC

SPECIAL SURFACE GRINDING AUTOMATIC MACHINE WITH CNC MODEL OSH-622.3.F3

Automatic machine is designed for double-sided grinding of surfaces of parts made from steel, hard alloy and ceramics.

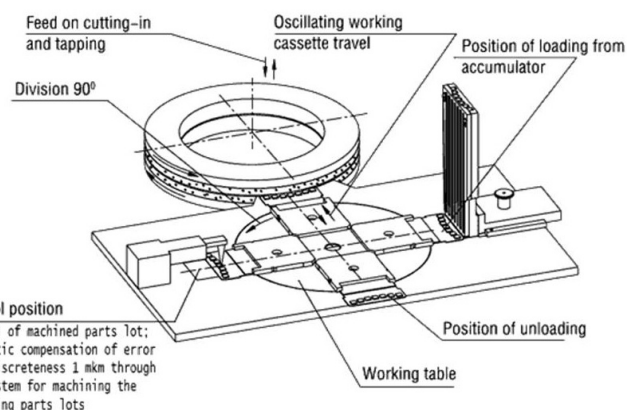
Machining of two surfaces of parts situated in cassette cells simultaneously is realized with feed on cutting-in of upper grinding wheel head with oscillating cassette travel.



OSH-622.3.F3



Machining schemes



MACHINE MODEL	OSH-622.3.F3	OSH-622.3.F3*01
Dimensions of el' bor borazon material or diamond grinding wheels : (D x H x d), mm	450x36...45x275	500x36x305
Dimensions of dressing abrasive wheel and diamond roller: (D x H x d), mm	125x10x32	-
Working feeds limits, mm/min : - of upper spindle - of dressing roller	1...200 1...200	1...200 -
Wheel heads spindles drive power, kW	7,5; 11,0; 15,0	22
Overall dimensions: length x width x height, mm	3250x3100x2500	4100x3700x2800
Mass, kg	6500	8000

MACHINES FOR PROFILING OF ABRASIVE GRINDING WHEELS

MACHINE FOR ABRASIVE GRINDING WHEELS PROFILING WITH CNC MODEL OSH-614

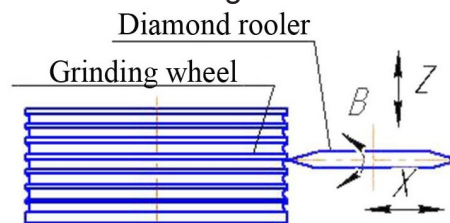
Machine is designed for performing of periphery profiling (shaping of geometrical profile) of abrasive grinding wheels.

Machine has the arrangement with dressing mechanism traveling in longitudinal and cross directions relative to motionlessly rotating grinding wheel. Dressing is produced by a special rotating diamond roller which has the opportunity of turn to the left and right sides relative to the top of radius ($R=0.2$ mm) of diamond roller.



OSH-614

Machining schemes



MACHINE MODEL	OSH-614
Dimensions of dressing diamond roller, mm	
- maximum outward diameter;	150
- inward diameter;	32h5
- radius at the top;	0,2
Dimensions of grinding wheels installed on the machine, mm	
- maximum outward diameter;	320
- minimum outward diameter;	231
- inward diameter;	76
- height;	10...130
Indications of main and auxiliary motions	
Quantity of controllable coordinates	5
Travels:	
- maximum longitudinal one (coordinate Z), mm	330
- maximum cross one (coordinate X), mm	130
- angle of diamond roller turn (coordinate B), degree	(-90/+45)
Overall dimensions of machine LxBxH, mm	2500x1700x2300
Mass, kg	1500

MACHINES FOR DIAMOND – ELECTROCHEMICAL GRINDING WITH CNC

MACHINE WITH CNC FOR DIAMOND-ELECTROCHEMICAL GRINDING OF SLOTS MODEL OSH-625EF3

Machine is designed for electrochemical grinding by diamond wheel of flat-profile surfaces and gap slots on parts made from hard machined materials: hard alloys, high-temperature alloys and steels on chromium-nickel basis, titanium alloys, etc.

Machining of surfaces over the whole with all the allowance removal is realized on the machine. Use of technological current source allows to realize the process of electric chemical grinding which includes anodic erosion of metal and diamond grinding. Machining is fulfilled by diamond conducting wheel with use of electrolyte and feed of potential “+” and “-“ onto the machined part and wheel. Machining of inclined and curvilinear surfaces and slots is possible.

Machine construction specific features:

- Cutting zone protection of cabinet type;
- Clearing of electrolyte from suspended particles of machining by means of centrifuge;
- Absence of weariness of diamond wheel at the expense of electrochemical process in the machining zone;
- Travel of work members on rolling supports by means of rolling ball screw pairs;
- Linear and circular interpolation over coordinates X, Y and Z;
- CNC system;
- Converters of linear travel;
- Precision bearings of wheel head.



OSH-625EF3

MACHINE MODEL	OSH-625EF3	OSH-625.1.EF3
Table working surface dimensions : length x width , mm	450x200	630x200
Maximum table travel, mm	500	650
Maximum distance between table mirror and spindle axis, mm	415	415
Maximum working feed speeds, mm/min	0,01...250	0,01...250
Positioning accuracy over coordinates : Y, Z, mm	0,004	0,004
Main drive power , kW	2,2	2,2
Overall dimensions: length x width x height, mm	2500x2650x2360	2900x2650x2360
Mass, kg	2000	2100

KNEE-TYPE MILLING MACHINES

HORIZONTAL MODEL ORSHA-F32G, MULTI-PURPOSE MODEL ORSHA-F32U, WIDE MULTI-PURPOSE MODEL ORSHA-F32SH

Machines are designed for milling of the flat and contour surfaces by all kinds of mills.

Machines have a horizontal milling spindle with cone ISO-50.

Removable, rotary in the plane perpendicular to horizontal spindle axis, vertical milling head with spindle ISO-50 put in motion from horizontal spindle is used on multi-purpose machine.

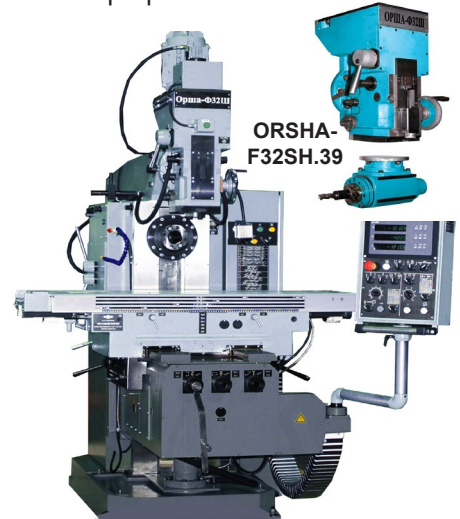
Rotary in two planes vertical milling head with spindle ISO-50 is used on wide multi-purpose machine. The head is installed on the slider and has an autonomous drive.



ORSHA-F32G



ORSHA-F32U



ORSHA-F32SH

Design advantages:

- Presence of frequency control of rate of induction electric motors of the main drive and feeds drive.
- Possibility to connect the hydraulic attachment of manufactured article clamping.
- Travels over axes X, Y, Z have mechanized and manual drive and are realized along the hardened cast-iron guide ways of sliding.
- Possibility of installation of the digital read-out device over coordinates X, Y, Z ;
- Machine has master controller, which controls the electrics and automatics of the machine and provides the operation in semiautomatic cycle.
- Presence of the recoil-approach mechanism over coordinate Z and mechanisms of discrete feeds over X, Y, Z coordinates.
- Presence of highly reliable hydraulic mechanism of tool clamping.
- Components of electric equipment of the best world manufacturers.
- The machines are produced in two industrial versions: version 30 without digital readout and version 31 with digital readout with imported electrical equipment.

MACHINE MODEL	ORSHA-F32G	ORSHA-F32U	ORSHA-F32SH
Machines accuracy class	Heightened precision		
Dimensions of table working surface, mm (length/ width)	1400/320		
Table maximum travel , mm : - longitudinal (coordinate X) -cross (coordinate Y) when operating with horizontal / vertical spindle	840(1040) 320/-	840(1040) 320/265	840(1040) 320/320
Table working feed range, mm/min : - longitudinal and cross (coordinates X and Y) - vertical (coordinate Z)	25...1250 6...320		
Spindles rotation speed ranges, min ⁻¹ horizontal / vertical	25...2000/-	25...2000/25...2000	25...2000/71...2240
Milling spindles drive power, kW horizontal / vertical	7,5/-	7,5/7,5	7,5/4,0
Angle of turning of milling head, degrees	-	+45	+45 (in two planes)
Overall dimensions: length x width x height, mm	2427x1890x1745	2427x1890x2060	2454x1890x2425
Mass, kg	2938	3234	3500
Delivery set :			
Machine assembled	+	+	+
Hydraulic unit for lubrication	+	+	+
Cooling system	+	+	+
Hydraulic mechanical attachment of tools gripping	+	+	+
Guarding screens of cutting zone	+	+	+
Set of quick-wearing parts, tools and attachments	+	+	+
Digital read-out device over coordinates X,Y,Z	*	*	*
Bench vice	*	*	*
Universal indexing head	*	*	*
Set of boring arbors	*	*	*
Set of arbors and collet chucks for tools gripping	*	*	*
Rotary table with manual and mechanized drive	*	*	*

+ - included into the delivery set * - at extra price

CRANK PRESSES

OPEN-SIDE CRANK PRESSES: INCLINABLE AND NON-INCLINABLE

Presses are designed for cold stamping operations in press forging and can function separately as well as a part of flexible technological system.

Design advantages:

- cast-iron bed;
- hardened steel overhead guide rails;
- the use of bronze linings on the slide guides;
- frontal arrangement of the eccentric shaft;
- mechanized regulation of the slider disposition position;

- centralized lubricating system;
- the presence of safety washer or hydraulic overload safety device
- Orsha-800 presses are manufactured in two versions: non-inclinable and inclinable.



**ORSHA-800 (force 80t)
inclinable**



**ORSHA-1400 (force 140t)
non-inclinable**

MACHINE MODEL	ORSHA-800 inclinable	ORSHA-800 *40 non-inclinable	ORSHA-1400 non-inclinable
Nominal force kN (tf)	800(80)	800(80)	1400(140)
Frequency of slider strokes, min ⁻¹ :			
- continuous	120		80
- single	45		30/38/45
Adjustable slider stroke, mm	10...130		2...150
Table dimensions, mm:			
- from right-to-left	800		1000
- from front-to-back	560		650
Maximum distance between table and slider in its lower position and with maximum stroke, mm	405		480
Adjustment value of distance between table and slider, mm	80		100
Slider dimensions, mm:			
- from right-to-left	560		650
- from front-to-back	400		425
Incline angle of bed, degrees	0;10;20	0	0
Main drive power, kW	8.5		15,0/ 18,5/ 22,0
Overall dimensions, mm:			
- from right-to-left	1820	1820	1930
- from front-to-back	2070	1730	1885
- height	3170	3085	3405
Mass, kg	7600	7000	11000

BENDING MACHINE

HYDRAULIC BENDING MACHINE MODEL MG-120

Multi-purpose bending machine is intended for bending of pipes, square profiles, strips, bars, angles, cutting-off of strips, rods, pipes, broaches, twisting, dies, blanks made of different materials with force up to 120 kN (12 t) in metal working. Most effectively the machine can be used under single-unit and small-scale production.

Parameters name	MG-120
Table working surface dimensions, mm	
-length	600
-width	490
Maximum travel of base plate of power-driven hydraulic cylinder, mm, not less than	170
Maximum travel speed of base plate of power-driven hydraulic cylinder, m/min	
-forward	0,6
-backward	1,0
Maximum force of power-driven hydraulic cylinder, kN(t)	120 (12)
Distance from upper surface of the table to the floor, mm	950
Power of hydraulic pump drive electric motor, kW	2,2
Bending machine overall dimensions (without attachments) , mm	
-length	1000
-width	760
-height	1120
Machine mass w/o attachments, kg	530

Standard delivery set :

Bending machine	MG-120	
Workpiece basing device	MG-120.55.0.000.0.00	- 1 pc.
Tools and accessories set	MG-120.90.1.000.0.00	- 1 set



MG-120

*Delivery set for a free

No. of adjustment	Purpose	Dimensions of blank, mm
MG-120.40.1	Attachment for strip bending	Height up to 130, thickness up to 6
42.2	Attachment for pipes and rolled stock	See adjustments for pipes bending
43.2	Attachment for chopping	Strip up to 8, circle up to 16, angle up to 32 x 4
47.1	Attachment for straightening	Circle, square, hexahedron, up to 30, deflection (flexure) up to 15
50.1	Device for twisting	See adjustments 51.1 and 52.1
51.1	Attachment for strip bending along set profile	Length up to 400, width up to 50, thickness up to 3
52.1	Attachment for twisting axis	Length up to 520, width up to 30, thickness up to 2
64.0-00	Pads for pipes bending	dy x S = 15x2,8
64.0-01		dy x S = 20x2,8
64.0-02		dy x S = 25x3,2
64.0-03		dy x S = 32x3,2
64.0-04		dy x S = 40x3,5
64.0-05		dy x S = 8x2,2
64.0-06		dy x S = 10x2,2
65H2	Pad for profile rolled stock	Circle, square, hexahedron up to 30
65H1	Pad for strip bending	Width up to 60, thickness up to 6
49.0	Die for angle punching	Width of shelf up to 32, thickness up to 4



SMALL-SCALE MECHANIZATION

SHARPENERS

Sharpeners are designed for fitting works (deburring, chamfering etc.). Use of corresponding fixtures allows to carry out grinding and polishing of parts.



TSH-1



TSH-2



TSH-3



TSH-4

MACHINE MODEL	TSH-1	TSH-2	TSH-3	TSH-4	TSH-4*01
Parameters of cutting tool on ceramic bundle (as per GOST 2424-83), mm					
- outside diameter	250	300	400	400	600
- diameter of circle fitting hole	32	76	127	203	203
- circle height	40	40	50	50	50
Grinding wheels rotation frequency, min ⁻¹	1430		1410	1440	1000
Drive power, kW	2,2		3,0	7,5	7,5
Overall dimensions (LxBxH), mm	497x425x537	494x440x1263	559x580x1300	900x620x1340	900x815x1505
Power supply specification	a.c., three-phase , 50 Hz, 380 V				
Mass, kg	55	80	152	380	440

The sharpeners have limit switches on housings for limitation of guard boards turning angle and socket for connecting vacuum cleaner 370.P16.

Sharpeners mod. TSH-1, TSH-2 and TSH-3 are manufactured on welded bed.

ABRASIVE BELT GRINDING MACHINE OLSH-1

Machine is designed for stationary grinding of metal materials with use of abrasive belts. Machine is equipped with built-in vacuum-cleaner for dust collection.

Parameters name	OLSH-1
Number of rotations of idling, min ⁻¹	1430/2790
Consumed power, W	3,0/3,75
Voltage, V	3x380
Frequency, Hz	50
Speed of abrasive belt, m/s	15/29
Number of rotations of fan, rpm	3000
Consumed power, W	0,37
Air consumption, m ³ /h	800
Suction vacuum, Pa	400
Overall dimensions (length x width x height), mm	1130x583x1022
Mass, kg	125



OLSH-1

GRINDING – POLISHING MACHINES MODEL TSHP – 1, TSHP – 2, TSHP – 2, VERS. 01

The machines are designed for carrying out the following operations: deburring, chamfering, sharpening cutting tools, polishing the parts from steel, wood and other materials.

Machine consists of polishing device, working table of which has the possibility to incline in vertical plane on angle 45 °. Simple and quick change of tape by means of one – lever clamp. Grinding or polishing wheel for grinding or polishing works is installed on the second end of the motor.



TSHP-1



TSHP-2,
TSHP-2*01

MACHINE MODEL	TSHP-1	TSHP-2	TSHP-2*01
Grinding wheel 25A F46 K6V 35m/s 2 class	1		
Outside diameter of wheel, mm	250	300	300
Wheel height, mm	40		
Bore diameter, mm	32	76	76
Abrasive tape LB-150x1250 15A 25P	1		
Tape width, mm	50		
Shaft rotation frequency, min-1	1430		
Coarse-haired wheel A300x40 RST RF 756-89 art. F0377	-	-	1
Tape length, mm	1250		
Maximum speed of wheel cutting, m/s	18,7	22,5	22,5
Maximum speed of tape motion, m/s	15		
Drive power, kW	2,2		
Power supply specification	a.c., three-phase , 50 Hz, 380 V		
Overall dimensions, mm (length x width x height)	510x414x707	504x448x1387	
Mass, kg	73,7	87	88,5

BENCH-TYPE MACHINES: DRILLING - MILLING MACHINE MODEL SF-1, DRILLING MACHINE MODEL SF-1 VERS.07

Machines are designed for performing drilling and drilling-milling operations. Use of guide ways type "dove tail" gives stability of work during milling. Machines have re-set stop of drilling depth which creates convenience in work. Table has fixation in all directions. Machines SF-1 are equipped with frequency converter of spindle rotation speed adjustment without steps. Machines are equipped with the pedestal at extra payment.



SF-1



SF-1 vers.07

MACHINE MODEL	SF-1	SF-1 vers.07
Maximum drilling diameter, mm	23	
Maximum drilling out diameter, mm	35	
Maximum diameter of installed cutter, mm	76	-
Dimensions of table working surface , mm (length x width)	450x180	250x250
Maximum travel, mm : - longitudinal travel of table; - cross travel of table; - vertical travel of wheel- head	260 150 280	- - 200
Inward spindle cone	Morze 3-AT6 GOST 25557-82	
Rotation frequency range, min ⁻¹	300...1500/300...3000 (without steps)	320; 520; 810; 1350; 2100
Distance between spindle face and table working surface, mm : - minimum; - maximum	90 370	323 423
Poppet sleeve stroke length, mm	100	
Turn of head in horizontal plane, degrees	±30	
Drive power, kW	1,5	
Overall dimensions, mm (length x width x height)	825x710x1005	705x440x1005
Mass, kg	200	150

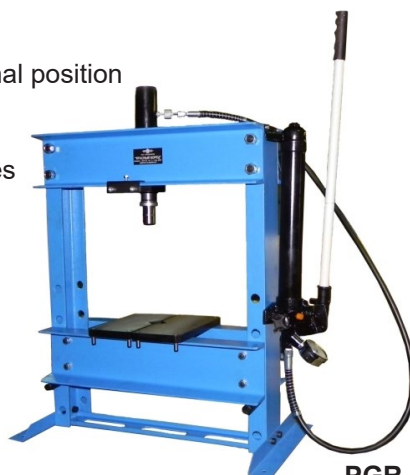
HYDRAULIC PRESS MODEL PGR-10, PGR-16

- Rigid welded frame construction
- Pressurization via pump lever
- Return spring bringing the piston in its original position

Designed for all repair and installation work:

- Piercing of bearings, bolts, bushings, etc.
- Dressing of carriers, shafts, axes and profiles
- Pressing and crushing
- Reliability of welds
- Dressing tools
- Control of the strength of materials

PGR-10



PGR-16



MACHINE MODEL	PGR-10(desktop)	PGR-16
Pressing force, t	10	16
The maximum pressure, Mpa	30	30
Stroke of piston, mm	135	140
Stroke of leadscrew, mm	70	70
Overall dimensions, mm (length x width x height)	470x200x860	830x1170x1920
Mass, kg	65	260

CUTTING-OFF MACHINES MODEL OOS VERS.10, OOS VERS.01

Machines are designed for cutting work pieces from metal and other materials off by cutoff wheel on bakelite basis with strengthening elements of other materials.



OOS vers.01



OOS vers.10

MACHINE MODEL	OOS vers.10	OOS vers.01
Maximum dimensions of machined workpiece section (when the wheel is new), mm :		
-channel, angle	80	
-tube, solid circle (with re-installation) diameter	50	
Angle of vice turning, degrees :		
clockwise / counter clockwise	45/25	
Dimensions of cut off wheel, mm	400x3,2x32	
Spindle rotation frequency, min-1	2100	
Drive power, kW	2,0	2,2
Overall dimensions : length x width x height (taking into consideration movable parts), mm	1280x1270x950	1280x1600x1500
Mass, kg	185	258
Power supply specification	a.c., three-phase , 50 Hz, 380 V	
Advantages :		
1. Marking-out rod with re-adjustable rest allows to cut parts of equal length.		
2. Fixation and unfixturing of rotary vice is carried out by simple turn of handle.		
3. Massive cast iron bed provides the necessary rigidity.		
4. There is a window on the spark collector for connection of vacuum-cleaner mod.370P16x07.		
5. OOS*01 is manufactured on welded base.		

CLEANING SYSTEMS

INDUSTRIAL VACUUM CLEANER 370.P16 VERSION 04

Vacuum cleaner is designed for suction of dust from surface grinding machines, sharpeners, cutting-off and other machines.



370.P16

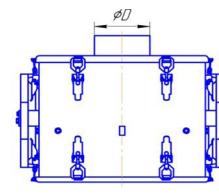
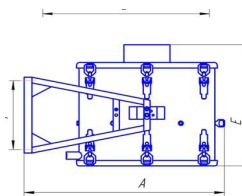
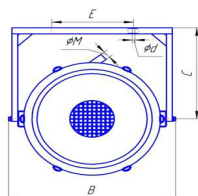
Parameters name	Value for version		
Version	01	04	07
For machines	surface grinding machines	sharpeners	cutting-off machines
Number of arms, pcs	1	2	1
Arm length, mm	2500	1000	
Diameter of impeller, mm	350		
Electric motor shaft rotation frequency, min ⁻¹	2800		
Productivity without arms and branch pipe connecting, m³/h	800		
Electric motor power, kW	1,1		
Overall dimensions (LxBxH), mm	610x475x1150	655x475x1150	610x475x1150
Mass, kg	52	56	54

EXHAUST DEVICE

The device is designed for extraction of coolant-lubricant mist with impurities of solid dust and fine metal chips.



UV-1200



MODEL	UV-600	UV-1200	UV-3000
Productivity, m ³ /h	600	1200	3000
Maximum level of noise, dB	80	80	80
Input diameter, mm	100	150	200
Rotation frequency, rpm	2800	2800	2800
Mass, kg	20	40	60

MAGNETIC SEPARATOR ORSHA-SM50

HORIZONTAL KNEE-TYPE MILLING MACHINE ORSHA-F32GF3

It is designed for automatic cleaning of coolant-lubricant from fine magnetic particles in mixture with abrasive and other non-magnetic particles.



ORSHA-SM50

Parameters name	Value for version		
Version	00; 05	10; 15	20;25
Nominal consumption, l/min	50	100	150
Electric motor power, kW	0,12		
Power supply specification	a.c., three-phase , 50 Hz, 380 V		
Overall dimensions (LxBxH), mm	320x240x380	527x240x380	687x240x380
Mass, kg	28	36	52

SWARF CONVEYOR MODEL OFC-4

Swarf conveyor is designed for collecting and removal of metal chip (swarf) from the processing zone of milling machining centre. Conveyor is equipped with the pump of lubricant - coolant feed into the part machining zone. It is possible to make conveyor with other technical specifications as per customer's expression of requirements.



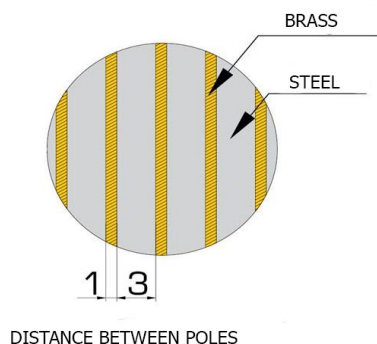
OFC-4

Parameters name	Value
Width of supporting scrapers, mm	232
Pitch of drive chain, mm	63
Gear-motor drive with electric motor:	
- electric motor power, kW	0,25
- electric motor rotation frequency, min-1	1300
- output shaft rotation frequency, min-1	6,5
- reduction rate of gear –motor drive	201
Electric motor of lubricant-coolant feed pump:	
- electric motor power, kW	0,75
- electric motor rotation frequency, min-1	2790
- nominal feed, m³/	3,2
Overall dimensions, mm	3240x1015x1580
Mass, kg	395

TECHNOLOGICAL EQUIPMENT

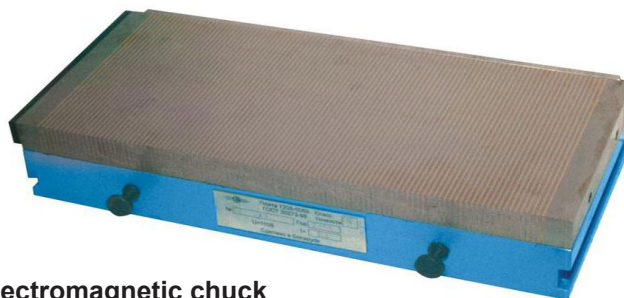
RECTANGULAR ELECTROMAGNETIC AND MAGNETIC CHUCKS WITH CROSS ARRANGEMENT OF POLES

Chucks are designed for fixing of the blanks from ferromagnetic materials being machined on surface grinding machines.



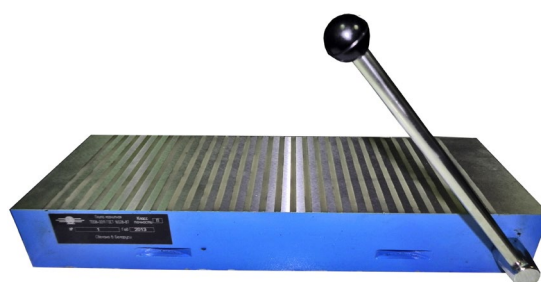
Design features and advantages :

- Possibility of use for fixing parts of small dimensions which is ensured by small distance between poles and cross arrangement of poles;
- Complete hermetic sealing of chucks for ensuring their utilization using coolant;
- High rigidity and accuracy.



Electromagnetic chuck

Parameters name	ELECTROMAGNETIC CHUCK									
	7208-0059-05	7208-0060-05	7208-0063-05	7208-0066-05	7208-0067-05	EMP 4080-05	EMP 40110-05	EMP 6080-05	EMP 60120-05	EMP 73120
Chuck accuracy class as per GOST 30273-98	Heightened precision									
Chuck mirror dimensions (BxL), mm	200x450	200x630	320x630	320x1250	400x630	400x800	400x1100	600x800	600x1200	730x1200
Rated mains supply voltage, V	110 V direct current D.C.)									
Chuck current (when direct current voltage is 110 V), A	0,52	0,7	0,98	0,98	1,4	1,6	2,4	3,21	3,21	3,21
Specific force of attraction with full loading of working surface, N/cm ²	25									
Mass, kg	55	75	125	250	135	200	325	350	485	590



MAGNETIC CHUCKS

Parameters name	MAGNETIC CHUCKS		
	7208-0012	7208-0011	7208-0117
Chuck accuracy class as per GOST 16528-84	Heightened precision		
Chuck mirror dimensions (BxL), mm	200x560	200x630	320x630
Specific force of attraction, N/cm ²	80		
Mass, kg	41,5	52	81,5

MAGNETIC CHUCK

Magnetic chuck is designed to secure the workpiece (mainly of ferromagnetic materials of flat products such as discs, rings, etc.) when they are processed on surface grinding machines. The technical characteristics comply with GOST 24568-81.



7108-0006

Parameters name	7108-0006
Outer diameter, mm	200
Height, mm	75
Specific gravity N_y on pole-not less, N/cm^2	40
Chuck mass, kg	12,0

MULTI-PURPOSE INDEXING HEAD

It is designed for different milling, gear milling, boring, drilling, marking and other operations connected with turning of part on the desired magnitude. The delivery set contains chuck, tailstock center, support. Heads are manufactured in two versions: version 00 is without accessory gears; version 01 – with accessory gears (swing frame).



Parameters name	Value				
	7036-0051	7036-0052	7036-0053	7036-0054	7036-0055
Maximum diameter of machined article, mm	160	200	250	320	400
Transmission ratio of worm indexing head transmission	1:40	1:40	1:40	1:40	1:40
Overall dimension (LxBxH), mm	340x415x185	380x435x240	380x460x250	428x500x305	428x500x350
Mass of head, kg not more	40	50	55	105	110
Total mass of head with attachments, kg not more					
- 00 version	70	81	90	140	160
- 01 version with accessory gears (swing frame)	87	97	106	158	180

MACHINE ACCESSORIES



3E70.P01

GRINDING WHEEL BALANCING ATTACHMENT 3E70.P01

3E70P01 – Maximum diameter of balanced wheel – 320 mm
3E70P01-04 - Maximum diameter of balanced wheel – 400 mm

CIRCULAR INDEXING SINE TABLES 3E70.P11

Table diameter – 160 mm
Maximum angle of table tilting – 45 °
Variants of delivery – with magnetic, three cams chuck or without it.
Overall dimensions (LxBxH) – 240x224x240 mm.
Maximum mass of attachment – 32 kg.

CIRCULAR ROTARY SINE TABLES 3E70.P13

Table (chuck) diameter – 160 mm
Maximum angle of table tilting – 45 °
Rotation frequency of table or magnetic chuck – 41 rpm
Variants of delivery – with magnetic, three cams chuck or without it.
Maximum mass of attachment – 56 kg.

LONGITUDINAL SINE TABLES 3E70.P20

Dimensions of table surface (version without electromagnetic chuck) – 400 x 200 mm.
Dimensions of table surface (version with electromagnetic chuck) – 450 x 200 mm.
Maximum angle of table tilting – 45 °
Variants of delivery – with electromagnetic chuck or without it.
Maximum overall dimensions (LxBxH) – 450 x 200 x 184 mm.
Mass of attachment without chuck – 35 kg, with chuck – 85 kg

CROSS SINE TABLES 3E70.P21

Dimensions of table surface (version without electromagnetic chuck) – 400 x 200 mm.
Dimensions of table surface (version with electromagnetic chuck) – 450 x 200 mm.
Maximum angle of table tilting – 45 °
Variants of delivery – with electromagnetic chuck or without it.
Maximum overall dimensions (LxBxH) – 450 x 200 x 184 mm.
Mass of attachment without chuck – 35 kg, with chuck – 85 kg

GRINDING WHEEL ANGULAR DRESSING ATTACHMENT 3E70.P32

Width of grinding wheel dressing – 75 mm.
Maximum angle of dressing - 60 °
Overall dimensions (length x width x height) - 205 x 220 x 120 mm
Mass of attachment – 9,8 kg.

GRINDING WHEEL RADIUS DRESSING ATTACHMENT 3E70.P35

Maximum dressing radius (convex/concave) - 68/31 mm
Overall dimensions (length x width x height) - 396 x 160 x 240 mm
Mass of attachment - 16,5 kg

TEMPLET VICE 3E70.P40 / PRECISION VICE 3E70.P41

Thickness of workpiece gripped - 0,5 ...70 mm / 0,5 ...100 mm
Width of vice jaw - 69 mm / 119 mm
Overall dimensions (length x width x height) - 300 x 70 x 50 mm / 300 x 120 x 80 mm
Mass of attachment - 3,3 kg / 13,3 kg

SINE VICE 3E70.P42

Thickness of workpiece gripped – 0,5...90 mm
Width of vice jaw – 119 mm
Maximum swiveling angle of vice – 45 °
Overall dimensions (length x width x height) – 390 x 160 x 144 mm
Mass of attachment – 24,5 kg

GRINDING WHEEL DRESSING ATTACHMENTS

3D70.P43 (mechanical), 3D70.P46 (hydraulic), 3D70.P47 (electric)

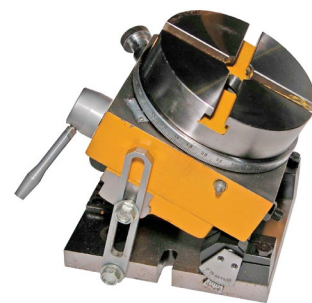
Maximum vertical stroke of poppet sleeve
without resetting / with resetting – 10/102 mm
Maximum horizontal stroke of poppet sleeve – 90 mm

INDEXING DEVICE 3E70.P50

Number of slots in index disk – 24
Maximum diameter of workpiece installed – 100 mm
Maximum length of installed part – 340 mm
Overall dimensions (length x width x height) – 630 x 225 x 140 mm
Centres height – 116 mm. Mass – 35 kg

SWIVELING SINE SQUARE 3E70.P54

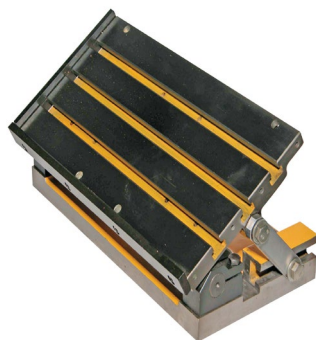
Maximum tilting angle of sine edge - ± 60 °
Maximum swiveling angle of square - ± 60 °
Overall dimensions (length x width x height) - 195 x 200 x 200 mm
Mass - 9,5 kg



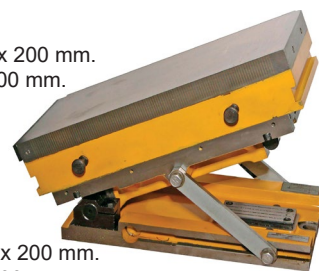
3E70.P11



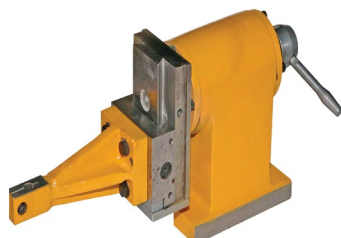
3E70.P13



3E70.P21



3E70.P20



3E70.P35



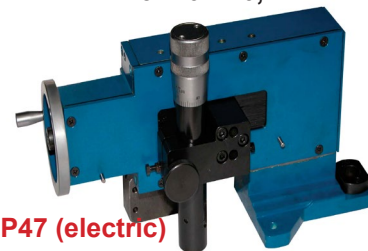
3E70.P32



3E70.P42



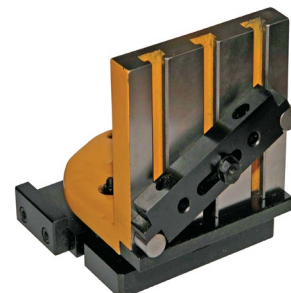
3E70.P40, P41



3D70.P43. P46. P47



3E70.P50



3E70.P54

LEVER SHEARS FOR CUTTING METAL NRL, NRL-1

Lever shears are designed for cutting blanks from sheet metal, bars from circle and other profiles.

The advantages of lever shears are as follows:

- easy, smooth cutting along all the length of cutting;
- high quality knife.

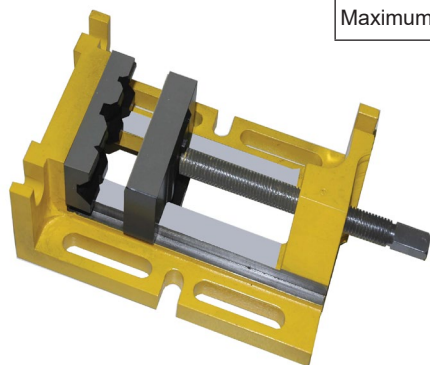


NRL



NRL-1

Parameters name	NRL	NRL-1
Knife length, mm	150	180
Maximum thickness of cut sheet, mm	4	8
Maximum diameter of cut bar, mm	11	15
Maximum dimension of cut square, mm	-	14
Maximum dimension of cut angle piece, mm	-	40

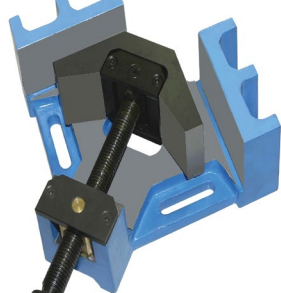


TSS-1

DRILLING BENCH VICE TSS-1

Vice is designed for parts fixation when doing metal working and drilling. Vice can be installed on the face and two side surfaces in addition to the main basic surface. Vice can be equipped with accessory prism jaws for fixation of cylinder parts.

Parameters name	TSS-1
Jaws width, mm	125
Jaws height, mm	50
Maximum stroke of mobile jaw, mm	125
Overall dimensions: length x width x height, mm	352x150x85
Mass, kg	12



SS-1

METALWORK CRAMP SS-1

Cramp is designed for precise angle fixation of parts under right angle when doing welding or mounting works. It provides endurance of angle 90 ° for any connections independent on connections type: angle, joint, connection with bevel or T-type one. Swimming jaw allows to make butt - jointing and welding of parts of different thickness.

Parameters name	SS-1
Maximum opening of gripping jaws, mm	100
Jaws height, mm	50
Overall dimensions: length x width x height, mm	470x326x85
Mass, kg	10



SHKVT

DIE FOR EDGE CUTTING-OUT OF PIPES MODEL SHKVT

Die for edge cutting-out of pipes is designed for machining pipes from steel or non-ferrous metals and alloys with thickness of wall up to 3 mm, Ø 27 – Ø 43 mm, butt-jointing of pipes to each other or welding under angle 90°, combining of one construction from several pipes of different diameter, has horizontal and vertical operation, fits for double-sided connections. Mass is 7,6 kg.

UNIVERSAL BENDING ATTACHMENT MODEL PUG-1

Universal bending attachment allows to form curvilinear profiles from strip (band-pass), round and square rod material including angles, rings, spirals and hoops. The received configurations are the initial material designed for making window and garden grates, gates, wickets, other different tracery constructions from steel, brass, copper and aluminium.

The most effective use is in single - and small – series enterprises and also at home.

Parameters name	PUG-1
Maximum diameter of round rod for bending, mm	10
Maximum width of square rod for bending, mm	10
Maximum dimensions of sheet strip for bending, mm	30x8
Overall dimensions: length x width x height, mm	390x695x145
Mass, kg	26



PUG-1

INDUSTRIAL FURNITURE AND ACCESSORIES

METALWORKER'S WORKBENCHES MODEL OVS

Metal metalworker's workbenches models OVS are designed for convenient organization of working place in workshops, educational establishments, shops and garages.

Workbenches are purchased as a set which can include different variants of table tops and pedestals (boxes quantity and dimensions) as per order. In addition the workbenches can be equipped with holed (perforated) screens (square perforation) and lighting. Workbenches colour of painting and paintwork materials are coordinated with the customer. Delivered knocked-down (kd).

SINGLE - PEDESTAL WORKBENCH OVS 01.103 (OVS 01.106 without lamp) :

- pedestal with drawers (according to order from 2 to 6 drawers)
- central lock of all drawers shut-off
- telescoping guides of drawers
- drawers complete moving-out
- post with luminaire
- permissible loading on drawer: on a small one – 15 kg, on a large one – 30 kg
- holed (perforated) screen with square perforation , height of one section is 200 mm;
- table top (as per order):

Postforming (plastic) with thickness of 28 mm, overall dimensions 1390 x 700 mm (OVS 01.103);

Plywood with thickness of 30 mm with metal covering with thickness of 2-4 mm, overall dimensions 1390 x 700 mm (OVS 01.106 without lamp);

- overall dimensions of workbench: 1390 x 700 x 850h mm
- uniform load: 500 kg.
- weight 95 kg.



OVS-01.103



OVS-01.236

DOUBLE - PEDESTAL WORKBENCH OVS 01.236:

- pedestal with drawers (according to order from 2 to 6 drawers)
- central lock of all drawers shut-off
- drawers complete moving-out
- permissible loading on drawer: on a small one – 15 kg, on a large one – 30 kg
- table top (as per order):

Postforming (plastic) with thickness of 28 mm, overall dimensions 1900 x 700 mm;

Plywood with thickness of 30 mm with metal covering with thickness of 2-4 mm, overall dimensions 1900 x 700 mm;

- holed (perforated) screen with square perforation , height of one section is 200 mm;
- post with luminaire
- overall dimensions of workbench: 1900 x 700 x 850h mm
- uniform load: 500 kg.
- weight 120 kg.



18-7800-5566X01

RACK FOR DOCUMENTS 18-7800-5148:

Mobile (mobile) rack is designed for convenient arrangement of drawings, various types of documents horizontally and vertically. For a better view, the rack is equipped with a fluorescent lamp.

Overall dimensions of the rack: 1396x550x2024mm.

DRAWING STORAGE RACK 18-7808-5566X01:

The metal rack is designed for convenient storage of documents and drawings in a vertical position at production plants and workshops.

There are 6 horizontal shelves. The shelves are equipped with re-installable cells for convenient storage of documents in a vertical position.

You can connect multiple racks in a section.

Overall dimensions (length x width x height) 980x320x2004 mm



18-7800-5148

TOOL TROLLEY TI-1:

Tool trolley mod. TI-1 is designed for storage and efficient movement of tools and attachments at the industrial enterprises, in service centers and job shops.

Painting colour of tool trolley is coordinated with the customer. Delivered assembled.

The trolleys are equipped with convenient handles, upper tray with niches for storage of tools and hardware, rubber wheels (diameter 100 mm): 2 pcs. – rotary ones, 2 pcs. – rotary ones with brake.

- telescoping guides of drawers
- drawers complete moving-out
- central lock of all drawers shut-off
- number of drawers (as per order from 3 to 6 drawers)
- permissible loading on drawer: on a small one – 15 kg, on a large one – 30 kg
- side panels with perforation for possibility of fastening holders and hooks for tool storage
- maximum loading on trolley is 200 kg
- weight 40 kg
- overall dimensions 825x465x840h mm subject to the wheels



TI-1



TROLLEY-BIN

TROLLEY-BIN FOR CHIPS COLLECTION AND TRANSPORTATION:

Tilting trolley-bin is designed for collection and transportation of the chips from metal working machines.

Weight 80 kg

Overall dimensions (length x width x height) 817x1130x400 mm

EXHAUST CABINET FOR TINNING 18-7800-5149:

It is intended for extraction of harmful impurities released during soldering. The working area is located inside the cabinet. Access to the working area is carried out by opening the doors that are on hinges. At the back of the cabinet there is a hole with a pipe for connection to extracting device. The cabinet is made of sheet metal. The joints are welded.

Overall dimensions: 817x1130x400 mm

Weight: 65 kg.



18-7800-5149

METAL WARDROBE 18-7808-5529:

Metal wardrobes are designed for storage of working clothes in workshops, service centers, job shops and private workrooms.

Overall dimensions: 800x1816x500 mm

Weight: 113 kg.

MOVABLE RACK ARRANGEMENT (STILLAGE) SP-1:

Overall dimensions: 1000x750x845 mm

Weight: 25 kg

MOVABLE RACK ARRANGEMENT (STILLAGE) SP-2:

Overall dimensions: 1500x750x845 mm

Weight: 30 kg

STATIONARY RACK ARRANGEMENT (STILLAGE) S-2:

Overall dimensions: 1500x750x845 mm

Weight: 25 kg

MASTER'S TABLE SM-1:

Overall dimensions: 1500x750x750 mm

Weight: 23 kg



18-7808-5529

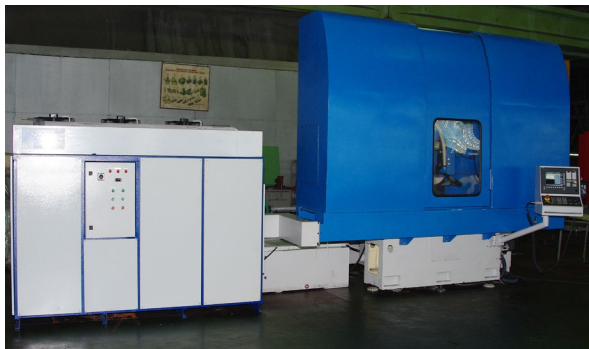


MODERNIZATION AND MAJOR REPAIR OF GRINDING MACHINES

One of directions of plant activities is a restoration, repair and modernization of grinding equipment of own production as well as of other producers. The plant actively works over searching customers, carries out technical expertise of equipment, offers the variants of modernization and repair to customers on different base of home-made as well as foreign components.

Plant realizes major repairs and modernization of the below listed and other grinding equipment:

LSH-220 – surface & profile grinding machine with CNC for creep feed grinding of profile surfaces and deep slops of parts from heatproof and other hard-to-cut materials.
Producer: “Lipetsk machine-tool plant”, Russia.



LSH-233 – special twin-spindle surface & profile grinding machine with CNC for double-sided processing by method of creep feed grinding of precision surfaces of shank ends of gas turbine engine blades.
Producer: “Lipetsk machine-tool plant”, Russia.

SS-13 – special twin-spindle surface & profile grinding machine with CNC for double-sided processing by method of creep feed grinding of precision surfaces of shank ends of gas turbine engine blades.
Producer: «ELB-SCHLIFF WZM GmbH», Germany

CHURCHILL model SHC – spline grinding machine with CNC
Producer: «CHURCHILL», Great Britain

REFORM models RSM-1600, RSM-2500 – spline grinding machines with CNC
Producer: «REFORM Maschinenfabrik Adolf Rabenseifner GmbH Co. KG», Germany
Producer: «CHURCHILL», Germany

WERNER model SKR-20a - spline grinding machine with CNC
Producer: «FRITZ WERNER werkzeugmaschinen GmbH», Germany



The list of operations on modernization and major repairs includes:

- restoration of accuracy parameters and polymer coating of guide ways;
- replacement of ball-screw pairs;
- replacement ball-bearings and seals;
- replacement of system of cooling and coolant-lubricant feed pumps;
- replacement of working zone protection;
- replacement of end switches;
- replacement of low voltage equipment;
- replacement of control system CNC;
- replacement of hydraulic equipment;
- replacement of feedback transducers;
- replacement of all electric communications of machines;
- assembling and start-adjustment works;
- guarantee and post-guarantee servicing;
- personnel training

Modernization will allow:

- to widen technological capabilities of equipment;
- to increase productivity;
- to heighten accuracy of machining;
- to reduce expenses on maintenance;
- to increase the memory volume for programs processing;
- to heighten possibility of machines network for transmitting controlling programs and data acquisition (DAQ) about equipment operation, quick diagnostics (troubleshooting).

These indices heighten economic efficiency of production.

WORKS ON MACHINING PROCESS OF PARTS AS PER CUSTOMER'S DRAWINGS

OJSC Machine-tool plant "Krasny boret" fulfills the following works:

1.	Machining process	
1.1.	Turning	<ul style="list-style-type: none"> – maximum diameter of machined part: above bed is 630 mm, above compound slide is 350 mm; – maximum length of machining is 2800 mm.
1.2.	Milling	<ul style="list-style-type: none"> – maximum width of machined part is 1 800 mm, – maximum length of machined part is 6000 mm.
1.3.	Horizontal boring	<ul style="list-style-type: none"> – table working surface dimensions -1600 x 1800 mm; – maximum vertical travel is 1500 mm; – maximum longitudinal travel is 2000 mm; – maximum cross travel is 1500 mm.
1.4.	Drilling	<ul style="list-style-type: none"> – maximum drilling diameter: steel 50 mm; cast iron 63 mm; – range of threading: steel 45 to M52 x 5, cast iron C4 20 to M64 x 4; – possibility of threading with non-standard pitch
1.5.	Cylindrical grinding	<ul style="list-style-type: none"> – maximum diameter of machined part is 340 mm, – maximum distance between centres is 1400 mm.
1.6.	Internal grinding	<ul style="list-style-type: none"> – maximum diameter of installed part is 340 mm, – maximum distance between centres is 1400 mm.
1.7.	Longitudinal grinding	<ul style="list-style-type: none"> – maximum dimensions of machined part: height 1250 mm, width 1450 mm, length 4000 mm, distance between posts 1540 mm .
1.8.	Profile grinding (cylindrical parts)	<ul style="list-style-type: none"> – maximum diameter of installed part is 390 mm; – maximum length of installed part is 500.
1.9.	Gear milling (cylindrical gears)	<ul style="list-style-type: none"> – maximum diameters of machined part is 350 mm, – maximum modulus is 6
1.10.	Gear grinding (cylindrical gears)	<ul style="list-style-type: none"> – maximum diameters of machined part is 40-320 mm; – machined part modulus is 0,5-4 mm; – number of machined part teeth is 12-200.
2.	Galvanic processing	
2.1.	Chemical oxidation	<ul style="list-style-type: none"> – maximum loading according to overall dimensions 1100x500x600 mm; – maximum weight is 200 kg.
2.2.	Chromizing	<ul style="list-style-type: none"> – stationary bath is 1200x150x600 mm.
2.3.	Glittering nickelizing	<ul style="list-style-type: none"> – stationary bath is 1200x150x600 mm.
2.4.	Galvanization (small ironware and hardware)	<ul style="list-style-type: none"> – part maximum weight is 0,1 kg; – maximum loading of drum is 20 kg.
3.	Iron casting (gray cast iron C420)	<ul style="list-style-type: none"> –maximum weight of casting in clay –sandy mold is 1,5 t.
4.	Heat treatment	
4.1.	Hardening by RF current	<p>Bodies of rotation and guide ways:</p> <ul style="list-style-type: none"> - maximum length of installed part is 1400 mm; - maximum weight is 60 kg. <p>Large-size parts:</p> <ul style="list-style-type: none"> - maximum length of installed part is 2000 mm; - maximum height of installed part is 800 mm; - maximum width of installed part is 900 mm .
4.2.	Bulk hardening	<ul style="list-style-type: none"> –working space of furnace is 600x400x1000 mm;
5.	Laser processing	
5.1.	Sheet metal laser cutting	<ul style="list-style-type: none"> –maximum thickness of machined sheet is 20 mm; –maximum overall dimensions of machined sheet are 1500x3000 mm.
5.2.	Laser marking (of round and flat parts)	<ul style="list-style-type: none"> –maximum diameter and weight of round part is 180 mm; –maximum dimension of flat part is 250x250 mm.
6.	Gas-plasma processing	
6.1.	Sheet metal plasma cutting	<ul style="list-style-type: none"> – maximum thickness of machined sheet is 30 mm; – maximum overall dimensions of machined sheet are 1500x3000 mm.
6.2.	Sheet metal gas cutting	<ul style="list-style-type: none"> – maximum thickness of machined sheet is 90 mm; – maximum overall dimensions of machined sheet are 1500x3000 mm.
7.	Bending	
7.1.	Sheet metal bending	<ul style="list-style-type: none"> – maximum thickness of machined sheet is 5 mm; – maximum length of machined sheet is 3000 mm.
8.	Painting of sheet, basic and body parts, fabricated constructions.	

Plant has an opportunity to make different types of fabricated metals according to customer's design documentation (ECO).

FOR NOTES

[illegible]

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